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Producers and consumers' choices regarding cattle farming systems and products - surveys in Slovenia -

Editors

Abele Kuipers, Marko Verbič, Janez Glavač, Mira Kos-Skubic, Marija Klopčič



University of Ljubljana



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"Farming with Quota and
Premiums"

in cooperation with



Twinning project
SI06/IB/AG/01/TL:
"Cross-Compliance and
Good Farming Practices"



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"Food Quality Products"

in cooperation with



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Preface

Abele Kuipers, Project leader of Twinning projects and bilateral project & president of Cattle Commission of European Association for Animal Production (EAAP)

Branko Ravnik, Director of Directorate of Agriculture, Slovenian Ministry of Agriculture, Forestry and Food

Since Slovenia became one of the new members of the European Union, farmers and organisations worked on adjustments to the European environment and rules. Three so called EU Twinning projects between Slovenia and The Netherlands were executed from 2005 through 2009 as well as a bilateral project dealing with this adaptation. This cooperation focussed on dairy farm management, food quality products, and strategy and sector development. 66 experts, mostly from The Netherlands but also from France, Germany, Denmark and Norway, spend in total 553 working days in Slovenia participating in 126 open educational meetings and workshops. In addition, one technical advisor stayed for 16 months in the host country. The first Twinning project was ranked highest in performance of all EU agricultural projects in this region in that period, which resulted in a work visit of the Dutch Minister of Agriculture, Nature and Food Quality to the project. Especially the professional meetings organised in the winters of 2005/2006, 2006/2007 and 2008/2009 were very successful. These meetings attracted in total 3.800 farmers and workers from extension service and cooperatives and others. Several studies were performed mostly using questionnaires to collect data. The farming community was questioned regarding:

- Information and communication
- Future plans
- Farmer goals
- Opportunity and threats
- Entrepreneurial characteristics
- Emphasis on different traits in breeding program

Regarding opportunities for special local products and organic products, interviews with as well producers, processors as consumers were held. Moreover, perceptions towards home made, mountain, organic, traditional and industrial produced cheeses and sausages were examined.

The results of this series of studies are reported in this booklet. Some studies were already accepted as scientific articles, while others are in the process of further analyses, review and improvement or have just passed this stage. In addition, some more technical topics are included related to EU Cross-Compliance conditions, like animal welfare and landscape management. Concerning animal welfare, sound housing of cattle and sustainable economical breeding programs are described. Concerning landscape management, care of grassland and nature elements are discussed.

This booklet provides insight into the mindset of farmers and of producers and processors of special local products, and it examines the perceptions of consumers towards various food quality products. This material is useful to help in developing policies for the future and in extension and education work. It illustrates wishes and plans of important groups from the Slovenian society. We hope it will be appreciated.

Finally, it should be emphasised that the cooperation between all the persons involved in all these activities in last years was tremendous and very fruitful.

Information exchange and decision making of Slovenian dairy farmers under EU policies

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Summary

After accession to EU, farmers in the new-member states have to adjust to the EU agricultural policies and market. In Slovenia an analysis is made of the farm development plans and information exchange under quota and CAP. Three research questions were addressed: what information is received and how; how does the farmer prefer to receive information and what kind; how to make decisions to react to the new EU policies concerning farm management and future plans. These questions were linked to the base variables, being the farm and farmers' characteristics. As tool a questionnaire was distributed to dairy farmers. 1114 questionnaires, 22% of the distributed ones have been returned anonymously, implying that 11% of the dairy farmers' population is part of the analysis. It appeared that the research sample of farmers used represents the more future oriented farmers. As main factors describing the farm and farmers' characteristics were found farm size, age and number of other activities than dairy. Results show that nearly all farmers did receive information about some specific aspects of the quota system. Communication channels dealing with this administrative info and also with farm management advice are divers, but frequency of direct contact with advisors may be less than predicted. Results also indicate a very significant demand for info about strategic planning, farm management aspects and EU premium programs, especially about CAP general policies and milk premiums, and a considerable activity in farm planning. About 40% of farmers choose for keeping the farm business the same and 50% intend to develop the farm further. More than half of these developing farmers choose for specialisation and somewhat less than half for diversification. The interest in special local products and ecological farming is far below expectations. The request for information and advice and the routes to follow is very much associated with farm size, age of farmer and sometimes with the number of activities other than dairy on the farm.

For short overview of this article see Appendix of this chapter.

1. Introduction

The new Member States of the European Union have to deal with new policies and markets. In agriculture farmers may very well consider to change management on their farm and develop strategies for the future to adapt to the changing circumstances. Slovenia is one of the new members of the EU. In this country a project is started to guide farmers in adapting to EU regulations. This so called *Twinning Project* "Farming with quota and premiums" is a combined project of Slovenia and The Netherlands, financed by the EU.

The effect of general agricultural policies, including quota and premiums on macro developments in agriculture, like structural developments and price effects are well documented (Dillon, 1989; Kavčič and Erjavec, 2003; Jongeneel and Ponsioen, 2006), but effects on micro level, i.e. farm level, are less extensively

mentioned. Previous studies from the 1980's in Western Europe concentrated on the effects of the quota system on farm management (Burrell, 1989) and on animal breeding indexes (Groen, 1989). Berentsen (1999) performed model calculations analysing the effect of two environmental and two market policies on micro level, c.q. on the farm. A recent study of Huba et al. (2006) explains the effect of the quota system on animal breeding indexes, when introducing this system in 2004 in the new EU countries. Several studies address the link between characteristics of the farm, like size of farm and intensity of farming, and the characteristics of the farmer, like education, preferences, management styles and plans (Bergeroet, 2005; Willock et al., 1999). However, the role of information and communication as a result of EU regulations and premiums is almost never recognized as a factor in decision making at farm level. In a summary of three workshops on this issue concerning the introduction of the new countries to the EU (Kuipers et al., 2006) was concluded that "The main emphasis is clearly on administrative aspects while extension efforts towards farmers are in an initial stage". Also "The awareness of the impact of quota and premiums on the dairy sector and especially on the individual farmers is still at a low level."

Therefore, the objective of this study is to quantify and present how the current situation of the Slovenian farmer in regard to information availability on the EU quota regulation and CAP premiums relates to decision making in farm management and strategy choices. Moreover, this study does analyse the link between the wish for information about EU regulations, the role of organisations and magazines in facilitating the flow of information and resulting opinions about farm management plans and strategies.

The communication process from EU to farm is summarised in Figure 1. The most important stakeholders in this process are EU (parliaments and committees), Slovenian Ministry of Agriculture, Forestry and Food, facilitators (extension workers, advisors, magazines, internet, etc.) and of course the farmers. However this study does not include the info flow of EU to the Ministry and the info flow of Ministry to the facilitators.



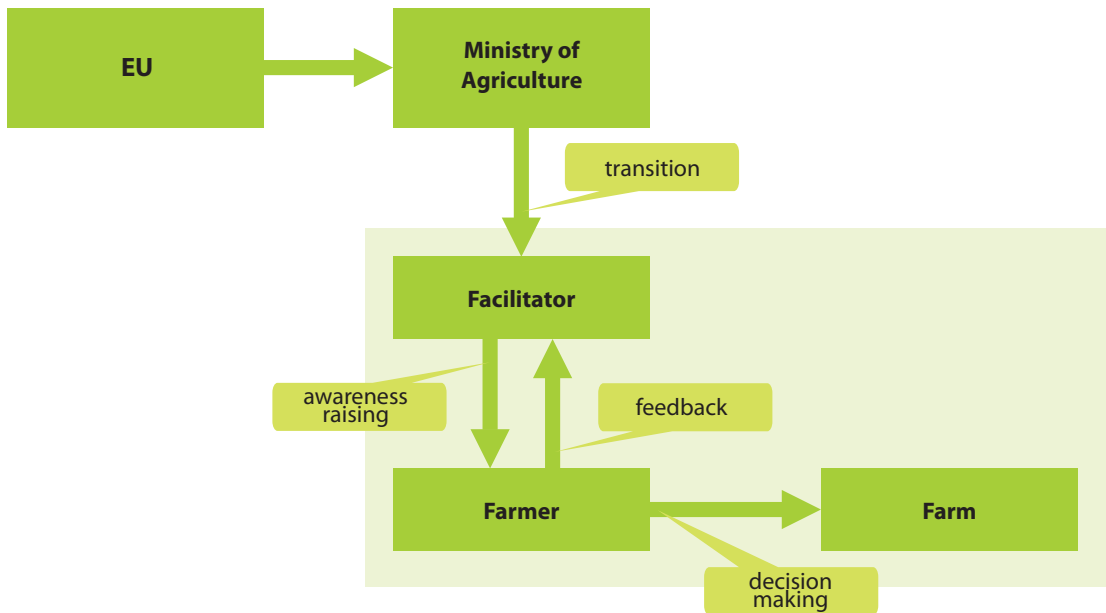


Figure 1. **Communication scheme of transmitting EU information to farmers**

Three research questions were formulated:

- What information is received now and how is it received? In Figure 1 this question refers to the link facilitator > farmer and is indicated as “awareness raising”.
- How does the farmer prefer to receive information in the future and what kind of information? In Figure 1 this question refers to the link farmer > facilitator and is indicated as “feed back”.
- How to make decisions to react to new EU policies? (concerning farm management and strategy / future plans). In Figure 1 this question refers to the link farmer > farm and is indicated by “decision making”.

To give an answer to the objective of this study, these three questions were analysed. As tool a questionnaire was used.

To structure the results of this study we start with a description of the characteristics of the farms and the farmers included in the research sample. Later on this description will be used to check if there are any associations between the answers on the three research questions and these farm and farmers’ characterisations. Secondly the current information structure and flow will be presented. Fourthly, the way the farmers like to receive information and what kind of information is described. Finally we tell how farmers think to make decisions in farm management and strategies to react to the EU quota system and premiums. This description of the study is completed with a discussion and conclusions.

2. Material and methods

2.1. Data

In winter of year 2005/2006 questionnaires with 27 main questions were sent to dairy farmers. Questions were asked about how farmers receive information about EU regulations, how and what kind of information they want to receive in future and how they think to react to the regulations in decision making on farm management and farm strategy. In this context the farmer is asked what kind of changes he considers to make at his farm in reaction to the quota regulation and general agricultural premiums. The questionnaires were distributed to 5,000 dairy farmers out of a total of 10,000 dairy farmers in Slovenia: milk haulers distributed the questionnaires to farmers in the cooperatives and the Twinning secretariat to farmers present at the organised meetings. 1,114 questionnaires were returned anonymously in a closed envelope resulting in a response of 22%. This group of farmers represented 11% of the total dairy farm population. The response was very satisfactorily considering the fact that Slovenian farmers are these days very reluctant to answer policy oriented questions. Nevertheless, we have to realise that the returned questionnaires are not fully a representative sample of the complete Slovenian dairy farm population. That is one of the reasons that we include in the results a detailed description of the farm and farmers' characteristics of the sample.

2.2. Variables

Some continuous variables were asked by marking classes. For the analysis the central value of each class is used to reconstruct the continuous variable again. This was done for instance for the variables Quota size and Farm size. If questions in the questionnaire were not answered the value is indicated as missing value and not counted in the analysis. In cases where options for answers were yes, no, perhaps or don't know, the values for this variable were reduced to a binomial variable: 1 is yes and 0 is not yes. An exception on this rule was introduced: for questions about "what info farmers like to receive about quota system and premiums", the missing values were included in "not yes". The reason behind this choice was that farmers systematically skipped answers that were not relevant to their situation (for instance farmers in flat areas skipped answer about premium for compensation payments).

2.3. Statistical methods

In order to check the answers in the questionnaire to be associated with the different types of farms and farmers, three variables were with STATISTIX 7, 2000 selected to serve as a quick characterization of the farm and farmer. The leading variable characterizing the farmer was: "age of farmer (years)"; the two leading variables characterizing the farm were: "farm size (ha of land)" and "number of other activities than dairy". Further on the term "main factors" is used for these leading variables.

3. Results

3.1. Farm and farmers' characteristics of sample

The average milk quota of the farms in this sample is 108 tons (Table 1), what is about twice the average amount of all dairy farms in Slovenia (Klopčič and Huba, 2006). The average farm size is 17.1 ha, which is high because this is 5.9 ha for all agricultural farms in Slovenia (SORS, 2002). 77% of the farmers in this sample participate in milk recording with an average production of 5,473 kg, while in practice 54% of farmers record the milk production of their herds with an average production of 4,896 kg (SORS, 2007). The percentage of 69% of farmers that expect to have a successor is very high and without doubt higher than in the total population. This description of farmer and farms in Table 1 indeed illustrates that the sample of farmers in this study does not represent all Slovenian dairy farms but the larger farms with higher productive herds and a high degree of succession.

In general Table 1 shows high associations of the farm characteristics with the main factors as it should be which results in rather high coefficients of determination (R^2) for the various characteristics. An interesting fact is that all farmers' characteristics are also highly determined by the main factors age of farmer and farm size, but not by other activities than dairy. Non agricultural employment exists especially for younger farmers at smaller farms. However, in general older farmers have smaller farms. Successors exist for older farmers at larger farms, and education is higher for younger farmers at larger farms.



Table 1. **Characteristics of farms and farmers in the research**

Variable (answer)	n	Mean	SD	Association with main factors ²⁾			
				A	F	O ¹⁾	R ² (%)
Characteristics of the farm							
Milk quota for processing plant (1000 kg)	1098	108.0	109.9		+***	–***	56
Number of dairy cows	1101	19.0	15.5	–**	+***	–***	58
Number of young stock (calves and heifers)	1114	16.7	13.1	–**	+***		35
Milk quota for direct sales (1000 kg)	1114	3.2	7.2		+***		7
Average milk production per cow (kg/year)	1059	5473	1504	–***	+***	–***	30
Agricultural land in use (ha)	1114	17.1	10.6	–***	X ³⁾		8
Farms with hilly or mountainous land (0); farms with flat or less favorable land (1)	1114	0.67	0.47		+**	+*	2
Farms with only Holstein Friesian cows (1); farms with other breeds or a mixture of breeds (0)	1109	0.13	0.34		+***	–***	8
Milk recording (no=0, yes=1)	1067	0.77	0.42	–*	+***		15
Number of fattening bulls	1114	2.1	4.5		+***	+***	13
Number of pigs	1114	4.7	26.4		+***	+***	5
Land for grain and maize (ha)	1114	5.1	6.8	+*	+***	+***	33
Forestry on the farm (no=0, yes=1)	1114	0.25	0.43			+***	11
Number of other activities on the farm than dairy ¹⁾	1114	2.0	1.5			X	0
Characteristics of the farmer							
Non agricultural employment of farmer/wife (no=0, yes=1)	1062	0.32	0.47	–***	–***		7
Successor on farm (no=0, yes=1)	1092	0.69	0.46	+***	+***		7
Age of farmer (years)	1100	51.5	12.7	X	–***		8
Farmers with education at public school level (0); education higher than public school (1)	1103	0.60	0.49	–***	+***	–*	19

¹⁾ In total there was a choice of 22 different activities (see Table 5). Choices related to dairy activities (calves, heifers, land for grain and maize, maize for silage) were not counted in this variable.

²⁾ Associations are tested by a linear regression model: variable = constant + b₁A + b₂F + b₃O. Constant is not presented. A is age of farmer; F is farm size; and O is number of other activities. Significance of b's is indicated by: * (p<0.05); ** (p<0.01); *** (p<0.001).

The sign of b is indicated by – in case of negative association and + for a positive association.

³⁾ X means not included in the model.



3.2. What information is received and how

Table 2. **What information is received and how it is received, and associations with farm and farmers' characteristics**

Variable (answer)	n	Mean	SD	Association with main factors ¹⁾			
				A	F	O	R ² (%)
Questions concerning what info is received now							
Do you know your butterfat reference? (no=0, yes=1)	1051	0.97	0.17		+***		1
Q5a: Did you receive explanatory info about quota system? (no=0, yes=1)	1096	0.94	0.24				0
Do you receive sufficient info about milk deliveries during the year compared to reference quantity? (no=0, yes=1)	1079	0.91	0.29		+***		1
Questions concerning how and from whom info is received							
If Q5a yes: from whom you received explanatory info? (no=0, yes=1)							
1 Ministry of agriculture and agencies	1001	0.38	0.49		+*		1
2 Extension Service	1001	0.40	0.49	-*			1
3 Agricultural chamber	1001	0.10	0.30		+***		2
4 Farmers Co-operative	1001	0.59	0.49				0
5 Co-operative Union	1001	0.01	0.09				0
6 Farmers Union/Syndicate	1001	0.02	0.13		+*		1
7 Dairy industry or milk processor	1001	0.09	0.29			+**	1
8 Other organizations	1001	0.06	0.24		+**		1
From whom do you receive info/advice about daily farm management practices? (no=0, yes=1)							
1 Extension Service	1114	0.69	0.46	-*		+*	1
2 Feed Company	1114	0.15	0.36		+***		5
3 University	1114	0.06	0.24		+***		3
4 Private consultant	1114	0.02	0.15		+*		1
5 Farmers Co-operative / Co-operative union	1114	0.28	0.45		+*		1
6 Veterinary	1114	0.31	0.46				0
7 Neighbours and friends	1114	0.33	0.47	-*	+*		1
8 Agricultural papers and magazines	1114	0.71	0.45	+**	+***		4
9 Radio and TV	1114	0.33	0.47	-*		+**	2
10 Internet	1114	0.17	0.37		+***		7
11 Other	1114	0.02	0.15				0
12 No advice	1114	0.04	0.20		-*		1

(continue)

(Table 2 continued)

Variable (answer)	n	Mean	SD	Association with main factors ¹⁾			
				A	F	O	R ² (%)
Appreciation for advice (score: 1- 5; 1=low; 5=high)							
1 Extension Service	1055	3.23	1.16		***	+	2
2 Feed Company	866	2.71	1.21		***		8
3 University	759	2.55	1.17		***		3
4 Private consultant	567	2.29	1.29				0
5 Farmers Co-operative	960	3.06	1.14			+	1
6 Veterinary	923	3.37	1.16	+			1
7 Co-operative union	779	1.97	0.97		*	+	2
8 Agricultural chamber	939	2.05	1.00		*	***	2
9 Dairy industry	878	2.02	1.14			***	2
10 Breeding organization	807	2.77	1.18		***	***	3
11 Ministry of agriculture and agencies	905	2.49	1.11				1
How often do you receive advice from your adviser on your farm management and plans per year? (≤ 1 time/year, score=0.5; 2–3 times/year, score=2; ≥ 3-times/year, score=5)	1058	1.90	1.67		**		1

¹⁾ Associations are tested by a linear regression model: variable = constant + $b_1 A + b_2 F + b_3 O$. Constant is not presented. A is age of farmer; F is farm size; and O is number of other activities. Significance of b's is indicated by: * ($p < 0.05$); ** ($p < 0.01$); *** ($p < 0.001$). The sign of b is indicated by – in case of negative association and + for a positive association.

More than 90% of farmers express that they received information about certain aspects of the quota system (Table 2). Larger farms are better informed than smaller farms.

In this administrative field the Farmers' cooperatives, Extension service and Ministry Agencies are the main facilitators in transmitting information (38-59% of farmers utilize each of these routes).

Info and advice about daily farm management practices come mostly from agricultural papers and magazines (71% of farmers) and from the Extension service (69%). The agricultural papers are mostly read by the older farmers on the larger farms. Internet is used on the larger farms, but still on a limited scale (17%). The Extension service is somewhat more active towards the slightly younger farmer with more activities on the farm. Feed companies and the University are mainly focussed on the larger farms.

The appreciation expressed by farmers (score 1-5) is highest for the veterinary, extension service and farmers' cooperatives (score 3 and higher) and lowest for the umbrella organisations (Agricultural Chamber, Cooperative Union), dairy industry and private consultants (score 2.3 and lower). The appreciation for the extension service comes mostly from the smaller farms with more often other activities than dairy on the farm. For the umbrella organisations the same tendency in appreciation seems to exist. On the contrary, Feed companies, University and breeding organisations are more appreciated by the larger farms, what corresponds with the focus of Feed companies and University as mentioned before.

The intensity of exchange of advice between adviser and farmer is on average less than 2-times per year with a large variation. This intensity is higher at larger farms. The communication channel in Slovenia is more extensively described by Klopčič et al. 2005.

3.3. Preference for receiving information and what kind

Most farmers (68%) prefer to receive advice orally and in the second place by agricultural journal (54%), which preference is not affected by the main factors (Table 3). Half of the farmers like to participate in a study group, which interest is increasing with farm size. The preference for internet is low (22%) and highly associated with larger farms and as expected with younger farmers. Radio and television are preferred by the older farmer.

More than 40% of the farmers indicate that they are prepared to pay for good expert advice. Especially farmers of larger farms say so.

About 40% of the farmers like to receive information about the quota system, with the highest interest for rules of quota transfer between farms and from the national reserve. Farmers of larger farms are especially interested in exchange and transfer of quota.

The degree of interest for info about the various EU-premiums is quite different: a very high interest exists for the milk premium and CAP general policies (72 and 62%) and an average interest for the more specific premiums (20-39% of farmers). The interest for suckler cow premium, early retirement premium and CAP general policies is associated with farm size (as well negative as positive associations) and for the suckler cow and beef premium, as can be expected, also highly associated with number of other activities than dairy on the farm.

A high interest exists for advice on daily farm management under a quota system (49%) and an even higher for assistance in strategic planning (65%). The interest is significantly associated with larger farms and younger age.

Table 3. **How does farmer prefer to receive information in future and what kind of information, and associations with farm and farmers' characteristics**

Variable (answer)	n	Mean ¹⁾	SD	Associations with main factors ²⁾			
				A	F	O	R ² (%)
Questions concerning how farmer prefers to receive info in future							
How do you prefer to receive info and advice? (no=0, yes=1)							
1 Orally by advisor	1093	0.68	0.46				1
2 By participating in study group	1093	0.50	0.50		+**		1
3 On Radio / TV	1093	0.24	0.42	+*			1
4 In agricultural magazine	1093	0.54	0.50				0
5 On paper in form of leaflet	1093	0.35	0.48	-**			1
6 By internet	1093	0.22	0.41	-**	+***		6
Would you be prepared to pay for good prepared expert advice? (no=0, yes=1)	1078	0.44	0.50		+***		4
Questions concerning what kind of info farmer likes to receive							
Would you like more explanatory info about? (no=0, yes=1)							
1 Reference quantities of milk	1114	0.43	0.50				0
2 Butterfat reference	1114	0.34	0.47				0
3 Exchange of quota	1114	0.42	0.49		+*		2
4 Possibilities of quota transfer	1114	0.45	0.50		+**		2

(continue)

(Table 3 continued)

Would you like more explanatory info about? (no=0, yes=1)						
1 Milk premiums	1114	0.72	0.45			0
2 Suckler cow premiums	1114	0.20	0.40	–*	+***	7
3 Beef premiums	1114	0.32	0.47		+**	6
4 Agricultural environment measures	1114	0.25	0.44			0
5 Extensification premium	1114	0.30	0.46			1
6 Early retirement program	1114	0.31	0.46	+*		1
7 Compensation payment for regions	1114	0.39	0.49			1
8 General EU agricultural policies: CAP	1114	0.62	0.49	+**		1
Do you like advice in adapting daily management of farm to the quota amount you have? (no=0, yes=1)	1052	0.49	0.50	–*	+***	2
Do you like to receive assistance in planning a future plan/strategy for you and your farm? (no=0, yes=1)	992	0.65	0.48	–*	+***	7

¹⁾ For the two questions in this table concerning "What kind of info farmer likes to receive", the "no answers" are included in the analysis as "no interest". The reason is that the conviction exists that farmers had the tendency not to fill in these particular questions, when not interested.

²⁾ Associations are tested by a linear regression model: variable = constant + b₁A + b₂F + b₃O.

Constant is not presented. A is age of farmer; F is farm size; and O is number of other activities.

Significance of b's is indicated by: * (p<0.05); ** (p<0.01); *** (p<0.001).

The sign of b is indicated by – in case of negative association and + for a positive association.

3.4. Plan making to react on EU policies

When farmers may exceed quota some time in the near future, 68 % of them plan to change the management of the farm to adjust to the available quota (Table 4). Nearly half of farmers which say so consider feeding less concentrates to adjust the milk volume. As second option the sale of one or more cows is considered (38%). This option is mostly chosen by the specialized larger dairy farms.

Nearly half of the farmers also consider improving the quality of calves by using beef bulls on the less productive part of the cows, when the quota system is limiting the production volume of the herd. This management practice is associated with farms with more other activities on the farm than dairy.

Indicators for change are the intention of farmers to develop the farm further and /or to build a new housing for the cattle and/or to choose for ecological farming. Six % of the farmers (especially older farms at smaller farms) do not think about future plans. One % of the farmers indicated to stop farming and 3% will keep the farm as a hobby. This 1 % is most likely an underestimate because it is known that some farmers who planned to stop farming did not return the questionnaire. Some farmers (41%) want to keep the farm as it is now, especially older farmers at smaller farms. In the sample 49% of the farmers plan to develop the farm further, representing the larger farms with younger farmers.

Table 4. **How to make decisions to react on new EU policies, and associations with farm and farmers' characteristics**

Variable (answer)	n	Mean	SD	Associations with main factors ¹⁾			
				A	F	O	R ² (%)
Questions about how to make decisions on management of the farm							
In case of exceeding quota: do you plan to change daily management of farm to adapt to quota? (no=0, yes=1)	723	0.68	0.47				0
If yes							
1 By selling some cows?	491	0.38	0.49	+*	-**		2
2 By feeding less concentrates?	491	0.50	0.50				0
3 By using less Nitrogen fertilizer?	491	0.23	0.42				0
Do you consider using more beef bulls on your cows under a quota system to improve quality of calves? (no=0, yes=1)	1085	0.47	0.50			+**	1
Questions about how to make decisions on farm strategy/future plans							
Q11: What are your plans for the future of your farm? (no=0, yes=1)							
1 I do not think about future plans	1114	0.06	0.23	+***	-***		3
2 I consider to stop farming	1114	0.01	0.11	+*		-*	2
3 I keep farm as a hobby	1114	0.03	0.16		-**		1
4 I consider to keep farm as it is now	1114	0.41	0.49	+*	-***		7
5 I consider to develop the farm further	1114	0.49	0.50	-***	+***		18
If Q11-5 is yes, would you							
1 Develop the farm by increasing number of dairy cows ?	296	0.56	0.50			+**	1
2 Develop the farm by starting or Enlarging another branch?	256	0.47	0.50				0
Do you consider to go in future into ecological or bio-dynamic farming? (no=0, yes=1)	663	0.04	0.19				0
Do you plan to invest in new barn or parlour? (no=0, yes=1)	787	0.63	0.48	-*	***		9
Do you consider to look for part-time off farm work ? (no=0, yes=1)	656	0.06	0.22	-*	-**		2

¹⁾ Associations are tested by a linear regression model: $variable = constant + b_1 A + b_2 F + b_3 O$. Constant is not presented. A is age of farmer; F is farm size; and O is number of other activities. Significance of b's is indicated by: * ($p < 0.05$); ** ($p < 0.01$); *** ($p < 0.001$). The sign of b is indicated by - in case of negative association and + for a positive association.

Only 4% of the farmers do consider going into ecological or bio-dynamic farming, while 6% think about part-time work outside the farm. This is less than expected. The positive expectation was based on data from Slovenia (MAFF, 2007) and on the situation in neighbouring country Austria, which show a much higher potential for local special products and agro-tourism (BMLFUW, 2007). Looking for part-time off farm work is associated with smaller farms and younger farmers. Many farmers intend to invest in new buildings (63%). This is associated with the larger farms with somewhat younger farmers.

Of the group of farmers that indicated to develop the farm further, 56% plan to increase the cow herd, which is a form of specialisation in the dairy profession, and 47% want to start or enlarge with some kind of diversification (other activities) on the farm. Some farmers intend to follow both routes.

As can be expected, farmers who want to develop through specialisation and/or diversification have a significant higher request for advice than farmers who opt for keeping the farm the same: for daily management advice respectively 67 versus 37% and for future strategy planning 75 versus 49%. Also the interest for participation in study groups and the demand for oral advice are somewhat higher (6-11%) for the developing farms. The use of internet as info tool is remarkably increasing when shifting from the group of farmers keeping the farm the same (14 % of farmers mention use of internet), to the specialised group (28%) to the group of farmers, which look for diversity (37%). The same trend exists for readiness to pay for good advice: respectively 37, 47 and 54% of farmers.



