

STRATEGIC RESPONSE TO INTERNATIONAL STANDARDS: INSIGHTS FROM THE BRAZILIAN BEEF CHAIN

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Abstract:

While Globalisation in the agri-food sector may provide opportunities for companies in developing countries to access international markets, it also threatens the existence of some sub-sectors. This paper reviews existing literature on co-ordination and international standards, identifying the importance of both to supply chain management. In the context of the Brazilian beef export chain, this paper contributes to the question of how exporters are changing their transaction practices in order to respond efficiently to those standards. In-depth interviews with key people and summaries of case study findings highlight the impact of international standards on the organisation of the export supply chain. It is highlighted that to be globally competitive, traditional mistrust and opportunism need to be overcome by the formation of network or quasi integration strategies between processors and suppliers. Prediction shows that sharing market information would lead to a supply chain management and could be considered trading-up.

Key-words: beef chain, international food standards, chain co-ordination.

1. INTRODUCTION

Standards are developed to signal quality, to respond to consumer's concern or to demonstrate compliance with a specific regulation. The establishment of standards may aid product differentiation providing access to niche market or assure safety. However, while standards may aim to provide greater transparency in the chain, conflicts of interest exist. For instance, participants may be seeking to appropriate added value of the product, if able to do so. It is fundamental to identify, in a chain analysis, the "co-ordinator" of the chain and how his power affects both the information and the material flows. Market information is considered a tool, which supports the setting of standards, and knowledge can be held to increase market power. However, the exercise of power does not have to be perceived as harmful. An example is a relationship where retailers, wanting to be recognised as prestigious, will teach manufacturers to produce better products. The learning achieved can aid to an internationally competitive company.

This paper aims to further the understanding of how the adoption of standards is impacting on established transaction practices used by the Brazilian beef export chain. In addition, it proposes changes in the co-ordination forms to respond more efficiently to the Globalisation process. Understanding changes in transactions due to standard setting has implication not only for the Brazilian Beef chain, but also to other supply chains coping with demanding markets.

This paper is organized as follows: Section 2 establishes the problem under analysis; Section 3 presents a theoretical background and data about the Brazilian beef chain; Section 4 details the method used; Section 5 summarises the results of four case studies and interviews carried out in the period 2001-2002 and, finally, Section 6 draws some conclusions and suggests further research.

2. STUDY PROBLEM

Until 1990 Brazil pursued a highly protectionist trade policy based on a complex system of non-tariff barriers and export incentive schemes which, combined with fiscal incentives and subsidies, resulted in a high degree of protection for specific sectors. The process of economic liberalisation, initiated in 1990, has produced significant changes in Brazil's foreign trade, resulting in a more competitive economy. This process was accelerated with "Real Plan" in 1994. Most markets can now be characterised by competition, participation of foreign firms through imports, local production and joint ventures between national and international companies. After more than ten years of liberalisation, deregulation and monetary stabilisation, food products are the only surplus in Brazilian external trade. However, products in which Brazil

has high competitiveness (such as sugar, poultry, coffee, beef and orange juice) have been finding strong barriers to the international market.

Brazil is a member of the World Trade Organization (WTO) and therefore has made commitments to subscribe to the Sanitary and Phytosanitary (SPS) Agreement, World Organisation for Animal Health (OIE) and to the underlying Codex Alimentarius (CODEX) principles. The country is also part of the Mercosur (South American Economic Block) along with Argentina, Uruguay and Paraguay. These countries implemented a common external tariff on the 1st January 1995. However, internal adjustments regarding regulation have been imposed to the economies of the country-members. But, so far, there has been no harmonisation in the SPS standards among Mercosur's members. Some sub-sectors, such as dairy and beef, have been negotiating to harmonise their SPS, but this initiative has been taken mainly by the private sector.

Vogel [1] states that as a consequence of international trade developing countries are adopting the high standards of their important trading partners. Consumers willing to pay more for higher standards demand companies working with lower standards to upgrade. In turn, as domestic companies have to comply with international standards, consumers in exporting countries will also benefit from stricter standards of importing countries. However, sometimes, these standards can be too high for consumers of developing countries. Nevertheless, these stricter standards will influence regulations and rules for domestic producers as well. This whole process is called **trading up** by Vogel [1] and Donovan et al. [2] and can be one of the benefits brought by Globalisation. However, Donovan et al. [2] also identify an opposite process: trading down, where developed countries lower their standards to compete with cheaper products produced under weaker standards. From this discussion, the broad question arises is that, if developing countries are becoming part of a concentrated and global supply chain, what are the consequences for their companies? Are they receiving any advantages from the compliance to international standards? The specific question that this paper contributes to answer is, how Brazilian beef exporters are changing their transaction practices to respond efficiently to these standards? In the context of the Brazilian beef export chain, this paper contributes to the question of how exporters are changing their transaction practices in order to respond efficiently to those standards.

