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**Changing Environment and Competitiveness
in the Food Industry**

**Veranderende Omgeving en Competitiviteit
in de Voedingsindustrie**

door

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Preface and Acknowledgements

With this thesis, I want to convey to the reader my enthusiasm about the role that marketing and strategic management plays in the successful operation of the food processing industry. I also believe that the thesis provides some useful analytical tools, interesting thoughts and comments or suggestions to meet the challenges of today and tomorrow. My target audience includes academics, policy makers, food industry representatives as well as individual food company managers.

This doctoral thesis is the result of research conducted during a significant part of the last eight years. Several people have contributed to the ideas, the development, the creation, the refinement and the finalization of the thesis. This preface presents an excellent opportunity to thank these people.

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Gent, June 2002

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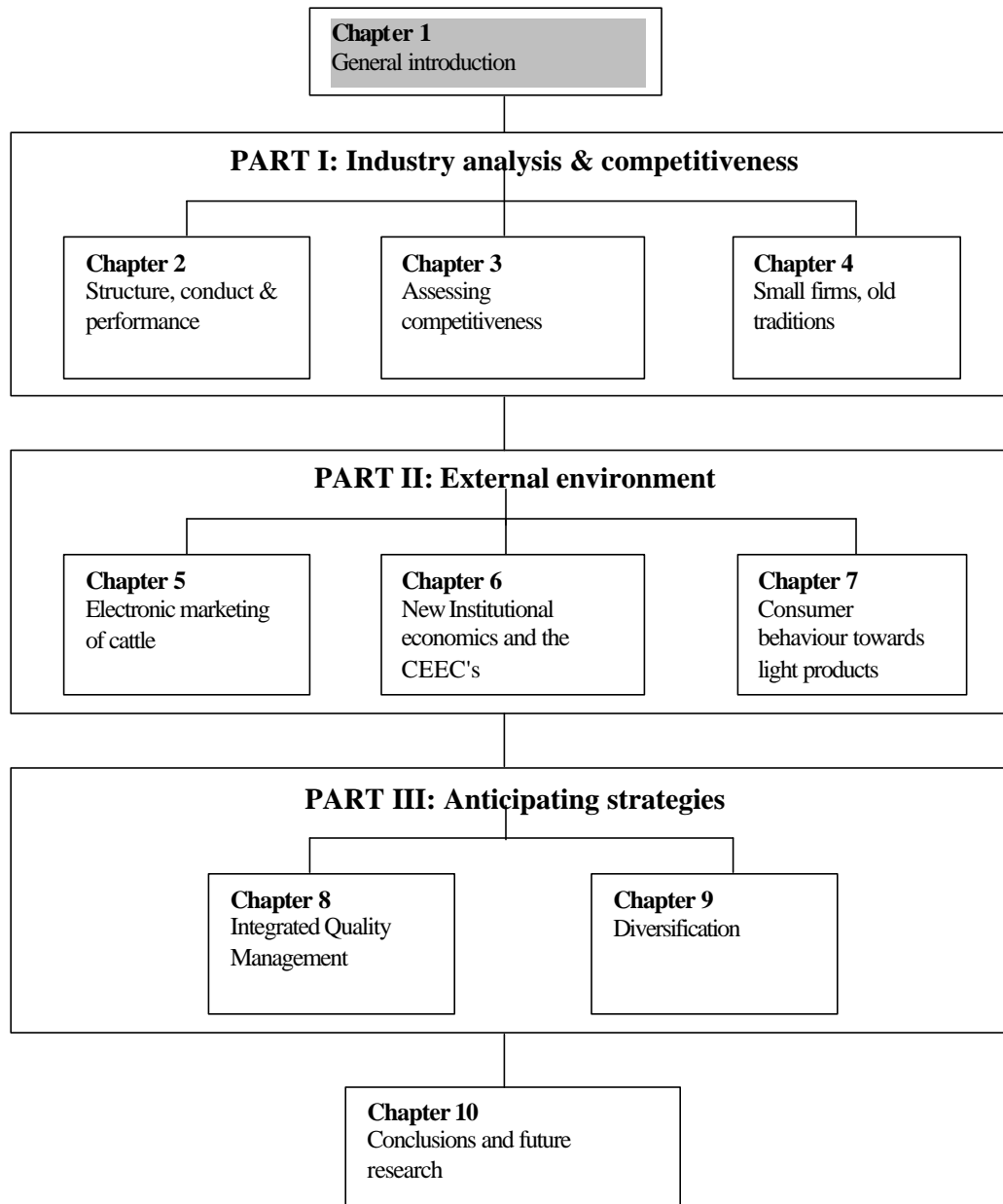
List of Abbreviations

AEI	Agricultural Economic Institute
AP	Attractiveness/Position
BCG	Boston Consultancy Group
BMI	Body Mass Index
BSE	Bovine Spongiform Encephalopathy
BTL	Bradford-Terry-Luce
CAP	Common Agricultural Policy
CFP	Common Food Policy
CEEC's	Central and Eastern European Countries
CMSA	Constant Market Shares Analysis
CSM	Competitive Strength Matrix
DNCA	Dunning-adapted Net Competitive Advantage
DRC	Domestic Resource Cost Analysis
EASE	Electronic Auction Systems Europe
EC	European Commission
ECR	Efficient Consumer Response
e.g.	exempli gratia (for example)
EMS	Electronic Marketing System
et al.	et alii (and other people)
EU	European Union
FDI	Foreign Direct Investments
FDT	Food, Drink and Tobacco
FEOGA	European Orientation and Guarantee Fund for Agriculture
FMD	Foot and Mouth Disease
FMI	Food Marketing Institute
GfK	Gesellschaft für Konsumforschung
GSM	Growth-Share Matrix
H	Hypothesis
HACCP	Hazard Analysis Critical Control Point
IDP	Indifference Price
IKB	Integraal Keten Beheer
IQM	Integrated Quality Management

ISO	International Standards Organisation
LCM	Life Cycle Matrix
MCC	Mission and Core Competences
MLC	Meat and Livestock Commission
n	number of observations
NIE	New Institutional Economics
NTR	Net Trade Ratio
OLS	Ordinary Least Squares
OPP	Optimal Pricing Point
PIMS	Profit Impact Market Strategy
PMC	Price of Marginal Cheapness
PME	Price of Marginal Expensiveness
PSE	Pale, Soft and Exudative
SAPARD	Special Accession Programme for Agriculture and Regional Development
SCM	Supply Chain Management
SCP	Structure, Conduct and Performance
SEM	Single European Market
SME	Small and Medium sized Enterprise
SPSS	Statistical Package for Social Sciences
SWOT	Strengths, Weaknesses, Opportunities and Threats
TCE	Transaction Cost Economics
TQM	Total Quality Management
RCA	Revealed Comparative Advantage
R&D	Research and Development
RIC	Relative International Competitiveness
RSCA	Revealed Symmetric Comparative Advantage
UK	United Kingdom
US	United States
VAP	Value-Adding Partnerships
WTO	World Trade Organisation

Chapter 1

General Introduction



Chapter 1: General Introduction

1.1 Research scope

As the title indicates, this doctoral thesis investigates the changing marketing environment and its effect on competitiveness in the food industry. To conduct this investigation, principles developed in strategic management theory, marketing management theory and public policy are integrated. The emphasis is on changing competitiveness in the food industry and its determinant factors on the one hand and on the way the food industry develops alternative or anticipating strategies as a reaction towards such changes in the external context on the other.

Agriculture and food is front-page news. Society is confronted daily with news about food shortages or surpluses, strikes, environmental disasters, boycotts, trade embargoes, tariffs and quotas, subsidies, food scares and scandals (Stonehouse, 1997; Cramer et al., 2001). Several authors argue that agricultural economists need to integrate knowledge from disciplines other than classical and/or neoclassical economics in order to assess these complex social and economic problems (Just & Rausser, 1989; Libby, 1994; Veeman, 1995; Stonehouse, 1997). In this regard, concepts from industrial economics (new institutional economics, marketing and strategic management) and business economics (resource based theory and competence based theory) are likely to provide particularly useful insights. Within the scope of the thesis, the principles from strategic management are applied and aspects from marketing management and consumer science, from institutional economics as well as from public policy are integrated to help in understanding and predicting better such events, which are typical of the food industry. This is the rationale of this thesis.

The food industry includes all companies that process agricultural commodities and manufacture food products (see Annex 1.1 for an overview of the sectors included). It covers a range of heterogeneous activities, varying from animal

slaughtering through vegetable canning to the bottling of water. The food industry was chosen as the core subject of the thesis because of the fundamental changes the industry faces. This choice was motivated by several factors:

- Over the past three to four decades markets everywhere have been characterized by dramatic changes. The monetary and economic integration of the European Union (EU) is a case in point. These dramatic changes have certainly affected competition in the food processing industry, which is one of the most important branches within the EU economy (Josling & Babinard, 1999) (see Table 1.1). The food industry is the EU's largest manufacturing sector in terms of the value of production. It is second in terms of employment and third in terms of value added.

Table 1.1 Economic importance of the food industry within the EU-15 economy, 1999.

	Value	% in EU manufacturing industries
Production value (in billion Euros)	572	14,4
Value added (in billion Euros)	127	10,5
Trade balance (in million Euros)	1.293	NA
Employment (in 1.000 employees)	2.548	11,5

Source: Based on Eurostat figures. NA = not available

- Food processing is strongly linked with the agricultural sector, which in turn has been governed largely by the operation of the Common Agricultural Policy (CAP). While the CAP directly influences the prices of the raw materials bought by the food processing industry, it has also played, and still plays, a crucial wider role in the creation, evolution and cohesiveness of the EU. The influence of the CAP is not limited only to the EU, but is felt worldwide through its effect, for example, on World Trade Organisation (WTO) negotiations. This strong link between the private food processing sector on the one hand and an agricultural sector heavily dependent on public support and regulation on the other, makes for an interesting study of public-private interaction.

- Food processing is concerned with perhaps the most basic of all commodities and there will therefore always be concerns over the adequacy of supply in times of war and other emergencies (Blandford, 2000). It also relies on supplies that are subject to cyclical movements, mainly because of physical and biological factors. These movements can cause price instability (Cramer & Jensen, 1988).
- Firms in the food industry have generally moved from a strong production orientation towards one that is more consumer and retailer focused in recent years. Since the food processing industry is a vital link in a chain that starts with farming and finishes with the food on our plate, it is interesting to investigate how such reorientation has come about. Clearly, the dramatic changes occurring both upstream and downstream of the food processing industry are considered as the main influences or drivers. Agricultural policy has become more market oriented (European Communities, 2000a) while retailing has become more concentrated and consequently retailers more powerful (Traill, 1998). It is generally accepted that the food industry in Western economies faces an increase in competitive pressure because of the reduction in both trade barriers and subsidies to producers of agricultural and food products (Yon & Bernaud, 1993; Grunert, 1997).
- A typical characteristic of the food industry is that several parties covering the stretch between original producer and final consumer, jointly market the product. Getting food and fiber products to all people in the right form and at the right time and place is an extremely complex process. Many categories of people are involved: those who farm the land, those who provide inputs (feed, seed, fertilizer, pesticides), the processing companies, food wholesalers and retailers. To understand what happens at the processing level, it is extremely important to understand what happens at the level of the agricultural input sector and the farm sector (Beierlein & Woolverton, 1991). This focus on the chain approach is predominant in studying this industry. These chains are characterized by interactions and coordinated marketing policies, which in turn are supported by appropriate marketing institutions such as auctions, marketing co-operatives, marketing boards and futures markets (Meulenberg, 1997). It is quite typical for the

food industry that understanding performance is heavily dependent on the proper functioning of the upstream sectors.

- The food processing industry is the key to increasing prosperity in some agricultural regions (Pierpoint, 1997; Destin, 2000), where it can act as a catalyst for more general regional development. This is important within the context of the proposed expansion of the EU to accommodate the Central and Eastern European Countries (CEEC's).
- The food processing industry has a role to play in economic and consequently social stabilization. Although some of its key supplies are characterized by random fluctuations, it faces fairly stable demand in Western economies, with only limited cyclical movements (Rozin, 1999; Atkins and Bowler, 2001). The evidence suggests low income elasticities for food (around 0.2 overall), compared with much higher elasticities for leisure (1.4) and higher education (1.7) (Samuelson and Nordhaus, 2001).

1.2 Strategic management

After an introduction presenting the evolution in strategic management during the last 40 years, the different components of strategic management are discussed, starting with the context and followed by an overview of potential strategies. Finally, performance and dynamics are discussed.

1.2.1 Introduction

The basis of this thesis can be found in the principles of strategic management, which is about navigating the external environment in a way that makes the most of the firm's assets (Saloner et al., 2001). Therefore, a set of tools and conceptual maps are used to clarify the relationship between context, strategy, actions and the performance of the firm. The process by which firms adapt to the rapidly changing world around them is called strategic management (Haberberg & Rieple, 2001). It is about strategic analysis, strategy formulation, strategy implementation and control. An important dimension of strategic management is to be proactive rather than reactive to external change (Proctor, 2000; Aaker, 2001; Donaldson & O'Toole, 2002).

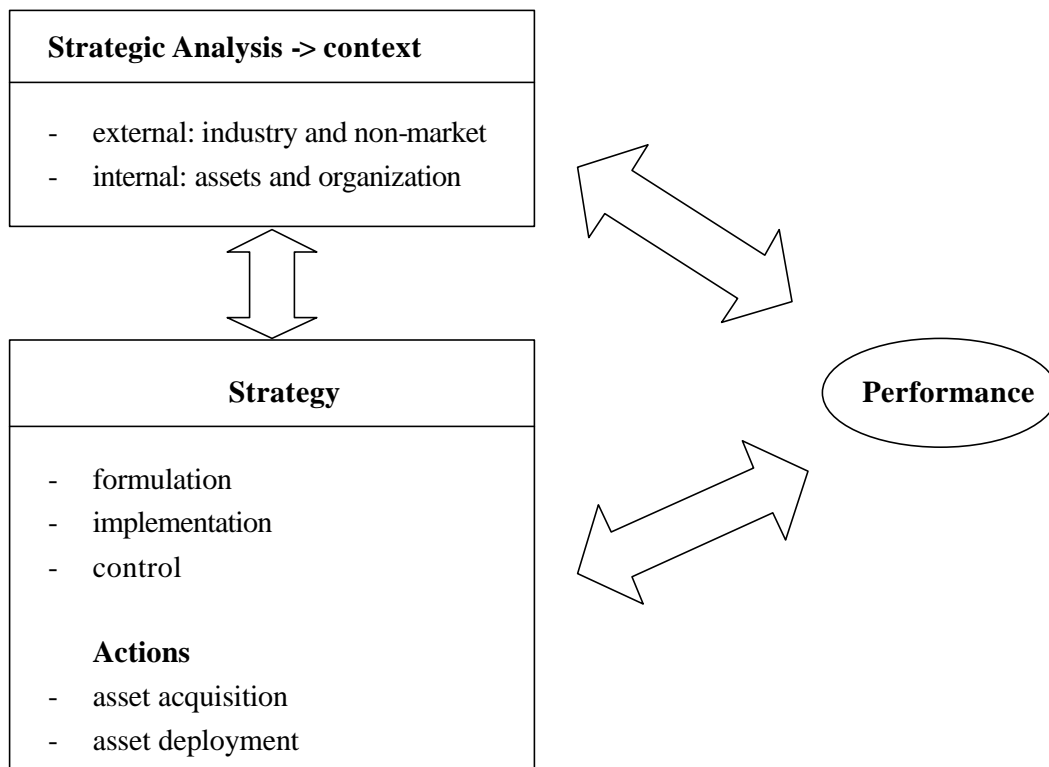
As Barney (2002) indicates, strategic management is one of the least mature disciplines in business economics. During the past 40 years, the strategic management concept has been cross-fertilized from other disciplines such as economics in general, psychology, and political and behavioral sciences (Hoskisson, et al., 1999; Pettigrew et al., 2002; Bowman et al., 2002; Barney, 2002):

- In the 1960s and 1970s, the so-called institutionalists dominated the discourse with a focus on the role of institutions within the strategic process, mostly from a manager's perspective (Chandler, 1962, 1972; Ansoff, 1965; Andrews, 1971; Rumelt, 1974; Mintzberg, 1978). Answers were sought by looking at the internal characteristics of the firm as well as through the examination of the external environment in which the firm operated. The firm was clearly the central point of analysis during this period, with its strengths and weaknesses as key elements.
- In the late 1970s and 1980s, economists influenced strategic thinking in two different directions. The first was linked with the ideas developed in the industrial organization economics (Porter, 1980, 1985). Within this approach, the focus fell on the industries in which firms operate and on the interrelationships between the firm and the industry. More recently, principles from game theory have been introduced into the discourse of such strategic interactions (Camerer, 1991; Saloner, 1991). The second direction relates to transaction cost economics, which provides a powerful tool for analyzing a firm's competitive position (Williamson, 1975, 1985). Within this approach, relations with upstream and downstream sectors are the key element in the analysis of a firm's strategy. The question to be answered relates to how the firm's internal mechanisms and attributes influence firm strategy and performance.
- In the 1980s and 1990s, influence from behavioral scientists gained momentum in strategic management (Pettigrew, 1987; Hannan & Freeman, 1989; Porac & Thomas, 1990; Burt, 1995). Here, the focus was on the functioning and survival of the organization, on the behaviour of its people and on intra- and inter-organizational networks. The focus in other words returned to the internal resources at the disposal of the firm (resource-based view) (Penrose, 1959; Wernerfelt, 1984) and the question was which

resource could give the firm a competitive advantage (Collis & Montgomery, 1995). Prahalad and Hamel (1990) shifted the focus more towards future competitive advantage in relation to firm capabilities and core competence. More recently, the role of knowledge in building capabilities and competitive advantage has been emphasized (Nonaka, 1994; Spender & Grant, 1996; Eisenhardt & Santos, 2002).

These three academic styles are not mutually exclusive, with the result that all still exist and thrive at the beginning of the third millenium. Looking back at the past four decades, the focus of strategic analysis has swung from the firm towards the industry and back again to the firm as the key element in strategic management. However, it is clear that whatever the key element both aspects, namely the external as well as the internal context have a crucial role to play (Figure 1.1).

Figure 1.1 Strategic management.



Source: Based upon Saloner et al., 2001.

1.2.2. Context

The external context of a firm refers to the environmental threats and opportunities, while the internal context refers to its organizational strengths and weaknesses. The external context includes industry characteristics such as customers, competition and suppliers as well as non-market factors such as the technological, regulatory, political and social environment. A customer analysis focuses on market segmentation and the respective needs of these segments. It also includes market analysis in terms of size, growth, profitability, costs, trends and key success factors. Over time, customers have increasingly become active partners rather than mere passive targets of product development and advertising. As Prahalad & Ramaswamy (2000) indicate, companies should encourage active dialogue, mobilize customer communities, manage customer diversity and co-create personalized experiences.

Competitor analysis starts with the identification of both current and potential competitors. The identification can be realized at different levels, including industry (Bain, 1968; Scherer & Ross, 1990; Porter, 1980; Rowe et al. 1990; Proctor, 2000; Saloner et al., 2001; Barney, 2002), strategic groups (Caves & Porter, 1977; McGee & Thomas, 1986; Barney & Hoskisson, 1990; Day et al., 1995; Houthoofd & Heene, 1997; Thomas & Pollock, 1999; Traill, 1999) or customers (Porter, 1980; Proctor, 2000; Aaker, 2001). Such a competitor analysis may include analysis of performance, image and personality, objectives, current and past strategy, culture, cost structure, strengths and weaknesses (Aaker, 2001).

The internal context consists of the assets of the firm and the way in which it is organized. At the level of internal organization, the first step is to understand the problem that the organization is supposed to solve. Here, a distinction is made between the coordination and the incentive problem (Saloner et al., 2001). The coordination problem refers to the acquisition and allocation of the firm's assets. The incentive problem revolves around the inconsistency between the objectives of the firm's owners on the one hand and those of the individuals or groups of individuals that constitute the firm (managers, workers) on the other. It is, in other words, also linked with human resources management. More details and discussions about these problems can be found in Baron &

Kreps (1999) and in Lazear (1997). To face both problems, a manager can work with three levers: architecture, routine and culture. Architecture includes the division of the firm into activity units, the way these units relate to each other, and the recruitment and remuneration policies applied to the people who work in the firm. Routine refers to the formal and informal, but generally accepted, procedures and habits for doing things. Culture comprises the commonly held values, beliefs and habits that characterize decision making within the organization.

1.2.3 Strategies

Both external and internal analyses help in generating strategic alternatives and in providing criteria for evaluating these alternatives. These result in strategy formulation and implementation and in the development of a control or review system to manage change. This assessment should be translated into actions such as asset acquisition and/or asset deployment. Assets refer to know-how, business processes, plant and equipment, infrastructure, brand equity, financial resources, human resources and so forth. Understanding the interaction between the changing context on the one hand and the actions planned on the other is crucial to achieving adequate performance.

A multiple set of definitions exists about strategy (for an overview see Porter, 1996; Barney, 2002). Within the context of this thesis, strategy is defined as the set of decisions on how to allocate resources and achieve sustainable competitive advantage in a selected business (Doyle, 1994). Strategy means developing a formula for how to compete, what the objectives are and how these objectives should be attained. It is a kind of philosophy indicating the type of products or services a company will produce, the basis on which competition will be faced and the type of resources a company must have or develop to implement the strategy successfully. Once the strategy is defined, a detailed action plan can be developed.

An overview of strategic alternatives is presented in Aaker (2001) and in Barney (2002). The latter makes a distinction between business and corporate strategies. Business strategies focus on actions that firms can take in a particular

or single market or industry. Corporate strategies concentrate on actions that firms can take to lever their resources across several markets or industries simultaneously. Within the context of the thesis, we shortly discuss the following strategies (Porter, 1980; Doyle, 1994; Aaker, 2001; Barney, 2002): vertical integration, cost leadership, product differentiation, focus strategies, flexibility, tacit collusion, strategic alliances, corporate diversification, and merger and acquisitions:

- *Vertical integration* is related to the decision whether or not to be active in particular business functions or not. It has to do with the construction of the value chain of the firm. Through vertical integration firms get access to supply or demand (backward and forward integration), obtain more complete control over the quality of the product or service or enter into an attractive business area. It is obvious that vertical integration also includes some disadvantages and more specifically the risk of managing a different business and the reduction in strategic flexibility.
- *Cost-leadership* concentrates on reducing the economic costs of a firm below that of all its competitors. Differences in costs between two firms producing the same product can have several causes, including economies of scale, learning-curve economies, differential access to resources, different product design and service, and technological differences.
- *Product differentiation* aims at creating differences in the perceived value of the product or service, often the result of alternations to the product or service properties. However, product differentiation remains a matter of customer perception, whether or not the intrinsic properties are different. Most successful strategies are not limited to low-cost advantages, but at the same time offer some difference in perceived value. Differentiation can be based on a lot of factors, e.g. design, ingredients, product line breadth and service. To be successful in following such a strategy, quality management is essential and complemented by branding. Originally, Porter (1980) suggested that companies should choose between either cost competitiveness or product differentiation, as those focusing on both strategies would perform poorly. However, recent research illustrates that simultaneously implementing cost-leadership and product differentiation strategies can be successful (Womack et al., 1990).

- *Focus strategies* concentrate on a specific part of the market or product line. Focus strategies usually include differentiation or cost-leadership, but add particular attention to market segmentation, product focus and geographic focus. Typical characteristics of focus strategies are to avoid strategy dilution or distraction, to compete with limited resources, to reduce competitive pressure, bypass competitor assets and competencies and provide positioning strategy.
- *Flexibility* is considered to be an important attribute of any strategy in markets that are characterized by a high level of uncertainty and consequently by high risks. This is certainly the case in markets where competition is strong and where the outcomes of strategic alternatives are difficult to predict. Flexibility is an important attribute in such markets as it means that a company is able to change direction quickly and at low cost. Flexibility is mostly related to the access to and power over assets, and can take numerous forms, namely the option to defer, the option to grow, the option to contract, the option to shut down and re-start, the option to abandon and the option to expand.
- *Tacit collusion* is a co-operative strategy. There are several examples of co-operative strategies such as joint ventures, licensing agreements, distribution agreements or explicit collusion. Two broad categories are distinguished: collusive strategies and strategic alliances. The former means that firms within an industry co-operate to reduce competition and raise prices above the fully competitive level. The latter means that firms within an industry co-operate, but competition is not reduced. Collusive strategies exist within an industry and are considered to be business strategies, while strategic alliances can be situated at business and at corporate level. Explicit collusion means that firms directly negotiate production and prices, actions that are usually illegal. In the case of tacit collusion, firms indirectly coordinate production and prices by observing output and the pricing behaviour of other firms. Both aim at avoiding rivalry. Collusion strategies are hampered by the incentive to cheat on co-operative agreements. Because of such problems, tacit collusion is possible only in an industry characterized by a small number of companies with similar costs and products. Moreover, firms need

the skills necessary to interpret the signal indicating the willingness to collude. Therefore, tacit collusion is not widely implemented.

- *Strategic alliances* occur when firms co-operate in the development, manufacture or sale of products or services. This can happen in one single market (business strategy) or in different markets (corporate strategy). Three categories of strategic alliances are distinguished: non-equity alliances, equity alliances and joint ventures. In the case of non-equity alliances, no equity positions are taken in each other's firms. Examples of non-equity alliances include licensing, and supply and distribution agreements. In the case of equity alliances, one partner invests in the other and in the case of a joint venture, the investments are jointly realized. The motivation for strategic alliances includes economies of scale, limiting risks and costs, facilitating tacit collusion, low-cost entry in markets and managing uncertainty.
- *Corporate diversification strategy* means that one firm brings multiple businesses within the boundaries of the company. Traditionally, three types of corporate diversification have been distinguished. Limited diversification means that a dominant share (more than 70%) of a firm's activities are within a single industry. Related diversification exists when a firm moves away from one market or industry and follows higher levels of diversification (less than 70% originates from a single market or industry), but in related industries. Unrelated corporate diversification occurs when less than 70% of a firm's revenues are generated from a single industry and when the different industries it serves share few common attributes. Corporate diversification can be motivated by several elements such as exploiting operational, financial and anti-competition economies of scope. Often interest conflicts arise between a firm's outside investors and its managers, the so-called agency problems. To avoid such problems, it is important for companies to create low-cost and effective monitoring and bonding activities.
- *Mergers and acquisitions* are used to create corporate diversification strategies and are mostly accomplished between strategically related firms. Mergers and acquisitions are motivated factors such as the desire to survive, the existence of free cash flow, agency problems between bidding firm managers and equity holders, managerial hubris and the possibility to earn

above normal profits. Particular problems related to mergers and acquisitions are linked with cultural differences between bidding and target firms.

1.2.4 Performance and dynamics

Strategy, as well as the context in which firms operate, determines performance. Performance can be measured through different indicators (Haberberg & Rieple, 2001; Barney, 2002):

- Financial indicators such as return on capital employed, profits and cash flow;
- Growth indicators such as market share, number of customers and number of contracts;
- Shareholders' indicators such as earnings per share, economic value per share, dividend per share and net asset value per share;
- Operating indicators that measure different aspects of efficiency and effectiveness such as asset turnover, profit margin, debtors measured in days of sales and stock turnover.

To evaluate performance, it has to be placed in a broader environment. It can be done by comparing actual performance with past performance or with performance of for example other companies, sectors or countries. Recently, more attention has been given to the views and interests of stakeholders other than shareholders (Mills & Weinstein, 2000; Young & O'Byrne, 2000; Scheipers et al., 2002). The idea is that a successful business will have purposes other than only the maximization of shareholder value. A business should provide returns to all its stakeholders in order to gain legitimacy for its use of scarce resources. Examples of stakeholders (besides shareholders) include top managers, employees, customers, suppliers, government and the public in general (Grant, 1998).

The arrows in Figure 1.1 indicate the relationship between the different components of strategic management as well as its dynamic character. It is logic that a change in the deployment and acquisition of assets leads to a change in the context. High performance of a company or industry could attract for example new entrants and in turn highlight the need for an adapted strategy. If a firm is performing poorly and willing to survive, a review and adaptation of the

current strategy is required. The main challenge for the manager exists in maintaining a mental map of the relationships between the external and internal environment, the strategy and its actions, and performance. The manager must understand what has changed in these relationships to know how to adapt.

1.3 Conceptual framework and research questions

In line with the components of strategic management, the conceptual framework of this thesis is portrayed in Figure 1.2. The thesis focuses on changes in the external context or environment of the food industry and its sectors, and not on the internal organization of the individual firm. The external environment refers to the elements external to the industry. It means that industry characteristics such as industry structure, industry life cycle or internal rivalry are not considered as external, but rather as the internal context of the industry.

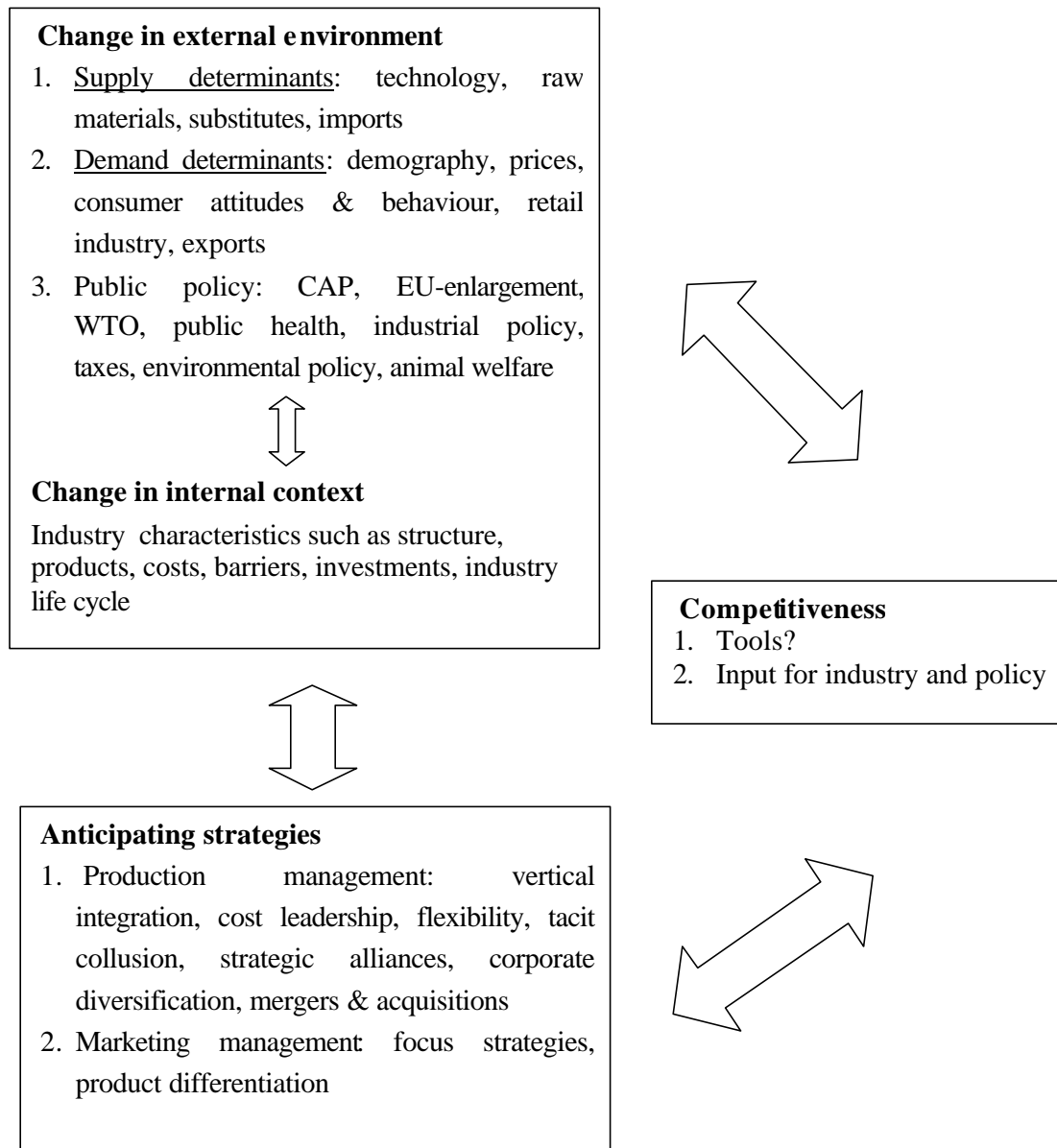
Change may be the greatest strategic challenge that managers face (Imai, 1986; Wierenga et al., 1997; Moenaert & Robben, 1999; Saloner et al., 2001). Many changes are situated at the level of the external environment and result from changes in demand and supply conditions or from changes in the non-market environment such as political and social situations. Because of such changes, firm strategy may no longer be aligned with its external context and in turn may require change. This challenge may be bigger when the nature of change, and consequently its outcomes, is uncertain. Fast and adequate reaction towards change results in competitive advantage and consequently in high competitiveness or performance.

The external context of the food industry is undergoing profound changes. The impact of some of these changes, such as an industry's changing position in the life cycle (introduction, growth, maturity and decline), is quite easy to predict. The impact of other changes is less predictable, especially when the influences on the food industry are more indirect. The idea of the thesis is to study some of these changes in the external environment and especially their impact on:

- The internal context or the industry characteristics;

- Competitiveness or performance;
- Anticipating strategies.

Figure 1.2 Conceptual framework.



Three categories of changes in the external environment can be distinguished, namely those resulting from changes in demand determinants, supply determinants and public policy. A non-exhaustive list of determinants is presented as illustration for each category in Figure 1.2. These examples include financial pressures created by low commodity and product prices, rapid

technological advances, new market entrants and mergers, foreign competition and government intervention. As a result food industry sectors and companies are working in a new, exciting and complex decision making environment.

At the level of anticipating strategies, a distinction is made between strategies situated in the field of production management on the one hand and marketing management on the other in order to illustrate where the main accent of the strategy can be found without being unnecessarily prescriptive about such categories. Within the field of the agri-business in the EU, concepts such as supply chain management and efficient consumer response have been recently introduced. These concepts can not be considered as anticipating strategies, but are extremely useful to implement anticipating strategies such as strategic alliances and vertical integration. The use of these concepts is more related to the development of an action plan, which is quite similar to the use of principles developed in business economics and the organizational theory (Omta et al., 2001).

In the frame of this thesis, performance or competitiveness is studied at the level of the food industry as a whole and at the level of specific sectors such as the pig meat sector or the processed vegetables sector. Therefore, a tool for measuring competitiveness at sector level is developed. Competitiveness is considered from an industry or sector representative's and a policy maker's point of view, hence required actions to manage change are suggested and illustrated using an industry or sectoral approach and not an approach from the individual firm. To this end an industrial sector is defined as a group of firms that produce similar products with the help of similar techniques (Daems & Douma, 1989).

It is clear that not all changes in the environment, in competitiveness or in performance aspects and the resulting anticipating strategies can be discussed within the scope of a single thesis. As the structure of the thesis indicates (see 1.5) some key elements have been selected for further investigation, motivated by the scientific as well as empirical relevance of these issues. The motivation for selecting such a broad research topic, covering a large variety of aspects affecting the competitiveness of the food industry, is linked with the ambition to

present the whole picture. Too often, a fragmented or narrow view of the influencing factors is presented, which leads to misinterpretation and falsified conclusions. As indicated above, we are aware that presenting the full story in the frame of a single thesis is not possible. However, this thesis attempts to broaden the view of both scientific and empirical research in tackling the problems affecting the food industry.

Within the frame of the thesis, the following research questions are answered:

- 1) *What are the interrelationships between structure, conduct and performance (SCP) of the food industry?* In several studies (Archibald et al., 1985; Connor et al., 1985; Marion, 1986; Zellner, 1995; Stark & Morgan, 1995; Suter & Henneberry, 1996; Connor & Schiek, 1997; Covino & Mariani, 1999; Agriculture and Agri-Food Canada, 2000), researchers illustrate the evolution of different components of the SCP-paradigm, but few investigate the interrelationships between the components and their mutual impact. Hence the structure, the conduct and the performance of the EU food industry is investigated in this thesis, with special attention to the interrelationships between these different components.
- 2) *How should competitiveness at industrial sector level be evaluated?* Hereby, a distinction is made between measuring and explaining competitiveness. A new tool for measuring competitiveness at sector level, namely the attractiveness/position (AP) indicator, is developed. Next, a set of methods intended to explain competitiveness is presented, of which one is used to explain competitiveness of the pig meat sector.
- 3) *What are the possibilities and problems when introducing a technological innovation in a traditional sector such as the agribusiness sector?* The scientific literature shows that R&D in general and technological innovation in particular are underdeveloped in the agribusiness sector (Christensen et al., 1996; Henson, 1996; Earle & Earle, 1997; Traill & Grunert, 1997) and particularly in the marketing systems of agricultural products (Jolly, 1983; Pennings & Meulenber, 1997; Meulenber, 1997; Jongen & Meulenber, 1998). In this thesis problems encountered in the introduction of electronic marketing to the cattle sector are analyzed empirically, and some necessary conditions for success are proposed. This example is chosen because of the

current discussion and public debate about the use of cattle markets for the commercialization of cattle. This discussion must be placed in the context of increasing consumer concerns about animal welfare (Cowan et al., 1998; Von Alvensleben et al., 1998; Blandford & Fulponi, 1999; Henson & Traill, 2000; Blandford et al., 2002).

- 4) *What can the new institutional economics literature contribute to a better understanding of the difficulties of Central and Eastern European Countries (CEEC's) in preparing accession to the EU?* Several authors illustrate that the preparations for the accession of the CEEC's to the EU have not run as smoothly as expected (Swinnen, 1996; Dewatripont & Roland, 1997; Hobbs et al., 1997; Gow & Swinnen, 1998a; Buckwell & Tangermann, 1999; Froberg & Hartmann, 2000; Declerck, 2001; Maresceau & Lannon, 2001). The thesis empirically investigates these problems using the principles developed in the new institutional economics literature and examines new ways of understanding the issues at hand.
- 5) *What determines changes in consumer behaviour towards food and how does this influence marketing management?* It is clear that changes in consumer behaviour have a significant influence on companies' marketing strategies. The food sector is currently faced with dramatic changes at consumer level. Several authors have recently investigated such changes: declining meat consumption (Latouche et al., 1998; Henson & Northen, 2000; Verbeke et al., 2000; Buzby, 2001), a reluctant attitude and behaviour towards biotechnology (Hoban, 1998; Viaene et al., 2000a; Huffman et al., 2001), increasing interest in food safety (Miles et al., 1999; Smith et al., 1999; Caswell, 2001) and labeling (Verbeke & Viaene, 1998; Tootelian & Ross, 2000; Nayga, 2001), increasing interest in quality assurance schemes and production methods (Schifferstein & Oude Ophuis, 1998; Philipsen & Anderson, 1998; Henson & Traill, 2000; Von Alvensleben, 2002), taste preference shifts (Cortez & Senaurer, 1996; Shepherd, 2001) and functional foods (Jonas & Beckmann, 1998; Poulsen, 1999). This rich variety of changes at consumer level make the food sector an ideal subject for investigating such problem. Therefore, the focus of this thesis is on an empirical investigation of 'light' products, using the Triandis-model as an input for marketing managers as they adapt their marketing strategies.

- 6) *Does a strategic alliance based on integrated quality management provide the potential for meeting consumer requirements?* The basic idea for integrating this chapter in the thesis is linked with two main changes that characterize recent developments in the agri-business sector. First, during the last two decades new management techniques such as supply chain management (Boehlje et al., 1995; Trienekens & Zuurbier, 1996; Ziggers et al., 1998; Trienekens & Zuurbier, 2000), efficient consumer response (FMI, 1993; Wipple et al., 1999), value adding partnerships (Wierenga, 1997; Northausen, 2001) and total quality management (Crank, 1995; Ortmann, 1997) have been introduced in the agribusiness sector. Second, several studies indicate that consumers are increasingly interested in the way agricultural and food products are produced (Oude Ophuis, 1994; Van Trijp et al., 1997; Philipsen & Anderson, 1998; Henson & Traill, 2000; Von Alvensleben, 2002). Therefore, the applicability of these new management techniques, which are mainly oriented towards increasing efficiency, is investigated in order to establish whether they can simultaneously be used to respond to these changing consumer concerns. In this regard, the case of the processed-vegetables sector is studied.
- 7) *Can agricultural policy learn from marketing research in promoting farm diversification?* Since the reform of the CAP at the beginning of the 90s, market oriented production has been promoted. However, several studies on the effectiveness of the reformed CAP indicate that policy makers have failed to take proper account of market conditions in designing policy measures (Gavin, 1994; Henrichsmeyer & Witzke, 1998; Revell, 2000). The thesis empirically illustrates that integrating marketing management principles should result in higher efficiency of the CAP.

1.4 Scientific contribution

Two categories of intended scientific contributions can be distinguished in this thesis, namely a methodological and an empirical contribution. The methodological contribution consists of two types, which can be identified throughout the thesis. The first type of methodological contribution is the

development of an analytical tool, namely the AP-indicator to measure competitiveness at sector level. It enables the analyst to assess competitiveness in a unique way and to produce a tangible result. The second type of methodological contribution concerns the use of methods generally accepted in market research (De Pelsmacker & Van Kenhove, 1994; Malhotra, 2000) and to introduce these methods in agricultural economic research. In this way, knowledge useful to a deeper understanding of agricultural economics and agricultural marketing is generated. Qualitative research techniques are used to generate inputs for hypothesis formulation, while quantitative methods are used for hypothesis testing.

The thesis contributes to empirical research by investigating change in the environment of the food industry from an industry or sector perspective. Moreover, the thesis illustrates that knowledge and principles often used in both strategic and marketing management can provide useful ideas and input for both policy makers and industry representatives. In this way, the concern of integrating knowledge from other disciplines than classical and neoclassical economics is addressed and part of this gap is addressed.

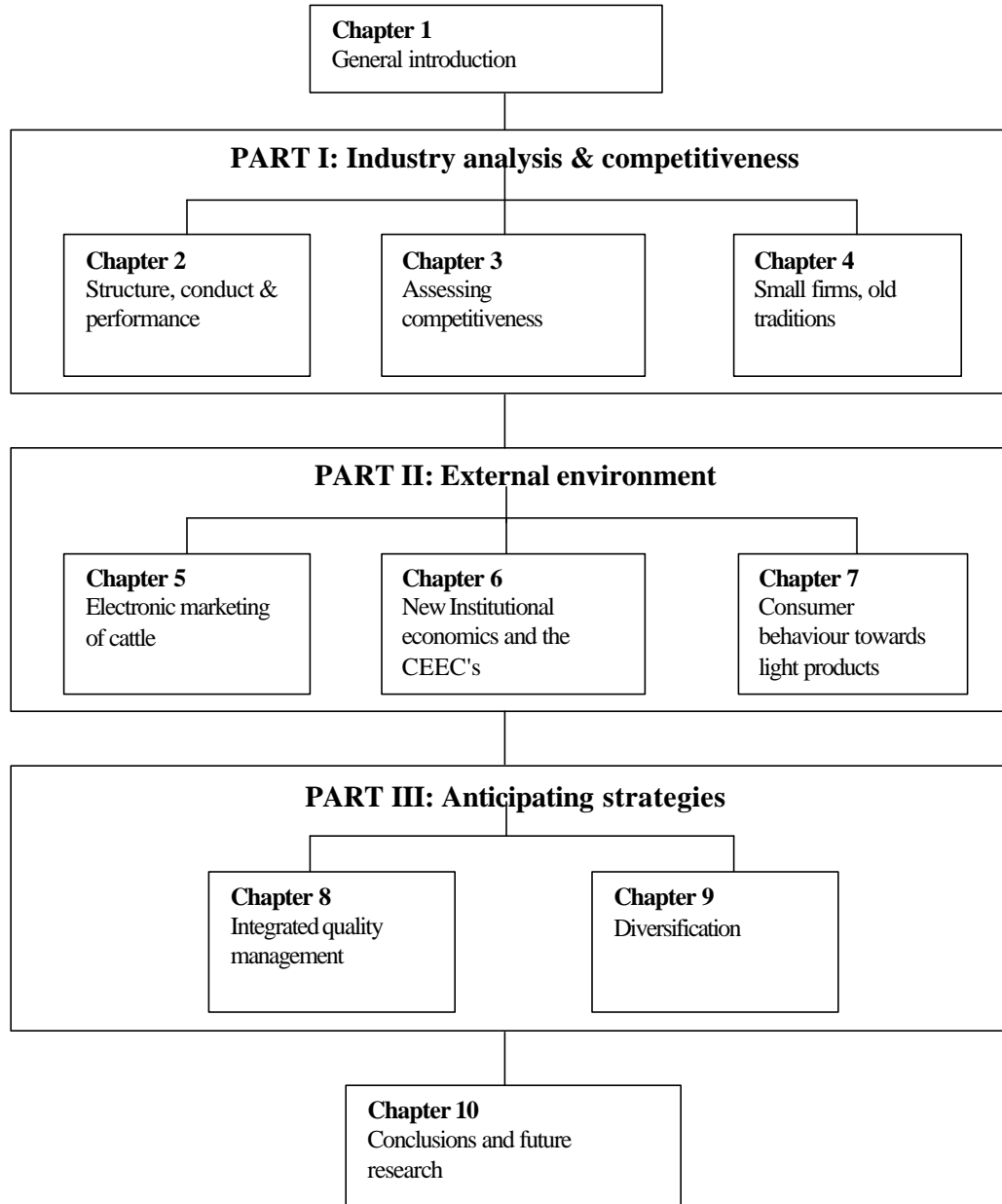
The research presented in the thesis also enables to stipulate a significant agenda for future research. Based on the findings in each chapter, topics for future research are identified. Executives are striving to interpret the determinants of competitiveness. To assist them, there is a clear need for further building theory and developing tools and methods for successful management and public policy. The future research agenda is presented in the final chapter.

1.5 Structure & research design

Figure 1.3 visualizes the structure of the thesis. After the general introduction, part one focuses on industry analysis on the one hand and competitiveness on the other. Chapter two investigates the structure, conduct and performance of the EU food industry. In chapter three, an analytical tool for assessing competitiveness at sector level, namely the AP-indicator is developed. In

chapter four, the AP-indicator is applied to the pig meat sector, which is characterized by small firms and old traditions. Porter's Diamond (1990) is used to explain competitiveness.

Figure 1.3 Thesis structure.



In part two, some changes in the external environment are discussed. Chapter five focuses on technological innovation, namely electronic marketing and its impact on changes in bargaining power within the cattle chain. In chapter six,

the problems associated with the accession of CEEC's to the EU are discussed through the use of the new institutional economics approach. Chapter seven looks at changes in consumer concerns and preferences and more specifically at willingness to change health related behaviour.

Part three focuses on anticipating strategies. Chapter eight discusses recent evolutions in quality management and more specifically in integrated quality management as part of chain management. It starts from changes at consumer level and looks at how these changes can be translated throughout the chain in order to respond to such changes. Chapter nine investigates diversification strategies stimulated by public authorities and verifies whether or not the way these are implemented corresponds with market requirements.

The information required to answer the research questions is collected through exploratory as well as conclusive research methods. Hereby, both secondary and primary data sources are consulted. At the level of exploratory research literature review, expert interviews as well as focus group discussions are used. At the level of the conclusive research, quantitative research techniques are used to statistically validate insights gained from explorative research. Therefor, several surveys were organized, both with consumers and company representatives. Characteristics of the survey designs are mentioned in each of the concerned chapters.

Chapter ten recapitulates the main results of each chapter and provides at the same time an answer to the research questions. This is followed by a discussion of the implications of the thesis and by describing the limitations of the research and by suggesting some directions for future research.

When data, schemes or figures are presented without mentioning the source, it means that these elements are collected or created by the researchers themselves. In the opposite case, the source is mentioned.

The thesis includes a selection of eight papers (Chapter 2 - Chapter 9), which were or will be presented in international scientific journals or as co-author contributions in a book. All papers were subject to the peer review procedure.

Two papers were published in journals mentioned in the Social Sciences Citation Index, namely the *European Review of Agricultural Economics* and the *Journal of Agricultural Economics*. Annex 1.2 provides an overview of these papers, indicating the journals and books where the work was or will be published.

Annex 1.1 Overview of the sectors included in the food industry (Source: Eurostat,1996).

The definition of the activities included in the food industry is based on the NACE Rev. 1 classification system of economic activities in the European Union. The food industry includes the following sectors:

- 15.1 Production, processing and preserving of meat and meat products
- 15.2 Processing and preserving of fish and fish products
- 15.3 Processing and preserving of fruit and vegetables
- 15.4 Manufacture of vegetable and animal oils and fats
- 15.5 Manufacture of dairy products
- 15.6 Manufacture of grain mill products, starches and starch products
- 15.7 Manufacture of prepared animal feeds
- 15.8 Manufacture of other food products
- 15.9 Manufacture of beverages

Often the food industry also includes the tobacco sector:

- 16.0 Tobacco products

Annex 1.2 Overview of the journals and books where the research results were or will be published.

Viaene, J. & Gellynck, X. (1995).

Structure, conduct and performance of the European food sector. *European Review of Agricultural Economics*, 22, 282-295.

Gellynck, X. & Viaene, J. (2002).

Assessing Competitiveness in Agribusiness at Meso Level through the Attractiveness/Position Indicator. Paper in second review for *Agribusiness: An International Journal*.

Viaene, J. & Gellynck, X. (1998).

Small firms, old traditions equals low profit: pig meat processing in Belgium. In W.B. Traill & E. Pitts (Eds). *Competitiveness in the Food Industry*. Bury St Edmunds, Suffolk, UK: Blackie Academic & Professional, Chapman & Hall, pp. 149-178.

Viaene, J.; Gellynck, X. & Verbeke, W. (1998).

Electronic Marketing of Cattle: Possibilities and Problems. *Journal of International Food & Agribusiness Marketing*, Vol. 9(4), 81-97.

Gellynck, X.; Halicka, E. & Viaene, J. (2002).

New Institutional Economics as a Tool for Improving Transaction Governance in the Polish Fruit sector. *Journal for East European Management Studies*, Vol 7 (3), 142-161.

Viaene, J. & Gellynck, X. (1997).

Consumer behaviour towards light products in Belgium. *British Food Journal*, 99(3), 105-113.

Viaene, J.; Gellynck, X. & Verbeke, W. (2000).

Integrated quality management applied to the processed-vegetables industry. In R. Shewfelt & B. Brückner (Eds.). *Fruit and Vegetable Quality: An integrated overview*. Lancaster: Technomic Publishing Company, pp. 246-266.

Gellynck, X. & Viaene, J. (2002).

On-farm processed foods and farm diversification. *Journal of Agricultural Economics*, 53(3), forthcoming.

PART ONE

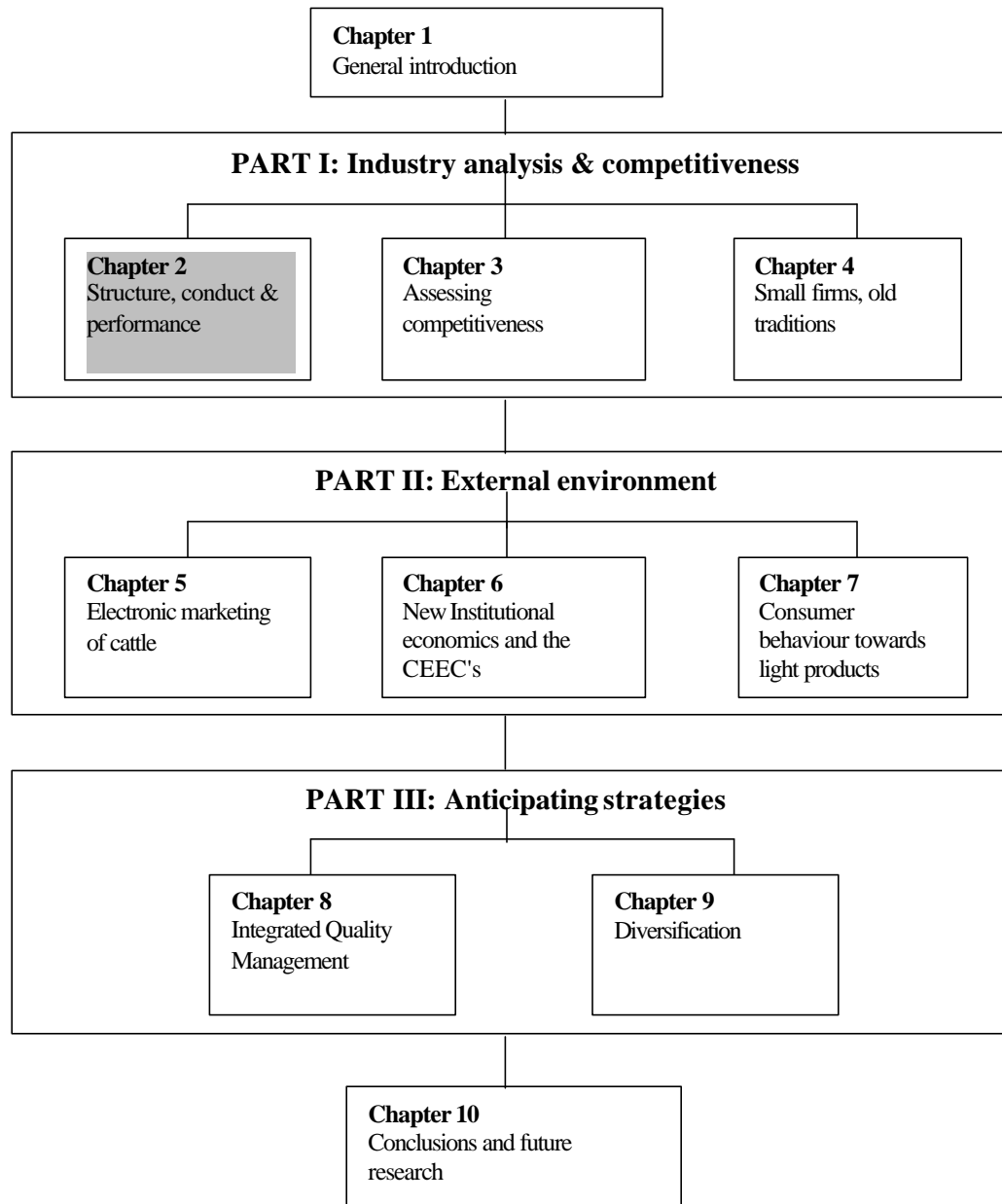
Chapter 2

Structure, Conduct and Performance of the European Food Industry

This chapter is adapted from:

Viaene, J. & Gellynck, X. (1995a). Structure, conduct and performance of the European food sector. *European Review of Agricultural Economics*, 22, 282-295.

Gellynck, X.; Verbeke, W. & Viaene, J. (2002). Food Processing. In P. Johnson (Ed.). *European Industries*, London: Edward Elgar (forthcoming).



Chapter 2: Structure, Conduct and Performance of the European Food Industry

2.1 Abstract

The Food, Drink and Tobacco (FDT) industry in the European Union (EU) is evaluated using the Structure-Conduct-Performance (SCP) paradigm. Hereby, the focus is on interrelationships between the components of the SCP-paradigm and their mutual impact. Statistical data and interviews with experts are the main information sources for this analysis. The structure of the FDT industry is characterized by increasing concentration, largely determined by growing concentration in the retail sector and consumer demand for variety and quality. Competitive conduct in the FDT industry involves both horizontal and geographic diversification, brought about through mergers and acquisitions. It also relates to product development and more recently to traceability systems. The overall performance in the FDT industry is adequate. Productivity, prices and profitability are higher in large companies and in sectors where concentration is high. Between sectors, differences in performance are noticed. Sectors such as the dairy, alcohol and spirits sector are characterized by a weakening position because of low performance.

2.2 Introduction and objective

The food processing industry covers a range of heterogeneous activities, varying from animal slaughtering through vegetable canning to water bottling. It includes all businesses that process agricultural commodities and manufacture food products. The common element within this large variety of activities is that the end goal is food consumption (Audroing, 1995). Food processing is traditionally seen as being closely linked to farming and to domestic household activities. Many food processing activities such as butter or cheese making, were originally performed at the farm and skills such as pickling and baking were traditionally mainly found in domestic kitchens (Connor & Schiek, 1997).

Over the last five decades, the ‘distance’ between farming and processing on the one hand and between farmer and consumer on the other has lengthened. This has meant that food processing has now become quite similar to the rest of manufacturing.

In the publications of the European Commission, the food, drink and tobacco sectors are frequently analyzed together (European Commission, 2000b) and this chapter follows this practice (see Annex 1.1 for classification system). The aim of this chapter is to evaluate the recent development and current situation of the industrial organisation in the European FDT industry. Special attention is given to the four Member States with the largest FDT industries, namely Germany, France, United Kingdom and the Netherlands.

The chapter's structure is as follows. First, the theoretical framework is discussed by indicating the different components of the SCP-paradigm. Second, the structural evolution of the food processing industry is explored. Particular attention is paid to the size of firms operating in the industry. Additionally, the factors determining structural change are identified. It relates to the basic conditions of supply and demand that faces the FDT industry. On the supply side, we focus on the impact of the structure of the FDT industry on the agricultural sector. On the demand side, we give an overview of trends in food consumption on the one hand and in food retailing on the other. Third, the conduct of firms in the industry is analyzed. This analysis includes the study of strategies aimed at responding to changes in consumer needs and requirements and to the increased competitive pressures that have been experienced in the sector. Also, the relationship between structure and conduct is discussed. Fifth, performance of the FDT industry in the EU is assessed and described. Performance can be measured through different indicators, relating to such factors as finance, growth, stakeholders' interests or operations (Haberberg and Rieple, 2001; Barney, 2002). Here, we evaluate performance using growth, labor productivity, external trade, price stability and profitability as measures and indicate the impact of structure and conduct on performance. Sixth, structure, conduct and performance patterns for some sectors in the FDT industry are explored. Finally, we draw some conclusions.