Table 5. **Other activities than dairy and associations with farm and farmers' characteristics**

Other activities than dairy on farms - question 2 in Table 1 (no=0, yes=1; n=1114)	Farmers that indicate (If Q11a-5 is yes in Table 4) to start or extend one or more activities (no=0, yes=1; n=541)							
	Mean	SD	Association with main factors ¹⁾					R ² (%)
	Mean	SD	Mean	SD	A	F	O	R ² (%)
1 Suckler cows	0.11	0.31	0.11	0.31		–*	+***	5
2 Fattening bulls	0.38	0.49	0.38	0.49			+***	7
3 Calves	0.75	0.43	0.30	0.46		–*		1
4 Heifers	0.81	0.39	0.37	0.48	+*			1
5 Pigs	0.38	0.48	0.07	0.26			+***	4
6 Sheep	0.02	0.14	0.01	0.07			+*	2
7 Goats	0.01	0.10	0.01	0.10				0
8 Poultry ²			0.02	0.13		–*		1
9 Grassland and pasture ²			0.23	0.42			+*	1
10 Land for grain and maize	0.58	0.49	0.22	0.41		+*		1
11 Produce of the arable field	0.33	0.47	0.15	0.36			++	3
12 Maize for silage ²	0.77	0.42						
13 Other cultures	0.12	0.32	0.03	0.18				1
14 Horticulture	0.03	0.16	0.03	0.18			+*	2
15 Fruit garden / orchard	0.06	0.24	0.02	0.15		+*		1
16 Vineyard	0.17	0.38	0.02	0.14			+***	4
17 Horses	0.07	0.26	0.03	0.16			++	2
18 Agro tourism	0.01	0.08	0.02	0.15				0
19 "Open doors" farm	0.00	0.07	0.02	0.14				0
20 Production of special products	0.01	0.03	0.01	0.10				1
21 Cottage industry	0.00	0.01	0.02	0.13				1
22 Forestry	0.25	0.43	0.10	0.30				0

¹⁾ Associations are tested by a linear regression model: $variable = constant + b_1 A + b_2 F + b_3 O$. Constant is not presented. A is age of farmer; F is farm size; and O is number of other activities. Significance of b's is indicated by: * ($p < 0.05$); ** ($p < 0.01$); *** ($p < 0.001$).

The sign of b is indicated by – in case of negative association and + for a positive association.

²⁾ For these activities some of data are not listed, because this data was not gathered.

Table 5 shows that starting or extending other activities are mostly related to dairy activities: calves were mentioned by 30 % of farmers, heifers 37%, grassland and pasture 23%, and land for grain and maize 22%. For non dairy activities most interest exists for other animal activities as fattening bulls (38% of farmers) and in a lesser extent suckler cows (11%) and pigs (7%). A very low ambition exists for expanding or starting poultry (2% of farmers) or a sheep or goats herd (both 1%). Produce from the arable field (15% of farmers) and forestry (10%) also score reasonable good. The interest to go into agro-tourism and local special products is rather low (respectively 2 and 1% of farmers).

Most of the mentioned "other activities" are logically highly significant associated with the main factor number of other activities, but interesting enough not with farm size and age of farmer, except for suckler cows and poultry, which tend to be kept on smaller farms.

4. Conclusions

- The farmers studied reflect the more future oriented entrepreneurs
- More than 90% of farmers did receive information about some different aspects of the quota system.
- Extension Service and Farmers' cooperatives act more towards all farmers, while Feed companies, University and Breeding Organisations work with the larger farms.
- Farmers feel most comfortable with personal advice.
- Almost half of the respondents, mostly at larger farms, say to be ready to pay for good advice.
- Farmers have a high interest in information about EU premium programs, especially CAP general policies and milk premiums, but also in advice about strategic plans.
- About 40% of the farmers intend to keep the farm more or less the same in the near future, while about 50% want to develop their farm business further. This last group concerns younger farmers at the larger farms. More than half of these developing farmers look for specialisation (56%) and less than half for diversification (47%).
- Developing farmers can be seen as the client group with most potential for info and advice. Maybe this is even more the case for farmers that plan to diversify.
- The high interest in info and advice asks for an intensive communication with farmers by utilizing the right channels to do so. Farmers' do indicate preferred channels of communication. For instance, the larger farms choose for other facilitators than the smaller ones. The set-up of study groups as another tool for communication may be an opportunity.
- The high interest for information and advice in Slovenia is a solid base for supporting the development of plans and strategies to adapt to the EU-environment and for the creation of opportunities for the future.

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INFORMATION EXCHANGE and FUTURE PLANS of Slovenian cattle farmers under EU policies

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Objective

To examine how the situation of the Slovenian farmer in regards to information availability on the EU quota regulation and CAP premiums relates to decision making in farm management and strategy choices.

Introduction

Three research questions were formulated:

What information is received now and how is it received? In Figure 1 this question refers to the link **facilitator** > farmer and is indicated as "awareness raising".

How does the farmer prefer to receive information in the future and what kind of information? In Figure 1 this question refers to the link **farmer** > **facilitator** and is indicated as "feed back".

How to make decisions to react to new EU policies? (concerning farm management and strategy / future plans). In Figure 1 this question refers to the link **farmer** > **farm** and is indicated by "decision making".

Material and methods

Data

A questionnaire with 27 main questions was sent to dairy farmers anonymously.

1,114 questionnaires out of 5,000 distributed (22%) were returned; the sample represent 11 % of dairy farmers population.

Statistical methods

Data were analysed with STATISTIX 7 statistical program.

Three variables were selected to serve as a quick characterisation of the farm and farmer (see Figure 2).

Using the "Principal Component" technique 3 main factors were selected to characterize farm and farmer:

1. Age of farmer (years) - A
2. Farm size (ha of land) - F
3. Number of other activities than dairy - O



Figure 1. Communication scheme of transmitting EU information to farmers



Conclusions

Farmers have a high interest in info about EU premium programs, CAP general policies and advice about strategic plans.

Extension Service and Farmers' cooperatives act more towards all farmers, while Feed companies, University and Breeding Organisations work with the larger farms.

Farmers feel most comfortable with personal advice.

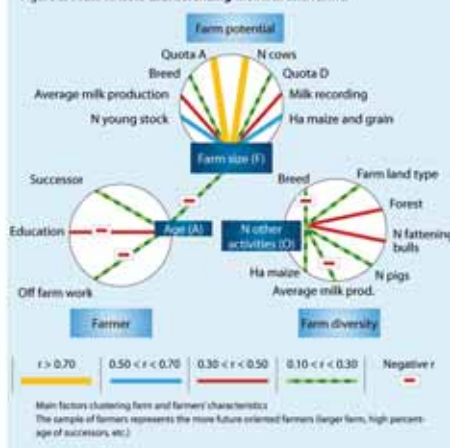
About 40% of the farmers intend to keep the farm more or less the same in the near future, while about 50% want to develop their farm business further. More than half of these developing farmers look for specialisation (56%) and less than half for diversification (47%).

Developing farmers can be seen as the client group with most potential for info and advice. Maybe this is even more the case for farmers who plan to diversify.

The high interest in info and advice asks for an intensive communication by utilizing the right channels to do so. Farmers' do indicate preferred channels of communication. For instance, larger farms choose for other facilitators than the smaller ones.

The high interest in information and advice in Slovenia is a solid base for supporting the development of strategies to adapt to the EU-environment and for the creation of opportunities for the future.

Figure 2. Main factors characterizing the farm and farmer



Results

What info is received and how it is received, and associations with farm and farmers' characteristics

Variable (answer)	n	Mean	SD	Associations with main factors ¹⁾						
				A	F	O	D	P	Ita	
Questions concerning what info is received now										
Q1a Did you receive regulatory info about quota system? (last 12 months)	1000	0.94	0.24							
Q1b Do you receive sufficient info about milk deliveries during the year compared to reference quantity? (last 12 months)	1024	0.81	0.29							
Questions concerning how and from whom info is received										
Q2a Yes, how often do you receive regulatory info? (last 12 months)										
1 Ministry of agriculture and extension	1001	0.20	0.40							
2 Extension service	1001	0.40	0.49							
3 Agricultural chamber	1001	0.10	0.30							
4 Farmers' co-operatives	1001	0.19	0.40							
5 Co-operative banks	1001	0.01	0.08							
6 Farmers' Unions/produces	1001	0.02	0.13							
7 Dairy production info providers	1001	0.06	0.24							
8 Other organisations	1001	0.06	0.24							

How does farmer prefer to receive info in future and what kind of info, and associations with farm and farmers' characteristics

Variable (answer)	n	Mean	SD	Associations with main factors ¹⁾						
				A	F	O	D	P	Ita	
Questions concerning how farmer prefers to receive info in future										
Q3a How do you prefer to receive info about CAP? (last 12 months)										
1 Only by website	1001	0.48	0.50							
2 By participating in study group	1001	0.00	0.00							
3 Via books / TV	1001	0.24	0.43							
4 Agricultural magazine	1001	0.54	0.50							
5 Via internet courses	1001	0.20	0.40							
6 Via classes or farm visits	1001	0.22	0.41							
7 By phone	1001	0.02	0.07							
Questions concerning what kind of info farmer likes to receive										
Q3b How do you prefer to receive info about? (last 12 months)										
1 Milk premiums	1114	0.72	0.45							
2 Further cow premiums	1114	0.22	0.42							
3 Feed premiums	1114	0.24	0.47							
4 Agricultural extension measures	1114	0.20	0.44							
5 Breeding/stocking programmes	1114	0.01	0.04							
6 Early retirement programs	1114	0.20	0.40							
7 Compensation schemes for regions	1114	0.20	0.40							
8 Other CAP related programs / CAP	1114	0.01	0.01							
Q3c Do you like advice in adopting info management of farm in the quota amount you have? (last 12 months)	1001	0.49	0.50							
Q3d Do you like to receive information or advisory if future opportunities for you and your herd? (last 12 months)	991	0.40	0.48							

How to make decisions to react on new EU policies, and associations with farm and farmers' characteristics

Variable (answer)	n	Mean	SD	Associations with main factors ¹⁾						
				A	F	O	D	P	Ita	
Questions about how to make decisions on management of the farm										
Q4a In case of exceeding quotas do you plan to change daily management of farm to adapt to quota? (last 12 months)	122	0.40	0.47							
Q4b If you reduce quota will you... (last 12 months)										
1 By feeding less concentrate	461	0.20	0.39							
2 By feeding less concentrate	461	0.23	0.42							
3 By changing the breeding herd	461	0.23	0.42							
Q4c Do you consider to give more feed to cows under a quota system to improve quality of calves? (last 12 months)	1000	0.47	0.50							
Questions about how to make decisions on farm strategy/future plans										
Q5a What are your plans for the future of your herd? (last 12 months)										
1 I will not work about future plans	1114	0.09	0.27							
2 I consider to stop farming	1114	0.01	0.11							
3 I will expand my herd	1114	0.20	0.39							
4 I consider to keep farm as it is now	1114	0.47	0.40							
5 I consider to diversify the farm further	1114	0.44	0.50							
Q5b In case you would like to diversify the farm by increasing number of dairy cows	296	0.36	0.39							
Q5c Do you consider to diversify the farm by starting an emerging sector? (last 12 months)	296	0.47	0.50							
Do you consider to give feedback into development of the regulatory framework? (last 12 months)										
Q6a Do you intend to give feedback on general? (last 12 months)	863	0.04	0.19							
Q6b Do you intend to give feedback on specific? (last 12 months)	1001	0.03	0.16							
Q6c Do you consider to look for part-time off-farm work? (last 12 months)	690	0.06	0.23							

¹⁾ Associations are analyzed by chi-square regression model variables = constant + A + F + O + D + P + Ita. It is considered to be significant if the p-value of the chi-square test is less than 0.05. The number of variables (significance of the model) is: * p < 0.05, ** p < 0.01, *** p < 0.001.

Communication and future plans under EU policies

Case study of farmers with the indigenous cattle breed Cika

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Summary

In EU farmers with autochthones breeds of farming animals are including in national and EU programs of Animal Genetic Resources. Ministry of Agriculture, Forestry and Food of the Republic of Slovenia has financially supported an on going project of conservation of native Slovene species of domestic animals for many years. One of these local breed is also "cika" breed, which is located on 323 farms with only 2 cika cows per farm in average. Our study aims to establish how "Cika" farmers think about their future, how to make decision in farm management and strategy and what kind of information and knowledge they need for their farms. The study is based on data from an anonymously survey (35 % of farmers participate). Future plans and strategies of cika farmers, their interest in information and knowledge and routes to collect this info are analysed and compare with groups of dairy farmers and farmers with suckler cows. The results show big differences between those three groups of farmers. Cika farmers have rather higher interest for organic farming and EU information regarding to environmental measures, diversification (suckler cows, fattening bulls, agro-tourism, local products...) and rural development programs then dairy farmers. Their interest for new knowledge is focused mainly on animal health/animal welfare, grassland management, breeding work and environment. Cika farmers are environmentally friendly oriented and they seem to appreciate quite a bit the Ministry, University and Extension service, while dairy farmers are much more business oriented.

Introduction

Description of Cika breed

- In Slovenia we have about 665 Cika cows, located on 323 farms. Average number of Cika cows per farm is 2.1
- **Cika** cattle have evolved from the light red single-coloured cattle in Slovenia; only indigenous breed. In the second half of the 19th century, Cika breed was crossbred with the Pinzgauer breed from Austria
- Cika is included in **National program for conservation of Slovenian indigenous breeds** which is running at Biotechnical Faculty, Dept. of Animal Science and financial supported by the Ministry of Agriculture, Forestry and Food
- Cika is suitable for keeping in mountainous regions, where conditions are unfavourable for mowing and production of fodder

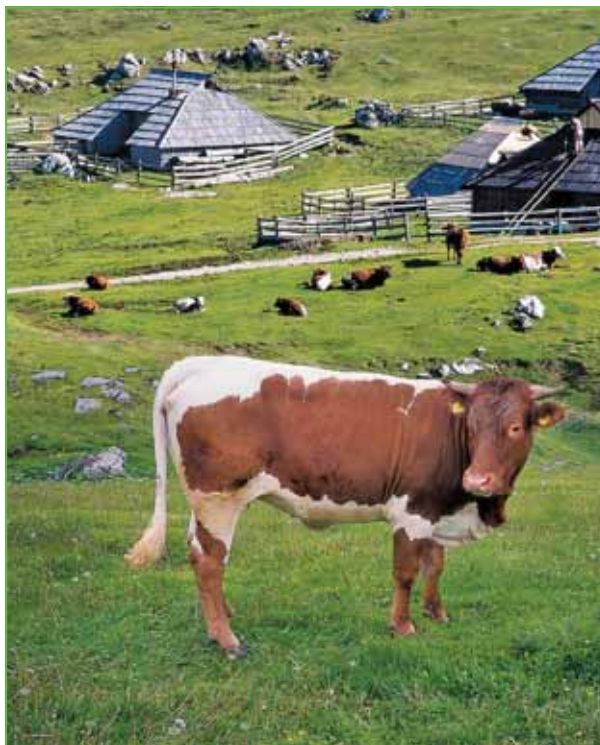
Aim of study

The aim of the study was to analyse communication with and future plans of Cika farmers in comparison with other breeds under EU policies

Research questions

The following research questions were examined:

- What information is received?
- How does the farmer prefer to receive information in the future?
- How farmers think about future plans to react to the EU policy?
- What interest do farmers have in different tasks of farming?
- Which emphasis on traits is desired in breeding program?



Material and methods

Anonymous questionnaire was distributed to Cika, suckler-cow and dairy farmers with similar kind of questions in the year 2007. The questionnaire for Cika and suckler cow farmers was identical, while the questionnaire for dairy farmers did have some questions differently formulated. The questionnaires were subdivided into two groups of questions:

- Characteristics of the farm and farmer
- Research questions

The response of all three farmers groups is illustrated in Table 1 and the response per region in Figure 1.

Table 1. **Response of Cika, suckler cow and dairy farmers**

Group of farmers	Distributed questionnaires	Returned questionnaires	% of returned questionnaires
Cika	269	111	41
Suckler	500	121	24
Dairy	5,000	1,114	22

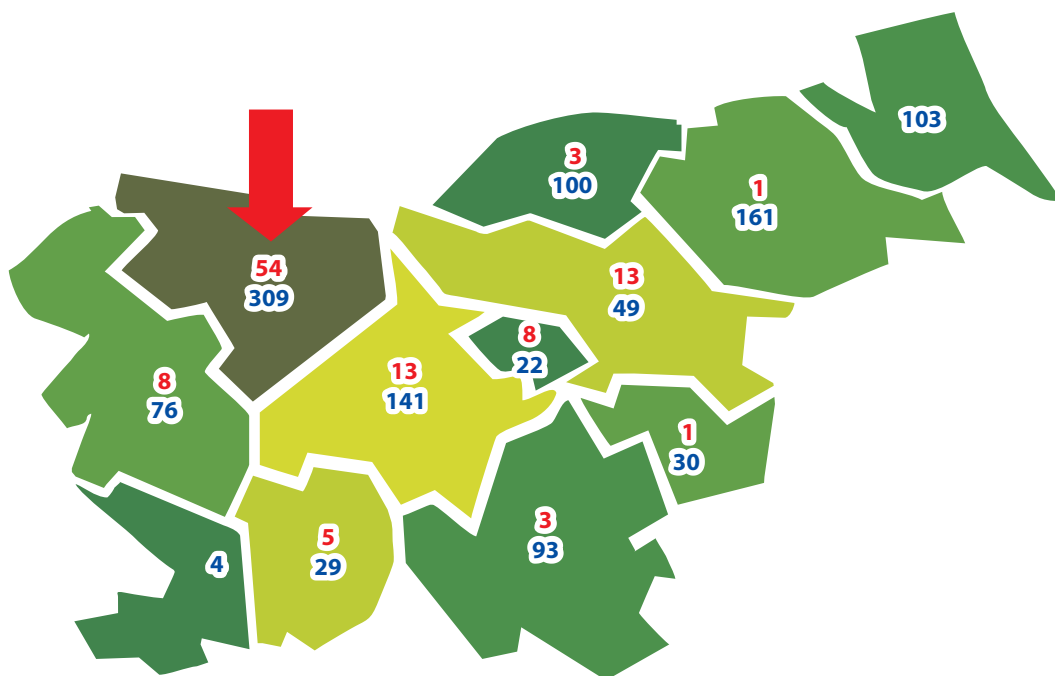


Figure 1. **Response of Cika (red numbers) and dairy farmers (blue numbers) by region**

About 40% of Cika farmers participated in the questionnaire, while only a small proportion of suckler cow farmers took part in the questionnaire. More than 10% of the 10,000 dairy farmers participated in the study.

The dairy questionnaire was also the base for the study reported in this book "Information exchange and decision making of Slovenian dairy farmers under EU policies".

Results

Characteristics of the farm and farmer

Cika farms appeared to be much smaller than suckler cow and dairy farms (Table 2). The majority of Cika and suckler cow farms are located in hilly and mountain regions. Less than half of the Cika farms' herds have purebred cattle.

Table 2. **Characteristics of the farm**

Variable (answer)	Cika farmers	Suckler cow farmers	Dairy farmers
Number of farms	111	121	1,114
Average no. of cows / farm	3.8	11.1	19.1
Agricultural land in use (ha)	8.8	12.1	17.1
Type of farm (% total)			
Flat farm	6	17	43
Hilly farm	33	37	19
Mountain farm	46	32	14
Farm with less favourable land	15	14	24
Breed (% of total)			
Only Cika cows	47		
Mixed herds (Cika/Br/ Sim/Beef)	53		

Cika and suckler cow farmers in this study are more often employed outside agriculture (61-64%) than dairy farmers (32%). Average age does not differ between the 3 groups (Table 3). Suckler cow farmers seem to have a somewhat higher education than the other two groups of farmers, however this may be caused by the relative small group of these farmers participating in the survey.

Table 3. **Characteristics of the farmer**

Variable (answer)	Cika farmers	Suckler cow farmers	Dairy farmers
No. of farmers	111	121	1,114
Non agricultural employment of farmer/wife (% YES)	61%	64%	32%
Having a successor on the farm (%YES)	55	62	69
Education of farmer (% of total):			
Public school	44	11	40
Vocational school / Gymnasium	53	69	54
High school / University	3	20	6
Age of farmer (years)	53 yr.	54 yr.	52 yr.

Information and communication

More than half of the Cika farmers is interested in suckler cow and beef premiums and half of them in agricultural environmental measures (Table 4). This is somewhat comparable to suckler cow farmers, but much higher than for dairy farmers. On the contrary, dairy farmers express a higher interest for CAP policies in general than Cika farmers do. More than 60% of Cika farmers express interest in strategy and daily management advice, which is a remarkable high percentage. But all three groups score rather high in curiosity about management issues of the farm operation.

Table 4. **Kind of info and professional advice (%)**

What kind of info would you like to receive?	Cika farmers %	Suckler cow farmers %	Dairy farmers %
More explanation and info about:	n=111	n=121	n=1114
Suckler cow premiums	74	62	20
Beef premiums	64	74	32
Agricultural environment measures	50	54	25
Extensification premiums	32	55	30
Early retirement program	20	49	31
Compensation payment for regions with limited chances	39	55	39
General EU agricultural policies: CAP	44	56	62
Would you like advice in adapting daily management of farm to the premiums you have?	YES	YES	YES
	62	54	49
Would you like to receive assistance in planning a future plan/strategy for you and your farm?	YES	YES	YES
	65	50	65

The three groups differ not so much the way they like to receive advices (Table 5). Face to face and the agricultural journal are most popular means of knowledge exchange. Dairy farms seem to be a bit more modern in the way they start to use internet.

Table 5. **Way of receiving information and advice (%)**

Way or resource	CIKA farmers %	Farmers with suckler cows %	Dairy farmers %
Face to face advice by expert	59	69	67
By participating in a study group	44	41	49
On radio / TV	21	14	23
In agricultural journal	50	57	53
On paper in form of leaflet	38	26	35
By internet	15	13	21

The thoughts of future planning of the farm business are rather similar between Cika and suckler cow farmers (Table 6). On average, they choose more often for consolidation than for expansion, while dairy farmers act the opposite way. The relatively small number of Cika and suckler cow farms studied that do wish to develop further choose mostly for diversification, in other words a combination of cattle and another branch. As second branch, agro-tourism is most popular as choice (26-32%), while there is a significant interest in organic farming (43-44%), which is completely opposite to the questioned dairy farmers: only 6% of them show interest for the organic farming system.

Table 6. **Future plans of farmers (%)**

	CIKA farmers n=111	Farmers with suckler cows n=121	Dairy farmers n=1114
	%	%	%
No future plans/ stop farming /keep hobby farm	20	14	10
Keep the farm as it is now	46	55	41
Develop the farm further	34	31	49
	(n=38)	(n=37)	(n=541)
by increasing number of cows	76	38	64
by starting/increasing with a new branch:	82	70	54
Horses	16	23	6
Agro-tourism	32	26	5
Local products	15	14	2
Changing to organic farming	44	43	6

Cika farmers score high on interest in tasks like animal breeding, working on a sound environment and also in the protection of nature elements surrounding the farm (Table 7). Especially nature protection is much higher rated by the local breed farmers, expressing a close tie to the environment they live in. Dairy and suckler cow farmers express a more economical oriented attitude towards the farm business and its environment in this study.



Table 7. **Farmers with high interest (in %) in different tasks of farming (choice was high, average or low interest)**

Tasks	Cika farmers %	Farmers with suckler cows %	Dairy Farmers %
Care for animal health and fertility	72	48	77
Feeding of cattle	59	49	75
Management of grassland and pasture	47	60	63
Organisation of work / labour input	47	43	63
Farming in economical way / entrepreneurship	37	52	61
Animal breeding work	51	38	60
Working on sound environment (use of fertilisers, manure, etc.)	54	32	51
Protecting nature elements on farm	44	17	26

Cika farmers ask for a high emphasis of health, fertility and maternal traits in the breeding goals (Table 8). Especially the focus on maternal traits and ease of calving are high also compared to suckler cow farmers opinions. Cika farmers have a rather low motivation to give focus to beef characteristics expressing probably that they are more milk than beef oriented.

Table 8. **Emphasis on traits in breeding program**

More emphasis on:	Cika farmers % Yes	Farmers with suckler cows % Yes
Fertility	51	40
Longevity - fitness	30	21
Health characteristics	77	71
Beef characteristics	19	51
Consumption of forage	12	17
Maternal traits of suckler cows	50	16
Calving easy	47	40

Conclusions

- Cika farmers have a very high interest in information about EU:
 - Suckler cow premiums, beef premiums, environmental measures
 - Information about CAP general policies
 - Nearly half of Cika farmers consider to keep farm as it is now;
- One third of farmers are considering to develop the farm further by increasing the number of cows or by developing other activities on the farm
- A big interest in organic farming exists (44% of farmers) compared to dairy farmers (6%);
- Surprisingly farmers have a very high interest in advice about strategic planning (65 %) and a slightly lower interest in farm management issues (62 %)
- Cika farmers are more environmentally aware than dairy and suckler cow farmers and less economically oriented
- Most emphasis in cow management is on health characteristics, fertility, maternal traits and ease of calving.

Examination of Slovenian farmers' strategies and perceived opportunities and threats as part of rural development

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Summary

Agriculture in Slovenia is characterized by less-favourable natural and structural conditions. The degree of competitiveness of the whole agro-food sector will eventually decide whether farmers and industry will be able to compete on the EU market. Slovenian agriculture at the moment still lacks competitiveness. For instance, average farm size is still rather small comparable to countries in the region. Agricultural policy of the Slovenian government gives much emphasis on diversification of activities in rural areas. The future of the country side and rural communities are partly depending on these developments.

Farmers that want to stay into business will have to further develop their farm. For farm development, besides craftsmanship and management skills increasingly entrepreneurial competencies are needed. Three basic strategies a firm can pursue are identified: cost leadership, differentiation, and market segmentation (or focus).

The objective of this paper is to determine whether differences in present farm size and differences in future strategies can be related to farmers goals, preferred farm type, the farmers personal characteristic and his/her perception of opportunities and threats.

The dairy sector was taken as case. Farm size, strategies like consolidation or expansion and operating in flat, hilly or mountainous regions have been considered as important factors to study. A questionnaire based on Bergevoet (2005) was further elaborated and applied to Slovenia. The questionnaire (Q) was distributed amongst participants of farmers meetings in 2007. This study was part of an EU Twinning project. Number of Q distributed was 1500. Number of Q returned 576 of which 525 were used for analysis, resulting in a useful response of 35%.

Results showed that farmers with plans to expand in the future have already larger milk quota than farmers that want to consolidate. 36% of the dairy farmers sample had non agricultural income besides their farming business. In this sample, farmers in flat areas had more milk quota than farmers in hilly and mountainous areas, but the total amount of agricultural land is about the same. Besides this, farmers in hilly and mountain areas have more forest land.

There is a strong relation between the farmers goals, preferred farm type, the farmers personal characteristic and his/her perception of opportunities and threats and the present size of milk quota. There is less relation to the expressed future plans of farmers.

In relation to perceived opportunities and threats farmers consider land and labour availability, the world market, legislation and town planning as a threat, while ICT, food safety and animal welfare and environmental issues, rural development, European borders, and EU subsidies are pictured as opportunities.

In general the outlook to the world at large seems to be rather positive, except acting on the world market, while restrictions in the local environment, like land and labour availability deteriorate the picture. Results are comparable with a similar study in earlier years in The Netherlands by Bergevoet (2005). These results suggest that local (policy) circumstances have a large impact on how comparable strategies amongst farmers can result in large country differences in the structure of the agricultural enterprises and rural landscape.

Introduction

Agriculture in Slovenia is characterized by less-favourable natural and structural conditions, which explains its status of a net importer of food and its relatively protectionist agricultural policy. Agriculture is of limited importance for Slovenian economy and its relative weight is decreasing. It contributes less than 3 % to the gross domestic product and around 6 % of the employed persons work in agriculture. Despite there is considerable financial support for the Slovenian farmer. Not only do farmers benefit from the CAP reform but also the Slovenian farmers receive additional support government from their government (Erjavec, 2005).

The great debates about supports, which in the end all have a very simple goal, i.e. to improve the income position of farmers, should not neglect the fact that agriculture is in the first place an economic activity. And the degree of competitiveness of the whole agro-food sector will eventually decide whether farmers and industry will be able to compete on the EU market. Slovenian agriculture at the moment still lacks competitiveness (Erjavec, 2005).