3. THEORETICAL FRAMEWORK

Beef export is characterised by commodities, tight margins and non-tariff barriers, (scientifically supported or not) raised by developed countries. Low cost used to be the main competitive advantage. Today, however, some consumer markets, such as the European Union, demand differentiated products with higher margins and full compliance to both process and product standards due fears over e.g. food safety concerns. These requirements try to guarantee food safety but they can also function as non-tariff barriers. In other words, beef processors must respond not only to Brazilian regulations or domestic consumers, but also to a more demanding international consumer.

The supply chain has been described as a sequence of transactions arranged by market or formal mechanisms (contracts), based on ideas from Coase [3] and Williamson [4] [5]. The core is the dichotomy between co-ordination of production activity through market (made up of isolated small firms communicating through price signals) and hierarchy (exemplified by the large, vertically integrated corporation). Co-ordination allows the firm to receive, to process, to diffuse and to use information to elaborate competitive strategies, reacting to changes and taking advantage of opportunities. In addition there are real transactions occurring at intermediary points along this continuum (market- hierarchy) embodied in different forms of co-operation. The organisational forms between market and hierarchy are known as co-operation agreements. Those strategies have increasingly been used and studied because they tend to result in greater flexibility to new situations than vertical integration. This study uses the classification developed by Humphrey and Schmitz [6] to characterise the different forms of chain co-ordination:

Table 1 - The Characteristics of the Chain Co-ordination

Chain Co-ordination	Characteristics
Spot market	Both links do not collaborate over production system, which is considered standard. Risks to the buyer are low due to the ability of the supplier.
Network	Co-operation between two firms in the same level of power, size and/or technology.
Quasi-integration	Buyer defines the product and controls its production. Buyer invests on suppliers to reduce risk of failures.
Vertical Integration	Buyer takes direct ownership of operations.

Source: Adapted from Humphrey and Schmitz (2000).

Information plays a valuable role to the supply chain co-ordination and, consequently, competitiveness. Spot markets usually are based on price information. For example, Casson [7] emphasizes the influence of collecting information and communicating it to firms, corresponding to different links in the chain. For example, raw material supplier's price, processor's price, wholesaler's price and retailer's price. However, when under conditions of uncertainty or differentiation of goods, price alone cannot transfer all relevant information to the whole chain in such a way to allow it to allocate resources efficiently. Other forms such as networks or quasi-integrations are prescribed due to the enabling of partners to share information. There are basically two kinds of information along the chain: the market information and technical information. The importance of making a distinction of both kinds of information, technical and market, is due to the difference in the way each one is available. An entrepreneur can obtain market information depending on the nature of the prevailing economic organisation (for example, the degree of concentration) while his access to technical information does not.

3.1 International Standards for beef export

Compliance to food standards is a qualifier factor to international trade. Farina and Reardon [8] state that standards (along with grades) can be outcomes (product characteristics) or manufacturing processes related to quality, safety, authenticity and "goodness of the production process". Product characteristics include pathogens, toxins, hormones, food additives, and fat content, among others, while a process standard may involve animal welfare, traceability, feed, growth enhancers and biotechnology. Another study, focusing on Brazilian case studies by Reardon and Farina [9] concludes that private standards can become public when enforced by the government. Generally, private standards are imposed by transnational companies and "become" the rule of the market. When standards exclude companies or nations from the international trade, they can be considered non-tariff barriers on agricultural products and mainly affect developing countries, the late movers in the Globalisation process.

World beef production was estimated at 47 million tonnes with the United States of America being responsible for about 25% of this followed by Brazil, which produced 6,4 millions tonnes in 2000. However, Brazil exported less than 8% of its production in 2000, 315 thousand tons, of which 60% was fresh, chilled or frozen and 40% processed beef. Brazil has no access to the most important fresh beef markets (the US and Japan) due to food safety problems. Nevertheless, the

country has been increasing its export, which was valued at more than US\$ 1 billion in 2001 and 2002.