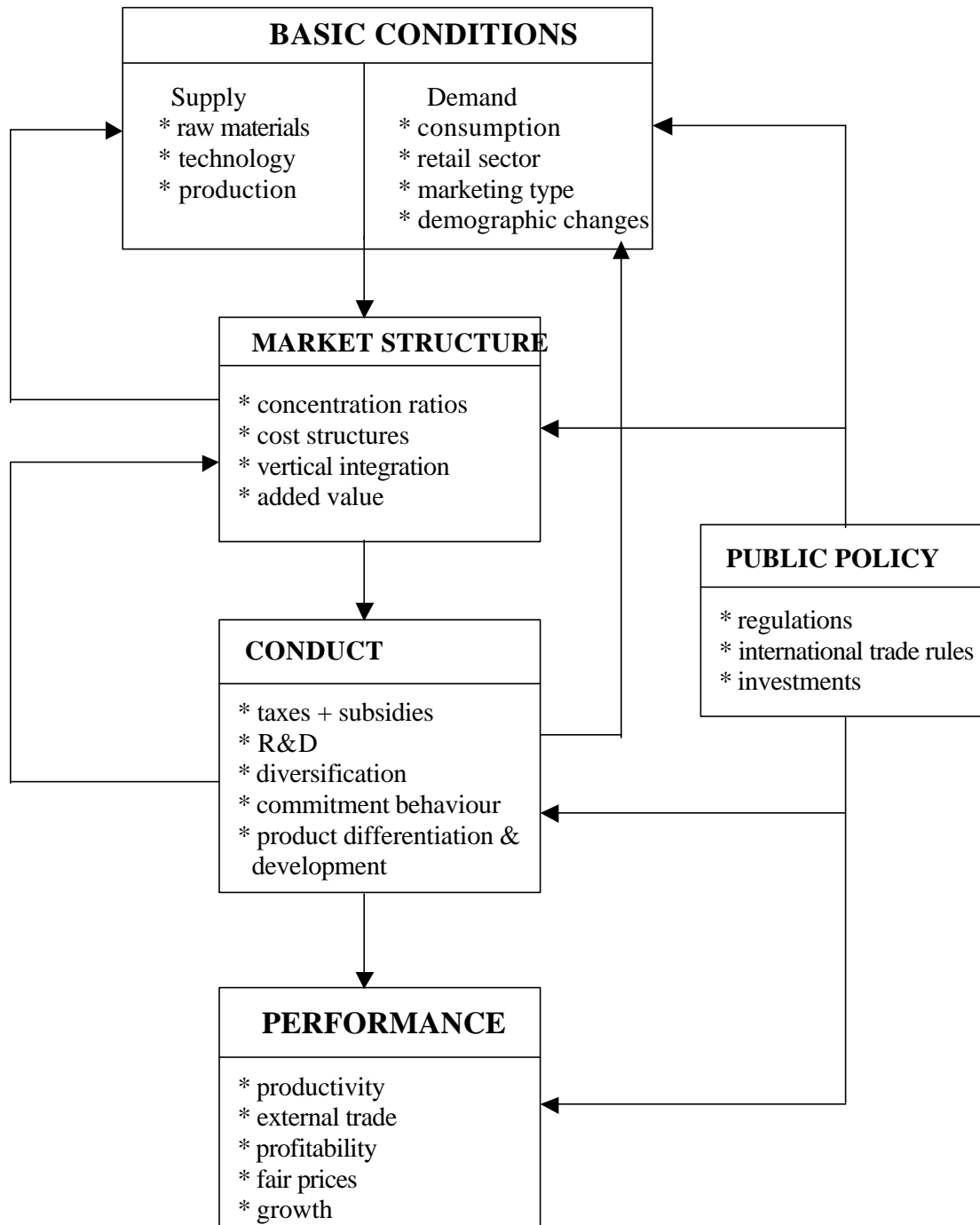
2.3 Theoretical framework and data collection

A well-known framework for evaluating the competitive structure and overall performance of the FDT industry is used, namely the structure-conduct-performance (SCP) paradigm (Bain, 1968; Scherer & Ross, 1990). Figure 2.1 indicates the different components of this model. The structure of the market is influenced by various elements connected with supply and demand, the so-called basic conditions. It is obvious that the variables mentioned in Figure 2.1 are not the only variables determining changes in supply and demand. Other factors such as the distribution pattern, general economic conditions and demographic change also have an impact.

The conduct of firms refers to their competitive strategy. Conduct in the FDT industry is influenced to a large extent by organizational characteristics, namely its structure. In order to understand the reasons for the (non)-performance of an industry or a sector, its conduct has to be analyzed. The objective of conduct studies is to understand how enterprises attract their customers and how they react to competitive actions.

Basic conditions, structure and conduct are interdependent. Although the direct relationships between these elements are the most important ones, it is also interesting to consider the "feed-back" arrows. For instance, the level of R&D expenditures influences the development of new technologies. In several studies (Archibald et al., 1985; Connor et al., 1985; Marion, 1986; Zellner, 1995; Stark & Morgan, 1995; Suter & Henneberry, 1996; Connor & Schiek, 1997; Covino & Mariani, 1999; Agriculture and Agri-Food Canada, 2000), researchers illustrate the evolution in the different components of the SCP-paradigm, but very few investigate the interrelationships and their mutual impact.

Figure 2.1 The industrial organisation model: Structure-Conduct-Performance linkages.



Source: Based upon Bain (1968) and Scherer & Ross (1990).

Related to performance, we focus on four indicators of performance, which are especially important at the level of sectors and individual firms, namely

productivity, profitability, prices and growth. In particular, we judge that 'good performance' implies that the following criteria are met:

- Efficient use of production factors, thereby achieving good productivity. Here, we emphasize labor productivity.
- Good profitability, which is measured by cash flow as a percentage of turnover.
- Price stability, which is determined by assessing the inflationary impact of food prices.
- External trade and more specifically the contribution to the trade balance.
- Growth, expressed as growth in turnover.

The choice of these performance indicators is based on an acceptable compromise between scientific excellence and requirements, and data availability. Other indicators of performance exist such as operational efficiency (value chain) and technological progressiveness (rate of technological change). When investigating the food industry, an interesting performance indicator could be the public health status (Marion, 1986). Hereby, the idea is that the food (tobacco) industry influences consumption patterns through advertising. However, data on these performance indicators are not available in the EU.

Our analysis uses a comparative approach. First, there is a comparison between the FDT industries of the four Member States with the largest FDT industries (Germany, France, the United Kingdom and the Netherlands). Second, various sectors within the FDT industry are compared. With this comparative approach, it is not necessary to define 'good performance' in terms of absolute levels of the indicators.

Normally, the good performance of the industry is a consequence of its structure and conduct, but this performance is not always guaranteed. Here, public authorities can intervene to improve the situation. Our approach permits to identify low-performing sectors of the FDT industry. In this way, public authorities can have access to information necessary to determine market-related strategies and to reverse low performance (Marion, 1986).

For the analysis reported in this chapter, statistical data and information were collected from primary and secondary sources. First, industrial statistics from

Eurostat and national statistical institutes were used to describe the evolution in the FDT industry. Second, missing data were collected by interviewing experts and professionals from the four Member States studied.

2.4 Structure

First, the structural evolution in the FDT industry is discussed. Second, some factors determining structural change are explored and finally, the link between structural change in the FDT industry and evolutions in agriculture are assessed.

2.4.1 Structural evolution

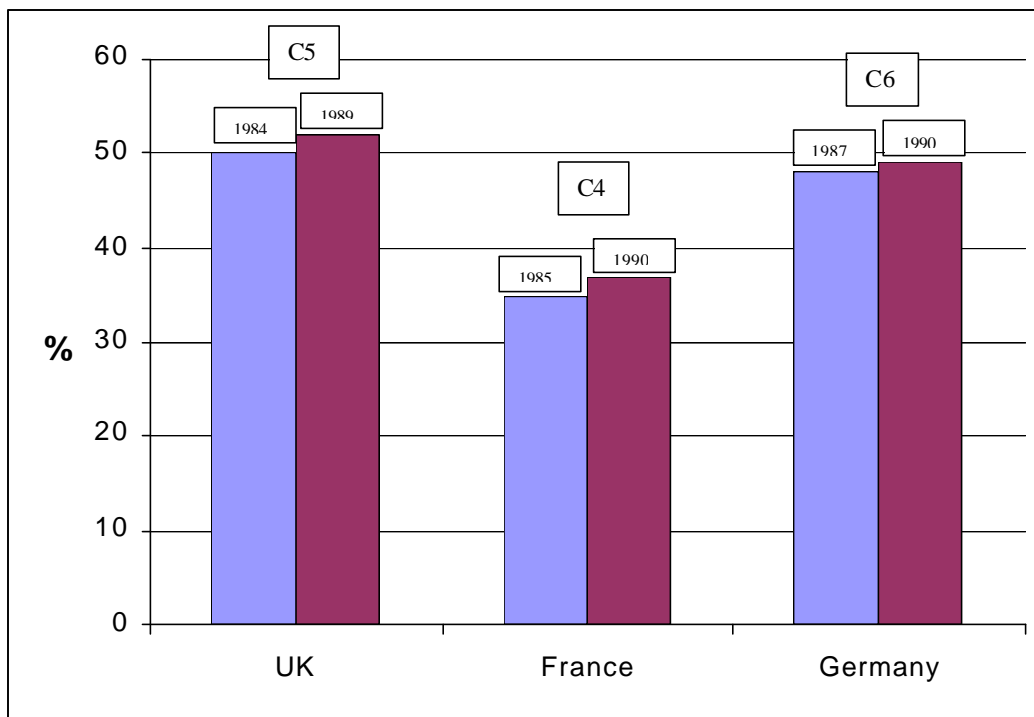
The most important variables for evaluating the structure of the FDT industry are concentration ratios, which measure the importance of a few leading firms in a market or sector. Figure 2.2 presents concentration ratios in the British, French and German FDT industry, for the five, four and six largest companies, respectively. Compared with France and Germany, the British FDT industry shows the highest concentration. This is due to several factors such as overseas sources of supply, favorable public policy for large companies and the severe regulations related to food hygiene (Burns, 1983). The basic motivation for creating large food companies are economies of scale in purchasing, marketing, transport, information and R&D.

Foreign multinationals play a significant role in FDT industry in the EU, where almost 40% of their affiliates are located (up to 65% for US multinationals). The location of these foreign affiliates is concentrated in Germany, France, UK and the Netherlands. However, it is clear that the extent of the internationalization of the food processing industry is not fully captured by an analysis of multinationals and foreign affiliates. Increasingly, internationalization is characterized by alliances that stop short of full ownership integration. Multinational companies often use agreements with local business, joint ventures, marketing or technology/supply agreements, in order to obtain market access, especially in countries that are culturally or

geographically remote (Covino & Mariani, 1999). Adequate information on these arrangements is sparse.

It is likely that concentration in the FDT industry in all Member States will continue in the future and result in a pattern of a dominant core of large firms and a fringe of small firms complementary to, rather than competing with the major food companies. These smaller manufacturers, which are mostly family owned, will tend to concentrate on and supply to niche or mainly local markets.

Figure 2.2 Weighted average concentration ratio in the FDT industry in U.K., France and Germany (% of total turnover).



Source: Business Monitor, Statistisches Bundesamt Wiesbaden, Agreste & own calculations.

The ratio of gross value added to production value can be used to measure the degree of industrial transformation (Corsani et al., 1990). In 1997, the food processing industry achieved a relatively low ratio of value added to production value: 20,4% compared with 32,2% for other manufacturing industries. Industries operating at the 'first-stage' of production have a lower percentage of production

value accounted for by value added - typically 10 - 20% - than those operating at the second-stage, where the percentage can rise to 38%. First-stage transformation relates to sectors mainly processing agricultural commodities, while second-stage production is mostly concerned with transforming the intermediate products produced at the first-stage into final products. Examples of first-stage production are the manufacture of flour from wheat, vegetable oils and fats and the production of animal feeds. Output from the second-stage of production includes, for example, 'other food products' such as chocolate confectionery and beverages. The British FDT industry tends to specialize in the higher value added, second-stage of production (Table 2.1). The structure of the German food processing industry is more evenly balanced between first- and second-stage production. By contrast, in the French and Dutch food processing industries, first-stage transformation dominates. The food processing industry in these two countries has a strong linkage with both animal and crop production.

Table 2.1 Structure of the FDT industry in the UK, Germany, France and the Netherlands¹, 1991.

Sectors	UK	Germany	France	Netherlands
1 st -stage transformation	*	**	**	**
2 nd -stage transformation	**	**	*	*
Key: ** dominant		* non-dominant		

Source: Own calculations based on Eurostat data.

2.4.2 Factors determining structural change

Structural change results from a diversity of factors. The most important are market demand and size, technology, public policy and environmental conditions. In the context of this chapter, two major factors are discussed, namely increasing concentration in the European retail sector and changing consumer patterns and requirements.

¹ This table is based on the relative share of 1st - and 2nd -stage transformation sectors in the total turnover of the FDT-industry. Non-dominant means the relevant group of sectors scores below the EU-average. Despite this fact, a non-dominant category in the countries examined is still important at EU level in absolute terms.

2.4.2.1 Food retailing

The food retailing sector in the EU is characterized by an increase in market share of large and middle sized distribution chains at the expense of small, independent and traditional shops. However, a wide variety of store formats persists in Europe. On the one hand, hypermarkets and supermarkets have become the dominant type of food retailing in countries like France, UK, Belgium, Netherlands, Sweden, Spain and Italy. In these countries, the top five grocery retailers take shares of 70 to 95% of the grocery retail market. Alongside the growing dominance of these large multiples, discount stores and specialty shops with deep product assortments have also been developed. The largest shares of discount stores are seen in Germany (22%) and Belgium (13%) (IGD, 2000). Small, self-service outlets remain dominant in Portugal and Greece.

The trend towards increasing concentration in the food retail sector has had mixed effects on the FDT industry. On the one hand, it may have lowered some costs for processors (Lagrange, 1992). For example, transactions costs tend to be lower, and the supply function more straightforward as there are fewer buyers to deal with. On the other, it may have put upward pressure on prices and made the importation of supplies from overseas more likely. The increasing level of concentration, international consolidation, and market orientation in food retailing yields considerable control over the food supply chain and substantial bargaining power vis à vis suppliers. This shifting balance of power in favor of retailers and away from food manufacturers has resulted in new types of relationships between the food processor as supplier and retailers as their customers. These relationships are characterized by the following (Food Marketing Institute, 1993, quoted in Meulenberg and Viaene, 1999):

- A focus on providing better value to consumers;
- A move from win/lose to win/win;
- The development of accurate and timely information;
- Maximization of value-adding processes;
- The development of a common and consistent performance and reward system.

Increasing concentration may also have led to the development of own brands - the so-called private labels - by the retailers, which imply lower risk in R&D and marketing, and do not participate in the creative process of growth (Kapferer, 2001). It results in more competition with processors' products. Whereas the initial private labels were positioned as low price alternatives to premium brands, there is currently a growing tendency to position such labels as products of good quality next to national brands, with the objective of building customer loyalty more efficiently (Marshall, 2001). The market share of private labels is steadily increasing. Currently, it accounts for some 55% of the market for packed grocery products in the UK, with supermarket chains, Sainsbury's and Asda, taking the lead. In Belgium, France and the Netherlands, private label shares amount to 20-25% (IGD, 2000). Own-label retail brands mainly dominate in generic food categories like fresh food and vegetables, meat, poultry and dairy products. It should be recognized however that own brands also have to be produced by someone, although the profit margin is likely to be lower. Increasing concentration in the retail sector has led the food processing industry to react by seeking mergers and acquisitions, in order to maintain its bargaining power.

2.4.2.2 Consumer patterns and requirements

Food demand is characterized by relatively low income elasticities (Burton & Young, 1992; Tiffin & Tiffin, 1999; Ritson & Petrovici, 2001; Ben Kaabia et al., 2001). It means that the growth of disposable income will have a less than proportionate effect on food demand. This suggests that competition in the EU food market will increase, as the market approaches saturation, at least in volume terms. Volume is not however the full story. Demand for quality and built-in services is expected to continue growing. Furthermore, concerns that go beyond narrowly defined economic factors are likely to play an increasingly important role in determining food consumption patterns. Four major trends at the consumer level have given a further boost to the shift in emphasis from quantity to quality in food demand: food safety concerns, health consciousness, the need for convenience and changing values and lifestyle patterns.

First, recent food safety scares have substantially increased consumer concerns about food consumption and potential human health risks (Miles & Frewer, 2001; Verbeke & Ward, 2001). These food safety concerns have led to a shift in demand to foods that are perceived as more natural, less processed, and therefore also as less risky. Alongside these developments, consumer interest in food production systems, as well as demand for transparency and information, have increased. As a result, food chains face a communication challenge, as well as a clear requirement to deliver wholesome food products.

The second trend relates to increasing health consciousness at the consumer level. In response, the health-promoting effects of foods are cited as the food industry's 'big idea' and new cash cows at the start of the 21st Century (Childs & Poryzees, 1997; Childs, 1997; Heasman and Mellentin, 2001). Almost invariably, analysts agree that the functional foods' segment is the fastest growing in the food market, with the lead being taken by probiotic dairy products. Figures of world market volumes range between 10 and 25 billion US\$ at present, depending on the precise definition used. These products are projected to have a one third share of the total European food market by 2010 (Menrad, 2000).

The third trend pertains to convenience in food purchasing and preparation. For food manufacturers, this trend entails challenges with respect to product development, and more specifically, to the application of food preservation techniques and advanced packaging materials. This trend is also illustrated by consumer demand for all-year round availability of produce.

The fourth trend concerns changing values and lifestyle patterns. As far as values are concerned, consumers now tend to attach higher importance to ethical aspects of food production and consumption, an interest that is exemplified by animal welfare, environment conservation and social welfare concerns. With respect to lifestyles, Grunert et al. (2001) have identified five cross-national consumer segments based on food-related lifestyles (uninvolved, careless, conservative, rational, adventurous). Clearly, a food processor managing to reach one segment successfully in a specific country will be

reasonably well equipped for serving this segment in another country as well. Furthermore, internationalization of European consumers' diets increases as a result of international travel and visiting overseas holiday destinations (e.g. demand for ethnic foods and spices rises after holiday seasons). The existence of common basic types of food consumers across country borders, as well as the increasing international orientation of consumers, emerge as a strong argument for approaching food markets with international or global marketing strategies.

The frequent and quick changes in consumer patterns and preferences described earlier, makes response to these changes more and more research and advertising intensive, which also usually means more capital intensive. Despite higher levels of flexibility in the allocation of labor and management, small and medium sized companies find it difficult to respond to these changes in consumption because of the capital required. Only large firms have the potential to realize such investments, which means that in markets where product innovation and differentiation are important, concentration levels tend to be high.

2.4.3 Impact on agriculture

Agricultural inputs are the most important category of inputs for the FDT industry, accounting for about one third of the total in 1997. Other key inputs are semi-processed foodstuffs ($\pm 20\%$) and packaging ($\pm 10\%$) (Conner & Schiek, 1997). Within the EU-15, agriculture represents a value added of about 115 billion EUR or 1,5% of the global EU-economy in 1998 (Europese Commissie, 2001). Both in plant and animal production, the EU occupies an important position in total world production. Cereal production represents for example 10% of total world production, while olive oil 65% in 1998. At the level of animal production, the EU's share in meat production totals 16% and in milk 23%.

The trends in EU agriculture are concentration and specialization. During the period 1995-1997, the total number of farms declines by 2,7% to reach a level of about 7 million in the EU-15 (European Commission, 1999a). During the same period, average farm size increases by 5,7% till 18,4 ha. Farmers specialize in milk production, pig raising, broiler production or flower growing.

Specialization is stimulated by economies of scale in production, which is accompanied by concentration into larger farms. Within the EU-15, the degree of concentration and specialization varies between Member States and regions. These trends are strongly present in the Benelux, the UK, some parts of Germany, in Italy and France, whereas other regions such as the Alpine regions, are characterized by small mixed farms.

A key characteristic distinguishing the agricultural sector from other input sectors relates to the fact that agricultural production is mostly seasonal and varies in both quality and quantity (Ennew & McDonald, 1995). This was an important motivation for policy makers to intervene in this market and to protect farmers' income through guaranteed floor prices within the CAP. Such floor prices can both benefit and hamper the food processing industry. Examples of benefiting the food industry relate to the fact that first stage processors obtain guaranteed sales. Otherwise, the bargaining power of food processors is limited when floor prices are installed.

In turn, European farmers have long had a significant influence on the political agenda of the agro-food sector. In several Member States, the national regulatory systems have been dominated for decades by farmers associations, agricultural co-operatives and agricultural ministries. This applies to some extent to the EU as a whole. Increasing free trade, decreasing political influence from the part of the farmers, increased agro-environmental pressure and the tendency of agricultural co-operatives to transform, challenge these national regulatory systems. However, agricultural co-operatives remain important in the EU, but face changes in the broader environment.

The increasing levels of concentration in the FDT industry in the EU have had important implications for agriculture. First, it has forced farmers to think of ways in which their bargaining power can be increased through, for example, the more effective use of co-operatives. Originally, co-operatives were developed as a part of a nation-building process (Bager, 1997), to improve farmers' product prices by increasing bargaining power of farmers or to introduce better quality and quality maintenance of food products (Barton,

1989). Cooperatives differ from other businesses in three ways (Meulenberg & Viaene, 1998):

- The user-owner principle, which means that the persons who own and finance the cooperative are those that use it;
- The user-control principle, which indicates that the persons controlling the cooperative are those using it;
- The user-benefit principle, which illustrates that the benefits of the cooperative are distributed to its users on the basis of their use.

The process of concentration in the food processing industry further aggravates this situation. It means that cooperatives change into hybrid organizations or even converge into purely commercial organizations. Also modern financial structures are developed to generate the necessary risk-bearing capital. These structural changes enhance a more rational and less emotional relationship between farmers and the cooperative, in particular young and modern farmers. In the near future, it is not expected that co-operatives and with them a channel for farmer influence will disappear.

Second, the market power of the food processors has forced the agricultural sector to become more market oriented, which in turn has led to special relationships with wholesalers, processors and even retailers, and to the development of supply and quality schemes as well as price agreements. In the frozen vegetables industry, for example, farmers make contracts with processors, in which the production process, quality, quantity and price are all stipulated. This has enabled the processors to manage supply risks (in relation to both quantity and price) more effectively. These developments have in some cases led to vertical integration and in other cases to close cooperation and partnerships within the chain (see Conduct below). Those farmers who are willing to participate in such linkages are more likely to remain competitive and stay in business (Connor & Schiek, 1997; Grunert et al., 1996a).

2.5 Conduct

The conduct of firms refers to their competitive behaviour. In a market characterized by homogeneous goods, open competition, a large number of sellers and no barriers to entry, companies have few strategic options. Competition drives down profits and prices to a uniform level, and production shifts to the competitor with the lowest unit costs. In contrast, oligopolistic markets tend to compete more on a non-price basis (Porter, 1985; Marion, 1986; Scherer & Ross, 1990; Greer, 1992).

Many sectors in the FDT industry can be categorized as oligopolistic, with firms using a variety of strategies to differentiate themselves from their competitors and to obtain market power. Examples of such strategies are product development, advertising and promotion, mergers and acquisitions, internationalization, supply chain management and the development of traceability systems. The competitive pressure to adopt these strategies is reinforced by the changes that are occurring in the external environment in food retailing and food consumption.

In the context of this chapter, we examine the competitive behaviour of the FDT industry by focusing on product development, internationalization and mergers and acquisitions, and traceability. This is motivated by the fact that these conduct patterns are the most important ones and currently under both scientific and public discussion (Grunert & Weindlmaier, 2001).

2.5.1 Product development

Innovation in the FDT industry is poor. This industry may be characterized as mature and low-tech. This fact is illustrated by the average skill level of the labor force: in 1997, only 11% of those employed in the FDT industry had completed a higher education degree, whilst about 45% had gone no further than lower secondary education (European Commission, 2000b).

The introduction of new food products is more frequent in markets with high concentration levels, growth rates and heavy advertising (Connor & Barkema, 1993) such as chocolate and sugar confectionery, sauces, snacks and other

convenience products. As substantial advertising expenditures are involved in launching new branded products, only the largest firms can afford to become involved in this activity. This in turn reinforces the move towards higher concentration.

2.5.2 Internationalization and mergers and acquisitions

As the environment in which food processing firms operate has changed – as the result of such influences as globalization, technological developments, public policy and more exacting consumer requirements - so the way in which these firms are organized has also changed. These organizational changes have taken many forms, such as the entry of new firms, downsizing and exit, mergers and acquisitions and the transfer or extension of productive activities to other regions (European Commission, 1999a).

Mergers and acquisitions can relate to suppliers and customers, which leads to vertical integration. Firms can also diversify into other sectors or industries, which is called horizontal diversification. Transfer or extension of activities to other regions refers to geographic diversification. Within the EU, diversification levels vary widely among Member States. Table 2.2 shows the diversification into other industries and outside Western Europe of the 100 leading FDT companies in Europe. Amongst EU Member States, the UK has the highest rate of diversification into other industries as well as outside Western Europe. Diversification in Germany and the Netherlands shows similar trends. Horizontal diversification is less developed, while geographic diversification reaches a level of almost 20% of total turnover. By contrast, the large French FDT companies are not characterized by high levels of diversification, either horizontal or geographic.

Restructuring and relocation activities are motivated by strategic decisions, which focus on integrating international supply structures more fully, through the development of more comprehensive production networking and subcontracting. Networking enables firms to concentrate on their core activities and to rationalize these. In this way, members of such networks can adapt more easily to changing market and costs conditions (Lusch & Brown, 1996;

Competitiveness Advisory Group, 1999; Viaene et al., 2000; Meulenbergh, 2002; Van Roekel, 2002).

Table 2.2 Horizontal and geographic diversification of the top 100 FDT companies in Europe, 1990, in billion EUR and %.

Controlled by	Number of companies	Total turnover BEUR	Turnover outside FDT = Horizontal		Turnover FDT outside Western Europe = Geographic	
			BEUR	%	BEUR	%
UK	31	116,1	37,1	32,0	21,9	27,8
FR	21	35,6	1,9	5,3	1,5	4,5
NL	13	40,0	4,9	12,2	6,8	19,4
GE	10	14,6	1,4	9,6	2,5	18,7
CH	3	32,2	6,8	11,1	10,8	42,4
US	6	53,7	7,8	14,5	30,3	66,0
Other	16	22,9	2,9	12,7	0,5	2,4
TOTAL	100	315,1	62,8	19,9	74,3	29,4

Source: Lademann (1991).

Such networking also leads to increases in both intra-industry trade and foreign direct investment (FDI), as it enables companies to better focus on their core activities. On the one hand, the existence of networks means that they can more easily sub-contract out their non-core activities, thereby increasing intra-industry trade. During the period 1988-1997, intra-industry trade in the food processing industry increased by 6,7% to reach a level of 50,1% of the industry's total trade. On the other hand, the management capacity released by sub-contracting can be used to expand core activity in other parts of the globe via FDI. In 1997, the FDT industry in the EU-15 held 46,8 billion EUR of FDI stocks in third countries, while the intra-EU stocks of EU companies are equal to 42,0 billion EUR (European Commission, 2000b). These data suggest that the FDT industry in the EU has a fairly outward-looking orientation when it comes to non-community markets. Non-EU countries FDI stocks in food processing in the EU-15 accounted for 23,3 billion EUR in 1997. Thus EU companies are more active in the food processing industry in terms of investments abroad than foreign competitors are within the EU. By expanding activities into foreign markets, companies are able to generate multi-plant economies of scale relating to investments in firm specific assets. FDI is not therefore only motivated by the

benefits that may be generated from relocating production activities, but also by the additional productivity advantages that may be obtained in the use of firm specific assets.

Mergers and acquisitions in food processing are motivated by several factors (McKenzie, 1988; Conner & Schiek, 1997). First, they are seen as a fast way of introducing new products into a firm's product range and of expanding its geographical coverage. Obtaining already successful brands (so-called cash cows) via merger or acquisition, may be perceived as avoiding the expense, delay and risk of developing new brands from scratch. The fact that strong individual brands will continue to be recognized and bought by consumers provides another incentive for this approach. Generally, the profitability of such products is high. The products generate resources and are used to support other products in the company's assortment. Second, mergers and acquisitions may enable growth in market share to occur more rapidly, especially where the firms concerned utilize the same marketing channels and are aiming at the same type of customers. This may sometimes be a cheaper route than building new capacity. Third, they provide opportunities for spreading the fixed costs of doing business over a larger sales base. This may be particularly relevant in relation to expenditures on intangible assets such as advertising and R&D. Fourth, when a merger or acquisition leads to a firm operating across a number of markets, there may be more stability in profits. Declerk's empirical study (1997) on mergers in the food industry shows that the larger premiums paid for companies taken over in highly concentrated food markets are justified by the profits these markets generate. However, the question remains open whether these higher profits come from efficiency gains or from increased monopoly power.

2.5.3 Traceability

Food safety crises of recent years have led to growing consumer concerns and to consumers rethinking their attitudes and behaviour towards food consumption (Burton & Young, 1996; Latouche et al., 1998; Verbeke & Viaene, 1999; Henson & Northen, 2000; Verbeke et al., 2000; Buzby, 2001). Both industry and the public authorities have responded by developing quality

and safety assurance systems (Bredahl et al., 2001), and many European countries are now paying much more attention to the introduction and expansion of food traceability systems. Such traceability systems provide opportunities and force the different links in the food chain to collaborate more intensively. In this way activities can be further integrated or strategic alliances along the chain can be created.

Wilson and Clarke (1998) and Jack et al. (1998) define food traceability as the information necessary to describe the production history of a food crop and any subsequent transformation or process the crop might undergo on its journey from the grower to the consumer's plate. Most of the traceability systems that are operational today used the existing systems of identification and registration as a starting point.

With respect to traceability characteristics, Gellynck and Verbeke (2001) make a distinction between functional and process attributes. The former refers to the scope for organizing the chain more efficiently, monitoring the chain, and assessing individual responsibilities. These attributes can be regarded as the minimum requirements for a true traceability system. Process attributes refer to the characteristics of the production processes themselves at different levels of the chain. Such attributes can be regarded as representing extensions to the minimum requirements. Empirical research by Gellynck and Verbeke (2001) has explored the issue of who is responsible, and to what extent, for providing meat quality and safety. Since functional attributes are broadly supported by all consumers, public policy plays an important role in guiding and monitoring this aspect of traceability. Process attributes, such as the nature of production methods, are less relevant to the general public and only interest specific market segments. Government intervention or regulation of process attributes of traceability is thus less evident. These attributes are more appropriate for the private initiatives of chain participants. They provide opportunities for the food chains to become more market oriented by differentiating their products on the basis of traceability linked with process attributes. Such differentiation may include guarantees of specific quality, regional linkages, and environmental or animal friendly production methods. Strategies of this kind should further

enable companies to create competitive advantage and consequently obtain better profitability in tomorrow's global markets.

2.6 Performance

First, some performance measures are discussed both at EU level and at the level of individual Member States. Second, the impact of structure and conduct on performance is assessed.

2.6.1 Performance measures

Within European manufacturing, the FDT industry is the largest industry in terms of production value² (Table 2.3). Some member states show significant specialization in food processing. The share of national manufacturing production value accounted for by food processing was more than twice the EU average in Ireland and Denmark in 1997, while in Greece and the Netherlands the figure was 1,75 and 1,65 respectively. Production specialisation ratios are lower than 75% of the EU average for both Germany and Italy.

During the period 1990-1997, the FDT industry's relative importance in EU manufacturing production increased. Production value increased by about 11% while that for total manufacturing rose by only about 8% and illustrates strong growth. While value added in total manufacturing remained fairly constant during the period, value added in the FDT industry increased by about 8%. Employment in the sector fell (-5%), but it did so by less than employment in total manufacturing (-11%).

The productivity of labor may be evaluated by looking at value added per employee. During the period 1990-1997, labor productivity increased by 33,0% in the FDT industry, reaching a level of about 49 000 EUR per employee. This substantial increase in labor productivity is perhaps surprising given that the

² Production value measures the amount actually produced, based on sales adjusted for changes in stocks and the resale of goods and services. The production value is defined as turnover plus or minus the changes in stocks of finished products, work in progress and goods and services purchased for resale, plus capitalized production, plus other operating income (excluding subsidies) (European Commission, 2000b).

food processing industry spends only about one per cent of value added on R&D (Grunert et al., 1997). One explanation for this is that the industry relies heavily on external sources for innovations affecting efficiency and labor productivity.

Table 2.3 The share of manufacturing industries in production value, employment and value added in the EU-15, 1997 (%).

Industry	Production value	Employment	Value added
Food, drink and Tobacco	16,0	13,0	11,4
Chemicals, rubber and plastic	14,7	14,1	16,3
Transport equipment	13,2	8,7	11,8
Electrical machinery and electronics	9,1	12,7	10,0
Machinery and equipment	8,4	10,5	11,2
Wood, paper, publishing and printing	8,2	12,0	10,0
Fabricated metal products	5,0	10,7	7,1
Textiles, clothing and footwear	4,9	5,9	5,0
Basic metals	4,7	3,4	4,3
Non-metallic mineral products	3,5	5,0	4,5
Instrument engineering	2,5	1,6	2,9
Other manufacturing industries	1,9	2,3	2,7

Source: based on Eurostat data.

When measured in terms of extra-Community exports, the FDT industry is however much smaller than is suggested by the data in Table 2.3, with a share of about 5%. This lower figure for extra-Community exports reflects the perishable nature of food products, which limits transportation possibilities. It is for this reason that historically, food trade has been orientated towards intra-community flows. Technological innovation in food preservation has made the long distance transportation of food products increasingly feasible, but it has so far been insufficient to enable food processors to match the transportability of the output of other manufacturing industries. The FDT industry in the EU contributes positively to the trade balance. The ratio of extra-EU exports to extra-EU imports was 1,21 or a positive balance of 6 billion EUR. The EU is a large exporter of dairy products, processed cereals, beverages and other food

products, while a net importer of fruit and vegetables, fish and vegetable and animal oils and fats. Extra-EU trade has a rather volatile character because of fluctuating EU currency.

The performance of the FDT industry with respect to prices is examined by analyzing trends in consumer prices. In all Member States, the increase in consumer prices for FDT products does not exceed the overall inflation rate during the period 1985-90. This implies that price increases of processed food have low inflationary impact.

By comparing some performance criteria of individual countries with the situation of the FDT industry, the performance of Germany, France, the Netherlands and UK is evaluated (Table 2.4). By comparing the performance criteria of individual countries with the situation of the FDT industry in the EU as a whole, each Member State is judged to be excellent, good or below average.

Table 2.4 Performance of the FDT industry in Germany, France, the Netherlands and UK, 1981-1992.

Performance criteria	GE	FR	NE	UK
Productivity	+	++	++	+
Growth	-	++	+	-
Prices	++	+	++	+
Profitability	++	+	-	++
Overall evaluation	+	++	++	+

Key: ++ : strong + : fair - : weak (for more details see Annex 2.1)

Source: Own calculations based on Eurostat data.

The overall evaluation of the Member States considered, varies from fair to strong. Since the 1st-stage transformation sectors are capital- rather than labor-intensive, labor productivity tends to be higher in these sectors than at the 2nd stage of transformation. The French and Dutch industries are dominated by 1st-stage transformation sectors. The fact that 1st-stage transformation sectors dominate the French and Dutch FDT industries also explains their rates of

profitability. 1st-stage transformation sectors are characterized by mass production, which involves low margins and hence the lower profitability of the French and Dutch FDT industries.

2.6.2 Impact of structure and conduct on performance

The relationships between market structure on the one hand and the level of wages and productivity on the other hand affect several performance criteria. Based on figures for the British FDT industry, the following relationships are evaluated by cross-tabulation:

- relationship between productivity and concentration ratio (C5);
- relationship between wage and productivity increases and concentration ratio;
- relationship between wage increases in the five largest companies and productivity increases.

In general, productivity is higher in the beverage industry and in large companies. In sectors where the concentration ratio of the five largest companies is high, productivity is also high. There is no apparent association between the rate of increase in wages and/or productivity on the one hand and the level of concentration on the other. This implies that high concentration does not per se exert an inflationary impact on the macro economy. In fact, in sectors where productivity is high, wages are also high and inversely so. Thus, wage increases in large firms are coupled with high productivity increases, which means that wage increases are not passed on as price increases.

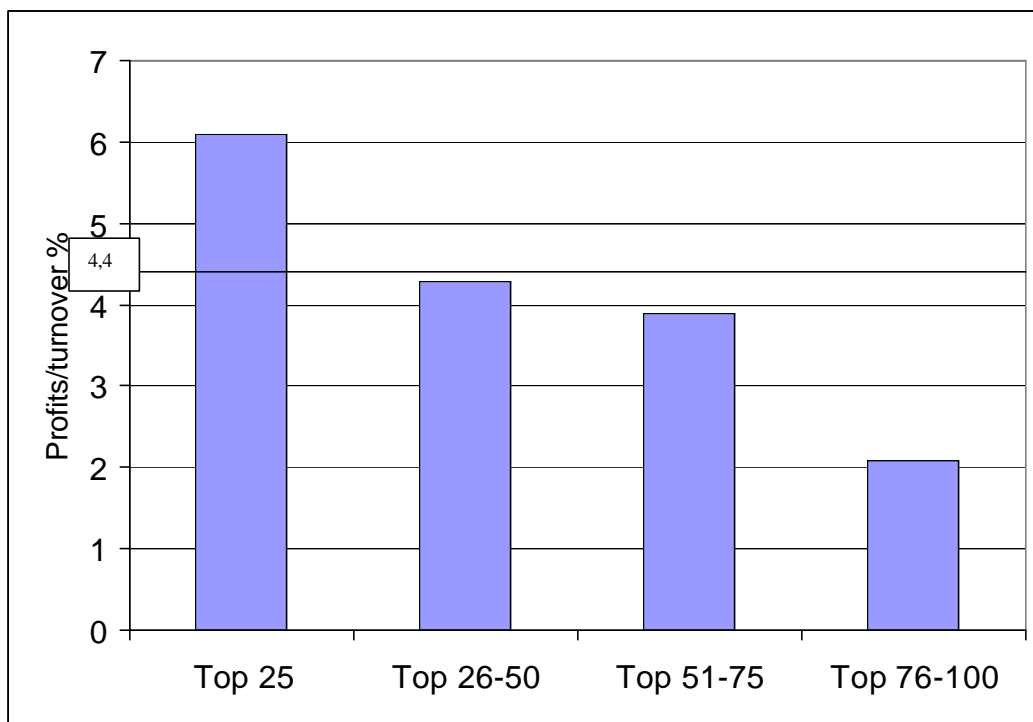
Of course, the analysis of the interrelationships between market structure and performance largely depends on the definition of the market. This study relies on the NACE classification, which groups various markets under one heading. Clearly, more specific results would be obtained by analyzing more disaggregated markets.

Appropriate statistical data for determining the relationship between market structure and profitability are lacking at EU level. However, German figures suggest that large firms realize higher profits than smaller ones (Figure 2.3). This implies that high concentration may be associated with high profits either

because of higher prices or lower average costs, due to greater efficiency. If the effect of concentration on costs is larger than the effect on prices, then high concentration could create net social benefits. It means that the gains to producers are larger than the losses to consumers. Otherwise, if high concentration induces higher costs, which can be passed on in prices, then net social losses are created due to market power. This would mean that both producers and consumers are disadvantaged when concentration is high.

As far as Germany is concerned, it can be said that high market shares are associated with high profits. However, more research is necessary to determine whether higher prices or higher efficiency dominate.

Figure 2.3 Net profitability of the top 100 firms in the German FDT industry, 1990 in profits as a % of turnover.



Source: GWH - Berechnungen, Basis Geschäftsberichte.

2.7 Findings at sectoral level

Structure-conduct-performance patterns of specific sectors that are of major importance for EU industrial policy are considered in Table 2.5. Since CAP intervention applies to agricultural products, the EU Commission has created a list of processed foodstuffs, the so-called "non-annex II" products, with the intention that export refunds and import levies on these processed products should reflect the refunds and levies that would be paid and collected on the agricultural products used in processing them. Most non-annex II products originate from the selected sectors in Table 2.5.

Table 2.5 Comparison between various sectors of the FDT industry in the EU, 1989-1992.

NACE code *	413	417	418	419	420	421	423	424	427	428
Economic variable										
Structure:										
Concentration	0	++	++	-	++	0	--	++	0	+
Labour intensity	-	-	+	++	0	+	0	-	+	+
Conduct:										
Value added	--	0	+	++	+	0	++	+	++	++
Investment	+	+	++	--	++	++	0	0	+	++
Performance:										
Productivity	-	++	++	--	++	0	++	++	++	++
Growth	--	+	NA	0	NA	-	++	--	--	++
Profitability	--	++	-	+	0	+	++	+	++	++

Key: ++ excellent + good 0 average - below average -- far below average

NA: Not Available (for more detail see Annex 2.2) * see text for NACE codes

Source: Own calculations based on Eurostat data.

Table 2.5 makes a comparative analysis of the situation in different sectors relative to the situation in the FDT industry as a whole. The different headings are interpreted as follows:

- Variables are compared with the average score of the FDT industry as a whole. For example, concentration in the pasta industry (NACE 417) is far above the average concentration ratio in the FDT-industry as a whole and therefore scores '+ +' in relation to the industry's average. The following

variables should be interpreted in this way: concentration, labor intensity, value added, investment, productivity and profitability.

- As regards growth, the trend in each sector turnover relative to that of the FDT industry as a whole is compared. For example, the share of turnover of the soft drinks and mineral water sector (NACE 428) in total FDT turnover in 1992 was more than 5% greater than its share in 1980. Therefore, this industry scores '++' for growth.

Table 2.5 makes it possible to distinguish three groups of sub-sectors, based on their performance. Neither the starch industry (NACE 418) nor the sugar industry (NACE 420) is included in this classification due to incomplete data:

- Sectors whose position we consider to be strong relative to the FDT-industry as a whole:
 - pasta industry (NACE 417)
 - other food (NACE 423)
 - soft drinks and mineral water (NACE 428)
- Sectors whose position can be considered average:
 - starch industry (NACE 418)
 - bread and flour confectionery (NACE 419)
 - sugar industry (NACE 420)
 - brewing and malting industry (NACE 427)
- Sectors whose position we consider to be relatively weak:
 - dairy industry (NACE 413)
 - bread and flour confectionery (NACE 419)

These two sectors have had difficulties in maintaining their position, largely caused by declining consumer demand and over-capacity.

2.8 Conclusions

The structure of the FDT industry in the EU is dominated by a small group of large companies representing the majority of employment and turnover. These companies usually operate at an EU or even global level. Surrounding these firms however is a fringe of small manufacturers who complement, rather than

compete with, their larger counterparts. The smaller firms are much more focused on national and local markets.

Many trends have influenced the evolution of the FDT industry in the EU, at the level of the industry, its sectors as well as at the level of the individual firm.

Key influences have been:

- Increasing concentration, international consolidation and a stronger market orientation in food retailing. Retailers now have substantial bargaining power vis à vis suppliers and have introduced efficiency improvements through logistics planning, the development of private labels and improved distribution methods and monitoring.
- Changes in food consumption patterns and consumer attitudes and behaviour. Four main trends can be identified: food safety, increasing health consciousness, demand for convenience foods and changing values and lifestyles.

In turn, increasing concentration at the level of the FDT industry influences its suppliers of raw materials, namely the agricultural sector. It has forced the agricultural sector to think of ways to increase bargaining power on the one hand and to become more market oriented on the other.

Developments in the external environment, as well as within the industry itself, significantly influence the competitive conduct or strategic behaviour of food companies, which are constantly seeking to differentiate their products from those of their rivals. They do this by a variety of means including product development, internationalization and mergers and acquisitions. More recently, concepts of supply chain management and traceability systems have been introduced into the food processing industry. The introduction of these concepts has shifted the emphasis from the performance of the individual firm towards the performance of the chain as a key determinant of future success.

We have seen that the FDT industry is the largest manufacturing industry in the EU in terms of production value. It has experienced rapid productivity growth and contributes positively to the EU's trade balance. The overall performance of the FDT industry measured in terms of labor productivity, extra-community

exports and price stability is judged to be adequate. Figures suggest that performance is higher in sectors with a higher concentration ratio. Higher wages are compensated by higher labor productivity and it is illustrated that higher market shares result in higher profits. More research is required to find out whether higher prices or higher efficiency dominate.

Annex 2.1 The evaluations in Table 2.4 are based on the following criteria:

Productivity: value added at factor costs per employee in 1992

strong: $> \text{EU-average} + 2.000 \text{ ECU}$

fair: $> (\text{EU-average} - 2.000 \text{ ECU})$ and $\leq (\text{EU-average} + 2.000 \text{ ECU})$

weak: $\leq (\text{EU-average} - 2.000 \text{ ECU})$

Growth: Evolution of share of turnover per Member State in total turnover of the EU FDT-industry, 1981-1992

strong: $\text{share } 1992 > \text{share } 1981$

fair: $\text{share } 1992 > (\text{share } 1981 - 1\%)$ and $\leq \text{share } 1981$

weak: $\text{share } 1992 \leq (\text{share } 1981 - 1\%)$

Prices: increase of consumer price index for FDT-products, relative to the consumer price index for all products during 1985-1990

strong: $< 50\%$

fair: $50\% - 75\%$

weak: $> 75\%$

Profitability: evolution of cash flow³ as a % of turnover during 1980-1991

strong: higher than EU-average in 1991

fair: increasing during 1980-1991 but lower than EU-average

weak: decreasing during 1980-1991 and lower than EU-average

³ Cash flow is calculated as turnover less purchases of goods and services and labor costs. The more customary definition (profit or loss plus depreciation) could not be used due to lack of data at the EU-level.

Annex 2.2 The evaluations in Table 2.5 are based on the following criteria:

Concentration in sector (1992):

- ++ > FDT-average + 5%
- + > FDT-average + 1% and \leq FDT-average + 5%
- < FDT-average - 5%
- < FDT-average - 1% and \geq FDT-average - 5%

Labour intensity as measured by the share of labor costs in sector turnover in 1991:

- ++ > FDT-average + 10%
- + > FDT-average + 1% and \leq FDT-average + 10%
- < FDT-average - 10%
- < FDT-average - 1% and \geq FDT-average - 10%

Value added as measured by sector gross value added at factor costs relative to sales in 1992:

- ++ > FDT-average + 5%
- + > FDT-average + 1% and \leq FDT-average + 5%
- < FDT-average - 5%
- < FDT-average - 1% and \geq FDT-average - 5%

Investment: average investment per employee in 1989 in sector:

- ++ > FDT-average + 2.000 ECU
- + > FDT-average + 500 ECU and \leq FDT-average + 2.000 ECU
- < FDT-average - 2.000 ECU
- < FDT-average - 500 ECU and > FDT-average - 2.000 ECU

Productivity: value added at factor costs per employee and per sector in 1992:

- ++ > FDT-average + 5.000 ECU
- + > FDT-average + 500 ECU and \leq FDT-average + 5.000 ECU
- < FDT-average - 5.000 ECU
- < FDT-average - 500 ECU and \geq FDT-average - 5.000 ECU

Growth: sector turnover relative to total FDT turnover in 1992:

- ++ \geq 1980 share + 0,5%
- + $>$ 1980 share and \leq 1980 share + 0,5%
- \leq 1980 share - 0,5%
- $<$ 1980 share and \geq 1980 share - 0,5%

Profitability: share of cash flow in sector turnover in 1991:

- ++ $>$ FDT-average + 5%
- + $>$ FDT-average + 1% and \leq FDT-average + 5%
- $<$ FDT-average - 5%
- $<$ FDT-average - 1% and \geq FDT-average - 5%

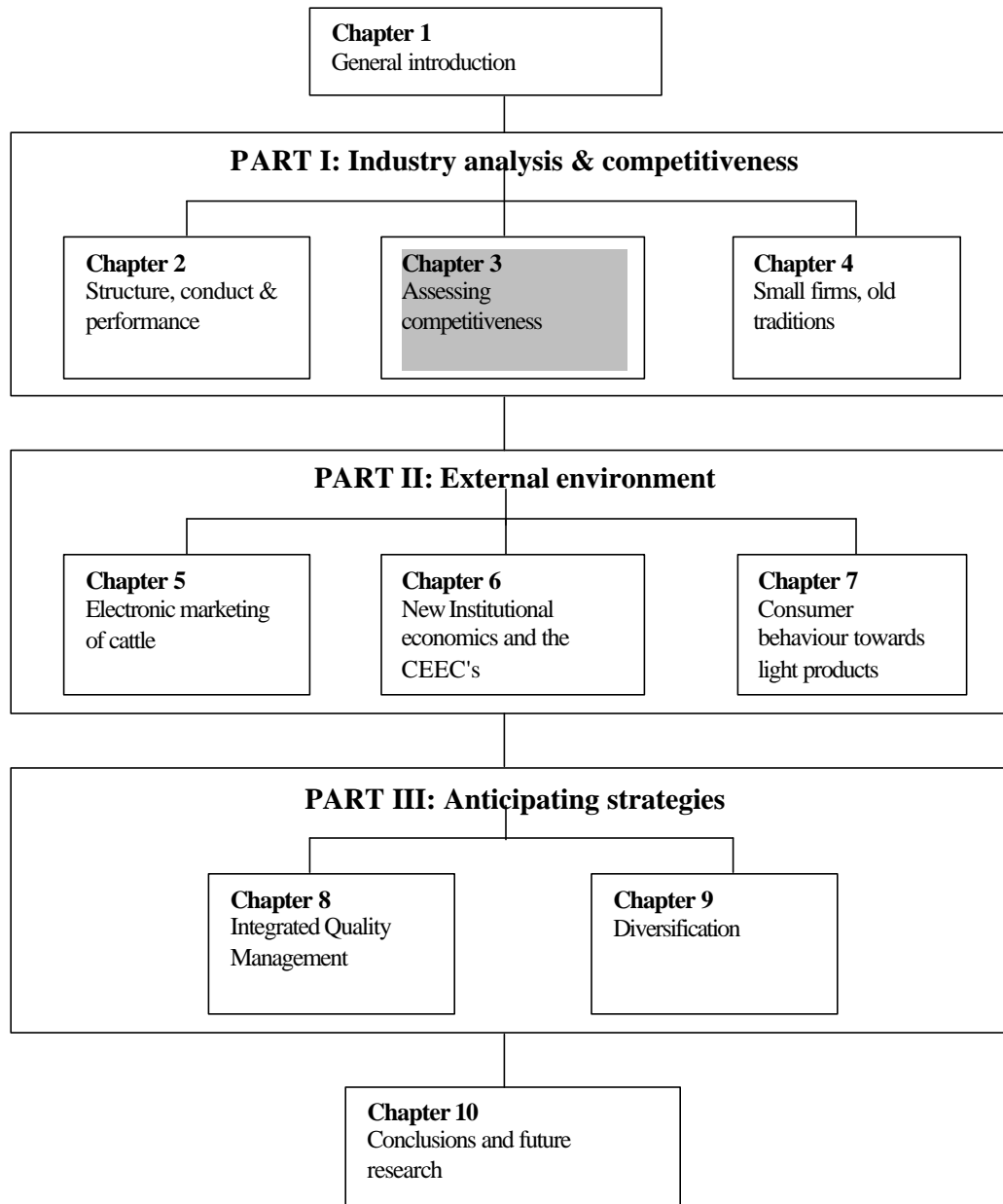
Chapter 3

Assessing Competitiveness at Industrial Sector Level

This chapter is adapted from:

Gellynck, X.; Viaene, J. & Heene, A. (2001). Measuring competitiveness at meso level. Dag van het Wetenschappelijk Economisch Onderzoek in Vlaanderen, 10 oktober 2001, published on the internet: <http://www.vwec2001.be/>, 35p.

Gellynck, X. & Viaene, J. (2002). Assessing Competitiveness in Agribusiness at Meso Level through the Attractiveness/Position Indicator. Paper in second review for Agribusiness: An International Journal.



Chapter 3: Assessing Competitiveness at Industrial Sector Level

3.1 Abstract

Measuring and explaining competitiveness focuses primarily on individual firms and strategic groups on the one hand and on countries or regions on the other. Few approaches focus on industries or its sectors, despite the fact that such instruments are essential for industrial policy makers. The chapter aims to contribute to the filling up of this gap and to express mathematically the attractiveness/position (AP)-indicator. First, the AP-indicator is placed in the spectrum of theories measuring and explaining competitiveness. Next, the calculation procedure for the AP-indicator is explained, which means that the evolution on importing markets of a particular sector is confronted with the exports of a specific country. Finally, weaknesses and advantages of the AP-indicator are indicated. When the AP-indicator is used in a proper way, it is a useful tool in measuring and monitoring competitiveness at the level of an industrial sector.

3.2 Introduction and objective

Open economies create global markets for both products and resources. A globalising economy increases interest in monitoring and measuring the international competitiveness of firms, groups of firms, industries, regions, countries and trade blocs, which are competing with each other for resources or for the spending power of the final consumer. For the private sector, it is important to generate market power to maximize profits (Porter, 1980; Buzzel & Gale; 1987). For public authorities, it is important to create the necessary framework to maintain competition and to maximize social welfare (Bain, 1968; Scherer & Ross, 1990). Therefore, understanding the forces for trade and the conditions for competitiveness becomes more important for decision makers (Traill, 1999).

Competitiveness is a very complex concept with no clear and agreed definition (Lagnevik & Fanfani, 1995; Pitts & Lagnevik, 1998; Viaene & Gellynck, 1998a; Banse et al., 1999; Frohberg, 2000). Consequently, the methods of measuring competitiveness differ. This makes it difficult for both public authorities and private organizations to verify whether or not changes in competitiveness occur and to intervene accurately. Moreover, it is almost impossible to assess the impact of actions to improve competitiveness (Bredahl et al, 1994; Pitts & Lagnevik, 1998).

Against this background, the objective of this chapter is to present the attractiveness/position indicator (AP-indicator) for measuring competitiveness at the level of an industrial sector. An industrial sector is defined as a group of firms that produce similar products with help of a similar technique (Daems & Douma, 1989), for example the frozen vegetables sector or the pig meat sector. The results obtained from the application of this method have been illustrated a number of publications (Viaene & Gellynck, 1989; Viaene & Gellynck, 1997a; Viaene & Gellynck, 1998a). However, the theoretical approach and basis as well as the weaknesses and advantages on the method have not been explained in detail. The aim here is to express mathematically the AP-indicator and to place it in the spectrum of measuring and explaining competitiveness.

The focus in analyzing competitiveness can vary, because it can be analyzed at the level of an entire economy or even several economies, at the level of an industry as a whole, one of its subsectors or of a strategic group. Competitiveness can also be measured at the level of an individual company or at the level of a single product or a group of products. Further, a distinction can be made in spatial terms: local/regional, domestic or international (export) market. Within the frame of this chapter, the AP-indicator is designed for measuring competitiveness at sectoral level on export markets.

The structure of the chapter is as follows. First, an overview of the salient literature is given, with the purpose of drawing a distinction between measuring (facts) and explaining (determinants or sources) competitiveness. Second, the

method for measuring competitiveness at sector level is set out and the AP-indicator is described. The final section presents a discussion and conclusions.

3.3 Issues in approaching competitiveness

As indicated above, several definitions of competitiveness exist and are used in the scientific literature. Competitiveness can be analyzed starting from a large variety of parameters such as factor costs, added value, investments, innovation and R&D, productivity, profitability, terms of trade or even social goals such as employment and inflation. Within the frame of this chapter, the definition used by Agriculture Canada: "The sustained ability to profitably gain and maintain market share in domestic and/or export markets" (Agriculture Canada, p. 3, 1993) is used. The predominant focus is therefore on the trade aspects related to competitiveness.

Buckley et al. (1988) make a distinction between performance, potential and process when discussing competitiveness. Performance can be measured in terms of profitability, market share or trade balance. Potential is linked to advantages at the level of inputs such as production factors. Process deals with the question of how the potential is translated in performance. Thus a distinction can be made between two categories, namely measuring and explaining competitiveness (Table 3.1). Measuring competitiveness is limited to quantifying, while explaining goes beyond this in looking for independent variables or drivers of competitiveness. The approaches belonging to the second category explain what the equations in the first category measure. Table 3.1 is all exhaustive but summarizes the main approaches in relation to trade, market share and foreign direct investments. For a more detailed overview on measures see Ballance et al. (1987), Balassa (1989), Porter (1990), Vollrath (1991), Scott & Vollrath (1992), Frohberg & Hartmann (1997), Laursen, (1998) and Weindlemaier (2000). Hunt (2000) recently presented the resource-advantage theory as a general theory of competition and provides a detailed overview of approaches aimed at explaining competitiveness.

Table 3.1 Overview of approaches to measure and explain competitiveness relative to trade.

Measuring performance/potential	Explaining potential/process
<p>Trade based indicators:</p> <p>Revealed Comparative Advantage (RCA)</p> <p>Net Trade Ratio (NTR)</p> <p>Revealed Symmetric Comparative Advantage (RSCA)</p> <p>Relative International Competitiveness (RIC)</p> <p>Constant Market Shares Analysis (CMSA)</p>	<p>Trade theory:</p> <p>Technology differs (Smith, 1776; Ricardo, 1817)</p> <p>Factor endowments (Heckscher-Ohlin, 1919; Leontieff, 1954)</p> <p>New Trade Theory (Krugman, 1989)</p> <p>Cross-fertilisation (Porter, 1980; Williamson, 1989; Sutton, 1992; Dunning, 1988; McCorrison & Sheldon, 1991; Abbott, 1998)</p>
<p>Foreign direct investments:</p> <p>Dunning-adapted net competitive advantage index (DNCA)</p>	<p>Industrial Economics:</p> <p>Structure-Conduct-Performance (Bain, 1968)</p> <p>Porters' Diamond (Porter, 1990)</p> <p>Transaction costs (Williamson, 1989)</p>
<p>Relative efficiency:</p> <p>Domestic Resource Cost Analysis (DRC)</p>	<p>Business Economics:</p> <p>Resource-based theory (Penrose, 1959; Wernerfelt, 1984; Connor, 1991; Barney, 1991)</p> <p>Competence-based theory (Hamel & Prahalad, 1994; Heene & Sanchez, 1996; Teece et al., 1997)</p> <p>Market orientation (Grunert, 1996b; Söllner & Rese, 2001)</p>

3.3.1 Measuring competitiveness

As indicated in Table 3.1, three approaches to measure competitiveness are distinguished: (1) trade based indicators, (2) foreign direct investments and (3) relative efficiency.

3.3.1.1 Trade based indicators

The most used and known trade based indicator of competitiveness is the revealed comparative advantage (RCA) indicator, developed by Balassa (1965) and defined as:

$$RCA_{ij} = (X_{ij} / \sum_i X_{ij}) / (\sum_j X_{ij} / \sum_i \sum_j X_{ij})$$

where the ratio in the numerator represents the share of sector i in country j total exports while the denominator represents the same share for the world economy. The RCA indicator takes values between 0 and +8 . A value less than 1 indicates sectors in which a country is relatively unspecialized with respect to the world economy. Values above unity suggest that the country has a competitive advantage in the studied product category. The assumption is that the commodity pattern of exports reflects both relative costs and non-price differences between the examined countries. To obtain a more dynamic measure, Balassa also calculated changes in export performance over time and obtained an average or moving average.

While the RCA is concerned only with export shares, the net trade ratio (NTR) looks at both exports and imports:

$$NTR_i = (X_{ij} - M_{ij}) / (X_{ij} + M_{ij})$$

where X refers to exports of the products belonging to sector i in country j and M to the imports. It compares export and import values for a set of products belonging to sector i and expresses the difference as a ratio. When the products of sector i are only imported and not exported, then the ratio will be -1. In the opposite extreme, namely where only products are exported, the ratio will be +1.