Slovenia is one of a number of countries with milk production and cattle in alpine or mountain regions. These countries have in common that dairy herds are small and mainly consist of dual purpose breeds such as Simmental and Brown Swiss breeds. The number of farms decreased substantially during the last 10 years. In the remaining farms the average herd size has grown considerably during the last 10 years as did the milk production per animal. But at the moment the average herd size is still rather small but comparable to countries in the region (Klopčič and Lovendahl 2008). It is expected that these trends will continue in the near future. The farmers that want to stay into farming will have to further develop their dairy farm. Given the relative lack of flexibility to change the business location (social and family ties and lack of availability of farms in other locations) most farmers want to develop their farm from its present location.

Strategic management and entrepreneurship

For farm development besides craftsmanship and management skills increasingly entrepreneurial competencies are needed (Bergevoet & Woerkum 2006). A vital part of these entrepreneurial competencies is making and executing business plans. This is a cyclical process that usually involves the following steps:

Formulating long-term goals, an internal and external assessment, the choice of a strategy and the execution of this strategy (David, 2001). Although described here as a linear processes in reality it is a process with continuous feed-back and fine tuning. Porter (Porter, 1985) identifies three basic strategies a firm can pursue. They are cost leadership, differentiation, and market segmentation (or focus). Market segmentation is narrow in scope while both cost leadership and differentiation are relatively broad in market scope. Market segmentation is a strategy that involves the development of niche markets with specific products; this is a strategy that is difficult to pursue for a dairy farming business. Cost leadership involves specialization, whereas differentiation involves the incorporation of other products (for example beef production, arable farming or agro-tourism) in the dairy farmers activity portfolio (figure 1). Agricultural policy of the Slovenian government gives much emphasis on diversification of activities in rural areas (Erjavec, 2005).

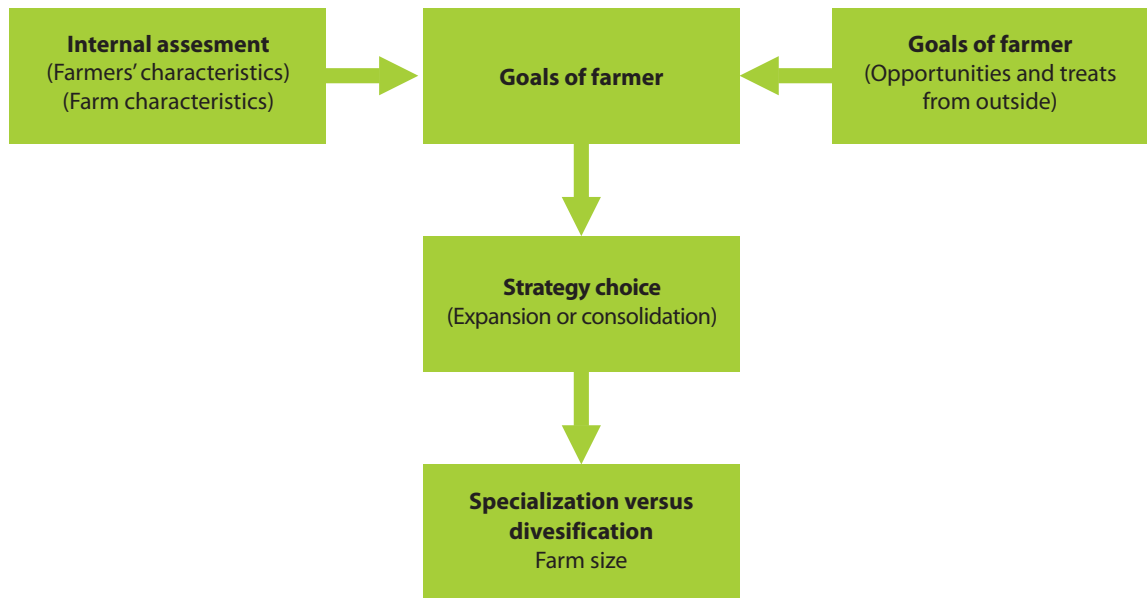


Figure 1. **The strategic management process**

Management is increasingly being recognized as a crucial factor underlying farm operations and something that can vary greatly from farmer to farmer. Olsson (1988), for instance, reviewed several Swedish studies that determined that management is a key element in the variable economic success of individual farms and other businesses, surpassing even quality and quantity of land, labour, and capital in importance. More recently, researchers have integrated farmers' goals and values in both economic spheres as well as social and lifestyle spheres into a comprehensive concept of individual management style (Bennett, 1980; Olsson, 1988; Colby, 1991; Fairweather and Keating, 1994). These researchers have shown that management style is an amalgam not only of different goal orientations, but also of different strategies farmers used to achieve their goals, depending partly on their available physical and human resources and partly on attitudes towards factors such as risk, family life, the future, and so on.

Objective of this paper:

- To determine whether differences in present farm size can be related to farmers goals, preferred farm type, the farmers personal characteristic and his/her perception of opportunities and threats.
- To determine whether differences in future strategies and plans can be related to farmers goals, preferred farm type, the farmers personal characteristic and his/her perception of opportunities and threats



Material and methods

Description of Questionnaire

A questionnaire based on (Bergevoet, 2005) was further elaborated and translated into Slovenian. The questionnaires (Q) were distributed amongst participants of farmers meetings in the winter of 2007. These meetings were part of a larger project (Twinning SI04-AG-06) that focused on information transfer on Farm quota and premiums. Number of Q send was 1500. Number of Q returned 576 of which 525 were used for analysis 51 questionnaires were excluded because the respondents did not have any quota or dairy cattle. Thus a response rate of 35% was achieved. Characteristics of participating farmers of the participating farmers are given in Table 1.

Table 1. **Descriptive data on the participants' farms**

	Mean	Minimum	Maximum	Std. Dev.
Milk quota per farm (quota A + quota D * 1000 kg) ¹	127	2	781	117
No. of dairy cows	21	1	110	15
ha grass	13	0	154	13
ha maize	5	0	160	8,7
ha corn	2	0	31	3,5

¹A quota is milk to be delivered to processing plant; D quota is milk for direct sales

As can be seen from Table 1 large differences in farm size exist amongst the respondents. The average milk quota was 127.000 litres with a minimum of 2.000 litres and a maximum of 781.000 litres per farm (see also Figure 2 for an insight into the distribution). To reduce the potential impact of the skewed distribution on further analysis a Log 10 transformation for the variable total milk quota was performed besides agricultural activities, 36% of the dairy farmers that responded had non-agricultural income.

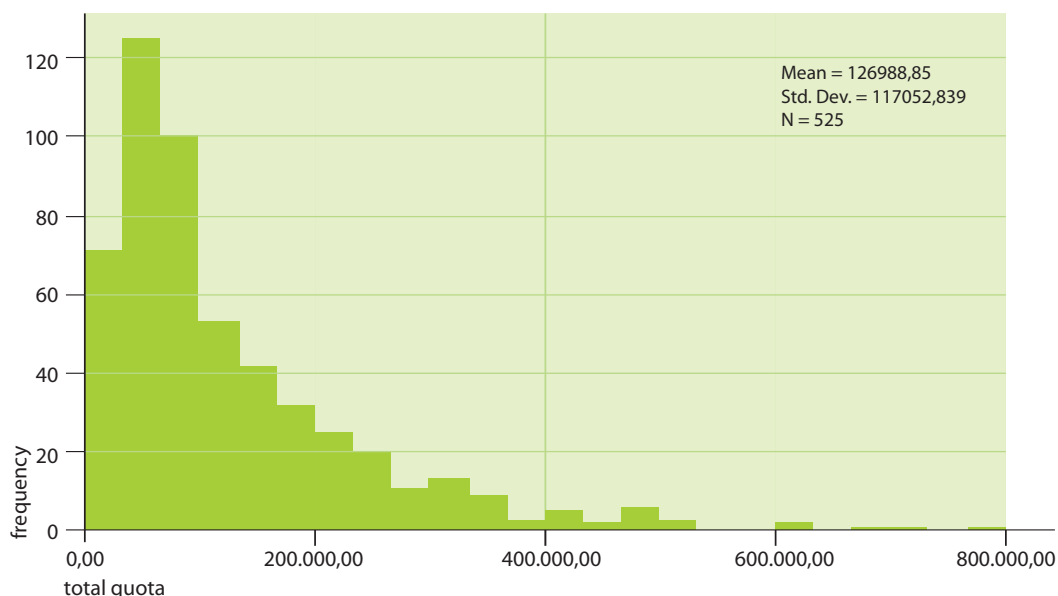


Figure 2. **Quota size of the participants' farms**

The age of respondents was rather high, but comparable to the situation in the field (see Figure 3).

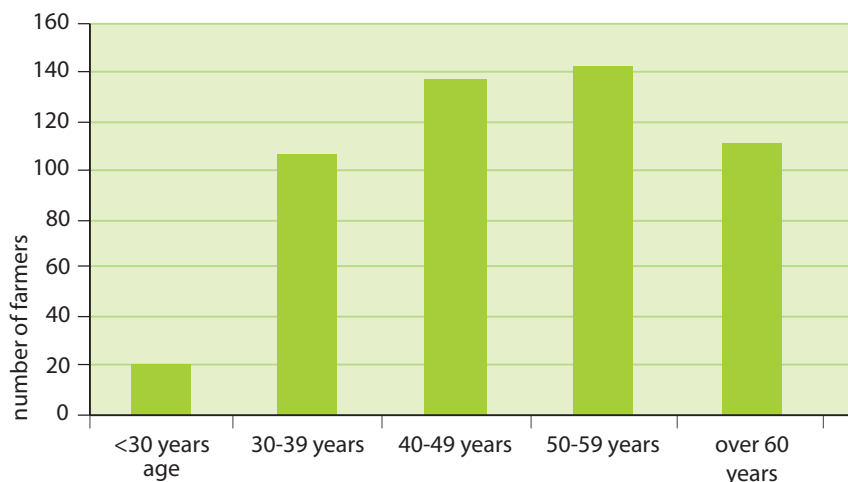


Figure 3. Age distribution of the respondents

Dairy farming in Slovenia is done in different geographical circumstances: farms can be either located in flat areas or in hilly or mountain areas. Differences in location were investigated to see whether these differences have impact on farm structure and size (Table 2). As can be seen from these table farms in hilly and mountain areas have smaller milk quota than farms in flat areas. Total farm size does not differ. However farmers in hilly and mountain areas have more grassland and less maize than their colleagues in flat areas.

Table 2. **Difference in farm structure: comparison of respondents' farm size originating from flat areas compared to hilly and mountain areas**

Farm structure	Farm location		Difference
	Flat area (n=340)	Hills and mountains area (n=165)	
Milk Quota (*1000 liters)	139,22	107,89	**
No. of cows	22,85	18,88	NS
ha grass	11,98	16,68	*
ha maize	6,03	2,12	**
Total agricultural land	18,19	17,08	NS
ha forest	7,97	17,40	**

NS = not significant, * $p < 0.05$, ** $p < 0.01$

Data reduction

Analysis was done with PASW statistics version 17.0. The analysis involved the following steps:

Step 1: data reduction by means of factor analysis

The aim of this step of the analysis was to get insight into common factors underlying the specific statements of the farmer. Therefore data reduction was performed by means of factor analysis. Data reduction was performed for farmers goals, preferred farm type, the farmers personal characteristic and his/her perception of opportunities and threats.

Step 2: investigate the relation between the in step 1 determined factors and present farm structure and future strategies and plans:

To investigate this relation a linear regression analysis was used with the identified factors on farmers goals, preferred farm type, the farmers personal characteristics acting as the independent variables and the milk quota or future strategies/plans as the dependent variable. The goal factors were analysed in a stepwise procedure and only those factors that contributed significantly were entered into the model.

Results

Farmers goals

Applying factor analysis to the data reduced the number of variables, related to the goals of the dairy farmer from 13 to 4. The identified goals can be described as follows:

- Factor 1 (Dairy-farming as a profession): High scores were found on questions regarding: "Enjoy my work", "Work with animals", "To work with machines", "To be able to work together with family members", "To work outside in the field".
- Factor 2 (take society into consideration): the variables, which have a relatively high loading on this factor are: "To create and maintain nature and landscape", "To contribute to a positive image of the dairy sector", "to be respected by the community?", "To produce a good and safe product", and "To create and improve animal welfare".
- Factor 3 (farming as business): all the variables which are related to running a farm as a business are in this factor. Variable with a high loading on this factor are: "To realize an income as high as possible", "To have sufficient leisure (vacation) time", "To be my own boss, thus to be independent", "To contribute to a positive image of the dairy sector / to be respected by the community".
- Factor 4 (satisfaction and continuity): variables that have high loading on this factor are "To have pleasure in my work", "To build on the continuity of the farm so a family member can take over in the future".

The identified factors gave insight into a whole array of goals of dairy farmers that are both economic and non-economic. These findings are consistent with the findings in the literature (Gasson 1973; Coughenour & Swanson 1988; Gasson & Errington 1993; Fairweather & Keating 1994; Willock et al., 1999). Besides economic goals (or instrumental goals, as they were termed by Gasson, 1973) -Factors 3 - several non-economic goals related to dairy farming can be distinguished. These are intrinsic (Factors 1, farming is valued as an activity in its own right), social (Factor 2, farming for the sake of interpersonal relations), and expressive (Factor 4, farming is a means of self-expression or personal fulfilment).

Desired farm type

Applying factor analysis to the data reduced the number of variables related to the desired farm type from 14 to 3. Similarity exists with the factors determined by Bergevoet et al., 2004.

Analysis of these resulting three factors showed that future farm types could be characterized as:

- Factor 1 (modern family farm),
- Factor 2 (diversification) and
- Factor 3 (low input farm).

Opportunities and threats

Figure 4 gives the average scores of the farmers towards a number of opportunities and threats.

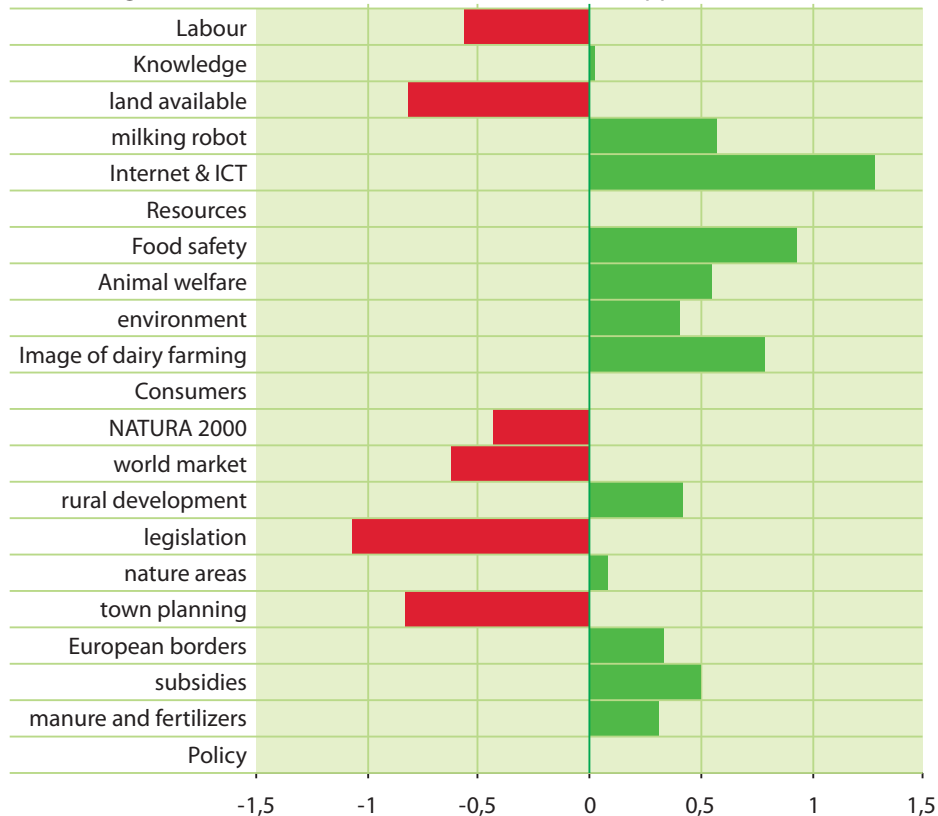


Figure 4. **Opportunities (+) and threats (-) as experienced by the farmers**

In relation to perceived opportunities and threats farmers consider land and labour availability, the world market, legislation and town planning as a threat, while ICT, food safety and animal welfare and environmental issues, rural development, European borders, and EU subsidies are pictured as opportunities. Factor analyses reduced the number of opportunities and threats from 18 to 5 indicated as “consumers concern”, “legislation”, “resources”, “policies” and “technology”.

Farmers' characteristics

The third group of variable on which factor analysis was performed were related to the farmers characteristics. In the questionnaire 24 questions were asked related to the planning and decision making process, farmers' personal characteristics and the farmers opinion towards legislation.

Factor analysis reduced the number of 24 variables related to personal characteristics to 7 factors. Analysis of the seven factors showed the following factors as identified:

Factor 1 (Entrepreneurship)

Variables with high loadings on this factor are:

- I monitor my production targets by analyzing my farm results,
- I am a good organizer,
- I regularly negotiate with suppliers or customers about prices and conditions to do business,
- I try to be among the highest (top) producers,
- I use the internet to find information for my farm,
- I look more often for challenges than other farmers,
- I'm good informed on the for my business relevant legislation

Factor 2 (Information seeking)

Variables with high loadings on this factor are:

- I prefer to receive advice on an individual basis,
- I like to participate to professional lectures and training,
- I like to participate in a study group,
- Farming is still great fun / satisfying,
- Before I take important decisions I take a lot of advise

Factor 3 (Risk averseness)

Variables with high loadings on this factor are:

- I like to avoid debts as much as possible,
- When I come to business I like to play on safe / I like to avoid risk,
- Before I take important decisions I take a lot of advise

Factor 4 (Planning)

Variables with high loadings on this factor are:

- My goals are written down in clear plans,
- It is clear to me where my farm will be within 5 years,
- Farming is still great fun / satisfying

Factor 5 (Diversification)

Variables with high loadings on this factor are:

- Having income from outside the farm (off farm work) is important for the continuity of the farm business,
- Contact with the general public is important to me, that is the reason why I invite visitors to my farm,
- I or my family enjoys/would enjoy to sell products directly to the consumer

These are all variable associated with rural business other than traditional dairy farming.

Factor 6 (External locus of control)

Variables with high loadings on this factor are:

- I can make plans but reality is always different. That's the reason that I have stopped planning things,
- The moment there are more solutions to a problem I find it difficult to make a choice

Locus of control is a term in psychology which refers to a person's belief about what causes the good or bad results in his or her life, either in general or in a specific area such as health or academics. Locus of control refers to the extent to which individuals believe that they can control events that affect them. Individuals with a high internal locus of control believe that events result primarily from their own behaviour and actions. Those with a high external locus of control believe that powerful others, fate, or chance primarily determine events. Those with a high internal locus of control have better control of their behaviour, tend to exhibit more political behaviours, and are more likely to attempt to influence other people than those with a high external locus of control; they are more likely to assume that their efforts will be successful. They are more active in seeking information and knowledge concerning their situation. (Wikipedia 18/11/2009)

Factor 7 (Pessimism)

The variable "I discourage young people to become a farmer" has high loadings on this variable. The items in this domain relate to an individual's general satisfaction with farming as a career and to the future prospects for themselves and others within the industry (Willock et al., 1999).

Future plans and farm size

Two groups of farmers were compared: (1) the group that indicated that their future plans were mainly focusing on consolidation (233 respondents) and (2) the group that indicated that they wanted to expand their farms (263 respondents). Almost half of the respondents focuses on consolidation whereas the other half wants to expand its dairy farm. This fraction is the same for both in farms located in the flat areas as well as in hilly and mountain areas.

To investigate the relation between the future strategies and plans and the identified factors on farmers goals, preferred farm type, the farmers personal characteristics and his/her perception of opportunities and threats, a linear regression was performed. The results of the final model are given in Table 3.

Table 3. **Final model of the linear regression analysis between the future plans) of farmers and farmers goals, preferred farm type, the farmers personal characteristic and his/her perception of opportunities and threats¹**

Dependent Variable: expansion yes / no	Standardized Coefficients
Modern family farm	0,17
Information searching	0,14
Pessimism	-0,20
Risk averseness	-0,15

¹R² is 11%. Only significant relations are displayed.

The explained variance in this model is rather small (11%). The variables "modern family farm", "information searching", "pessimism" and "risk averseness" in Table 3 contribute significantly to this.

To investigate the relation between the milk quota and the identified factors on farmers goals, preferred farm type, the farmers personal characteristic and his/her perception of opportunities and threats, a linear regression was performed. The results of the final model are given in Table 4.

Table 4. **Final model of the linear regression analysis between the present farm size (Log milk quota) and farmers goals, preferred farm type, the farmers personal characteristic and his/her perception of opportunities and threats¹**

	Standardized Coefficients
Entrepreneurship	0,20
Information searching	0,14
Being a farmer	-0,10
Low input farming	-0,19
Diversification	-0,20
Risk averseness	-0,25
External locus of control	-0,15
Limited resources	-0,15
Aversion towards legislation	-0,11

¹Dependent =log milk quota; R² of this final model= 43%; only significant relations are displayed.

The model was able to explain 45% of the observed variation in Milk Quota (Log transformation) which can be regarded sufficient. A positive relation with the milk quota (meaning the higher the score of the respondents the larger the milk quota were found) were found for the factor entrepreneurship and Information searching. These two factors are generally considered beneficial for executing plans. The factors that had a negative relation were those factors that are generally considered not very beneficial for executing plans: for example the observed external locus of control and risk averseness. And finally a set of factors with a negative relation that by nature are not unfavourable for entrepreneurs but probably result in other (successful) farm enterprises not being large specialised farms. Examples of this are the factors (farm types) diversification and low input farming.

Conclusions

- There is large variation of dairy farms in Slovenia in farm size, milk quota and natural circumstances in the sample of farms studied. Farms in flat areas have larger milk quota than farms in hilly and mountain areas and less forestry.
- The identified factors, i.e. farmers goals, farm type, farmers' characteristics, and opportunities and threats did not have a strong relation with the future strategies and plans as formulated by the farmers.
- Higher scores for factors which are considered important for entrepreneurial behaviour are associated with larger farms in the investigated Slovenian dairy farmers sample. This result is in agreement with other studies.

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Annex – Questions about future

How to continue or expand the farm business in next 5 years?

Please, make one of the five choices!

1. My farm is oké as it is now

- no change -

(N = 80)

Choice 1

go to question 3

2. I like to keep farm as it is now, but want to make it more efficiently

- optimize farm -

(N = 160)

Choice 2

go to question 3

3. I like to specialize in milk production by expanding thus

- more cows -

(N = 130)

Choice 3

fill in question A

4. I like more milk production as well as expanding or starting another branch(es) on farm

- more cows and other branch-

(N = 86)

Choice 4

fill in question A and B both

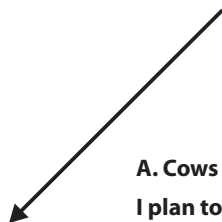
5. I like to expand or start another branch(es), while keeping the same or less cows

- other branch(es)

(N = 49)

Choice 5

fill in question B



A. Cows

I plan to have more cows

How many more? Cross one box

Till 5 cows more (N = 63)

5-10 cows more (N = 69)

10-15 cows more (N = 35)

15-20 cows more (N = 21)

20-30 cows more (N = 26)

More than 30 cows more (N = 24)

What do you consider as an optimal herd size in your situation for over 5 years: cows (N = 224) $\bar{x} = 36$ cows

I plan to have more agr. land

If yes, cross box

(grass)land and pasture (N = 204)

maize land (N = 170)

grain (N = 116)

other cultures (N = 27)

B. Other branch(es)

I plan to start or enlarge the following

branches: If yes, cross box

Suckler cows (N = 18)

Fattening bulls (N = 66)

Pigs (N = 21)

Sheep or goats (N = 7)

Poultry (N = 7)

Fruits, wine garden (N = 11)

Horticulture (N = 6)

Horses (N = 12)

Agro-tourism (N = 23)

Production of special regional products (N = 14)

Cottage industry (N = 9)

Forestry (N = 45)

Cheese making (N = 18)

Other: (N = 26)

Safe and good food, a beautiful landscape, long live subsidies for Agriculture^{1,2}

This article takes The Netherlands as a case to explain the benefits of agricultural subsidies in the EU

Herman Versteijlen, Former Director of Directorate Direct Payments, Market Measures and Promotion of Agricultural Products by the European Commission, Brussels

In some European countries, like The Netherlands, the average citizen thinks that European agriculture is a subsidy devouring sector that forms an obstacle to further liberalisation of world trade in the context of the WTO and, in this way, blocks further development of developing countries. Nothing is less true.

The consequence of these misconceptions could be that land-based agriculture will more rapidly disappear from for instance a country like the Netherlands. Once gone, it will not return because with its disappearance not only the know-how will be lost but also the present and future generations of farmers that are prepared to maintain the typical cultural landscape against a relatively small compensation for labour and capital. In many countries more than 60% of the surface is still agricultural land. In addition, countries who loose their agriculture risk to loose also an important part of their food security as well as added value.

Agricultural products are not expensive

As example: The Netherlands case

In 2003 the average family in The Netherlands spent 11.2% of its income on food and non-alcoholic beverages. That is not much for such a primary life need! Prices for agricultural products did not increase for decades, the result being that a bottle of milk is cheaper than a bottle of water in the average supermarket. In some Dutch supermarkets the price is only 0.29 Euro, most likely the lowest in Europe but not something to be proud of.

Supermarkets enthusiastically mount marketing stunts with a product like milk. They also know that the average consumer, in an effort to economise on the 11.2%, is prepared to run from one supermarket to the next... Confronted with questionnaires on entering the supermarket, the consumer pays lip service to his willingness to work for the environment and to buy (more expensive) organic products, but that willingness is not converted into practical actions if you check his shopping bag on leaving the supermarket. The organic sector continues to represent about 2 to 3% of consumption. Unfortunately EU agricultural prices will decrease even more due to the global liberalisation. European milk products, due to the present border protection, are still around 20% more expensive than similar products on the world market.

It is understandable that supermarkets, in spite of low prices, still like to make a profit and therefore price reductions are recovered on the price paid to the farmer.

¹ This article reflects personal views of Mr. Versteijlen and was written in 2006.

² This article was also published in Sodobno kmetijstvo No. 1/2007, p. 8-9

A misconception that I would like to get rid of is: "Agriculture swallows half of the European budget". In the first place, the European budget is miniscule compared to the total of national budgets of the 25 Member States: 1% of the European Gross National Income, while the added up national budgets will be between 30 to 40% of the GNI. Beside structural funds, agriculture is the only sector that is almost entirely financed from Brussels (42 billion Euros or 32% of the EU budget). Compared to all public expenditure in the 25 Member States on other policy areas this represents only about 1.5 to 2%.

Milk producer does not earn very much

In 2003 and 2004 the average Netherlands' family farm with 60 milking cows and 40 hectares, earned 1.650 Euros per month, including all "subsidies". This is not much for someone who works 7 days a week, and hardly takes any holidays.

Clearly idealists who love their job

For the above average milk farm the future is not very easy. In order to prepare the milk sector for future increased international competition European milk support prices will be decreased by about 20%. The farmer will receive a compensation of 60% for this decrease in the form of a fixed payment per hectare based on historical production. This compensation is fully decoupled from future production quantities of milk and is paid on condition that the farmer respects the demands which Society makes as regards the environment, animal welfare, hygiene, etc., the so-called cross-compliance. These conditions have been laid down in European Directives. The average compensation represents about 420 Euros per hectare.

The 420 Euros per hectare have been decided at European level and are paid from "Brussels". However, this amount is subject to erosion. This will cause a decrease of the hectare payments by 6 to 7% in 2013. In addition, Member States are allowed, on a voluntary basis, to skim off these payments by a maximum of 20% on top of the existing compulsory 5%, and to transfer the resulting funds to Rural Development. This makes many local authorities' mouth water since such funds would allow them to realise their regional plans: create cycling routes to look at the rural areas... however, these rural areas might have become much less attractive since farmers have left the country side or their cows produce milk on concrete floors inside the barns.