In order for Brazil to maintain an increasing export market, it is important to understand the impact of beef safety information on beef consumption. Flake and Patterson [10], comparing estimated elasticities, suggest that beef producers should maintain efforts in modifying their product with regard to both safety and health attributes. The more information a consumer has, the more concerned he/she is. The same authors affirm that the US and the EU consumer are shifting away from beef because of concerns over human health (such as cholesterol) and potential illnesses attributable to *Escherichia coli*, salmonellas and BSE (Bovine Spongiform Encephalopathy).

Furthermore, food safety issues may lead to changes in the traditional forms of transactions. According to Loader and Hobbs [11] food safety concerns creates an information asymmetry between all the buyers and sellers involved in the supply chain, meaning one agent in the transaction knows more than the other. This asymmetry of information alters the power relations during the transaction, where the seller usually knows more about the true quality of the product than the buyer. However, buyers have been developing mechanisms to obtain this information. Loader and Hobbs point out two kinds of response to this problem. The first is a private one, the firm-level response, meaning a certification or label to guarantee safety and quality. The second is a public response through legislation regulating the labelling and pathogen-reduction standards. Both responses (public and private) aim to guarantee true information keep the buyer and final consumer about the origin of the beef, how it was produced and whether it is free from diseases.

From the above discussion it is shown that a supply chain can be co-ordinated in different ways (market, hierarchy, network or quasi-integration) and different kinds of information (technical and market) flow in both directions of the chain. Another important point raised is that food standards can enhance (opening new markets) or reduce (eliminating companies) the supply chain competitiveness.

4. BEEF CHAIN

The paradox of the Brazilian beef chain, supplying two completely different markets (export-supermarkets and local retailers) is emphasized in a previous study where Silva and Batalha [12] split the beef chain into two sub-systems showing the impossibility of studying the beef sub-sector in a uniform way due to its heterogeneity. The Brazilian beef chain is represented by the figure below:

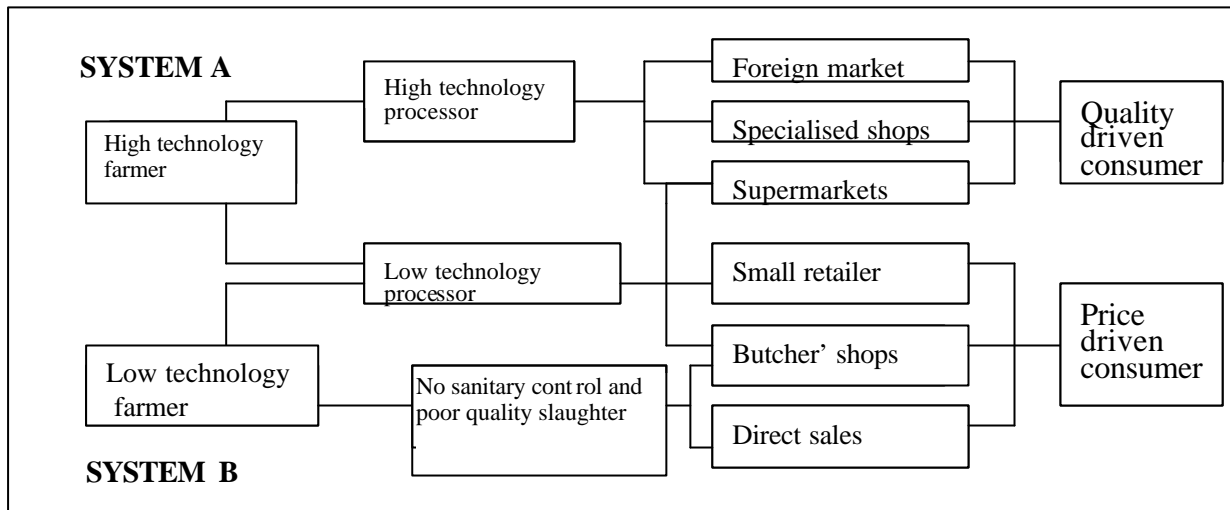


Figure 1: Two sub-systems in the Brazilian Beef Sector

Source: Silva and Batalha [12].

It can be broadly stated that system A covers requirements for urban towns (quality and price) or capable of supplying the international market as well. System B has little pressure to upgrade and just serves local markets, where price rather than quality is the driving force for purchase.