A useful transformation of the RCA consists of the revealed symmetric comparative advantage (RSCA), which has been used recently by Dalum et al. (1998) and by Brasili et al. (2000):

$$RSCA_{ij} = \frac{RCA_{ij} - 1}{RCA_{ij} + 1}$$

The properties of the RSCA are similar to the logarithmic transformation and the indicator takes values between -1 and +1. The idea of the RSCA is to reduce the weight of extreme values, namely the large weight to small industries and countries. It is specifically useful in econometric work, because the RCA indicator is not comparable on both sides of unity.

Lundberg (1988) criticised the RCA because imports are neglected. He prefers the relative international competitiveness index (RIC):

$$RIC_i = ((C_i + X_i - M_i) / C_i) / ((\sum_k C_k + \sum_k X_k - \sum_k M_k) / (\sum_k C_k))$$

where in the first part of the equation C represents domestic consumption of products of sector i , X exports and M imports, while in the second part the score for sector i is adjusted for the overall surplus or deficit in the total of k -sectors.

The advantages of these indicators relate to the fact that they can be calculated for a whole industry such as food and drinks or for sectors such as pig meat or fish. Pitts & Lagnevik (1998) mention some disadvantages of RCA and its derivatives:

- Countries only acting as transit countries obtain artificially high rates of competitiveness;
- Market size and market growth are not taken into account;
- Industries within one country are compared and not among countries.

Yeats (1992, 1998) criticized both the RCA and NTR because results could be affected by government intervention on the one hand and by transport charges and products that are closely located to raw materials on the other, which are both particularly the case in the agribusiness industry.

A more dynamic indicator of competitiveness related to trade consists of the constant market shares analysis (Fagerberg & Sollie, 1987; Milana, 1988). The change in a given market share is divided into (a) a structural effect (change in exports when market share remains constant), (b) a growth adaptation effect (move into growth products), (c) a stagnation adaptation effect (effort of getting out of the stagnating products) and (d) a market share effect (change in performance when no structural change occurs):

$$\Delta x_j = \underbrace{\sum_i (x_{ij}^{t-1} \Delta y_i)}_{(a)} + \frac{1}{2} \sum_i \left(\Delta y_i + \left| \Delta y_i \right| \right) \underbrace{\Delta x_{ij}}_{(b)} + \frac{1}{2} \sum_i \left(\Delta y_i - \left| \Delta y_i \right| \right) \underbrace{\Delta x_{ij}}_{(c)} + \sum_i (\Delta x_{ij} y_i^{t-1})_{(d)}$$

where

$$x_j = \sum_i X_{ij} / \sum_i \sum_j X_{ij} \text{ (a country's aggregate share of exports to the world)}$$

$$x_{ij} = X_{ij} / \sum_j X_{ij} \text{ (a country's share of a given sector in terms of exports)}$$

$$y_i = \sum_j X_{ij} / \sum_i \sum_j X_{ij} \text{ (a sector's share of total exports to the world)}$$

where X_{ij} denotes exports by firms situated in country j in sector i .

3.3.1.2 Foreign direct investments

Because production out of the home country surpasses (food) exports for many countries (Henderson, 1998; Pick et al., 1998), another set of indicators has been developed to measure international competitiveness, namely those taking into account foreign direct investment (FDI). Within this approach, it is suggested that besides exports, foreign direct investments can be regarded as an indicator of competitiveness. Here, we only mention the Dunning-adapted net competitive advantage (DNCA) index (for more details see Traill & Gomes da Silva, 1996):

$$DNCA_i = 100[(X_i + IPO_i) - (M_i + IPI_i)] / (Y_i + IPO_i - IPI_i)$$

where X_i is the value of national exports of industry i , M_i of national imports, Y_i the value of national production of industry i , IPO_i the value of output produced by the country's outbound FDI in industry i and IPI_i the value of output produced by the country's inbound FDI in industry i . Other authors also consider the ability to attract FDI as an indicator of competitiveness (e.g. Froberg, 2000).

3.3.1.3 Relative efficiency

The indicators presented above focus on past competitiveness performance. Within the frame of policy changes, it is important to assess the impact on competitiveness ex ante. Therefore, indicators such as the domestic resource cost (DRC) analysis have been developed (Masters & Winter-Nelson, 1995). The DRC measures the opportunity costs of domestic non-tradable factors required to produce a traded good per unit of tradable value added. It compares the value of domestic resources used in producing a good with the costs of purchasing the good abroad:

$$DRC_i = \frac{\sum_{j=k+1}^n a_{ij} V_j^D}{P_i^B - \sum_{j=1}^k a_{ij} P_j^B}$$

where a_{ij} is the quantity of the j -th traded (if $j \leq k$) and (if $j > k$) non-tradable intermediate input or domestic resource (for $j = 1, 2, \dots, n$) used to produce one unit of output i ; V_j^D is the domestic (opportunity) price of non-tradable intermediate input or domestic resource j ; P_i^B is the border price of output i ; P_j^B is the border price of input j . The DRC has been criticized by Masters & Winter-Nelson (1995) for producing biased results. Alternatives that rely heavily on domestic factors (land and labor) are invariably shown to be efficient, while in the case of alternatives that use large amounts of tradable inputs the relative profitability of activities is overstated. In addition, the distinction made between the costs of tradable and of non-tradable inputs is often rather ambiguous.

3.3.2 Explaining Competitiveness

A limitation of all measures of competitiveness is that changes in the patterns are shown, but not in the underlying causes and explanatory factors. Therefore, it is important to consider the right hand side of Table 3.1, which consists of different approaches aiming at explaining competitiveness in terms of potential and process. The scientific literature is characterized by a wide range of different approaches to the concept of explaining competitiveness. Within the overview that follows, we discuss trade theory, industrial economics and business economics.

3.3.2.1 Trade theory

The origin of trade theories relates to the question why international trade occurs, and assumes a competitive strength or advantage of a country, sector or firm. The first economist to try to explain the reasons behind trade was Adam Smith (1776). His approach was based on the assumption that trade occurs when absolute differences in costs exist. Ricardo (1817) showed the shortcomings of this argument by indicating that trade between two countries is even possible when one country can produce all products more efficiently (higher labor productivity because of different technology) than the other country (comparative advantage).

Heckscher-Ohlin elaborated upon Ricardo's theory and assumed that the same technology is available to everyone (Abbott, 1998). Differences in factor endowments (labor and capital) result in trade patterns, which are also explained by cost-based comparative advantage. However, Leontieff (1954), through empirical evidence, showed contrary results to the Heckscher-Ohlin model (the so-called Leontieff paradox). In his view, most trade is between countries with the same factor endowments.

This debate resulted in the incorporation of many other variables in trying to explain trade between countries, including differences in demand conditions across countries (Linder, 1967), natural resources (Vanek, 1959), human capital (Kenen, 1965), technological change and product cycles (Vernon, 1966). This evolution in the scientific literature and the fact that trade volumes become larger and grow more rapidly between similar and not different countries, resulted in the New Trade Theory of the 1980's (Krugman, 1989). The New Trade Theory is based on elements such as economies of scale, product differentiation and imperfect competition. These elements depend much more on firm behaviour rather than differences across countries. Outcomes are closely related to and largely determined by market institutions (Abbott, 1998). The roots of this theory can be found in the industrial organisation theory, which indicates the cross-fertilisation of sub-disciplines in business and economics. This cross-fertilisation continues, where trade economists incorporate elements such as transaction costs (Williamson, 1989), sunk costs

(Sutton, 1992), firm level competitiveness (Porter, 1980), intra-industry trade (McCorrison & Sheldon, 1991; 1997) and Dunning's ownership-location-internationalization paradigm (1988) into trade models (Ethier, 1986; Hortsman & Markusen, 1996).

It is clear that, related to trade, no unified theory for analyzing competitiveness exists. On this basis and because of industry specificities and the increasing role of market institutions, Bredahl et al. (1994) conclude that a unified, general theory to address international competitiveness may be unattainable. Consequently, trade economists incorporate much more elements from both industrial and business economics in their attempt to explain trade patterns.

3.3.2.2 Industrial Economics

The basis of the literature in industrial economics related to competitiveness originates from the Industrial Organization Theory (Bain, 1968). This theory deals with the Structure-Conduct-Performance (SCP) paradigm and aims to define conditions of economic optimum and social welfare by detecting and preventing anti-competitive practices such as barriers to entry in the market or monopolistic power. The original purpose of the SCP paradigm was to isolate industries that were not maximizing social welfare and to correct this situation (Scherer & Ross, 1990; Thomas & Pollack, 1999). The approach is not limited to the market-form (structure), but also takes into account the competitive behaviour and resulting performance. In this way, drivers and sources of a given performance or competitiveness can be identified.

However, business economists (see 3.3.2.3) try to help firms to maximize profits and to generate market power by getting around anti-trust policies and by creating an environment that is less than fully competitive. Based on internal resources, firms try to create conditions more favorable to them than to their competitors. This means that there is a contradiction between the goals of a firm and those of government. According to Barney & Hesterly (1996) too much attention is given to the environment within which the firm operates (external factors) and not enough to the unique skills and capabilities (internal factors) that firms add to an industry in evaluating the attractiveness of an industry.

Porter (1980, 1985, 1990) turns the Industrial Organization Theory around. If a better competitive position results primarily from industry factors, the focus should be on the increase of monopolistic power in these selected industries (Montgomery & Porter, 1991). Porter abandoned the formal approach used in trade theory and incorporated the different concepts of competitiveness in the well known conceptual framework, Porter's Diamond (Porter, 1990). The concept was developed with the aim of determining why a nation achieves international success as a whole or in a particular industry. Porter states that four interrelated factors determine the competitive strength: factor conditions, demand conditions, related and supporting industries, and firm strategy, structure and rivalry. The idea is that nations will succeed in industries where the Diamond is most favorable.

More recently, the Industrial Organization Theory has been extended with the theory of transaction costs (Williamson, 1989), as a reaction to the neo-classical economic model, which suggests that all parties have the necessary information to be able to make rational choices within the exchange process (Loader, 1996). It is clear that this information is not (always) available in practice. This situation creates transaction costs. Hereby, the cost determining attributes of individual transactions are outlined as their frequency, the environmental uncertainty surrounding them and the specificity of the assets required to consummate them. Building relationships within the chain reduces uncertainty and transaction costs on the one hand and creates access to economies of scale by by-passing traditional market arrangements on the other hand. The governance mechanisms present within an industry are determined by the cost-economizing attitudes of its firms. Industries with the most appropriate governance mechanisms are the most competitive.

3.3.2.3 Business economics

Within the relation between business economics and competitiveness, we focus on strategic management on the one hand and marketing management on the other. In discussing strategic management, a distinction is made between the Resource-Based Theory of Competitive Advantage and Competence based

theory. Both strategic management theories focus on the internal factors in explaining competitiveness.

The concept of the Resource-Based Theory of Competitive Advantage is that firms' ultimate objective is to obtain above-normal returns, which can be achieved when both tangible and intangible resources of an organisation (physical, financial, human, know-how, information, brand names, market position) are combined in a strategic way (Penrose, 1959; Wernerfelt, 1984). Consequently, the buyer perceives the firm's product or service as distinctive or a low cost position is obtained (Conner, 1991). Four characteristics of resources can be distinguished in order to obtain competitive advantage (Barney, 1991): Resources must be (1) valuable and make a positive contribution to exploiting a position in the market, (2) rare and not widely available to competitors, (3) not perfectly imitable because of the idiosyncratic history of the firm, socially complex phenomena within or between organizations or causal ambiguity in the strategy process (difficult to understand by competitors), (4) not easy to substitute.

As a reaction to the focus on the current competitive situation, Hamel & Prahalad (1994) turn the emphasis to the future and stress that strategy should focus on creating competitive advantage tomorrow through investments in core competence. Competitiveness derives from the ability to create core competence at lower costs and more rapidly than competitors. Characteristics of core competence are: (1) provides access to a wide variety of markets; (2) makes a significant contribution to customers' perception of benefits and (3) is difficult to imitate. This approach gained momentum and received further impetus through the publications of numerous articles in the scientific press (e.g. Aaker, 1995; Hamel & Heene, 1994; Heene & Sanchez, 1996; Sanchez et al., 1996; Sanchez & Heene, 1997; Teece et al., 1997). Essential within this approach is the importance attached to the competitive dynamics and the rapidly changing environment in which firms operate. Here reference is mainly to the environmental, genetic and information revolution, which creates opportunities for firms, on the assumption that opportunity share becomes more important than market share. Within this approach a company should focus on questions

such as: What will be customer requirement within five to ten years? What will be the basis for the company's competitive advantage? Which core competences are needed? The basis of competitive advantage lies in answering these questions and developing the core competence necessary to be competitive in the future.

In explaining the competitiveness of industries, it could be interesting to focus on common industry resources and competences, i.e. those resources and competences that are characteristic for all firms belonging to the studied industry. In this case, the competitive dynamics within an industry are crucial to building firm specific resources or competences and vice versa. In this way, dynamic industries can obtain a competitive advantage in supplying international markets vis-à-vis other groups of firms.

Marketing strategies focus on the demand side of the market. In the marketing literature, competitiveness is linked with the market orientation of firms or industries (Grunert, 1996b; Söllner & Rese, 2001). It refers to systematically monitoring market developments, both customers and competitors, and fitting products and services to these developments. Several authors have defined the concept of market orientation, emphasizing the management (Lichtental & Wilson, 1992), and the philosophical and behavioral (Deher, 1994) approach. Based on empirical findings described in the literature (Grunert et al., 1996), one can argue that market oriented firms or industries, achieve a competitive advantage and a higher overall business performance.

3.4 Attractiveness/position indicator

The AP-indicator has been developed to measure competitiveness at sector level. The aim of the AP-indicator is to monitor or measure competitiveness on export markets. It confronts the export results of a particular sector with the development of the market(s) (total imports) under investigation. This can be particularly useful for both public authorities and professional organizations in the frame of industrial policy. In the spectrum of measures of competitiveness,

the AP-indicator is a trade based indicator of competitive performance (see Table 3.1).

First, the theoretical background of the indicator is discussed. Next, the calculation procedure for both attractiveness and position is presented. The way in which attractiveness and position are estimated, is illustrated in Chapter 4.

3.4.1 Theoretical background

The AP-indicator is developed to measure competitiveness at meso or industry level. It is inspired by the portfolio planning methods, which were developed in the 1970's and used as tools for business strategy and for understanding causes of superior business performance in multi-business organizations (Näsi, 1999). These portfolio planning methods were mainly adopted from the industrial organization economics and marketing literature available at that time (Buzzell, 2002).

The most famous and well-known portfolio planning method is the Market Growth-Share matrix (GSM) developed by the Boston Consultancy Group (BCG, 1971). This matrix was developed to answer the question on how to allocate resources between competing claims (Nicholls, 1995). The GSM looks at the firm's position in two dimensions. The first dimension is the growth rate of the market in which the firm operates. High growth rates are assumed to be attractive because market share gains are supposed to be more easily obtained (Doyle, 1994; Davis & Devinney, 1997; Olsen & Ellram, 1997). The second dimension is the relative market share or the ratio of the firm's share to the share of the largest competitor. This is used as an indicator of relative competitive strength.

The Profit Impact of Market Strategy (PIMS) study (Buzzell & Gale, 1987) also indicates the importance of market share in relation to performance. Looking at answers to the question about 'What is the influence of strategy on performance?', the Profit Impact of Market Strategy (PIMS) investigated the causes of profitability. The conclusion of their research was that the most important profit influences were market share, relative product quality, capital

intensity capacity utilization, labor productivity and growth rate of a business unit's served market (Buzzell, 2002). The PIMS are the best known for its positive relation between market share and profitability. It was often criticized for not taking into account firm-specific factors such as management skills (Jacobson & Aaker, 1985; Jacobson, 1988, 1990). More recently, Annacker and Hildebrandt (2002) illustrated by using a structural equation approach and employing a 6-year panel of data from the PIMS database that these variables have a significant impact on business performance, even if the influence of time-invariant and firm-specific effects is controlled.

Inspired by the GMS approach, a 3 x 3 matrix, namely the Competitive Strength Matrix (CSM) was developed and popularized by large companies such as Shell, General Electric and McKinsey (Davis & Devinney, 1997). Again two dimensions are presented. The first includes market attractiveness as a more general concept than market growth and the second is called competitive strength, being an expansion of market share. Indicators of market attractiveness include market size, market growth, intensity of competition, opportunities and threats, technological and capital requirements, environmental impact, social, political and regulatory factors. Competitive position can be measured by relative market share, increasing profitability, manufacturing capability, reputation, image, technological skills and financial strength. The basic idea behind the CSM approach is to invest in areas where markets are attractive and simultaneously where the company's strengths can be utilized.

A popular variant on the CSM is the Life Cycle Matrix (LCM) developed by Arthur D. Little (Mikkola, 2001). Competitive strength is defined as in the CSM, but attractiveness of the industry is replaced by the life cycle stage of the product category. The idea behind this approach is that a company should have a diversified portfolio of products.

On the basis of these initial matrix approaches, a lot of variants have been created (Wind & Mahajan, 1981; Majluf & Hax, 1983a, 1983b; Devinney & Stewart, 1988; Nguyen et al., 1990). An interesting approach is the one presented by Owen & Harrison (1995), who propose a matrix with two axes.

The vertical axis deals with the degree of fit between critical success factors necessary to be successful in the business and the core competence of the corporation. The horizontal axis illustrates the degree of fit between the business opportunities and the core competence of the company. A similar matrix is proposed by Nicholls (1995), namely the Mission and Core Competences (MCC) portfolio decision matrix. The MCC matrix has mission on the vertical axis and core competences on the horizontal. Once defined, the axes are simply divided into two halves, where the one represents the good fit and the other the poor fit.

The portfolio approaches have been criticized (Haspeslagh, 1982; Majluf & Hax, 1983; Day, 1986; Porter, 1987; Morrison & Wensley, 1991; Hooley & Saunders, 1993; Doyle, 1994; Armstrong & Brodie, 1994; Davis & Devinney, 1999):

- Dimensions are measured either objectively, but narrowly (GSM) or subjectively and broadly (CSM & LCM);
- Questions about the assumption that a causal relationship exists between market share and profitability;
- Difficulties in defining the boundaries of markets (too narrowly versus too broadly);
- Variables included in the portfolio models do not cover the full picture of influencing variables (e.g. degree of vertical integration, location, entry barriers, core competence);
- Failure to account for the financial risk associated with strategic decisions;
- Attempts to quantify can disguise real issues.

Different authors approve the usefulness of portfolio models, when properly used (Haspeslagh, 1982; Dubinsky & Ingram, 1984; Turnbull, 1990; Boulding & Staeling, 1993; Doyle, 1994; Moutinho & Brownlie, 1994; Olsen & Ellram, 1997; Taggart & Harding, 1998). These authors suggest that portfolio models can be used as an analytical tool to organize information and to classify the items included in the research into a framework. It encourages corporate strategists to think long-term about linkages between the firm's various business. However, they also indicate that such models should be used with an

understanding of their limitations and perhaps in combinations with other tools. Portfolio models should not be used as decision-making tools, but as analytical tools that provide insights into the business, with relative strengths and weaknesses.

The approval of the usefulness of portfolio models is the main motivation and argument for developing the AP-indicator, which is clearly inspired by portfolio models. The AP-indicator comprises the variables market size, market growth, market share and market share growth (see 3.4.2 and 3.4.3). The selection of these variables is motivated by the fact that they are incorporated in most of the existing portfolio models. Of course the limitations of the AP-indicator have to be recognized (see discussion and conclusions) and decisions should not be based on the use of the indicator as a stand-alone guideline, but in conjunction with other techniques discussed earlier (see 3.3.2). Contrary to the portfolio models, the AP-indicator is not developed for understanding causes of superior performance, but for measuring and monitoring competitiveness.

Table 3.2 presents the definition of the AP-indicator and provides a general overview of the calculation procedure. Hereby, a distinction is made between a high, medium and low score for each of the investigated parameters. In total eight parameters are involved in the calculation of the AP-indicator, of which four are used to assess attractiveness and four to assess position. In both cases, two parameters relate to the evolution on the importing market of the products belonging to the investigated sector and two to the evolution of exports to the importing market. This comparison between and interaction of the evolution of the importing market and the exporting country under investigation is essential and results in an indication of competitiveness.

3.4.2 Attractiveness

We define attractiveness of the foreign or importing market(s) by market size and market growth (Table 3.2). In several scientific publications both market size and market growth are considered to be important indicators in industrial analysis (Dunne et al., 1988; Doyle, 1994; Saloner et al., 2001; Aaker, 2001). Market size corresponds with the volume of a product imported into the

examined foreign market in a particular year. Market growth corresponds with the percentage change in the volume imported of a particular product into the examined foreign market over a defined period. For both variables, a distinction is made between high, medium and low.

Table 3.2 Definition of the AP-indicator.

High	Medium	Low
$z > \frac{1}{m \times n} \sum_i \sum_j Z_{ij}$	$\frac{1}{m \times n} \sum_i \sum_j Z_{ij} \geq z \geq 0.5 \times \frac{1}{m \times n} \sum_i \sum_j Z_{ij}$	$z < 0.5 \times \frac{1}{m \times n} \sum_i \sum_j Z_{ij}$
<p>where i represents the number of m products $i = 1, 2, \dots, k \dots m$; j the number of n importing countries $j = 1, 2, \dots, l \dots n$;</p> <p>Attractiveness:</p> <ol style="list-style-type: none"> 1) <u>Market size importing market</u>: z equals M'_{kl} or imports of product k on market l in year t (final year of the investigated period) and Z equals M'_{ij} 2) <u>Market growth importing market</u>: z equals $\Delta_p M_{kl}$ or the percentage change in imports of product k on market l during D_p or the investigated period and Z equals $\Delta_p M_{ij}$ 3) <u>Market size of exports to importing market</u>: z equals X'_{kl} or exports from country c of product k to market l in year t (final year of the investigated period) and Z equals X'_{ij} 4) <u>Market growth of exports to importing market</u>: z equals $\Delta_p X_{kl}$ or the percentage change in exports of product k to market l during D_p or the investigated period and Z equals $\Delta_p X_{ij}$ <p>Position:</p> <ol style="list-style-type: none"> 1) <u>Market share on importing market</u>: z equals $M'_{kl} / \sum M'_i$ or the share of imports of product k on market l in year t (final year of the investigated period) and Z equals M'_{kj} / M'_{ij} 2) <u>Market share growth on importing market</u>: z equals $\Delta_p M_{kl} / \sum M_i$ or the percentage change in the share of imports of product k on market l during D_p or the investigated period and Z equals $\Delta_p M_{kj} / M_{ij}$ 3) <u>Market share of exports to importing market</u>: z equals $X'_{kl} / \sum X'_i$ or the share of exports of product k on market l in year t (final year of the investigated period) and Z equals M'_{kj} / M'_{ij} 4) <u>Market share growth of exports to importing market</u>: z equals $\Delta_p X_{kl} / \sum X_i$ or the percentage change in the share of imports of product k on market l during D_p or the investigated period and Z equals $\Delta_p M_{kj} / M_{ij}$ 		

The selection of trade volumes rather than trade values is motivated by the fact that when a common denominator is used (e.g. carcass weight equivalent), abstraction is made from price differences between the products under investigation. These price differences can reflect differences in demand or differences in value added. It is obvious that these elements should be considered when the AP-indicator is analyzed and the determinants of change are investigated.

The combination of market size and market growth results in a 3 x 3 matrix, which indicates attractiveness. Hereby, the rows indicate market growth and the columns market size, which results in three levels of attractiveness: high for the products situated above the diagonal from top left to bottom right, medium for the products on the diagonal and low for the products below the diagonal.

The next step in the evaluation of competitiveness of the investigated sector is to determine attractiveness of the exporting country, which is measured using the same principles as for the importing country. It also results in a 3x3 matrix, similar to the one described above.

3.4.3 Position

We define position on the foreign or importing market by market share and market share growth (Table 3.2). Market share is considered as an important determinant in industry analysis (Porter, 1980, 1985; Kerin et al.; 1982; Buzzel & Gale, 1987; Doyle, 1994). It is measured in volume terms and corresponds with the share of a product imported into the examined foreign market in total imports of the product range for a particular year. Market share growth corresponds with the percentage change in the market share of a particular product on the examined foreign market over a defined period. For both variables, a distinction is made between high, medium and low.

The combination of market share and market share growth results in a 3 x 3 matrix, which indicates position. Here, the rows indicate market share growth and the columns market share, which results in three levels of position: high for

the products situated above the diagonal from top left to bottom right, medium for the products on the diagonal and low for the products below the diagonal.




The evaluation of the competitiveness of the investigated sector continues with the determination of position of the exporting country. This is measured according to the same principles as for the importing country and results in a similar 3x3 matrix as the one described above. It is important to remember that product market shares of the exporting country are compared with average market shares on the importing markets.

3.4.3 Combining Attractiveness and Position

The combination of attractiveness and position is presented in Figure 3.1.

Figure 3.1 Combination of attractiveness and position for the Belgian pig meat industry on the French import market.

		POSITION			
		LOW	MEDIUM	HIGH	
ATTRACTIVENESS	HIGH	France	Bellies	Carcasses, deboned meat	Hams
		Belgium			Carcasses, deboned meat
	MEDIUM	France	Shoulders		
		Belgium	Hams		Shoulders
	LOW	France	Loins		
		Belgium	Loins, bellies		

AP-Indicator: High:  Medium:  Low: 

For the individual investigated sector with a varied portfolio of products, the results of the attractiveness and position assessments can be combined in two new 3x3 matrices: namely one for the foreign market and one for the exporting country (Figure 3.1). Both matrices show three levels of the AP-indicator: (1)

high for the products above the diagonal; (2) medium for the products on the diagonal and (3) low for the products below the diagonal.

The comparison of both matrices enables an evaluation of the competitiveness of the investigated sector. The way the evolution of the investigated sector (exporting country) corresponds with or reacts to changes on foreign markets becomes clear. When a sector obtains a similar or better market AP-indicator than the one calculated for the imports, the sector is regarded as being competitive and vice versa. Figure 3.1 illustrates that the Belgian pig meat industry holds a strong competitive position for both carcasses and deboned meat on the French market. However, the competitive position of Belgium for hams is weak as the sector's position does not at all correspond with the high level of the AP-indicator on the French market.

3.5 Discussion and conclusions

A national or even regional approach to the analysis of the competitiveness of industries or sectors remains interesting, even within a trade bloc such as the single European market. Despite the fact that many trade barriers have disappeared, industry clusters will remain in the locations and regions where the infrastructure, industrial climate and competitive dynamics are well developed. Regional and national authorities can support an industry with the development of infrastructure, education, research and development, climate for innovation and incentives to create and improve sector specific companies. Industrial policy should be less general and more industry or even sector specific since both regions and industry or sector requirements differ (Lagnevik & Kola, 1998). This is especially the case in the agribusiness industry. Moreover, the empirical evidence shows that the average industry profitability is the most significant predictor of firm profitability (Montgomery & Porter, 1991)¹.

A wide range of tools has been developed to measure and explain competitiveness at the level of either a country or region and at the level of an

¹ It is important to mention that several authors do not agree with this statement and even suggest the opposite (see Schmalensee, 1985; Rumelt, 1991).

individual firm. However, the availability of tools to measure competitiveness at the level of an industrial sector is rather poor. We believe that the AP-indicator contributes to the filling up of this gap.

However, we are also aware of the limitations of the AP-indicator. The boundaries between high, medium and low attractiveness and position categories are subject to an arbitrary decision by the researcher. Nevertheless, the placing of the boundaries at the level of the average and 50% of the average is based on experience in applying the indicator in the agribusiness sector over several years.

Another potential weakness is that the indicator is limited to market size and market growth as factors of attractiveness and to market share and market share growth as factors of position. Other factors such as concentration or technology can be important for attractiveness and factors such as bargaining power and service for position. However, it is our opinion that for each component the two most important factors are included in the model.

Further, the results of the assessment depend on the choice of time period for the investigation. The beginning and end years could, for example, be exceptional or extreme years and result in misleading conclusions. A possible solution to this problem is to work with moving averages.

Besides the fact that the AP-indicator is quite simple to use, easy to understand and permits portraying of trade patterns, it has several advantages compared to other tools. First, it enables the investigation to verify how a sector adapts to changes in target import markets. The confrontation of the evolution in exports on the one hand and in imports on the other hand provides a clear overview of the evolution in competitiveness. The target market can easily be extended with supplies of home producers (assuming such data are available). However, in the case of agricultural and food products originating from primary processing sectors such as vegetable oils and fats, slaughtering/cutting units, dairy, and grain milling, one can expect that home producers are the dominant source of supply and real competitors are situated at the level of other exporting

countries. Second, the AP-indicator provides a comparison between the evolution of the different products within one and the same sector. In this way, the export/import structure of the studied products becomes clear. Thirdly, it allows comparison between different target markets through a standard and common approach. Hereby, the competitive position of the sector can be compared between each of the considered markets.

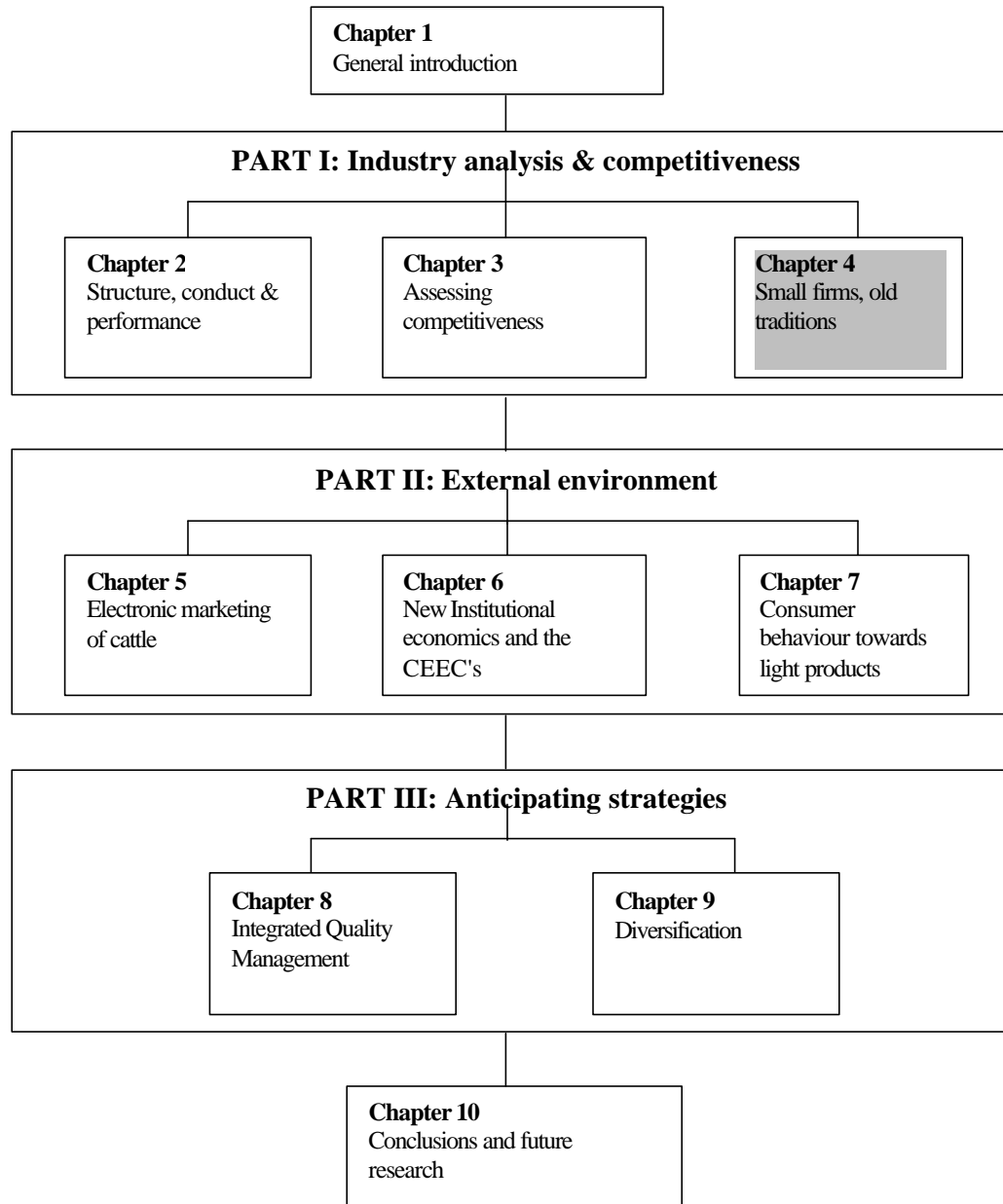
Finally, it is important to heed a warning against the misuse of the indicator as a prescriptive aid. The AP-indicator provides an objective way of filtering data and of monitoring sectors. It provides additional insights and adds structure to chaos so that the investigation for the determinants and basis of competitiveness can begin. Yet, this should only be the first step of the assessment. The second step should be to use of one of the different theories aiming at explaining the competitive potential and process. Explaining what is measured and estimating future competitiveness complete the analysis of competitiveness at industrial sector level.

Chapter 4

Small firms, old traditions equals low profit: pig meat processing in Belgium

This chapter is adapted from:

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Chapter 4: Small firms, old traditions equals low profit: pig meat processing in Belgium

4.1 Abstract

The poor financial situation of the Belgian pig slaughterhouses and cutting units is caused by a complex set of factors, which are determined by both local and international developments. On the domestic market, the sector is characterized by low concentration and overcapacity, which results in price pressure. On export markets, Belgium maintains its position due to product quality and service. However, price competition increases because of overcapacity in the neighboring countries. The Single European Market (SEM) seems to have little effect, while the impact of WTO is expected to be important. One solution to solve the actual crisis is not available. On the domestic market, companies have to cooperate to eliminate lack of working capital and lack of price transparency. At the company level, efficient management focusing on a low cost strategy is necessary to face the future. The problem of overcapacity goes beyond the national border. The sector should elaborate a restructuration plan to buy out capacity and to face the consequences of the globalising trade environment.

4.2 Introduction and objective

Total gross meat production accounts for 1,7 billion tons in 2000 and pig meat represents 63,4% (Table 4.1). With a self sufficiency ratio of 225,2% for pig meat in 2000, the Belgian meat sector is a net exporter. Traditionally, the exporters are oriented to other Member States of the EU, mostly Germany, France and Italy. Pig meat accounts for 56,7% of total Belgian meat exports. Total apparent meat consumption reaches a level of 91,2 kg per person in Belgium in 2000 and the share of pig meat represents 51,8%. Since Belgium is a net exporter of pig meat, the sector contributes positively to the national trade balance. The balance of trade

surplus of pig meat accounted for, 842,1 million EUR in 2000 and represents 5,8% of the total balance of trade surplus for the Belgian economy.

Table 4.1 Meat balances for pig meat and total meat, 2000 in 1.000 tons carcass weight equivalent.

Tons carcass weight	Pig meat	Total meat	Share pig meat (%)
Gross production	1.090,4	1.720,1	63,4
- live exports	72,6	135,4	
+ live imports	25,5	169,7	
Net production	1.043,3	1.754,5	59,5
+ beginning stock	8,0	8,0	
- final stock	-	-	
- meat exports	657,5	1.160,1	56,7
+ meat imports	90,4	331,3	
Human consumption	484,2	933,7	51,9
kg/person	47,3	91,2	
Self sufficiency %	225,2	184,2	

Source: CLE, 2000.

Generally, the competitive position of the Belgian meat sector is considered to be worsening. Overcapacity on the one hand and pressure from both the meat products and the retail sector on the other result in fierce competition in domestic and EU markets. The objective of this chapter is to measure competitiveness of the Belgian pig meat sector using the AP-indicator as defined in Chapter 3. Related to competitiveness, we agree upon the definition used by Agriculture Canada: "The sustained ability to profitably gain and maintain market share in domestic and/or export markets" (Agriculture Canada, p. 3, 1993). It means that we predominantly focus on the trade aspects related to competitiveness. Hence, the determinant factors of what is measured on the domestic and export markets are discussed.

The study is applied to the Belgian pig meat sector at the level of slaughterhouses and cutting units. In Belgium, meat companies are mostly family owned small and medium sized enterprises (SME's). The largest company has about 500 employees

and the many slaughterhouses (56 for pigs in 1998) are highly resistant to crisis and competition. This is because family and company are mutually dependent, which implies that new family capital is used in times of crisis and high competition.

The structure of the chapter is as follows. First, the research methodology used for measuring and explaining competitiveness is presented. Second, the competitive analysis starts with measuring the profitability of the meat sector. A sector with a high profitability has good competitive potential and can improve its competitiveness. Competitiveness on external markets is measured by using the AP-indicator. The Belgian situation is examined for its three main export markets, namely Germany, Italy and France. The most important components determining its profitability and competitive position are analyzed. In this perspective, the competitive factors from the Porter Diamond are used (Porter, 1990). The final section presents a discussion and conclusions. Hereby, some benefits and disadvantages of Porter's Diamond are explored.

4.3 Research methodology

First, the methodology used to measure competitiveness of the Belgian pig meat sector is explained. Secondly, the different elements of Porters' Diamond focusing on explaining competitiveness, are discussed.

4.3.1 Measurement

In order to realize the objectives, the study starts with an analysis of the current situation of the sector. A financial analysis, based on the published annual accounts, is made for the years 1996, 1997 and 1998. Hereby, a distinction is made between two categories, namely slaughterhouses and cutting units. The financial results of the 10 largest private companies for each category are aggregated. This sample represents about 30% of total private pig slaughterhouses in Belgium in 1998, which represent about 85% of all slaughterings.

The financial analysis develops a model using ratios, which discriminates between failing and running companies. The model is based on multiple linear discriminant analysis (Viaene & Gellynck, 1995). The statistical construction of the model is not a topic for this chapter, but its application to the meat sector provides interesting information for further identification of problems in the sector.

To measure competitiveness on external markets, the AP-indicator is used by measuring market attractiveness and market position (see Chapter 3) on the German, Italian and French market. It is both analyzed from the point of view of the importing and exporting countries for the period 1995-2000. Market attractiveness of these importing markets is determined by market size and market growth. Market size corresponds with the volume of a pig meat product imported into the examined foreign markets in 2000. Market growth corresponds with the percentage change in the volume imported of a pig meat product into the examined foreign markets over the period 1995-2000. For both variables, a distinction is made between high, medium and low. The next step is to determine attractiveness of Belgium as exporting country. It is realized according to the same principles as for the importing country.

Market position on the German, Italian and French importing market is assessed by market share and market share growth. The market share is measured in volume and corresponds with the share of a pig meat product imported into the examined foreign markets in total imports of the product range for 2000. Market share growth corresponds with the percentage change in the market share of a pig meat product on the examined foreign markets over the period 1995-2000. For both variables, a distinction is made between high, medium and low. The evaluation of competitiveness of the pig meat sector continues with the determination of position of Belgium, as an exporting country. It is realized according to the same principles as for the importing countries. It is important to remember that market shares of Belgium are compared with average market shares on the importing markets.

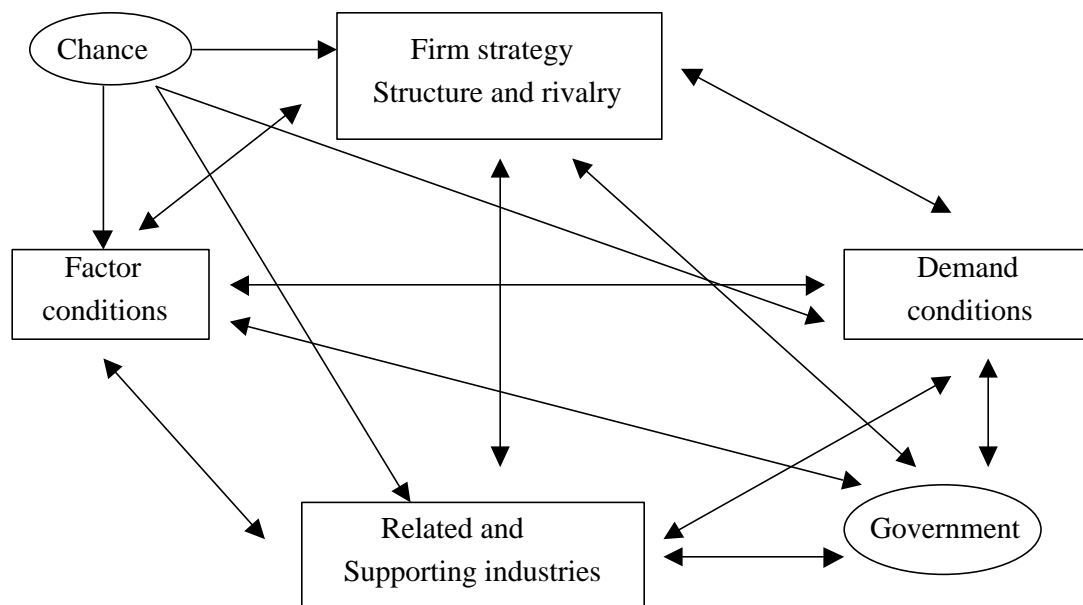
The data are based on the Combined Nomenclature, used in external trade statistics by Eurostat. The market for each country is defined as the total volume

imported of the following categories of pig meat, both fresh and frozen: carcasses, hams, shoulders, loins, bellies and deboned meat.

4.3.2 Explanation

To explain and to identify the causes of the current situation in the Belgian pig meat sector, Porters' Diamond is used (Figure 4.1).

Figure 4.1 Porters' Diamond.



Source: Porter, M.E. (1990).

The theory developed by Porter concentrates on the competitive advantage of nations. It is about why nations succeed in particular industries and helping firms and governments to make more informed allocations of national resources. Porter (1990) classifies the phenomena that are analyzed into six broad factors incorporated in the so-called Porter's Diamond:

- Factor conditions refer to resources such as capital, land, labor and climate. A distinction is made between basic resources and advanced factors (Douglas & Craig, 1995). The former refers to resources such as labor costs and raw

materials, while the latter to technology and specialized skills. Basic resources provide an initial competitive advantage that has to be upgraded through the development of advanced factors in order to create sustainable competitive advantage. Lack of basic resources should stimulate companies to invest in advanced factors.

- Demand conditions are considered as the engine for creating competitive advantage. It means that sophisticated buyers and consumers force companies to innovate faster and to create more advanced products than those of competitors. Companies able to adapt to changing demand conditions obtain a competitive advantage.
- Related and supporting industries can produce inputs which are important for innovation and internationalization. Cooperation within a sector is considered as a potential for competitive advantage. It means that if a sector with suppliers of raw materials, processors and industrial customers or retailers are able to work together as a network, mutual support and exchange of market information creates the basis for competitive advantage. Rather than to operate as a source of external competition for a company, mutual cooperation should operate as a source of competitive advantage.
- Firm strategy, structure and rivalry relate to the way in which companies are created, set goals and are managed. Internal competition is considered as the basis for high performance. It forces to cut costs, to improve in quality and to innovate.
- Government intervention often plays a key role in the above mentioned factors and influences supply conditions of production factors such as labor and capital, demand conditions in the home market and competition between firms. Such intervention can occur at the local, regional, national and supranational level.
- Chance events are outside the control of the firm. Examples of such events are changes in exchange rates on financial markets. Such events create discontinuities in which some gain competitiveness and some loose. In the frame of this chapter, such events are not discussed.

The information required to evaluate competitive position of the pig meat industry is obtained by contacting 19 slaughterhouses and/or cutting units. During an

intensive interview with the general manager, all relevant aspects were discussed. The interviews are based on a topic list (annex 4.1) which considered characteristics of the company, purchase of raw materials, the production process, the level of sales and future prospects.

4.4 Measuring competitiveness

After describing the financial results of the slaughterhouses and cutting units, the AP-indicator is presented for Germany, Italy and France.

4.4.1 Financial analysis

Generally, the financial position of the slaughterhouses and cutting units is weak during the period 1996-1998 and no improvement appears in the annual accounts. The main results of the financial analysis for 1998 are summarized in Table 4.2.

Liquidity ratios measure a company's ability to pay its current liabilities as they mature and also the degree of efficiency in using resources. The current ratio is computed by dividing current assets by current liabilities¹. The stock turnover measures the level of stocks in relation to total sales. Creditors' payment period minus debtors' collection period measures, in days, the difference between the average payment period of accounts receivable and the average collection period of accounts payable. The liquidity of the companies analyzed is not quite high enough in the case of the slaughterhouses and just high enough for cutting units to fulfil their short term payment liabilities. Pressure on stock turnover could lead to liquidity problems. The negative net working capital² of the pig slaughterhouses is particularly alarming. Both slaughterhouses and cutting units provide longer credit to customers than they receive credit suppliers. It means that debts towards suppliers have to be financed by other resources than sales. These other resources consist mostly of bank loans, which are much more expensive than credit from suppliers.

¹Current assets = cash + accounts receivable + stock + prepaid expenses; Current liabilities = accounts payable + bank loans payable + accrued taxes + current long-term debt.

²Net working capital = current assets - current liabilities.

Table 4.2 Main results of financial analysis for the pig meat sector, 1998.

Financial ratio	Slaughterhouses	Cutting units
Liquidity		
Current ratio	0,96	1,18
Stock turnover	42	40
Credit customers-suppliers (days)	3	5
Solvency		
Degree of debt (%)	70	67
Self-financing degree (%)	8,7	9,6
Net result/financial costs	0,95	1,38
Profitability		
Net sales margin (%)	0,44	0,38
Business assets turnover	6,1	7,2
Net profits/proper funds (%)	-0,2	0,8
Financial leverage	-0,2	1,2
Value added (%)		
Labor costs	71	75
Depreciation	20	18
Financial costs	5	2
Taxes	6	3
Added profits/losses	-2	2
TOTAL	100	100

Source: Nationale Bank van België.

There are two types of solvency ratios. The first measures the extent to which a company finances its activity with debt as opposed to equity sources. The degree of debt measures the percentage of total funds provided by debts, while the self-sufficiency degree is the percentage of total funds provided by retained earnings. The second type of ratio measures the company's ability to generate a level of income sufficient to meet its debt obligations (net result/financial costs).

The pig meat sector is characterized by a high degree of debts. It means that the share of own funds in total assets is very low (varying from 30% to 33%). Moreover, the degree of self-financing is low and declines during 1996-1998. This situation means that banks will be more and more careful in lending money,

because own funds are not increasing. In the case of the slaughterhouses, the net result is not high enough to cover financial costs. It means that companies are unable to pay for new debts.

Profitability ratios provide an overall evaluation of the performance of a company and its management. It concerns the measurement of the returns generated by the company from several different aspects:

- net sales margin: an assessment of the overall profitability of a business by comparing the net trading profit achieved relative to the level of sales;
- business assets turnover: sales divided by business assets³;
- net profits/proper funds: earnings after taxes divided by own funds, or the ability of a company to remunerate its shareholders;
- financial leverage: the relation between profitability of proper funds and the profitability of total assets before taxes. Assets financed by debts imply financial costs and if profitability of investments is lower than financial costs, the financial leverage is lower than 1 and vice versa.

Profitability is under pressure because of low net sales margins (< 1%). If the companies' business assets turnover declines, for example because of new investment, profitability will continue its decline and liquidity problems could occur. This situation is made worse by the negative financial leverage in the case of slaughterhouses. It means that financial costs are higher than profitability of investments. The ratio net profits/own funds is negative because of losses in 1998.

By analyzing the value added, it becomes clear that labor costs are high and still increase. Moreover, the continuous added losses are alarming. Gross value added per employee is low and varies between 40.000 and 60.000 EUR per year during the period 1996-1998.

The weak financial position of the slaughterhouses/cutting units is confirmed by applying the discriminant model. It results in a low score, indicating the presence

³business assets = fixed assets + stocks + accounts receivable.

of companies in the sample for which the risks of bankruptcy in the near future is a reality.

4.4.2 AP-Indicator

Belgium is an important exporter of pig meat. In 2000, total exports of pig meat reach a level of 494.614 tons (Table 4.3). The EU represents 98,4% of total Belgian pig meat exports in 2000. The main importers are Germany, Italy and France, with a share of 78,6% in total exports.

Table 4.3 Evolution of Belgian exports of pig meat by destination, 1993-2000 in tons carcass weight equivalent and %.

Destination	1993		1995		2000	
	Tons	%	Tons	%	Tons	%
Germany	218.218	55,3	282.415	60,8	287.126	58,1
France	65.137	16,5	62.449	13,4	48.054	9,7
Italy	75.741	19,2	64.365	13,9	53.341	10,8
Total	359.096	91,0	409.229	88,1	388.521	78,6
Total exports	394.473	100	464.522	100	494.614	100

Source: Based upon Eurostat.

During the period 1993-2000, Belgian pig meat exports increase by 25,4%. The structure of Belgian pig meat exports according to the country of destination changes dramatically during the considered period. Exports towards Italy and France drop from about 20% to 10%, while Germany maintains its position as the main importer of Belgian pig meat.

Trends in the Belgian market share and that of its competitors on the German, Italian and French market are illustrated in Table 4.4. The Netherlands is the main competitor on the French and Italian markets, and holds a similar position as Denmark on the German market. On the Italian and French market, Belgium holds third position. The Belgian market share increases on the German market, but declines on both the Italian and French market.

During the period 1995-2000, both the Italian and French markets increased, by +19,9% and +25,6% respectively. The increase on the Italian market refers to growing consumption while production remains constant. On the French market, an increase in the production of meat products based on pig meat is responsible for the evolution noticed. German imports declined by 15,3%, which mainly relates to declining meat consumption.

Table 4.4 Evolution of market shares in Germany, Italy and France, 1995-2000 in % of total imported volume of pig meat.

Importing country	Germany		Italy		France	
	1995	2000	1995	2000	1995	2000
Exporting country						
Belgium	34,8	41,8	10,7	7,4	25,8	15,8
Netherlands	36,3	26,8	37,0	30,4	24,2	23,7
Denmark	18,7	27,5	14,7	14,0	37,4	19,9
Total (%)	89,9	96,1	62,4	51,8	87,3	59,4
Total market (1.000 T)	811	687	602	722	242	304

Source: Based upon Eurostat.



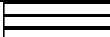
The AP-indicator for the German market is shown in Figure 4.2. The way market attractiveness and market position are calculated is illustrated in Annex 4.1. Hereby both German imports and Belgian exports are evaluated. On the German market, the AP-indicator scores high for hams. Belgian ham exports correspond perfectly with this evolution and consequently, the Belgian pig meat sector is competitive for this product on the German market. Belgium also holds a highly competitive position for shoulders and loins, despite the fact that the German market declines for these products. Carcasses and deboned meat hold a medium AP-combination, both from the importing and exporting point of view.

Carcasses, hams and deboned meat represent 80% of total German imports in 2000. The high level of imports of carcasses is unique in the EU. It is related to the new and large cutting units, recently built in Germany, and the lack of live pigs. It results in large quantities of carcasses imported from the neighboring countries, namely Belgium, The Netherlands and Denmark.

Competition on the German market is sharp and originates mostly from within Belgium. German companies appreciate the quality of the Belgian pig as well as the service and flexibility of the Belgian companies. Service and flexibility refer to quick and accurate response to changes in requirements of German customers. These changes in requirements concern topics such as packaging, time and place of delivery, payment period. Flexibility is also related to the willingness of Belgian companies to work late and during weekends in order to prepare late orders placed by German customers.

Figure 4.2 AP-indicator for the Belgian pig meat sector on the German import market, 1995-2000.

		POSITION			
		LOW	MEDIUM	HIGH	
ATTRACTIVENESS	HIGH	Germany		Hams	
		Belgium		Loins Hams Shoulders	
	MEDIUM	Germany		Carcasses, Deboned meat	
		Belgium		Carcasses, Deboned meat	
	LOW	Germany	Bellies	Loins	Shoulders
		Belgium	Bellies		



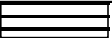
AP-Indicator: High:  Medium:  Low: 

In order to create a sustainable relationship between supplier and customer, German buyers aim to set contracts where both price and quantity are specified. However, this causes problems for Belgian companies, because of the lack of price transparency at the supply side, especially for live pigs. There are strong and frequent price variations.

The Dutch and Danish pig meat sector are characterized by high concentration. Large companies can more readily fulfil the needs of the largest buyers such as supermarket chains and large meat product companies in Germany. Belgian exporters operate much more in niche markets, where price competition is not as high as on the mass-markets. Since 1995, France started to export pig meat to the German market. It means that France became an additional competitor on the German market in recent years.

Figure 4.3 AP-indicator for the Belgian pig meat sector on the Italian import market, 1995-2000.

		POSITION			
		LOW	MEDIUM	HIGH	
ATTRACTIVENESS	HIGH	Italy	Carcasses		Hams
		Belgium			Hams
	MEDIUM	Italy	Shoulders	Loins	
		Belgium	Deboned meat	Shoulders, Loins	
	LOW	Italy	Deboned meat Bellies		
		Belgium	Carcasses Bellies		

AP-Indicator: High:  Medium:  Low: 

Italian pig farming is concentrated in the north. The Po valley accounts for more than 70% of total Italian pig production. Italian pig farming is mostly oriented towards the production of the famous Parma-ham. However, Italian pig meat production only reached a self-sufficiency level of 67% in 1999 (MLC, 2001).




Figure 4.3 shows the AP-indicator for the Italian market. The Italian market is interesting for hams and the Belgian competitive position corresponds with the Italian demand for hams. The AP-indicator for Italy shows a medium position for

carcasses and loins. Belgian exports do not correspond for carcasses, especially because of a decline in exports, while imports increased during the considered period. For shoulders, Belgium holds a better position compared with the Italian. It relates to the relative small market size of Italian imports. For the other products, namely bellies, loins and deboned meat, the Belgian AP-indicator corresponds with the Italian one.

During the period 1990-1994, the French self-sufficiency ratio for pig meat increases by 14% to become self-sufficient in 1994. The self-sufficiency ratio reaches a level of 106% in 1999. Pig farming in France is highly concentrated in Brittany, which represents 55% of total French pig population (MLC, 2001).

Figure 4.4 AP-indicator for the Belgian pig meat sector on the French import market, 1995-2000.

		POSITION			
		LOW	MEDIUM	HIGH	
ATTRACTIVENESS	HIGH	France	Bellies	Carcasses, deboned meat	Hams
		Belgium			Carcasses, deboned meat
	MEDIUM	France	Shoulders		
		Belgium	Hams		Shoulders
	LOW	France	Loins		
		Belgium	Loins, bellies		

AP-Indicator: High:  Medium:  Low: 

The Belgian competitive position on the French market weakened during the period 1995-2000, particularly for hams (Figure 4.4). In general this is related to low market size and market growth of Belgian exports, while French imports are characterized by a high market size and medium market growth. Belgian hams

lost their strong position to Danish companies. The heavy weight of Belgian hams is a particular disadvantage (Viaene & Gellynck, 1989).

For carcasses, deboned meat and shoulders, the Belgian pig meat sector is competitive on the French market, as the AP-indicator gives similar results for Belgian exports as for French imports. A weak competitive position is noticed for bellies. It results from a high market growth of French imports, while Belgian exports obtain a low market growth.

For Belgian exporters, meat quality and service is the basis of competitiveness whereas with the Netherlands and Denmark, price and homogeneity dominates. However, on all three markets sales prices are under pressure because of overcapacity in The Netherlands, Germany and France.

4.5 Explaining competitiveness

As indicated above, each of the factors of Porter's Diamond is discussed in order to explain the competitiveness of the Belgian pig meat sector

4.5.1 Factor conditions

Live pigs are the raw material for slaughterhouses and relations with suppliers of live pigs are based on a specific purchase pattern, trust and tradition. However, it is surprising that almost every slaughterhouse has its own purchase pattern and these vary widely:

- direct supply by the producer;
- payment based on live- or deadweight;
- with or without a premium for quality;
- with or without the use of a trade agent as intermediary;
- with cash payment or up to 5-6 weeks' credit.

These varying criteria and their many possible combinations result in lack of price transparency and difficulty in price determination. Based on the interviews, it

became clear that the most profitable slaughterhouses are those with a standard purchasing pattern focusing on a specific type of pig.

Cutting units purchase live pigs, carcasses or parts. The share of live pigs in total purchases depends on the degree of specialization, price, physical integration and special customer requirements. A high degree of specialisation means that companies work with a limited number of products, and results in few purchases of live pigs. Related to price, it is often cost efficient to purchase the desired parts (e.g. hams) rather than live pigs, where remaining unwanted must be disposed of. Physical integration relates to the fact that some cutting units are linked to slaughterhouses. It often means that contracts exist to slaughter a minimum of live pigs per year. It also happens that special customer requirements force a slaughterhouse or cutting unit to purchase specific parts.

Three types of problem occur in relation to purchases of raw materials:

- lack of price transparency;
- uncertainty about the continuity of supply;
- quality of the purchased raw material.

The lack of price transparency for live pigs results in a high level of competition among slaughterhouses. Attempts at cooperation and agreements between slaughterhouses and cutting units have not thus far been successful. Due to overcapacity, it is extremely difficult to obtain a competitive advantage through a sharper purchasing policy. Despite these difficulties, those interviewed consider the present price determination to be balanced and acceptable.

Uncertainty about a continuity of supply is related to the overcapacity problem and to the pressure on prices for live pigs. Under these conditions, pig suppliers are not always reliable. Slaughterhouses and cutting units thus focus on a win-win situation, by guaranteeing purchase.

Raw material quality problems relate to pale, soft and exudative (PSE) meat and residues. During the last 10 years, a lot of work has been done to avoid the PSE problem which has been substantially ameliorated. More recently, the control of

antibiotic residues has been targeted and the proportion of positive tests has dropped significantly.

The most important component of production costs are the live animals. As already indicated, overcapacity in slaughterhouses has resulted in high demand and prices for live pigs. The second element consists of labor costs, which are high in Belgium compared than in its European competitors. High taxes and levies for social security are the basis of this problem. Three of the interviewed companies are looking for a location outside Belgium where, besides labor costs, environmental legislation and the interference of public authorities are less severe and less expensive. In order to control labor costs and to maintain productivity, the interviewed companies search for flexibility in the number of persons employed by applying 'technical unemployment' and compulsory leave.

Because suppliers are usually paid within a week, whereas customers take 30 to 60 days to pay, financial costs are important. It means that purchases of raw materials have to be financed by other resources than sales. Slaughterhouses are capital intensive and this implies high fixed costs which, combined with overcapacity, impose a heavy burden on company balance sheets.

These combined problems mean that some slaughterhouses do not know the production costs of the products they sell. Companies work in an intuitive way and undercut the market. The best performers compute a cost both per product and per customer on weekly basis, thus enabling accurate production and sales management.