Milk production without hormones

If land-based agriculture disappears from a country or from Europe, not only will we become dependant on the whims of the world market as regards production quantities but we also have to accept the quality and the applied production methods. In the United States and South America cows are injected with the BST hormone in order to increase production by about 20% per year, the life cycle of the cow is shorter... In Europe the use of this hormone is prohibited.

The farmer as steward of the countryside

In most countries more than 60% of the surface is agricultural land. Many people do appreciate the open space. And where should we go on holiday in Europe if the magnificent grain fields, vineyards, olive groves and sunflower fields would disappear?

When the Netherlands' milk producer would disappear (taking care of 30% of surface or 1 million hectares) could the "Foundation for Nature Conservation" take over the maintenance as an "entrepreneur of cultural landscape"? At present this organisation maintains already 90 000 hectares at a cost of 447 Euros per hectare, actually 1 000 Euros if all costs including purchase of land, publicity, etc. are to be considered.

The average milk producer with 420 Euros per hectare is not expensive. Why is he then chased off the land with short-sighted twaddle about “subsidies”? What is the difference for a public authority to pay him or the Foundation for Nature Conservation? I have of course nothing against this foundation but a symbiosis seems very well possible. In cases where **a farmer is paid it should not be called “subsidies” but payments for services rendered to Society.** All civil servants’ salaries are based on that principle. A farmer does not necessarily want to become a “civil servant”, but he also has to make a mental switch.

Not unimportantly, land-based agriculture in The Netherlands generates for the overall national economy an added value of about 11.4 billion Euros per year (2003). The Foundation for Nature Conservation will not be able to generate such a sum.

It would be interesting to find and present also similar figures for Slovenia!

Developing countries and agricultural subsidies

Especially Non Governmental Organisations (NGO) such as Oxfam-Novib love to stigmatise European agriculture as the one and only reason for underdevelopment in the Third World. In their Campaign for Fair Trade they continue to claim that Europe dumps its excess production on the world market, prevents the development of agriculture in the developing countries to develop and keeps their products from our markets by means of protection at the EU borders.

One forgets that the EU has already for years drastically reduced its exports with refunds.

Looking at the milk sector, the EU share of the world market has been reduced by half. However, no developing country has filled the gap. Countries like New Zealand, Australia and the US did. “Developing countries” like Brazil, Argentina and India might join them in the future.

With other words it is an illusion to think that poor countries in Africa will fill the gap left by the EU. Where the EU withdraws other (rich) countries take over be it at a higher price level what is not always an advantage for countries where milk production is difficult.

Developing countries that want to produce sufficient food of their own and are capable to do so should increase protection for agricultural products at their borders. Next to income for the treasury, this would generate higher internal prices for the farmers. The EU would have little problem with such a solution, after all we did the same in the past.

Actual negotiations in the WTO are clearly meant to improve the situation of developing countries. It is a “developing Round” and that is excellent. In that context the EU decided already years ago to open its borders in favour of the least developed countries for all products except arms. Others, such as the developed countries mentioned earlier do not follow us or only very partially. Just recently the EU sugar price has been drastically reduced resulting in a 30% lower production. It is interesting to note that, where Oxfam has always insisted on this sugar reform, they protest now because they realise rather late in the day, that also the EU price, paid to some least developed countries, will be reduced and the advantage risks to go to other more developed countries like Brazil.

One can wonder why European agriculture is put forward as the main culprit for underdevelopment in the third world. NGO’s do not know that corrupt governance, arms trade, war, climate change and HIV are the main causes? That the possible influence of EU agriculture is neglectable/of minor importance? Are they looking for a way out to mask their own failure?

Agriculture and the WTO

Within the framework of the present WTO negotiations, the EU has made already many constructive proposals also under pressure from internal public opinion (often based on misunderstandings). Our international partners do not follow with equivalent proposals. The EU has committed itself to abolish all export refunds by 2013. For Europe it is important not only to obtain equivalent concessions in Agriculture (US export credits, "food aid") but also, as regards access to markets, for non-agricultural products and services. In the services sector, very important for many European countries, hardly any progress is made.

The most important reason that present negotiations might fail is that our WTO partners simply pocked the conditional EU concessions and refuse to do any concession at all. Especially the US refuse to adapt their internal support (for example in favour of cotton) but demand unlimited access in all countries around the world, including developing countries. Liberalisation for Americans means access for American products.

Not without importance, from the 9 bigger countries representing 70% of Agricultural trade, the EU together with China were the only ones with a negative trade balance in agricultural products.

Choose really for agriculture

It seems worthwhile to carefully analyse the future development of land-based agriculture. Who knows, one might come to the conclusion that "choosing for agriculture" means supporting efforts in Brussels to maintain a sufficient agricultural budget. From a political point of view it does not seem impossible to obtain broad public support given the elements of country stewardship, care for people with low incomes, food safety and security. In addition the broader economic interest is served as regards added value and employment in the Agro-industry. "Brussels" will in the meantime continue its efforts to gradually abolish all product oriented support and show to the European tax payer that he becomes value for money where payments to farmers are linked to the respect of high standards (called cross-compliance conditions) and the conservation of our cultural heritage.



Slovenian special products

Strengths, weaknesses, opportunities and threats

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1. Introduction

The Slovenians are proud of their heritage, their culinary tradition and their special food products. A number of Slovenian farmers and manufacturers are involved in maintaining the culinary heritage of traditional Slovenian products. The Slovenian government supports these companies by offering producers certification schemes that will protect their special food products. Regional production in general can become important for the regional economy and for maintaining or creating short chains between producers and consumers.

A number of initiatives have been developed over the last 15 years in western European countries to challenge the mainstream strategy of price competition from countries with lower production costs. These initiatives concern regional quality products or organic products, or a combination of quality and organic production (Tacken & de Vlieger, 2005). Lessons learned from these initiatives can be shared with producers in Slovenia.

There are many Slovenian special products. This project focuses on the 12 protected special products that are described in the brochure Slovenian Protected Special Agricultural Products and Foodstuffs. The products fall into seven categories: dairy (cheese), oils (olive and pumpkin), meat (ham and stomach), honey, salt, baked goods (gibanica and cake) and pasta (žlikrofi). The Slovenian protection of geographical indications and designations of origin for agricultural products and foodstuffs is based on EU regulations and definitions. See the text box below for these definitions.

Definitions of PDO, PGI and TSG

Products protected by the designation of origin label (PDO) meet two requirements:

- the production and processing of the product from raw material to end product must take place within the specific geographical area named on the product.
- the product must have a property or composition that is essentially or exclusively characteristic of that particular geographical area; it is considered that a geographical area represents natural and human factors, such as climate, soil quality, and local know-how and experience.

Products protected by the geographical indication (PGI) also meet two requirements:

- the product must be produced or processed in the geographical area whose name it bears. As opposed to the PDO label, a geographical indication may be used if at least one of the production stages takes place within that area.
- there must be a link between the product and the area whose name it bears. Important properties need not have developed essentially or exclusively as a result of the geographical origin, as is the case with PDO.

The traditional speciality guaranteed label (TSG) on an agricultural product means:

- the product is made of traditional ingredients.
- the product has a traditional composition.
- the product is characterized by the production or processing method that reflects the traditional production or processing method.

The protected status of the products provides a base for fair competition in the market, as competitors who copy the products can be sued. However, a protected status is not sufficient to compete successfully in the market: companies also need to have a solid strategy. Therefore the Ministry of Agriculture in Slovenia requested the Agricultural Economics Research Institute (LEI) to make a SWOT (strengths, weaknesses, opportunities, threats) analysis of the Slovenian special products. Strategies can be based on a SWOT analysis.

This chapter presents a summary of our findings. We report not on the strategies of individual producers, but at the level of the producers of the three certifications (PDO, PGI and TSG) and the group of special products as a whole. In the following section, we introduce a model to describe regional food products, clarify the SWOT analysis and present two notions on market strategy. In section 3 we explain the data collection and processing, in section 4 we present our findings and reflect on related experiences in the Netherlands, and in section 5 we summarize the strengths, weaknesses, opportunities and threats at a national level, and then conclude this paper. Data collection and analysis took place in the period December 2005 – February 2006.

2. Theoretical framework

The theoretical framework for this project consists of a model to describe regional products, a framework for a SWOT analysis and two notions on market strategy.

A model to describe a regional product

Researchers in the field of regional production and regional foods in the Netherlands categorized regional products and identified three groups of such products, namely local produce, typical food products and industrial regional products (van der Meulen, 1999). The second group closely resembles products that comply with the PDO definition, while the first group matches the group that complies with the PGI definition. A lot of the new regional products that were introduced in the Netherlands are in the group 'local produce'. Concerning the third group – industrial regional products – it was noted that these products could be manufactured anywhere on an industrial scale by individual producers, even outside the region they originally came from, and produced according to a recipe that may to some extent be related to the original recipe. Consumers may still associate the product with this region or with a traditional or artisanal method. For example, Gouda cheese: Dutch dairy producers have exported the recipe for this cheese all over the world, and therefore the 'territoriality' of this product can be disputed. Interestingly, the Dutch cheese called 'Aged Artisan Gouda'¹ complies with the PDO definition, but has no PDO certification. To complicate the matter further, the Dutch government allowed a factory outside the Gouda region to bear the name 'Noord-Hollandse Gouda cheese' and have a PDO certification.

Whatever the category of regional product or definition, four factors quite extensively describe the extent to which the various categories of regional products are region specific. These factors are summarized in table 1. The summary is based on literature published in the Netherlands (van der Meulen, 1999).

¹ www.boerengouseoplegkaas.nl

Table 1. **Factors and aspects describing region-specificity**

Factor	Subject	Aspect
Territoriality	Chain	Regional agriculture Regional processing Regional trade organisation Local / regional consumption
Typicality	Physical product/ processing	Typical raw material (<i>terroir</i>) Regional recipe Artisanal processing Limited production capacity Typical shape or packing
Tradition specificity	Story of the product	Long tradition Exclusive historical bonds Quality of the story (convincing story) Traditional practice (recipe, processing)
Collectivity	Organization	Of the primary producers Of the processors Of the marketing



Territoriality

Territoriality refers to the physical specificity of the product to the region or place. Besides the region or place name (which in most cases is part of the product name), the product may be related to the region in other ways: the region may be the source of the raw material, and it may be the area where the product is processed and/or where the trade organization has its base and where the product is consumed. Because local consumption adds to the credibility of the product as a regional product, sales are not limited to the region itself. The various aspects of territoriality are summarized in Table 1. It will be an advantage in the market if the region after which the product is named creates the right consumer perceptions and the resulting surplus value. Therefore, the region should preferably be culturally or geographically (soil, landscape) homogeneous. The region should also be a credible entity in the view of the consumer. Not all regions have or can create strong consumer associations. If consumers have better knowledge of a region, they will be more involved. This involvement may positively affect the buying process.

The aspects of territoriality may explain which part/parts of the production and supply chain is/are linked to the region.

Typicality

Typicality refers to the special and distinguishing features of the product or the way the product is processed compared to more common products. Of particular interest are those features that make the product unique and that logically follow from the relation with the region of origin. An artisanal or craft method of processing adds to typicality in two ways: the processing results in typical tastes or flavours, and the consumer appreciates artisanal production. An artisanal method of processing consists of a relatively high share of handwork and requires knowledge and craftsmanship. The agricultural raw material itself may also add to the uniqueness if its features are a result of the soil and climate of the region. In addition, special feed can lead to special meats. The French speak of *terroir*, that is, the unique combination of microclimate, grape, soil and processing of wine. Typicality makes it less easy for others to reproduce a product. Typicality is very important if a regional product is to be a success. Consumers are not willing to pay more just because a product has a certain name. In a saturated market, it is crucial that a food product has distinguishing features. Agricultural producers have often experienced difficulty in realizing this typicality.

Tradition specificity

This factor refers to the age of a product, the exclusiveness of the historical ties between the product and the region, the quality of the history, and the traditional and artisanal method of production. Market research has shown that the age of a product ('produced since xxxx') does not have a significant effect on consumers' appreciation of a product. A long tradition is the least important buying consideration, after price, country of origin, and labels that guarantee the origin or production methods. This creates a market that is open to new products.

Collectivity

Collectivity requires that more than one producer makes the regional product. Producers, whether they are primary producers or processors, have to cooperate to reach consensus on product quality and the production method. In principle, the production should be open to new entries (as long as they fulfil the conditions set for product quality). Collectivity supports the idea that the regional product is or has become part of the region's culture. Collectivity can also be a tool to increase selling power.

Collectivity may be expressed in different ways or organizational forms. For example, a product may be produced at several farms in a region or by one manufacturer that is cooperating with a group of farmers, or the producers may coordinate promotional activities. The various parties involved take coordinated action to meet the quality standards of the product.

Figure 1 indicates that all factors and aspects in table 1 can be used to determine the region specificity of a regional product.

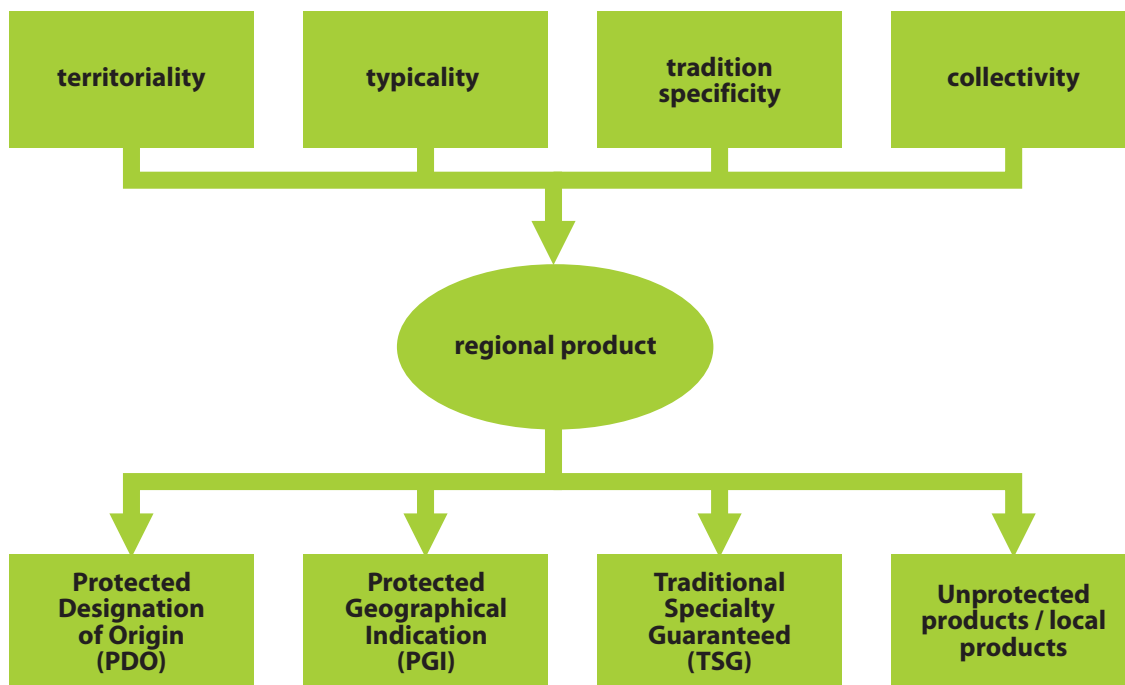


Figure 1. Factors determining region specificity and the kind of protection

SWOT analysis

A SWOT analysis is a tool developed in the field of marketing theory, but it can be used in various settings. More information about the tool can be found in the literature and on the Internet (<http://missionitac.pbworks.com/f/swot.pdf>, or Aaker, 1992). Here, the tool is used in its original marketing setting. Marketing is a management process for identifying, anticipating and satisfying customers' requirements profitably. A SWOT analysis is a summary of an organization's strengths (S) and weaknesses (W), which are derived from an internal analysis, and of its threats (T) and opportunities (O), which are derived from the external analysis. Strengths are established by asking such questions as: what advantages do you have compared to others? What resources do you have access to? Weaknesses are found by answering questions like: what could you improve? External to the organization are, for example, issues related to the economic situation of an ageing population, and answers to such questions as: what trends do you see in the market? How will a change in government policy affect you? Or does people's changing lifestyle affect you?

The ultimate goal of a SWOT is to craft a strategy by confronting the weaknesses and threats with the opportunities and strengths: which strengths can be used take advantage of the opportunities? Which strengths can be used to combat threats? Which weaknesses should be improved to make use of the opportunities? One should not try to find strategies in the area where there are weaknesses and threats. The advice here is: turn around.

Crafting strategies is not an easy exercise, although procedures have been developed to support the process. Table 2 summarizes the issues on which the SWOT in this project is based.

Table 2. **Issues covered in the SWOT for Slovenian Special Products**

Issues for the internal analysis
1. Marketing
a. Past experiences (sales, distribution channels, market share)
b. Strategy/market orientation (sales, distribution channels, overall plan/objectives)
c. Existing consumers
d. Product and positioning
e. Pricing
f. Promotion and advertising
g. Distribution and outbound logistics
2. Operations (facilities, equipment, quality control)
3. Management and organizational structure
4. Personnel
5. Finance
6. Information system
Issues for the external analysis
1. Existing competitors
2. New entrants

Some notions on market strategy

A good market strategy must be feasible (implementable) and consistent (no mutually exclusive goals or policies), and capable of providing competitive advantage. Furthermore, strategies must achieve consonance, namely a fit between the organization and its environment (de Wit & Meijer, 2002).

There are two opposing outlooks on strategy (de Wit & Meijer, 2002): the outside-in approach and the inside-out approach. Companies that follow the outside-in approach – which is also called the positioning approach – take the environment as a starting point. An analysis of the market or industry in which they are acting is the basis for finding market opportunities. External developments are the basis for positioning and product development. Companies that follow the inside-out approach argue that strategies should be built not around external opportunities, but around the strengths of a company. From this strategic viewpoint, companies focus on the development of difficult to imitate competences and/or the acquisition of exclusive assets.

Kotler (2003) describes six stages in the development of a market strategy:

- Production orientation. In this orientation, the basic thought is that consumers will prefer products that are widely available and inexpensive.
- Quality orientation. Here, the basic thought is that consumers will prefer the products that have the most quality, performance or innovative features.
- Selling orientation. Here, the basic thought is that organizations must undertake aggressive selling and promotion efforts in order to convince consumers to buy products. The idea is that consumers typically show buying inertia.
- Marketing orientation. Here, the key to achieving organizational goals consists of the company being more effective than its competitors in creating, delivering and communicating superior customer value to the target market.
- Customer orientation. Here, separate offers, services and messages are created for individual customers in addition to the marketing concept.

- Societal marketing orientation. Here, the organization's task is to determine needs, wants and interests of its target market and to deliver the desired satisfactions more effectively and efficiently than its competitors in a way that preserves or enhances the consumer's and society's well-being.

Producers of regional products usually start from the production orientation in their marketing strategy. They sell products directly from farm or factory to specialty shops, restaurants and hotels. During this development stage, they learn that more companies and consumers are interested in their product, so they scale up production. The company's efforts at this stage are focused on lowering production costs while maintaining the quality characteristics of the products or on producing a cheaper version of their original product. When the scale of production is larger, unit costs will be lower, thus allowing for the development of a larger assortment of products. Through this, the market base becomes broader. Next, companies move to the selling approach: they put more effort into advertising and promotion with the objective of stimulating consumer demand. Our experience is that most companies that produce regional food products shift gradually from a production orientation to a marketing orientation, and ultimately to a customer orientation. Thus, a company's stage of orientation is not a static situation.

3. Methods

When we considered the limitations of the project and the diversity of companies that produce protected special products, we realized that we could not analyse all of the 12 products in depth. After data collection at the level of the individual producer, the strengths, weaknesses, opportunities and threats were presented at the national level at a seminar, and more generic strategies were discussed. The individual producers were thus able to learn about the analysis, receive the information they needed and find out how the information should be structured in order to apply the SWOT analysis in their own situation.

The data collection for the SWOT analysis was executed in two steps. First, a base questionnaire was developed in order to establish the general characteristics of the companies. The questionnaire included questions about the type of organization, its production capacity, the number of participants, current sales and distribution channels, and the organization's plans for the future. The second step comprised a structured questionnaire with open questions covering the subjects in table 2; this was in preparation for the internal and the external analysis. Four in-depth interviews based on this questionnaire were conducted by the University of Ljubljana. After answering each section of questions, the producers were asked to indicate weaknesses and strengths, and their relevance. The questionnaire covered only few questions about the market environment, as this subject was to be discussed during the seminar.

All the producers were asked to participate in the project. Nearly all companies participated in the first round. Twelve producers completed the base questionnaire. In the second round, stakeholders in seven products were interviewed and four of the products were analysed in more detail. Results concerning the individual products will be communicated to the relevant producers.

During the seminar, we summarized and presented our findings and the SWOT analysis at the national level. More generic strategies were also discussed. In the following sections, we summarize the findings and conclusions in the form of the SWOT.

4. Findings on Slovenian protected special products

Competition

What is most striking about the answers to the questionnaires and the results of the interviews is that a lot of producers of the protected special products stated that they have no competitors. Perhaps they reason that their products are unique. In the market, however, it should be realized that every producer faces competition all the time. This competition exists at various levels. Take the example of a milk producer and a thirsty consumer.

- In what type of drink is this consumer going to buy? An alcoholic or a soft drink, or juice, milk, tea, coffee, water – or perhaps something else? All companies that produce drinks are competitors of the milk producer at the wish/want level.
- If the consumer chooses healthy drinks, soft and alcoholic drinks drop out. But the milk producer is still in competition with the other producers of healthy drinks. At this generic level, the competition may be even more severe.
- If the consumer chooses to drink milk, he or she then has to decide how much to buy: a litre, or half a litre, or even less? All types of products that meet the demand of amount are product type competitors.
- Then a choice is made between brands.

There are Slovenian protected special products in the meat, cheese, honey, pasta and olive oil category groups. A wide range of products in these categories are available on the local, national and world markets. Some of these products are produced by multinationals that already have a solid base in the market and have large budgets to promote their products. To gain market share on such parties, efforts must be focused on the product's unique selling points. Defining the unique selling points of your product may be a route to higher market exposure. We deal with this in the following section.

Market orientation of the producers of Slovenian protected special products

The responses to the questionnaires and during the interviews show that most producers are focused on the excellent characteristics of their products, their unique production processes and the protection of their unique recipes. They have very limited information about the market or industry around them and/or about competing products. Thus, most producers approach the market from the inside-out perspective, which means that they require an analysis of the market and of the positioning of products. However, almost none of the producers is taking the competitors into account in its market approach or in its pricing strategy. Hardly any respondents mentioned positioning the product in relation to other products on the market.

In terms of the stages of a marketing strategy, Slovenian protected special products are in the production till marketing orientation. Only in the wine category are there some organizations that have a customer-oriented marketing strategy or that have adopted the societal marketing strategy. Other companies emphasize the quality of their products, the small production size and the selective distribution. This reflects their production orientation. PDO products have a more solid base for such a strategy than companies that produce PGI or TSG products. This is because PDO products have the unique characteristics of the local environment integrated in them. Apart from pumpkin oil, this relationship is less tight for PGI and TSG products, so these products are more easy to copy. If this market strategy provides enough revenues to the chain in the long term, there will be no problem at all. However, the interviews revealed that some producers expect that their financial situation will not be strong enough in the long run. They thus signalled that more money for market development is needed.

All producers of protected products prefer market growth. The producers of PDO products wanted to grow by 150–700%, the companies selling PGI products by 40–300% and the companies selling TSP products by 20–100%. As illustrated in the section on competition, market growth is always achieved at another company's expense. Therefore, positioning is of utmost importance to identify the unique selling points of a product and

a suitable promotion, distribution and pricing strategy. In some cases, a more societal orientation strategy – a strategy that is based on identifying wants and needs in the market – is helpful to achieve this growth. This requires investments in gathering information and in techniques to determine the needs, wants and interests of target markets.

Characterizing and positioning of Slovenian protected special products

In most cases, the name of a protected product links it to the region of origin. As the history of some of the products shows, a tradition may have been started at one farm or by a single manufacturer.

Products with PDO labels are closely linked to the area whose names they bear. The production and processing of the products from raw material to end product must take place within the region. These products must also have property compositions that are essentially or exclusively characteristic of their particular geographical environments and may include natural and human factors (see for details the brochure Slovenian Protected Special Agricultural Products and Foodstuffs). This requirement is what the French call *terroir*. In our model it is an aspect of typicality. Having such distinguishing characteristics is a very important advantage for the marketing of the product. A typical recipe may be copied, but *terroir* cannot be.

The label PGI also links the product to the region. The relation with the region is less direct than in the case of the PDO label. At least one of the stages of production must take place in the area (either the production of the raw material or its processing; see aspects of territoriality). Therefore, raw materials may originate from other areas. Besides this there must be another link with the region, for example the reputation of the product (which may be a combination of typicality, recipe or processing, and aspects of the tradition specificity), but it is not necessary that important properties have developed essentially or exclusively as a result of the geographical origin.

The TSG label primarily protects the recipe or the production method (aspects of typicality). However, there could be additional links with the region through the aspect of territoriality (at least food culture) and tradition. Thus, labelled products may be produced by anyone who follows the traditional recipe, procedure or form, and one might expect that more artisan products will be in severe competition with more industrial regional products.

It is therefore very important to know how your product performs in the consumer market compared to competing products and their characteristics (or attributes). Comparing your product with competing products is called 'positioning'. An important tool for comparing is the 'positioning matrix', in which products can be positioned with respect to two attributes. One of them is usually price. Figure 2 is an example of a positioning matrix of five products based on the method of preparation and the price. The products are compared on price on the horizontal axis and on cooking method (frying pan, oven, microwave) on the vertical axis. The matrix shows that the orange product can be prepared in various ways and has a medium price level, while the blue product cannot compete on price.

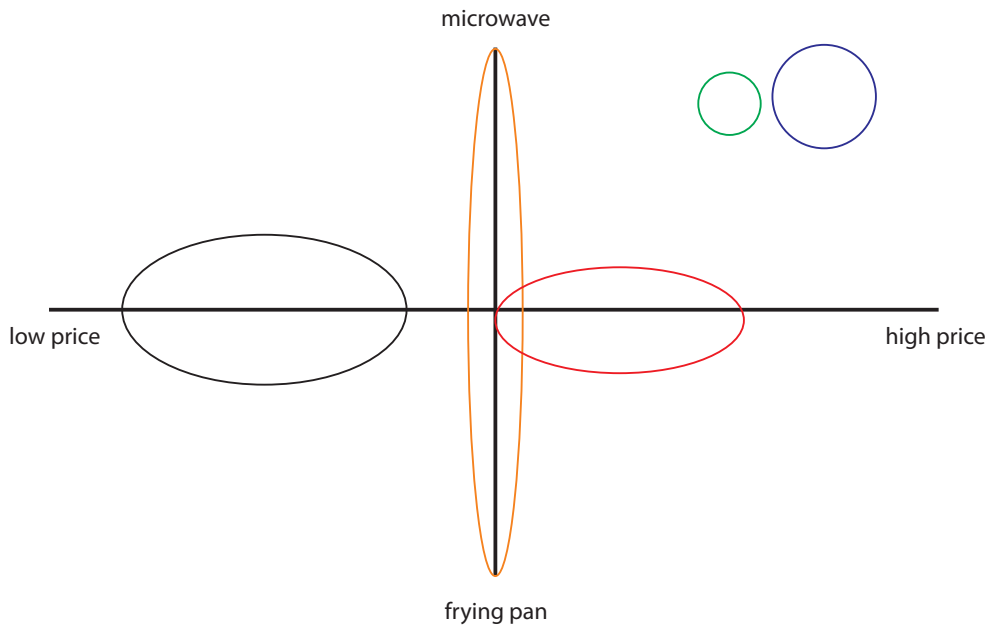


Figure 2. **Positioning matrix of 5 products in the market (cooking method versus price)**

This type of comparison can be made for the Slovenian food products on a national and an international basis. This would give the companies more insight into their competitive situation as well as starting points for positioning and marketing their product(s). On the basis of the results of the questionnaire, our impression is that more emphasis should be given to the positioning of products in the market.

Pricing

All the parties we interviewed determined their prices on the basis of cost price plus profit margin. This pricing strategy is called 'cost pricing'. Within some producers' unions, each individual producer has its own pricing strategy. Note that the margin between costs and customer price should also cover the cost of innovations, promotion and gathering consumer information.