However, analysing the division made by this previous study [12], Zylbersztajn and Machado Filho [13] find that differentiating the heterogeneity of the Brazilian chain through technical standards alone is a reductionism. The authors affirm that both systems can be considered efficient. System B is organised to supply low income and geographically dispersed consumers with few or no demands for quality. These consumers are essentially price-driven. On the other hand, consumers supplied by system A are quality-driven. As a result of this feature, System A is organised to supply local and international markets covering international standards. According to these authors, the co-ordination of these chains supplying quality driven consumers tend to be through network or quasi-integration forms. The reason is to facilitate the information flow and assure food safety along beef processing.

Traditionally, a lack of trust between producers and processors in Brazil is common. Such bad relationships lead to the instability in the supply of cattle; no reward for quality or for physical distance between producer and processor and payment is given for dead weight and paid at least 30 days after the meat is received.

5. METHOD

As market concentration increases and sub-sectors become smaller in number in the agricultural sector, according to Sterns et al. [14], more case studies seems relevant to the development of agribusiness theory. Thus, this study adopts a qualitative approach to describe Brazilian beef supply chains, answering how these chains are organised. The focus is on the link in the middle of the supply chain (in this case, the beef processor) and the two sets of transactions downwards and upwards (T1 and T2).

The first step was to identify participants in the industry and the existent vertical or horizontal relationships. This was achieved through 19 interviews with key-persons and secondary data building a profile of the industry structure. 76 interviews were carried out, however, in this paper, only four case studies are presented, using documentation, focused interviews and direct observation (site visits). The link in the middle of the chain (beef processor/exporter) and its direct supplier were interviewed. Documentation included secondary data (such as theses, dissertations, journals, newspapers and technical magazines) and promotional brochures provided by the companies visited. When available, production costs and annual reports were also analysed.

Semi-structured interviews were carried out and took around two hours. The sessions focused particularly on the following issues: activities carried out by the company; interactions with other links (suppliers, customers) and to what degree; inputs and outputs features; how information is obtained; how prices are determined and problems perceived in the supply chain. These questions clarified the transaction features, levels of trust and power within each chain. The standards required were also discussed and their impacts on links and the whole chain. The following figure shows the issues underlying the data collection and analysis.

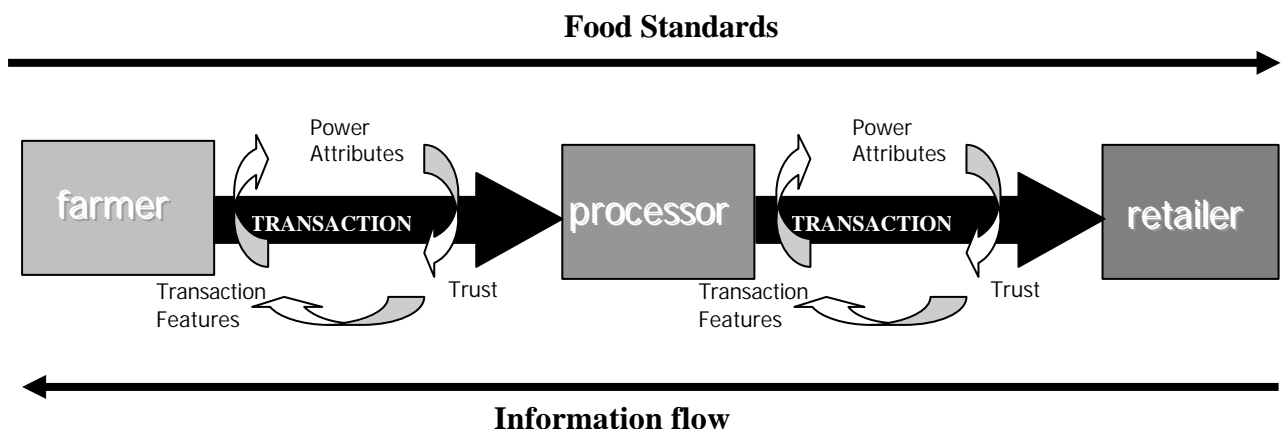


Figure 2: Research Construct

Findings can be analytically (or “theoretically”) generalised as suggested by Yin [15]. Despite their influence, other important links (such as input industry and wholesalers) of the supply chain are not covered in this study, as it deliberately focuses on the farmer -processor interface.