Some slaughterhouses score low on productivity of capital, due to overcapacity. Because of the variable activity of slaughterhouses, labor productivity could be improved by increasing flexibility. Productivity of labor is crucial, and because of overcapacity, labor productivity is under pressure.

The products of slaughterhouses and cutting units are distinguished in increasing order of transformation:

- carcasses;

- 1st cut: bellies, hams, loins, shoulders;
- 2nd cut: deboned and defatted
- 3rd cut: portioned
- 4th cut: preparations such as cooked dishes

Each of these product types requires specialized technology. Technology in Belgian slaughterhouses and cutting units is well developed at the levels of carcasses and 1st and 2nd cuts, but generally poor at the level of 3rd and 4th cuts. However, it is noticeable that companies which specialize in a certain activity, independent of the level of transformation, manage to be profitable.

At the end of the 1980's and during the 1990's investments were high in the Belgian meat sector, partly supported by the European Orientation and Guarantee Fund for Agriculture (FEOGA). These investments were not limited to the improvement of production techniques, but also included the extension of capacity. Companies which intend to invest during the coming years foresee the need to extend the capacity for the 3rd cut. However, some companies intend to invest in 'software' rather than in 'hardware'. These companies are convinced that during the last 10 years, too much was invested in buildings and trucks, but not enough in hygiene, quality and management. The objective is to improve profitability and quality and especially to produce what the market requires.

Analyzing the link between investment and profitability, three elements are clear:

- Companies that invested before 1995 realize a higher profitability than the companies which invested after 1995;
- The largest and smallest companies are relatively more profitable than the group in the middle.
- Companies working with trained and experienced managers score better than those run by managers close to retirement or by managers, who are too young and inexperienced to run a company in times of crisis.

The sector requires management innovation given the changing working conditions. During the 1980s and even at the beginning of the 1990s, margins were high and the cost of errors could be relatively easily absorbed. Today, the

sector faces low margins and errors are catastrophic. It means that accurate control and feedback is a necessity.

4.5.2 Demand conditions

The share of food expenditures in total expenditures is low and falling in Western Europe during the last decade. During the period 1992-1996, this share declines by 15,6% to reach a level of 12,4% in Belgium.

Demographic changes are an important factor for meat consumption. As elsewhere in Western Europe, Belgium has a stagnant, ageing population. However, this does imply that the category of people where meat consumption is below average increases. In 1999, people older than 65 years consume about 37,4 kg per capita, while the average reaches a level of 46,1 kg per head (Table 4.5). Moreover, the longer run outlook is not bright because younger people not only consume less meat in general but in particular consume.

Table 4.5 Household meat consumption in Belgium according to age, 1999 in kg per person.

Type of meat	<35 years	35-49 years	50-64 years	≥65	TOTAL
Beef	6,0	10,8	12,1	9,6	9,8
Pig meat	9,8	17,1	16,7	11,3	14,0
Mixtures	10,1	14,1	10,3	5,8	10,3
Poultry	7,6	13,6	15,1	10,6	12,0
TOTAL	33,4	55,7	54,3	37,4	46,1

Source: GfK (2000).

Continuous negative publicity about meat (news in the mass media about scandals relating to Bovine Spongiform Encephalopathy (BSE), Foot and Mouth disease, dioxins, hormones, antibiotics, residues or animal welfare), makes it very hard to project a positive image for meat. In order to counterbalance such a negative image, the sector needs a proactive rather than reactive approach in communicating with the public.

Consumer needs are dominated by two important factors. Increasing demand for:

- variety and value added products;
- safe meat, which refers to BSE, dioxins and to the absence of antibiotic and hormone residues.

Within the framework of these changing demand patterns, it is difficult for the Belgian pig meat sector to develop a brand identity at the consumer level. The development of a brand is capital intensive (research and advertising) and risky, and margins on the one hand and the structure of the Belgian pig meat sector (SME's) on the other do not permit these investments.

At the industrial sector level, Belgian slaughterhouses have a good reputation for:

- high quality products with good service;
- flexibility related to the requirements of the customer.

4.5.3 Related and supporting industries

Related and supporting industries are discussed at the level of suppliers and customers of the slaughterhouses and cutting units. Hereby, we focus on the retail sector and processed meat companies.

Under pressure from the increasing bargaining power of the retail sector, the slaughterhouses are forced to produce more value added products, which are not always fully compensated by a higher price. Each customer also requires specific service, related to the product and packaging as well as to time of delivery and payment. Prices are determined after delivery of the product. Co-operation with suppliers is essential for the retail sector in order to avoid dependence on one supplier. Retailers stimulate several companies to invest in further finishing of products. However, the retail sector is considered to be a fair partner and correct payer by the few companies able to fulfil their requirements.

Developments in the processed meat sector are similar to those in the retail sector. However, processed meat companies switch more often between suppliers. Processed meat companies also make price agreements among themselves. Payment is somewhat difficult because of problems in the processed meat sector, related to declining consumption and their own overcapacity.

4.5.4 Firm strategy, structure and rivalry

During the period 1994-2000, the number of pig slaughterings in Belgium increased by 2,9% to reach a level of 11.079.581 pigs in 2000. During the same period, the number of slaughterhouses declined by 6,3% (Table 4.6). Obviously, more animals are being slaughtered by fewer companies, which leads to an increasing concentration.

Table 4.6 Structure of the Belgian pig slaughterhouses with more than 10.000 slaughterings per year, 1994-2000.

Slaughterings per year	Slaughterhouses				Slaughterings			
	Number		%		X 1.000		%	
	1994	2000	1994	2000	1994	2000	1994	2000
10.000-100.000	15	14	31,3	31,1	545	342	5,1	3,1
100.000 - 300.000	20	17	41,7	37,8	3.753	3.563	34,9	32,2
>300.000	13	14	27,1	31,1	6.470	7.174	60,1	64,8
TOTAL	48	45	100	100	10.768	11.079	100	100

Source: Ministry of Agriculture and IVK.

There are both private and public slaughterhouses in Belgium. The public slaughterhouses operate as service companies, mostly for cutting units. The largest slaughterhouses are in private hands and represent 92% of total slaughterings. Despite increasing concentration, Belgian slaughterhouses remain small compared to the Dutch, French and Danish.

Since products from different companies are good substitutes (product differentiation is difficult to realize), most companies use price as the only competitive weapon. This results in a high level of price competition. However, price is not the only element taken into consideration by the customer, who also looks for service.

Co-operation in the sector is very low. Attempts in the past failed and harmed confidence. However, the current problems in the sector have created a new willingness to co-operate at the level of price determination, export to non-EU markets and quality control (Hazard Analysis Critical Control Point (HACCP) and International Standards Organisation (ISO) for example).

Potential competition of new entrants is high because products are homogeneous and entry barriers are low. If one firm specializes, for example in 3rd cut, it can be easily copied by colleagues with relatively low investment. Moreover, all competitors work with the same basic product and brand identity does not exist. The threat of substitutes is also a reality. Both poultry and fish increase their market share at the expense of beef and pig meat.

Voluntary exit from the sector is rare. A strong financial as well as intense emotional link exist, because companies are family owned. This is reinforced by the fact that slaughterhouses and cutting units have no alternative uses. Moreover, the very expensive regulations in Belgium for dismissal of employees make closing down almost impossible.

Just as in Belgium, the meat sectors in Germany, The Netherlands and France are confronted by overcapacity, which has also partly been supported by EU funds. This situation creates an additional supply and price pressure.

The EU as a whole is self-sufficient in pig meat and exports to third countries are vital for the price level on the internal market. As, for example, Danish exports of pig meat to Japan decrease, the decline in exports is available for sale on the European market and results in price pressure. In the future, it will be important for the Belgian pig meat sector to look for potential markets outside the EU. Since about 60% of Belgian exports are realized in one market (Germany), Belgium occupies a very vulnerable position in the international pig meat market.

Profitability of the companies is not linked to the percentage of sales realized on the domestic or external markets. The most profitable companies are characterized by a stable and clear sales pattern, focused on specific products to fulfil specific requirements, whatever the market.

4.5.5 Government

On the domestic market, the creation of the Single European Market (SEM) has two major consequences:

- slaughterhouses were obliged to invest to meet the European hygiene export standards;
- introduction of French and German retail chains, which increases competition and pressure on pig meat prices at the level of slaughterhouses/cutting units.

Increased competition from other Member States was not experienced.

Slaughterhouses with an activity limited to the domestic market were not obliged to invest and could continue to work until 1994. Some of these companies are still active and destabilize the market because of lower production costs. It is up to the Commission to insist that national governments in Belgium and in other member states apply the EU regulations and to avoid unfair competition.

In relation to the Common Agricultural Policy (CAP), export restitutions do not stimulate the export of high value added products such as deboned meat. As Belgium specializes in deboned meat, this increases competition on value added products. Given the changing demand patterns, restitutions should be changed to stimulate exports of value added rather than mass products. This suggestion emanating from the slaughterhouses refers to the fact that the Commission decided to eliminate restitutions for deboned meat and maintain them for carcasses and other low value added products.

All of the exporting slaughterhouses interviewed stated that the creation of the SEM had little impact on their exports. Administration and transportation delays were reduced because of less frontier bureaucracy (Viaene & Gallet, 1989; Nicolas et al, 1995). It also appears that harmonization rather than mutual recognition had some effect, while national preferences and prejudices remain, for example the negative publicity in the German press about the way meat is controlled in Belgian and Dutch slaughterhouses.

The implementation of the EU nitrogen Directive (91/676/EEG) limits the use of nitrogen in vulnerable regions. For Belgium and especially for Flanders, it means that pig manure has to be processed and exported. In 2002, no profitable processing technique is available and the pig herd will have to be reduced. This

will result in additional overcapacity at the level of the slaughterhouses and put additional pressure on the supply side.

The next round of the World Trade Organisation (WTO) negotiations started in Seattle on November 30th, 1999. It is expected that trade liberalization will continue and that export restitutions, import duties and internal support will further decline (Agra Focus, 1999). Besides less support, it is also expected that new regulations about environmental aspects on the one hand and animal welfare on the other will add limitations to the intensive animal production systems, such as the current one in Belgium.

4.5.6 Dynamics

A strong interaction of the described determinants of competitive position should result in competitive advantage. The strength of this interaction depends on two factors (Douglas & Craig, 1995):

- geographical concentration, which accelerates the diffusion of innovation, development of specialized resources and of supporting industries;
- the development of clusters, which facilitate the creation of advanced factors such as specialized technology and skills, while the success of downstream industries stimulates growth in supplier industries and vice versa.

However, in the case of the Belgian pig meat sector the interaction between the different components limits the creation of competitive advantage rather than stimulates it. The pig meat sector, including feed companies, farmers, slaughterhouses, cutting units and processed meat plants, is geographically concentrated in the Flemish part of Belgium but this does not accelerate innovation at the level of slaughterhouses and cutting units. A slight pull effect from the processed meat companies and the retail sector stimulates some companies to innovate at the management level. However, the majority of the companies do not change management and are not able to manage change. It results in unworkable (price) competition and market power in hands of suppliers and customers.

The development of advanced factors such as specialized technologies and skills is hampered by the structure of the industry. This structure implies lack of capital to develop the advanced factors and ultimately competitive advantage.

4.6 Discussion and conclusions

The poor financial situation of the Belgian pig slaughterhouses/cutting units is caused by a complex set of factors, which are determined by both local and international components. On the domestic market, problems are situated at the sectoral and governmental level as well as at the level of supply and demand. The sector is characterized by SME's and a low level of concentration in combination with overcapacity, which results in price pressure. Investments to meet the European export hygiene standards were stimulated by the EU subsidies.

Lack of transparency in live animal price determination and a uniform end product result in intensive competition and pressure on the margins. These changing working conditions characterized by small margins, make calculation of production costs essential.

On the demand side, both the evolution of population and consumption are stagnant or even decreasing. Moreover, meat suffers from a negative image. It means that slaughterhouses and cutting units work on a stagnating or even declining domestic market.

In export markets, Belgium has maintained its position due to product quality and service. However, price competition has increased because of overcapacity of slaughterhouses and cutting units in the neighboring countries (the Netherlands, Germany and France). From the AP-indicator, it becomes clear that Belgium is not always able to maintain its competitive position on the main export markets. Especially on the French market, the competitive position of the Belgian pig meat sector has weakened.

The SEM seems to have had little effect, while more impact is expected from the coming WTO-round. Export restitutions will decline and increased competition from the USA is expected on third markets, especially South-East Asia. In this way an additional volume of meat presently sold in this area will be lost and offered for sale in Europe, which will put pressure on prices.

At the company level, it is necessary that management adjust to face the future. Costs have to be reduced and controlled to increase productivity of both labor and capital. Before investing in further transformation, slaughterhouses and cutting units should first acquire a leading position related in their current activity. Investment in people, rather than in capacity or further transformation, is a means that the whole production chain has to work together to provide priority. On the demand side, the consumer requires 'healthy meat'. This guarantees to the consumer about meat quality and production methods.

The Commission should continue to insist that national governments apply Community Regulations related to export standards and no exceptions should be admitted. Companies which have not modernized should stop their activities.

The problem of overcapacity is not limited to the domestic market. It should be solved at the European level, in co-operation with the Commission and the sector. By oversubsidizing investment, the Commission is partly responsible for the present situation. The Commission should take care to stimulate exports of value added products rather than mass products. In the case of the meat business, this refers especially deboned meat, which must currently be sold on third markets without restitutions. As exports to third markets remain vital for the pig meat sector, Belgian companies should work together to finance market research and organize common exports. Hereby, special attention should be given to the developments in the Central and Eastern European Countries (CEEC's).

Since natural elimination of companies in difficulty would be slow and also harm profitable companies, it is necessary to work out a restructuring plan for the sector as quickly as possible. The aim of this plan should be to buy out capacity.

By using Porters' Diamond to explain the competitive position of the Belgian pig meat sector, it has become clear that this approach has both strengths and weaknesses. A major strength of Porters' Diamond is that it provides a practical checklist to analyze a sector. The emphasis on mutual relationships between each component of the Diamond is extremely useful.

One major weakness of the Porter model is related to the fact that it does not provide the possibility to measure competitiveness of a sector objectively. Its value is limited to an analytical tool. Interpretation by the user becomes extremely important and may even become subjective. Since the model is rather complete and considers all the factors influencing competitiveness, focusing on one specific factor gives the possibility of classifying a sector as competitive or either as uncompetitive.

A second major weakness is that within the Porter model one component can be so dominant that it counterbalances other components and results in an uncompetitive sector, even if the other points of the Diamond suggest that the competitive position is strong (or vice versa). This is particularly the case when a competitive sector, defined as 'one that possesses the sustained ability to profitable gain and maintain market share in foreign markets' (Agriculture Canada, 1991) is characterized by a high level of government intervention, which dominates the other components. In the European food industry, the meat sector is a clear example of this.

Annex 4.1 Interview guide.

De Belgische vleessektor: huidige toestand en invloedsfactoren

Nr.:

A. Bedrijfssituatie

Naam:

Kontaktpersoon en functie:

Adres:

1. Wat is de activiteit van de onderneming in de vleessektor.

slachthuis geïntegreerde uitsnijderij niet-geïntegreerde uitsnijderij vleeshandel	
--	--

2. Wat is het belang van de onderscheiden produktgroepen voor de onderneming (in % van de totale omzet).

varkensvlees rundvlees kalfsvlees andere:	
---	--

3. Wat is de omvang van de activiteit in 1994.

	slachtingen (stuks/jaar)	versnijding (ton/jaar)
varkens		
runderen		
kalveren		
andere:		

4. In welke mate heeft de onderneming bindingen in de bedrijfskolom

Bindingen	aard		ligging	
	kontrakt	eigendom	binnen-land	buiten-land
veevoeder veehouderij slachthuis uitsnijderij distributie transport andere:				

5. Geef een overzicht van de tewerkstelling in de onderneming in 1994.

Tewerkstelling	totaal	zelf-standigen	via zuster-bedrijf
arbeiders bedienden kaderleden totaal			

- Hoe is de tewerkstelling geëvolueerd gedurende de voorbije 5 jar (1990-1994)?

B. Grondstoffen

6. Welke grondstoffen worden aangekocht en waar (% belang, met 100% = totale aankoop van dieren en vlees in 1994).

Grondstoffen	binnenland	Buitenland
levende dieren karkassen snijstukken andere:		

7. Via welke kanalen verloopt de bevoorrading.

eigen integratie zelfstandige handel commissionairs andere:	
---	--

8. Laat ons nu wat dieper ingaan op de aankoop van grondstoffen. Zijn er factoren aan de aanbodzijde die de balans gunstig of ongunstig beïnvloeden?

- Welke evoluties onderkent u betreffende de aankoop (produkt, plaats en kanaal van aankoop, integratie, ...)
- Waarom wordt gewerkt met de aangegeven produkten?
- Welke stukken zijn het interessantst?
- Waarom wordt op de aangegeven plaatsen/via de aangegeven kanalen aangekocht?
- Hoe verloopt de prijsvorming en wat zijn de beïnvloedende factoren?
- Hoe verloopt de relatie met de leveranciers (service, kwaliteit, betalingsvoorwaarden, trouw, verhouding klanten-leverancierskrediet, ...)?
- Wat is de impact van de concurrentie bij de aankoop van grondstoffen?
- Wat ziet u voor uw eigen onderneming als sterke/zwakke punten bij de aankoop van grondstoffen.
- Welke knelpunten onderscheidt u voor de Belgische vleessektor bij de aankoop van grondstoffen en wat is hun impact?
- Impact van de Europese éénmaking?

C. Produktie

9. Werden er gedurende de voorbije vijf jaar (1990-1994) investeringen doorgevoerd.

ja	Neen
----	------

Worden er investeringen gepland in de komende jaren (1995-2000).

ja	Neen
----	------

Indien investeringen werden doorgevoerd en/of worden gepland, geef een overzicht van de investeringen.

Investeringen	Doorgevoerd 1990-1994	gepland 1995-2000
waarde mln BF steun (FEOGA, ...) type: modernisering wetgeving uitbreiding ander: aard:		

- Doel van de geplande investeringen?
- Indien geen investeringen, wat in de toekomst?

10. Geef een overzicht van de kostenstructuur (Bef/kg vlees).

grondstof: - dier/vlees - andere: personeel verpakking afschrijving en interest overhead andere:	
---	--

11. Laat ons wat dieper ingaan op de produktiestructuur van uw onderneming. Geef daartoe voor elk van de onderscheiden elementen de sterke/zwakke punten van uw onderneming.

infrastructuur
 personeel
 produktieproces
 stockage
 capaciteitsbenuttinging
 transport van het eindprodukt

Welke knelpunten onderkent u voor de vleessektor betreffende de produktiestructuur en wat is hun impakt?

D. Verkoop

12. Hoe is de totale verkoop in 1994 verdeeld (%)

binnenland	
buitenland	

13. Betreffende de binnenlandse verkoop: wat is het belang van de onderscheiden afnemers (% van de totale verkoop) en hoe is de evolutie (↓, ↑, =).

Afnemers	% belang 1994	evolutie	
		1990-1994	1995-2000
uitsnijderijen			
vleesgroothandel			
slagers			
grootdistributie			
horeca/catering			
andere:			

Laten we (voor de belangrijkste afnemersgroep) ingaan op de volgende elementen van de verkoop. Welke sterke en zwakke punten heeft uw onderneming.

prijszetting
 betalingsmodaliteiten
 kwaliteit
 service

leveringsmodaliteiten
promotie
buitenlands aanbod

Welke zijn de belangrijkste verschillen tussen de afzetkanalen? Welk afzetkanaal verkiest U? Verschil in marge tussen de afzetkanalen?

Impact van de ontwikkelingen op het niveau van de grootdistributie?

Welke knelpunten onderkent u voor de vleessektor betreffende de binnenlandse verkoop en wat is hun impact. Impact Europese éénmaking?

14. Voor de verkoop in het buitenland: geef het belang van de onderscheiden afzetmarkten (in % van de totale verkoop in 1994) en een overzicht van het exportgebeuren per afzetmarkt.

Export	Frank-Rijk	Duits-land	Italië	andere EU	derde landen
belang 1994 evolutie 1990-1994 1995-2000 regio's produkt: aard kwaliteit afzetkanaal: onrechtstreeks eigen verkoopkantoor agent/commissionair vleeswarenindustrie grootdistributie slagers andere: prijsbepaling concurrentie: wie belang sterke punten zwakke punten eigen onderneming sterke punten zwakke punten					

Laten we voor uw onderneming en de Belgische vleessektor ingaan op elementen verbonden aan de buitenlandse verkoop. Waar onderkent u knelpunten en wat is hun impact op de concurrentiepositie van de Belgische vleessektor.

administratie: - financieel
 - sanitair/veterinair

kredietverzekering

valuta problematiek

exportondersteunende instellingen en organisaties:

 - federale en gewestelijke overheid
 - financiële wereld
 - beroepsvereniging

hoeveelheid, aard en kwaliteit van het aanbod

prijsvorming en invloedsfactoren

imago van de onderneming/de sektor

Europese éénmaking

GATT, restitutiebeleid

E. Afronding

15. Wat is volgens u dé belangrijkste oorzaak van de huidige toestand in de Belgische vleessektor.
- Wat zijn sterke/zwakke punten van de Belgische vleessektor naar de toekomst toe. Gelden die ook voor uw onderneming.
- Wat ziet u als mogelijke oplossing voor de sektor/voor uw onderneming.
- Wat verwacht u van financiële sector/overheid
- Hoe ziet u de sektor/uw onderneming evolueren in de toekomst.

Annex 4.2 Calculation the AP-indicator for the Belgian pig meat sector on the German, French and Italian import markets, 1995-2000.

Table A1 Evolution of market size in Germany, Italy and France, 1995-2000 in total imported tons carcass weight equivalent of pig meat.

Products	Germany		Italy		France		TOTAL	
	1995	2000	1995	2000	1995	2000	1995	2000
Carcasses	342.493	254.252	95.914	113.978	17.808	9.159	456.215	377.389
Hams	70.627	92.837	371.164	476.005	107.663	116.000	549.454	684.842
Shoulders	68.922	67.012	19.305	22.152	15.258	25.245	103.485	114.409
Loins	53.162	45.306	7.300	9.823	4.762	5.082	65.224	60.211
Bellies	38.016	27.831	18.925	19.919	29.112	45.821	86.053	93.571
Deboned	238.080	199.483	89.679	80.219	67.686	102.431	395.445	382.133
TOTAL	811.300	686.721	602.287	722.096	242.289	303.738	1.655.876	1.712.555
Average	135.217	114.454	100.381	120.349	40.382	50.623	275.979	285.426
Average	-	-	-	-	-	-	91.993	95.142

3 countries

Source: Based on Eurostat data.

Table A2 Evaluation of market size per pig meat product in Germany, Italy and France, 2000 in imported tons carcass weight equivalent. H = high or > 95.142 tons; M = medium or ≤ 95.142 and ≥ 47.571 tons; L = low or < 47.571 tons.

Products	Germany	Italy	France
Carcasses	H	H	L
Hams	M	H	H
Shoulders	M	L	L
Loins	L	L	L
Bellies	L	L	L
Deboned	H	M	H

Source: Based on Eurostat data.

Table A3 Market growth and its evaluation on the German, Italian and French import market for pig meat in volume, 1995-2000 in %. H = high or > 10%; M = medium or $\leq 10\%$ and $\geq 5\%$; L = low or < 5%.

Products	Germany		Italy		France	
	Market growth (%)	Evaluation	Market growth (%)	Evaluation	Market growth (%)	Evaluation
Carcasses	-26	L	19	H	-49	L
Hams	31	H	28	H	8	M
Shoulders	-3	L	15	H	65	H
Loins	-15	L	35	H	7	M
Bellies	-27	L	5	M	57	H
Deboned	-16	L	-11	L	51	H

Average 3 countries = 10%

Source: Based on Eurostat data.

Table A4 Evolution of market share in Germany, Italy and France, 1995-2000 in % of imported tons carcass weight equivalent per product.

Products	Germany		Italy		France	
	1995	2000	1995	2000	1995	2000
Carcasses	42,2	37,0	15,9	15,8	7,3	3,0
Hams	8,7	13,5	61,6	65,9	44,4	38,2
Shoulders	8,5	9,8	3,2	3,1	6,3	8,3
Loins	6,6	6,6	1,2	1,4	2,0	1,7
Bellies	4,7	4,1	3,1	2,8	12,0	15,1
Deboned	29,3	29,0	14,9	11,1	27,9	33,7
TOTAL	100	100	100	100	100	100

Average 3 countries 1993 = 16,7%

Source: Based on Eurostat data.

Table A5 Evaluation of market share per pig meat product in Germany, Italy and France, 2000 in % imported tons carcass weight equivalent. H = high or > 16,7%; M = medium or $\leq 16,7\%$ and $\geq 8,4\%$; L = low or < 8,4%.

Products	Germany	Italy	France
Carcasses	H	M	L
Hams	M	H	H
Shoulders	M	L	L
Loins	L	L	L
Bellies	L	L	M
Deboned	H	M	H

Source: Based on Eurostat data.

Table A6 Market share growth and its evaluation on the German, Italian and French import market for pig meat, 1995-2000 in %. H = high or > 0,6%; M = medium or $\leq 0,6\%$ and $\geq 0,3\%$; L = low or $< 0,3\%$.

Products	Germany		Italy		France	
	Market share growth (%)	Evaluation	Market share growth (%)	Evaluation	Market share growth (%)	Evaluation
Carcasses	-12,3	L	-0,9	L	-59,0	L
Hams	55,3	H	7,0	H	-14,1	L
Shoulders	14,9	H	-4,3	L	32,0	H
Loins	0,7	H	12,2	H	-14,9	L
Bellies	-13,5	L	-12,2	L	25,6	H
Deboned	-1,0	L	-25,4	L	20,7	H

Average 3 countries = 0,6%

Source: Based on Eurostat data.

Figure A1 Attractiveness for pig meat products imported on the German market based on market size and market growth, 1995-2000.

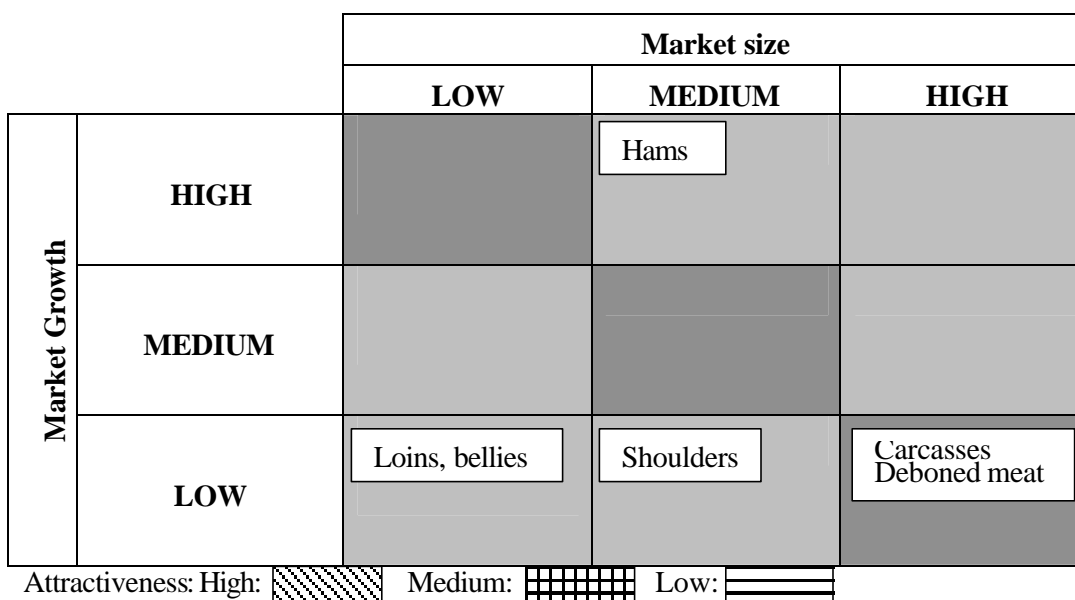


Figure A2 Position for pig meat products imported on the German market based on market share and market share growth, 1995-2000.

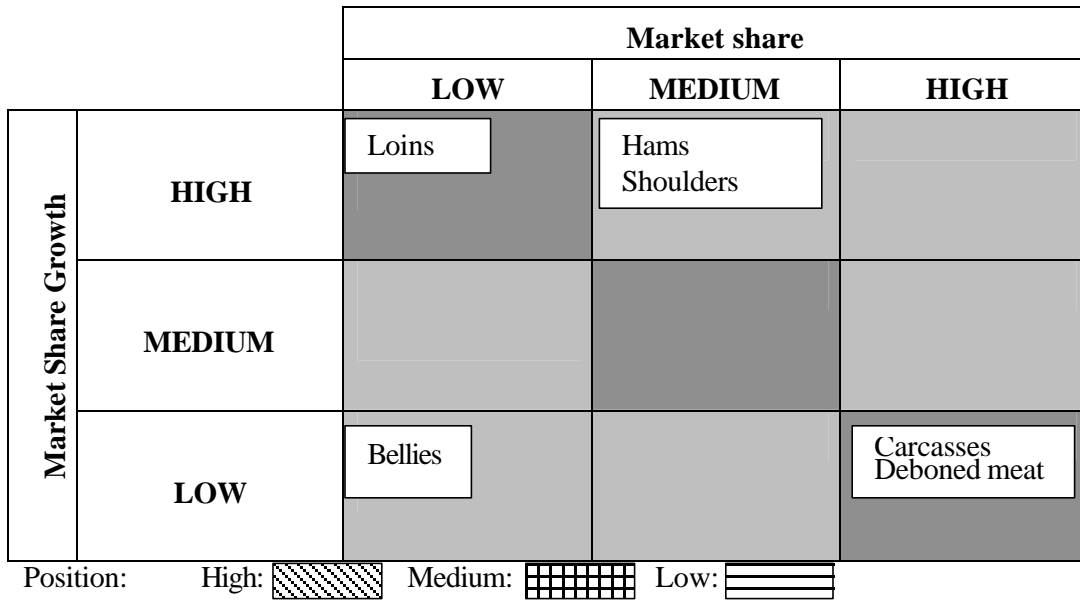


Figure A3 Attractiveness for pig meat products imported on the Italian market based on market size and market growth, 1995-2000.

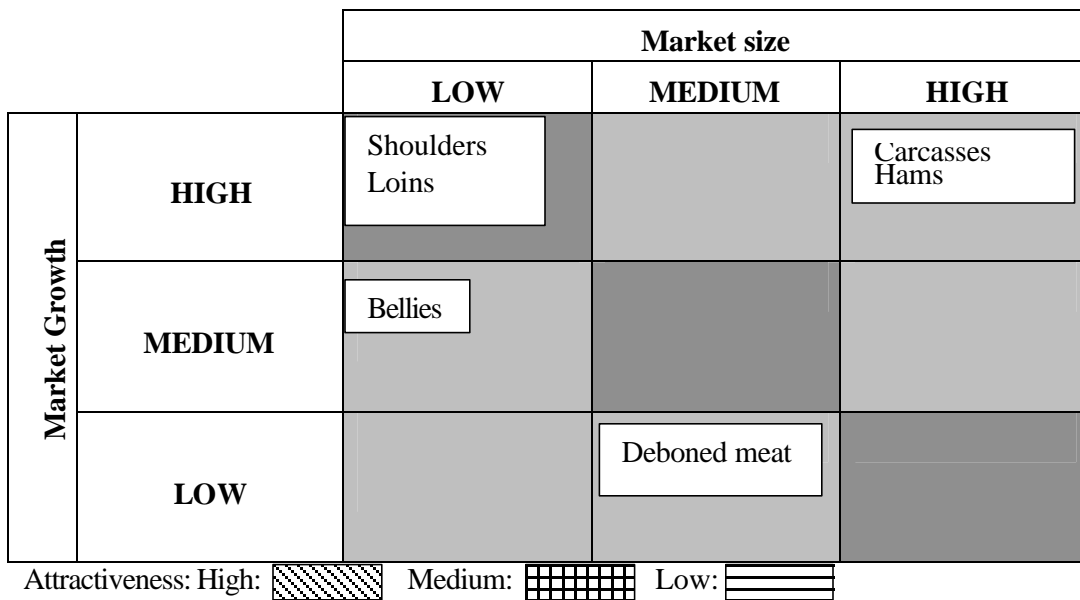


Figure A4 Position for pig meat products imported on the Italian market based on market share and market share growth, 1995-2000.

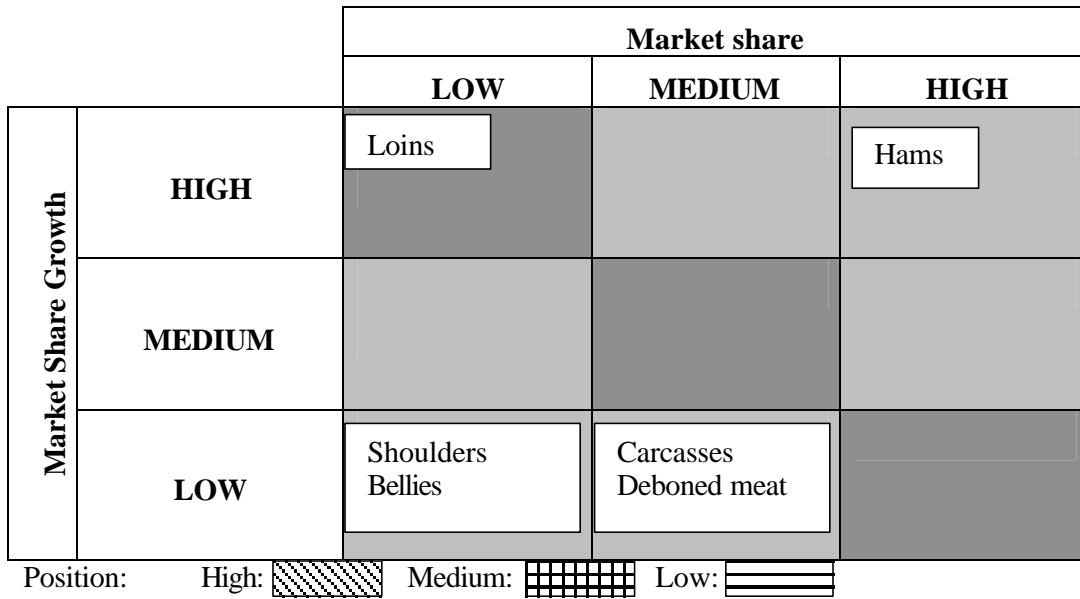


Figure A5 Attractiveness for pig meat products imported on the French market based on market size and market growth, 1995-2000.

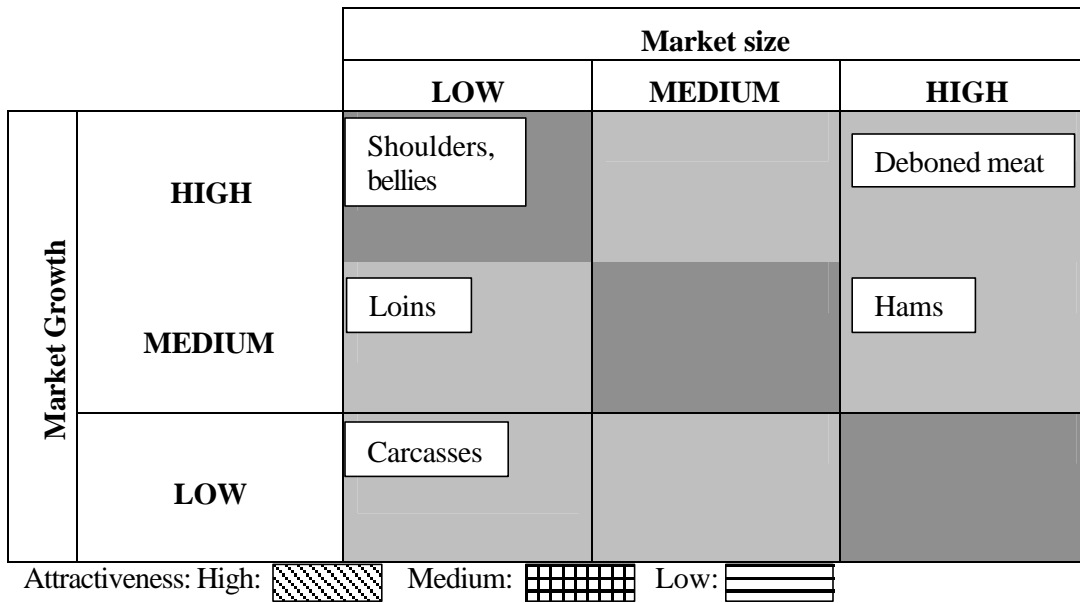


Figure A6 Position for pig meat products imported on the French market based on market share and market share growth, 1995-2000.

		Market share		
		LOW	MEDIUM	HIGH
Market Share Growth	HIGH	Shoulders	Bellies	Deboned meat
	MEDIUM			
	LOW	Carcasses, Loins		Hams




Position: High:  Medium:  Low: 

Table A7 Evolution of market size in Germany, Italy and France, 1995-2000 in total exported tons carcass weight equivalent of pig meat from Belgium.

Products	Germany		Italy		France		TOTAL	
	1995	2000	1995	2000	1995	2000	1995	2000
Carcasses	145.224	147.087	8.755	6.991	5.690	2.038	159.669	156.116
Hams	19.049	36.372	35.892	32.012	9.231	7.408	64.172	75.792
Shoulders	11.390	14.311	765	3.741	7.313	4.232	19.468	22.284
Loins	17.946	20.518	683	1.333	1.912	1.829	20.541	23.680
Bellies	8.547	6.898	2.623	514	14.331	13.297	25.501	20.709
Deboned	80.259	61.940	15.647	8.750	23.972	19.250	119.878	89.940
TOTAL	282.415	287.126	64.365	53.341	62.449	48.054	409.229	388.521
Average	47.069	47.854	10.728	8.890	10.408	8.009	68.205	64.754
Average							22.735	21.585

3 countries

Source: Based on Eurostat data.

Table A8 Evaluation of market size per pig meat product in Germany, Italy and France, 2000 in exported tons carcass weight equivalent from Belgium. H = high or >21.585 tons; M = medium or ≤ 21.585 and ≥ 10.792 tons; L = low or <10.792 tons.

Products	Germany	Italy	France
Carcasses	H	L	L
Hams	M	H	L
Shoulders	M	L	L
Loins	M	L	L
Bellies	L	L	M
Deboned	H	H	M

Source: Based on Eurostat data.

Table A9 Market growth and its evaluation on the German, Italian and French import market for pig meat in exported tons carcass weight equivalent from Belgium, 1995-2000 in %. H = high or > 16%; M = medium or $\leq 16\%$ and $\geq 8\%$; L = low or <8%.

Products	Germany		Italy		France	
	Market growth (%)	Evaluation	Market growth (%)	Evaluation	Market growth (%)	Evaluation
Carcasses	1	L	-20	L	-64	L
Hams	91	H	-11	L	-20	L
Shoulders	26	H	389	H	-42	L
Loins	14	M	95	H	-4	L
Bellies	-19	L	-80	L	-7	L
Deboned	-23	L	-44	L	-20	L

Average 3 countries = 16%

Source: Based on Eurostat data.

Table A10 Evolution of market share in Germany, Italy and France, 1995-2000 in % of imported tons carcass weight equivalent per product.

Products	Germany		Italy		France	
	1987	1993	1987	1993	1987	1993
Carcasses	51,4	51,2	13,6	13,1	9,1	4,2
Hams	6,7	12,7	55,8	60,0	14,8	15,4
Shoulders	4,0	5,0	1,2	7,0	11,7	8,8
Loins	6,4	7,1	1,1	2,5	3,1	3,8
Bellies	3,0	2,4	4,1	1,0	22,9	27,7
Deboned	28,4	21,6	24,3	16,4	38,4	40,1
TOTAL	100	100	100	100	100	100

Source: Based on Eurostat data.

Table A11 Evaluation of market share per pig meat product in Germany, Italy and France, 2000 in % exported tons carcass weight equivalent from Belgium. H = high or $> 16,7\%$; M = medium or $\leq 16,7\%$ and $\geq 8,4\%$; L = low or $< 8,4\%$.

Products	Germany	Italy	France
Carcasses	H	M	L
Hams	M	H	M
Shoulders	L	L	L
Loins	L	L	L
Bellies	L	L	H
Deboned	H	M	H

Source: Based on Eurostat data.

Table A12 Market share growth and its evaluation on the German, Italian and French import market for pig meat, 1995-2000 in % of exported tons carcass weight equivalent from Belgium. H = high or $> 0,6\%$; M = medium or $\leq 0,6\%$ and $\geq 0,3\%$; L = low or $< 0,3\%$.

Products	Germany		Italy		France	
	Market share growth (%)	Evaluation	Market share growth (%)	Evaluation	Market share growth (%)	Evaluation
Carcasses	-0,4	L	-3,6	L	-53,5	L
Hams	87,8	H	7,6	H	4,3	H
Shoulders	23,6	H	490,1	H	-24,8	L
Loins	12,5	H	135,5	H	24,3	H
Bellies	-20,6	L	-76,4	L	20,6	H
Deboned	-24,1	L	-32,5	L	4,4	L

Source: Based on Eurostat data.

Figure A7 Attractiveness for pig meat products exported from Belgium to the German market based on market size and market growth, 1995-2000.

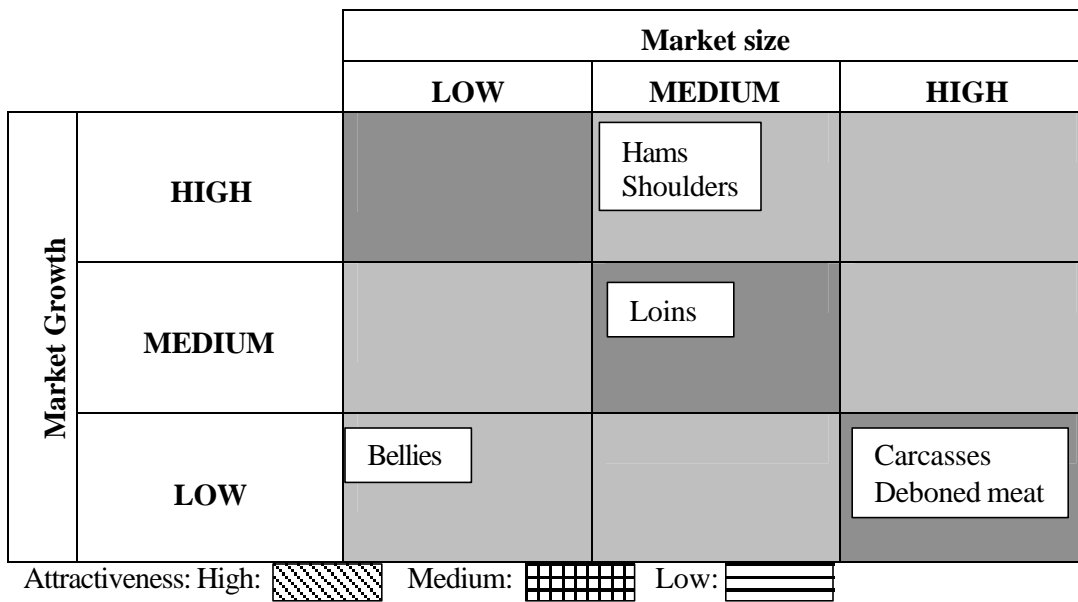


Figure A8 Position for pig meat products exported from Belgium to the German market based on market share and market share growth, 1995-2000.

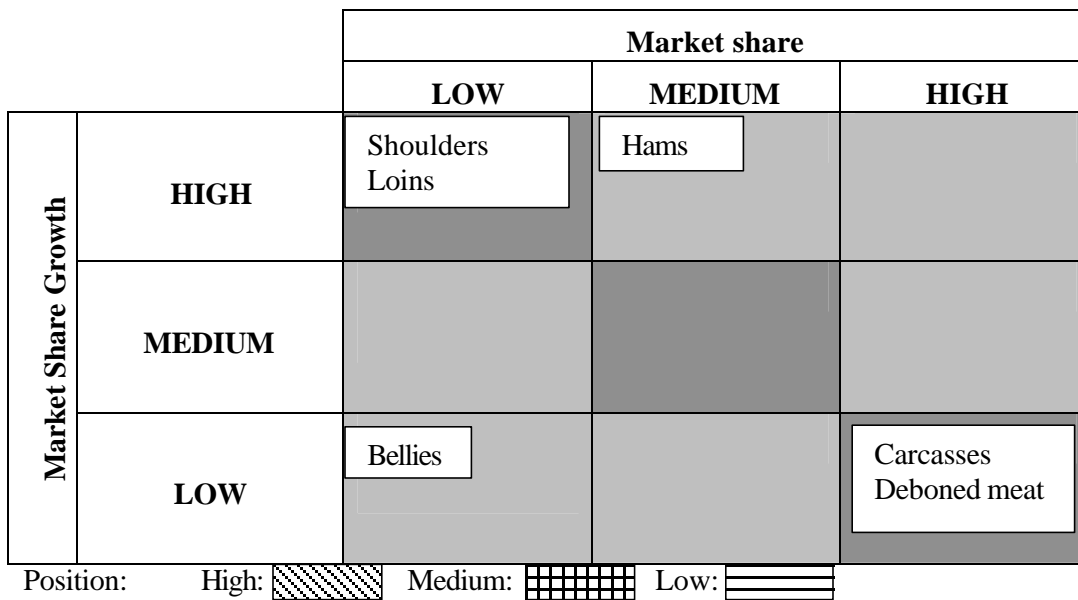


Figure A9 Attractiveness for pig meat products exported from Belgium to the Italian market based on market size and market growth, 1995-2000.

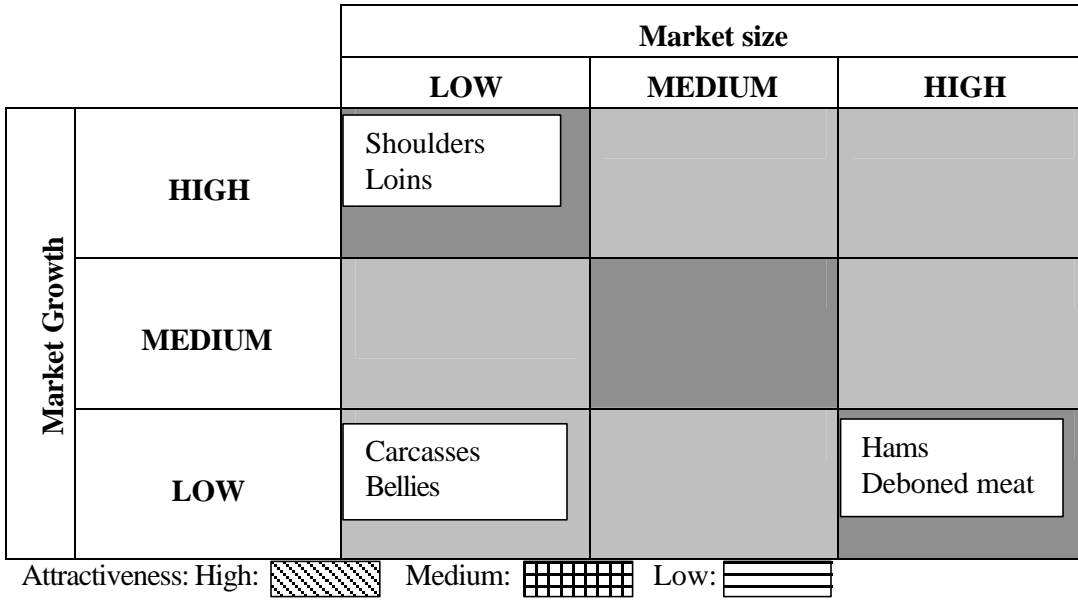


Figure A10 Position for pig meat products exported from Belgium to the Italian market based on market share and market share growth, 1995-2000.

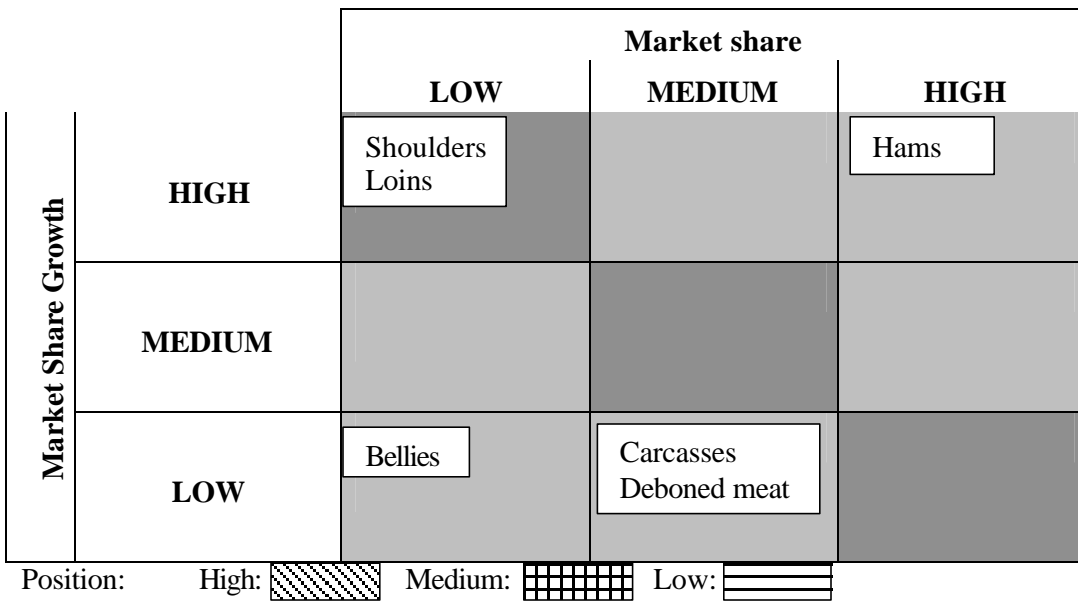


Figure A11 Attractiveness for pig meat products exported from Belgium to the French market based on market size and market growth, 1995-2000.

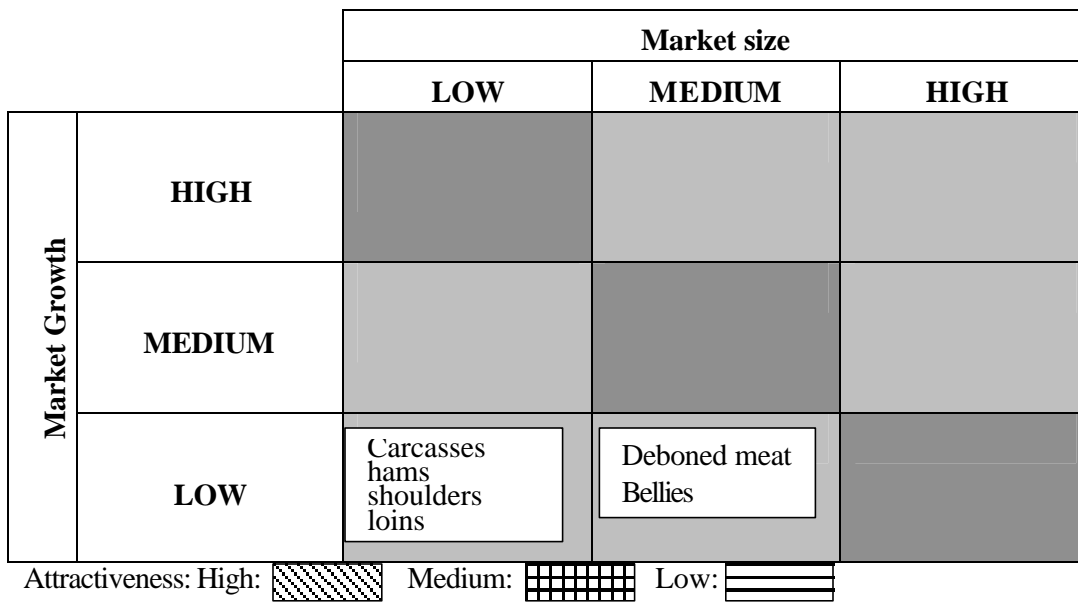
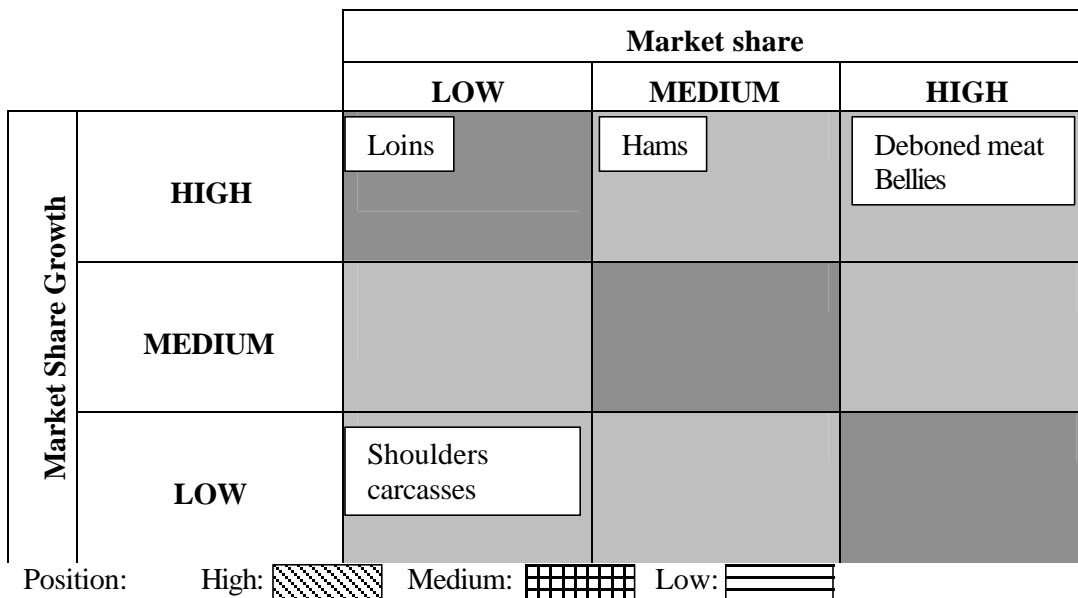


Figure A12 Position for pig meat products exported from Belgium to the French market based on market share and market share growth, 1995-2000.



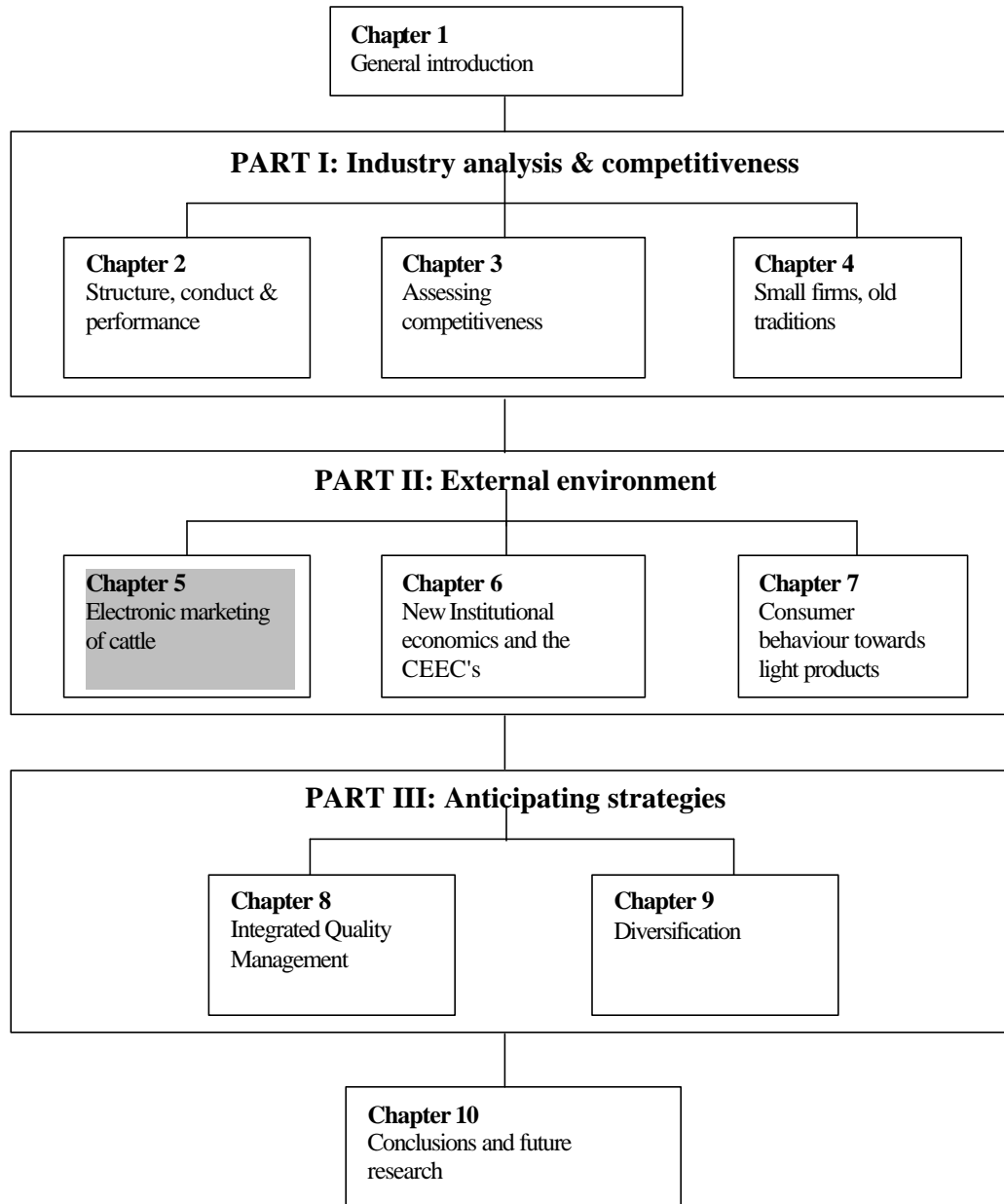
PART TWO

Chapter 5

Electronic Marketing of Cattle: Possibilities and Problems

This chapter is adapted from:

Viaene, J.; Gellynck, X. & Verbeke, W. (1998). Electronic Marketing of Cattle: Possibilities and Problems. *Journal of International Food & Agribusiness Marketing*, Vol. 9(4), 81-97.



Chapter 5: Electronic Marketing of Cattle: Possibilities and Problems

5.1 Abstract

The objective of this chapter is to evaluate the possibility and problems related to the introduction of electronic marketing for cattle in Belgium. By evaluating existing electronic marketing systems in the UK and France, followed by a survey by farmers and slaughterhouses in Belgium, the necessary information was collected to determine conditions for successful introduction. Possibilities and problems can be summarized as seven necessary conditions to be fulfilled, namely the creation of the potentially competitive market, the presence of sufficient trading potential, the development of an acceptable method of product description, the guarantee of performance, the market support, the presence of entrepreneurship backed up by venture capital and the development of human capital. Introduction of electronic marketing for cattle in Belgium could be worthwhile, if these seven elements are worked out as essential parts of a marketing plan, including objectives, strategic options related to the four P's, actions for implementation, marketing budget and method for control and feedback.