None of the parties we interviewed indicated that he/she applies the alternative strategy, namely a pricing strategy that is based on customer value or on a positioning to other products. The idea behind this approach is that once you know about your unique position, you know it is justified to raise the price. Research in the Netherlands has shown that most food products are low involvement products, meaning that consumers want



to put only little effort into buying and choosing (Steenkamp, 1996). This implies that the product presentation has to make it clear to consumers straight away what the added value of the product is. Labelling can be very important to indicate the added value. The labels for protection could be used to indicate that the product is not the bulk product. We were surprised to find that not all the companies used the label for Slovenian protected special agricultural products and foodstuffs on their product labelling.

In order to re-buy, consumers must be satisfied with the price/quality relationship. Some of the respondents indicated that they have a solid customer base that is buying their products regularly. Others do not have any indication of the re-buy figures. Re-buy can give an indication about the pricing strategy and the perception of added value. We therefore advise the companies to gain insight into re-buying and consumer satisfaction with your product versus other products. Thus, positioning in relation to other products in the market is very important also from the pricing perspective.

Promotion and advertising

The interviews in Slovenia revealed that most promotion and advertising efforts are in the form of attending fairs and distributing leaflets. Promotion in newspapers is also often used. This latter strategy is effective only if the publicity is free, because in general advertising is expensive. For new products advertising is especially expensive because awareness and preference have to be created and it may not be immediately clear which consumers are interested.

In the Netherlands, free publicity on local radio and television stations and in local papers has helped Dutch regional producers to create awareness of their products. Another means of promotion is personal selling by shop staff and by cooks and waiters at restaurants. This means investing in business-to-business relationships. This is very effective in the Netherlands. If a professional is positive about a product, consumers are easier to convince and are more inclined towards a positive attitude. Visibility in shops can also be a very important means of promotion, but not every specialty shop or supermarket gives specialty products enough facings or allows the producers of regional products to put leaflets in the shop. Restaurants are even more willing to present the regional products on the menu.

In promoting a specific product, all the involved companies must have the same message. Consumers are confused if the story is different depending on the person they meet or the publication they read.

Distribution and outbound logistics

Slovenian PDO producers mainly concentrate on direct selling, specialty shops and restaurants, and they want to stay in those channels. PGI producers focus on direct selling, specialty shops, wholesale and supermarkets, and they want to expand to hotels and restaurants. TSG producers mainly focus on direct selling, specialty shops, hotels and restaurants, and they want to expand in the near future through restaurant menus. In the long run, they consider going directly to the consumer market with retail products.

These distribution strategies seem realistic and the most likely. Specialty shops, hotels and restaurants seem to be the most interesting markets for regional products all over Europe (see the text box on the next page). Supermarkets are only interesting if it is possible for a producer to deliver in large amounts on a regular basis. Some of the producers of PGI products have the opportunity to realize such production capacity. PDO producers are more bound to the region and are therefore less flexible in production capacity. TSG producers mainly want to get the typical Slovenian products on to restaurant menus in the coming years.

Advantages of different distribution channels

1. Farm and factory sales are mostly very useful in the first years of selling a regional product. The collectivity or organization will get a direct insight into consumers' perception of the product. Direct sales do, however, make up a small part of the potential market, because consumers usually do not travel long distances to buy products. In addition, in the beginning the producer may not be very selective in his choice of distribution channels (or additional ones), but in the longer run he may need to focus.

2. Specialty shops have the advantage that their sales people provide additional information about products. Most regional products are handled in this channel. Working with entrepreneurs in this segment can be mutually beneficial: these entrepreneurs are always looking for new and unique products that will help them in their battle with supermarkets and hypermarkets. In relation to supermarkets, this is a small and decreasing market.

3. Hotels and restaurants. These could be approached directly or through specialized wholesalers. Being on the list of these parties could be a very interesting market opportunity. An advantage of this market is that products are also sold along with additional information from the waiter. Contrary to the second market, this is still a growth market in Europe. However, in relation to supermarkets it is a small market.

4. The gift market for non-perishable products could also be very interesting. This is quite successful in the Netherlands, especially in tourist environments. The gift market for regional products is also quite interesting for the local people. The responses show that in the Slovenian tourist market there are also chances for non-perishable products.

5. Supermarkets are potentially the largest market for regional products. For this market, however, products must have ISO and HACCP and meet other strict quality specifications. Another condition is that products must be supplied the whole year round, and sometime in large quantities. Selling in supermarkets provides opportunities for a large market and broad distribution.

6. Another distribution tool is the Internet. However, in most countries this is not a large market for food products, as consumers want to see the products before they buy them. There are so many substitutes for every product that there is always some interesting product in regular shops that they can buy.

7. Recent developments in the Netherlands are catering services based on regional protected produce and farmers' markets selling high-quality products in the urban environment.

8. French and Dutch experiences have shown that as for logistics, joining a regular company by adding the special products to the company's assortment can be an option to pursue. In this case, all primary processes of such a company can be used in the distribution and sales of the special product.

International selling opportunities

Some Slovenian special products are already being sold abroad. The Ministry is especially interested in opportunities on the international scene.

From an international viewpoint, these product will face a lot of competition. In the product groups to which these special products belong, a lot of competition can be expected from local products and products from multinationals. In most product groups, multinationals are actively advertising and promoting their brands. In addition, every country has its own special products in most markets. When organizations go international with Slovenian products, they will have to ensure that they have a strong product proposition with internal consistency, which means that the added value story in relation to competing products must be strong. This product proposition should be communicated to a specific target group and the evidence for the proposition must be provided and maintained. For international selling it is also necessary that the wants and needs of the local consumer are identified and clear to the companies. Market leaders and buying motives in the specific product group must be identified. Moreover, local tastes must be taken into account. In Holland, for example,

the sweet the Dutch call drop is very popular, but outside the Netherlands the taste is perceived as 'strange'. Moreover, a positioning in relation to the local products has to be made and the pricing strategy has to be adjusted to local prices.

Since Slovenia is a relatively new member of the EU, it must to invest in building a reputation in the minds of EU citizens. Slovenian heritage is even less familiar to an average European. However, the Alps have a positive association for most Europeans, since Switzerland and Austria and some multinationals based in those countries have promoted the Alps and products from the Alps intensively in recent decades. Slovenian companies could utilize this positive image in their product proposition.

The companies that are active in regional products in Slovenia are still relatively small. Perhaps they should first invest in the local market in order to improve their financial position, and shift from a product orientation to a marketing orientation before going international, because going international demands enormous investments. Gaining market share for a small company is relatively easy if its product fits in with a new trend in the market. The pumpkin oil and honey companies have implemented new trends in their product propositions. This gives them more chances in the international market. Pumpkin oil and Idrijski žlikrofi are the most unique products from an international viewpoint. But to gain market share internationally, the unique characteristics of these products in relation to olive oil and other pastas have to be made clear. This implies that an awareness campaign has to be started.

5. Conclusions

We identified the following strengths, weaknesses, opportunities and threats related to the Slovenian special products.

Strengths

- Nearly all products have unique characteristics that are difficult to copy; this applies especially to PDOs
- High product quality; all products are ISO and HACCP certified
- Local market as base
- Producers are ambitious
- Protected status is valued business-to-business
- Distribution in specialty shops and tourist market
- Strategy focused on personal selling

Weaknesses

- Low market awareness
- Positioning of products could be more clear
- No specific choice concerning distribution channels
- Not all producers use the official labels
- Most companies are product orientated (could be a strength if viable in the long run)
- Market strategy not clear in some cases (in some producers unions, each producer has its own product, pricing and promotion strategy)
- Slovenian heritage is not well known internationally
- Nearly all companies are small (from both a national and an international perspective)
- Financial situation not solid for some companies

Opportunities

- International market for unique regional products
- International market for healthy products
- Positive image of the Alps; use the Alps in the product proposition
- Alliances with tourist or governmental organizations could be very useful

Threats

- Strong competition in the international market
- Some products have to compete with products from multinationals in the national market if they want to scale up to supermarkets

6. Recommendations

Recommendations for the organizations that produce PDOs:

- use the natural differences between products in the product proposition
- use the content of regional promotions in the product proposition
- use direct selling to promote the business and the origin of the products
- assess market potential in specific target groups
- decide who you want to sell to

Recommendations for the PGI producers:

- identify and communicate the distinguishing product characteristics in your product proposition
- use the content of regional promotions in the product proposition
- use the possibilities for scaling up production
- potential products for the supermarkets: explore this channel if you have not yet done so
- assess market potential in specific target groups
- decide who you want to sell to

Recommendations for the TSG producers:

- protect the recipe against copying, and sue copiers
- keep the product small; scale up only if freshness and quality can be guaranteed
- recent cooling techniques could be valuable in scaling up
- use the content of regional promotions in the product proposition
- enter alliances with tourist organizations

Recommendations for the Slovenian government:

- promote the meaning of the various special product labels
- encourage supermarkets to organize special product corners
- promote Slovenia and the Slovenian heritage in Europe

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Protecting against foreign competitors

The case of farm made cheese and sausages in Slovenia

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Introduction

Removing trade barriers between countries increases competition in national markets because foreign competitors can offer their produce more easily in domestic markets. For example European companies can more easily enter national markets of countries that have joined the European Union. Thus, national and local producers of countries joining the EU have to develop marketing plans to defend against foreign competitors. This paper presents cases from Slovenia, which joined the E.U. in May 2004, and the Euro zone in January 2007. The paper focuses on marketing challenges faced by farm-based cheese and sausage processors.

The case offers valuable insights for small business owners that face similar market environments with increasing foreign competition. Moreover, it offers suggestions for policy makers that want to increase the competitiveness of domestic producers. Finally, the case can be used in marketing courses to demonstrate the application of market research for marketing planning.

The marketing research presented in this paper shows opportunities for Slovene farm-based processors of cheese and sausages to improve their market position: improve the taste, availability and awareness of their products. Moreover, it demonstrates that marketers should not use only consumer's stated attribute importance to identify market segments.

First, a marketing perspective on competition is presented. Second, the situation of cheese and sausage processors in Slovenia is presented. Third the methodology of the market researches is discussed. It focuses on the marketing of cheese and sausages in Slovenia, but the method can easily be adapted to other products and countries. Fourth, the results of the market research are presented. Fifth, implications for marketing planning of Slovene cheese and sausage processors are discussed. Finally, some issues are suggested that can be discussed based on the presented case.

Marketing perspective on competition

Market orientation as a dynamic capability

Research has shown that a market orientation improves performance (Kirca *et al.*, 2005). The basis for a market orientation is the philosophy or business culture that the key to organizational performance is to satisfy your customers more than your competitors do (Homburg and Pflesser, 2000; Narver and Slater, 1990). However, a philosophy alone does not improve performance; it needs to be implemented. Firms need to understand customers and competitors to be able to satisfy customers better than competitors. Thus they need to generate information about their customers and competitors and learn from this information by discussing it with other people within their organizations (Kohli and Jaworski, 1990). Finally, firms need to respond to this new knowledge (Kohli and Jaworski, 1990).

The implementation of a market orientation is supported by other organizational resources, such as a learning orientation, an entrepreneurial orientation, and innovativeness (Hult and Ketchen, 2001). These organizational cultures and procedures that allow a firm to adapt to changing market conditions are referred to as dynamic capabilities (Menguc and Auh, 2006).

Market positioning

A firm's resources allow it to obtain a market positioning (Day and Wensley, 1988). A market position is defined by the way customers perceive the offer of a firm relative to offers of competitors that fulfil the same need. A superior market position means that customers believe that the firm's offer fulfils their needs better than competitive offers do. If the firm's market position is superior the firm can perform better than its competitors (Hult and Ketchen, 2001). To obtain a superior market position, firms need to realize that not all consumers are the same. Different customers may value different aspects of the offer and, therefore, an offer may be superior for one customer, but not for another. Market positioning, therefore, is preceded by market segmentation and market targeting.

Target marketing is performed in three steps: market segmentation, market targeting and positioning (Kotler and Keller, 2009). Market segmentation holds that firms identify groups of customers where differences in within the groups are small compared to differences between the groups. Market targeting holds that firms evaluate the attractiveness of serving each segment and choose the ones they wish to serve. Positioning holds that firms try to obtain a position in the minds of their customers. Positioning is about perceptions of customers. A firm's positioning shows how the firm's offers are perceived by customers in relation to offers of competitors. This can be described with points-of-difference and points-of-parity. Points-of-difference are attributes or benefits consumers strongly associate with an offer, positively evaluate, and believe they could not find to the same extent with a competitive offer. Points-of-parity indicates associations that are not necessarily unique to the offer but may be shared with other offers.

Numerous variables can be used for market segmentation, but the most valuable variables have clear implications for adapting the offer to customer's needs. Variables for market segmentation should, therefore, be related to consumer behaviour models, such as the multi attribute model. The multi attribute model holds that consumer's overall evaluation of an offer is based on the importance they attach to benefits and attributes of the offer and their perceptions of offers on these benefits and attributes. It assumes a compensatory decision rule, which means that favourable perceptions about the attributes of an offer can compensate for unfavourable perceptions of another attribute. In other words, perceptions of attributes and benefits of an offer drive the consumer's intention to buy an offer and the weight of each attribute depends on the importance for that attribute. Attribute importance, however, consists of three dimensions: salience, relevance and determinance (Van Ittersum *et al.*, 2007).

Salient characteristics for food

Salience reflects the degree to which characteristics of food come to mind (Van Ittersum *et al.*, 2007). Salience of an attribute is measured by an open ended question to let people indicate which attributes they believe are important. Salience has marketing implications when attribute information is available only in memory during the decision process.

Relevance of food characteristics

Relevance reflects the importance of attributes for individuals and is largely determined by values and desires (Van Ittersum *et al.*, 2007). Attributes and benefits that satisfy important values and desires are more relevant. Relevance of an attribute is measured by directly asking people to judge the importance of attributes. For example via the direct rating method that asks individuals to rate an attribute on a rating scale (e.g. 1 = "unimportant" – 7 = "important"). Measuring relevance has implications for marketing planning because relevance is positively related to determinance. Moreover, relevance is important when consumers decide whether or not to buy at all. Finally, relevant attributes identify opportunities for attribute levels that are outside the range of existing attribute levels.

Perception of food characteristics

Perception reflects how food attribute levels of a certain product, like a cheese or a sausage are viewed by customers. Perceptions of attribute levels are not the same as actual attribute levels, because perceptions are subjective. For example, an objective price of 1 Euro for a sausage may be perceived as expensive by one consumer and cheap by another. Perceptions of attribute levels have a more direct influence on consumers' liking of a product than objective attribute levels.

Determinance of food characteristics

Determinance reflects the importance of attributes in judgement and choice and is generally calculated based on the differences in attribute levels in a choice set (Van Ittersum *et al.*, 2007). Determinance of an attribute is measured by regressing attribute levels of an object on an overall liking of the object. The regression coefficient obtained for an attribute measures the determinance of the attribute. Determinance has clear implications for marketing planning because it is closely related to behavioural outcomes (e.g. purchases). Determinance is important when consumers decide which one of two products to buy and, thus, for a products competitive position in the market.

Superior performance

Superior performance means that a firm achieves its objectives better than its competitors. A firm's objectives can be profit, market share, employment or simply survival. A superior market positioning is a prerequisite for, but does not guarantee superior performance. Firms incur costs to create offers that are valued by customers. Firms need to appropriate part of this value from customers via higher prices or higher sales. Pricing strategies and policies based on consumer's willingness to pay and the value of competitive offers are, therefore, crucial to turn a superior market position into superior performance for the firm.

The case: farm-made cheese and sausages in Slovenia

Slovenia has established a liberal political culture after it became independent in December 1991. It adapted successfully to the world market: it joined the E.U. in May 2004, and the Euro zone in January, 2007, and its economy has grown more than the E.U. average, from 2004 until the start of the financial crisis in 2008. Agriculture in Slovenia, however, is facing problems to compete on the E.U. market. A quarter of Slovene land is defined as less favoured areas and, thus, most farms include hilly and mountainous areas that limit the

possibilities of farming. Moreover, the size of farms is small, for example 84.4 % of the farms own less than 8 ha, which limits their production and raises costs, compared to farms in other E.U. countries. Similarly, most processors of agricultural produce, such as dairies, are smaller than their competitors in the E.U. Consequently, production costs for most agricultural produce are higher in Slovenia than in other areas of the E.U., which makes it hard to compete on foreign E.U. markets with commodities such as cheese and meat. Finally, food retailing in Slovenia is highly concentrated. These large retailers look across the border for competitive offers. Moreover, some foreign retailers are penetrating the Slovene market bringing their own suppliers from abroad. Thus in an open economy farmers and processors of agricultural produce have to define marketing strategies to defend their domestic market.

The goal of the marketing research presented hereafter is to identify marketing strategies for farm-made cheese and sausages in Slovenia to defend their domestic market against foreign competition. Positional defence is chosen as the competitive strategy. It means that Slovene producers offer exactly what domestic customers want and thus leave no room for foreign competitors to enter the Slovene market in a profitable way. This research analyzes consumer's preferences and perceptions of products to identify marketing strategies that can help Slovene producers and processors to protect their local market against foreign competition.

Methodology

Design

This research measures the relevance and determinance of food characteristics according to Slovene customers.

To measure relevance of food characteristics it reports average relevance scores across all respondents for each food characteristic. These scores are reported from most relevant characteristic to least the relevant characteristic, which helps firms to differentiate their offer on characteristics that are relevant to consumers.

This research also measures customer's perceptions of several offers within the same product category (i.e. cheese and sausages). Points-of-difference and points-of-parity will be identified for each offer.

To measure determinance of food characteristics it reports regression coefficients of food characteristics that drive customer's intentions to buy food products.

Market segments are identified based on the relevance of food characteristics. Superior market positions can be obtained by targeting specific market segments that value some characteristics more than other market segments.

Sample

A random sample from the Slovene population (above the age of 18 years old) was obtained from statistics Slovenia. This allows a generalization of the results to the Slovene population. Questionnaires were sent to 2300 consumers and 340 questionnaires were returned. To limit the length of the questionnaire respondents rated either cheeses or sausages: 220 respondents rated 4 or 5 cheeses and 120 respondents rated 4 sausages. Eventually 315 questionnaires without missing values were used for the analyses.

Perceptions of food characteristics are measured for several cheeses and sausages available in Slovenia: regular cheese and sausages, organic cheese and sausages, PDO cheese (Product from a Protected Designated of Origin, such as Nanos cheese) and PGI sausages (Protected geographical Indication, such as Kranjska sausage), mountain cheese, and farm-made cheese and sausages.

The first part of the questionnaire asks respondents some background variables: age, education, stage in their professional career, and region where they live. Results presented in Table 1 do not indicate a serious bias in the responses compared with the Slovene population. However, more women than men returned the

questionnaire, but this is appropriate because more woman than man do the daily shopping. Moreover, older people responded slightly more. These results allow a generalization of our findings to the Slovene population.

Table 1: **Comparison between respondents and the Slovene population**

	Respondents	Population
Age (above 18)	49	40.8
Sex: Man / women	37.8 % / 62.2 %	49 % / 51 %
Education		
• Primary school	10.5 %	24.1 %
• Vocational school	19.8 %	27.8 %
• Secondary school	36.1 %	31.0 %
• High school	17.0 %	6.6 %
• University	14.2 %	9.2 %
• Master / PhD	2.5 %	1.3 %
Profession		
• School / student	9.0 %	14.1 %
• (Self) employed (or looking for a job)	48.5 %	37.0 %
• Farmers	1.2 %	
• House wife	4.9 %	
• Retired	31.5 %	26.0 %
Region		
• Pomurska	4.9 %	5.8 %
• Zasavska	5.6 %	2.2 %
• Gorenjska	9.9 %	9.9 %
• Podravska	17.6 %	15.8 %
• Spodnje-posavska	1.9 %	3.4 %
• Notranjsko-kraška	3.4 %	2.6 %
• Koroška	5.6 %	3.6 %
• JV Slovenija	7.1 %	6.9 %
• Goriška	1.5 %	5.8 %
• Savinjska	6.5 %	12.7 %
• Osrednjeslovenska	31.2 %	25.9 %
• Obalno-kraška	4.9 %	5.4 %

Measures

Salient food characteristics

We identified 6 salient characteristics of food: health, price, sustainability, tradition, indulgence, and convenience. Health characteristics of food are related to the absence of negative influences, such as saturated fats, salt, and too many calories. Moreover, health is related to positive influences of food, such as stimulating the immune system. Price is about low or at least competitive prices. Sustainability is about doing business without harming the interests of society and future generation. It includes societal issues such as the environment, animal welfare, and fair trade. Tradition is about conserving what is good. Some people value the past and want to

maintain what is threatened by innovation and globalization, such as local or national products and traditional production methods. Indulgence is about enjoying life and for food it means excellent taste and enjoyable meals. Convenience is about saving time and effort. For food it means that it should be convenient to buy and easy to prepare.

Perception of food characteristics

Respondents are questioned about their perceptions of cheeses and sausages. For example, to measure consumer's perception of a cheese's health, 4 items related to health aspects were examined:

- Do you think that the (e.g. farm made) cheeses are nutritious?
- Do you think that the (e.g. farm made) cheeses improve your health?
- Do you think that the (e.g. farm made) cheeses are healthy products?
- Do you think that the (e.g. farm made) cheeses have certificates that guarantee the safety of the product?

These questions are answered on a seven point scale that is anchored by absolutely not and absolutely yes. PCA (Principal Component Analysis) with varimax rotation was used to assess whether consumer actually perceived the cheese products along the lines of the 6 salient food characteristics that we identified. The PCA was performed on 1415 product evaluations because 220 respondents rated 4 or 5 cheeses and 120 respondents rated 4 sausages. Evaluations with missing values were excluded from the analyses. Table 2 shows the factor loading of the items after rotation. The dimensions are clearly visible in the results of the PCA with 6 components. The highest loading of each item on the components is underlined. Groups of items load highest on the expected component, with one exception, a "Good value for money". It turned out that the translation of this item in Slovene was very difficult, which resulted in a long description. Factor loadings suggest that consumers interpreted this item in different ways and, therefore, the item was not used for further analyses.

Table 2: **Factor loadings of perceived attributes of cheeses and sausages**

Perceived attributes of Cheese	Healthy	Sustainable production	Traditional production	Good Price	Convenient	Indulgence
Nutritious	<u>0.72</u>	0.20	-0.08	0.07	0.13	0.30
Improving health	<u>0.82</u>	0.13	0.24	0.15	0.01	0.13
Healthy	<u>0.80</u>	0.20	0.33	0.08	0.05	0.16
Certificates as safety guarantees	<u>0.49</u>	0.23	0.41	-0.03	0.33	0.00
Low price	0.08	0.03	0.04	<u>0.90</u>	0.13	-0.02
Competitive price	0.10	0.08	0.15	<u>0.83</u>	0.17	0.18
Good value for money	0.12	0.13	0.47	0.36	0.07	<u>0.56</u>
Fair price for producers	0.03	0.18	<u>0.63</u>	0.31	0.12	0.25
Environmental friendly production	0.45	0.38	<u>0.67</u>	0.00	0.02	0.13
Animal friendly production	0.44	0.34	<u>0.68</u>	0.03	0.03	0.07
Produced in Slovenia	0.13	<u>0.81</u>	0.17	0.07	0.13	0.20
Traditionally produced	0.23	<u>0.82</u>	0.22	0.06	0.03	0.18
Produced in a specific region	0.20	<u>0.82</u>	0.20	0.04	0.08	0.16
Enjoyable meal	0.31	0.35	0.16	0.06	0.22	<u>0.70</u>
Excellent taste	0.31	0.36	0.13	0.04	0.28	<u>0.69</u>
Convenient to buy	0.02	0.05	0.07	0.25	<u>0.88</u>	0.05
Easy to prepare	0.15	0.12	0.06	0.08	<u>0.81</u>	0.29

Additional PCAs and a reliability analyses (Cronbach Alpha) were performed only on the items that load highest on one component in Table 2. Table 3 shows the results of these analyses. The measures for each perceptual dimension have good measurement scale properties: all the Eigen values of the second component in a PCA are below 1; the variance accounted for by the first component is higher than 60%; and all items load higher than 0.60 on the first component (even higher than 0.67). All Cronbach Alpha's are higher than 0.60 (even higher than 0.78). For subsequent analyses average scores of the items that load high on the respective component are used as measures for the perceptual dimensions.

Table 3: **Measurement scale properties of perceived attributes of cheeses and sausages**

Scale	# of items	Eigen value second component	Variance accounted for	Lowest item loading	Cronbach's Alpha
Healthy	4	0.65	65%	0.71	0.82
Low price	2	0.35	82%	0.91	0.79
Sustainable	3	0.70	71%	0.67	0.79
Traditional	3	0.36	79%	0.87	0.87
Indulgence	2	0.23	88%	0.94	0.87
Convenience	2	0.36	82%	0.91	0.78

Relevance of food characteristics

To measure the relevance of food characteristics respondents are questioned about the importance of each item when they buy food. For example, to measure the relevance of health when consumers buy food, 4 items related to health aspects were examined:

- When buying food products how important is the nutritional value for you?
- When buying food products how important is it for you to improve your health?
- When buying food products how important is healthy food for you?
- When buying food products how important is for you food security, guaranteed by certificates?

These questions are answered on a seven point scale that is anchored by not important and very important. Health, low price, sustainability, tradition, indulgence, and convenience are expected as underlying dimensions for relevance, because the questions about relevance mirror the perceptions of food characteristics. PCA with varimax rotation was used to identify the underlying dimensions of the relevance measures. The PCA was performed on 315 respondents. Respondents with missing values were excluded from the analyses. Table 4 shows the factor loading of the items after rotation. The highest loading of each item on the components is underlined. The dimensions are clearly visible in the results of the PCA with 6 components. Groups of items load highest on the expected component, again with one exception, good value for money, which loads higher on the sustainability component than on the expected good-price component. This confirms our decision to exclude this item from further analyses.

Table 4: **Factor loadings of relevance attached to food attributes**

Perceived attributes of Cheese	Healthy	Sustainable production	Traditional production	Good Price	Convenient	Indulgence
Nutritious	<u>0.80</u>	0.16	0.04	0.00	-0.01	0.17
Improving health	<u>0.82</u>	0.15	0.19	0.08	0.08	0.08
Healthy	<u>0.80</u>	0.12	0.28	0.04	0.17	0.06
Certificates as safety guarantees	<u>0.56</u>	0.39	0.25	0.08	0.09	-0.06
Low price	0.07	-0.03	0.07	<u>0.76</u>	0.00	0.27
Competitive price	0.01	0.10	0.09	<u>0.84</u>	0.03	0.05
Good value for money	0.16	<u>0.58</u>	-0.15	<u>0.48</u>	0.19	-0.01
Fair price for producers	0.07	<u>0.71</u>	0.19	0.28	0.09	0.06
Environmental friendly production	0.33	<u>0.69</u>	0.35	-0.14	0.06	0.12
Animal friendly production	0.30	<u>0.72</u>	0.24	-0.16	0.03	0.17
Produced in Slovenia	0.22	0.16	<u>0.70</u>	-0.15	0.10	0.17
Traditionally produced	0.19	0.16	<u>0.84</u>	0.10	0.07	-0.02
Produced in a specific region	0.15	0.16	<u>0.68</u>	0.21	0.13	0.01
Enjoyable meal	0.11	0.06	0.12	0.11	<u>0.87</u>	0.05
Excellent taste	0.08	0.11	0.12	-0.04	<u>0.85</u>	0.12
Convenient to buy	0.05	0.17	0.06	0.14	0.22	<u>0.80</u>
Easy to prepare	0.16	0.03	0.04	0.16	-0.01	<u>0.86</u>

Further analyses show that the measures for each relevance dimension have good measurement scale properties (see Table 5): all the Eigen values of the second component in a PCA are below 1; the variance accounted for by the first component is higher than 60%; all items load higher than 0.60 on the first component, and all Cronbach Alpha's are higher than 0.60.

Table 5: **Measurement scale properties of relevance attached to food attributes**

Scale	# of items	Eigen value second component	Variance accounted for	Lowest item loading	Cronbach's Alpha
Healthy	4	0.61	66%	0.73	0.81
Price	2	0.48	76%	0.87	0.69
Sustainable	3	0.68	69%	0.69	0.77
Traditional	3	0.66	65%	0.76	0.72
Indulgence	2	0.42	79%	0.89	0.72
Convenience	2	0.46	77%	0.88	0.70

Determinance of food characteristics

After each series of questions about customer's perception of a cheese or a sausage the Juster scale is used to measure respondent's behavioural intentions to buy the product (Day *et al.*, 1991; East, 1997). The Juster scale is an 11 point scale (from 0 to 10) with verbal description and percentages that respondents can use to indicate their likelihood of buying a specific product within a specified period of time. In our research the time period is within one month.