5. 1 STEP 1: Key Person Interviews and Secondary Data

Focusing on the processing link, this section presents results about the chain structure. Beef exporters have little flexibility for new activities due to high asset specificity (such as the processing plant, human resources training and food safety requirements). While the farmer can maintain livestock grazing, the processor has a higher risk of not selling due to the perishability of the beef. Farmers, due to the extensive production system adopted, have little difference on costs maintaining the cattle on the field for longer than planned.

Approximately 60% of Brazilian beef exports result from five nationally owned beef processors, a highly concentrated group organised as such to increase power in overseas transactions. These companies are extremely competitive, producing on a large scale and, recently, specialising in some products exported such as forequarter cuts and organic beef. Through the Ministry of Agriculture, and private company financial support, since 2001, an important horizontal co-operation has been promoting the Brazilian beef brand on the international market. Beef exporters have also invested in compliance with food safety standards through the implementation of HACCP (Hazard Analysis and Critical Control Points). Usually, HACCP consists of an internal team identifying critical control points throughout the process. Critical points in beef processing generally cover areas such as receiving raw materials, packaging materials, cleaning chemicals, process equipment, and the temperature of products during processing, chilling and freezing temperature controls. Investments in microbiological testing were also done. The beef processor must prove that control schemes are efficient and applied daily. HACCP may initially increase costs to beef processors, especially in an industry with low margins like beef processing. Still, the manager perceives it makes labour more aware of waste. Another important point raised during the interviews is that the compliance of HACCP removes from the market those small and medium companies that cannot produce large volumes and obtain scale economies.

Following the path identified by Reardon and Farina [9], private standards adopted by exporters are today part of the regulations of the Brazilian Ministry of Agricultural and Food Supply. These regulations are pushing for improvements in the whole chain, especially for beef processors that are not able to export. New legislation (for example, Portaria 130 e 145) requires improvements in terms of sanitary, technological and hygiene standards in the commercialisation and distribution of meat. Besides protecting the consumer's health, these regulations are reorganising the supply chain. Another Brazilian regulation (Portaria 046) states that Beef processors should apply HACCP (Hazard Analysis and Critical Control Points) to guarantee food safety. This international standard has been extended to the national regulation with only partial compliance until now.

A key mover in the Brazilian beef export increase was the creation of external agents to manage information flow (technical and market) and international advertising. There are two important associations, Abiec and Sicadergs (Sindicato da Industria da carne do Rio Grande do Sul), playing this role. Both created a common brand for a group of beef processors, Brazilian beef and South Brazilian Beef.

This initiative is an attempt to develop effective horizontal partnerships changing managers' opportunistic behaviour. Usually competitors, beef processors are having some adaptation difficulties in joining strengths, mainly when they have to share information. Awkwardly, processors are more effective developing horizontal partnerships than vertical ones. A probable reason is the homogeneity of this concentrated group as mentioned above. The horizontal partnerships can be considered a survival strategy used to increase bargaining power regarding even more concentrated links (national supermarkets chains and importers). One example is a joint venture that started in 2000 between Bertin (the largest beef exporters) and Friboi (the second largest beef exporter) and called BF (initial of the two company's name). BF is a plant processing with the capacity to slaughter and bone 800 head of cattle per day and employing 800 employees.

Regulations for traceability along the supply chain come previously from the EU directives 1760/2000 (17/07/2000) and 1825/2000 (25/08/2000). These directives establish a system for the identification and registration of bovine animals and regard the labelling of beef and beef products. Aiming to support and regulate this process, the Office of Agricultural Protection (SDA) from the Brazilian Ministry of Agricultural and Food Supply implemented the Normative Instruction 1/2002 from 09/01/2002, which creates the Brazilian System of Identification and

Certification of Bovine Origin, known simply as traceability. Summarising, this instruction states that an identification system to register bovines should be established and consisted on:

- Individual identification of the animal
- Creation of a Data base
- Animal passport (including animal movement)
- Individual registration of the animal to be maintain on farms and slaughterhouses.

In sum, other important agents, private and public institutions, and both internal and external to the supply chain, are co-ordinating efforts for the compliance of the food standards. In the next section, four case studies findings are presented to show the impact of the compliance within selected chains.