5.2 Introduction and objective

Because of increasing competition both at the level of the EU and world market, innovation and especially technological innovation are very much in demand. This demand is enforced by the belief that more market competition means more innovation as stated by Adam Smith at the eve of the industrial revolution and by Schumpeter in the middle of the 20th century (Bobe & Bobe, 1998). However, in literature several definitions of innovation and derived concepts such as innovativeness and innovative success are given. Two major views on innovation can be found (Yon, 1992; Grunert et al., 1997), which are closely related to either supply push or demand pull (Viaene & Gellynck, 1996a). The

first view links innovation closely to technological change, with research and development as a key factor. The second view concentrates on fulfilling unfilled needs and wants of the market based on skills, resources and competences of a company. The latter is much more a process known as market-orientation. Both views on innovation apply to product as well as to process innovation (Davies, 1988; Johne 1985), despite the fact that the distinction between these latter concepts is not always clear-cut and often go hand in hand (Donckels & Mok, 1990). Product innovations relate to new products and services, while process innovations reduce costs of producing existing products or enable the production of new products.

Many researchers (Schumpeter, 1939; Galbraith, 1952; Scherer, 1984; Donckels & Mok, 1990; Rothwell & Dodgson, 1994; Galizzi & Venturini, 1994) have investigated the link between the size of the company on the one hand and innovation on the other hand. Two main opinions exist about the relationship. One view states that large companies are more innovative than small ones because management, scientists and technicians are highly qualified on the one hand and available time and financial resources on the other. The second view argues that small and medium sized companies (SME's) are market makers because SME's are more exposed to competition, apply niche strategies and have little bureaucracy. Compared to large companies, SME's are characterized by a higher proportion of innovative activities outside the traditional research and development (R&D) (Scherer, 1984). Moreover, SME's are much more active at the level of invention and development rather than at the level of market introduction and diffusion (Leder, 1989).

Looking at innovation in the agricultural and food industry, several studies indicate that most of the technological innovations originate from a wide variety of sources outside the food processing industries (Connor & Schiek, 1997; Scherer, 1984; Putnam & Allshouse, 1993). It relates both to license agreements and purchase of efficiency-enhancing inputs. The specific characteristics of the food industry such as nutritional benefits and perishability have consequences for product innovation. The special vertical relations with farmers as deliverers of input to the food processing industry and with retailers as distributors of the

food products are important for the innovation process (Grunert, et al., 1997). Moreover, the agricultural and food industry are characterized by a low R&D intensity, radical innovations are rare and R&D is a minor component of expenditures (Galizzi & Venturini, 1996).

Given the findings described above, the current chapter focuses on process innovation and more specifically on innovation in the marketing process of agricultural products, which is a typical SME-sector. Traditionally, markets in general and livestock markets in particular operate as a place for price discovery and to realize transaction. Supply and demand are confronted with each other and result in a price. This price also is directive for transactions outside the livestock market. Marketing methods are difficult to change, particularly in the agricultural sector (Hobbs, 1997). The introduction of new communication technologies such as computers also has potential in the marketing of agricultural products in general and cattle in particular. Hobbs (1996) illustrates that transaction costs can be lowered when different supply channels are used. The objective of the paper is to evaluate the possibility and problems related to the introduction of electronic marketing for cattle in Belgium, without transportation to the market place.

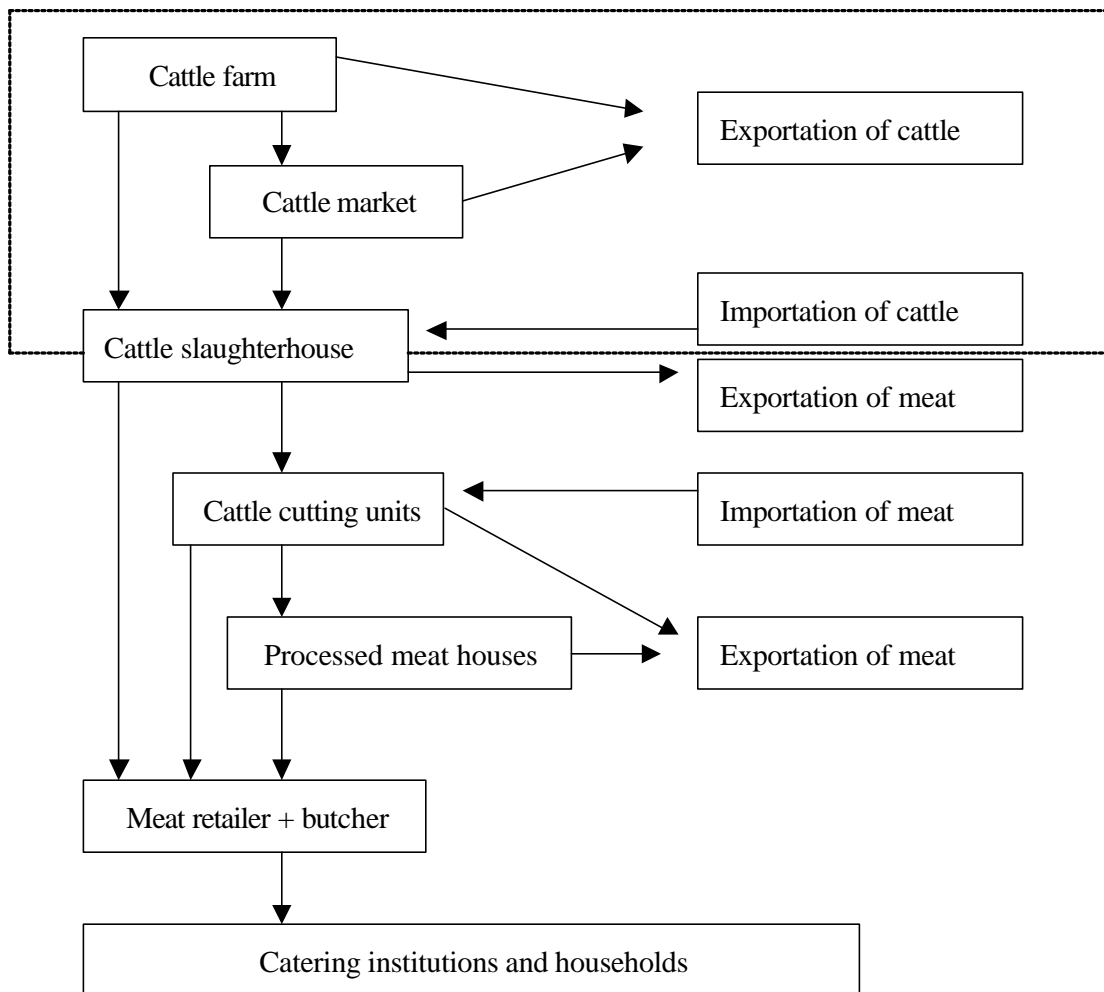
The structure of the chapter is as follows. After describing the research methodology, electronic marketing for cattle in Europe is discussed. Next, potentials and eventual problems when introducing such an electronic marketing system (EMS) in Belgium are pointed out. Finally, the conditions for a successful introduction are explored and conclusions are drawn.

5.3 Research methodology

The different links in the market chain for beef are illustrated in Figure 5.1 (Viaene & Debrabander, 1990). During the past 25 years, agriculture in general and cattle farming in particular are characterized by increasing specialization, which implies interdependence, less independence and more risks for each link in the market chain. To lower these risks, more direct marketing is used.

Open markets guarantee competition and pricing efficiency, while direct marketing is characterized by weaknesses such as insufficient competition, lack of transparency and inaccurate prices. To avoid these problems, electronic marketing could be a solution. Figure 5.1 indicates the marketing chain for cattle and meat. The institutions involved in the current study are farmers, cattle markets and slaughterhouses.

Figure 5.1 Marketing chain for cattle and beef in Belgium.



Source: Adapted from Viaene & De Brabander, 1990.

To analyze the relationships in the market, both secondary and primary data were used. Secondary data consist of statistics, books and reports. Primary data were collected in the market itself by survey and interviews with professionals. Two

types of information were collected. Firstly, existing electronic markets in the UK and France were visited. During these visits, both problems with starting up the electronic marketing system and the actual situation were discussed. Secondly, a survey of farmers and slaughterhouses was conducted in Belgium. During the personal interviews, a videotape illustrating the working of the system, was used as an introduction. Then, a structured questionnaire was completed considering the following topics:

- Actual sales/purchase channels and pitfalls;
- Important components today related to buying/selling of cattle;
- Acceptability of electronic marketing.

In total 66 farmers and seven slaughterhouse managers were interviewed. The data obtained by the survey of the farmers were processed through the software package SPSS (Statistical Package for Social Sciences). The data obtained from the slaughterhouse managers were interpreted in a qualitative way. Based on the collected information, conditions for successful introduction were determined.

5.4 Electronic marketing for cattle in Europe

The description electronic marketing for cattle in Europe starts with the essentials of EMS. Secondly, EMS in both France and the UK are discussed. Thirdly, a SWOT-analysis is presented on the basis of the collected data.

5.4.1 Essentials of EMS

All EMS are based on similar principles and five essential characteristics can be identified (Henderson, 1982):

- Organized trading;
- Centralized sales negotiation;
- Remote market access;
- Description selling;
- Post-sale shipment.

None of these five essential characteristics are unique to EMS, but the combination of all of them makes EMS a unique alternative to conventional marketing systems for agricultural products.

Organized trading or exchanging products implies a set of behavioral rules, which apply to all participants. It means that all participants know the rules of market behaviour and respect these consistently. These rules are not limited to delivery and payment, but also include sanctions against participants who do not respect the accepted rules.

EMS implies centralized sales negotiation. Numerous buyers and sellers interface with one another to realize transactions. It is the opposite of one-to-one trading, in that alternative buyers and sellers are readily available and accessible. The use of progressive auction bidding illustrates this quite well. The second highest bidder stands as a ready buyer at a marginally lower price.

One of the most important characteristics of EMS is that neither buyers nor sellers need to be physically present at one and the same location. It means remote market access. Participants enter the market via telephone lines and Personal Computers. In this way, participants can be dispersed over a wide geographic area.

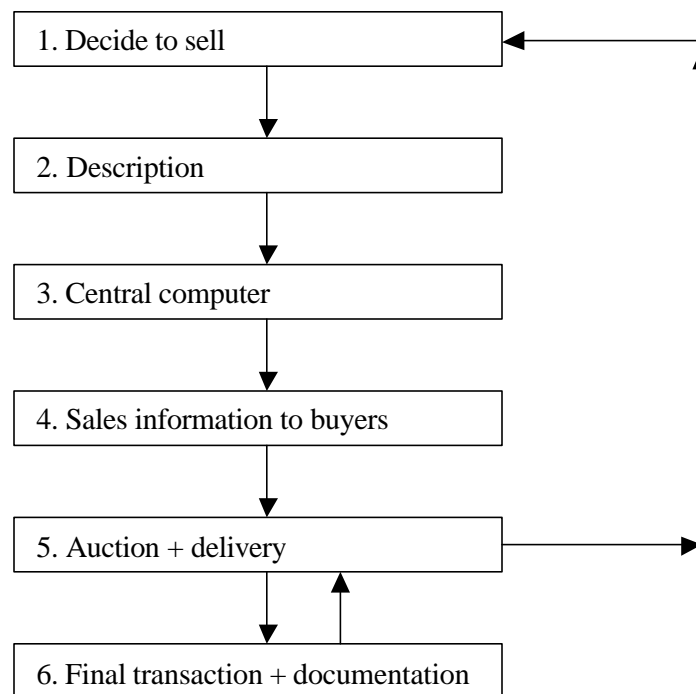
Transaction is realized on description of the product. It means that it is not necessary to move products to a central location for inspection by potential buyers. Description implies the creation of a language, which can be easily understood by all participants. Product description by third-party assessors may be necessary to assure accuracy, objectivity and integrity.

The EMS include post-sale shipment. Since products are sold by description, product delivery can be made on a direct basis from seller to buyer. Products must not be transported to a central point for inspection. In this way, sellers maintain physical control over the product until it is sold and shipping time is saved.

5.4.2 Working of EMS for cattle livestock in the UK

An overview of the working of EMS is given in Figure 5.2. When the farmer decides to sell cattle, he contacts the company organizing the electronic market (the auctioneer). The auctioneer will send an assessor to collect information related to the livestock for sale and to agree about a minimum price. One assessor is able to classify about 300 bovine animals per week.

Figure 5.2 Process in EMS for cattle livestock.



The description includes information such as breed, sex, age, estimated live and carcass weight, assessment of the likely carcass classification based on the SEUROP-grid (see Annex 5.1), followed feed programme, housing technique and location of the animals. The description of each lot to be sold is entered into the central computer and a catalogue for the coming sale is compiled. In the UK, the average size of a lot varies from eight to ten bovine animals, with a maximum of 30 heads.

Buyers connect to the central computer via their personal computer, office telephone and modem, through the public data network. Each buyer is given his own secure user name and password to permit access to the system. Sales are conducted using the central computer of the auctioneer. Buyers "log in" at the appointed sale time and bid from their own office on the basis of the on-screen description. The EMS is a competitive sale. Buyers bid against each other simply by pressing the return key on their computer terminal. As the sale progresses, the computer automatically brings up the lots in catalogue number order. The auctioneer enters the asking price from his computer terminal, which appears simultaneously on the computer screen of the buyers. Prices descend in a predetermined pattern, for example, 2 pences per kg, until the first bid is registered. When the bidding starts, the price ascends with each new bid. If the predetermined bidding period elapses with no further bid being placed, then the auction of that lot is complete. The auctioneer will either notify all buyers that the lot has been sold or, if the lot has failed to reach its reserve price, that the lot has been withdrawn. It happens that a lot is offered again at the end of the sale.

Table 5.1 Basis for bidding on cattle livestock in the UK, including premiums and discounts, 1995 in pences/kg.

	1	2	3	4L	4H	5L
E	+4	+8	+8	+8	+4	-5
U	-2	+4	+4	+4	0	-10
R	-2	BID PRICE			-4	-15
O+	-10	-5	-5	-5	-10	-20
O-	-20	-12	-12	-12	-15	-25
P	-20	-20	-20	-20	-20	-25

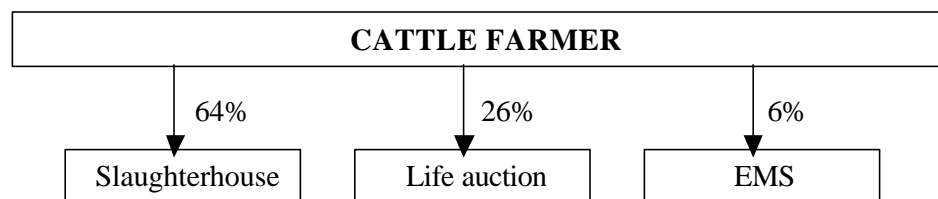
Source: APEX.

The bidding is based on the R2 - 4L classification (Table 5.1) with predetermined premiums for carcasses classifying E or U and discounts for poorer quality and over-fat carcasses. Cattle is collected within seven days of sale and slaughtered within 24 hours. The Meat and Livestock Commission (MLC) grades the carcasses and trimming is based on the New National Standard. Invoices are raised and payments arranged according to the carcass weight and classification.

The slaughterhouse pays within 14 days and a price of 5 £ an hour is charged for use of the software. Commission is payable to the auctioneer by the seller. Eventually, the price is adjusted, taking into account any variations from the catalogue description. Payment to the farmer is made by the auctioneer within 7 to 14 days of slaughter and is guaranteed. The farmer receives a full report on the slaughtering of his cattle. The commission for the auctioneer, a bad debt levy and statutory MLC charges are deducted.

In 1990, the EMS was introduced in the UK from Canada by Electronic Auction Systems Europe (EASE) (Christie et al., 1991). In 1995, five other companies are competing in the market. Based on interviews, the market share of EMS as a purchase channel for cattle is indicated in Figure 5.3. In 1995, the share of EMS was estimated at 6% or about 200.000 animals and is expected to increase in the coming years. This market share was realized over a period of five years at the expense of both the life auction and the middlemen (cattle merchant). Related to the quality of the cattle being auctioned, most animals are of the types R, O and P according to the SEUROP-classification. The types of cattle can be considered as a quite standardized type of animal.

Figure 5.3 Market share of EMS for cattle in the UK, 1995 in % of total slaughtering cattle.



5.4.3 Working of EMS for cattle livestock in France

Sicamob, located in Brittany, has developed an EMS very similar to the ones operating in the UK. The system became operational in February 1991. The starting point is the description of cattle by an assessor of Sicamob. This assessor is able to visit approximately 10 farms per day. The description comprises information concerning number, category, race, SEUROP-grade and location of the cattle. In agreement with the farmer, the assessor composes lots of eight to ten heads. Before the auction takes place, a catalogue, containing all information

about the presented lots, is available to the buyers at 'Minitel'. The auction is held every Friday afternoon.

Buyers connect to the system by use of the telephone network and 'Minitel'. To enter the EMS as buyer, a bank guarantee covering two weeks purchases must be available. Sicamob installs all necessary equipment for the buyer. This equipment comprises 'Minitel' and an operation panel. The operating panel is connected with Sicamob through the telephone network and comprises a mini auction clock, a bidding button and a loudspeaker, transmitting the voice of the auctioneer during the auction. The information about every lot appears on the 'Minitel'-screen.

Parallel with the remote marketing, the bidding can be followed and joined by potential buyers, physically present at the auction. Some buyers still prefer to be at the auction. Especially the social aspect of meeting some colleagues accounts for this preference. The lots are sold to the highest bidder if the farmer, often present at the auction place, or the auctioneer agrees with the price obtained. Sicamob guarantees transportation and payment to the farmers. Payment is realized to farmers and by slaughterhouses within 14 days. Assessors in the slaughterhouses grade the carcasses. The Ministry of Agriculture controls these assessors. An independent organization, named 'Interbovi' operates as a 'referee' if problems or disagreements arise.

Through this system, Sicamob markets weekly about 100 to 300 heads to a maximum of 15 buyers, of which eight can be considered to be regular buyers. About 50 heads are marketed in a period of no more than three minutes. The auction commission accounts for 1,5% to the seller and 0,5% to the buyer. The Sicamob EMS operates besides a more traditional cattle livestock market. The rather small amount of cattle sold through EMS is part of Sicamob's strategy, in which the traditional marketing, with physical presence of cattle and buyers, still takes precedence.

5.4.4 SWOT-analysis

'SWOT' stands for Strengths, Weaknesses, Opportunities and Threats (Day, 1984). Strengths and Weaknesses of EMS result from its competitive position on the one

hand and from its technological and managerial capabilities (resources and competencies) on the other. Strengths and Weaknesses refer to the internal characteristics of EMS and rise from substitutes, suppliers and customers, technology and development of new products. On the contrary, Opportunities and Threats refer to the external environmental factors and the competitive position of EMS related to these factors. Examples of Opportunities and Threats are regulations, consumer behaviour and price evolution. Based on the experience with the existence systems in the UK and France, a SWOT-analysis is realized.

The strengths of EMS can be summarized as follows:

- Because of direct transportation of livestock from farm to slaughterhouse and search-time saving, reduction in purchase costs.
- Easy access to a wide range of sellers and buyers which generally implies better prices than through the use of conventional marketing methods.
- Possibility for buyers to purchase a much tighter specification.
- Selling on deadweight classification, which means that the slaughterhouses participating in the EMS apply the same rules. It results in higher price transparency.
- Cost effective marketing system because commission is modest and only charged on completed sales.
- The auctioneer guarantees payment.

According to contacts with users of EMS in the UK, the following weaknesses can be identified:

- Convincing slaughterhouses to participate in EMS is hard because current purchase channels give satisfaction. The use of EMS could result in a loss of bargaining power for the slaughterhouse. It means that the move to more extended use of EMS must come from the cattle farmer. It is estimated that a market share of about 20% is required to force enough slaughterhouses to participate in EMS.
- Collecting farmers to participate in the system requires a lot of advertising.
- The subjective classification of livestock by the fieldsmen could anger both farmers and slaughterhouses if it differs a lot from the SEUROP-classification.

External changes create the following opportunities for EMS:

- The public cares about animal welfare and more and more criticism can be heard related to transportation of animals and live auctions.
- Supermarkets prefer and sometimes insist that cattle come straight from the farm and should be traceable back to the farm. It implies that cattle under quality assurance schemes can be clearly identified.
- Actually, prices on the cattle market are low. This could force farmers to look for new selling systems, which could give them a better return.
- The EMS as it has been developed for cattle can easily be copied for other farm products, which could broaden the market.

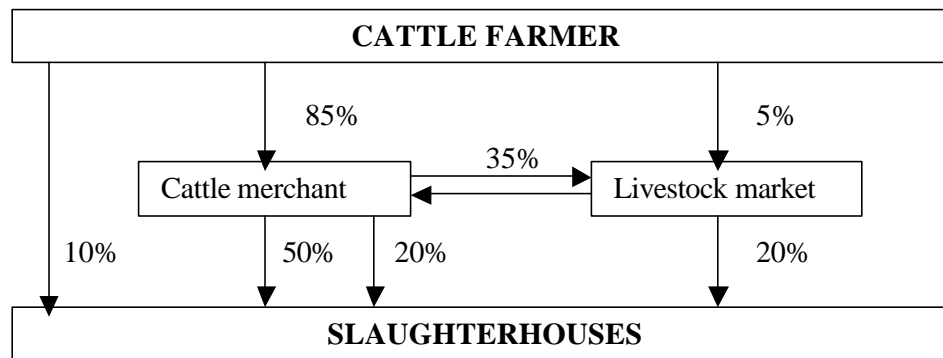
Also some threats can be identified:

- Most farmers selling directly to slaughterhouses are committed and loyal to them and will not change their habits.
- Slaughterhouses do not always use the MLC grading system and apply their own classification system. Based on these systems, cattle are purchased.

5.5 Potentials and eventual problems in Belgium

In Belgium, total slaughterings of cattle represented about 640.000 heads in 1995 and two main channels can be distinguished for the purchase of slaughtering cattle by slaughterhouses, namely directly at farm and through the livestock market (Figure 5.4). During the last 35 years, the share of purchases through the livestock market is characterized by a continuous decline. In 1959, the share of livestock markets still represented 80% of the total supply of slaughtering cattle (Baptist et al., 1961), while during the 1970s this share decreased to 60%-70% (Studien zur Agrarwirtschaft, 1971). Based on the interviews with farmers, and the managers of slaughterhouses and livestock markets, the share of slaughtering cattle purchases on the livestock market in total slaughterings is estimated at 40% in 1995.

Figure 5.4 Purchase channels for slaughtering cattle in Belgium, 1995 in % of total slaughtering cattle.



Despite the fact that direct supply from the farm to slaughterhouses has increased, the role of the cattle merchant remains important. About 85% of all slaughtering cattle pass through cattle merchants. The cattle merchant works as an independent or as a commission agent for slaughterhouses. The share of slaughtering coming directly from the farm and going to the slaughterhouses, through the hands of the cattle merchant, is estimated at 50%. The share of slaughtering cattle delivered by the cattle merchant and which passed over the livestock market is 40%. Slaughterhouses buy 10% of total slaughtering cattle directly at the farm and 20% on the livestock market. In 1995, the conformation of cattle slaughtered in Belgium was dominated by the classes S and E, which represented 57% of total slaughterings. It concerned mostly young bulls, while the conformation of cows is much more spread over all classes.

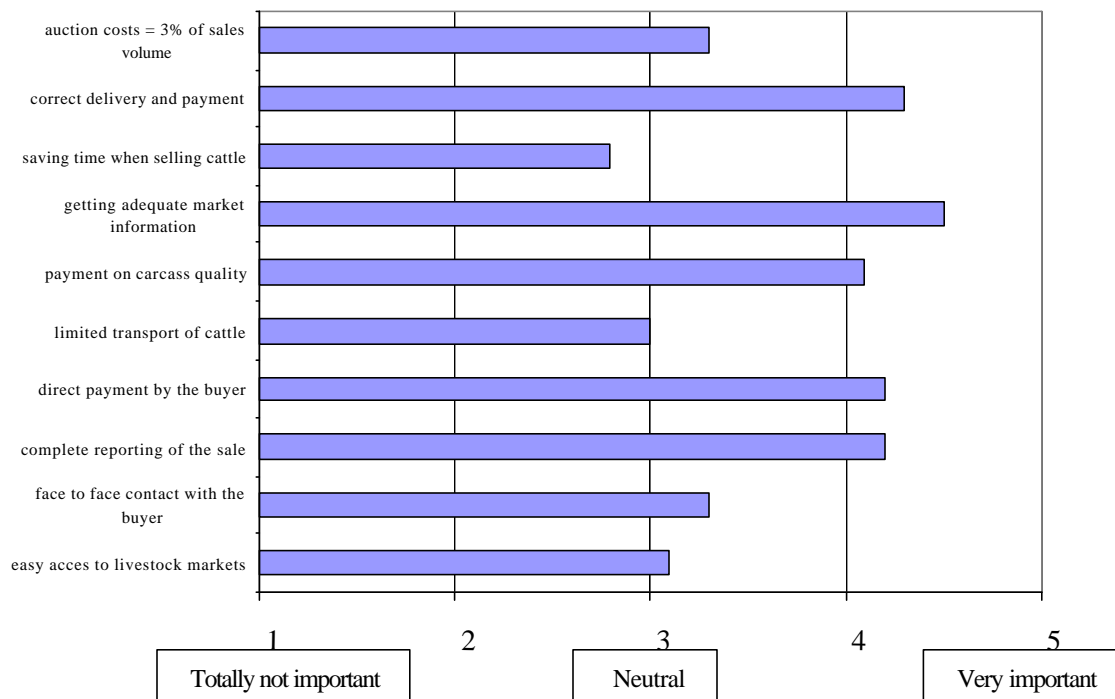
Table 5.2 Farmer's intention towards selling through an EMS according to farm size in Belgium, in % of respondents (n = 66).

Total number of cattle	Sell through EMS?		
	Yes	NO	TOTAL
<100	55	45	100
100-150	92	8	100
>150	100	0	100
TOTAL	78	22	100

$\chi^2 = 16,077$; $p = 0,000$

Based on the survey of farmers and slaughterhouses, potentials and eventual problems by introducing EMS on the Belgian market are determined. More than three quarters of the interviewed farmers intend to sell cattle through an electronic marketing system. Especially the larger farmers favor selling through an EMS (Table 5.2). As the interviewed sample of farmers consists mainly of dairy farmers, the types of cattle concerned are mostly U, R, O and P cattle, namely culled cows, suckler cows and heifers.

Figure 5.5 Importance of selling criteria.



The main benefits sought by the farmers have to do with information and payment (Figure 5.5). The farmers are in search of adequate market information, which implies better information about market prices and quality demanded. In the same context, the farmer attaches high importance to a clearly structured and complete reporting of the sale. The farmer looks forward to payment on carcass quality. Correct and guaranteed payment is a priority for the farmer. The EMS is an opportunity to meet these farmer's needs, rather than selling through the cattle merchant.

The cattle merchant is perceived to be very resistant to the introduction of the new technology since it eliminates his role in the marketing of cattle. By introducing the EMS, farmers remarked that a problem could occur related to selling remainders or emergency slaughtering cattle. The cattle merchant will probably refuse to pick it up, as the 'good' cattle is no longer available to him.

The farmers believe in the feasibility of an EMS. The few objections have to do with selling cattle without seeing it and selling through computers. Farmers with few cattle to sell, consider EMS not to be useful for them. Further question marks remain according to insurance (tapeworm), responsibilities (ownership of the cattle), payment guarantees and minimum numbers of cattle required to sell through EMS. Although farmer's intentions rate positive, little credit is to be expected due to their traditional attitude and skeptical nature. The EMS will have to hit the bull's eye from the first trial on.

Slaughterhouses and cutting units can be divided into two groups according to the purchasing intention. The groups are indicated as advocates and adversaries of purchasing slaughtering cattle through an EMS. Advocates favor EMS whereas adversaries are perceived to be resistant. Both groups make remarks according to the working and characteristics of an EMS. The concerning topics are:

- Eliminating the cattle merchant who performs the task of assembly and transportation of livestock;
- Disappearance on the long run of the livestock markets as a meeting place of beef business people;
- Purchasing cattle without visual representation and personal contact with the seller;
- Select, train and control trustworthy classifiers for grading livestock in the field and carcasses in the slaughterhouse;
- Compatibility of the SEUROP-classification grid with the Belgian type of cattle.

These items are considered to be insurmountable by the adversaries. The advocates indicate the importance of each topic but are convinced that a

convenient solution can be found for each mentioned pitfall. Related to EMS, buyers identify the following benefits:

- According to the issue of animal welfare: limited transportation and costs by avoiding livestock markets;
- Better opportunities to trace the origin of each animal, which is necessary for establishing quality labels and guarantees of safety and healthiness;
- Possibility to postpone the payment terms compared with cash payment to cattle merchants or farmers on livestock markets.

5.6 Successful introduction: possibilities and problems

Seven conditions (Henderson, 1984) for successful introduction of EMS on the Belgian market are discussed. A potentially competitive market is the first condition for success. It means that it has no sense in developing an EMS when a single party controls the market. However, in the case of cattle selling in Belgium, EMS has an opportunity to broaden the exposure of individual market participants to potential traders on the other side of their transaction. It refers to confronting farmers (sellers of cattle) to more slaughterhouses (buyers of cattle) and vice versa. This system could be especially helpful to farmers, since they are in contact with very few buyers, in most cases some cattle merchants. It implies that there is an imbalance in market power, which favors buyers of cattle.

Second, to be successful, sufficient trading potential is necessary for reasons of both costs and trader interest. Compared with direct purchase of cattle, EMS imposes some additional costs such as computer hardware and software, fieldsmen, credit insurance and financing the whole activity. Direct purchase of cattle requires search-time, which means money. However, establishing direct purchase implies that the individual slaughterhouse is confronted with a limited number of regular suppliers. Through EMS, slaughterhouses obtain an additional purchase channel, which can complete current supply and allow more efficient planning of the slaughtering activity. Compared with purchases through livestock markets, costs of EMS must remain under the additional costs of livestock markets (+ 35 EUR/bovine animal). Also in this case, a minimum trade volume,

estimated at 600 cattle per auction, is required. To obtain a solid market position and to force slaughterhouses to continue participating in the system, a minimum share of 20% of total slaughterings in participating slaughterhouses is required.

Third, to exchange products through EMS an acceptable method of product description is required. The SEUROP-classification for carcasses as such enables it to describe cattle, but both buyers and sellers must be willing to accept it as a common descriptive system. The description of cattle is made by fieldsmen, who play a crucial role in EMS. Most cattle are sold live, but farmers are interested to be paid on deadweight. Since the market pull must come from the farmers, it implies that selling on deadweight has to be promoted at farm level. At the level of the slaughterhouses, few effectively work with the SEUROP-classification system. Their share is estimated at about 15% to 20% of total slaughterings. These slaughterhouses consider the SEUROP-classification grid satisfactory for the middle (U and R) and lower quality (O and P) when sub-classes are used. For the superior quality (S + E), slaughterhouses have difficulties to classify the carcasses, even by using sub-classes. Other variables such as color are important. An additional problem related to the SEUROP-classification consists of the fact that it is the buyer (the slaughterhouse) who classifies the carcasses. Despite the fact that the Ministry of Agriculture controls the classifiers, these people are paid by and work for the slaughterhouse. This aspect results in different grades from different slaughterhouses. Organizing the classification by independent classifiers from the Ministry of Agriculture could solve this problem. These people could be paid by a levy per slaughtered animal, just as it is organized in the Netherlands or by using an independent organisation as in France, which operates as a referee.

The fourth condition for success concerns performance guarantee. Because face-to-face dealing does not occur in EMS, it is important to assure confidence by participants. Sellers must deliver what was offered and buyers must pay as agreed. It means that some method of warranting trader behaviour is required. To introduce EMS on the Belgian market, it is suggested that the auctioneer guarantees payment to the farmer within seven days after haulage of the animals. Some kind of sanction has to be foreseen for sellers not delivering and for buyers not picking up the animals. To be able to guarantee payment to the farmer, the

auctioneer needs to be paid by the slaughterhouse. Because of the large amount of capital involved, only buyers able to present a bank guarantee or for whom it is possible to obtain credit insurance, should be accepted to participate in EMS.

The fifth condition for successful introduction relates to market support. Introducing an EMS for cattle in Belgium will certainly be considered as a threat to some existing market participants. The system aims to eliminate the cattle merchant, at least as buyer of slaughtering cattle, and a competitive reaction can be expected from this side. As far as the cattle merchants' financial means reach, a reaction through higher prices paid to the farmer can be expected. Because the introduction of EMS will be cheaper than purchasing through the livestock market, the market share of the livestock markets is expected to decline. These livestock markets can react by declining market taxes and by creating new services for both buyers and sellers. Resistance towards EMS could occur from slaughterhouses dominating a local market situation. Strategies have to be developed to take care of such resistance.

The sixth condition for successful introduction concerns venture capital and entrepreneurship. Innovative spirit is an essential ingredient in the successful development and implementation of EMS. It will be necessary because people with vested interests in the current system have much reason to argue that it cannot be done and to discourage its use by whatever means possible. Something which could help to temper the slaughterhouses' resistance concerns new product development. Since retail chains install integrated quality assurance schemes and supply must be guaranteed, both farmers and slaughterhouses could benefit from EMS. It offers possibilities to auction contracts at term. For example, farmers offer contracts for the production of slaughtering cattle within a period of six months and slaughterhouses bid for these contracts. However, this entrepreneurial spirit must be backed by adequate venture capital. An undercapitalized EMS is likely to wither before it can be fully and fairly tested in the marketplace.

The seventh and last essential condition for a successful test on the Belgian market concerns the development of human capital. Because electronic marketing is a relatively new and innovative concept, few operators in the market chain for cattle

understand how it functions and much less their potential benefits and costs. Considerable investment in education of fieldsmen and both buyers and suppliers is required. Fieldsmen must be educated in the various ways that EMS can be designed and operated. Farmers and slaughterhouses must be educated in both the procedures and the potential benefits and costs associated with EMS.

5.7 Conclusions

EMS for cattle aims to buy and sell cattle livestock by personal computer, without transportation to the market place. It guarantees competition and pricing efficiency. In both the UK and France, several EMS were introduced during the period 1990-1995. The market share of EMS in these countries is growing rather slowly because of the strongly traditional market structure for selling and buying cattle. However, market share of EMS is expected to continue its growth.

The introduction of EMS in Belgium for cattle is worthwhile, if some conditions are fulfilled. The most important condition for success concerns the development of a method of product description and related payment, acceptable for both parties, namely the buyers and the sellers. The market pull must come from the farmers and the SEUROP-classification grid could be used as basis for product description. However, before introducing EMS in Belgium the essential parts of a marketing plan should be worked out, including objectives, strategic options related to the four P's, actions for implementation, marketing budget and methods for control and feedback.

Annex 5.1 Questionnaire farmers.

Annex 5.2 Questionnaire slaughterhouses.

Annex 5.3 SEUROP-classification in the EU.

The EU worked out the SEUROP-classification system for carcasses with the aim to:

- enable price comparison between the different Member States;
- determine intervention prices for specific types of carcasses.

The classification is based on three parameters, namely type of cattle, conformation and fat cover (Table A1). According to the type of cattle, carcasses are divided into the following categories:

- A: uncastrated young male animals, less than two years old (young bulls);
- B: other uncastrated male animals;
- C: castrated male animals;
- D: female animals that have calved;
- E: other female animals (heifers).

Table A1 Characteristics of the SEUROP-classification grid.

CONFORMATION		FAT COVER	
S Superior	all profiles extremely convex; exceptional muscle development (double muscled carcass type)	1 Low	no to low fat cover
E Excellent	all profiles convex to superconvex; exceptional muscle development	2 Slight everywhere	slight fat cover, flesh between the ribs
U Very good	profiles on the whole convex; very good muscle	3 Average	flesh, with the exception of the round and the shoulder almost everywhere covered with fat, slight deposits of fat in the thoracic cavity
R Good	profiles on the whole straight, good muscle	4 High	flesh covered with fat, but on the round and shoulder still partly visible, some distinctive fat deposits in the thoracic cavity
O Fair	profiles straight to concave; average muscle development	5 Very high	entire carcass covered with fat; heavy fat deposits in the thoracic cavity
P Poor	all profiles concave to very concave; poor muscle development		

Source: Meat and Livestock Commission (MLC), 1993.

Chapter 6

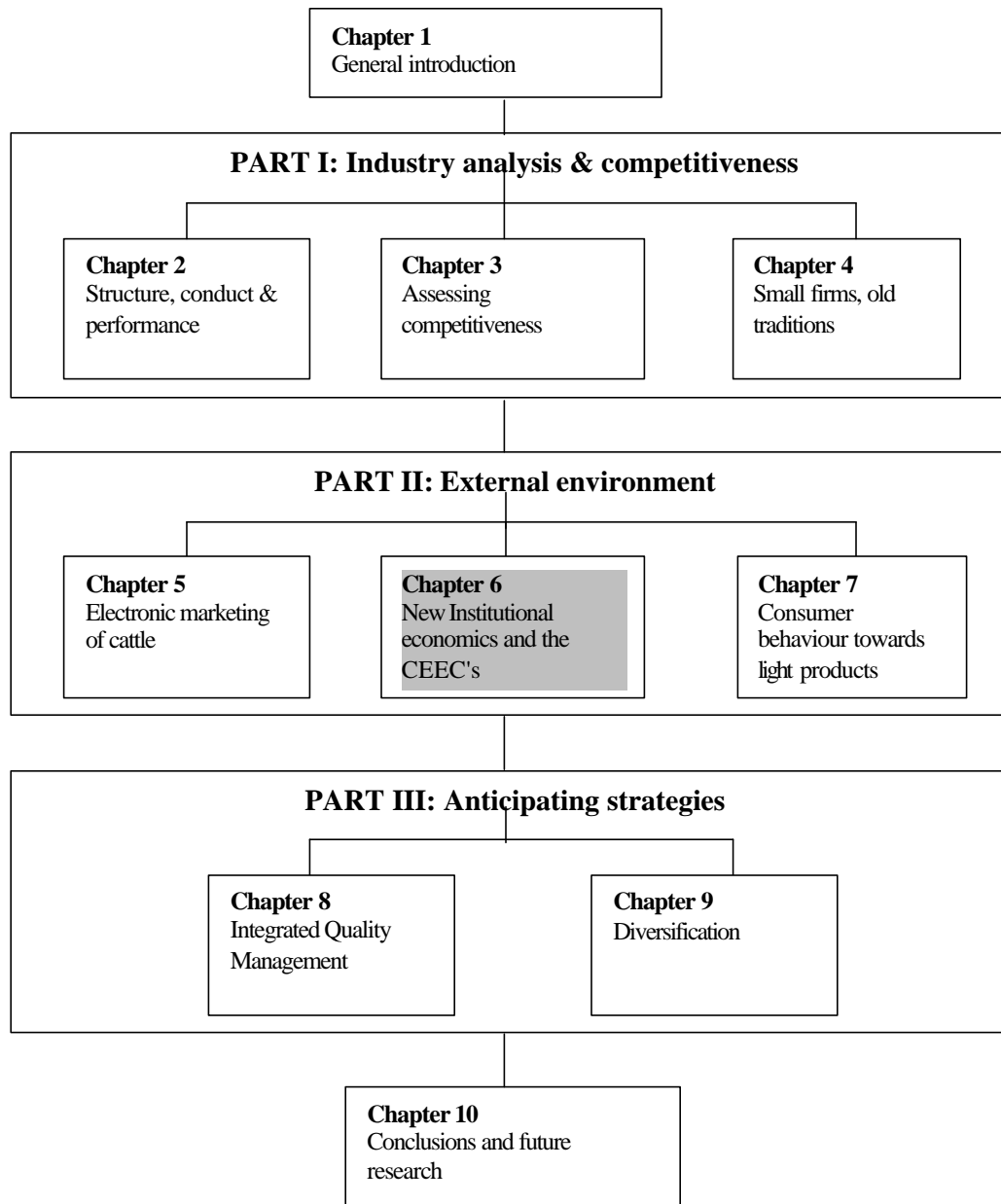
New Institutional Economics as a Tool for Improving Transaction Governance in the Polish Fruit Sector

This chapter is adapted from:

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Viaene, J. & Gellynck, X. (2001b). Overview of literature on New Institutional Economics: A tool for development of the agri-business sector in transition economies? In B. Kowrygo; Halicka, E. & Rejman, K. (Eds.). Institutional economics and the food sector in Poland, Hungary and the Czech Republic: Implications for EU-integration. Warsaw: Wydawnictwo SGGW, pp. 17-30.

Gellynck, X.; Halicka, E. & Viaene, J. (2002). New Institutional Economics as a Tool for Improving Transaction Governance in the Polish Fruit sector. *Journal for East European Management Studies*, Vol 7 (2), 142-161.



Chapter 6: New Institutional Economics as a Tool for Improving Transaction Governance in the Polish Fruit Sector¹

6.1 Abstract

There was an expectation that price liberalization and privatization in the transitional economies would spontaneously result in the necessary institutions that underpin Western market economies. However, these institutions are not developing as expected. The objective of this chapter is to understand why these institutions are not developing in the Polish fruit sector. The analysis focuses mainly on transaction cost economics and its link with economic development. Based on interviews with all participants in the Polish fruit chain, hold-up problems are identified and solutions proposed: information systems, quality monitoring, horizontal integration, management training, financial support, contract enforcement by legal regulations and communication with consumers.

6.2 Problem definition and objective

The enlargement of the EU represents an important opportunity for supporting stability and prosperity on the continent. A single set of rules, tariffs and administrative procedures will simplify business and allow more efficient organizational structures. A more positive investment climate will be created in the Central and Eastern European Countries (CEEC's) (Kawecka-Wyrzykowska, 1996; Baldwin et al., 1997). An important element in the accession process consists of the adoption and implementation of the *acquis communautaire* (European Commission, 2000c). This relates to the set of rules, norms and standards valid in the EU, and compliance requires considerable investments, particularly in the case of the agribusiness sector. Moreover,

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agricultural and food production activities are not included in the association agreements between the candidate countries and the EU and are subject to limited liberalization (Rabinowicz, 2000). The application of the CAP under the scenario that all ten candidate countries enter the EU in 2002 would result in an additional cost of 11 billion EURO's per year (Banse et al., 1998). Under Agenda 2000, the EU is politically not able to pay this, consequently it is expected that CAP will be adapted and a well-functioning agri-food market will be essential if these new members are to be in a position to compete successfully with the current member states.

In the transition process from a centrally planned to a market economy, the agri-business sector is crucial because food security is essential to individuals' welfare on the one hand and because of the relative importance of this sector in the national economies on the other. Effective transition requires a new institutional framework ranging from constitutional guarantees to hygienic and sanitary standards that might enhance or hamper competitiveness (Frohberg & Hartmann, 2000). In this respect, price liberalization and privatization during the 1990's was expected to spontaneously result in the institutions that underpin Western market economies (Hobbs et al., 1997).

However, the necessary institutions have not developed as expected. Thus it is important to understand the key role of institutions in the transition process, especially as Western agri-food markets are characterized by a set of specialized institutions that facilitate the functioning of all participants in the multiple set of market chains.

The objective of this chapter is to investigate whether or not the considerations in the new institutional economics theory are useful in understanding the role of institutions in transition economies in general and in the Polish fruit sector in particular. The focus is not on the decision-making process for agricultural policy and the institutions intervening in this process, but rather on the need to guard against opportunistic behaviour. The key question is: What kind of hold-up problems exist and how can this situation be reversed? Therefore, the

central point of discussion is the role of institutions in the agri-business sector and more specifically in the marketing of fruit products in Poland.

After discussing the principles of the new institutional economics theory, the importance of the Polish fruit sector is illustrated. Next, the research methodology is described and hold-up problems identified. Finally, an institutional strategy to tackle the hold-up problems is proposed and conclusions are drawn.

6.3 New Institutional Economics

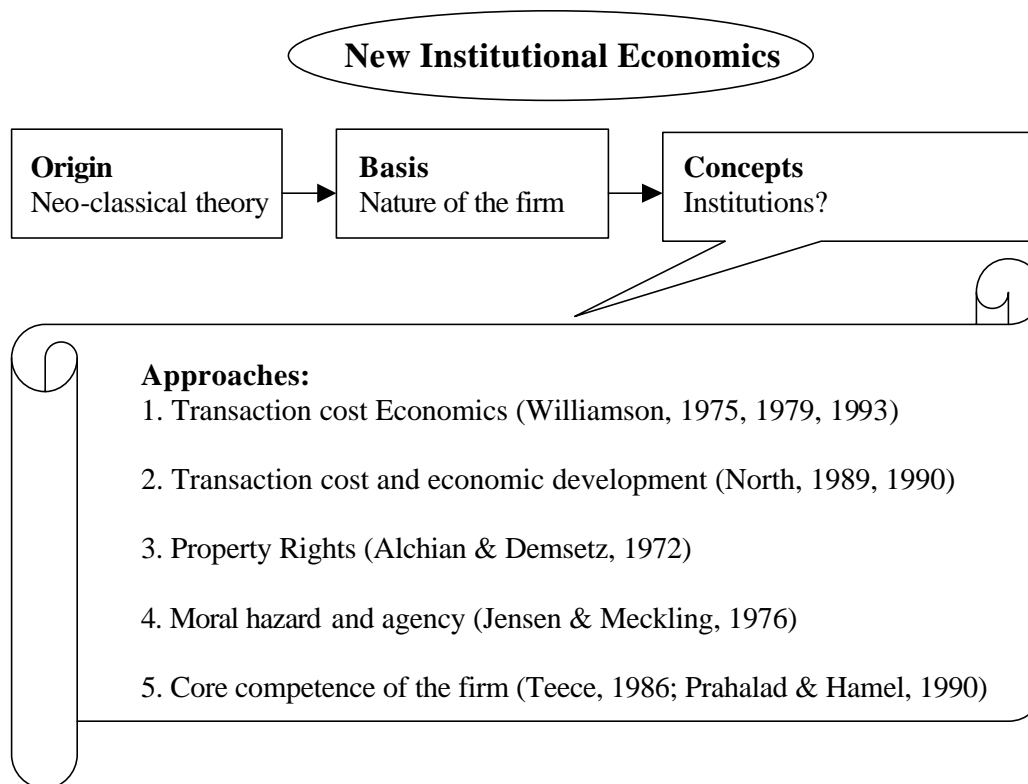
After the introduction, the different approaches present in the economic literature on new institutional economics are discussed.

6.3.1 Introduction

The figure below indicates new institutional economics (NIE) in relation to its origin, its basis and what different concepts can be considered as part of new institutional economics. The term 'new' refers both to the fact that now we are able to explain why institutional arrangements are as they are (Cheung, 1992) and to the fact that real economic problems are explained (Verhaegen, 2001).

Economic analysis of markets, industries and the firm is largely based on neo-classical economics. The reasoning in the neo-classical theory is based on the concept of a single-product firm operating in a perfectly competitive industry. This industry is characterized by a large number of firms producing the same product under the same cost conditions, having the same necessary information to be able to make rational choices within the exchange process and all facing the same market demand curve (North, 1989; Loader, 1996; Hobbs et al., 1997). However, such markets, where transactions are characterized by demand that equals supply resulting in the equilibrium price and quantity, only exists in introductory microeconomics textbooks. In reality, the market mechanism includes costs and this hypothetical benchmark of perfectly competitive general equilibrium does not exist.

Figure 6.1 The origin, basis and concepts of new institutional economics.



NIE is a mix of several scientific disciplines: economics, law, organisation theory, political science, sociology and anthropology (Klein, 2000). Williamson (1975) introduced the term NIE. It mainly focuses on economics and explains institutions: what institutions are, how they arise, function, evolve and if they should be reformed. The basis of this theory originates from Coase's analysis of the firm (Coase, 1937), in which the author explains why firms exist and how firms operate. Using the market mechanism involves costs such as discovering prices, and the costs of negotiating and specifying individual contracts. Firms can avoid these market costs by producing the required product/service themselves. This means that firms will take over production activities until the costs of producing the required product/service within the firm equal the costs of working through the open market ('make-or-buy' decision). Firms exist because transaction costs exist.

NIE maintains the basic concepts of neo-classical theory, namely scarcity and competition. However, the concept of perfect competition without institutions is

abandoned. Institutions are the rules of the game and can be formal (constitutions, laws, property rights) or informal (social conventions, norms) (North, 1990). These institutions are constraints to perfect competition. It is also important to consider that institutions are not always set up to be socially efficient. Often the rules are created to serve the interests of those with the bargaining power to change the rules. Organizations are the players and include political parties and governmental organizations, firms, households, schools. Given this context, players in the economy make choices that are subject to both formal and informal constraints. To explain these institutions (formal and informal) and their consequences, five approaches can be identified in the literature (Figure 6.1). Although transaction cost is associated mostly with the work of Williamson, the core concepts are fundamental to all branches of the NIE. The approaches differ in the type of economic problem on which they focus.

6.3.2 Transaction cost economics

In the transaction cost economics (TCE) approach, the focus is on governing transactions (institutional arrangements) with the spot market and the fully vertically integrated market as the two extremes. Transaction costs include information, negotiating and monitoring costs (Williamson, 1985). The core concepts or behavioral assumptions of TCE are bounded rationality and opportunism. Bounded rationality means that human action is intended to be rational, but limited because of cognitive limits (Simon, 1961). Opportunism refers to the behaviour of economic agents who seek to exploit a situation to their advantage (Williamson, 1979). The risk of opportunism is greater when bargaining power is larger.

Because of these concepts, contracts between members of the production and distribution chain are incomplete (Williamson, 1990). Because of incomplete contracts, risks occur for the partners involved in the contract. Unexpected changes in circumstances can result in ineffective contracts. The failure to adapt contracts to such unforeseen circumstances creates 'maladaptation' costs (Williamson, 1991a). The most often discussed example is the hold-up problem. It is defined as the general business problem in which each party to a contract

worries about being forced to accept disadvantageous terms later, after it has sunk an investment, or worries that its investment may be devalued by others (Milgrom & Roberts, 1992). It means that hold-up problems originate from transaction costs and problems with contract enforcement.

Contractual difficulties can arise from several sources (Klein, 2000):

- Bilateral dependence;
- Weak property rights;
- Measurement difficulties and/or oversearching
- Intertemporal issues that can take the form of disequilibrium contracting, real time responsiveness, long latency and strategic abuse;
- Weaknesses in the institutional environment

In this way, TCE can be seen as the study of alternative institutions of governance. Economic organization is mainly an effort to align transactions (which differ in objectives) with governance structures (which differ in costs) in a transaction cost economizing way. TCE explains how partners choose from among several institutional alternatives the arrangement that protects their relation-specific investments at the least costs (Williamson, 1991b).

Within this framework asset specificity, uncertainty and frequency are considered as the most important dimensions of transactions. Asset specificity relates to relation-specific investments such as physical and human capital, R&D, knowledge and capabilities (Williamson, 1985). These investments have no or little value in an alternative use than the specific transaction and result in post-contractual opportunistic behaviour of the partner with the most bargaining power in the transaction. It is clear that the more vertically integrated a firm, the least asset specificity is at risk. However, in the case of fully integrated markets, incentives to maximize profits are weaker than in the case of the other extreme, namely the pure spot market. It means that the installation of the most adequate governance structure is the result of a trade-off between the pure market form and its properties on the one hand and the safeguards of the central coordinating approach on the other hand.

Uncertainty about the outcome or output of a transaction (e.g. quality and quantity of agricultural products) leads to a more formal type of vertical co-ordination. Low levels of uncertainty are characteristic for transactions on spot markets. Uncertainty about the quality of a product is particularly important in the case of agricultural and food products. Governance structures such as warranties, brand names, quality assurance schemes or vertical integration are installed with the purpose of lowering the measurement costs (sorting + monitoring) related to quality,.

Frequency of transactions indicates the number of contacts between buyers and sellers. In the case of frequent transactions, reputation is important. When frequency is high, the temptation of opportunistic behaviour is lower and vice versa. Frequent transactions tend to be carried out on spot markets. The combination of the three dimensions of transactions (asset specificity, uncertainty and frequency) will lead to different vertical co-ordination arrangements (governance structures) in different markets.

6.3.3 Transaction costs and economic development

In the approach of Williamson, the focus is on the study of governance (theory of the firm), while in the approach of North the broader environment is more central. The approach followed by North focuses much more on the consequences of institutional change and considers its determinants related to transaction costs. Development is seen as a response to institutional change that supports both social and economical relationships. Hereby, price theory is important in understanding institutional change, as the latter is considered to be a consequence of changes in relative prices. Changes occur when players believe that restructuring exchanges results in a better situation, which in turn is a result of learning and competition. The connection between institutions and production costs is transaction costs such as trade, banking, finance, insurance and management (Wallis & North, 1986). Industrialization or economic development requires institutions to lower and control costs associated with transactions.

Prescriptions for successful economic development are difficult to make. North (1990) has suggested a range of such prescriptions, based on the link between economic performance and institutions:

- Economic performance relates to formal rules, informal norms and the enforcement characteristics of both. Copying institutional systems from one economy to another will result in different economic performance because the informal norms and enforcement characteristics differ. It is for example not sufficient to copy the formal political and economic rules that are successful in Western Europe to CEEC's because the legitimacy for these rules is provided by the norms. These norms differ between Western Europe and CEEC's.
- Political institutions are stable when these institutions are supported by organizations with an interest in their perpetuation. It implies that organizations are essential to obtain reform.
- Changing norms, essential to legitimize new rules, is a lengthy process while in the absence of such legitimization formal rules will be unstable.
- In the short run, economic growth can occur under autocratic regimes. In the long run however, economic growth entails the development of the rule of law and the protection of civil and political freedom.
- Informal norms or constraints are essential for a performing economy. Societies with norms favorable to economic growth can sometimes prosper even with unstable or adverse rules. Under these conditions, the level of economic growth will be linked with the enforcement of the adverse political rules. Very little is known about the belief systems and consequent informal constraints although religions have clearly been a basic component of beliefs.
- The key to success is a flexible rather than static institutional matrix.

This list of influencing factors for institutional change relates largely to the concept introduced by Simon (1961), namely bounded rationality. As indicated above, human behaviour tends to be rational but only to a limited extent because people have limited knowledge and often react emotionally.

6.3.4 Property rights

The property rights approach argues that the set of rules or the distribution of property rights determines the level of output of the firm because these property rights are the incentives to each individual (Alchian & Demsetz, 1972; Allen, 2000). Property rights are defined as the rights to the use of resources. They constitute not only legal rights but also the ones originating from custom, reciprocity and voluntary restraints. The main research question in the property rights approach focuses on 'what explains the distribution of property rights?'. Within this approach, property rights have a broad meaning as it includes all sets of rules, governance structures and organizations. The hypothesis followed by the property rights approach indicates that the optimal distribution of property rights is the one that generates a maximum of gains, taking into account all relevant costs. The main difference with the TCE approach of Williamson relates to the fact that the property rights approach is limited to the internal organisation of the firm (Demsetz, 1988). Here, authority rather than formal relations are crucial as indicated in the work of Coase (1988).

6.3.5 Moral hazard and agency

This approach focuses on explaining changes in the internal organisation of the firm. It focuses on the design of ex-ante incentive compatible mechanisms to reduce agency costs in the face of moral hazard (malfeasance) by agents (Klein, 2000). Agency costs are defined as follows (Jensen & Meckling, 1976):

- Monitoring expenditures of general management (e.g. landlord);
- Bonding expenditures by the agent (e.g. farmer);
- Residual loss

The residual loss represents non-realized gains because general management is not able to provide the necessary incentives for the agent. In this approach, the firm is seen as a convenient label for the collection of contracts between owners and agents. The firm is not the subject of attention.

6.3.6 Core competencies and capabilities

An alternative approach to explaining institutional arrangements relates to core competence and capabilities (Klein, 2000). In this approach, the firm is not considered as a nexus of contracts, but as a stock of resources and capabilities

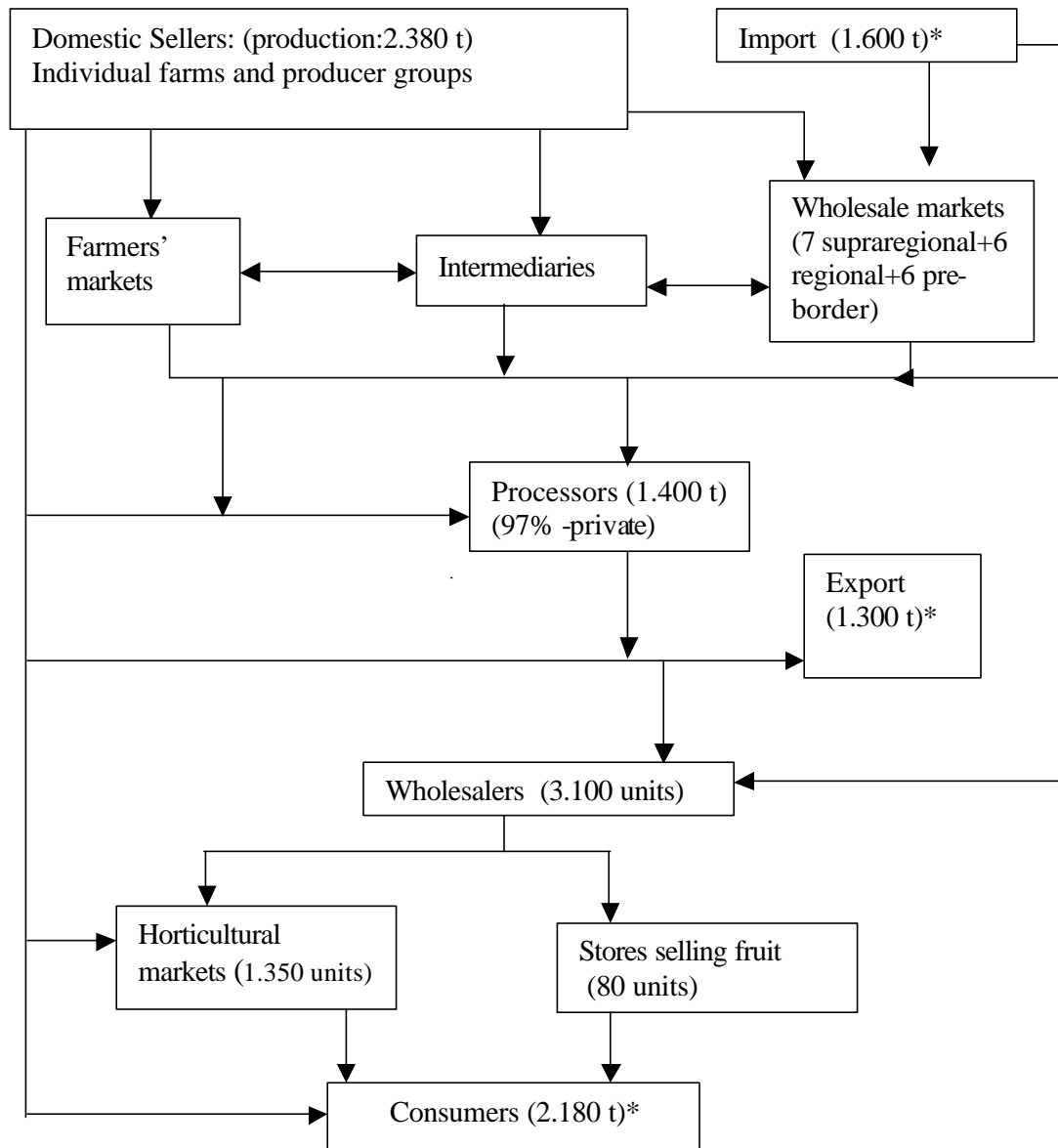
(Teece, 1980, 1982, 1986; Prahalad & Hamel, 1990; Hamel & Prahalad, 1994). In this sense, firms exist because they are superior institutional arrangements for accumulating knowledge (Foss, 1996). This approach relates to the resource-based view of the firm, which stipulates that competitive advantage originates from resources that are difficult to imitate. Prahalad & Hamel (1990) define core competence as the outcome of collective learning in the organization, which are communicated across boundaries within the organization to coordinate production skills and integrate multiple technologies. They suggest that an organization able to identify and cultivate its core competence creates sustainable competitive advantage.