To measure the intention to buy a certain food product the next question was used:

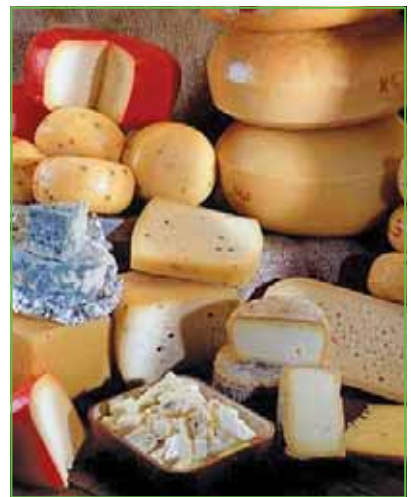
"When buying cheese, how likely it is that you buy farm made cheese (or organic cheese or mountain cheese or) in next one month?"

The same for sausages.

Regression analyses are preformed of perceptions of cheese on behavioural intentions to buy cheese. This procedure produces estimates of the determinance of perceptual dimensions of food characteristics. These estimates of determinance can be compared to estimates of relevance. In other words, it is a check to see whether relevance of food characteristics influences determinance of food characteristics. Regression analyses are performed across all respondents and for each product.

Market segmentation

A procedure is applied to identify segments of consumers that attach similar importance to the importance of food attributes. However, these analyses are still in progress and will not yet be reported in this article.



Results

Relevance of food characteristics

Table 1 shows the food attributes by decreasing relevance. It shows that taste and health are the most relevant attributes, followed by production in Slovenia. The second indulgence attributes enjoyment is the next relevant food characteristic for Slovene consumers. Sustainability issues, such as environmental and animal friendly production, and a fair price for producers score above average for relevance in this list of food characteristics. Low prices and competitive prices are least relevant for Slovene consumers. Tradition seems less relevant because production in a specific region and traditionally produced are rated as not relevant, but production in Slovenia is very relevant. Convenience elements score below average on relevance in this list of food characteristics.

Table 6: **Relevance of food attributes**

Perceived attributes of food	Average relevance across the sample
Excellent taste	6.36
Healthy	6.04
Produced in Slovenia	5.97
Enjoyment	5.93
Environmental friendly production	5.92
Improving health	5.88
Animal friendly production of food products	5.85
Fair price for producers	5.69
Convenient shopping	5.47
Certificates as safety guarantees	5.38
Traditionally produced	5.36
Easy to prepare	5.22
Nutritional Value	4.95
Competitive price	4.61
Produced in a specific region	4.40
Low price	4.30
N	325

Market positioning of cheeses

Table 7 shows how consumers evaluate the various cheeses. Advantageous scores for a product are indicated in green and disadvantageous scores for a product in red. Different colours indicate statistical differences. A single green score on a characteristic for an offer, therefore, signals a points-of-difference for that product. Points-of-parity are indicated by similar colours on a characteristic across offers.

The positional advantages for regular cheese over competitors are its low and competitive price, and its convenience. Convenience is also a point-of-difference. Moreover, everybody is assumed to know regular cheese. However, it has disadvantages on all other perceived food characteristics: health, sustainability, tradition and taste.

The positional advantage of organic cheese is its perceived health, which is guaranteed by certificates. However, this is a point-of-parity because this positional advantage is shared with mountain cheese and PDO cheese. Organic cheese has disadvantages in price.

The positional advantages for PDO cheese are, obviously, its region of origin and its traditional production. Moreover, to some extent PDO is considered as a certificate that guarantees its safety. None of these positional advantages, however, is a point-of-difference because it shares these advantages with other offers. Its disadvantage is its price, which is considered high and not competitive.

Mountain cheeses are perceived as healthy, although they do not have a certificate to prove it. Its points-of-difference are its animal and environmental friendly image. Its traditional production is an advantage that it shares with other cheeses. Its major disadvantage is that it is not convenient to buy.

Farm-made cheeses are competitively priced, like regular cheese, and traditionally produced, like mountain cheese and PDO cheese, which are points-of-parity. Its biggest disadvantage is its lack of convenience and it lacks a certificate that guarantees its safety. Moreover, many people lack knowledge of farm made cheese.

Notice that indulgence is a point-of-parity for all cheeses, which means that none of the cheese distinguishes itself on enjoyment or taste.



Table 7: **Consumer's perception of categories of cheeses¹⁾**

Perceived attributes of Cheese	Regular Cheese	Organic Cheese	PDO Cheese	Mountain Cheese	Farm made
Healthy	4.39	5.53	5.33	5.37	5.06
Nutritious	4.96	5.61	5.62	5.85	5.76
Improving health	3.99	5.25	4.86	5.16	4.88
Healthy	4.37	5.70	5.36	5.63	5.17
Certificates as safety guarantees	4.27	5.60	5.50	4.88	4.47
Good Price	4.46	3.20	3.48	3.71	4.06
Low price	4.24	2.88	3.18	3.49	3.90
Competitive price	4.69	3.53	3.77	3.94	4.21
Sustainable production	3.98	4.88	4.76	5.23	4.87
Fair price for producers	3.83	4.10	4.32	4.44	4.34
Environmental friendly production	4.03	5.30	5.01	5.63	5.14
Animal friendly production	4.12	5.27	4.95	5.63	5.15
Traditional production	4.09	4.97	5.84	5.85	5.53
Produced in Slovenia	4.57	5.00	6.05	5.91	5.89
Traditionally produced	3.80	4.94	5.51	5.85	5.61
Produced in a specific region	3.92	4.97	5.95	5.79	5.13
Indulgence	5.03	5.29	5.43	5.44	5.11
Enjoyable meal	5.02	5.27	5.39	5.44	5.06
Excellent taste	5.05	5.31	5.47	5.44	5.16
Convenience	5.53	4.96	5.12	4.74	4.63
Convenient to buy	5.54	4.65	4.86	4.28	4.24
Easy to prepare	5.52	5.28	5.38	5.20	5.01
Knowledge of the product		5.28	5.55	5.14	4.75
N	214	211	206	208	108

¹⁾ *red: significant low compared to other cheeses;*

green: significant high compared to other cheeses

Market positioning of sausages

Table 8 shows how consumers evaluate the various sausages. Regular sausages have no points-of-difference because its low and competitive price is matched by PGI (i.e. Kranjska) sausage and farm made sausages. It has disadvantages on all other perceptual dimensions: health, sustainability, tradition, taste, and convenience.

The points of parity for organic sausages are its perceived health and its environmental and animal friendly production. However, it has disadvantages in price and convenience to buy, and many consumers know little about the product.

PDO/PGI (like Kranjska) sausages has a big positional advantage over its competitors on many dimensions: safety, price, a fair price for producers, traditional production, indulgence, and convenience. Moreover, most people know PGI (Kranjska) sausages very well. Convenience to buy is its point-of-difference, while all other characteristics are points of parity.

Farm-made sausages have no points-of-difference but many points-of-parity: nutritious, a low, and competitive price, a fair price for producers, traditional production in Slovenia, enjoyable and excellent taste, and easy to prepare. It has few disadvantages. It only lacks a certificate that guarantees its safety.

Table 8: **Consumer's perception of categories of sausages¹⁾**

Perceived attributes of Sausages	Regular Sausage	Organic Sausage	PDO/PGI Sausage	Farm Sausage
Healthy	3.60	4.68	4.13	4.12
Nutritious	4.38	4.92	4.88	5.24
Improving health	2.87	4.25	3.25	3.42
Healthy	3.23	4.58	3.56	3.95
Certificates as safety guarantees	3.92	4.97	4.85	3.88
Good Price	3.71	2.78	3.55	3.71
Low price	3.47	2.41	3.28	3.41
Competitive price	3.95	3.15	3.81	4.01
Sustainable production	3.27	4.22	3.81	4.01
Fair price for producers	3.32	3.68	3.89	4.15
Environmental friendly production	3.31	4.78	3.86	4.15
Animal friendly production	3.17	4.21	3.70	3.74
Traditional production	3.83	4.60	5.45	5.24
Produced in Slovenia	4.28	4.75	5.91	5.60
Traditionally produced	3.66	4.58	5.18	5.27
Produced in a specific region	3.57	4.46	5.26	4.85
Indulgence	4.37	4.92	5.01	5.33
Enjoyable meal	4.30	4.82	4.85	5.21
Excellent taste	4.44	5.03	5.19	5.45
Convenience	5.15	5.03	5.59	5.28
Convenient to buy	5.14	4.72	5.42	4.95
Easy to prepare	5.16	5.34	5.76	5.62
Knowledge of the product		5.65	6.12	6.39
N	119	118	118	117

1) *red*: significant low compared to other sausages;

green: significant high compared to other sausages

Determinance of perceived food attributes

Perceived food characteristics that are indicated by consumers as relevant are expected to have the biggest impact on consumer's intention to buy these products (i.e. determinance). To measure determinance, perceived food characteristics of products are regressed on consumer's intention to buy these products. Table 9 shows the results of these regression analyses.

Table 9: **Coefficients for OLS regression of intentions to buy on perceived food characteristics of cheese and sausages**

	Behavioural intentions to buy	
	Cheese	Sausages
Health	0.07	0.16
Good Price	0.08	0.20
Sustainable production	-0.14	-0.10
Traditional production	-0.06	-0.20
Indulgence	0.62	0.81
Convenience	0.32	0.09
Knowledge	0.22	0.25
Dummy organic	-3.43	-2.27
Dummy PDO	-3.46	-1.99
Dummy Mountain	-3.78	
Dummy Farm made	-3.86	-1.70
R ²	0.42	0.26
N	882	466
F	57.7	15.8

High convenience and indulgence have a positive influence on consumer's intention to buy cheeses, but health, low prices, sustainable and traditional production do not influence consumer's intention to buy cheese. Indulgence is the food characteristic which determines consumers intention to buy cheese, which is in line with the relevance of this food characteristic. Convenience, however, had only a modest rating on relevance while it is one of the two food characteristics that have a positive influence on consumer's intention to buy cheese. Health and sustainability rated high on relevance, but do not determine consumer's intention to buy cheese.

Good price and indulgence determine consumer's intention to buy sausages. The determinance of indulgence is in line with its relevance. Good price, however, determines consumer's intention to buy sausages but is not considered a relevant food characteristic. Health, sustainable production, traditional production and convenience do not determine consumer's intention to buy cheese. Health and sustainability rated high on relevance, but do not determine consumer's intention to buy cheese.

Three explanations are offered for the contradiction in these findings. First, consumers hold a minimum level for some food attributes. Below this level consumers will not buy the product but above this level it does not determine consumer's intention to buy. If all products meet the minimum level food attributes do not determine intentions to buy. Such food attributes are called dis-satisfiers. Health and sustainability may be such attributes. Health is important to consumers, but they expect that all the products meet health regulations and are thus not harmful for their health. Sustainability also is important to consumers, but they expect that all producers meet regulations and thus do not fall below their threshold level. Notice that these characteristics can determine intention to buy if products score below consumer's minimum level of acceptance. For example in case of food scares and when products are scrutinized by NGO's. Second, heterogeneity in consumer preferences obscures the determinance of certain food attributes. Consequently only attributes that are important for all or the majority of consumers are identified as determinants. Third, consumers buy different products for different occasions and thus the determinance of food characteristics may depend on the occasion. Previous analyses do not account for this heterogeneity. In the follow-up analyses heterogeneity between consumers will be explored.

Determinants various cheeses and sausages

Tables 10 show the determinants of the different cheeses in our research and Table 11 of the different sausages.

For all cheeses indulgence is a determinant. For regular cheese also health is a determinant. For mountain cheese and farm-made cheese convenience is a determinant. Moreover, knowledge of the products positively influences consumer's intentions to buy organic and PDO cheese. These results have obvious implications for marketing different cheeses in Slovenia. Improving the taste of cheese is a fruitful venue for all cheese producers. Regular cheese producers can improve their market position by improving the health perception of regular cheese. Organic and PDO cheese producers can improve their market position by increasing the knowledge (i.e. awareness) of the product. Mountain and Farm-made cheese producers can improve their performance by increasing also the convenience (to buy) these products.

Table 10: **Coefficients for OLS regression of perceptions of specific Cheeses on intentions to buy specific Cheeses**

Product	Behavioural intentions to buy				
	Regular Cheese	Organic Cheese	PDO Cheese	Mountain Cheese	Farm made Cheese
Healthy	0.38	-0.13	0.31	-0.22	-0.31
Good Price	-0.08	0.04	0.17	0.14	0.09
Sustainable production	-0.29	0.01	-0.15	-0.17	-0.04
Traditional production	-0.15	0.11	-0.33	0.08	0.17
Indulgence	0.64	0.65	0.82	0.53	0.60
Convenience	0.28	0.08	0.20	0.54	0.57
Knowledge		0.24	0.28	0.12	0.18
R ²	0.16	0.22	0.29	0.20	0.33
N	209	204	202	201	64
F	6.6**	7.9**	11.3**	7.0**	4.1**

For all sausages indulgence is the determinant and consequently the marketing implication is that sausage producers should focus on and emphasize taste and enjoyment in their marketing strategies. Farm made sausages can improve their marketing position also by increasing the knowledge (i.e. awareness) of the product.



Table 11: **Coefficients for OLS regression of perceptions of specific Sausages on intentions to buy specific Sausages**

Product	Regular Sausages	Organic Sausages	PDO Sausages	Farm made Sausages
Healthy	0.38	-0.13	0.26	0.34
Good Price	0.04	0.25	0.25	0.14
Sustainable production	-0.51	-0.19	0.05	0.09
Traditional production	0.00	-0.19	-0.09	-0.26
Indulgence	0.72	0.79	0.61	0.99
Convenience	0.28	0.20	0.13	-0.34
Knowledge		0.17	0.21	0.59
R ²	0.20	0.19	0.23	0.34
N	117	116	116	117
F	11.3**	10.3**	13.4**	15.5

Market segmentation

Segments of consumers attaching similar relevance to food attributes (after standardization) have been found. The statistical procedure resulted in 6 consumer segments. In a follow-up research, differences in relevance and determinance of the various food characteristics between segments will be examined. The results of this analysis will be reported later.

Managerial implications

The marketing research presented in this paper shows opportunities for Slovene farm-based processors of cheese to improve their market position: improve the taste, and availability of their products. Slovene farm-based processors of sausages should try to improve the taste, and knowledge of their products.

Slovene farm-based processors of cheese have unique market positions. They are differentiated from regular cheese on health, traditional and sustainable production. However, these characteristics do not determine consumer's purchases of cheese, but indulgence and convenience (to buy and prepare) do. However, Slovene farm-based processors of cheese do not differentiate themselves on taste and even perform worse than regular cheese on convenience.

Slovene farm-based processors of sausages also have unique market positions. Particularly PDO/PGI (i.e. Kranjska) sausage is differentiated from regular sausages on all dimensions of food characteristics, except a good price. This demonstrates the strong market position of PDO/PGI (i.e. Kranjska) sausage. Farm made sausages can improve their marketing position also by increasing the knowledge (i.e. awareness) of the product.

The results demonstrate that consumer's stated attribute importance (i.e. relevance) should be used to identify market segments only with caution. The relationship with actual behaviour (i.e. determinance) is weak, which may result in faulty marketing decisions.

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Diversity of cattle systems and products in Austria

The assets of mountain and hilly areas

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Agriculture in Austria is in many cases comparable to the situation in Slovenia. Both countries have a high proportion on hilly and alpine areas and nearly the same climate conditions. Therefore grassland and alpine pasture is the natural bases for farming. Even the structure of farms is not very different. Small holdings dominate agriculture.

Present situation of farming in Austria

The total farmland in Austria comprises 6.542.800 ha distributed across 187.000 farms. 3.340.300 ha or 57,3% is forestry and 3.202.500 or 42,7% agricultural land. On average a farmer is cultivating 18,9 ha and together with forestry 40,5 ha. About 18.000 holdings have only forestry. Of the agricultural land 43,4% is arable land, 34,1% grassland and 22,5% alpine pasture. In some regions, e.g. the federal state Salzburg, arable land has only a proportion of 2,5% of total agricultural land. Cattle production is therefore playing a dominant role in agriculture.

In Austria all farms in less favoured mountain areas are classified in so called Mountain Farm Categories - MFC (BHK – Berghöfekataster) depending on. In alpine regions like Salzburg nearly all farms are situated in such areas. "Favourable" is flat land outside the mountain area. Within the mountain area MFC-0 are better and MFC-4 the most difficult conditions for farming (Table 1).

Table 1: **Distribution of farms by Mountain Farm Category***
(farms with forestry only are excluded)

Category	Austria in total		Salzburg	
	No. of farms	%	No. of farms	%
MFC-0	10.754	6,4	3.392	35,9
MFC-1	21.453	12,7	1.583	16,8
MFC-2	28.661	17,0	2.261	23,9
MFC-3	12.622	7,5	1.337	14,2
MFC-4	6.632	4,8	737	7,8
favourable	88.957	52,6	131	1,4

* Mountain Farm Categories MFC 0 to 4 show an increasing difficult situation to farm; category "favourable" is linked to flat land; criteria like height, average yearly temperature, steepness and infrastructure are used to categorize.

From all 169.079 farms nearly 60% are operated by part time farmers and their families. For these farmers agro tourism is an important second pillar of the total revenue. Closely linked to agro tourism is direct marketing of regional products produced on farms or during summer on Alps.

Supported by the national agricultural policy organic farming has a long tradition in Austria. A significant increase in organic farming was observed after Austria joined the EU in 1995, which was associated with a better financial support to organic farming in the framework of CAP. At present, close to 15% of all holdings are operated as organic farms, while in Salzburg even 40% of holdings with more than 50% of agricultural land are organic farms. Compared to all other EU member states it is the highest density of organic farming.

Cattle Production

In total around 2 million cattle are kept on 73.500 farms. 533.000 cows (67% of the cow population) are distributed over 42.000 dairy herds with an average herd size of 12 cows. The main breeds are dual purpose breeds (Simmental, Brown Swiss and Pinzgauer) and Holstein Friesian. The remaining 264.500 cows (33%) are suckler cows mainly in small holdings of part time farmers. In herds with suckler cows we can find as terminal sires the whole variety of beef breeds

From 1995 to 2009 the number of farms that delivered milk to dairy plants decreased by more than 50% while the average farm quota increased from 27.400 kg to 66.500 kg milk. It can be expected that this trend will still continue in the next decade. About 8% of produced milk is processed on farm to cheese and other products - regional specialities - for direct marketing.

An important source of income for many farmers in the alpine region of Austria is the combination with alpine pasture rearing of young breeding stock as replacements for specialised dairy farms. These replacements are bred as well for the national as for the export market.

The future of farms in mountain areas

If specific **basic conditions** can be ensured farming with cattle in mountain areas will still continue. One important reason for this assumption is a high emotional binding also of young people to their farm and may be even more to their home region. In a study of the Chamber of Agriculture in Salzburg it was shown that from 1995 to 2000 in the mountain district "Pinzgau" only 1,9% of farmers went out of business. In the district "Flachgau", a region with much better condition for farming (flat land, longer vegetation period) this figure was 13,4%.

For staying in business important basic conditions are:

- **Improved value and prices for agricultural products**

Milk from organic farms for processing to a variety of BIO-Products can be sold for a higher price and nearly without additional costs because in mountain areas it is not a big change from traditional to organic farming. The same is true for branded products from beef. But to have a significant impact on a continuous sales quantity and price the offer must be concentrated by a farmer organisation and contracts with trade chains have to be set over a longer period. A further alternative are traditional regional products in combination with direct marketing on the farm.

- **Financial support by EU- and national payments**

Farming in less favourable mountain areas never can be competitive to favourable areas, where products can be produced for much lower costs per unit. But it must always be kept in mind that sustainable farming in these areas guarantees an open and diverse environment. This is an additional immaterial good and a

benefit for the whole society. Therefore, investment of public money is easy to justify. In the long term, the tax payer will understand and accept this much easier than subsidy payments based on production units or temporary storage of milk powder and butter fat or for export subsidies. In this context the upcoming negotiations for the next period of CAP will be of immense importance to the future of farming in mountain areas.

- **Side revenues**

In many cases an additional earning outside the farm is a necessity to survive as a farmer in less favourable farming areas. In regions with an existing touristic infrastructure it can be realized often without big difficulties. The advantage is that tourist activities fit quite well into the work on the farm. Another possibility for additional income is part-time work for communities where the own farm technique can be used. Examples are cleaning of roads and landscape maintenance. Too, it is more and more common that one member of the farmer family is working in a profession outside of the farm.

In general it can be said that farmers in mountain areas in Austria are looking optimistic towards the next decade. One part will invest in farm structure by leasing additional farm land, enlarging the dairy herd and intensifying production. Another part - mainly part-time farmers - will change to more labour extensive production systems like keeping of suckler cows or small ruminants. But only a small part of these farmers will stop farming completely.



Diversity of dairy systems and products in France and in Europe

The assets of less favoured areas

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Market expectations

Everyone agrees that the demand for quality products is growing at the European market level, but with considerable differences in pace, depending on the country or the sector; some could regress, while others increase quickly.

This demand remains, however, extremely sensitive to the various types of crises: food (BSE) or health (foot and mouth disease) crises boost demand, notably for organic products, whilst the announcement of an economic crisis brings about a drop in demand. More generally, most consumers are not prepared to pay a large difference in price for this quality. What is more, consumer expectations differ from country to country, and generally from North to South.

In Northern Europe, the consumer seems to give priority to the health aspect and respect for the environment and will thus move towards organic products as a reaction to intensive agriculture and “industrial farms” of these countries. This is the case in Denmark, where organic dairy production represents 9% of the production and 30% of the consumption of fresh milk. A Eurobaromètre 2002 survey confirms this growing environmental sensitivity in countries of the North, even in Sweden and Finland where problems of nitrates or pesticides in water are nevertheless more limited. In this context, there is relatively little room for the “positive and festive quality” of local traditional products and in particular for raw milk products.



In Southern Europe, the consumer seems to look more for a “pleasure” product, regional and full of flavour; this is explained by a different gastronomic culture and by the greater availability of traditional products, with an important emphasis placed on cheeses made from raw ewe’s, goat’s and cow’s milk. The good image of these products and consumer confidence are explained in particular by the importance of small holdings, the traditional production processes and the commercialisation on local or regional markets. But these three “assets” could evolve quite quickly, favoured by considerable restructuring and industrialisation of production in several countries (Spain and Italy in particular).



Furthermore, a recent French study (Agreste, 2003) shows that the raw milk cheese market, i.e. the majority of PDO and farmhouse products and some organic products are making markedly less progress than pasteurised milk cheeses that are considerably cheaper. Soft raw milk cheeses, in particular Camembert, have clearly dropped behind, whilst hard cheeses are keeping up better.

This French example is undoubtedly not valid for other countries but it demonstrates that, even in one of the leading countries in the production and consumption of cheese, nothing is ever definitive and that the development of the quality sectors market is a long-term process.

This market also depends on the attitude of the food-processing and distribution industry. The dairy industry and mass distribution have long favoured health safety, standardisation, and simplification of product ranges, and consequently a lower milk price and animal/forage intensification. Today, in spite of concentration in these two sectors, policies favourable to such quality products (Organic, PDO) are found in most countries, albeit cautious and limited.

Mass distribution is still a major channel for dairy products, whereas creameries and specialised shops are still very marginal in most countries (1 % in France). Differences exist between countries as to this point too; French-style supermarkets with a very wide range of products are more favourable to variety than the “hard discounts” that are in a position of strength in other countries. Finally, producers in the PDO sector must nevertheless remain vigilant as to quality and production volumes, in order not to lose consumer interest along with the characteristic nature of the products.

The role of European and national institutions

In 1989, the European Commission published a report on the Future of the Rural World which aimed at promoting the recognition and protection of the geographical origin of food products. This objective was expressed in two decrees, one relative to organic farming in 1991, complemented in 1999 for animal productions, the other on the protection of geographical indications and PDO, which has also been modified several times. The regulations regarding PDO and PGI (Protected Geographical Indication) are not limited to proofs as to the origin of the product but also require that this origin attribute a distinctive quality on the product that is superior or specific. It is this interpretation that encourages most of the countries and PDO/PGI associations to review their specifications, from the delimitation of areas and the conditions of production to the maturing method and other characteristics of the cheeses.

Consequently, the existing legal framework should open up good prospects for many local cheeses, beyond those already registered as labels of origin and presented in Table 1.

Out of the 132 PDO cheeses registered at the level of EU-15, there are 105 (80 %) in the five countries of Southern Europe, a few in Germany, Austria, the United Kingdom and the Netherlands, and none in the Scandinavian countries.

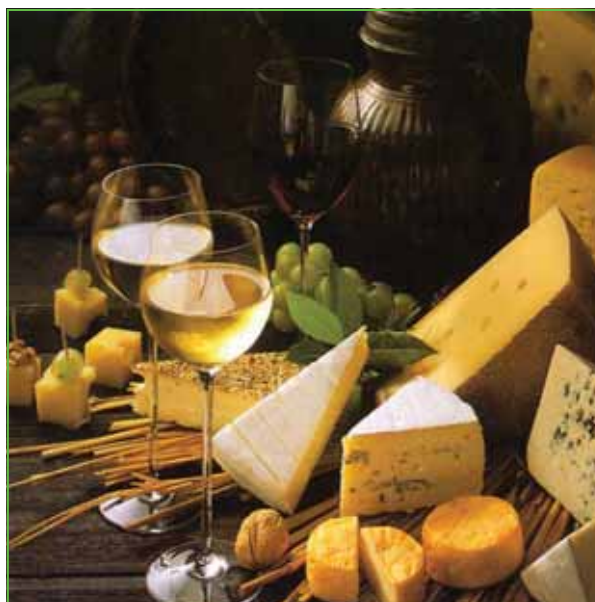
However, this regulatory framework must not be idealised:

- Some judge it too complex, too bureaucratic and therefore dissuasive for producers, without providing any real guarantees for quality so as to win the consumer's confidence (Péri & Gaeta, 2000). It would thus leave hardly any chance of integration for the numerous traditional cheeses registered (502 for EU-12) in a preliminary list drawn up on the initiative of the European Commission, called Euroterroirs (Froc, 1996).
- It is also thought that this regulatory framework remains very fragile because of some ill-defined requirements related to WTO (World Trade Organisation) negotiations, whilst the reference to origin alone would be sufficient and indisputable (Péri-Gaeta, 2000).
- It must also be remembered that this quality sign is not a guarantee of commercial success, nor of a better remuneration for producers, as has been shown earlier for Cantal cheese.

National regulations also play an important role in the development or disappearance of traditional products. A look back over the history of dairy industries during the 20th century should allow a better comprehension of the present situation in different countries, and a better definition of heritage that has been forgotten, badly developed or condemned by health regulations, concerning raw milk products in particular. The numerous personal experiences heard at a FROMAGORA symposium (Institut de l'Élevage et al., 1996) on farmhouse and traditional cheeses are eloquent as to the attitude of public authorities and the dairy industry in most of the European countries concerning raw milk products, whatever the type of product, fresh or mature. It has to be recognised, however, that the majority of consumers demand "zero risk", so public authorities are tempted to favour food health safety at the expense of diversity and taste. In these sectors, more inspections are required at the different stages to provide the maximum of guarantees to consumers.

An incentive role via rural development

Since the reform of 1992 with product quality and environmental protection as priorities, and following the CAP reforms of 2000 and 2003 placing these priorities in the framework of Rural.



Development, awareness is growing rapidly, even if the essential part of aid still remains linked to historical production volumes, and therefore to the most fertile regions.

Table 1. **Distribution of PDO and PGI cheese producers in the Europe of 15**

Number of products	ES	FR	EL	IT	PT	GB	NL	DE	AT	other 6 countries	Total
PDO	13	32	19	30	11	8	4	4	6	5	132
PGI	-	4	-	-	1	3	-	-	-	3	11

Source: EU DG Agri, 2001.