5.2 STEP 2:Case Studies

5.2.1. Case Study A

Case A is a family business and the largest Brazilian beef exporter selling 45% of its production to North America, Chile, Far East, the European Union and Middle East. It has five processing plants with total slaughter capacity of 5 100 cattle heads per day. Case A chose a backward vertical integration as a way of co-ordinate its chain, owning seven farms, where the traditional production system has been adopted (nursing, raising and fattening). On its seven farms, it breeds livestock to protect against price distortions or lack of supply. The farm manager is a family member. The vertical integration solves the problem of uncertainty regarding quality and timing. Case A also sources from farms around the processing plant, buying on auctions market or through agents. There have been few attempts to establish quasi-integration or networks forms with its suppliers and none of them was successful. During an interview with one of the processor occasional supplier to raise the reasons of the failure, it was said *“it is better to try to get some profit in each negotiation than to be tied by a long term contract”*. However, the vertical integration gives a security to the processor that, if some opportunistic behaviour occurs among one of its supplier, it has an alternative option. It reduces his information costs in the long-term. Therefore, it increases the processor’s power in front of his suppliers. Thus, this processor uses the two extremes form of co-ordination: vertical integration and spot market.

Concerning market information, Case A would like to know more about where its output is consumed. At present, the transaction is realised based on an inspector’s visit (representing the

importer) to the processing plant and monthly orders. This inspector checks the compliance with HACCP standards and the extrinsic and intrinsic cues of the final product (leanness, colour, package material, cut, marbling, etc). But there is no learning or knowledge transfer in this relationship. Case A has developed its own export brand and has opened up an office in the European Union to learn more about this markets dynamics and to try to negotiate direct with supermarket chains. This step also overcomes the power the importer in holding market information. It considers that this alternative was only possible due to his vertical integration strategy. The compliance of product standard such as HACCP is not a problem. The new requirement for traceability has been already started on Case A farms.

5.2.2 Case Study B

The second case study is the third largest beef exporter in Brazil. The company slaughters 2,800 heads per day at three different processing plants 70% of the total is exported. Besides supplying traditional beef, B also produces organic beef using vertical integration to assure the compliance with standards. Organic beef has a 5-10% higher margin and opens up sophisticated markets abroad (UK, Germany, the Netherlands). To be able to export organic beef, the company detained an ISO 14000 (environmental standards) and is certified by a Brazilian Institute (Instituto Bio-Dinamico). However, Brazilian organic standards are not considered equivalent to the European standards. Imports had to recertify by certification bodies in the importing countries. In the farm, 3 000 hectares are certified as organic where 7 300 bulls are bred. The organic beef has to be economically feasible (as other production systems), socially just and ecologically produced only. Only homeopathic and phytotherapeutic products can be given to the livestock and the pastures cannot receive artificial pesticides or fertilizers. Conversion to organic production, therefore, takes time (in average, two years).

The manager pointed out that if the organic market does not become as interesting as it promises, the company will still continue producing in the organic way. According to the Quality manager, this production system brings a change of mentality and value of waste, and ultimately reduces production costs in the long term. Both the fattening of the livestock and the productivity of the pasture is over average. So, the manager concludes, even if the margin does not compensate for the investment made, changing for organic production system worth it.

Additionally to the use of vertical integration to produce organic beef, spot markets are also taken advantage of. Case B argues that there is a lack of trust between farmer and producer to implement relationships such as contracts, networks and quasi-integration. But he also thinks

that this kind of behaviour is a barrier to the development of a real quality assurance scheme as required by importers.

Case A and B are located in the Mato Grosso do Sul and are part of the horizontal alliance to promote the Brazilian beef in the international market.

5.2.3 Cases Studies C and D

The other two cases are located in the Southern Brazil and have some similar features. Compared to the first cases, are smaller beef processors (processing 350 and 600 heads per day, respectively) but with a good access to international market due to the breed of European livestock. However, they do not sell using their own brand and instead are trying to reach niches markets (such as hotels and restaurants). Both buy their inputs on the spot market, but C is starting to develop alliances with local farmers. Due to the non-adoption of traceability by all farmers, cases C and D face problems in sourcing inputs. Local farmers prefer to trade to merchants that pay cash resulting in high quality beef being sold to either to local butchers or street market instead of more value added market such as the EU one. The main reason being the absence of premium price compensating for the extra effort required in implementing the standards.

Cases C and D comply with the HACCP requirement, but according to C, it adds 20% to the fixed costs.