6.4 Importance of the Polish fruit sector

The fruit sector represented 8,9% of the total value of the Polish agro-market in 1999. During the period 1990-1999, fruit production increased by about 60% to reach a level of 2.3 million tons in 1999. Apples represent about two thirds of total fruit production. Fruit production is mainly located in the central part of Poland and the four largest fruit-growing voivodships (Mazowieckie, Lubeskie, Łódzkie, Swietokrzyskie) represent 57% of the total fruit area in 1998 (Central Statistical Office Data).

The distribution network of the Polish fruit sector is indicated in Figure 6.2. About 60% of total domestic fruit production is processed. Two companies dominate the fruit processing market, namely Agros Holding and Hortex Holding. Both companies benefit from foreign investments (Bank of America and European Bank of Reconstruction and Development in Hortex and Pernod Ricard in Agros).

Figure 6.2 Distribution network of the Polish fruit sector, 1999/2000 in 1.000 tons.



* in 1999/2000, calculated in terms of fresh fruit
Source: FAPA, GUS and own research

6.5 Research methodology

To realize the objectives of the research, all stakeholders in the Polish fruit sector were involved in the study. To identify hold-up problems in the fruit chain and to formulate solutions in terms of an adapted institutional strategy, the relationships

between the different links in the chain are investigated. Therefore, interviews based on a structured questionnaire were conducted during the year 2000 (Table 6.1). Small as well as big companies were included in the research. In addition, policy makers involved with the fruit sector were interviewed.

Table 6.1 Size of the sample and characteristics of the different links involved in the research.

Link in the chain	Sample size	Characteristics
Supplier of production means	14 companies	Local and national suppliers of pesticides, fertilizers, cuttings, stocks, packaging materials
Fruit producers	120 farms	Individual farms and producer groups
Processors	35 companies	Local small companies and market leaders
Distributors	71 units	Wholesale markets, intermediaries and retailers
Consumers	150 people	Warsaw inhabitants

Based on the collected data and interviews with policy makers, the relationships between the different links in the fruit chain are described through a focus on hold-up problems. Unfortunately, quantitative data are not available because of the reluctant attitude of the respondents to deliver figures and to answer the questions. Few respondents were willing to collaborate. The analysis is largely based on the concepts and dimensions of the TCE approach on the one hand and on the potential consequences in terms of economic development on the other. Next, suggestions for an adapted institutional strategy are derived.

6.6 Hold-up problems

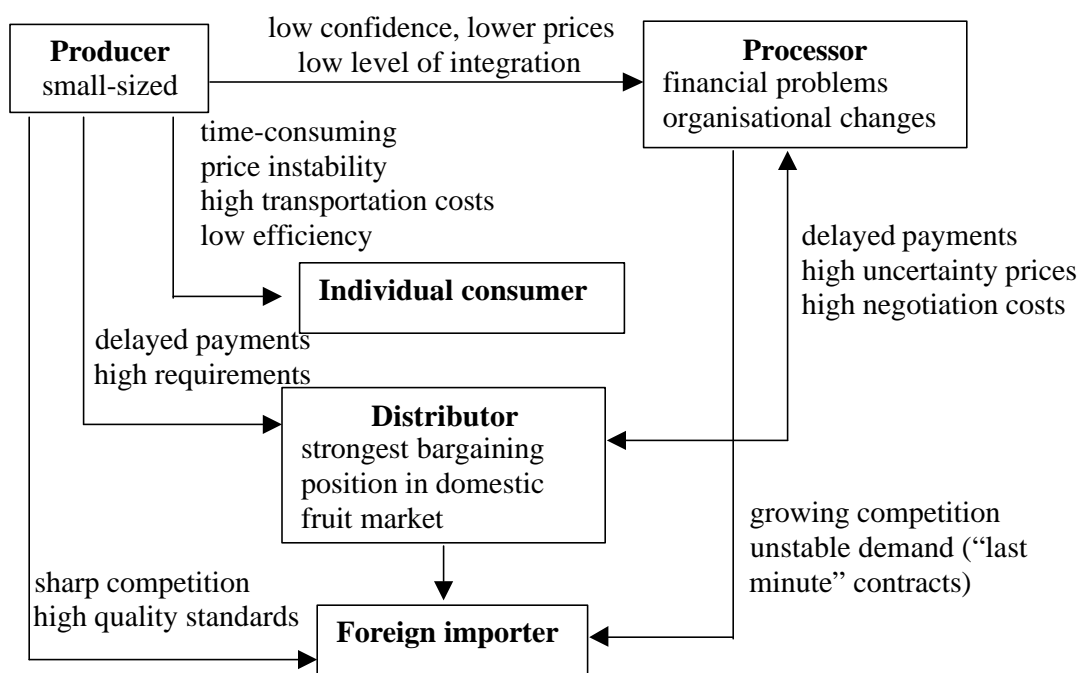
Hold-up problems in the Polish fruit sector are illustrated in Figure 6.3. Here, a distinction can be made between producer-buyer relationships and between processor-buyer relationships.

6.6.1 Producer-buyer relationships

The average size of the Polish fruit farm is very small. This is illustrated by the fact that Poland has about 400.000 farms with orchards, of which only 10% had

more than 1 ha according to the agricultural census conducted in 1996 (Kubiak, 1998). This small size does not enable farmers to realize the necessary investments in modern equipment and especially in irrigation systems. Consequently, yields strongly depend on the weather conditions and vary from year to year. Economies of scale can not be realized and productivity is low. Moreover, storage capacity is insufficient, which results in quality variation, losses and price uncertainty.

Figure 6.3 Hold-up problems in the Polish fruit sector.



The highly fragmented market structure inhibits the organization of transactions through vertical integration. This would be too costly for both processors and distributors. Small farmers often sell directly on the spot market. Despite the fact that price formation is enhanced, it remains a time consuming and inefficient activity.

The larger farms working with contracts consider processors as less loyal compared to supermarkets. Processors offer lower prices and face both organizational and ownership changes, which influences their financial position. However, payment delays remain a problem both at the level of processors and

distributors. Payment delays are especially harmful in economies with a high inflation rate (about 10% in Poland in 2000). It results in an overall reduction in investments in relation-specific assets, because of lack of confidence in both up- and downstream partners. This problem is exaggerated by the lack of legal or private enforcement, which results in a reduction of relation-specific investments and moves resources out of the affected sector. It ends up with disinvestment and adverse effects on productivity.

Because buyers govern transactions and set the terms, fruit growers feel the need to co-operate horizontally in order to strengthen their position on the market and to lower transaction costs. A process of establishing voluntary marketing systems started in 1995, but some problems are still encountered:

- A lack of a tradition in establishing organizations and co-operation between producers as well as other market members;
- A lack of clear legal and executive regulations following the legal Act n° 983 of September 15th, 2000 on the process of creating producer groups in the agribusiness sector and managing their financial support;
- Inadequate knowledge of the rules of free-market economies and accounting;
- Lack of information;
- Problems in finding a leader;
- Opportunistic behaviour among members of existing groups;
- Bad memories among older farmers of obligatorily agriculture collectivization after the World War II;
- Fear of excessive administrative costs related to organizing the group.

The government program “For Organisation of Wholesale Markets and Commodity Exchanges” has resulted in the creation of a wholesale distribution system similar to the one in the EU in 1994. It should reduce transaction costs in terms of information, negotiation and monitoring costs for both buyers and sellers. However, this study has revealed difficulties in the functioning of the wholesale market. On the one hand, small-scale farmers are used to the farmers' markets and complain about the high transportation costs (Ciechomski, 1999). On the other hand, both small processors and small retailers want to maintain

their dominant position in the negotiation process with farmers and want to avoid storage and waste costs.

6.6.2 Processor-buyer relationships

Poland had some 1.500 fruit processing companies in 1999 (Central Statistical Office Data), about two thirds of which employ less than six people, while only 3% employ more than 250 people. These small scale processing units are in poor financial shape and unable to invest in the future (FAPA, 1998).

Processors consider the big annual fluctuations in the prices of fruit products as a main hold-up problem. Trade partners react with opportunistic behaviour and hamper the development of the sector. They renege on contractual agreements if the market prices are much higher or lower compared to the contracting terms. Reputation as a potential informal rule is of little importance in this situation, while legal enforcement is too slow. Processors react by refusing to enter into new contracts.

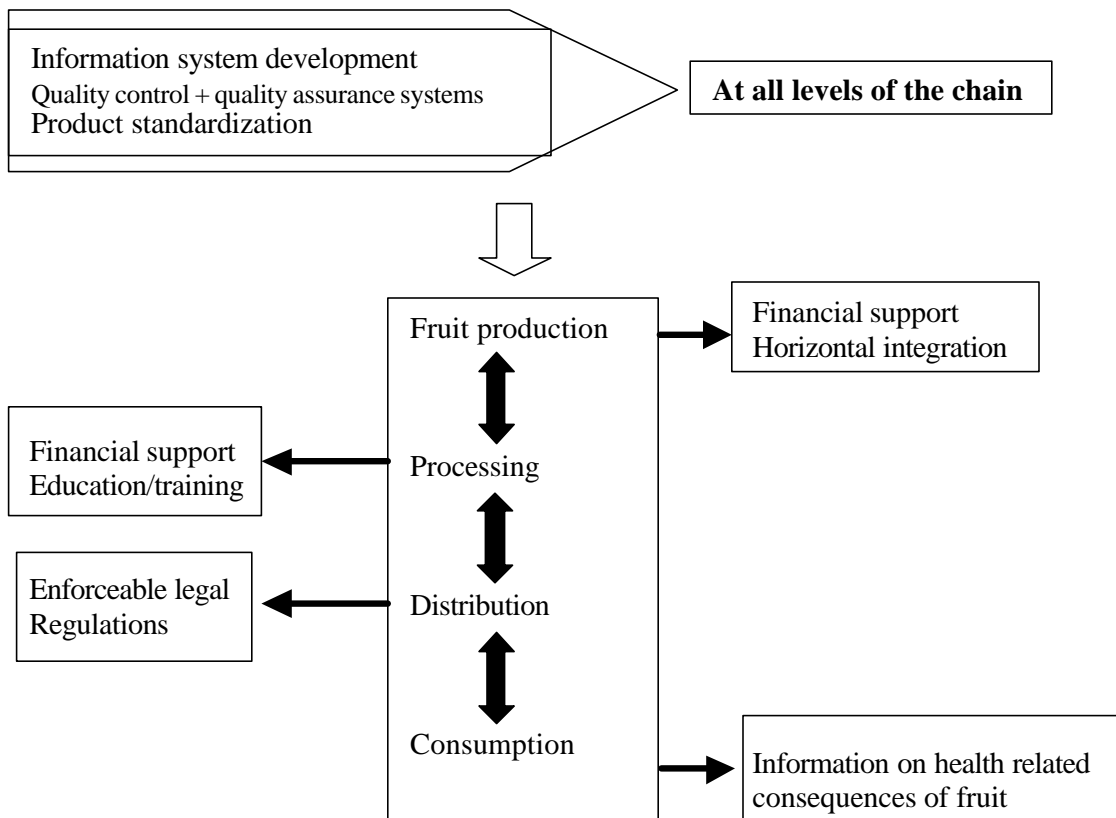
During the interviews, processing companies as well as retailers working with contracted production indicated that farmers had been behaving less opportunistically in the last two years. This has enabled these companies to reduce supply risks and to invest in modern technology. However, the modern technology sets additional requirements in terms of quality and size of the fruit entering the company. The next step is to introduce effective grading systems at farm level or quality assurance schemes in order to lower sorting and monitoring costs.

It is costly to negotiate contracts with individual suppliers. Distributors look for producer organizations in the case of fresh food and for bigger companies in the case of processed food. Products have to meet the quality standards imposed by the retail sector. The retailers dictate contract terms and control procedures. Towards consumers, more and more communication focuses on the importance of fruits in a healthy diet.

6.7 Institutional strategy

The agri-business sector in the EU is characterized by different kinds of collaboration, co-operation or integration in order to reduce negotiation, information and monitoring costs. From the farmer's side, situations can occur where no buyer is found for the perishable product, which is consequently lost. At the level of the processor, it can happen that growers fail to supply, while no stocks of the raw product can be held to counterbalance such a situation. Because both parties are at risk, vertical co-ordination is widespread in the agri-business sector.

Figure 6.4 Institutional changes needed in the Polish fruit chain.



Different marketing institutions such as marketing boards, auctions, wholesale markets and co-operatives characterize the agri-business sector. The efficiency of these systems depends on several factors (Hobbs et al., 1997):

- The presence of effective commercial law;

- The availability of storage and transportation capacity for agricultural commodities;
- The existence of a system to disseminate market information among producers.

When these conditions are not fulfilled, the marketing channels will fail to generate correct prices and to allocate resources efficiently. It is clear that just liberalizing the market is not sufficient to obtain properly functioning marketing channels. Clearly, there is a need for underlying institutions.

Institutional strategies aimed at reducing hold-up problems and lowering transaction costs (including information, negotiation and monitoring costs) in the Polish fruit sector should include both institutional arrangements and contract enforcement mechanisms (Figure 6.4). A readjustment of the institutional framework is already taking place due to the process of preparation for integration with the EU and harmonization with EU law. However, it seems necessary to choose solutions in accordance with the specificities of the Polish fruit sector in order to make the process more efficient. As a result, it is essential to ensure that the creation of new or adaptation of existing institutions can benefit from the necessary legitimacy through norms and values present at the level of the different players in the fruit chain.

Gow & Swinnen (1998b) investigated several sectors in different CEECs and observed that hold-up problems were more prevalent in some sectors than in others. They come to the conclusion that the classical institutional arrangements such as long-term contracts, co-operatives or vertical integration all have critical problems. However, the presence of foreign direct investments in terms of affiliates created private sanctions, which resulted in reliable relations and provided the correct incentives to farmers to realize the relation-specific investments.

6.7.1 Information system

In the case of the Polish fruit sector the development of an effective information system, or rather overall improvement of communication in the whole agribusiness sector, is essential in order to reduce extremely high information

costs along the chain. Reliable information on prices, quality standards, legal regulations, demand changes etc. should be quickly obtainable on all levels of the food-chains through mass-media, internet and specialized publications. Monopolistic power in the chain can be counterbalanced through such an information system.

6.7.2 Quality monitoring

The implementation of an inspection system covering all stages in the chain should be a priority within the process of institutions building in order to reduce monitoring costs. Standardization of products and processing must be harmonized with EU-regulations. Quality assurance schemes applied nationally or established locally, and self-control systems, will accelerate the reduction of monitoring costs (tests, controls) and increase the reputation of the companies/marketing groups.

6.7.3 Horizontal integration

All stages of the Polish fruit chain are fragmented. This results in difficulties in creating efficient exchange relations between all the actors in the sector. Transaction costs are high, information scattered and the quality of products difficult to control. Producers are, however, reluctant to integrate horizontally and generally do not have the knowledge on why and how to do so. Fruit growers, who are used to competing rather than co-operating, are not aware of the importance of establishing marketing groups. The legislation act on the creation of producer groups was introduced in Poland in September 2000 (harmonized with EU law) but still lacks executive regulations. A nation-wide information system regarding co-operation under market conditions in the agribusiness sector, especially in the perspective of Poland's accession to the EU, seems essential to accelerate the process of development of the horizontal component in the institutional organisation of the sector.

6.7.4 Management Training

Another issue that seems very important in the light of the conducted research relates to the insufficient knowledge of fruit processors regarding production cost calculations and the development of long-term product strategies.

Educational institutions such as courses in accounting, business planning, marketing, data searching and issues concerning EU accession are essential to make better marketing decisions. Intensive courses in these fields could be organized by e.g. the Agricultural Advisory Service, or independent advisors. Many hold-up problems in the sector would be reduced if entrepreneurs and managers were better informed about institutional arrangements. This would consequently strengthen the farmers' position, preventing opportunistic behaviour and therefore lowering negotiation costs.

6.7.5 Financial support

The level of fruit production in Poland shows large annual fluctuations that are hard to predict. The development of technical infrastructure (irrigation systems as well as fruit storage facilities with controlled atmosphere and a cold chain) is essential both to strengthen the farmer's position in the sector and to improve product quality. Investment in inputs should be institutionally supported and loans made more readily available.

The existing system of preferential loans, supervised by the Agency for Modernisation and Restructuring of Agriculture, is (according to the conducted research) very limited in its impact. The most recently preferential investment loans among fruit growers are the so-called MR credit-line loans aimed at young farmers (under the age of 40). The interest rate on this type of loan is 50% of a commercial bank loan, and loans are repayable over a maximum of 15 years. The banks are obliged to make sure that all the offered loans are fully available to potential beneficiaries. However many farmers feel that the age limit for applying for the MR-credit line loans should be increased from 40 to 50 years.

Only 10% of the interviewed Polish farmers and fruit processors were informed about the Special Accession Programme for Agriculture and Regional Development (SAPARD-programme) which is meant to be a source of financial support in the period before Poland's integration with the EU. The Program also will be implemented by the Agency for Modernisation and Restructuring of Agriculture and is supposed to have started in mid-2001.

6.7.6 Improving trade legislative regulations

Relationships in the fruit sector are characterized by the domination of distributors, giving processors an incentive to sign long-term agreements with distributors or to create their own distribution chains. Opportunistic behaviour regarding payments puts the processing companies as well as farmers in a weaker market position. In this situation institutional changes in the form of legal regulations concerning the consequences of not respecting contractual terms must be introduced. Legal institutions regulating (or controlling) transactions in the sector (especially concerning distributors) have to be developed in order to reduce negotiation costs and assure contract enforcement.

6.7.7 Communicating with consumers

It is the duty of public authorities to monitor public health. In this regard, the link between food and health is essential. Here, the nutritional role of fruit and vegetables can be highlighted. In this way, reliable information is provided to consumers, and educated consumers are usually willing to change their current behaviour and to judge for themselves, resulting in a correction of market failure and a lowering of monitoring costs.

6.8 Conclusions

Clearly, public intervention in the agribusiness sector is important both in terms of the protection of the population as well as market organization. However, little is known empirically about the economic effect of the 'rules of the game' (institutional environment) on transaction costs (Menard, 2000). Several examples illustrate this lack of knowledge, even when looking at the impact of institutions in the Western European agri-business sector: organizations created to develop and commercialize quality products; the discussion on performance between co-operative and integrated market organization.

Reforms have eliminated the exchange system of the central planned economy, where opportunistic behaviour was limited. However, nowadays no valid alternative is currently available in most sectors of the agri-food business, and the

lack of adequate institutions is one of the major factors explaining the current problems in the Polish fruit sector. This sector is characterized by autonomous firms and spot markets without institutional arrangements and contract enforcement mechanisms. Without adequate market institutions, transaction costs remain high, competition is inhibited and monopolistic power develops. These institutions include financial, legal, communication and marketing institutions that underpin the agri-business sector in Western Economies. However, copying institutions from Western economies such as written contracts, wholesale markets or auctions into the CEEC's, has little chance of success. Current priorities can be identified at other levels such as building reputations and providing information, grading systems, training and education. The only way to participate in the long run benefits is to open markets and face competition within the globalising economy. This will also lead to a reduction in the costs associated with parties not willing to change and trying to maintain present institutions. The lack of necessary institutions together with a programme of mass privatization and liberalization leads to the risk of monopolies due to high transaction costs. Monopolies mean that rewards are not distributed according to effort.

The important contribution of the transaction cost approach both in terms of enhancing understanding of the role of the institutional environment (rules of the game) and institutional governance (organizations) relates to the clarification of their impact on vertical co-ordination in the chain. In this regard, it is essential to understand how transaction costs emerge (hold-up problems) to be able to develop the correct policy reforms and consequently adequate institutions. The latter should focus on the reduction of transaction costs through the creation of economic incentives to guard against opportunistic behaviour.

The words of Williamson (1996: p. 115) can be used to illustrate the importance of NIE in understanding the failures and the time lag involved in the transition period: 'If we only had a better theory of organization and institutions, the agonies - false starts, mistakes, conundrums - of economic reform in Eastern Europe and the former Soviet Union would be much relieved. Indeed, it is my belief that prices will largely take care of themselves once the reformers focus on and get the institutions right. The tendency to neglect institutions in favor of the pricing

instruments that economists know best is understandable, but was more excusable for Oskar Lange in 1938 than it is today.'

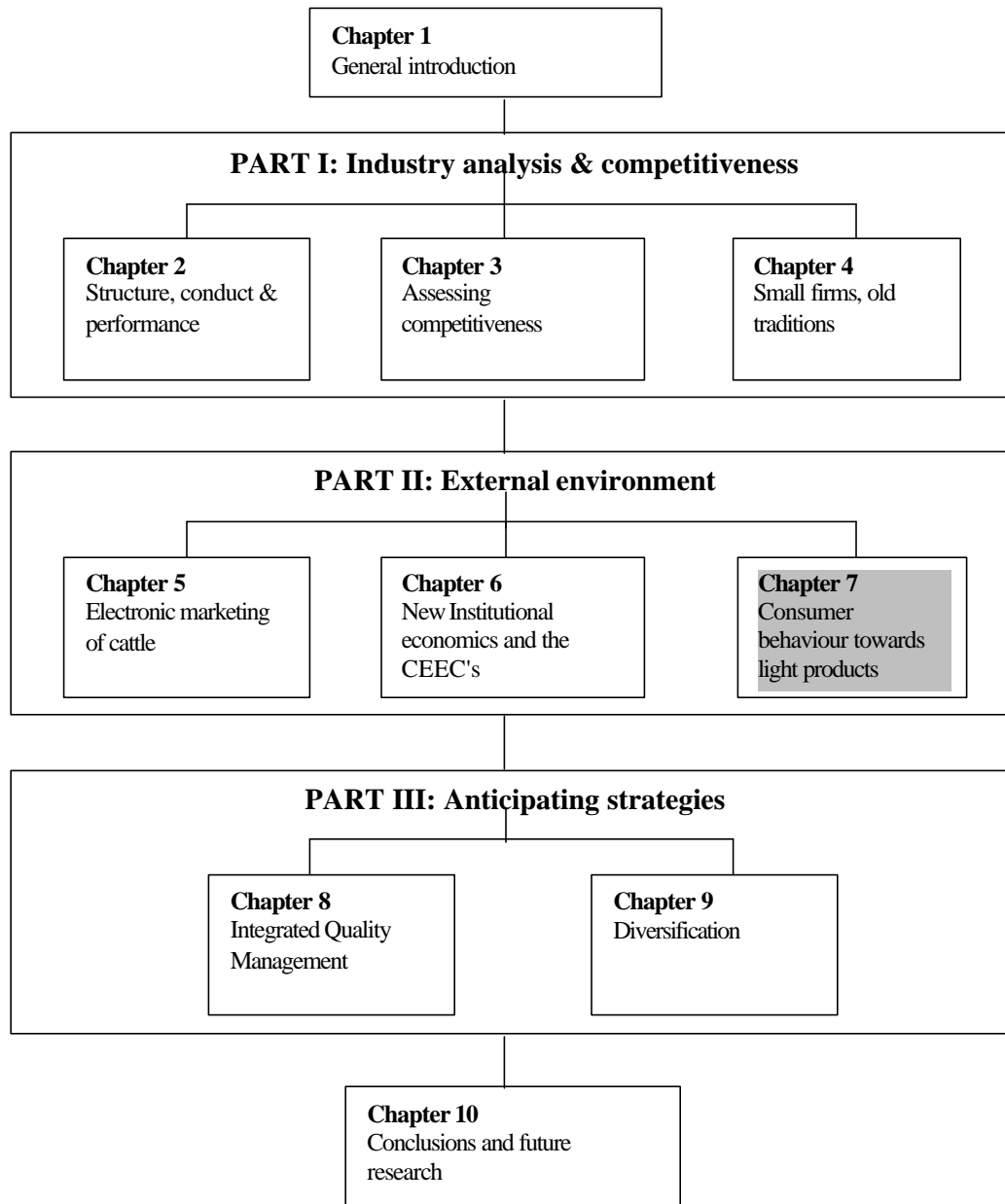
Chapter 7

Consumer Behaviour towards Light Products in Belgium

This chapter is adapted from:

Viaene, J. & Gellynck, X. (1996b). Consumer Behaviour towards Light Products in Belgium. In B. Wierenga; Grunert, K.; Steenkamp, J-B.E.M.; Wedel, M. & van Tilburg, A. (Eds.). Proceedings of the 47th Seminar of the EAAE on Agricultural Marketing and Consumer Behavior in a Changing World. 13-15 March, Wageningen: Wageningen Agricultural University, The Netherlands, pp. 99-109.

Viaene, J. & Gellynck, X. (1997b). Consumer behaviour towards light products in Belgium. *British Food Journal*, 99(3), 105-113.



Chapter 7: Consumer Behaviour towards Light Products in Belgium

7.1 Abstract

This chapter presents the results of an empirical research on the increasing consumer sensitivity to health issues in relation to food and focuses on the factors that determine consumer behaviour in relation to light products. Both quantitative and qualitative research techniques are used. As qualitative research technique, diagnostic in-depth interviews are used, with the aim to elaborate a structured questionnaire. As quantitative technique, a mail survey was organized through which the questionnaire was completed by 1.891 households. The collected data are analyzed by means of the Triandis-model. Eight components are analyzed to explain behaviour: cognitive, affective, moral, social, behavioral control, willingness to change behaviour, facilitating conditions and habits. Results reveal that dairy products are the most popular of the light products, though they do not have a far from 'light' image. Behaviour is dominated by a preoccupation with weight control and illness prevention, and is highly influenced by the household's view. However, the 'light' focus on the slim figure is now less appreciated by consumers, while a dominant role is being allocated to health aspects. From a marketing point of view, a dramatic switch in product development and communication is needed.

7.2 Introduction and objective

Since the mid-1970s, changing conditions in the industrialized world such as the greater number of working women, the increasing incidence of single parent families and the ageing of the population, have influenced people's consumption behaviour towards food products. Several trends are evident:

- *Quality dominates quantity:* First, food consumption in general is characterized by an increasing concern to eat less and to control weight. It is related to the socially dominant image of the slim figure. Second, in the context of the

growing sensitivity to health issues, people want to eat better and acquire "fitness for use" (Meulenberg, 1990). This attitude is characterized on the one hand by a declining consumption of food products with a negative 'health image' such as butter, fatty meats, coffee, spirits and beer, and on the other hand by an increasing consumption of products with labels such as 'low-fat', 'cholesterol-free', 'light' and 'vital'.

- *Back to the roots:* Most of the food products are produced by the food industry and distributed through supermarkets. In this way, the consumer has become the 'pure consumer', who has lost contact with the origins and processes of food production. However, because people are more and better informed and human nature is inquisitive, consumers want to know where a product comes from, how it is produced and what ingredients are used. In this way, the increasing interest in labels, brands and guarantees of origin can be explained. This concern with 'roots' also reflects to the increasing demand for traditional farm and 'alternative' products (Oude Ophuis et al., 1990).
- *Taking a bite to eat:* The general structure of meal times, namely breakfast, dinner and supper remains. However, more meals are taken out of the home and more people eat snacks during the day.
- *Convenience products:* It is considered that as a general trend the time spent in preparing meals has declined. The success of convenience foods such as frozen products and ready-to-eat meals can be placed in this context.

The consumption of light products in Belgium has been analyzed in terms of these general trends relating to consumer attitudes and behaviour towards food. It has been found to fit with the increasing consumer preference for quality rather than quantity.

Given the current welfare provision and medical expertise in Western Europe, major objectives in the field of public health are concerned less with extending life than with improving the quality of life. This accounts for the emphasis on the relationship between nutrition and health (Tones & Tilford, 1993). A major concern of public policy in Belgium is with promoting health education by means of communication and information campaigns. For many years, attempts have been made to convince people of the importance of healthy food and eating habits.

Research towards measuring the impact of former campaigns has recently been programmed in Belgium. One of the recent research programmes deals with the Consumption of light products in Belgium. The research was implemented by the Universities of Ghent and Liège¹. Ghent University took up responsibility for carrying out the research in the Dutch speaking areas of Belgium, while Liège has covered the French speaking areas.

The overall objective of the research lies in describing and understanding Belgian consumer behaviour in relation to food (and nutrition) in general and light products in particular. The following questions arose to:

- Who is the light product buyer?
- Who is the light product consumer?
- Which light products are frequently bought and consumed, and why?
- Which factors influence buyers' choices and decision-making process?

In this study, the definition of light products used was: "Any food product or beverage characterized by a decline in calories on the one hand and a modification of its nutritional composition on the other hand."

The structure of the chapter is as follows. After explaining the research methodology, the results are presented. It starts with a description of the perception of threats to health and consumer behaviour on the one hand and a discussion of the basic behaviour influencers on the other. Next, the willingness to change behaviour and the influence of facilitating conditions and habits are explored, followed by indicating the influence of demographics. Finally, some conclusions are drawn.

7.3 Research methodology

Both qualitative and quantitative research techniques were applied in the study. During the qualitative research, data were collected through in-depth diagnostic

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interviews, structured around a set of probing questions related to the subjects of nutrition in general and light products in particular.

The interviews were based on an interview guide, which is a semi-structured topic list, built up according to the funnel approach (Aaker et al., 1995; Burns & Bush, 1995). Starting with topics about food and nutrition, the focus was gradually narrowed towards food-health relationships and light product consumption.

The sample population was defined as households which were former members of the consumer panel of the Agricultural Economic Institute (AEI) in Brussels. This consumer panel was established in 1972, but, due to budgetary constraints, was abandoned in 1992. The sample size for the qualitative research was established at 40 respondents, equally divided between the Dutch and French speaking parts of Belgium. Quotas were put forward according to:

- age,
- gender and
- consumption rate: light product users versus non-users.

These quotas were intended to cover relevant demographic distributions, rather than to obtain statistical representativeness. Data about light product users and non-users were obtained from the consumer panel of the AEI, where respondents were asked to indicate for each product whether or not it concerns a light product.

The qualitative research revealed some interesting topics both at the level of light products users and non-users, and these were incorporated in the two structured questionnaires for the quantitative research. At the level of the light product users, the perception of products as "light" does not correspond with the definition mentioned above. "Light" makes consumers think about products labelled light or which are normally associated with fat such as mayonnaise or cream, but labelled "low fat" and focusing on a slim figure. Products such as yoghurt, milk and cheese are not perceived as light products, even if a lower fat content is mentioned. Related motivational elements such as medical care, weight loss, good shape and other members of the family were mentioned. At the level of the non-users of light products, light products are perceived as a threat for taste and providing no surplus

as compared to traditional products. During the qualitative research, respondents mentioned the misleading labelling of light products and the abuses, highlighted in the press and on TV.

In order to measure the importance of these topics, they were incorporated in the two structured questionnaires for the quantitative research. One questionnaire was for households as a whole and one the other for its different members (see annex 7.1). Representative quotas were put forward according to:

- region;
- professional status;
- size of the household.

The questionnaires were administered by mail and completed by 1.891 households and by 3.697 individuals, which means an average of 1,95 questionnaires per household.

In the attempt to explain and describe the health-related behaviour reported in the questionnaires returns, the Triandis (1980) model was applied as analysis schedule (Figure 7.1 & Annex 7.2). Tuorila and Pangborn (1988) tested a part of the model statistically to predict behaviour related to food. Hereby, the probability of an act depends on the strength of the habit producing the behaviour, the intention to act out the behaviour and the facilitating conditions. Of the various models available, the Triandis model seems to the authors the most relevant because it takes habit into consideration.

The Triandis model is applied in four stages:

First, the perceived threats to human health in general and consumer behaviour in respect of light products are described by:

- type of products bought and consumed;
- frequency of buying and consuming;
- supply channel.

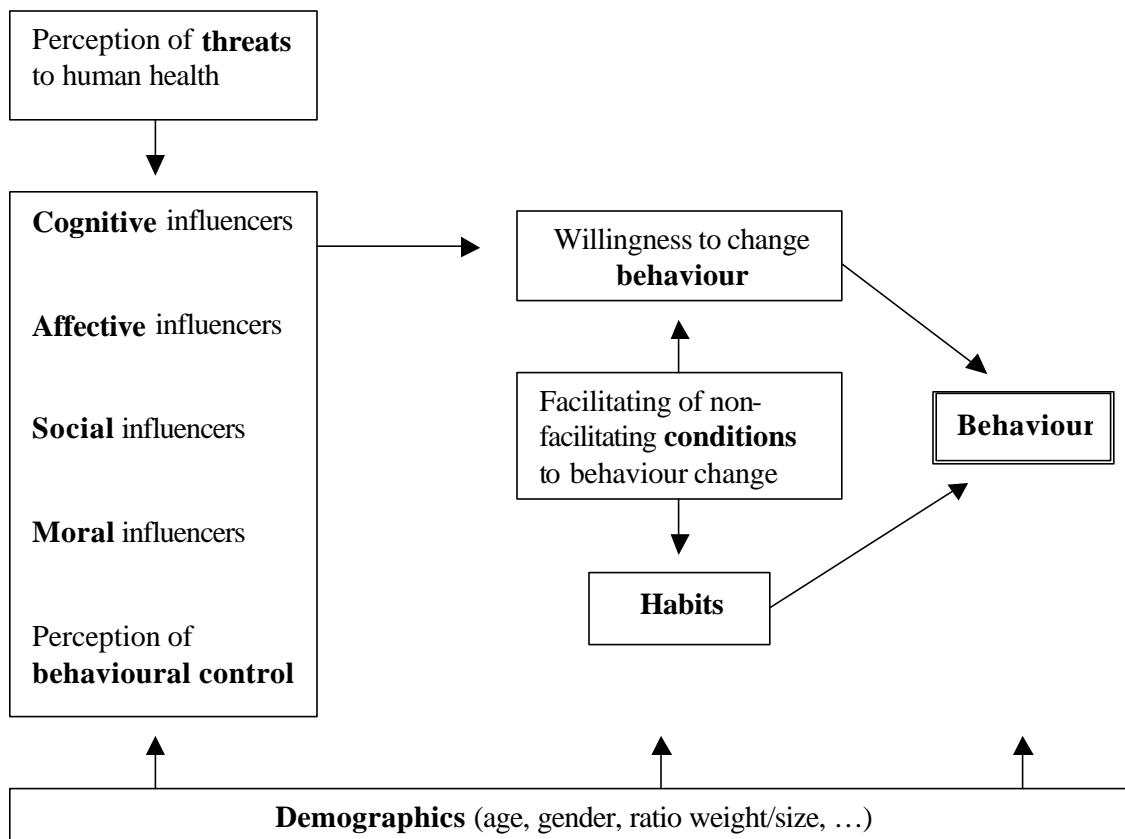
Second, behaviour is explained through an analysis five basic 'behaviour-influencers':

- cognitive;
- affective;

- social;
- moral or ethical;
- behavioral control components.

Third, these five basic influencers are used to determine the extent of willingness to change behaviour, which in turn is influenced by facilitating conditions. Facilitating conditions also influence the habits. Finally, the influence of demographics is considered.

Figure 7.1 The Triandis model



Source: Triandis, 1980.

7.4 Results

The results of the research are described below in terms of each element of the TRIANDIS-model: perception of threats to health and consumer behaviour; basic behaviour-influencers; willingness to change behaviour, facilitating conditions and habits; and finally, the influence of demographics.

7.4.1. Perception of threats to health and consumer behaviour

The majority of the respondents (97,3%) evaluate the impact of food on health as important or very important. This perception is positively correlated with the age, since the importance attributed to food in relation to health increases with the age. Also a significant relationship is identified between consumers and non-consumers of light products on the one hand and the perception of the impact of food on health on the other hand. Despite the fact that for the majority of the respondents, food in relation to health is considered as important, higher scores are obtained for consumers of light products.

The degree of penetration of different types of light products is determined by calculating the share of households which had bought the light product in question at least once during the last three months (Table 7.1).

It is important to notice that eight of the top ten of light products, are dairy products. With the exception of semi-skimmed butter and light desserts, all dairy products are listed in the top-ten.

Based on the number of persons in a household who consume a specific light product - a measure of so-called intra-family consumption - three categories of light products consumption can be distinguished (Table 7.2):

- *family products*: each or a majority of the family members (up to 50%) consume(s) the particular light product;
- *individual products*: only one or a minority of the family members (below 50%) consume(s) the particular light product;
- *mixed products*: for the light product in question no general trend is identifiable.

Table 7.1 Degrees of penetration of households in Belgium, 1993-1994 in % and by different types of light product.

Light product	Degree of penetration of total households in % (n = 1891)
Low-fat yoghurt	76,8
Semi-skimmed milk, products based on semi-skimmed milk	73,2
Low-fat fresh cheese	72,5
Low-fat margarine	58,5
Low-fat processed cheese	50,4
Low-fat matured cheese	37,8
Low-fat mayonnaise	37,5
Low-fat cream	30,9
Skimmed milk, products based on skimmed milk	30,3
Light soft drinks	27,5
Semi-skimmed butter	20,1
Light soup and broth	19,4
Beer without alcohol	18,0
Light desserts	17,0
Light jam	16,9
Light confectionery	13,0
Light meat products	11,7
Light spirits	10,7
Light ready-to-eat meals	10,1
Low-fat vinaigrette	7,9
Light crisps and other snacks	6,8

Within the group of light products with a penetration degree higher than 30%, five of these products are classified as family products, while three are mixed products and only one is an individual product. It means that the household penetration of light products depends on the number of family members consuming the product.

The supermarket is the most important supply channel for light products. In 1993-1994, light products were bought in supermarkets by 90,5% of the households interviewed, in local shops by 6,5% and in both supply channels by 3,0%.

Table 7.2 Classification of light products according to intra-family consumption, Belgium 1993-1994.

Family products	Individual products	Mixed products
semi-skimmed milk	low-fat processed cheese	low-fat fresh cheese
low-fat yoghurt	light soft-drinks	low-fat matured cheese
low-fat margarine	beer without alcohol	skimmed milk
low-fat mayonnaise	light jam	semi-skimmed milk
low-fat cream	light confectionery	light desserts
light soup and broth	light spirits	light meat products
	light ready-to-eat meals	low-fat vinaigrette
		light crisps and other snacks

Based on consumption frequencies calculated for the consumers of light products, the light products are classified into three categories (Table 7.3):

- light products for which daily consumption dominates: >50% of the respondents consume the product daily;
- light products for which occasional consumption dominates: >50% of the respondents consume the product less than once a week;
- light products for which consumption is diversified: no clear consumption pattern can be identified.

Table 7.3 Consumption frequencies for light products in Belgium, 1993-1994 in %.

Daily consumption by >50% of consumers	Occasional consumption: less than once a week by >50% of the consumers	Diversified consumption
low-fat margarine (76,8%)	light snacks (78,3%)	low-fat yoghurt
semi-skimmed milk (61,2%)	light ready-to-eat meals (74,3%)	skimmed milk
semi-skimmed butter (50,3%)	beer without alcohol (67,8%)	low-fat fresh cheese
	low-fat cream (66,9%)	low-fat processed cheese
	light spirits (62,5%)	low-fat matured cheese
	light vinaigrette (62,4%)	low-fat mayonnaise
	light desserts (58,5%)	light jam
	light meat products (51,7%)	light soup and broth
	light confectionery (50,1%)	light soft drinks

Only three products are consumed daily by a majority of the respondents. Most of the light products characterized by an occasional consumption are products for which high consumption frequencies are difficult to obtain because of the product type. However, within the group of products with a diversified consumption, higher consumption frequencies could be obtained for products such as yoghurt, skimmed milk, cheese and jam.

7.4.2 Basic behaviour influencers

Respondents' motivation and perception of the "light image" are examined as cognitive influencers. The perception of a product's "light image" is verified through two questions:

- first, the respondent was asked if he or she consumes light products;
- second, the respondent was asked which of the listed products (see Table 7.1) he or she consumes.

The perception is obtained by calculating the perception coefficient, which is obtained by calculating the following ratio (A/B):

- A: the percentage of respondents declaring consumption of light products and who do consume the light product;
- B: the percentage of respondents declaring non-consumption of light products but who consume the light product.

A high perception coefficient indicates a clear "light image" for the product and vice versa.

It is interesting to notice (Table 7.4) that the dairy products mentioned in the product list do not have a strong "light image". Moreover, the top three of the light products obtain the lowest perception coefficient.

The most important motivations for consuming light products (Table 7.5) concerns "to avoid an increase in weight" and their "preventive effect for certain illnesses". Two other motivations have a score higher than 20%, namely "to improve diet" and "because these products are bought by another member of the family".

Table 7.4 Perception coefficient of light image per product considered, Belgium 1993-1994.

LIGHT PRODUCT	PERCEPTION COEFFICIENT
Light ready-to-eat meals	12,4
Light jam	9,2
Light meat products	8,8
Low-fat vinaigrette	7,4
Low-fat mayonnaise	6,8
Light soup and broth	6,1
Low-fat cream	5,5
Light confectionery	5,5
Light crisps and other snacks	5,1
Light soft drinks	5
Light desserts	3,4
Low-fat processed cheese	3,2
Skimmed milk	3
Light spirits	2,9
Low-fat margarine	2,9
Semi-skimmed butter	2,7
Beer without alcohol	2,4
Low-fat matured cheese	2,3
Low-fat fresh cheese	2,2
Low-fat yoghurt	2,1
Semi-skimmed milk	1,7

By verifying correlations between motivation and the demographics age, gender and the body mass index (BMI), interesting relationships are identified. The BMI is obtained by calculating the ratio between weight (in kg) and the size squared (m^2)². Health care professionals frequently use this index to determine an excess or deficit in weight.

The following correlations were noticed:

² BMI = kg/m^2
 Related to BMI obtained, the following classification is made (Gosset, 1992): BMI < 18 = high deficit in weight; $18 \leq BMI < 20$ = underweight; $20 \leq BMI < 27$ = normal weight; $27 \leq BMI < 30$ = excess in weight; $BMI \geq 30$ = high excess in weight, obesity.

- There is a positive correlation between the motivations "in terms of medical care" and "to lose weight" and the demographic factors of age and BMI;
- There is a negative correlation between the motivations "because I like the products" and "because these products are bought by another member of the family" and the demographic factors of age and BMI;
- Significant differences in motivation were noticed between males and females. The most important motivation for females is "to avoid an increase in weight", while males are motivated "because these products are bought by another member of the family".

Table 7.5 Motivation for consuming light products, in % of respondents, Belgium 1993-1994.

Motivation	n	%
To avoid an increase in weight	1.042	37,2
Preventive effect for certain illnesses	892	31,8
To improve my diet	763	27,2
Because these products are bought by another member of the family	627	22,4
Because I like these products	480	17,1
To be in good shape	450	16,0
Part of a medical treatment	406	14,5
To lose weight	310	11,1
Other reason	121	4,4

The highest levels of consumption of light products are recorded for the respondents whose motivations were "to lose weight" and "to be in good shape", with an average consumption score of respectively 5,2 and 4,7³. The importance of taste of food in general and light products in particular are examined as affective influencers. Respondents were asked what level of importance they attach to taste. Three levels were distinguished:

³ The global consumption score per respondent for the light products considered is calculated as follows:

- daily consumption of a light product: 1 point;
- minimum consumption of once a week: 0,5 point;
- consumption of less than once a week: 0,1 point;
- no consumption: 0 point.

- very important;
- important;
- less important.

Related to other characteristics of food products such as presentation, composition and energy value, taste is considered by 76% of the respondents as very important. For 22% of the respondents taste is important, while only 2% consider it as less important.

By comparing the taste of light products with similar traditional products, the answers obtained are not unanimous. For 53,6% of the respondents light products were as good as traditional products, while 34,5% evaluated light products as having less taste. Only 1,6% of the respondents consider these products to be better than the traditional ones. The rest (10,3%) has no opinion. Within the group of respondents, who considered light products less tasty than similar traditional ones, 85,2% were consumers of light products. In this way, taste is not a determinant for consuming this kind of products.

The social environment of the respondents was likely to influence their decision to try a light product for the first time. The presence of a light product in the home was considered the most important incentive to try the product (31,4%), followed by recommendations of a medical doctor (27,3%) and the opinion of a member of the family (20,2%).

The following correlations with demographics were identified:

- recommendations of a medical doctor and recommendations of a dietitian are positively correlated with age and BMI;
- the presence of the product in the home and individual curiosity are negatively correlated with age and BMI.

As regards moral influencers towards light products, interesting data are obtained from two groups of respondents:

- Group A: respondents who did not consume any light products or gave up consuming one or all light products;

- Group B: respondents whose consumption pattern had not changed during the last three months, but who did not consume all of the considered light products in any case.

Here, the link to attitude formation and the resulting behaviour becomes clear.

The most important reason cited by both groups of respondents for not consuming a particular light product was failure to "see any benefit in consuming this kind of products" (31,0%), followed by "not wanting to modify your food habits" (18,6%) and considering "these products too expensive" (16,4%). For a survey administered by mail, the pricing aspect scores very highly and must therefore be high in reality.

Significant differences noticed between Group A and Group B appeared to be related to gender:

- respondents of Group A cited significantly more "no utility" and "not wishing to modify food habits";
- respondents of Group B cited significantly more "pricing" and "lack of information about these products";
- for females, the "price" is the dominant factor;
- for males, "no utility" and "not wishing to modify food habits" are significantly more important.

Behaviour control was examined in relation to the extent of intention to control weight. "To avoid an increase in weight" is the most important motivation for consuming light products. To control weight, 55% of the respondents from time to time pay attention to what they eat, while 14% always do and 31% never do. At the time of the survey, 15,9% of the respondents followed a specific diet.

Significant correlations were noticed related to demographics and consumption:

- 44% of males claimed never to pay attention to what they eat, with the intention to control weight, while only 18,3% of females claimed to have this behaviour;
- there was a positive correlation between the preoccupation with weight control and the age of the respondent;

- the consumption of light products and the preoccupation with weight control were positively correlation between.

7.4.3 Willingness to change behaviour, facilitating conditions and habits

The results of the survey enable examination of the willingness to change behaviour by discussing possible diet improvements and consumption intentions for the future. According to 69,8% of the respondents, their diet could be improved. The way most frequently cited by the respondents (46,9%) to improve diet was to eat less between the meals (Table 7.6). It is important to note that about 25% of the respondents consider the increased consumption of organic food as a way to improve the diet, while only 11,9% cited increased consumption of light products.

Table 7.6 Means of improving the diet, in % of respondents, Belgium 1993-1994.

Means	n	%
Eat less between meals	1.199	46,9
Diversify the diet	1.110	43,5
Take more time for a meal	981	38,4
Pay more attention to the quality of food	757	29,6
Consume more organic food	627	24,5
Take more time to prepare meals	525	20,6
Consume more light products	303	11,9
Spend more money on food	114	4,5

By verifying consumers' intentions for the future, it became clear that most of the respondents (70,3%) intended to maintain their consumption of light products at the same level. Only 6,1% intended to consume more light products in the future, while 3,7% said they would consume less light products. For 19,9% of the respondents, it was not clear whether consumption of light products will change.

Facilitating conditions examined the availability of light products on the one hand and reasons for modifying the diet on the other hand. The availability of light products in retail outlets satisfied the consumers. The results of the survey reveal

that for 64% of the consumers supply was considered sufficient, while 25,2% had no opinion on the topic.

The most important reasons for modifying the diet are indicated in Table 7.7. Consumption of light products was significantly higher by respondents who modified their diet as a result of:

- recommendations of a medical doctor or dietitian;
- information obtained from magazines and books.

The following correlations with demographic factors are identified:

- recommendations of a medical doctor or dietitian are positively correlated with age and BMI;
- the opinion of members of the family and opinion of friends and colleagues are negatively correlated with age and BMI.

Table 7.7 Reasons for modifying the diet, in % of respondents, Belgium 1993-1994.

Reasons	n	%
Information obtained from books/magazines	1.811	48,9
Opinion of members of the family	1.584	42,9
Recommendations of medical doctor or dietitian	1.546	42,7
Changes in the diet of a member of the family	703	19
Information obtained from TV	692	18,7
Opinion of friends, colleagues	516	14
Budgetary reason	151	4,1

Concerning information on the packaging of food products in general, 24,6% of the respondents evaluated it as insufficient. A significant difference was noticed between consumers and non-consumers of light products, namely more information is required by the consumers. The information required concerns:

- energy value;
- fat content;
- sugar content.

Related to the satisfaction of actual food habits, 36,3% of the respondents claimed to be very satisfied, while 59,0% were more or less satisfied and 4,7% were not satisfied. A large majority of the respondents (92%) claimed to take a hot meal each day, of whom 94,3% take it at home. Considering the different types of meals, namely breakfast, lunch and supper, 30% of the respondents had lunch outside of the home. It is obvious that for these cases, control over what is eaten is less evident than when lunch is taken at home.

7.4.4 Demographics

Demographics have a considerable influence on the consumption of light products. Based on binominal regression, the following significant relationships have been determined between consumption of light products and demographics (Table 7.8):

- Households with a larger number of children below the age of 16 years are characterized by a lower consumption of light products;
- A larger number of females per household implies a higher consumption of light products;
- The age of the housewife influences negatively influences the consumption of light products;
- Households in which the woman have a job outside of the home are characterized by a higher level of light products consumption.

Table 7.8 Significant relationships between consumption of light products per household and demographic factors ($p < 0,05$).

Demographics	Estimated Coefficient	Standard error	Coefficient/ Standard error
Number of children below 16 years of age	-0,31	0,09	-3,56
Number of females per household	+0,16	0,06	+2,54
Age of housewife	-0,003	0,001	-2,44
Woman having a job outside of the house	+0,33	0,08	+3,95

7.5 Conclusions

The Triandis-model is a helpful instrument for the evaluation of consumer sensitivity to health issues and resulting behaviour. Despite the fact that the boundaries between its different components are not always very clear, a major advantage of the model consists of its ability to split up and to identify several components and determinants of behaviour. However, in order to test the statistical relevance and reliability of all components of the model, more research is required.

The impact of food on health is perceived by a large majority of consumers as important. In other words, food is a possible threat to human health. Dairy products are the most popular light products in Belgium, but are not necessarily perceived as such by the consumer. The study reveals that only products where the word "light" is clearly marked on the packaging obtain a relatively high "light image". However, these products indicate the lowest penetration degree at household level.

Consumers are aware of the fact that their diet can be improved, mostly through eating less between the meals and by diversifying the diet. Consumption of light products is not considered as a determinant of improved diet. Behaviour and the willingness to change behaviour towards light products are influenced by several factors:

- Consumers of light products are motivated by weight control, illness prevention, dietary improvement and family purchases. The taste of foods is considered very important, but is not a determinant for consumption of light products.
- Trying light products for the first time is highly influenced by family members. The presence of the product in the home and the opinion of family members are important determinant factors.
- Reasons for not consuming or for renouncing consumption of light products are lack of benefit, refusal to modify food habits and price.
- Consumption of light products is higher by consumers preoccupied with weight control.

- Changes in the diet through consumption of light products are the result of recommendations from a medical doctor/dietitian or of information obtained from books/magazines.
- Consumers of light products require more product information related to energy value, fat and sugar content.
- The traditional pattern of three meals, namely breakfast, lunch and supper, remains strong. But, eating out of the home is on the increase and implies less control over food consumption.
- Demographic factors have a major impact on consumption of light products. Households with children younger than 16 years and those with elderly females consume less light products, while households with women working outside of the home and/or which include several females consume more light products.

Based on the results of the study, the frequent user of light products can be described as:

- A member of a family in which everyone consumes light products;
- A person for whom weight control is a preoccupation and at regular times a specific diet is followed;
- Motivated to start light product consumption by a medical doctor or dietitian.

It can be concluded that the word "light" on the label or the packaging of a product is no longer a magic tool for selling that product. Several abuses of the "light"-image were highlighted in the Belgian press, which perhaps suggest that the consumer has lost confidence in the label "light". "Light-labelling", focusing on the slim figure, is currently less appreciated by consumers, while a more important role is now allocated to health aspects. From a marketing point of view, the research reported here indicates that a dramatic switch in product development and communication is required.

Annex 7.1 Individual questionnaire 'light' products.

Annex 7.2 Detail of the Triandis (1980) model.

The perceived threats to human health are classifiable into five influencers or components:

1. *Cognitive* components relate to consumer knowledge, information sources and information processing. In terms of "light" products, such topics as consumers' definition of the term "light" and the rational objectives of consuming light products are involved.
2. *Affective* components represent people's feelings, emotions and moods. In the research under consideration, it represents the importance of taste related to food in general and light products in particular.
3. *Social* components refer to the impact of the cultural environment and factors that influence social control, including reference groups, sub-cultures and family. A major role is played by the overall "picture" people have about food, nutrition and health, and the threat to health of obesity or being significantly overweight. In the context of light products, it refers to social influencers inciting people to try a product for the first time.
4. *Moral* or ethical components deal with people's personal way of life and the rules imposed on and by oneself. It refers to the exercise of personal control over the quantity of food consumed. Related to light products, it consists of moral feelings that lead people to renounce light products.
5. *Behavioral* control components include the extent to which people experience difficulties in managing their personal behaviour. It refers to the ability of someone to maintain a proper weight.

These five basic influencers determine the *willingness* to change behaviour, which is a matter of attitude formation. This willingness to change behaviour in turn is determined by *facilitating conditions*, which refer to environmental stimuli as product availability, persuasive information, medical and dietetic advice. Facilitating conditions also determine people's *habits*. Related to food, habits concern the satisfaction of current food intake patterns and whether or not one regularly eats at home. *Demographic* factors influence all five or the basic influencers as well as the willingness to change behaviour through habits and facilitating conditions, and behaviour itself.

PART THREE

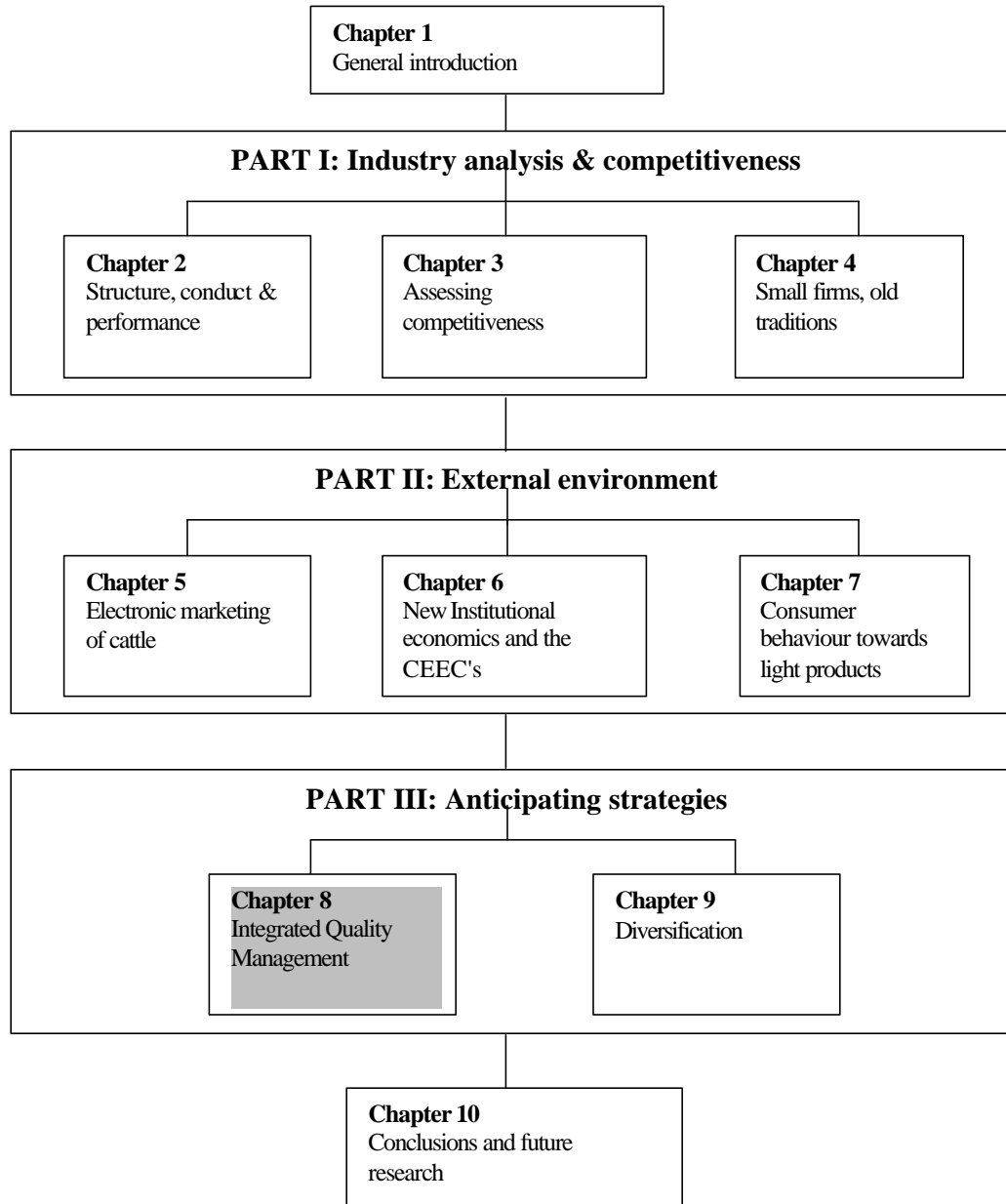
Chapter 8

Consumer Perception of Processed Vegetables as Input for Integrated Quality Management

This chapter is adapted from:

Viaene, J. & Gellynck, X. (1997c). Consumer Perception of Integrated Quality Management for Vegetables in Belgium. In Proceedings of the International Conference of Fruit and Vegetable Quality, Potsdam, 11-15 May, pp. 1-11p.