Based on the concepts of sustainable development and multi-functional agriculture, we are moving towards a new type of contract between society and livestock farmers, more precisely farmers in areas that are called less-favoured at agronomic level, but which often have a rich heritage and potential for tourism. Political measures are being taken at European, national and regional level, which make it possible to propose means of support to favour the emergence or consolidation of projects aimed at developing quality products, in the framework of the Rural Development plan. But like in any local development initiative, those involved in quality sectors have to be able to rely on people, jobs and very different skills, all motivated by the same project and sharing a certain number of common values. It is essential for this type of approach to be formalised for the PDO, but it would equally be very useful to give a more territorial foothold to organic and farmhouse producers. It could also be useful to work out collective messages for consumers outside the PDO areas, with the support of regional authorities, as is the case in Bavaria for example. The authorities are becoming increasingly aware that these quality sectors, even on a fairly modest scale, can be both the basic nucleus for other rural employment related to the cheese creamery or farmer markets, and a display case for local tourism. It is these livestock regions in difficult areas, with a heritage of traditional know-how that has long been ignored, that should be encouraged as a priority.

These different sectors (PDO, Organic, farmhouse) do not have the same development prospects in the different major livestock areas. They do not target the same consumer expectations either. Consequently, they are much more complementary than competing with each other.

In Table 2, we have simplified the relative importance of these sectors per major livestock area. This presentation, too simplified out of necessity, has no other ambition than to illustrate the proposition and clarify the challenges.

Globally, these three sectors cover about 10% of dairy production in Europe, but in many regions in less favoured areas they concern the majority of livestock farmers and cheese transformation, thus constituting the pivot of local economy.

This is particularly true for humid mountain areas where the PDO (in France) or Organic (in Austria) or both sectors (in Switzerland) are particularly well-developed, contributing to the limitation of migration of milk to the valleys, even reconquering high mountain pastures and limiting the advance of the forest.

Undoubtedly more diversity will be found in the Mediterranean areas where small ruminants farming is often in competition for the best lands with very intensive crops of cereals, fruit or vegetables. Traditionally, these herds of ewes and goats make use of wide expanses of more or less wooded rangelands, which are increasingly abandoned, causing fire risks every summer. In these regions, products that are highly typical still find a good added value on local markets. However, for lack of appropriate measures, the evolution towards livestock systems with permanent housing, including small ruminants, is progressing rapidly, making unjustified use of the good image of pastoral systems.

Table 2. **Relative importance of the quality dairy sectors per livestock area in Europe**

Livestock areas (<i>Type of milk</i>)	Sectors		
	PDO	Organic	Farmhouse products
Wet mountain (<i>Cows</i>)	High (FR, CH)	Low to high (AT, CH)	Average (DE)
Mediterranean area (<i>Cows, ewes, goats</i>)	High (IT, ES, EL, PT)	Very low	Average (ES, EL, FR, IT)
Grassland areas (<i>Cows</i>)	Low (FR, UK)	Low/average (FR, UK)	Low (BE)
Forage crop areas (<i>Cows, goats</i>)	Low (FR)	Low/average (DK)	Low
North Scandinavia (<i>Cows</i>)	Nil	Average (FI, SE, NO)	

Present importance: nil or very low; low; average; high. Most involved countries: designated by the first two letters (+ Switzerland = CH).

But it is for grassland areas, where the rearing of herbivores is still the only alternative to the forest, that the potential for development of quality products seems the greatest, given the specific features and assets previously developed. The example of Normandy already mentioned is a good illustration of this awareness of a seam that has not been exploited for its PDO products and grasslands. On the other hand, in areas of forage crops, with a large proportion of maize silage or cereals for grain or silage to feed Holstein cows in permanent housing, there is little room for differentiated products, except for products from organic farming, as shown by the example of Denmark and the other Scandinavian countries.

For these different dairy sectors associated with the local environment and the locality, it is more a question of preserving the present heritage than of encouraging a large development which would not be in phase with the market. The experience of the Organic dairy sector in the years 2000-2003, when encouragement to conversion brought about an excess of milk in relation to slow market growth, is quite a severe lesson that ought not to be forgotten.

Conclusions

Livestock areas with significant natural constraints represent about half the European farming territory and about two thirds of farms that rear herbivores. Dairy systems are the most numerous and most diverse in size, products and sectors. These livestock systems often result from a long adaptation process that has enabled them to survive a harsh natural environment and a post-war technical and economic productivity context, as well as the industrialisation of dairy industries and cheap mass products.

Since the CAP reform of 1992, stressing product quality and environmental protection among its priorities, and following the reform of 2000 and 2003 placing these two priorities within Rural Development with slightly more significant financial inducements, awareness has accelerated.

In this presentation we have demonstrated the territorial importance of the less favoured areas of plains and mountains, where farming with dairy ruminants plays a major role, without any other real alternative. Europe cannot allow the concentration and intensification of livestock to continue in the more fertile areas with all the environmental risks associated with it, leaving about half of its territory in economic set-aside. It concerns not only the durability of milk and meat industries, but also rural life and tourism, and therefore the whole regional economy. What is more, these regions are also subject to major natural hazards such as fires, avalanches or land slips, thus requiring careful maintenance and monitoring that can be guaranteed better by these dairy sectors.

At the same time, these regions have often developed very characteristic local products, which ought to be considered as being part of the cultural, biological and gastronomic heritage. This heritage deserves to be preserved with the same determination as the biodiversity of flora and fauna in the region.

It is these livestock regions of so-called less favoured areas, with a strong local identity and a heritage of traditional know-how, both of them impossible to disassociate from their locality, which should be encouraged as a matter of priority. In order to speed up this belated awareness, it would be useful to encourage the exchange of experience between regions whose history and natural surroundings have a certain number of common or complementary features at European level, based on even rudimentary zonings like the one presented in this paper.



Perception of robustness traits in breeding goal for dairy cattle in a new EU country¹

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Summary

The objective of this study was to examine the farmers' perception of robustness (sustainable) traits in the breeding goal, and any associations of this perception with the farm's and farmers' characteristics and plans for the future in countries in transition to the EU environment. As a case, the new member state country of Slovenia was taken. As a tool, a questionnaire was used: 1,114 questionnaires, about 20% of the distributed ones, were anonymously returned. This implies that 12% of the dairy farmers' population is part of the analysis. The farmers were asked if they desired more emphasis on a variety of traits, e.g. production and robustness traits. The robustness trait was constructed afterwards from the fertility, health and longevity traits and simply calculated as the sum of the answers on the question whether (1) or not (0) more emphasis should be placed on the trait in the breeding goal. It was analysed whether the perception of these traits was associated with farm's and farmers' characteristics, and interest in different aspects of farming. Also the relations with breed of herd and plans for the future of farmers were studied. Principal components, characterized as 'age of farmer', 'size of farm' and 'number of activities other than dairy farming' were indicated as main factors characterising the farm and farmer. A total of 25% of the farmers did not see a need to change the emphasis in the existing breeding goal. A majority of the farmers would like more emphasis to be placed on health traits (62%), fertility traits (55%) and protein content (56%). The perception of farmers was significantly dependent on farm size, breed of herd and plans for the future. In the farmers' population in transition, a positive attitude towards sustainable traits was found. A general interest for animal breeding work was not associated with a desired increase in emphasis on a specific trait. This is different for economically oriented farmers and farmers who are interested in feeding or calf rearing practices. These farmers focus more on, respectively, longevity, health and fertility traits. This indicates that it may be worthwhile to think further about the composition of the working group(s) to be involved in the preparation of breeding goals to obtain a well balanced sustainable breeding program. Moreover, it would provide valuable insight in addition to model calculations and the results of this study, when trying out a Profile experiment in combination with other techniques in some farmers' populations in the transition countries.

For reference to book "Breeding for robustness in cattle" and short illustration of study, see also the Appendix of this chapter.

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Introduction

Breeding programmes are constructed to improve each future generation. What constitutes “improvement”, however, is a “political” decision and various basic principles exist to define the desired improvement. For each basic principle, there are various scientific methods to translate “improvement” into index weights for the traits in the breeding goal. Examples of such basic principles are:

- (1) Maximise the total economic response for a dairy herd (Hazel, 1943; Perez-Cabal & Alenda, 2003; Dekkers *et al.*, 2004; VanRaaden, 2004; Nielsen *et al.*, 2005; Mulder *et al.*, 2006; Vangen, 2003, 2008);
- (2) Correct weaknesses relative to the competition of other breeds or populations (Rauw *et al.*, 1998); Dillon & Veerkamp, 2001)
- (3) Work on trouble-free production (Hamoen & De Jong, 2008, this book; Price *et al.*, 2008, this book; Wall *et al.*, 2008, this book);
- (4) Look for desired gains according to the preferences of dairy farmers (Veerkamp, 1998; Tozer & Stokes, 2002; Nielsen & Amer, 2007);
- (5) Look for desired gains based on preferences in society (Oleson *et al.* 2000; Nielsen *et al.*, 2006).

Combinations of the above basic principles are also possible. (Amer, 2006).

Various methods exist to identify the “best” future parents of the next generation. BLUP methods are most commonly used for estimating breeding values in dairy cattle breeding. Each estimated breeding value (EBV) of an individual is weighted with the index weight of the trait. For optimization of the index weights a merit equation is used including the economic values of the traits (Kuipers & Shook, 1980; Mulder & Jansen, 2001; Sölkner & Fürst, 2002; Pedersen *et al.*, 2002; VanRaden & Seykora, 2003). De Vries & Cole (2008, this book), discussed the economic weights of traits for hot climatic conditions. The gene-flow method by McClintock & Cunningham (1974) has widely been used to calculate the economic values, both considering the long term effects of selection and to get the values of all traits of the sexes at a given point in time, e.g. at insemination. The selection index combines the weighted EBV's into a single figure for each selection candidate. However, concerning the reasons behind the choice of a certain combination of traits limited information is available (Pearson, 1986; Philipsson *et al.*, 1994; Philipsson & Lindhé, 2003; Berry *et al.*, 2005; Sölkner *et al.*, 2008).

The basic principle for defining “improvement”, as described above, is often chosen implicitly. Concerning the impact of the main target group, the farmers on the process of composing breeding goals and indices is hardly any literature found. Nevertheless, the opinions and experiences of farmers or groups of farmers as main users of the products of animal breeding do play a role. The **Farm Animal Breeding and Reproduction Technology Platform (FABRE, 2006)** even states: “Changes in the breeding goal are always decided upon by the members of breeding organisations – by the dairy farmers. Breeding organisations ensure the health and welfare of the animals they keep and select. They are engaged in the search for selectable traits that are indicative of species-specific animal welfare”. Perhaps it would be closer to practice to say “Changes in breeding programmes *should always be* decided upon in cooperation with the members of breeding organisations – the dairy farmers”. Amer *et al.* (1998) explained that “a well-defined breeding objective is the first requirement of any genetic improvement program and comprise those traits, which one attempts to improve genetically because they influence returns and costs to the producer. The breeding objective should closely align with the overall objectives of the target groups in the livestock business, who are the critical link in the use of genetically improved animals”. Nielsen *et al.* (2006) add that “the objectives of any breeding program are to achieve the goals of the breeder, and some of the goals of the breeder may not be economic or may include goals that are not directly measurable using some economic gauge”. Veerkamp (1998) and Tozer & Stokes (2002) state that “it is possible to incorporate non-economic as well as economic objectives of dairy producers into a multiple-objective breeding model”.

The Research Institute for Organic Agriculture (FiBL) in Switzerland carried out a survey under 1,000 organic dairy farmers to obtain information on the state of breeding affairs. The response of 608 out of 1000 returned questionnaires was high. The farmers weighted functional traits to be very important in the breeding program. The most important criteria for selection appeared to be fertility (84% of farmers ranked this as first priority), low cell count (81%), longevity (78%), good milk production from forage (77%) and milk quality, especially protein content (72%). On farms with high milk yield (>7,000 kg milk per cow/lactation), protein content was considered to be most important. Fleckvieh holders emphasized in particular the selection criterion of milking speed. Milk yield was important on farms in the valleys, whereas meat production was of great concern to Fleckvieh holders, farms with low average milk yield and farms in the mountain areas. Persistence of yield over lactation was found very important in the French speaking part of Switzerland and on farms with high milk yield (Haas & Bapst, 2004; Bapst *et al.*, 2005). This shift of emphasis from production traits to functional traits was also observed in Austria (Schwarzenbacher, 2001; Schwarzenbacher *et al.*, 2003).

A survey among 132 Dutch organic dairy farmers revealed that 55% of the farmers were specialized in milk production and 45% were running a multi-functional farm. Farmers from both strategies were asked to value different breeding aspects of the animals. In general, the two groups of farmers valued the various aspects more or less the same: they wanted a robust, long living cow, with good udder health and fertility (Nauta *et al.*, 2006). A survey involving 18 organic dairy farms in Ontario, Canada, was carried out to collect data on their production systems, breeding policies and concerns. An organic index was constructed based on farmers' preferences. The relative weight of production to functional traits (28% vs. 72%) was substantially different from those in the Canadian Lifetime Profit Index (54% vs. 46%), but similar to those used in conventional indices in Sweden and Denmark and in the Swiss organic index (Rozzi *et al.*, 2007).

When studying literature the impression arises that the "young organic/ecological sector" gives, relatively to the traditional sector, quite some attention to the opinions of farmers in formulating the breeding goals, whereas it may not be as well documented in the traditional sector. Solkner and Fuerst (2002), who compared index methods across countries, "found it very difficult to find details on the rationale for choosing traits included in the index and the methodology used for derivation of the index weights". VanRaden (2004) believes that "trait values often are assigned by committee and consensus rather than by strict economic or mathematical models". He adds: "Some difficulties Solkner and Fuerst (2002) encountered may be caused by economic goals being debated informally in local languages and not translated into published scientific documents". Madalena (2008) states that "In Brazil, the increased popularity of more fertile and adapted breeds indicates that farmers are at least aware of the economic set back associated too high yield genetics, although nonetheless more research on the better alternatives is needed. Unfortunately, research and information are too often directed more towards the vendors' interest than the farmers' needs".

A practical way of customizing the Total Merit Indexes according to different needs of various farmers' groups has been applied for a longer time in Sweden (Philipsson & Lindhé, 2003; Philipsson *et al.*, 2005). Hamoen & De Jong (2008, this book) indicate that inclusion of a robustness score in the overall score for conformation was discussed in member (farmers') meetings of this Dairy Herd Improvement Organisation. However, the impact of these discussions on the decision making is not described quantitatively. Bebe *et al.* (2003) studied the breed preferences and breeding practices in small holder dairy systems in the Kenya highlands. They looked at traits, like hardiness, high milk yield, traction ability, high butterfat and attractive looks, but included in the same question practices like availability of semen of choice and input of the extension service.

A wide variety of indices exist (Miglior *et al.*, 2005; Shook, 2006; Miglior & Sewalem, 2008). Sustainability or robustness of animals becomes a more and more important characteristic. In fact, robustness is often seen as a combination of functional traits. However, in the "new" EU Central and Eastern European countries and adjacent non-EU countries to the East virtually all emphasis in the selection process is still on the production and type traits.

Pärna *et al.* (2003) and Wolfova *et al.* (2007) described the merits of including various functional traits in the “total merit index”, using both the same bio-economic model adapted to respectively the Estonian and Czech Republic circumstances. On basis of their study, Wolfova *et al.* (2007) advise that “somatic cell count should be introduced in the breeding goal, and in the future also emphasis should be given to length of productive life and the reproductive performance of cows”.

It can be observed that these countries are in a transition phase (Kuipers *et al.*, 2006). The country reports show that each is adapting in their own way to the EU policy and environment, which also concerns developments in the cattle sectors and breeding goals. In this context several questions can be raised:

- How are farmers in transition countries looking at the sustainability of their cows and do they want to change the currently used indices to more sustainable indices? Assessing the attitudes of farmers towards sustainability in breeding programs may help in the decision to adapt the indices and in choosing the time frame to do this.
- Is it possible to identify different groups of farmers with specific strategies and/or interests that show a different attitude towards the breeding goal? If so, this may help to formulate a strategy to adapt the breeding program in the most successful way.

These questions are addressed in this paper.

As a case, the “new” member state of Slovenia was taken. The farmers in Slovenia represent a community in transition (Osterc *et al.*, 2003) with a small herd size and good opportunities for diversification of the farm business, because of their positioning in the outskirts of the mountains and large numbers of tourists visiting (Klopčič & Osterc, 2005). In these aspects, Slovenia is similar to regions in transition in Poland, Czech Republic, Romania and Bulgaria, etc. In Slovenia a revised total merit index for sires and cows has been introduced in 2005. The TMI for market orientation on milk (Holstein-Friesian breed) has the following relative index weights decided in small committee: production traits 40%, type traits 45%, age at first calving and calving interval 10%, and calving ease 5%. TMI for dual-purpose breeds (Simmental and Brown) include milk production traits (9%), type traits (52%), age at first calving and calving interval (10%), calving ease (9%) and daily gain (20%). As can be seen some functional traits have recently been included in breeding index. However, it is experienced that by far the most selection emphasis in the field is on the production and type traits (Klopčič & Osterc, 2005).

In summary, the objective of this study is to examine farmers` perceptions towards robustness (sustainable) traits, and associations with farm and farmers` characteristics and future plans in countries in transition to the EU environment.

Material and Methods

Data

In year 2005/2006 questionnaires were sent to dairy farmers in Slovenia. Questions were asked about:

- Characteristics of the farm and farmers
- Interests of the farmers in various aspects of farming
- The farmer’s plans for the future, e.g. specialisation in dairy farming or diversification of the farm or both
- The farmer’s preferences for changes in emphasis on traits in breeding goal under the new EU policies. Seven traits were presented as well as the option “I want to keep the breeding program the same”. As production traits were listed protein and butterfat content, milk yield and beef characteristics and as robustness traits were considered health, fertility and longevity. The farmers were requested to tick the traits of their choice or tick the option “keep breeding goal as it is”.

The questionnaires were distributed to 5,000 dairy farmers out of a total of 10,000 dairy farmers in Slovenia: milk haulers distributed the questionnaires to farmers in the cooperatives and the researchers to farmers present at organised meetings. 1,114 questionnaires were returned anonymously in a closed envelope resulting in a response of 22%. This group of farmers represented 11% of the total dairy farm population. The response was very satisfactory. Nevertheless, we have to realize that the returned questionnaires are not fully a representative sample of the complete Slovenian dairy farm population. That is one of the reasons that we include in the results a detailed description of the farm and farmers' characteristics of the sample.

By interpretation of the data in Results chapter, we must also realize that the breeding program in Slovenia is focusing on the production traits. In other words, more emphasis on a production trait is additional to the weight already given to this trait in the current breeding index, while more emphasis on functional (say robustness) traits is a signal to enter these traits (or some of those) into the breeding program.

Variables

Some continuous variables were included in the survey as a number of classes with a range. The farmer was asked to mark the applicable class. For the analysis, the central value of each class was used to reconstruct the continuous variable again. This was done for instance for the variables Quota size and Farm size. If questions in the questionnaire were not answered, the value was indicated as a missing value and not included in the analysis. In cases where options for answers were 'yes', 'no', 'perhaps' or 'don't know', the values for this variable were reduced to a binomial variable: 1 is 'yes' and 0 is 'not yes'.

The composite trait "robustness" was introduced. This artificial trait is derived adding the answers to the question about preferred emphasis on the fertility, health and longevity traits together: robustness (0,1,2,3) = fertility (0,1) + health (0,1) + longevity (0,1).

Statistical methods

In order to check the answers in the questionnaire to be associated with the different types of farms and farmers, some "characterizing variables" were selected to represent the types of farms and farmers. In a preliminary analysis using Principal Component Analysis (PCA) (STATISTIX 7, 2000) it was found that three variables highly determine the type of farm and farmer. Two "characterizing variables" were related to the farm: (1) "farm size (ha of agricultural land)" and (2) "number of other activities than dairy". The third characterizing variable was for the farmer: (3) "age of farmer (years)". This offers the opportunity to identify groups of farms: farms with young or old farmers, small or large farms, and very specialized farms versus farms with more activities on the farm. To apply a PCA, categorical variables, like breed of herd were transformed to binomial variables (for example: only Holstein-Friesian versus other breeds). Breed of the herd, however, is in this study also used as independent variable to see whether the preferences for a change of emphasis in the breeding goal were breed-dependent. In this case the original categorical variable with more classes was used.

The STATISTIX 7 statistical program (2000) was used to analyze the data. For each question of the questionnaire the answers were summarized in terms of the mean and standard deviation. With multiple regressions it was analysed whether answers were associated with the main factors. R^2 is used to indicate the fraction sums of squares explained by the main factors.

Significance is indicated by * if $P < .05$, by ** if $P < .01$ and by *** if $P < .001$.

Results

Farm and farmers' characteristics

The average milk quota of the farms in this sample is 108 tons (Table 1), which is about twice the average amount of all dairy farms in Slovenia (Klopčič & Huba, 2006). The average farm size is 17.1 ha, which is high because this is 5.9 ha for all agricultural farms in Slovenia (SORS, 2002). A total of 77% of the farmers in this sample participate in milk recording with an average production of 5,473 kg, while in practice 54% of farmers record the milk production of their herds with an average production of 4,896 kg (SORS, 2007). The percentage of 69% of farmers that expect to have a successor is very high and without doubt higher than in the total population. This description of farmer and farms in Table 1 indeed illustrates that the sample of farmers in this study is not representative for all Slovenian dairy farms, but represents the larger farms with a higher average production and relatively often with a known successor. It reflects farmers who opt for continuity.

Table 1. **Mean and standard deviations (SD) of characteristics of farms and farmers**

Variable (answer)	n	Mean	SD
Characteristics of the farm			
Milk quota for processing plant (1000 kg)	1098	108.0	109.9
Number of dairy cows	1101	19.0	15.5
Number of young stock (calves and heifers)	1114	16.7	13.1
Milk quota for direct sales (1000 kg)	1114	3.2	7.2
Average milk production per cow (kg/year)	1059	5473	1504
Agricultural land in use (ha)	1114	17.1	10.6
Farms with hilly or mountainous land (0); farms with flat or less favourable land (1)	1114	0.67	0.47
Farms with only Holstein Friesian cows (1); farms with other breeds or a mixture of breeds (0)	1109	0.13	0.34
Milk recording (no=0, yes=1)	1067	0.77	0.42
Number of fattening bulls	428	6.1	5.85
Number of pigs	420	14.3	44.5
Land for grain and maize (ha)	888	7.0	7.1
Forestry on the farm (no=0, yes=1)	1114	0.25	0.43
Number of other activities on the farm than dairy ¹⁾	1114	2.0	1.5
Characteristics of the farmer			
Non agricultural employment of farmer/wife (no=0, yes=1)	1062	0.32	0.47
Successor on farm (no=0, yes=1)	1092	0.69	0.46
Age of farmer (years)	1100	51.5	12.7
Farmers with education at public school level (0); education higher than public school (1)	1103	0.60	0.49

¹⁾ In total there was a choice of 22 different activities. Choices related to dairy activities (calves, heifers, land for grain and maize, maize for silage) were not counted in this variable.

Emphasis on traits

The majority of farmers (see Table 2) want more emphasis on health traits (62% of farmers), protein yield (56%) and fertility (55%). Lowest interest is in putting more emphasis on butterfat (28%) and beef characteristics (only 14 %). 25% of farmers appeared to be content with the current breeding program and see no reason for change.

a) Associations with farm and farmer characteristics

More emphasis on protein yield is positively associated with farm size, while emphasis on butterfat, although limited (Table 2), is mostly favoured on the smaller farms. Surprisingly, a higher emphasis on milk yield is not associated with the Variables that characterise farm and farmer. A higher emphasis on the robustness traits is also positively associated with farm size. More emphasis on longevity is associated with the somewhat younger farmer, as is the composite robustness trait. More emphasis on beef characteristics is expressed by farmers with a higher number of other activities than dairy on the farm. Farmers who want the breeding program to stay the same are older farmers on smaller farms.

Table 2. **Mean and standard deviations (SD) of milk, beef and robustness traits and associations with the Variables characterising farm and farmer**

More emphasis on traits or keep program the same (yes/no)	Variables characterizing farm and farmer ¹						
	N	Mean	SD	Farm size	No of other activities	Age of farmer	R ²
Protein %	1114	0,56	0,50	+***			2,10
Butterfat %	1114	0,28	0,45	-***			1,82
Milk yield	1114	0,43	0,50				0,08
Fertility	1114	0,55	0,50	+***			2,32
Health	1114	0,62	0,49	+**			1,56
Longevity	1114	0,39	0,49	+***		-**	9,76
Robustness composite	1114	1,57	1,13	+***		-*	6,21
Beef characteristics	1114	0,14	0,35		+***		4,69
Keep breeding program the same	1114	0,25	0,43	-***		+*	3,09

¹) Associations are tested by a linear regression model: $variable = constant + b_1 F + b_2 O + b_3 A$. Constant is not presented. F is farm size; O is number of other activities, and A is age of farmer.

Significance of b's is indicated by: * ($p < 0.05$); ** ($p < 0.01$); *** ($p < 0.001$).

The sign of b is indicated by - in case of negative association and + for a positive association.

b) Associations with fields of interest of farmer

The desire for more emphasis on milk yield is positively associated with interest in grassland management and milking and milk quality, but negatively with the interest in working environmentally friendly (Table 3). More emphasis on fertility is positively associated with interest in calf rearing, while more emphasis on both fertility and health is related to interest in care for these traits, as can be expected. A higher emphasis on health traits was associated with interest in feeding practices. Farmers focussing on farm economics desire strongly more attention for longevity. The composite robustness trait shows a clear association with farmers' interest in farm economics, care for health & fertility and feeding. It accumulates the associations of the underlying traits. Emphasis on beef traits is more often expressed by farmers who find calf rearing interesting than by farmers who do not think so. Remarkably, interest in animal breeding work is not significantly associated with more focus on either production or robustness or beef traits. Most positive to a change in breeding program appear

to be farmers with interest in feeding and calf rearing. However, the analysis is somewhat sensitive to some of the tasks included. A clear change occurs, when deleting the interest field “milking and milk quality” from analysis, because focus on milk protein becomes positively associated with interest in grassland management, economical farming and good feeding practices, while leaving most other associations the same.

Table 3 Associations of “more emphasis” on milk, beef and robustness traits with interest in different tasks of farming¹

More emphasis on trait/ keep program the same (yes/no)	Interest in aspects of dairy farming (low (1), average (3), high (5))								R ²
	Grass-land management	Breeding work	Farm economics	Working environmentally friendly	Rearing of calves	Care for health & fertility	Feeding	Milking & milk quality	
Protein %									3,48
Butterfat %									0,89
Milk yield	+*			-**				+*	2,85
Fertility					+*	+**			4,68
Health						+*	+*		3,64
Longevity			+***						6,08
Robustness composite			+**			+**	+*		6,76
Beef characteristics					+***				3,20
To keep breeding program the same					-*		-*		2,88

¹) Associations are tested by a linear regression model: $trait = constant + \sum (b_i * interest_i)$, with i is 1 to 8. Constant is not presented. Significance of b 's is indicated by: * ($p < 0.05$); ** ($p < 0.01$); *** ($p < 0.001$). The sign of b is indicated by - in case of negative association and + for a positive association.

c. Association with breed of herd

In general, when analysing the focus on traits for the three breed groups, herds with crossbreeds or multiple breeds (Mixed herd) are between Holstein herds and Simmental or Brown herds (Table 4). The wish for more emphasis on protein yield is significantly higher for farmers with Holstein-Friesian (HF) and Mixed herds than for farmers with Simmental and Brown (S&B) herds. On the contrary, HF farmers have less interest in increasing butterfat yield than S&B and mixed herd farmers. HF farmers showed a highly significantly higher interest in focus on robustness traits than S&B farmers. This is opposite for the beef characteristics. In addition, more S&B farmers than HF farmers chose for keeping the breeding goal as it is.

Table 4. Associations of “more emphasis” on milk, beef and robustness traits with breed of farm herd (% yes)

More emphasis on traits or keep program the same (yes/no)	No. of farmers who say yes	Breed of farm herd (% yes) ¹			Total (% yes)
		Holstein-Friesian	Simmental &/or Brown	Mixed herd	
Protein %	619	65,5 ^a	49,6 ^b	58,6 ^a	55,8
Butterfat %	311	19,3 ^a	29,3 ^b	29,3 ^b	28,0
Milk yield	475	35,9	42,8	44,8	42,8
Fertility	615	61,4 ^a	50,4 ^b	58,2 ^a	55,4
Health	691	75,2 ^a	56,3 ^b	64,0 ^c	62,3
Longevity	439	52,4 ^a	30,9 ^b	43,8 ^a	39,6
Beef characteristics	155	4,8 ^a	18,3 ^b	12,7 ^c	14,0
Keep breeding program the same	273	15,2 ^a	28,9 ^b	23,4 ^c	24,6
Total of farmers	1110	145	460	505	1110

¹⁾ Percentages within rows with different superscripts are significantly different with $P < 0.05$, using Bonferroni t-test.

d. Associations with plans for the future

The desired emphasis on various traits appeared to depend also on the future orientation of the farmer (Table 5). Farmers who do express plans for further development of the farm business want a higher focus on protein content and robustness traits than farmers who intend to keep the farm the same. However the emphasis on robustness traits does not differ significantly between farmers who want to specialise or to diversify the farm business or to develop in both directions. As can be expected, farmers who choose for diversification are less interested in increasing the milk yield level and want more emphasis on beef characteristics than the other two groups of farmers.