5.4 CASE ANALYSIS

Beef exporters use two forms of co-ordination: vertical integration and spot market. The largest exporters hold a backward vertical integration as security stock mainly to avoid price distortions or lack of supply. It also gives a security to the processor that, if some opportunistic behaviour occurs among one of its suppliers, he has an alternative option. Additionally, it compensates against lack of trust as well. Vertical integration reduces his information and negotiation costs in the long-term although increase his monitoring costs. Furthermore, it increases his bargain power with his suppliers because he is dependent on them just at a certain point in time. The flexibility of maintaining the steer/bull grazing for unlimited time is a specific feature of the beef chain. Livestock can be slaughter at any time with only slight increase of the production costs. Risk and perishability is transferred to the processing link.

To reason why two cases adopt vertical integration and two cases do not, can be explained according to transaction features. The two cases where is an asset specificity (brand name and

organic) motivated cases A and B to use a vertical integration. Cases C and D can find many potential input suppliers for which future demand is uncertain, it may be cheaper to buy the input than to make it internally. However, process standard such as traceability can be considered asset specificity since they are not yet uniformly implemented. The monitoring costs are also higher. Therefore, farmers and processors will have to use other forms of co-ordination such as networks and quasi-integration and change the transactions practices so far established.

These four beef processors are well known exporters and invested in HACCP inside their companies. The two large companies are more willing to implement food safety a quality control systems, because they are a one-off expenditure and their large production easily justifies an investment of this scale. Now, however, they are under pressure by the EU regulation to develop **a proper supply chain**, moving from spot market to closer relationships. It is clear that this is not an easy move due to behavioural factors (existence of mistrust, opportunism, traditional practices) that prevent the use of network or quasi integration forms. The traceability emerges as the new international standard challenging beef processors.

When the traceability requirements began, a beef exporter Quality manager foresaw that all beef processors would pay a market price for an animal with traceability and less for the one without it. This comment highlights that the establishment of standards is top-down encompassing the whole supply chain. For example, the importer requires the new standards and Brazilian companies have to follow them. Consequently, Brazilian beef processors demand traceable livestock and the farmer have to cover this requirement. There is no extra payment, just additional costs.

The poor relationship creates losses to both links of the chain. For the beef processor, it brings a great uncertainty in finding the specific input at the right time (breed, age, traceable, among others). For the producer, there is an uncertainty of sales and prices. The adoption of vertical integration reduces this uncertainty but do not give flexibility to respond new situations and demands a high investment, not available for medium processors.

6.CONCLUSIONS

This paper has highlighted how Brazilian beef exporters are changing their practices in response to international standards, such as HACCP and traceability. Product standards such as HACCP are more easily implemented, however, process standard that involve supply chain management have not yet been successfully put into practice. Behavioural issues have to be overcome to allow changes in the transaction practices of spot markets. It is suggested that the formation of

networks and quasi integration strategies should be considered and the spread of market and technical information are necessary to the maintenance of the beef export chain competitiveness.

On one hand, international standards are a qualifying factor in international trade but also act as non-tariff barriers. These standards squeeze small sized companies with no capacity to invest in out of the market. On the other hand, compliance with standards is demanding new forms of co-ordination resulting in flexibility and information sharing. Organisational change would be considered as *trading-up*, the establishment of international strict standards bringing benefits to local environment. The new challenge for Brazilian exporters is the development of a trustable traceability scheme along the supply chain. So far, farmers are not investing in these schemes unless the beef processor covers/refunds these extra costs. Yet processors do not want to pay premium price and less so to the ones who do not supply according to the new requirements.

An interesting finding is that horizontal alliances have been made between the largest beef processors improving access to the international market (Brazilian beef brand). This is an important initiative showing that processors could move from competition to co-operation aiming the same target. Nevertheless, there is still low co-operation and minimal trust exists between beef processors and their suppliers. The majority of transactions still happen through spot markets. Some preliminary alliances should begin, mainly with large and technological producers, to guarantee the supply. This will allow a concentration process to start on the farmers' link, eliminating those with no traceability scheme from supplying large export companies.

One probable effect of complying with international standards is that the monitoring (traceability) scheme requires sharing of information throughout the supply chain. Co-operative arrangements will help to monitor safety standards to beef exported. Fearne [16] described a similar process of closer co-ordination happened in the UK after the BSE crisis in order to recover consumer's trust. After the natural structural adjustment, it brought a trading up as farmers participating actively in the chain receive market information and premium prices for their cattle. However, further research on the development of traceability scheme along beef supply chain and changes of co-ordination are recommended to confirm the issues pointed by this study.

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