Viaene, J.; Gellynck, X. & Verbeke, W. (2000b). Integrated quality management applied to the processed-vegetables industry. In R. Shewfelt & Brückner, B. (Eds.). Fruit and Vegetable Quality: An integrated overview. Lancaster: Technomic Publishing Company, pp. 246-266.



Chapter 8: Consumer Perception of Processed Vegetables as Input for Integrated Quality Management

8.1 Abstract

This chapter focuses on Integrated Quality Management (IQM) in agri-food chains, with an application to the processed-vegetable chain. The research illustrates how theoretical concepts can be applied in practice through consumer research. The basic idea is to consider consumer satisfaction as the ultimate goal of IQM. Hence, filling in IQM in practice is impossible without first questioning the actors at the final and ultimate level: consumers. Being able to meet the quality definition from the consumer viewpoint is recognized as a comparative advantage in pursuing a trustworthy relationship with the consumer. The research methodology used in our study is based on a qualitative, exploratory research and quantitative survey with 500 respondents based on a formal questionnaire. Data analysis reveals significant differences in attitude towards vegetables, in vegetable quality perception and quality definition between consumers. The study also reveals the interests consumers attach to soil preparation, seed choice, growth surveillance, harvesting and processing. Finally, some key attention points for consumer-oriented quality management of vegetables throughout the chain on the one hand and some recommendations for communicating the IQM-concept to the vegetable consumer on the other hand are formulated.

8.2 Introduction and objective

A positive product perception by consumers is the base for increasing consumption, while a negative perception results in passive consumer behaviour. The research question in this chapter centers on the potential actions and communications to stimulate the consumption of processed-vegetables. The

research is concerned with identifying the key factors that create the competitive advantage for processed-vegetables and with formulating appropriate strategies to ensure that these advantages within the agri-food chain are fully exploited in the future.

The aim of the research is two-fold: (1) to identify topics within Integrated Quality Management (IQM) in the processed-vegetables sector which correspond with consumer requirements and (2) to collect input for communication about these topics within the IQM system with the consumer, focusing on competitive advantage.

This chapter emphasizes the state of the art related to quality management. Recent introductions of several relatively new concepts in the field of management are presented, namely Supply Chain Management, Efficient Consumer Response, Total Quality Management and Integrated Quality Management. The drivers of these changes in management will be described focusing on the creation of competitive advantage. A case study on quality management in the processing vegetables sector will then be introduced. After discussing the research methodology, the results of the research are presented. Finally, some conclusions and needs for future research are drawn.

8.3 State of the art

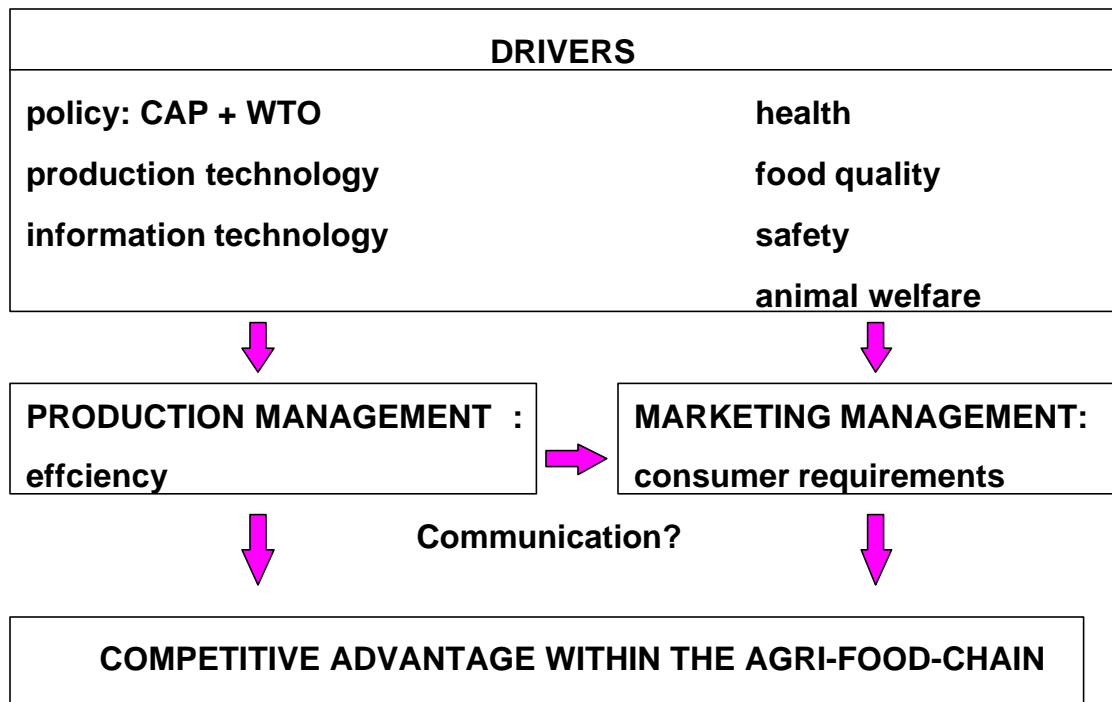
To succeed in today's competitive agri-food marketplace, two options are available (Grunert, 1996) (Figure 8.1):

- Organize production more efficiently;
- Meet consumer requirements.

The organization of more efficient production relates not only to the individual company, but also involves all links in the market chain from the supplier of raw materials to the farmer and to the final consumer. It concerns a strategy that focuses on cost saving. In European literature this concept is called Supply Chain Management (SCM). The SCM concept is of particular interest for

logistic control (Evans et al., 1993; Hakansson, 1995; Harland, 1995). Supply chain management is defined as a concern with the linkages in the chain, from primary producer to final consumer, with the incentive of reducing the transaction costs incurred (S-Bridge, 1996; Wilson, 1996). SCM seeks to break down barriers between each of the units so as to achieve higher levels of service and substantial savings in costs. The concept of SCM is largely based on the Transaction Cost Economics (TCE) as a reaction to the neo-classical economic model, which suggests that all parties have the necessary information to be able to make rational choices within the exchange process (Loader, 1996). It is clear that this information is not (always) available in practice, a situation that creates transaction costs.

Figure 8.1 Competitive advantage and the agri-food chain.



Economists ignored largely the original insights of Coase until the late 1960s and early 1970s, when the work of Williamson was published (Williamson, 1975, 1979; Williamson & Winter, 1993). Hereby, the cost determining attributes of individual transactions are outlined as their frequency, the environmental uncertainty surrounding them and the specificity of the assets

required to consummate them. However, there is still no clear definition of transaction costs (Loader, 1996). Major issues include:

- Lack of definition of the concept of transaction costs (Williamson, 1979);
- The costs of running the economic system (Arrow, 1969);
- The resource inputs involved in transacting – defining, protecting, and enforcing the property rights to goods (North, 1989);
- Resource losses due to lack of information (Dahlman, 1979).

Building relationships within the chain reduces uncertainty and transaction costs on the one hand and creates an access to economies of scale by bypassing traditional market arrangements on the other hand. In this way the cooperative behaviour in relationships between channel members creates an opportunity for higher profits, attainable by the channel as a whole (Arndt, 1979).

In the USA, Efficient Consumer Response (ECR) is the more common term for SCM. However, ECR goes further in that it combines both supply- and demand-side elements. ECR originated from discussions in the American food and beverage industry in 1992, which involved food producers, retail chains and industry organizations (FMI, 1993). The purpose of ECR is to increase the efficiency and effectiveness of the entire food chain by the integration of marketing and logistic decisions and optimal coordination between the different links throughout the chain. The ultimate goal is to maximize consumer satisfaction by a maximally performing chain (Corstjens and Corstjens, 1995; Buxbaum, 1995). It has been estimated that the application of ECR in the USA will lead to as much as \$30 billion in total savings to the food industry (Van der Laan, 1994; Molpus, 1994).

ECR is often considered as a combination of demand-side management, also called category management, and supply-side management. The theory of ECR consists of four strategies regarding the marketing and logistics processes (Wierenga, 1997):

- Category management, which refers to the processes that involve managing product categories as business units;

- Efficient replenishment, which aims at bringing the right product at the right time to the right place in the most efficient way;
- Efficient promotions, which relate to the efficiency of sales promotions to retailers and consumers and focus on avoiding excessive stocks and high performing production planning processes;
- Efficient product introductions, which aim at reducing the chance of failure through intensive collaboration between retailers and producers.

Another concept focusing on the links throughout the chain is called Value-Adding Partnerships (VAP). The concept originates from contributions to the Functional School, which recognize that each enterprise has to perform specific functions within the whole of the processing and distributions processes between the primary producer and the final consumer (Alderson, 1957). Porter (1990) concretized these ideas within the concepts of the added value chain and the value system. A company's value chain consists of all activities such as production, marketing, delivery, service and supporting activities that contribute value to the buyer. Placed within an industry, this value chain is embedded in a larger stream of activities that together form the value system. It includes suppliers and the different stages in the distribution channel as well as the ultimate consumer.

Historically, companies at different stages of the system tended to behave in an autonomous way and demonstrated adversary, rather than cooperative behaviour towards each other. However, it is increasingly apparent that the overall performance of the system can benefit from internal cooperation and partnerships. All participants benefit from the better performance of the entire system.

Winning customers from competitors cannot only be realized by saving costs, but also by delivering greater value. A product offering good value creates consumer satisfaction. The complex idea of quality is closely related to satisfaction (Kotler & Armstrong, 1991). Quality has a direct impact on product performance and hence on customer satisfaction. Quality begins with customer needs and ends with customer satisfaction. While there are many definitions of

quality, all share the common assumption that quality is determined by the customer (Cortada, 1993), and hence should be defined from a consumer-oriented perspective. Quality definitions of this kind include the following aspects:

- Continuous improvement (Deming, 1986);
- Fitness for use (Juran, 1989);
- Conformance to requirements (Crosby, 1979);
- A product that is most economical, most useful and always satisfactory to the consumer (Ishikawa, 1985).

In recent years, many companies have adopted Total Quality Management (TQM) programs, designed to constantly improve the quality of their products, services and marketing processes. TQM relates to all of the processes in the organization that contribute directly or indirectly to delivering quality as defined by the consumer (Ross, 1993). The control component (quality assurance) has shifted from product inspection to process control. As a result, the processes in the various divisions or links of a company and the intermediate products and services are continuously improved in quality. It concerns the acceptance of TQM as a way of company life, by including all functions of the business and its integration into the product life cycle such as design, planning, control, production, distribution and field service.

In order to differentiate and to respond to changing consumer requirements, quality assurance schemes are created, covering a multiple set of stages and links in the production process. Quality assurance systems are initiatives either from producers (e.g. Label Rouge in France, IKB-pork in the Netherlands, Farm Assurance in the UK) or from distributors (e.g. Selected Beef by Marks and Spencer, Filière Qualité Carrefour by Carrefour), and focus on aspects such as production method, animal welfare, origin, and environmental impact (Weaver, 1995, 1998; Sylvander, 1995; Fearne, 1998; Lagrange, 1999). The introduction of more transparency and the formalization of transactions by written contracts indicating quality specifications are typical characteristics of such quality assurance systems (Klein, 1992).

TQM in each link and company of the market chain, and the coordination of these links, is called Integrated Quality Management (IQM). The concept of IQM goes beyond the individual company's quality management. It is referred to as 'integrated' since the individual TQM concepts of individual companies in the chain are vertically integrated in order to make them fit each other. The knowledge about and control of the production process and the coordination of all links is essential for a good quality and improved performance of the chain. It means that several of the above defined concepts are included in the concept of IQM, namely TQM, SCM, ECR, VAP and approaches followed to developing quality assurance schemes. The overall objective is to add value to the entire chain and to realize competitive advantages and a better performance of the entire chain.

8.4 Drivers of competitive advantage

Trends or drivers create major economic opportunities for companies that demonstrate the ability to manage the system components to gain competitive advantage (Downey, 1996). As indicated in Figure 8.1, competitive advantage derives from the value a company offers to its buyers on the one hand (marketing management) and from the costs incurred in delivering this value, on the other hand (production management).

The impact of consumer values and preferences is the single greatest driving force changing the structure of the vegetable chain from producer to consumer:

- An increasing health-conscious public has placed far greater importance on food quality, which makes health related characteristics a strategic issue in building a competitive position in the market place.
- The increasing sensitivity of consumers to the safety and environmental aspects of agricultural and food products results in huge investments to build identity, brand recognition and public trust. Food companies attempt to build differential advantage upon the unique qualities of their products. However, the consumer is also used to an industry structure that boosts production

efficiency and lowers food costs. Chains are challenged to design a framework that balances both consumer interests.

It is vital for the processing vegetable chain to transmit these consumer preferences throughout all stages of the vertical system. Therefore, it is necessary to gain insights into the way costs and benefits along the various stages of the chain are influenced and distributed. These insights may help to develop effective transfer pricing instruments. It is clear that in an economic environment prices are the efficacious incentives in affecting economic decisions to realize the transmission process (Viaene & Truyen, 1995).

Second, food and agricultural policy continue to play a major role in the development of the food and agribusiness chain. The reduction of agricultural support programs in the EU continues to place greater pressure for efficiency on the production sector. Moreover, the generally accepted scenario of EU enlargement and the coming World Trade Organization (WTO)-negotiations are major turning points for the EU Common Agricultural Policy (CAP). This evolution will take place against a background of world markets becoming more volatile and competitive, and will result in structural changes in food supply throughout the EU. The traditional family-oriented farms continue to be important, but the critical decisions about variety, price, production period and quality are part of a more sophisticated business approach. The policy aspects are also related to regulations with respect to product standards, environmental controls, pesticides and additives usage, which can result in competitive advantages for parties that are not affected or that have the know-how to deal effectively with the new situations.

Third, technological progress has created new opportunities in every part of the food chain. For example, advances in production technology allow farmers to increase both the efficiency and precision of the raw agricultural products supplied into the system. Biotechnology and genetic engineering are creating new products and new production processes in the food domain. In the nonfood domain, technologies are developed to use agricultural products as raw materials for industrial processes such as natural fibers and starch-based packaging materials.

Fourth, information technology creates new possibilities for management and control systems. The ability to measure more precisely and track product and processes more easily increases the obligation of every company to be responsible for its contribution to the final product.

The four groups of drivers result in a more efficient production management on the one hand and a better integrated quality management on the other. The competitive position of the companies is improving by decreasing relative costs and increasing the perceived value for the consumer. The question remains how to communicate both advances to consumers. Corresponding with the IQM-approach to vegetables, a communication strategy for consumers is developed.

8.5 Research Methodology: IQM for processed-vegetables

This research methodology is based on primary exploratory and conclusive research. Qualitative research by means of focus group discussions was established to gain preliminary insights into consumer attitude, perception and behaviour towards vegetable consumption. Additionally, insights were gained about requirements of consumer information (chain perception) concerning the vegetable chain and potential topics for communication. Five focus group discussions with each six to eight respondents were conducted. The participants were consumers of fresh and processed-vegetables several times per month. Based on a topic list or interview guide, the moderator coordinated the discussion. For three to four hours the moderator applied the funnel approach and projective techniques to guide the discussion and probe the respondents to elicit insights. Next, based on the information gathered, hypotheses and key attention topics for quantitative conclusive research were drawn.

Second, quantitative primary data were gathered through a sample survey research. The research approach began with administering pre-tested formal questionnaires during personal in-home interviews led by trained field workers. The questionnaire comprised issues such as general consumer behaviour and attitude towards vegetable consumption and consumers' chain perception of and

interest in different processes within the processed-vegetable chain (see annex 8.1). The target population of the survey consisted of people living in Belgium, aged between 15 and 65 years, who were the main responsible person for purchasing vegetables within their household. The respondents were selected by means of non-probability quota sampling. Quotas towards age and place of living were established. The overall sample size was set at $N = 500$ respondents, equally split up between Flanders (northern Belgium) and Wallonia (southern Belgium). This sample size satisfied the minimum sample size rules suggested by Sudman (1976). After coding and editing the questionnaires, the collected data were analyzed by means of the statistical package for social sciences (SPSS).

8.6 Results

The discussion of the results is presented in four major parts, combining in each part the results of the qualitative research (focus group discussions) and the results of the quantitative research (survey):

- consumer attitude towards vegetable consumption;
- overview of consumer perception of fresh, canned, glass and frozen vegetables;
- the ideal product identified from a consumer point of view;
- IQM in the processed vegetable chain and communication to consumers.

Table 8.1 Consumption frequency of vegetables, % of the respondents (n=500).

	Fresh	Frozen	Canned	Glass
Every day	46,5	3,6	1,1	0,5
Several times a week	46,7	34,5	17,7	10,8
Once a week	5,8	28,6	30,3	23,9
Less than once a week	1,0	22,1	25,5	46,0
Never	-	11,2	25,4	18,8
TOTAL	100	100	100	100

Based on consumption frequency distributions of the four types of vegetables, the respondents are split up in four groups of consumers, namely typical fresh, frozen, canned and glass-packaged vegetable users (Table 8.1).

Typical glass-packaged vegetable users are defined as persons who consumer at least once a week glass-packaged vegetables and who do not eat canned or frozen vegetables with a daily consumption frequency. According to this definition, 95 respondents are classified as typical vegetable users. Further, 119 respondents are identified as canned vegetables consumers: people who eat at least once a week canned vegetables and who are not yet classified as a glass user. The category of frozen vegetable consumers counts 135 respondents who eat at least once a week frozen vegetables and who are not yet classified as belonging to the glass or canned user. A total of 109 respondents have finally been classified as typical fresh vegetable consumers, with a daily consumption frequency of fresh vegetables and who are not yet classified in another category. The classification based on these definitions allowed to classify 458 of the 500 respondents.

8.6.1 Consumer attitude towards vegetable consumption

Based on the focus group sessions, it became clear that the consumer is confronted with a dilemma. Fresh vegetables are clearly considered to be the ideal product, but in some circumstances, such as unexpected situations (late at home, visitors) and lack of time, preparation of fresh vegetables is impossible. Under these circumstances, the consumer looks for an alternative in frozen vegetables, canned vegetables or vegetables in glass. Focusing on vegetables in glass, three functions can be identified:

1. Ideal vegetable for fast and cold preparations such as celery and grated carrots;
2. Useful in the case of unexpected situations such as late at home and unexpected visitors;
3. Alternative for fresh vegetables, of which the preparation is time-consuming, such as salsifies, asparagus, red cabbage, carrots and peas.

An interesting topic resulting from the analysis of the purchase criteria for vegetables in glass concerns the fact that heavy users (several times per week) did not consider themselves as such. This attitude is related to a preference of fresh vegetable and that housewives who only prepare and serve vegetables in glass fear being considered as less caring for their family and even as being lazy.

The attitude of the respondents towards vegetables in general was evaluated by means of a 3-point Likert (ordinal) scale that required the respondents to indicate a degree of agreement or disagreement with a series of statements derived from the qualitative research part. The profile analysis of the responses for the total sample is presented in Table 8.2. Statistically significant differences in attitude between the four defined types of vegetable consumers are revealed through performing the Kruskal-Wallis non-metric one-way analysis of variance. This test examines the difference in medians with the null hypothesis being that the medians of the four populations are equal. Taking account of the different types of vegetable consumers defined above, the following set of hypotheses is advanced:

H_1 Higher levels of consumption of glass-packaged vegetables are associated with:

- a) higher agreement with the statement that the preparation of vegetables is time consuming,
- b) higher levels of concern about seeing the vegetables to judge their quality,
- c) higher perception of branded vegetables as a guarantee for better quality,

H_2 Higher levels of consumption of fresh vegetables are associated with:

- a) higher preference for environment friendly produced vegetables,
- b) higher willingness to pay a premium for environment friendly produced vegetables,
- c) higher levels of agreement with the statement that vegetables are more important in families with children,
- d) higher preference for locally produced vegetables,

- e) higher levels of agreement with the statement that vegetables are the most important part of the dish and that a meal is not complete without vegetables.

The significance of the computed chi-square statistic implies the rejection of the null hypothesis (Malhotra, 1996) and the support of the formulated hypothesis.

Table 8.2 Profile analysis for evaluation of attitude towards vegetables, % of respondents (n=500).

Statements	Agree	Neither Agree nor Disagree	Disagree	Total
1. A meal is not complete without vegetables	85.4	5.0	9.6	100
2. Branded vegetables guarantee a better quality	30.0	22.2	47.8	100
3. The preparation of vegetables is too time consuming	27.0	11.8	61.2	100
4. I buy preferably vegetables from my own country or region	44.4	21.0	34.6	100
5. Vegetables are the most important part of the daily dish	59.8	18.8	21.4	100
6. I must see the vegetables to judge their quality	86.0	7.8	6.2	100
7. Vegetables are more important in families with little children	57.4	12.6	30.0	100
8. I buy preferably environment friendly produced vegetables	55.6	23.4	21.0	100
9. I am willing to pay a premium price for environment-friendly produced vegetables	44.6	20.2	35.2	100

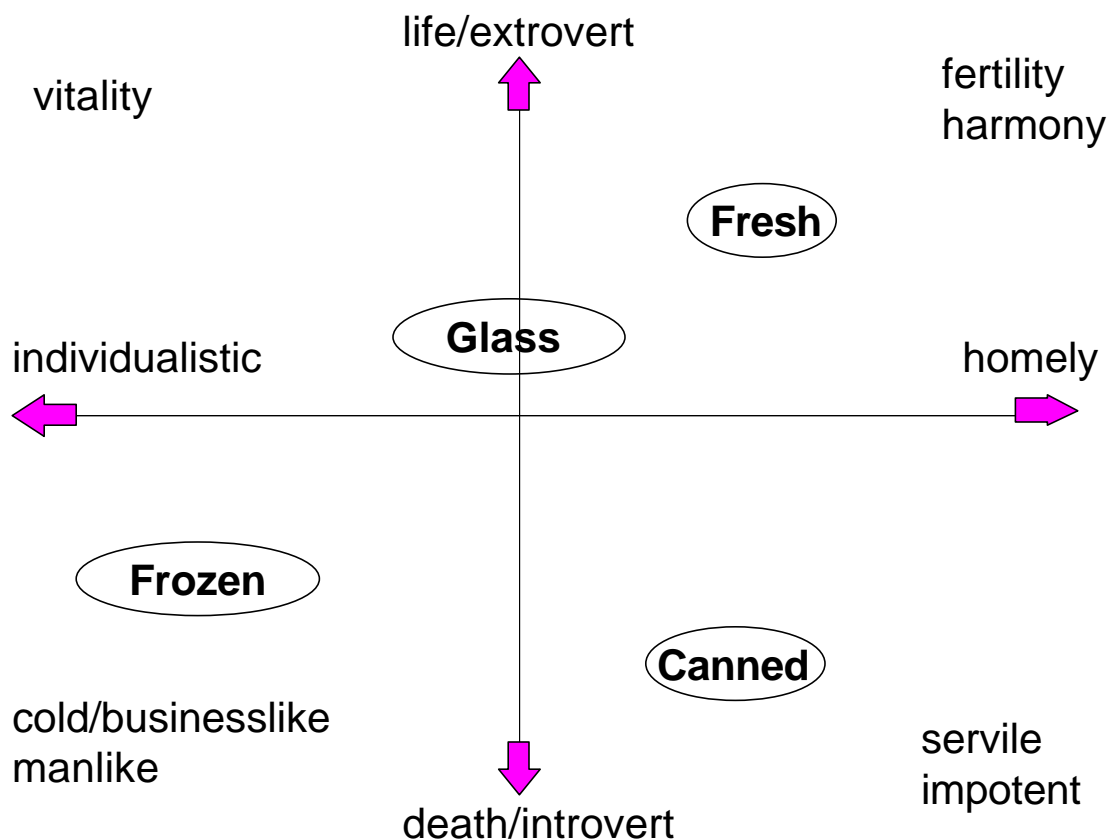
Consumers of fresh and frozen vegetables, when compared to consumers of vegetables in glass, agreed more with the statement that the meal is not complete without vegetables ($\chi^2=19,05$; $p=0.020$) and with the statement that vegetables are the most important part of the daily meal ($\chi^2= 42,14$; $p=0.010$). Hence, the hypothesis H_{2e} is supported. Consumers of fresh vegetables disagreed more than consumers of glass-packaged vegetables that preparation is too time-consuming ($\chi^2= 21,28$; $p=0.029$). This leads to supporting hypothesis H_{1a} . The typical consumer of fresh vegetables also expressed both higher preference for vegetables produced within his/her country or region ($\chi^2= 33,08$; $p=0.000$) and a higher willingness to pay a premium price for environment-friendly produced vegetables ($\chi^2= 20,07$; $p=0.038$). Hence, the hypotheses H_{2b} and H_{2d} are supported. Consumers of fresh vegetables also attached higher

importance to seeing the vegetables as a guide to judging their quality ($\eta^2=13,33$; $p=0.014$), and not the consumers of glass-packaged vegetables as stipulated in hypothesis H_{1b} . The other hypotheses (H_{1c} , H_{2a} , H_{2c}) are not supported by the empirical findings and are therefore rejected.

8.6.2 Perception of fresh and processed-vegetables

Within the focus group discussions, the perception of fresh, frozen, canned vegetables and vegetables in glass was determined by using a projective technique, namely the photo sort. Hereby, respondents are asked what type of consumer prefers fresh, frozen, canned vegetables and vegetables in glass. In this way, elements were collected enabling a description the typical consumer of each category of products. In total, eight types of consumers were shown during the photo sort. The results of this exercise are shown in Figure 8.2.

Figure 8.2 Perceptions of consumers of fresh, frozen, canned vegetables and glass-packaged vegetables.



The typical consumer of fresh vegetables can be described as a female person who corresponds with the traditional mother figure and concentrates on healthy food, containing all minerals, vitamins and energy. Cocooning is a central lifestyle in the life of this person, who is positioned in the second quadrant on the figure.

The consumer of frozen vegetables is defined as someone who wants to serve fresh vegetables but looks for the ideal compromise, which is found in frozen vegetables. This type of consumer is described as modern, sophisticated and chic - a busy person, working outside home, who considers cooking a waste of time. In the family of the consumer of frozen vegetables, the microwave oven takes a central place. On the figure, the typical consumer of frozen vegetables is situated in the third quadrant.

The typical consumer of canned vegetables is considered old-fashioned, having no taste. This person is considered as introvert and servile. A typical characteristic of this person is a lack of spending much money on food. The typical consumer of canned vegetables is situated in the fourth quadrant of the figure.

The consumer of glass-packaged vegetables occupies a dualistic position in the upper half of the figure. This person is perceived as active, working outside the home and responsible for a family. Normally, fresh vegetables are preferred, but the typical consumer of glass-packaged vegetables does not like cooking and values personal time. Under these circumstances, glass-packaged vegetables are an ideal alternative. Quality occupies a dominant position related to food choice. The fact that the core product can be seen through the glass helps to evaluate the quality. Another typical characteristic is related to the ideal that glass-packaged vegetables give the possibility of meeting every wish in the family.

In the quantitative research, the perception of the different types of vegetables is assessed using a pick-any scaling technique. The pick-any scaling method differs from the more classical scaling methods such as the Likert scale or

semantic differential in that respondents need less time and find the method easier, without any loss of reliability or validity (Van Kenhove, 1995). The respondents were asked to choose for each type of vegetable the most relevant attributes out of a list of attributes, resulting from the qualitative research. The selection of an attribute by the respondents means that the attribute is highly associated with the product discussed.

Table 8.3 Perception of vegetables on five attribute lists, % of respondents (n=500).

	Fresh	Frozen	Canned	Glass
Core product				
Has a good taste	29.1	11.1	6.5	7.2
Contains a lot of minerals and vitamins	20.0	23.3	5.9	10.9
Is cheap	3.4	6.4	29.7	13.3
Is healthy	35.1	6.4	2.6	4.0
Has a good quality	11.4	12.7	8.9	11.9
Is easy to prepare	1.0	40.0	46.5	52.7
Augmented product				
Natural	73.2	24.2	6.4	9.3
Traditional	5.0	21.8	13.0	20.5
Organic	12.8	4.8	3.0	3.6
Industrial	1.0	32.1	50.9	37.0
Forced	1.0	9.5	15.0	10.7
Old fashioned	1.5	2.6	9.8	9.9
Environment friendly	5.8	5.0	1.8	9.1
Product benefit				
Provides necessary minerals and vitamins	68.4	21.9	6.7	7.4
Presents well	6.6	14.3	6.7	22.7
A taste for everybody	4.2	21.3	35.2	17.7
Quality can be judged through seeing	10.4	5.2	1.8	23.3
Is good for the environment	6.0	4.2	0.6	4.0
Provides variety	4.4	33.0	49.1	24.7
Situation factor				
For fast preparation	3.0	39.2	47.4	45.0
For cold dishes	9.8	0	6.6	16.1
For dishes prepared for the whole family	58.0	8.8	5.6	4.6
For summer time	13.2	1.0	1.8	3.4
For storage purposes	4.8	28.7	24.9	16.3
For winter time	1.0	16.9	8.6	9.0
For dishes prepared for myself	10.2	5.2	5.0	5.6
Image component				
For the real family mother	36.8	9.7	5.0	5.5
For active people	13.6	32.2	25.4	25.9
For connoisseurs	24.0	4.4	3.0	1.8
For cheerful people	4.4	3.4	2.4	3.2
For modern people	3.6	27.2	22.3	23.4
For old fashioned people	1.8	2.2	8.7	10.1
For people with little children	12.8	4.6	3.6	3.6
For single people	3.0	16.3	29.6	26.5

The attributes were split up in core product attributes, augmented product attributes, product benefits, situation factors and image components. The response profiles for each type of vegetables are presented in Table 8.3. Fresh vegetables were most associated with the attributes healthy, tasty and natural. The perceived benefit of fresh vegetables is that they provide people with necessary vitamins and minerals. Fresh vegetables are served in meals prepared for the whole family and most appreciated by the traditional family mother and connoisseurs. No statistically significant differences are found in the perception of fresh vegetables between the four groups of vegetable consumers.

Of all processed-vegetables, frozen vegetables had the best image in terms of vitamin and mineral content. This attribute was significantly more mentioned by typical consumers of frozen vegetables. Frozen vegetables were perceived as easy and fast to prepare, providing variety and ideal for active and modern people. An association with the attribute 'industrial' was mentioned. Canned vegetables are perceived as cheap and industrial. Other associations included convenience, speed and variety. Canned vegetables had the image of being the preferred vegetable of single living people. Glass-packaged vegetables have a less industrial and cheap connotation but a more traditional image than canned vegetables. Apart from offering variety, important product benefits included a good presentation and that quality of the product can be judged visually. A similar response pattern for glass and canned is found for situation and image components.

These quantitative results about perception and image of vegetables fully confirm the findings of the qualitative research. Frozen vegetables are clearly the preferred alternative for fresh, which can be explained by greater familiarization of consumers with the freezing preservation technique, rather than with the vegetable sterilization technique, which was commonly applied in households some decades ago.

8.6.3 The ideal product

A definition of the ideal product is determined on the basis of asking the consumers to describe the ideal production process from the beginning till the

final prepared product as it is presented on a plate. During the focus group discussions, respondents were asked to think about every step, each element in the production process and to describe the ideal picture. Qualitative research revealed that consumers attach specific attention to the soil, the seed, the growth process, harvesting practices, vegetable processing and preparation. Using a pick-any scale enabled to quantitatively assess the consumer concerns related to each of these six steps in the production process. For each step in the production process, relevant attributes were selected based on the qualitative research. These attributes are labeled as 'must' and 'should not' be present, which respectively means that the ideal production process 'must' take care of specific practices and 'avoid' others. The attributes were presented to the respondents, who are asked to indicate the most relevant attributes for their imagined ideal vegetable production process.

For each step in the production chain, an importance weight coefficient was calculated. An initial response to the results is that the differences in importance attached to chain processes are rather small. Consumers rated all steps with a similar importance. Nevertheless, it was perceived that greatest importance was associated with those processes with which the consumer had the greatest familiarity through their own experiences in vegetable production: tillage or soil cultivation, harvesting and vegetable preparation.

With respect to the soil, consumers stressed that the soil must be pure and carefully cultivated. Treatments with pesticides and, to a lesser extent, chemical fertilizers were not accepted for the ideal vegetable production process. Soil purity was statistically more likely to be mentioned by typical consumers of glass-packaged and canned vegetables consumers than by others. The seed for the ideal vegetable production must be of premium quality and should not be treated or coated with pesticides. In addition, about a quarter of the respondents indicated that the seed should not be genetically engineered. The growth process must be under permanent control. Again reservations about the use of pesticides were the major concern, together with the rejection of any kind of sprays on the vegetables. The harvesting process must be conducted at the right moment,

especially not too late. Care should also be given to avoid damaging the vegetables during the harvest.

During the processing, special attention must be paid to careful washing of the vegetables and to strictly minimize the storage period between harvesting and processing. Consumers of canned and glass-packaged vegetables attach significantly more importance to 'not supplying vitamins' during the processing of the vegetables. During preparation, loss of taste, vitamins and minerals should be avoided. This topic was significantly more stressed by frozen and fresh-vegetable consumers. All family members must finally appreciate the ideal vegetable as it is served.

The identified topics from a consumer viewpoint for the ideal vegetable production chain reveal both key factors for a successful improvement of the processes in the processed-vegetable chain and relevant topics for communication with consumers around chains. It is obvious that some topics related to the production process of vegetables, such as manual labor or avoiding the use of machinery can not be realized in practice. A great majority of the indicated issues for ideal vegetable production are however perfectly feasible in practice. Concerns about the use of pesticides confirm the findings of previous research by Dittus and Hillers (1993 and 1996). Their consumer research about pesticide use in vegetable production led to the conclusions that concerns dealt with residue effects on both personal health and the environment. They also revealed that concerns about pesticide residues on vegetables might confound appreciation of the nutritional merit of these foods. In our survey, concerns about pesticides were emphasized, which indicates that these practices should be approached with caution. Any technological improvement within the vegetable chain should be communicated to the consumer.

Several topics related to the production process of glass-packaged vegetables, such as sowing seeds by children and manual removal of weeds, are not practical. However, these suggestions provide important topics for image building and communication with consumers.

8.6.4 IQM & communication

A communication plan typically includes the following elements (Kotler & Armstrong, 1991):

- identification of the target audience and quantitative objectives in terms of market share;
- formulation of the message (content, structure, format);
- choice of the media (promotion above - below the line);
- definition of the source, namely who is sending the message;
- collection of feedback.

Once the elements of the communication plan are determined, the developed communication concept must be tested (e.g. through in-depth interviews). Through this test it is verified whether or not the message is understood and if the medium and source are accepted, liked and trustworthy.

Related to the stipulated objective, two approaches of IQM and communication can be advanced. It is important to mention that the discussion focuses on the way the consumer perceives IQM and more specifically the way vegetables are processed. For companies willing to defend their status as market leader or premium brand, the whole concept of IQM focuses on providing 'the ideal product' as a kind of guarantee concept. These elements offer a tremendous opportunity for chains that manage first to respond to these consumer preoccupations and second to use them as an effective communication tool. Alternatively, focusing on a specific market segment creates the opportunity to increase market share. It is possible to identify differences between groups of consumers (typical consumers of fresh, frozen, canned and vegetables in glass) in perception of the ideal product. By focusing on these differences, a chain must be able to develop a communication strategy aiming at gaining market share by winning specific consumers at the expense of another type of processed-vegetables.

In developing communication about IQM for processed-vegetables, the following topics should be kept in mind:

- Consumers have a poor knowledge about the processing technique related to glass-packaged vegetables, more specifically the sterilization process. It

relates to the fact that consumers are much more familiar with freezing rather than with sterilization.

- By communicating with consumers about vegetables, a non-scientific language should be used. It relates to the emotional product approach and the fact that a scientific language could be experienced as ‘chemical’;
- Within the communication process, children and the farmer should retain a central place as a symbol of purity, harmony with nature and future.

8.7 Conclusions

During the last two decades, new management techniques such as supply chain management, efficient consumer response, value-added partnerships, total quality management and integrated quality management have been introduced in the agri-food business. These techniques focus either on production management, on marketing management or both. Changes in the working conditions of the agri-food business, such as the desire of consumers to know the origins and production processes of the products they buy, the pressure from retailers to increase the efficiency of the channel, and the need of the primary producers to be assured of a destination for their products, create tremendous opportunities for chains on their way to develop competitive advantages.

The evaluation of the consumers' needs and interests to know the production process and their ideal image of vegetables reveals several opportunities. The vegetable consumer is confronted with a dilemma. The consumer approaches vegetable consumption emotionally. Fresh vegetables are perceived on the one hand as the best product in terms of health, quality, nutrition and naturalness. On the other hand, the preparation of fresh vegetables is increasingly considered as too time-consuming, especially by working people. Under these circumstances, the consumer looks for an alternative under the form of processed-vegetables: frozen, canned or glass-packaged. To justify this choice to other people such as family members, the consumer looks for rational support. Much of this rational support is identified by the elements provided during the description of the ideal product in terms of the ideal vegetable

production process. Consumers' search for rational support offers great opportunities for chains that manage first, to guarantee integrated quality and chain management, and second, to work out the realized consumer driven chain improvements as an effective communication tool. It is up to the processed-vegetables chain to translate these opportunities into adapted processes and institutional adjustments in order to realize and implement the consumers' ideal chain perception.

Annex 8.1 Questionnaire processed-vegetables sector.**ENQUÊTEFORMULIER CONSERVENKETEN**

De afdeling Agro-Marketing van de Universiteit Gent, onder leiding van Prof. Viaene, doet momenteel een onderzoek bij consumenten over het gebruik van groenten. Het is de bedoeling om een duidelijk beeld te krijgen van de houding en het gedrag met betrekking tot groenten. De enquête is volledig anoniem en wordt naamloos verwerkt. Graag hadden wij gedurende een tiental minuten een aantal vraagjes gesteld.

A. Profiel respondent - groenten algemeen**A.1. Selectie respondent - iedereen VVA****1. Bent u verantwoordelijk voor de aankoop van groenten in uw gezin ?**

1	Ja
2	Nee : STOP!

A.2. Gebruikersprofiel - Gedrag**2. Hoe vaak eet u volgende soorten groenten ?**

	2.1	2.2	2.3	2.4
	Vers	Diepvries	Blik	Glas
nooit				
dagelijks				
meerdere keren per week				
éénmaal per week				
meerdere keren per maand				
éénmaal per maand				
minder dan éénmaal per maand				

A.3. Aankoopprofiel - Gedrag**3. Waar koopt / haalt u volgende soorten groenten ?**

	3.1	3.2	3.3	3.4
	Vers	Diepvries	Blik	Glas
grote supermarkt				
supermarkt				
superette / buurtwinkel				
groenten- en fruitwinkel				
slagerij				
markt				
hoeve				
eigen productie				

B. Perceptie van groenten door de respondent

B.1. *Imago van groenten in het algemeen*

4. We hebben met een aantal mensen gesproken over het gebruik van groenten. Op basis daarvan hebben een aantal uitspraken gekozen. Kunt u ons zeggen in welke mate u het met elk van deze uitspraken eens bent ?

1= akkoord, 2=neutraal, 3=niet akkoord

4.1	Een maaltijd zonder groenten is geen volwaardige maaltijd	1	2	3
4.2	Groenten met een merk verzekeren een betere kwaliteit	1	2	3
4.3	De bereiding van verse groenten neemt te veel tijd in beslag	1	2	3
4.4	Ik koop bij voorkeur groenten uit eigen streek of land	1	2	3
4.5	Groenten zijn het belangrijkste deel van de maaltijd	1	2	3
4.6	Om de kwaliteit van groenten te beoordelen moet ik de groenten zien	1	2	3
4.7	Groenten zijn belangrijker in gezinnen met kleine kinderen			
4.8	Ik koop bij voorkeur groenten die milieuvriendelijk geteeld zijn			
4.9	Ik ben bereid een meerprijs te betalen voor groentend die milieuvriendelijk geteeld zijn.	1	2	3

B.2. *Imago van verse, diepvries-, blik-, glas-, voorgesneden/voorverpakte groenten op vandaag*

5. Uit een aantal interviews hebben we enkele woorden en uitspraken gehaald in verband met groenten. Kruis in de volgende lijsten telkens het woord aan dat het best jouw mening i.v.m. groenten weergeven (het woord dat u het meest associeert met ...).

Methode pick any, keuze van 1 item per woordenbatterij, rotatie van soort groente en woordenbatterij, 5 batterijen met woorden / uitspraken ingedeeld in :

- *Productattributen core product (A)*
- *Productattributen augmented product (B)*
- *Productbenefits (C)*
- *Situationele factoren (D)*
- *Image-componenten (E)*

Vraagstelling voor: vers, diepvries, glas, blik. Telkens benadrukken om welk soort groenten het gaat!!

Omcirkel het cijfer dat overeenstemt met de woordkeuze van de respondent voor elk van de vier groentensoorten. Invullen in het rooster op de volgende bladzijde.

D. Rooster voor het invullen van de antwoorden op vraag 5

		5.2 GLAS	5.1 DIEPVRIES	5.4 BLIK	5.3 VERS
A	1 Goede smaak	1	1	1	1
	2 Behoud mineralen/vitaminen	2	2	2	2
	3 Goedkoop	3	3	3	3
	4 Gezond	4	4	4	4
	5 Goede kwaliteit	5	5	5	5
	6 Gemakkelijk te bereiden	6	6	6	6
B	1 Natuurlijk	1	1	1	1
	2 Traditioneel	2	2	2	2
	3 Biologisch	3	3	3	3
	4 Industrieel	4	4	4	4
	5 Geforceerd	5	5	5	5
	6 Ouderwets	6	6	6	6
	7 Milieuvriendelijk	7	7	7	7
C	1 noodzakelijke vitamines/vezels	1	1	1	1
	2 presenteert goed	2	2	2	2
	3 voor elk wat wils	3	3	3	3
	4 kwaliteit beoordelen op zicht	4	4	4	4
	5 goed voor het milieu	5	5	5	5
	6 zorgt voor afwisseling	6	6	6	6
D	1 voor snelle bereiding	1	1	1	1
	2 voor koude bereiding	2	2	2	2
	3 koken voor het hele gezin	3	3	3	3
	4 voor tijdens de zomer	4	4	4	4
	5 om voorraad aan te leggen	5	5	5	5
	6 voor tijdens de winter	6	6	6	6
	7 koken voor mezelf	7	7	7	7
E	1 echte huismoeder	1	1	1	1
	2 actieve mensen	2	2	2	2
	3 fijnproevers	3	3	3	3
	4 opgewekte mensen	4	4	4	4
	5 moderne mensen	5	5	5	5
	6 ouderwetse mensen	6	6	6	6
	7 mensen met kleine kinderen	7	7	7	7
	8 alleenwonende mensen	8	8	8	8

C. Groenten in glas

C.1. Kennis en gedrag t.a.v. groenten in glas

6. Welke merken van groenten in glas kent u ? *Ongeholpen !*

7. Welke merken van groenten in glas kent u ? *Geholpen ! Toon de lijst !*

8. Welke merken van groenten in glas koopt u ?

		6	7	8
		Ongeholpen	Geholpen	Koop
1	HAK			
2	Rena			
3	Marie Thumas / Bonduelle			
4	La Corbeille			
5	Devos Lemmens			
6	Huismerk			
7	Andere (<i>Vul in</i>)			

9. Koopt u groenten in glas van huismerken van supermarkten? Indien ja, welke?

Ja	
Neen	

Supermarkt	Huismerk

Van de drie meest gekochte merken + meest gekochte huismerk:

10. Welke variëteiten (soorten groenten) koopt u van dat merk? *Vul merk in in kolom!*

Indien HAK en RENA gekocht worden, zeker beide bespreken!

Van de huismerken, het meest gekochte bespreken!

	Merk1:	Merk 2:	Merk 3:	Huismerk
Appelmoes				
Rode kool				
Boontjes, erwtjes, wortelen voor koude bereiding				
zure conserven				
Asperges, schorseneren				
Champignons				

D. Communicatieconcepten - integrale ketenbewaking groenten

D.1. Ideale groente

Ideaal product laten definiëren op 6 aspecten uit de conservenketen: grond, zaad, groeiproces, oogstomstandigheden, verwerking, en bereiding.

Respondenten een keuze laten maken uit een aantal concepten voor hun ideale product voor elk van de zes geïdentificeerde aspecten. De keuze bestaat voor elk aspect uit 2 items: enerzijds een voorwaarde die zeker moet voldaan zijn en anderzijds een voorwaarde die zeker niet mag voldaan zijn voor de ideale groente.

11. Uit een aantal interviews hebben we enkele woorden en uitspraken gehaald in verband met het telen en bewerken van groenten. Kruis in de volgende lijsten telkens 1 woord of uitspraak aan die het best jouw mening i.v.m. jouw ideale groente weergeeft.

Omcirkel het cijfer dat overeenstemt met de gekozen voorwaarde voor elk van de aspecten van de conservenketen. Telkens slechts 1 antwoord voor MOET en voor MAG NIET!!

	10.1	10.2	10.3	10.4	10.5	10.6
	Grond	Zaad	Groei	Oogst	Verwerk	Bereid
M	1 zuiver	1 handmatig	1 perm.contr.	1 juist moment	1 selecteren	1 snel
O	2 zorgv.bew.	2 uitgelez.kw.	2 gn.slechte	2 selectief	2 wassen	2 mogelijk.
E	3 m.compost	3 nt.geforceerd	3 gn.onkruid	3 handmatig	3 snel verw.	3 appreciatie
T	4 natuurl.pest.	4 vorige oogst	4 regenwater	4 voorzichtig	4 natuurl. man.	4 uitzicht
M	1 machin.bew.	1 geforceerd	1 bespuiten	1 machinaal	1 lange stock	1 verlies smaak
A	2 chem.mestst.	2 gen.gemanip.	2 pesticiden	2 onkruid mee	2 toevoeg. vit.	2 " vorm
G	3 pesticiden	3 pesticiden	3 onkruid	3 te late oogst	3 kwal.mengen	3 " min/vit
N	4 dierl.mestst.	4 tweede keus	4 onregel m ctr	4 beschadiging	4 gn.cont.contr.	4 tijdrovend

12. Welk van de 3 belangrijkste aspecten die we zopas besproken hebben ?

Grond	
Zaad-zaaiproces	
Groeiproces	
Oogst	
Verwerking	
Bereiding	

13. Aan welke groente (soort groente) heeft u gedacht tijdens het spreken over uw ideale groente?

Groente?	
----------	--

D.2. Impact concept op gedrag in de toekomst - koopintenties

- 14. Wanneer u in de winkel een groente ziet die beantwoordt aan uw ideaal beeld, (zoals zopas gedefinieerd) overweegt u om die groente klaar te maken voor uw gezinsleden ?**

Ja	
Neen	

- 15. Indien nee, hoe komt het dat u die ideale groente niet klaarmaakt?**

.....

- 16. Overweegt u nog steeds om die ideale groente klaar te maken voor uw gezinsleden wanneer die groente**

	Ja	Neen
... is blik zit		
... diepgevroren is		
... is glas zit		

- 17. Indien neen voor glas, Hoe komt het dat u die ideale groente in glas niet klaarmaakt voor uzelf en uw gezinsleden?**

.....

- 18. Indien ja voor glas, Wanneer die ideale groente in glas aangeboden wordt, zou u dan....?**

	Ja	Neen
Groenten in blik vervangen door groenten in glas		
Groenten uit de diepvries vervangen door glas		
Meer variëteiten (soorten) groenten in glas aankopen		

- 19. Op welke manier wordt u het best en meest geloofwaardig overtuigd van het feit dat uw ideale groente als dusdanig geproduceerd wordt?**

		Ja	Neen
1	Label met garantie op de verpakking		
2	Reclameboodschap		
3	Consumentenorganisatie		
4	Mogelijkheid om de volledige geschiedenis die het product doorlopen heeft te achterhalen		
5	Winkelier		
6	Andere:		

E. Socio-demografische gegevens**E.1. Gezinssituatie****20. Woont u ?**

1	Samenwonend / Gehuwd	
2	Alleenwonend	

E.2. Gezinsgrootte**21. Hoeveel personen telt uw gezin in totaal ?**

22. Indien thuiswonende kinderen: Leeftijd van het jongste (thuiswonend) kind?

E.3. Beroep**23. Wat is uw beroep ?**

1	Huisvrouw	
2	Werkloos	
3	Student	
4	Gepensioneerd	
5	Arbeider	
6	Bediende	

E.4. Woonplaats**24. Waar woont u ?**

1	Vlaanderen	
2	Wallonië	

1	Stad	
2	Verstedelijkte gemeente	
3	Platteland	

E.5. Leeftijd respondent**25. Wat is uw leeftijd ?**

E.6. Geslacht respondent**26. Wat is uw geslacht ?**

1	Vrouw	
2	Man	

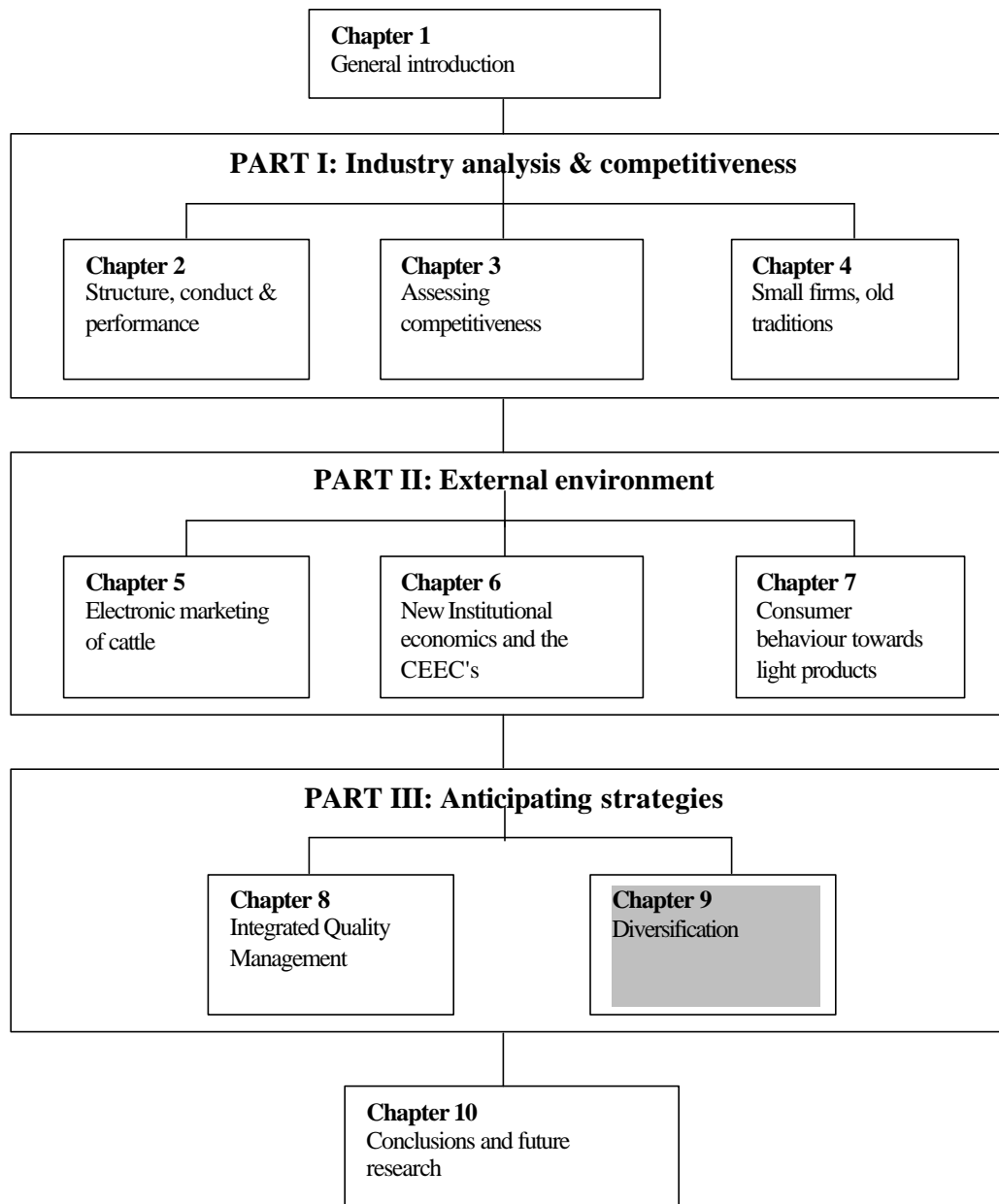
Chapter 9

Market Oriented Positioning of On-Farm Processed Foods as a Condition for Successful Farm Diversification

This chapter is adapted from:

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Gellynck, X. & Viaene, J. (2002a). On-farm processed foods and farm diversification. *Journal of Agricultural Economics*, 53(3), forthcoming.



Chapter 9: Market Oriented Positioning of On-Farm Processed Foods as a Condition for Successful Farm Diversification

9.1 Abstract

Farm diversification is stimulated by the reform of the common agricultural policy. Farmers have the incentive to introduce innovations in the field of on-farm processing and direct marketing, but often lack a market oriented approach. This paper illustrates the problem by presenting a consumer survey regarding on-farm processed yogurt. Conjoint analysis is used to define the most preferred yogurt in different market segments. Results of the price sensitivity meter are similar to the conjoint analysis. Farmers' price setting is not always adequate, which means that opportunities and additional income are lost. Providing the necessary assistance in collecting market information and commercial training is essential in obtaining sustainable benefits from on-farm processing and direct marketing. Policy makers should integrate marketing management principles in developing adequate policy instruments.

9.2 Introduction and objective

The reformed common agricultural policy (CAP) has expanded interest in the rural economy or rural development through the Rural Development Regulation (CE, 1998). This has been hailed as the new second pillar of the CAP (European Commission, 1999). Even in the context of the MacSharry reform in 1992, more resources were made available to maintain and develop viable rural communities, while preserving their traditions, their culture and their natural environment, and to encourage diversification in order to maintain and create local employment (Tracy, 1996). The idea is to reallocate some resources utilized for price support and compensation payments to rural development. Globalization and liberalization of markets enhances this evolution, implying

less of a focus on the production function of agriculture, and more on agricultural multifunctionality. This multifunctionality emphasizes the social function of preserving the natural resources of rural areas, delivering attractive products, sustaining rural communities and safeguarding rural environmental capital (Zervoudaki, 1999; Latacz-Lohmann & Hodge, 2001).

It is generally accepted that the CAP was originally developed to promote and stimulate production through pricing policies, minimum import prices, intervention and export restitutions (Swinbank, 1994, 1997; Meulenberg & Viaene, 1998; Davis, 2001; Marshall, 2001; van Meijl & van Tongeren, 2001). After the MacSharry reform in 1992, there has been a shift in the mix of support in favor of direct payments as compared to market price support. Since this shift, the CAP operates in a more market oriented fashion because of the reduction in market intervention (Salvatici et al., 2001). It is assumed that a properly functioning market will automatically result in more market oriented production.

The shift in the CAP is driven by the declining importance of agriculture as an economic activity and by issues of concern to the public. The latter relates to the growing public interest in food in general (Nast & Pile, 1998; Ilbery & Kneafsey, 2000) and topics such as food safety (Saucier, 1999; Henson & Traill, 2000; Caswell, 2001), quality (Steenkamp & van Trijp, 1996; Grunert, 1997), origin (Sylvander et al., 2000; Vannoppen et al., 2001), labelling (Verbeke & Viaene, 1998; Stapela, 2000; Golan et al., 2000; Bonnet & Simioni, 2001; Nayga, 2001), and the ethical and environmental implications of intensive food production (Bansback, 1995; Verbeke & Viaene, 2000; Ilbery & Kneafsey, 2000). It is within such a climate of change that value-laden concepts such as authenticity, healthiness and traditional values become more important. Some consumer segments are interested in knowing how the food is produced, not only for health or safety reasons but also in terms of nostalgia, which is related to traditional farming systems being an alternative to the industrialized food market (Gilg & Battershill, 1998).

This changing environment offers opportunities for the traditional, low intensive farm sector but adapted competitive strategies, which can focus on aspects such as adding value, direct links with consumers or diversification of farm based activities, are required. Direct selling of fresh or processed farm produce is such a diversification activity. Among other actions, the EU provides specific financial support for investments in on-farm processing and commercialization in rural areas. However, measures are rather production than market oriented. Because of economic vulnerability, several authors argue that better support measures are necessary if farmers are to fully benefit from the opportunities (Gilg & Battershill, 1998; Barjolle & Sylvander, 2000; Keyzer, 2001; Atkins & Bowler, 2001).

One better way to support such diversification activities is to systematically promote and encourage the investigation of consumer requirements. This means that the main principles of marketing management can be integrated into policy measures. These main principles relate to identifying, anticipating and satisfying customer requirements profitably (Chisnall; 1995; Bagozzi et al., 1998). This chapter demonstrates that such an approach can be worthwhile and that integrating the marketing principles in the selection process of policy instruments, necessary to realize the objectives of the CAP, should be considered. In the case of on-farm processing, it should reduce reliance on agricultural production as a source of income and result in maintaining or increasing income, employment and quality of life (McNally, 2001). Farmers' motivations to diversify farm activities originate mainly from the production side and are related to elements such as low farm-gate prices, a lack of available land, machinery, and labor, or surplus production (Gasson, 1988; McInerney & Turner, 1991). McNally (2001) also illustrates that farm size and type influence diversification possibilities. Large farms on the one hand and dairy, horticultural, poultry or pig farms on the other, have more options than other types of farms.

Many studies stress that diversification cannot be seen as a general solution for falling incomes and that problems can occur (McInerney & Turner, 1991; Bowler et al, 1996; van den Bor et al., 1997; Gale, 1997; Poole, 2000). Niche

markets are elusive, dispersed, small and often require a different approach in marketing terms. Retailers are often reluctant to work with small scale producers, while direct sales offer an alternative. Meulenberg (2000) indicates the need for a more market-oriented approach to studying the market for regional products rather than a production-oriented approach. The empirical work of Ilbery and Kneafsey (2000) confirms this lack of formal marketing strategies. Previous research illustrates that consumers have different motivations for buying fresh or processed farm products (Cavailles et al., 1994; Durand & Decoene, 1994; Viaene & Gellynck, 1995b; Belletti & Marescotti, 1997; Revell & Kupiec, 1998; Trognon et al., 2000; Hinrichs, 2000). While some consumer segments consider direct sales of farm produce as an opportunity for more fresh and cheaper food, other segments consider it as a leisure activity. Other obvious selling points include the natural, traditional, authentic, traceable, home made production process, the contact with animals or the opportunity to discuss food and farming systems with the farmer.

In order to fully benefit from and respond to consumer requirements, product development and innovation becomes an additional task for the farmer who chooses to commercialize directly or via shorter market channels. Promotion and other commercial actions are necessary to become recognized in the market. Adequate pricing of fresh or on-farm processed produce is essential to realize the direct flow of value added to farms. While the other elements of the marketing mix (product, promotion and distribution) include costs, price provides turnover and income. Against this background, the objective of this chapter is to illustrate that a more market-oriented approach, particularly optimal price setting, is essential to fully benefit from the opportunities that direct farm sales offer.

The structure of the chapter is as follows. Section 3 presents the research methodology, focusing on price setting techniques on the one hand and data collection on the other. Section 4 sets out the empirical findings and illustrates what the impact of more market oriented pricing can be. Here, the case of on-farm processed skimmed yogurt is developed. Some conclusions are presented in the final section.

9.3 Research methodology

First, the techniques used to analyze price sensitivity are discussed. Next, the data collection procedure is described.

9.3.1 Price setting techniques

Price setting approaches are grouped into two categories, namely cost-based approaches and market-based approaches (Morris & Joyce, 1988). In the underlying study, a market-based approach is used, which focuses on the perceived value that products hold in the minds of consumers, on the price elasticity of demand and on competitive considerations. An emphasis on price as a reflection of consumer value allows for greater flexibility in pricing. Price discrimination among market segments can be quite profitable if based on the existence of fundamental differences in the way consumers value the same set of product attributes.

Several research techniques can be used to investigate consumers' sensitivity to pricing (for an overview see Desmet & Zollinger, 1997; Wedel & Leeflang, 1998; Skiera, 1999). In our paper, we use a comparative method, namely conjoint analysis on the one hand and a monadic method, namely the price sensitivity meter on the other. Comparative methods place the investigated product in a competitive environment, while monadic methods evaluate the price of only one product. The idea of using both methods is to verify whether or not different methods provide different results and could lead to different conclusions.

Conjoint analysis is a multivariate technique designed to measure consumer preferences for a multiattribute product (Hair et al., 1998). The idea is that the overall judgement of a product can be broken down into the contribution of each attribute level, called part-worths (Green & Srinivasan, 1978). Hair et al. (1998) suggest four steps when designing a conjoint study: (1) identify relevant product attributes; (2) determine the relevant levels of the attributes; (3) choose a method to generate data and scale type; (4) select the estimation method. Firstly, primary explorative research (the Kelly grid method) was used to

identify relevant product attributes. This method comprises two components, namely the elements (products) which constitute the objects of thought on which the grid is built and the attributes or constructs which are the dimensions used by the subject to evaluate those elements (Dainty, 1991; Fournier, 1996). Secondly, the relevant attribute levels are chosen so that the full range of the attribute is covered and by ensuring that for each combination of attribute levels the respondent can imagine a realistic product (De Pelsmacker & Van Kenhove, 1994). To reduce the number of combinations, a fractional factorial design is used to select the profiles to be evaluated by the respondents. It is a subset of factorials by which useful information can be obtained with a reasonable degree of precision. The random combination of attributes and attribute levels is withheld to obtain the product profiles or combinations of levels of all the attributes. The stimuli are constructed in an orthogonal way to ensure the correct estimation of the main effects. The design is balanced so that each level occurs with equal frequency within each attribute. A balanced and orthogonal design has maximum efficiency (Hair et al., 1998, Zwerina, 1997).

Thirdly, the full profile approach is used for the generation of data, which means that each profile is described separately on a profile card. Respondents are asked to rate the full product profiles according to preference or likelihood of purchase on a 9-point scale, which means that metric conjoint analysis is applied (Grunert, 1997). Fourthly, we use the additive model, which assumes that the overall evaluations are formed by the sum of the separate part-worths of the attributes (Steenkamp, 1987). Since respondents were asked to rate their preference on a 9-point scale, ordinary least-squares (OLS) regression can be used to estimate these part-worths (Green & Krieger, 1993). Next to this, the relative importance of each attribute is estimated by measuring the utility range for each attribute. This range is calculated by subtracting the lowest part-worth utility from the highest for a particular attribute. The attribute with the widest range is considered to be the most important (Green & Tull, 1978).

The price sensitivity meter uses direct questioning to determine a range of acceptable prices (Van Westendorp, 1976; Tatham et al., 1995). Respondents are asked four questions:

- At what price do you begin to consider the product to be too cheap to be of value?
- At what price do you begin to consider the product to be cheap, but not too cheap to start questioning quality?
- At what price do you begin to consider the product to be expensive but worth taking into account?
- At what price do you begin to consider the product to be too expensive to buy?

9.3.2 Data collection

As indicated above, on-farm processed skimmed set yogurt is the subject of investigation. The study started with individual in-depth interviews with consumers of on-farm processed yogurt to conduct the Kelly grid and to identify the relevant product attributes and levels for the conjoint study. In total five product attributes are identified with two or three attribute levels (Table 9.1).

Table 9.1 Attributes and attribute levels used in the conjoint study on-farm processed yogurt (500 g).

Attribute	Levels
Packaging	1) glass and reclosable; 2) disposable and reclosable; 3) disposable and not reclosable
Outlet	1) farm; 2) market; 3) shop or supermarket
Price (500 g)	1) 0,87 EUR; 2) 1,12 EUR; 3) 1,36 EUR
Shelf life	1) one week; 2) three weeks
Information	1) only obligatory information; 2) additional information

The level of additional information refers to the presence of information about production process or nutritional value.

To evaluate the market positioning of farm products in a competitive environment, eight existing on-farm processed yogurts were selected. The profiles of these products according to the identified attributes are given in Annex 9.1.

Next, single cross-sectional consumer data were collected from a sample of 249 consumers of on-farm processed skimmed yogurt in Belgium (questionnaire in Annex 9.2). The socio-demographic and behavioral characteristics of the sample are presented in Table 9.2. Respondents were selected based on randomized proportionate stratified sampling, with the outlet as stratification variable. This resulted in an outlet distribution of 41% for the farm, 30% for the market (public or farmers' market) and 29% for the shop (grocery shop or supermarket). The selection procedure also included the restriction that respondents were the main person responsible for buying food in the household and that they buy on-farm processed yogurt at least once a month. About two thirds of the respondents purchase on-farm processed skimmed yogurt at least once a week and 40% of the respondents only purchase on-farm processed yogurt and never conventionally produced yogurt.

The sampling resulted in a gender distribution of 72% female and 28% male respondents. Elderly people (> 55 years) are slightly underrepresented in our sample. Socio-demographic and behavioral characteristics differ significantly according to the outlet, the gender and the presence in the household of children under 10 years old. Respondents buying at the farm have a higher likelihood of being male and having children under 10, while female respondents and those without children under 10 buy more often at the market and shop. No statistically significant differences across the outlets are noticed for age, family size and purchase frequency.

The data were collected by means of a structured questionnaire separated into seven sections. The first section measured claimed dairy consumption for on-farm processed products, and the second section looked for consumption motivations. In the third section, the consumption pattern for yoghurt is examined. The fourth section comprised the questions related to the price sensitivity meter and the fifth section collected some detailed information about the last purchase and more specifically about the ability of the respondents to recall brand and price. In the sixth section, the product profiles were shown to the respondents and preferences were recorded on a 9-point scale. In total 21 full product profiles were shown in a randomly mixed set, of which 18 were

used to estimate the part-worths and 3 as holdout to check the validity of the additive model. The seventh and last section included socio-demographic characteristics such as gender, age, number of children, education and distance between outlet and place of residence.

Table 9.2 Socio-demographic and behavioral characteristics of the sample according to the outlet, % of respondents (n=249).

	Farm	Market	Shop	TOTAL
Gender				
Female	65.0	74.3	80.6	72.3
Male	35.0	25.7	19.4	27.7
Statistical test: $\chi^2 = 5.183$; $p < 0.10$				
Age				
Under 35	15.5	21.6	25.0	20.1
Between 35-55	56.3	45.9	52.8	52.2
Over 55	28.2	32.5	22.3	27.7
Statistical test: $\chi^2 = 14.290$; $p > 0.10$				
Children under 10				
Yes	63.9	43.8	44.7	53.4
No	36.1	56.3	55.3	46.6
Statistical test: $\chi^2 = 5.064$; $p < 0.10$				
Family size				
1 person	7.8	10.8	9.7	9.2
2 persons	35.9	47.3	37.5	39.8
3 or 4 persons	46.6	33.8	45.8	42.6
Over 4 persons	9.7	8.1	6.9	8.4
Statistical test: $\chi^2 = 4.302$; $p > 0.10$				
Purchase frequency				
Over once a week	8,7	5.4	11.1	8.4
Once a week	49.5	58.1	62.5	55.8
Once in two week	28.2	20.3	22.2	24.1
Less frequently	13.6	16.2	4.2	11.6
Statistical test: $\chi^2 = 9.186$; $p > 0.10$				
TOTAL	41.4	29.7	28.9	100

9.4 Research findings

The discussion of the research findings starts with consumer segmentation based on the results of the conjoint study. Next, the range of acceptable prices is determined and confronted with the results of the conjoint study in order to evaluate whether or not the findings are comparable. Finally, market share predictions are formulated based on both existing and hypothetical products.

9.4.1 Consumer segments

A hierarchical cluster analysis (Ward's method - squared Euclidean distance), followed by a k-means clustering on the part-worths for the attribute 'price' results in a three cluster solution (Table 9.3). The part-worths are assessed using the preference scores for the product profiles. One-way ANOVA was carried out to illustrate the differences in part-worths between the clusters or consumer segments. Both Pearson's R and Kendall's tau illustrate that the fit of the additive model to the data was good.

Table 9.3 illustrates that packaging is the most important of the five attributes, followed by outlet, price, shelf life and information. The on-farm processed skimmed yogurt (500 g) obtaining the highest preference score can be defined as a product that is packed in glass, sold at the farm at a price of 0,87 EUR, that provides additional product information and that has a shelf life of one week.

Significant differences can be noticed between the obtained clusters or segments. The first segment is the smallest and the most price sensitive. Price is considered to be the most important attribute. This segment prefers skimmed yogurt at 0,87 EUR per 500 g and a disposable and reclosable packaging to glass. In the second and third segment, the ranking of the attributes corresponds with the one for the total sample. Between segment 2 and 3, two significant differences can be noticed. First, the former prefers the most expensive skimmed yogurt, and the latter the cheapest one. Second, a three weeks shelf life obtains the highest utility in segment 2, while a negative one in segment 3.

Table 9.3 Average part-worths and relative importance for the attributes of skimmed set yogurt (500 g) for different segments.

Attributes and levels/ Relative importance	Average part-worths ¹			
	Segment 1 (n=39)	Segment 2 (n=89)	Segment 3 (n=115)	TOTAL (n=243)
Packaging				
Glass	0,144 ^a	0,941 ^b	0,929 ^b	0,807
Disposable and reclosable	0,306 ^a	-0,117 ^b	-0,230 ^b	-0,103
Disposable and not reclosable	-0,450 ^a	-0,823 ^b	-0,699 ^{ab}	-0,704
<i>Relative importance</i>	17,5%	35,1	29,8%	29,7%
Outlet				
Farm	0,370	0,220	0,319	0,291
Market	-0,232	0,002	0,074	-0,001
Shop	-0,138	-0,222	-0,393	-0,289
<i>Relative importance</i>	22,9%	28,7%	26,4%	26,7%
Price				
0,87 EUR	1,452 ^a	-0,325 ^b	0,494 ^c	0,348
1,12 EUR	0,212 ^a	0,070 ^{ab}	0,001 ^b	0,060
1,36 EUR	-1,664 ^a	0,255^b	-0,495 ^c	-0,409
<i>Relative importance</i>	37,8%	13,8%	18,0%	19,6%
Information				
No	-0,161	-0,006	-0,179	-0,112
Yes	0,161	0,006	0,179	0,112
<i>Relative importance</i>	8,3%	8,7%	9,2%	8,9%
Shelf life				
1 week	0,269 ^a	-0,156 ^b	0,126 ^a	0,097
3 weeks	-0,269 ^a	0,156^b	-0,126 ^a	-0,097
<i>Relative importance</i>	13,4%	13,8%	16,7%	15,1%
Pearson's R	0,989	0,992	0,981	0,995
Kendall's tau	0,686	0,922	0,856	0,862

¹ Part-worths within a line showing a different superscript are significantly different in the post-hoc Duncan test ($p < 0,05$).

The results of the conjoint analysis clearly illustrate that price is not the most important product attribute related to on-farm processed yogurt. It even

indicates the existence of a consumer group willing to pay a much higher than average price charged by farmers, namely 1,12 EUR for 500 g skimmed yogurt.

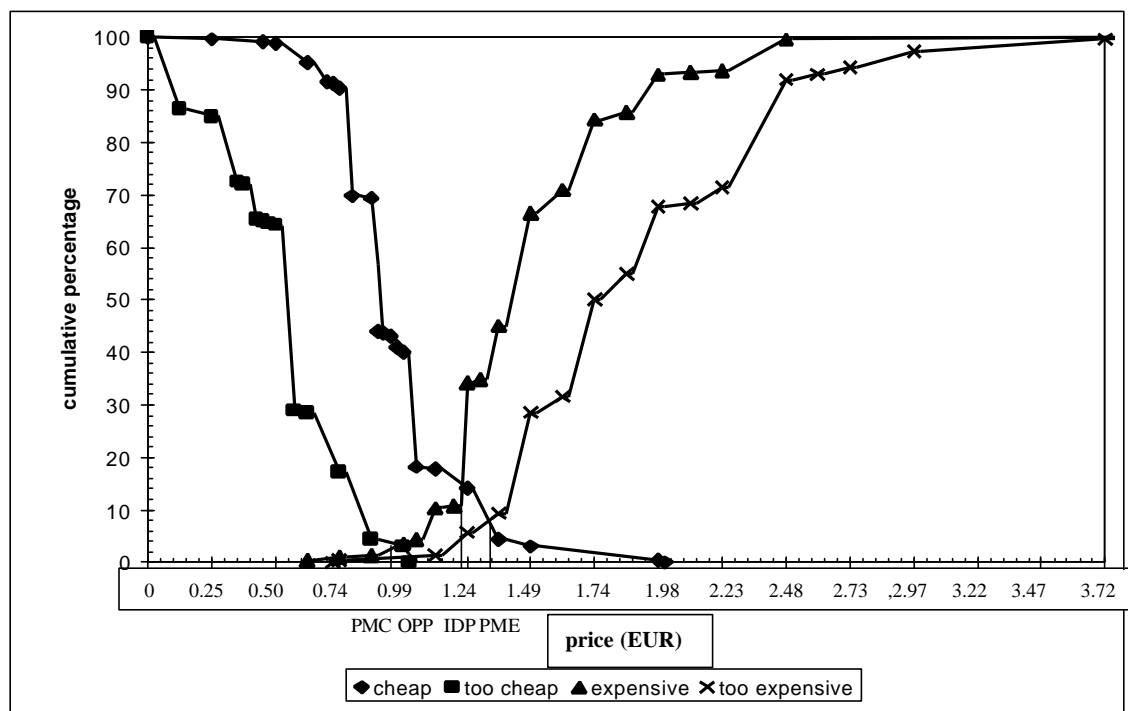
There are interesting and significant differences in motivation between the segments. The main purchase motivation for consuming farmhouse yogurt is similar for all segments and relates to the tasty characteristic of these products. However, the fact that people do not live far away from the outlet is an important motivator for respondents belonging to segment 1. For the other two segments, healthiness is claimed to be the second most important motivation. Substitute awareness was measured by asking respondents to recall brands of yogurt producers. Here, we notice that the most price sensitive segment is able to recall a significant higher number of brands (4,5) than the other two segments (3,7). Segment 3 indicates the highest purchase frequency with more than two thirds (68,7%) of the respondents buying on-farm processed yogurt at least once a week. Both segment 1 (51,6%) and 2 (60,3%) obtain lower scores. Consumers are less price sensitive to a product when they perceive it as a necessity. In our study, this necessity was measured by asking at what time of the day yogurt was consumed, assuming that at breakfast yogurt is a part of the meal and more necessary than in the case of other meals, where it is often consumed as a dessert. Results indicate that a significantly higher share of segment 2 (75,4%) than segment 1 (67,7%) or segment 3 (66,7%) consume yogurt at breakfast. We also notice a significant difference between the segments in terms of presence of children younger than 10 years old. Such families are much more present in segment 2 (23,5%) than in the other segments (respectively 6,5% in segment 1 and 14,7% in segment 3). This is likely to correspond with lower price sensitivity when young children are involved. Based on our questionnaire and the data collected, no other significant differences between the three segments could be identified. Other characteristics such as age, family size, purchase frequency or distance from outlet have no distinctive character for the three segments.

9.4.2 Range of acceptable prices

The questions related to the price sensitivity meter (see price setting techniques) yield four cumulative distributions for on-farm processed skimmed yogurt

(Figure 9.1). At the indifference price (IDP) an equal number of people experience the product as cheap or as expensive. The distributions cross at 15,3%, indicating a price of 1,19 EUR on the horizontal axis. It means that 69,4% of the respondents experience this price as 'normal'. The indifference percentage is low, indicating a sharp price-consciousness.

Figure 9.1 Price sensitivity measurement for 500 g of on-farm processed skimmed set yogurt, in EUR with PMC = price of marginal cheapness; OPP = optimal pricing point, IDP = indifference price and PME = price of marginal expensiveness, (n = 224).



At the optimal pricing point (OPP) the same number of respondents experience the product as too expensive and too cheap, which indicates that resistance against the price of the product is very low. The OPP is reached at 1,02 EUR and lies under the IDP (1,19 EUR). In the literature, cases where IDP and OPP are the same are numerous (Van Westendorp, 1976). In a number of cases, OPP is found to lie to the left of IDP. Separate positions indicate some kind of

‘stress’ in price-consciousness. Consumers experience a normal price but a number of them already experience this price as being too high.

The point of marginal cheapness (PMC) is the price at which the same number of respondents experience the product as expensive and too cheap. Price fixing between PMC and IDP is considered as ‘relatively cheap’. The price at which the respondents experience the product as cheap and too expensive is called the point of marginal expensiveness (PME). Price fixing between IDP and PME is considered as ‘relatively expensive’. The PMC is located at a price of 0,97 EUR, while PME is at 1,31 EUR. The range of acceptable prices is situated between these two prices.

The prices of four products belonging to the eight on-farm processed products studied fall within the range of acceptable prices. Two products have a price lower than 0,97 EUR, which means that some farmers sell at a price too low compared with the range of acceptable prices. In such cases, farmers do not fully benefit from the opportunities for income increase present in the market and supported by public policy. This illustrates that additional instruments such as providing market information and commercial training are required to obtain more effective public policy in general and farm diversification in particular.

Table 9.4 Range of acceptable prices according to the different market segments, in EUR for on-farm processed skimmed yogurt (500 g) with PMC = price of marginal cheapness; OPP = optimal pricing point, IDP = indifference price and PME = price of marginal expensiveness, (n = 224).

	Segment 1	Segment 2	Segment 3	TOTAL
IDP	1.12	1.26	1.19	1.19
OPP	0,88	1,18	0,93	1,02
PMC	0,77	1,09	0,87	0,97
PME	1,26	1,44	1,29	1,31
Range acceptable prices	0,77-1,26	1,09-1,44	0,87-1,29	0,97-1,31

By calculating the range of acceptable prices for each segment, similar results are obtained compared with the results of the conjoint analysis (Table 9.4). This

means that both OPP and the range of acceptable prices are the lowest for segment 1 and the highest for segment 2. The OPP for segment 3 is situated at 0,93 EUR. The indifference percentage of segment 1 (10,1%) is lower than that of segments 2 and 3 (respectively 17,7% and 15,0%). Low values (5 - 15%) indicate a sharp price-consciousness while high values generally indicate diffuse price-consciousness.

9.4.3 Market share predictions

In addition to understanding the preference structures of the three segments, the conjoint results are used to simulate choices and to predict market shares. Two types of choice models (Hair et al., 1998) can be used to predict the market shares that products are likely to capture in a competitive scenario (Table 9.5).

Table 9.5 Aggregated preference scores on a 9-point scale and market share predictions in % according to the Maximum Utility model and the Bradford-Terry-Luce model.

Product	Preference	Market share predictions in %	
		Maximum Utility	Bradford-Terry-Luce
P1	3,7	4,9	8,6
P2	3,5	5,2	8,4
P3	4,6	10,2	11,1
P4	3,5	5,2	8,4
P5	5,2	7,6	12,4
P6	5	13,2	11,3
P7	5,9	19,2	13,9
P8	5,5	20,4	13,2
Pref S2*	5,2	14,3	12,7
TOTAL		100	100

* product preferred by segment 2; product profile description: see Annex 9.1.

The first is the Maximum Utility model that counts the number of times each of the products has the highest utility across the set of respondents and determines the probability of choosing a product as the most preferred. This approach is appropriate in cases of markets where individuals are characterized by different preferences. The alternative choice rule is a purchase probability measure such

as the Bradford-Terry-Luce (BTL) model, where predictions of choice probability sum up to 100% over the set of stimuli tested. This method is best suited to repetitive and usage situations. General predictions are presented in Table 9.5, where the results of both models are compared for the total sample. A competitive environment is created where market share predictions are formulated for the eight studied products together, with the most preferred one by segment 2. The description of the product profiles according to the attributes and levels is given in Annex 9.1. The figures illustrate clear differences in market share predictions across the models applied. In the case of the Maximum Utility model, the range of values is larger than in the case of the BTL model, where the values are situated closer to each other.

Table 9.6 Aggregated preference scores on a 9-point scale (Pref) and market share predictions in % (MS).

Product	Segment 1		Segment 2		Segment 3	
	Pref	MS	Pref	MS	Pref	MS
P1	2,6	0,0	4,6	6,3	3,3	4,4
P2	3,7	13,5	3,7	2,7	3,4	5,9
P3	2,4	0,0	5,6	16,1	4,5	5,9
P4	3,7	13,5	3,7	2,7	3,4	5,9
P5	4,8	5,4	5,4	10,0	5,2	5,2
P6	6,4	36,5	4,4	7,9	4,9	13,3
P7	6,2	14,9	5,5	15,2	6,1	25,1
P8	4,7	16,2	5,6	16,5	5,7	22,6
Pref S2*	2,9	0,0	6,1	22,5	5,2	11,8
TOTAL		100		100		100

* product preferred by segment 2; product profile description: see Annex 9.1.

To illustrate market share predictions according to the different segments and to focus on the importance of adequate pricing in market oriented positioning of on-farm processed products, market share predictions across the segments are calculated according to the Maximum Utility model. This is presented in Table 9.6. The Maximum Utility model is used since it is the most appropriate for markets with wide differences.

Let us suppose that a farmer focuses on consumers belonging to and corresponding with the characteristics of segment 2, when producing and selling on-farm processed yoghurt of type P7. The most preferred yoghurt by this segment is packed in glass, sold at the farm at a price of 1.36 EUR (500 g) with a shelf life of three weeks and providing additional product information. This product obtains a predicted preference score of 6.1 and a market share of 22.5%. Comparing the most preferred one with P7, a difference in attribute levels is noticed for price and shelf life. This product obtains a preference score of 5.5 and a market share of 15.2%. Based on these assumptions, better price setting and an extended shelf life for P7 should definitely lead to an increase in market share. It indicates and illustrates that adequate market positioning can result in capturing additional market and income. An increase in price is supposed to have a positive impact on both sales volumes and margin.

These results are of interest for policy makers and farmers' organizations as well as for individual farmers. By stimulating farm diversification and the rural economy through on-farm processing, policy makers should provide the necessary support for collecting market information and for training in commercial and marketing knowledge. Unknown and new product opportunities, which are not matched by existing products, are revealed through market studies such as conjoint analysis. At the level of farmers' organizations and individual farmers, more market research could be undertaken to gain improved insight into consumer preferences and consequently to enable positioning of products in a market oriented way.

9.5 Conclusions

The more intensive focus on rural development and the rural economy within the frame of CAP reform provides opportunities for agricultural diversification, such as on-farm processing. However, when specializing in on-farm processing, the farmer becomes more a price setter than a price taker. Price setting is rather a new concept for farmers. Inadequate market orientation in price setting results in income and profitability losses. In this analysis of the case of on-farm

processed skimmed yogurt, it is illustrated that a more market oriented approach based on collecting market information is advisable. Conjoint analysis can be used to define the most preferred product in different market segments and reveal new product opportunities. It can be useful in examining the role that different product attributes play in the evaluation process regarding food products. Moreover, it creates the ability to identify and target market segments based on different levels of attributes. By clearly targeting one of these segments and by working in a more market oriented manner, a more adequate price setting and consequently better profitability can be obtained.

Related to price setting, the price sensitivity meter reveals results similar to the conjoint analysis. Price setting at the optimal price or within the range of acceptable prices does not always take place in the market for on-farm processed foods. In this way, farmers do not fully benefit from market opportunities in terms of additional income. Higher pricing than the conventional, industrial counterparts seems to be the best option in the long run to retain a larger part of what the final consumers pay at the regional level.

In recognizing that small farmers and processors may not have the necessary resources and skills to develop their market and to position their products, it is useful to concentrate future efforts on ensuring a high profile for on-farm processors and to provide them with the necessary assistance to exploring market opportunities. Future research could focus on how to work out a proactive strategy and the potential roles of policy makers and professional organizations as well as the individual farmer. In this regard, principles and techniques used in marketing management have some use.

Annex 9.1 Description of products used for predicting market shares according to the identified attributes and levels, on-farm processed skimmed yogurt of 500 g.

Product	Attributes and levels				
	Packaging	Outlet	Price (EUR)	shelf life	Info
P1	Disposable/reclosable	Shop	1,36	3 weeks	Yes
P2	Disposable/not reclosable	Shop	1,12	3 weeks	Yes
P3	Glass	Shop	1,36	3 weeks	Yes
P4	Disposable/not reclosable	Shop	1,12	3 weeks	Yes
P5	Glass	Shop	1,12	1 week	No
P6	Disposable/reclosable	Farm	0,87	1 week	No
P7	Glass	Farm	0,87	1 week	Yes
P8	Glass	Market	1,12	1 week	Yes
Pref S2*	Glass	Farm	1,36	3 weeks	Yes

* Product preferred by segment 2

Annex 9.2 Questionnaire on-farm processed yoghurt.

Chapter 10: Conclusions and Future Research

10.1 Introduction

As indicated in the title of the thesis 'Changing Marketing Environment and Competitiveness in the Food Industry', the doctoral research focused on changes in competitiveness and its determinant factors. Moreover, the research discussed the way the food industry develops alternative or anticipating strategies given the changes in its external environment.

In the final chapter, the first section discusses the main results of the research in relation to the research questions formulated in the introductory chapter. The second section assesses the implications of the study and the final section concentrates on research limitations and directions for future research.

10.2 Discussion of results

The discussion recapitulates the main results of each chapter and provides at the same time an answer to the research questions formulated in Chapter 1. Each of the research questions is repeated and followed by a discussion.

1) What are the interrelationships between structure, conduct and performance (SCP) of the food industry?

In Chapter 2, we discussed the performance of the European food industry using the SCP paradigm. Here, the focus was on the interrelationships between the components of the paradigm. We learned that increasing concentration at the level of the retail sector on the one hand and changes in food consumption patterns on the other, has resulted in structural change (increasing concentration) at the level of the food industry. In turn, suppliers of raw materials to the food industry such as the agricultural sector are forced to increase their bargaining power and to become more market oriented.

The analysis of the impact of structure and conduct on performance revealed that wage increases (investments in people) in large firms are coupled with productivity increases, which means that wage increases are not passed on as price increases. Empirical evidence also suggests that larger companies are associated with higher profits, either because of higher prices or because of lower costs. When the effects of concentration on costs is larger than the effects on prices, then high concentration creates net social benefits. It refers to the fact that the gains to producers are larger than the losses to consumers.

The introduction of new concepts such as supply chain management and traceability systems in the food industry has shifted the emphasis from the performance of the individual firm towards the performance of the chain as the key determinant of future success. In the future, the performance of the firm will no longer exclusively depend on its individual effectiveness and efficiency, but mainly on the performance of the chain to which the individual firm belongs. The success of the chain will become an important factor in explaining a company's success.

2) How should competitiveness at industrial sector level be evaluated?

In Chapter 3 we presented the attractiveness/position (AP) indicator for measuring competitiveness at industrial sector level on export markets. We placed it in the spectrum of the currently available instruments aiming at measuring and explaining competitiveness. The emphasis is on the industrial sector, rather than on the individual firm, strategic groups or the entire economy. Essentially, the AP-indicator focuses on market size, market growth, market share and market share growth.

Since the availability of tools to measure competitiveness at industrial sector level is rather poor, we believe that the AP-indicator contributes to the filling of this gap. The AP-indicator enables the analyst to verify how a sector adapts to changes in target import markets. The conjunction between total imports on the one hand and total exports on the other, provides a clear overview of the evolution in competitiveness. Additionally, the AP-indicator permits comparisons between the evolution of different products within the same sector.

Finally, the AP-indicator enables comparisons between different target markets at the same time through a standard and common approach.

The AP-indicator is also characterized by some limitations. First, the boundaries between high, medium and low are subject to an arbitrary decision of the researcher. However, it is our experience that using the average and 50% of the average provides a well distributed picture over the different product categories. Second, the AP-indicator is limited to market size, market growth, market share and market share growth. Other factors such as concentration, technology, bargaining power and service provision can also influence the competitiveness of an industrial sector. Nevertheless, the most important factors for evaluating competitiveness are included in the model.

Chapter 4 illustrates the use of the AP-indicator by means of an example from the Belgian pig meat sector. The chapter includes a discussion of the determinant factors of what is measured, using Porter's Diamond. From the AP-indicator, it becomes clear that Belgium is not always able to maintain its competitive position on its main export markets. This is especially true with respect to the French market, where competitiveness has weakened.

An analysis of the pig meat sector using Porter's Diamond shows that management within the sector has to be adjusted, with the aim of controlling costs and increasing productivity. The sector is confronted with an urgent need to invest in people rather than in production capacity. With about half of the pig meat exports going to Germany, Belgian slaughterhouses and cutting units occupy an extremely vulnerable position. One way of dealing with this vulnerability is to focus on new emerging markets such as the Central and Eastern European Countries (CEEC's). Further, the Commission should insist that national authorities should strictly apply Community Regulations related to export standards. The problem of a structural overcapacity within the European pig meat sector should, in other words, be solved in collaboration with the public authorities. A restructuring plan should be worked out with the aim of buying out capacity.

The use of Porter's Diamond to explain the competitiveness of the Belgian pig meat sector has revealed both the strengths and weaknesses of the approach. A major strength is that the Diamond provides a practical checklist to explain competitiveness and that the emphasis on mutual relationships between the different components of the Diamond is extremely useful. A major weakness relates to the fact that its value as an analytical tool is limited, as interpretation by the user may become subjective. A second weakness is that one component of the Diamond can be so dominant that it counterbalances the other components, even if these suggest high competitiveness. This is particularly the case in a sector where government intervention is strong, such as the meat sector.

3) What are the possibilities and problems when introducing a technological innovation in a traditional sector such as the agribusiness sector?

In chapter 5, we looked at technological innovation in the agricultural sector. Hereby, the focus is on electronic marketing of cattle. Some important possibilities and problems were revealed through primary market research on both the domestic and foreign markets.

Electronic marketing systems in the agricultural sector are characterized by organized trading, centralized sales negotiation, remote market access, description selling and post-sale shipment. Organized trading or exchanging products implies a set of behavioral rules that apply to all participants. Centralized sales negotiation means that numerous buyers and sellers are readily available and accessible, as opposed to one-to-one trading. Remote market access means that neither buyers nor sellers need to be physically present at the same location. Participants enter the market via telephone lines and Personal Computers. Because of description selling, products are not moved to a central location for inspection by potential buyers. Post-sale shipment means that sellers maintain physical control over the product until it is sold, resulting in a saving in shipping time.

The survey of farmers revealed that about three quarters intend to sell cattle through an electronic marketing system. The main benefits sought by the farmers when using such a system have to do with access to adequate market information

and correct payment according to the quality delivered. Objections have to do with selling cattle without seeing the animals and using the computer. The interviews with slaughterhouses revealed that both advocates and adversaries exist. Important objections relate to the disappearance of the livestock markets as a place to meet colleagues, the elimination of cattle merchants as assemblers and transporters, the lack of visual representation and personal contact with the seller, the trustworthiness of the classifiers and the compatibility of the European classification system with the Belgian type of cattle.

Conditions for the successful introduction of electronic marketing on the Belgian cattle market include firstly the creation of a competitive market, where several buyers and sellers participate. Second, the necessary scale to cover operational and financial costs should be feasible (so called 'minimum-vitalis'). Third, both parties should agree on and accept the description method. Fourth, performance guarantees are required related to delivery and payment. Fifth, the introduction of electronic marketing should take into account and be able to overcome the competitive reactions from cattle merchants and livestock markets. Sixth, venture capital and entrepreneurship will be necessary to convince the many adversaries in traditional markets. A seventh and final condition for the successful introduction of electronic marketing relates to the training and education of both market participants (buyers and sellers) and classifiers.

4) What can the new institutional economics literature contribute to a better understanding of the difficulties of Central and Eastern European Countries (CEEC's) in preparing accession to the EU?

In Chapter 6 an overview of the literature related to the New Institutional Economics (NIE) is provided with a view to investigating whether these approaches are useful in understanding the problems that the CEEC's face in preparing for accession to the EU. The investigation focuses on the Polish fruit sector as a case study. Here concepts and dimensions based on transaction cost economics and on the potential consequences for economic development are used as a framework for the analysis.

Reforms made disappear the central planned economy. However, nowadays no valid alternative is currently available in most sectors of the agri-food business. The study reveals that the lack of adequate and appropriate institutions and contract enforcement mechanisms in the post-reform Poland is one of the major factors explaining the current problems they face. Without adequate and appropriate market institutions, transaction costs remain high, competition is inhibited and monopolistic power develops. These institutions include financial, legal, communication and marketing institutions that underpin the agri-business sector in Western economies.

However, it is not sufficient to simply copy institutions such as written contracts, wholesale markets or auctions from Western economies. Current priorities can be identified at other levels such as building reputations, providing information, grading, training and education. The only way to participate in the long run benefits is to open markets and face competition within the globalising economy. This will also reduce the costs associated with resistance to change and maintenance of the present institutional status quo. The lack of necessary institutions together with mass privatization and liberalization and high transaction costs could lead to the creation of monopolies and therefore to a sub-optimal distribution of rewards.

The transaction cost approach both in terms of the institutional environment (rules of the game) and institutional governance (organizations) contributes to the analysis by clarifying the impact on vertical co-ordination in the chain. When applied to the problems of the CEEC's, it is essential to understand how transaction costs emerge (hold-up problems) to be able to develop the correct policy reforms and consequently adequate institutions. The latter should focus on the reduction of transaction costs through the creation of economic incentives to guard against opportunistic behaviour.

5) What determines changes in consumer behaviour towards food and how does this influence marketing management?

Food consumption is characterized by increasing concerns about weight problems on the one hand and by a growing sensitivity to health issues on the

other. Chapter 7 investigates consumer behaviour towards light products and reveals that dairy products are the most popular light products in Belgium. However, consumers do not perceive dairy products as light products. The study indicates that only products where the word "light" is clearly marked on the packaging obtain a relatively high "light image", but these products show the lowest degree of penetration at household level.

It is evident from the study that consumers of light products are motivated by factors such as weight control, illness prevention, dietary improvement and family purchases. Changes in the diet through consumption of light products are often the result of recommendations from a medical doctor/dietitian or of information obtained from books/magazines. Demographic factors also appeared to have a major impact on consumption of light products. Households with children younger than 16 years and those with elderly females consume less light products, while households with women working outside of the home and/or which include several females consume more light products.

The empirical findings of the study show that there is evidence to suggest that the word "light" on the label or the packaging of a product is no longer a guarantee for success. Because of abuses, highlighted in the Belgian press, consumers no longer trust the label "light", especially when focusing on the slim figure. Individual firms need to take account of these findings in planning marketing strategies and product development.

6) Does a strategic alliance based on integrated quality management provide potential for meeting consumer requirements?

The introduction of new management techniques such as supply chain management, efficient consumer response, value-added partnerships, total quality management and integrated quality management stimulates the creation of strategic alliances between companies or groups of companies in the agribusiness sector. Together with the desire of consumers to get information about the origins and production processes of the food products they buy, opportunities may exist for chains to create a competitive advantage by

responding to these consumer requirements as a chain and not as an individual company.

Chapter 8 investigates the existence of such opportunities in the processed-vegetables sector, by identifying the ideal image of vegetables. The vegetable consumer is confronted with a dilemma. Most consumers approach vegetable consumption emotionally. On the one hand, fresh vegetables are perceived as the best product in terms of health, quality, nutrition and naturalness. On the other hand, the preparation of fresh vegetables is increasingly considered as too time-consuming, especially by working people. Under these circumstances, the consumer looks for an alternative in the form of processed vegetables: frozen, canned or glass-packaged. To justify this choice to other people such as family members, consumers look for rational support. Consumers' search for rational support offers great opportunities for chains that manage first, to guarantee integrated quality management, and second, to work out the realized consumer-driven chain improvements as an effective communication tool in responding consumer requirements.

7) Can agricultural policy learn from marketing research in promoting farm diversification?

The more intensive focus on rural development and the rural economy under the Common Agricultural Policy (CAP) provides opportunities for agricultural diversification, such as on-farm processing. However, by specializing in on-farm processing, the farmer becomes a price setter rather than a price taker. Price setting is rather new for farmers. Inadequate or lack of market orientation in price setting results in a loss of income and profitability.

These problems are illustrated in Chapter 9 an investigation of skimmed yogurt that has been processed on-farm. The entrepreneur is advised to follow more market oriented approach based on the collection of market information and targeting of market segments. The result should be more adequate price setting and consequently better profitability and income. The findings in Chapter 9 illustrate that farmers do not fully benefit from market opportunities because of non-optimal price setting.

It is useful to concentrate future efforts on ensuring a high profile for on-farm processors and to provide the necessary assistance in exploring new markets, as small farmers and processors may not have the necessary resources and skills to develop their market and to position their products.

10.3 Implications

Implications from the research are situated at four levels, namely science, industry representatives, policy makers and individual companies. In what follows, each of these implications is discussed.

At the scientific level, the thesis provides, with the AP-indicator, an interesting tool for assessing the competitiveness of industrial sectors. The indicator is a result of the integration of current knowledge from trade based indicators of competitiveness on the one hand and from portfolio planning methods on the other. The advantages of both approaches are integrated in the indicator:

- Trade based indicators of competitiveness enable to position an industry or a country relative to a set of countries or even to the world economy;
- Portfolio planning methods bring structure into chaos by the portraying of product/market combinations.

This results in the creation of an indicator able to portraying changes in target markets and to verifying whether or not the competitiveness of an industry or sector strengthens, stabilizes or weakens. Both industry representatives and policy makers could use the indicator to monitor the competitiveness of industries and to compare with the targets set. When deterioration is noticed, additional information can be collected and the necessary measures can be worked out to reverse the situation.

In addition, the thesis illustrates that the integration of knowledge from strategic and marketing management can be useful in understanding problems in the field of the agribusiness sector. These problems are traditionally tackled by using the principles from agricultural economics, which rely mainly on the knowledge developed in classical and neoclassical economics. Since the confrontation of

the agribusiness sector in the EU with changes in the market and in the competition will be intensified, the insights from both strategic and marketing management will be helpful to become successful in the future.

At the level of industry representatives, the research results (Chapter 2 and Chapter 4) provide arguments for the industry as a whole as well as its sectors to continuously monitor the external environment in which they operate. Two reasons motivate this statement:

- The structure of the food industry is dominated by small and medium sized enterprises (SME's). Consequently, companies are disadvantaged at the level of economies of scale. The installation of a common structure to monitor and report on changes in the external environment could counterbalance this disadvantage.
- Changes in the environment of the food industry are expected to become more frequent and more intensive, mainly because of two elements. First, the modern information and communication technology enables a quick and wide availability of information. This technology also provides opportunities to reorganizing the relations in the food chains (traceability systems, networking). Second, the shift in consumer requirements based on concerns related to food safety, animal welfare and the environment will become more frequent (Henson, 2000; Ilbery & Kneafsey, 2000).

Currently professional organizations in the Belgian food industry mostly limit their activity to lobbying and rarely focus on marketing and management topics. Providing such information would enable the members of these professional organizations to identify opportunities and threats in the external environment. Once the information is available, it is up to the individual firms to integrate this information in the internal decision making process and to confront it with the own resources and capabilities.

At the level of policy makers, two implications can be suggested. First, research results from the thesis provide evidence to suggest that industry clusters will remain in the locations and the regions where the infrastructure, industrial climate and competitive dynamics are well developed, despite the fact that lots of barriers have disappeared in the EU (Chapter 2). Regional and national

authorities can support an industry with the development of infrastructure, education, research and development, and by creating a climate for innovation and incentives to create and improve sector specific companies. Industrial policy should be less general and more industry or even sector specific since both regions and industry or sector requirements differ (Lagnevik & Kola, 1998). This is especially the case in the agribusiness industry. The CAP is an example of a sector specific policy and has proofed its success. Nowadays, the CAP is under discussion, mainly because of the declining economic importance of the agricultural sector. It could be suggested to broaden the CAP and to include the whole agribusiness sector into a 'Common Food Policy' (CFP). Because of its economic importance, more and stronger legitimacy could be obtained from society. When implementing such a tailor-made policy for the agribusiness industry or one of its sectors, the conceptual framework developed in chapter 1 could be helpful in improving policy efficiency.

Second, the thesis demonstrates that using the principles of the NIE could help policy makers in tackling the current problems faced by the CEEC's as they prepare for accession to the EU. These principles mainly relate to the fact that formal rules and norms require support from both society and the business environment in terms of informal norms and values. The specificities of the CEEC's should be studied to ascertain whether the necessary legitimacy is present before introducing Western formal rules and norms. Without the legitimacy of the society and the business environment, formal rules and norms have no chance of success.

At the level of the individual firm, this doctoral research has collected empirical evidence (Chapter 5, Chapter 7 and Chapter 9) for stimulating and implementing a more market oriented approach in food production. Changes in the external environment of firms should be confronted taking into account the assets the firm owns and the way it is organized. It should result in anticipating strategies to obtain competitive advantage and sustainable competitiveness. The doctoral thesis also provides evidence in support of the building of stronger relationships at the level of the chain to meet consumer requirements (Chapter 8). Opportunities exist to differentiate as a chain rather than as an individual

company. This requires the identification and selection of a chain leader to take the lead in such co-operation.

10.4 Limitations and future research

Before starting with the discussion of the limitations and formulating some suggestions for future research, we want to draw the attention to the fact that market orientation should also be present in conducting marketing research. Just as Grunert et al. (1996b) indicate, scientific research in the field of agricultural economics in general and marketing research in the agribusiness sector in particular should contribute to the generation of knowledge and therefore live up to the standards of scientific excellence. However, our research should also live up to the standards of practical usefulness and contribute to the generation of economic development and public welfare.

Because of the broad spectrum of topics covered in the thesis, it is evident that the research is characterized by some limitations. These limitations are discussed per chapter and could be addressed in future research.

Chapter 2 uses the SCP-paradigm to assess the performance of the food industry in the EU. Two limitations should be clarified. First, by using the SCP-paradigm to analyze the food industry important factors such as resources, capabilities and core competence are not taken into consideration. These topics are introduced more recently in strategic management literature with the work of Wernerfelt (1984) and Hamel & Prahalad (1994). Future research could concentrate on the question whether or not the use of these principles and especially the creation of core competence could be useful in studying and developing competitive advantage for an industry as a whole or for a particular sector. We also agree with the proposal of Thomas & Pollock (1999), namely that there is a need to investigate the impact of core competence at different levels of analysis (business unit, firm, strategic group, industry, nation). This could illustrate the importance and identify differences in the role of the different stakeholders.

Second, the performance indicators used to assess the performance of the food industry are limited. Other performance indicators such as public health status, operational efficiency and technological progressiveness are not taken into account. This may lead to some bias in interpreting the results. A major problem related to incorporating these variables into research is the lack of data. Both the number of variables available at EU level and the quality of the collected data are questionable. In order to develop an efficient food policy, there is an urgent need for more data collection and for a higher quality of the data collected. Since we are confronted with globalising economies and markets, the decision making process both at company and policy level should be supported by the availability of knowledge and information that surpasses national boundaries. Future research and information gathering should not be limited to regional or national markets, but include the globalising economy. The possibilities of creating a strategic alliance between government, industry and knowledge institutions should be investigated. To use the terms from strategic management literature, such a knowledge base must be seen as an important resource for the food industry.

In chapter 3, we develop the AP-indicator and can identify two limitations. First, the variables included in the AP-indicator are limited to market size, market growth, market share and market share growth. It is evident that other variables may have an impact on competitiveness (e.g. intensity of competition, opportunities and threats, financial strength). Future research could concentrate on extending the AP-indicator by the introduction of additional variables.

Second, we recognize the arbitrary nature of the AP-boundaries in distinguishing low, medium and high AP-categories. However, the sensitivity of these boundaries to changes in the scaling factors was not checked. The possibility exists that the conclusions about competitiveness change when other scaling factors are used. This possibility could be investigated in future research by changing the scaling factors.

Chapter 4 assesses competitiveness in the pig meat sector. After the calculation of the AP-indicator, competitiveness is explained by applying Porter's Diamond.

Explaining competitiveness is limited mostly to statements based on qualitative findings. Future research could concentrate on quantifying such findings, particularly focusing on the dynamics of the Diamond. Therefore, structural equation modeling could be used (Hair et al., 1998). This technique allows to estimate multiple and interrelated dependence relationships.

In chapter 5 the introduction of electronic marketing is discussed. The research is limited to the identification of the necessary conditions for the successful introduction of this technology on the Belgian market for cattle. It is not verified whether these conditions are fulfilled on the Belgian market. However, the impression exists that given the recent food scares related to beef and other food products, the retailer organizes the chain in another way by contracting animals directly at farm level. This means that the role of the market as a place for price determination is eliminated. Future research could investigate whether or not this scenario will be more frequently installed in the future.

The research approach in this chapter concentrates on the determination of the willingness to work with such a system at the level of the market players, namely the slaughterhouses and the farmers. Future research could focus on the determination of the value created by the introduction of such a system for all links in the chain, including the final consumer. In such a study the concepts developed in the transaction cost economics (Williamson, 1985) and in efficient consumer response (FMI, 1993) could be included and deliver the conceptual framework for such a study.

Chapter 6 discusses the contribution of the New Institutional Economics to a better understanding of the problems in the CEEC's. Because of problems with the collection of the data, no quantitative results can be presented. This limits the justification of the findings. Nevertheless, the findings could be integrated in future research aiming at quantifying the stipulated relationships.

In chapter 7 consumer attitudes and behaviour towards 'light' products are discussed. The questionnaires were administered by mail. Several limitations can be mentioned. First, the data about behaviour are self-declared data. We

were not able to use other databases to verify whether or not this claimed behaviour corresponds with overt behaviour. Second, we might obtain bias from group completion of the questionnaire. Since we did not use face-to-face interviews, it might be that other people than the targeted respondent completed the questionnaire (e.g. neighbor, friend). Third, we collected cross-sectional data and are therefore unable to draw conclusions about causality of the relationships in the Triandis-model.

The topic discussed in Chapter 7 is inspiring for future research, which could concentrate on the question whether or not the decision making process for 'light' products is different from other food products. Therefore the Theory of Planned Behaviour (Ajzen, 1985, 1991) could provide the conceptual framework. Another future research topic could be to identify the determinants of changing food patterns, e.g. out of home consumption, changing social patterns in the households, information technology, and changing type of work

Chapter 8 provides input from the consumer side for integrated quality management. An important bias in this research may originate from social desirability of answers because of the face-to-face interactions of the interviewer and the respondent. Other research techniques and in particular experimental research techniques could be used to overcome this inconvenience.

The results of Chapter 8 include evidence for more intensive collaboration in the food chain. Future research on the precise working and implementation of chain management should generate knowledge as a basis for creating competitive advantage. It is expected that a condition of being a successful company in the future will require integration into successful chains. This will require the generation of better knowledge about the characteristics and dynamics of successful chains in order to capture the benefits from this change. In this context, we can agree with the suggestions for future research proposed by Omta et al. (2002):

- Which are the critical success factors for the design and control of chains?

- Which governance structures should be used to enhance the innovative potential of chains?
- How should firms share the costs and the benefits of their co-operation?
- How can the performance of a chain be evaluated quantitatively?

In chapter 9 empirical evidence is collected to suggest the incorporation of more marketing research in the political decision making. Taking account of the research set up (cross-sectional data, personal face-to-face interviews), the same limitations can be identified as mentioned above, including social desirability of answers and no conclusions related to causality.

It is evident that the political decision making process is largely influenced by what preoccupies consumers in general. However, it would be interesting to conduct consumer research in the future on differences between what is supposed to preoccupy consumers on the one hand and what consumers do in reality on the other (difference between claimed and overt behaviour; consistence between attitudes and behaviour). Therefore, experimental research would be a very useful instrument. In this frame, we can however not agree with the proposal of Davies (2001) to involve consumers in the decisions about the type of food and food production methods, and to create mechanisms for developing a dialogue with consumers and their representatives. In fact, this statement includes a pleonasm because policy makers already represent consumers. We agree that policy makers should listen more carefully and interpret correctly what they hear at the level of consumers, but we are not convinced that a dialogue would be helpful.

Summary

The food industry is one of the most important branches within the EU economy. The external environment of the food industry changes constantly. Agriculture and food is front-page news. Society is confronted daily with news about food shortages, environmental disasters, quotas, subsidies, food scares and scandals. Some of these changes are discussed in the doctoral thesis and linked with its impact on competitiveness and anticipating strategies. Therefore, principles from strategic and marketing management are integrated in agricultural economics. The research concentrates on the food industry as a whole or on one of the subsectors and does not focus on the level of individual companies.

The doctoral thesis comprises three parts and ten chapters, including a selection of eight papers. Each of these papers was or will be published in international journals or books. The first part of the dissertation analyzes the food industry and the competitiveness. It starts with an analysis of the food industry in the EU. Next, the Attractiveness/Position-indicator is developed, which enables to measure and to monitor competitiveness at the level of an industry or a subsector. Empirical research of the meat sector illustrates how the indicator can be used in practice.

The second part discussed some changes in the external environment of the food industry. The first subject illustrates the problems experienced when introducing a technological innovation (electronic marketing) in a traditional sector such as the agribusiness sector. Next, some of the problems with the preparations for the accession of the Central and Eastern European Countries (CEEC's) to the EU are discussed. Finally, the influence of changes in consumer attitudes and behaviour is illustrated.

In part three some possible strategies to anticipate the changes in the external environment are presented. First, it is investigated how consumer requirements can be an input to enhance and stimulate stronger collaboration in the chain. Here, the key element is integrated quality management. Second, it is advised to

use more intensively market information when stipulating public policy measures. In this way, public funds can be spent more efficiently.

The most important implications of the work can be summarized as follows:

- The AP-indicator is an interesting tool to measure and monitor the competitiveness of industrial sectors. The indicator is a result of the integration of current knowledge from trade based indicators of competitiveness on the one hand and from portfolio planning methods on the other. Trade based indicators are used to evaluate external trade performance. Portfolio models are used in strategic planning. This results in the creation of an indicator able to portraying changes in target markets and to verifying whether or not the competitiveness of an industry or sector strengthens, stabilises or weakens. Both industry representatives and policy makers could use the indicator to monitor the competitiveness of industries and to compare with the targets set.
- Through empirical research, it is illustrated that the further integration of knowledge from strategic and marketing management can be useful in understanding problems in the field of the agribusiness sector. In this way, problems can be tackled and solutions can be worked out.
- At the level of industry representatives, the research results provide arguments to monitoring the external environment. Two reasons motivate this. First, the food industry is dominated by small and medium sized enterprises (SME's). Consequently, companies are disadvantaged at the level of economies of scale. Second, changes in the environment are expected to become more frequent and more intensive, mainly because of two elements. First, the modern information and communication technology enables a quick and wide availability of information. Second, the increasing consumer concerns related to food safety will become more frequent.
- Changes in the environment are often industry specific. Research results from the thesis provide evidence to suggest that industrial policy should be less general and more industry or even sector specific since both regions and industry or sector requirements differ. At the European level, a 'Common Food Policy' (CFP) could be worked out to obtain a broader and stronger legitimacy from society.

- The specificities of the CEEC's should be studied to ascertain whether the necessary legitimacy is present before copying Western formal rules and norms. Without the legitimacy of the society and the business environment, formal rules and norms have no chance of success. In this way, the accession can be prepared more appropriate and more adequate.
- At the level of the individual firm, this doctoral research has collected empirical evidence for stimulating and implementing a more market oriented approach in food production. Opportunities exist to differentiate as a chain rather than as an individual company.

Samenvatting

De voedingsindustrie is één van de belangrijkste sectoren binnen de economie. De omgeving waarin de voedingsindustrie opereert is constant onderhevig aan veranderingen. Dagelijkse nieuwsberichten omtrent overschotten, voedselschandalen en subsidies zijn hiervan een illustratie. In het doctoraal proefschrift worden een aantal van deze veranderingen toegelicht en geplaatst binnen het kader van de competitiviteit van de voedingsindustrie en anticiperende strategieën die kunnen gevolgd worden. Hierbij worden principes vanuit het strategisch en marketing management ingepast in het landbouw-economisch denken. Het onderzoek concentreert zich op het niveau van de voedingsindustrie als geheel of op één van de subsectoren en niet op individueel bedrijfsniveau.

Het doctoraal proefschrift omvat drie delen en tien hoofdstukken, waarbij in totaal acht papers geselecteerd werden. Elk van deze papers werd gepubliceerd in internationale tijdschriften of boeken. Het eerste deel van het proefschrift analyseert de voedingsindustrie en de competitiviteit. Hierbij wordt gestart met een analyse van de voedingsindustrie in de Europese Unie. Vervolgens wordt de 'attractiviteit/positie indicator' ontwikkeld, die toelaat competitiviteit op het niveau van een industrie of subsector te meten en op te volgen. Via empirisch onderzoek in de vleessector wordt aangetoond hoe de indicator in de praktijk kan gebruikt worden.

In het tweede deel worden een aantal wijzigingen in de externe omgeving van de voedingsindustrie toegelicht. Problemen ervaren bij het introduceren van technologische innovatie (electronic marketing) in een traditionele sector zoals de agri-business zijn een eerste onderwerp. Vervolgens worden een aantal moeilijkheden, waarmee de kandidaat-lidstaten van de EU geconfronteerd worden bij de voorbereiding van de toetreding, besproken. Tenslotte wordt de invloed van wijzigingen op het niveau van consumentenhouding en -gedrag toegelicht.

In het derde deel wordt ingegaan op anticiperende strategieën die kunnen gevolgd worden bij een veranderende omgeving. Enerzijds wordt nagegaan hoe consumentenbehoeftes een input kunnen zijn om tot nauwere samenwerking te komen in de keten. Integraal kwaliteitsbeheer staat hierbij centraal. Anderzijds wordt aangetoond dat intensiever gebruik van marktinformatie bij het uitstippelen van het overheidsbeleid wenselijk is. Op die manier kunnen overheidsmiddelen efficiënter besteed worden.

De belangrijkste bijdrage van het werk kan als volgt worden toegelicht:

- De AP-indicator wordt enerzijds ontwikkeld vanuit bestaande indicatoren die gebruikt worden om buitenlandse handel te evalueren en anderzijds vanuit de portfolio models die gebruikt worden in strategische planning. Het resulteert in een indicator die de mogelijkheid biedt om veranderingen in doelmarkten te identificeren en te visualiseren. Het is een nuttig instrument voor zowel beleidsmensen als vertegenwoordigers van professionele organisaties.
- Aan de hand van empirisch onderzoek wordt meermaals aangetoond dat het integreren in de landbouweconomie van kennis vanuit marketing en strategisch management nuttig kan zijn om problemen in de agribusiness sector te onderkennen en oplossingen uit te werken.
- Het continu analyseren en opvolgen door beroepsorganisaties van veranderingen in de externe omgeving van de voedingsindustrie of sector is wenselijk omwille van twee redenen. Ten eerste bestaat de voedingsindustrie hoofdzakelijk uit KMO's, die dergelijke taak niet zelf kunnen uitvoeren omwille van het ontbreken van schaalvoordelen. Ten tweede wordt verwacht dat veranderingen in de toekomst frequenter zullen optreden omwille van beschikbare informatietechnologie en groeiende consumentenbekommernissen aangaande voedselveiligheid.
- Veranderingen in de omgeving zijn sterk verschillend in functie van de industrie. Het onderzoek brengt elementen aan die aangeven dat een specifiek beleid, gericht op de voedingsindustrie wenselijk is. Op Europees niveau zou dan kunnen gewerkt worden aan een Gemeenschappelijke Voedingspolitiek.

- Het kopiëren van Europese regelgeving naar Centraal en Oost-Europa zonder noodzakelijke legitimiteit van de plaatselijke bevolking werkt niet. Het is noodzakelijk om in te spelen op de plaatselijke waarden en normen. Op die manier kan een degelijke voorbereiding op toetreding tot de EU uitgewerkt worden.
- Op het niveau van het individuele voedingsbedrijf toont het proefschrift duidelijk aan dat het belangrijk is om in de toekomst meer marktgeoriënteerd te produceren. Hierbij zal in de toekomst samenwerking de keten zeker belangrijker worden.

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Scientific Curriculum Vitae

Xavier Gellynck (°1964) graduated in Applied Industrial Economics at Ghent University in 1987. He obtained an MBA (Diplôme d'Etudes Supérieures Spécialisées) in Marketing and Management of Service Industries at the Institute of Business Administration, University of Aix-Marseille (France) in 1988. Since 1989, he is involved with research at the Agricultural Economics Department, Ghent University. His main fields of interest include agribusiness economics, agribusiness marketing, market research, chain management and business-to-business relations. Xavier Gellynck is author of more than 80 scientific reports. Research findings were presented at several national and international conferences. The main topics are listed below making a distinction between journal articles, proceedings and books.

Journal Articles:

- Gellynck, X. & Verbeke, W. (2001). Consumer Perception of Traceability in the meat chain. In: *Agrarwirtschaft: Zeitschrift für Betriebswirtschaft, Marktforschung und Agrarpolitik*, 50, Heft 6, pp. 368-374.
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