Table 5. Associations of “more emphasis” on milk, beef and robustness traits with future plans of farmers (% yes)

More emphasis on traits or keep program the same (yes/no)	No. of farmers who say yes	Plans for the future (% yes) ¹			
		Keep farm the same	Specialization ³	Diversification ⁴	Both ⁵
Protein %	544	52,4 ^a	64,4 ^b	54,4 ^a	68,9 ^b
Butterfat %	269	30,7	25,7	25,0	34,4
Milk yield	431	40,2 ^a	55,7 ^b	37,8 ^a	62,2 ^c
Fertility	544	47,6 ^a	63,5 ^b	62,2 ^b	71,1 ^b
Health	614	60,6 ^a	64,8 ^b	71,7 ^b	66,7 ^b
Longevity	406	27,9 ^a	52,2 ^b	52,8 ^b	62,2 ^b
Beef characteristics	141	13,0 ^a	10,4 ^a	22,8 ^b	14,4 ^a
Keep breeding program the same	225	32,2 ^a	18,7 ^b	13,3 ^b	18,9 ^b
Total of farmers	901 ²	401	230	180	90

¹⁾ Percentages within rows with different superscripts are significantly different with $P < 0.05$, using Bonferroni t test;

²⁾ 901 farmers = total of 1114 farmers minus 213 farmers who intend to stop farming or continue as hobby or who did not make a future choice;

³⁾ Specialization by increase in number of dairy cows;

⁴⁾ Diversification by start of new branch(es) or increasing this branch(es)

⁵⁾ Both: increase in number of dairy cows and start of new branch(es)

Discussion

Farm and farmers' characteristics

In general, the sample of farmers in this study reflects farmers who opt for continuity, as described in Farm and Farmers' Characteristics. This implies that the means and SD's are not representative for all farmers in this case country, but the calculation of associations and relationships, on which most of the analysis in this study relies, is usually assumed to be less sensitive to such a kind of sample. Moreover, this sample still showed a substantial variation in attitudes: farmers who want to keep the breeding program the same or to adapt, and farmers who want to specialise or to diversify, and farmers with different interest in the various aspects of farming. This sample allows to analyse the posed research questions.

Attitude towards sustainable traits

The first research question raised was *how farmers in transition countries look at the sustainability of their cows and if they want to change the currently used indices to more sustainable indices?* This study gives indeed an impression of the attitude of farmers towards the individual traits as part of the breeding program. A majority of farmers express that they like more focus on the health and fertility traits. This is most distinctive when compared with the interest in more emphasis on butterfat content. A lower emphasis on longevity as trait is signalled than on fertility and health. However, farmers who are economical oriented express relatively more interest in having "longevity" in the breeding goal. In general, this analysis shows a substantial interest for including "robustness traits" into the breeding indices, which is a good base for authorities and animal breeding associations in the "new" Central and Eastern European countries to do so. The "robustness traits" can be specified and measured in a variety of ways. Many countries participate in Interbull evaluations with longevity, defined usually as productive life or as surviving 1, 2 or more lactations (Philipsson, 2008; *personal communication*). Longevity can be also derived from the type classification data, as explained by Hamoen & De Jong (2008).

However, the economic weights that farmers may wish to assign to the various traits cannot be derived from the questionnaire data of this study. Nielsen & Amer (2007) explain that enabling "the estimation of economic weights from questionnaires demands the relative importance of the traits and the trade-off or marginal rates of substitution between the traits that farmers are willing to take to be established". Partial profile experiments can be used to achieve this goal. In a choice experiment, a set of alternatives (the choice set), that are pre-specified in terms of levels of attributes, are incorporated into a questionnaire (Nielsen & Amer (2007). Respondents are then asked to view various alternative descriptions of a good, differentiated by their attributes and levels, and asked to choose their most preferred alternative in a given choice set. In this study, the alternatives could be breed of herd (3) or future plans (4), while the attributes in each alternative are represented with the traits (7) each expressed at different performance levels.

Jabar *et al.* (1999) and Bebe *et al.* (2003) took a simpler approach applied in developing countries. Bebe *et al.* (2003) asked farmers to give their primary preference to the attributes (traits and practices) for keeping the breed. The odds ratio was presented as a measure of the relative performance for an attribute in a given breed. One of the breeds was chosen as reference (base) to compare with. Rozzi *et al.* (2007) based an organic breeding index also on farmers' preferences, but used a score of 0-5 for each trait. Scores were averaged across farmers to determine the relative (subjective) weight for each trait.

As discussed by Nielsen *et al.* (2005; 2006), a breeding goal including economic value (EV) may be "too narrow minded", because the EV may represent only economic aspects of the current market opportunity. In contrast, the nonmarket value (NV) represents a wider perspective, like the value of improved animal welfare or other societal influences on animal production. Among others, NV is a desired gain based on consumers' or societies' willingness to pay for a certain product. In other words, Nielsen *et al.* (2006) argues that farmers are not the only stakeholders to be heard when establishing really sustainable breeding goals.

Wolfova *et al.* (2007), applying a bio-economic model to the Czech Republic circumstances, calculated somatic cell count as a measure for cow health and longevity to get the highest economic weights relative to milk yield (range of 30-40%), while various fertility traits received low weights. Thus, these model results are (only) partly in agreement with the impressions obtained from measuring farmers' attitudes towards the traits in this study.

Solkner *et al.* (1999) discussed plus and minuses of including type traits in the index. In a questionnaire Austrian Simmental farmers were asked to give subjective weights of dairy vs. beef vs. functional traits vs. conformation traits. The average ratio's expressed by 7,137 breeders were 44:22:19:15. Solkner *et al.* (1999) state that, although this is definitely not comparable with an economic weight, it gives some indication of the importance of conformation to farmers. However it is arguable whether the farmer thinks about the part of conformation related to fitness or about the beauty of the cow when he is placing this subjective weight". In this study conformation traits were not included in the questionnaire. This may have been an omission, but at the same time it made the comparison between production and functional traits probably more straightforward for the farmer.

We think that it would provide valuable insight in addition to model calculations and the results of this study, when trying out a Profile experiment in combination with other techniques described above in some farmers' populations in the transition countries.

Differentiation of farmers towards breeding goals

The research question was raised *if it is possible to identify different groups of farmers with specific strategies and/or interests that show a different attitude towards the breeding goal?* This study indeed showed groups of farmers who reacted quite differently towards the preference for the series of traits proposed to them. The attitude towards the traits was affected by the size of the farm business as well as the interest in various management tasks: a larger farm as well as interest in economics, calf rearing, and care expressed for animal health and fertility correspond with the wish for a greater emphasis on robustness traits. Different breeds on the farm as well as different future plans also lead to a variety of wishes concerning the breeding goal. A practical way of customizing the Total Merit Indexes according to different needs of various farmers' groups is practiced in Sweden: all sub-indexes with their weights are published together with the TMI so that farmers may apply other weights than those practised for the population as a whole (Philipsson & Lindhé, 2003; Philipsson *et al.*, 2005).

Because of lack of similar research, the results of this study cannot be validated easily. Often, breeding goals for different breeds are prepared separately. This study underlines this choice, because significant differences in attitudes towards some traits are noticed between the breeds. Nauta *et al.* (2005) found that organic farmers who followed different strategies on their farm comparable to this study, i.e. specialisation or diversification, did value the various breeding aspects about the same. This is the same in this study for the robustness traits, but specialised farmers did react differently towards the production traits than farmers who (want to) diversify. Especially the higher emphasis expressed by the specialised farmers on protein content is notable. This is similar to results of Huba *et al.* (2006), who concluded that the transition of Slovakia to the EU requires updating of the selection index by favouring protein to fat yield. We would too have expected the specialised dairy farmers to prefer more healthy, fertile and easy to handle cows. This makes work more efficient in a larger herd. The attitude may be different towards longevity. Farmers with smaller herds and diversified farms may be more interested in long living cows, than the specialist dairy farm manager who likes the young healthy cow. This is one of the reasons that the average culling age has decreased for many years in the past. Hamoen & De Jong (2008, this book) stated that farmers in The Netherlands "want to give more attention to feet and legs, while cows should not become taller, but do need adequate body condition and weight to handle the milk production".

Sometimes it is argued that perceptions of people may change rapidly over time. In other words, results of a questionnaire like this present just a momentarily impression. In this reasoning profit equations or bio-economic models are favoured to compute economic weights. Indeed, the answers of farmers are expected to

be influenced somewhat by the news of the day. But the preferences and associations found in this study show a high degree of logic. It is postulated that the tendencies in attitudes registered would not dramatically differ when the experiment would be repeated in the same country. That no association is found between general interest in breeding work and focus on certain groups of traits, however, is curious. But we must realise that the associations are calculated between groups of farmers with certain interests. It is possible that within the group of farmers with interest in animal breeding work variation exists in focus on specific traits. Anyway, this may be a signal for some extra thought about the composition of the working group(s), that are involved in preparing breeding goals for the future. It is possible that a group of farmers with a variety of practical know-how, including economical and environmental insight, may contribute the best in making a well balanced and sustainable breeding plan. Moreover, when choosing farmers to be involved, it can be advised on base of this study to look for farmers who opt for further development of the farm business, because they show a more sustainable attitude towards the breeding goal than the farmer who wants to keep the farm the same.

We believe that this analysis presents useful information for the authorities responsible for the breeding goals in the “new” Central and Eastern European countries, but more in particular for somewhat similar regions as Slovenia. Also Animal Breeding Companies in Western Europe and elsewhere may be interested in the perceptions of farmers in Central and Eastern Europe towards breeding goals and the emphasis on robustness as part of this.

Conclusions

- 75 % of farmers in the case country in transition like to adapt the breeding program; a majority of farmers in this transition country desire more emphasis on the health, fertility and protein traits
- The reaction of farmers was highly influenced by the size of farm, the breed of herd and by the future strategic plans the farmer has in mind
- Farmers who intend to develop the farm further have a significant higher wish in adapting the breeding program; the choice for specialization or diversification influences the emphasis wanted on milk yield and beef characteristics significantly, while it does not affect the emphasis desired on the robustness traits. The impression is that the variation in attitudes of these two groups of farmers towards the production traits is largely similar to the preference of farmers with different breeds.
- Longevity as indicator provides similar associations with farm and farmer characteristics, breed of herd and future strategic plans as the composite robustness trait.
- Interest for animal breeding work, as expressed by a group of farmers, appears to be not associated with the wish for more focus on specific traits. This is different for the group of economical oriented farmers and farmers who have interest in feeding and/or calf rearing practices. These farmers focus respectively more on the longevity, fertility and health traits. This may indicate that it is beneficial to choose a diverse composition of the working group(s) to be involved in the preparation of the breeding goals to obtain a well balance sustainable breeding program. Moreover, future oriented farmers may have the better input.
- It is advised and planned to check the repeatability of these results in some other countries in Eastern Europe to make the conclusions more generally applicable. Use of “Profile experiments” in combination with other techniques may be considered.

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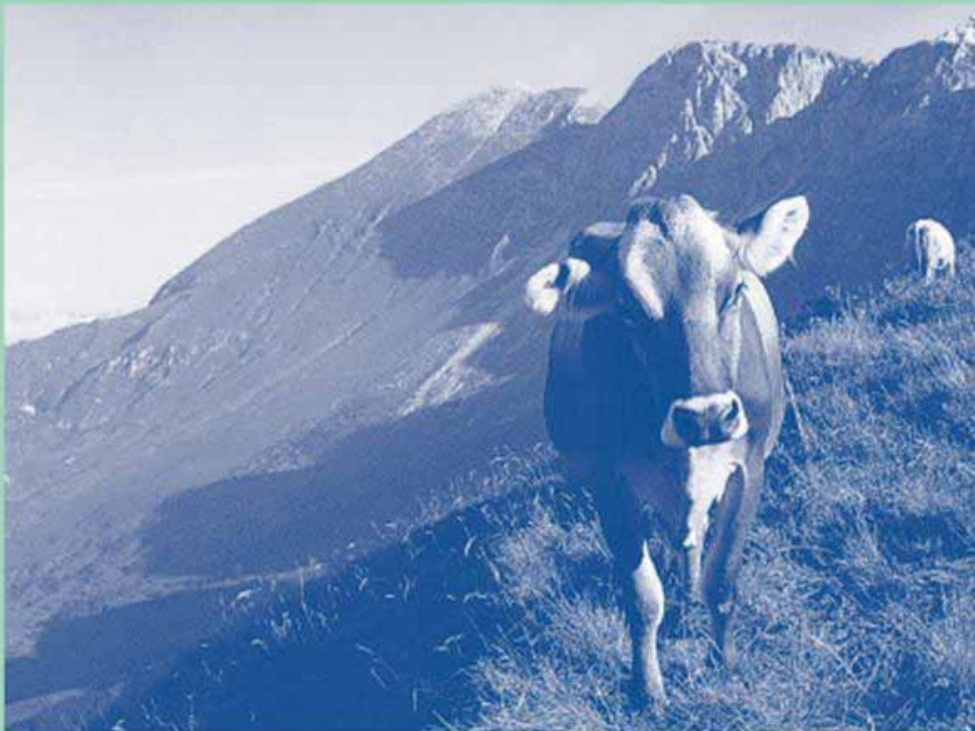
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Breeding for robustness in cattle



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How farmers think about robustness traits?

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OBJECTIVE

To examine relationships of robustness traits with farm and farmers' characteristics and future plans

INTRODUCTION AND CASE

These days robustness traits receive more attention. But how do farmers in a strongly changing environment think about this? As case the opinions in Slovenia were studied.

CONCLUSIONS

- 25 % of farmers like to keep breeding program the same
- A high percentage of farmers desire more emphasis on the health (62 %), protein (56 %) and fertility (55 %) traits
- The reaction of farmers was influenced by:
 - Size of farm for longevity and beef traits
 - Their breed of cows or fattening bulls as other activity for nearly all traits
- Farmers who intend to develop farm further have a significant higher wish in adopting the breeding program.
- Choice for specialization or diversification influences the emphasis wanted on milk yield and beef characteristics significantly.

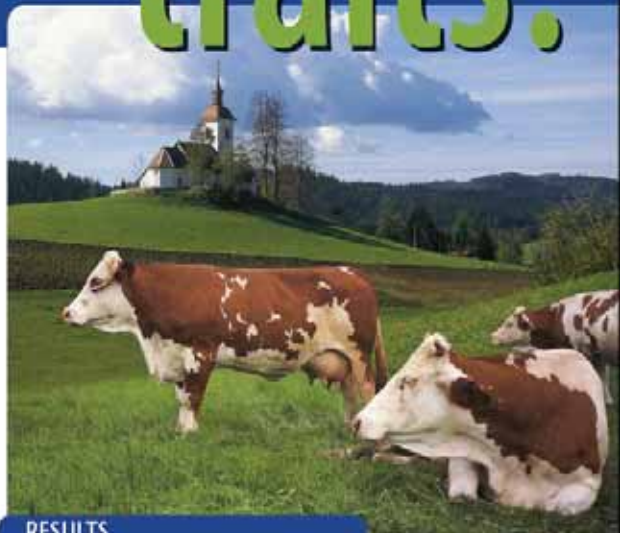
MATERIAL AND METHODS

Material

- A questionnaire was distributed to dairy farmers anonymously
 - 1,114 questionnaires out of 5,000 distributed (22 %) were returned; the sample represent 11 % of dairy farmers population
- Questionnaire was subdivided in groups of questions:
- Farm and farmers' characteristics
 - What are your plans for the future?
 - Do you prefer under the new EU policies in breeding program more emphasis on...?

Methods

- Collected data were processed by SAS/STAT package
- Cluster analysis was used
- To test associations between binomial and/or continuous variables Pearson correlation was used and with categorical variables Chi Square test



RESULTS

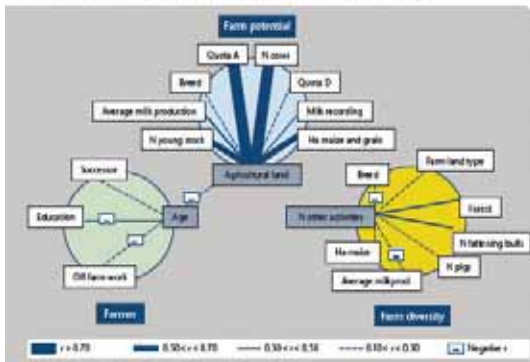
More emphasis on milk and robustness traits per breed of herd (% Yes)

Traits / breed of	No. of farmers	Holstein-Friesian %	Sarmental & Brown %	Mixed herd %
Protein	622	66	30	38
Butterfat	312	19	29	30
Milk yield	477	36	43	45
Fertility	617	61	50	59
Health	692	76	56	64
Longevity	439	52	31	44
Beef characteristics	156	3	18	13
To keep breeding program the same	274	15	29	23
Total	1110	145	440	505

Associations of milk and robustness traits with the main factors characterizing farm and farmer and with future plans¹

More emphasis on trait	Main factors describing farm and farmer			Future plans			
	Farm size	Other activities - fattening bulls	Age of farmer	Future plans ²	Specialization ³	Diversification ⁴	Both ⁵
Protein			***		*		
Butterfat							
Milk yield	*			*	*	***	***
Fertility				****			
Health		*		*			
Longevity	***			****			
Robustness	**	*		****			
Beef characteristics	*	***			**		***
To keep breeding program the same				***			

¹ Significance of Pearson's r is indicated by: * (p<0.05); ** (p<0.01); *** (p<0.001). The sign of Pearson's r is indicated by - in case of negative association and + for a positive association.
² Future plans: keep farm the same (code=0); develop farm further (code=1)
³ Specialization by increase in number of dairy cows
⁴ Diversification by start of new branch(es)
⁵ Both: increase in number of dairy cows and start of new branch(es)
⁶ Robustness (code: 0- 3) = fertility (0, 1) + health (0, 1) + longevity (0, 1)



Main factors clustering farm and farmers' characteristics. The sample of farmers represents the more future oriented farmers (larger farm, high percentage of successor, etc.)

Economic indices for various breeds under different farming systems and price uncertainty: case Slovenia¹

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Summary

Breeding indices need to be looked at periodically to evaluate the goal of the breeding program. In recent times the economic perspective of the breeding program has become more and more used in deciding the breeding objectives. However, prices are becoming more difficult to predict with increased fluctuations in all commodity prices which adds a level of complexity to the inclusion of economics into the selection index. With these challenges in mind a breeding program in the new EU country Slovenia was developed. All three Breeding Associations joined the deliberations. This paper studies the set-up of an economic selection index under price uncertainty, taking the Slovenia situation as a case study. The constructed economic indices, using a farm economic model (Moorepark Dairy Systems Model – MDSM - Shalloo *et al.*, 2004), ranked bulls in a significantly different manor than how the current Total Merit Indices rank the bulls. The economic indices were rather robust towards sensitivity in prices. Sensitivity towards the milk price showed the highest variation. Because the calculations are still not completely finished for some aspects, this paper only describes the present situation and part of the results. The Breeding Associations are very interested in the application of it.

Introduction

The goal of a breeding program will likely change over time as well as the focus on different traits, the economic perspective and as a consequence the traits included in the index. In this context, breeding indices are continually being developed and evaluated as new technologies and information becomes available. In recent times some model input prices have become much more difficult to project because of strongly fluctuating prices. This adds a challenge to the inclusion of economics into the selection index. Also the optimum farming system may change and therefore influence the composition of an economic selection index. As an illustration: about half of dairy farmers in Slovenia choose for specialisation in milk and about half for diversification in two questionnaires answered by 1,112 dairy farmers in 2005-2006 and 600 in 2007 (Klopčič *et al.*, 2006; 2008). With these challenges in mind, the breeding indices in the new EU country Slovenia were evaluated. This was also stimulated by the questionnaire under the same group of 1,112 dairy farmers, in which farmers expressed quite some interest in sustainable traits, like longevity, while the existing Total Merit Index (TMI) did not contain this trait (Klopčič and Kuipers, 2009). Also the economic situation in the dairy sector asked for reconsideration of the breeding goals.

¹ This article is published in Interbull Bulletin no 40, 2009, p. 275-280.
<http://www-interbull.slu.se/bulletins/bulletin40/paermen.html>

The Holstein-Friesian Association requested for action, and later on during the process the Simmental and Brown Swiss Associations joined the deliberations. Therefore, the general goal of this paper is to study economic indices under various farming systems and future uncertainty concerning costs and prices in a more global economy. The study is focused at the dairy herd and bull stud in the Central European country of Slovenia and encompasses the breeds Holstein-Friesian, Brown Swiss and Simmental. Because the work is still not completely finished for some aspects, this paper describes the present situation for all three breeds and results only for the Holstein-Friesian breed. The Breeding Associations are waiting for the final results.

Current indices in Slovenia

In year 2008 the dairy sector in Slovenia counted 8,600 dairy farms with on average 12.5 milking cows. Average milk production of recorded herds (75% of total dairy cows) was 6,043 kg with 4.05% fat and 3.26% protein in 305-days (KIS, 2009). A large variation in size exists. The strategies of farmers differ from specialization to diversification in about a 50 to 50 ratio (Klopčič *et al.*, 2006). Diversification is mainly practiced by including other animal branches than dairy cows in the farm operation. In this respect, fattening of bulls is one of the economically more successful branches (Kavčič *et al.*, 2009). Also a large suckler cow sector is present, although on very small farms. This causes a split of the dairy farmers in focus on milk and beef production and all intermediate choices. Nevertheless, the percentage of Holstein-Friesian cows is increasing indicating some focus on milk production. Interest of dairy farmers to go into local and organic products appeared to be still very limited, although a large influx of tourists is available. The landscape (flat, hilly and mountainous areas) also influences the choice of breed and probably the breeding goals (Klopčič *et al.*, 2008).

The current indices used in Slovenia are a TMI for milk for Holstein-Friesian (HF), and two TMIs for Brown Swiss (BS) and Simmental (SIM): one for milk and one for beef. The weights were established by a small group of experts and based on common sense, strategy and experience in cattle breeding. The weights for the milk and beef indices are listed in Table 1. The number of traits included in the indices is ranging from 18 for TMI-beef SIM till 30 for TMI-milk HF&SIM. In TMI-milk most emphasis is on the milk production and conformation traits. For example, the TMI for HF is composed of 5 milk production, 4 fertility, 20 conformation and 1 beef trait. There is a remarkable high weight on the conformation traits from 28% for TMI-milk BS till 52% for TMI-beef SIM.

In the current paper we only focus on an economic index for HF.

Table 1. **Weights in % and number of traits used in Total Merit Indices (TMI) for milk and beef for Holstein-Friesian (HF), Brown Swiss (BS) and Simmental (SIM) breeds in Slovenia**

Category of traits	Weights in TMI-milk (%)			Weights in TMI-beef (%)	
	HF	BS	SIM	BS	SIM
Milk production	38	55	38	14	9
Fertility & calving ease	15	12	15	19	19
Conformation	42	28	42	47	52
Beef	5	5	5	20	20
No of traits	30	29	30	21	18

Methods

An economic index requires economic values of each trait to be used to calculate the economic weights. For calculating the economic values of traits, an Irish Farm-Economic-model was used (Veerkamp *et al.*, 2002; Shalloo *et al.*, 2004). The model had been previously applied to study the dairy cattle breeding objectives combining yield, survival and calving interval for pasture-based systems in Ireland under different milk quota scenarios. For the purpose of the present study this model was adapted to Slovenian genetic and economical circumstances.

The following costs and prices were used as economic parameters:

- Animal costs, labour, grass silage making, buildings, machinery, veterinarian.
- Both fixed and variable costs were taken into account.
- Prices of milk, beef, concentrates, milk replacer, fertilizer, semen.

As base farming system for HF farms is a conventional farm in the flat area of Slovenia considered. Costs per cow place are euro 4000 when building a new barn. The average production is approximately 7200 kg in 305 days with 150.000 kg milk quota. Table 2 shows the current default costs and prices for HF farms in Slovenia. Also different farming situations were studied, being low-production vs. high-production (ranging from 6000 to 10.000 kg milk in 305d), low-cost vs. high-cost per cow-place (ranging from 1000 to 4000€), organic vs. conventional, and flat areas vs. hilly areas. For the latter two farming systems, the costs and prices from year 2009 were used, taking into account the additional subsidies from government that organic farms and farms in hilly areas receive.

Table 2. **Current default herd characteristics, costs and prices for Holstein-Friesian farms in Slovenia**

	Unit	No. / Volume / Price
Farm Size	ha	20.00
No. of cows	units	23.00
No. of Livestock Units (incl. youngstock)	units	31.25
Labour units	man	1.19
Milk per cow	305d kg	7,247.00
Fat yield per cow	305d kg	288.43
Protein per cow	305d kg	232.63
Concentrate per cow	kg / 305d	2,534.00
Culling percentage	proportion	0.25
Calving interval	days	365.00
Gross milk price	€ / kg	0.205
Fat price	€ / kg	2.24
Protein price	€ / kg	3.93
Total feed costs per cow (concentrates and roughage)	€	942.07
Replacement heifer price	€	1300.00
Culled cow price	€	500.00
Labour costs/month	€	1000.00

As traits to study for the economic index in Slovenia were taken: milk (kg), fat (kg), protein (kg), longevity, which can also be expressed as survival (%), and calving interval (d). These were considered as the traits which contribute the most to the economic returns of the farmer. The inclusion of daily gain (gr/d) for SIM and BF is

still under construction. Udder health was taken in reserve with the plan to consider implementing it in the index later on. The economic values of traits were calculated as the net return of 1 unit more of a certain trait. To illustrate - the calculation of the economic value for longevity in %: How much do you earn when a cow lives 1% longer? Example: current involuntary culling% on farm is 20%, corresponding with a longevity of 80%; when involuntary culling is improved with 1%, this means 1% of 20%, which is 0.2%; then involuntary culling% on farm becomes 19.8%, and longevity 80.2%; the net return of this new situation is calculated.

In comparison to the economic model published by Veerkamp *et al.* (2002), the economic values are now calculated for a zero-profit situation. The number of cow-days producing per year is assumed to be fixed. With an extended calving interval, you have to adjust the number of cows down, to make sure that the number of cows' milking days is the same in the default and changed scenario. Otherwise you simply produce more milk with extended calving interval and hide that you produce relatively more milk in a less economic part of the lactation. The change in profit of the farm originates then from a change in costs per animal, corrected for the change in costs due to a change in the number of animals (Groen *et al.*, 1997).

Results

The assumed costs and prices in the model are shown in Table 2. Changing one trait with one unit results in absolute economic weights. The absolute economic weights derived with the Economic-Farm-Model are shown for the Holstein-Friesian breed in Table 3. Based on this absolute economic weight and the genetic standard deviation of each trait, the weight in the index is determined as well, and also shown in Table 3. Similar analyses will also be performed for the Brown Swiss and Simmental breeds in Slovenia, including also a beef trait. These results cannot be shown yet.

Table 3. **Weights on traits in % and absolute economic weights in euro for Holstein-Friesian breed**

	Weight on trait	Absolute economic weight
Milk (kg)	19%	- 0.04 €
Fat (kg)	11%	+ 0.55 €
Protein (kg)	40%	+ 2.89 €
Longevity (%)	16%	+ 9.55 €
Calving int. (d)	14%	- 0.99 €

The ranking of 19 HF-sires based on their TMI and their economic index (E.I.) were compared. The Spearman correlation $r_{TMI-E.I.}$ for ranking of HF bulls was 0.393. Clearly, a low correlation between ranking with TMI and ranking with E.I. exists, indicating a significant re-ranking of sires. The reason for this is the fact that several traits in TMI are not affecting farm profit directly, but those traits have a strong weight in the current TMI. The E.I. represents a more economical oriented philosophy towards animal breeding.

But the E.I. is dependant on the input of prices and costs, which fluctuate strongly these days. Moreover, selection in animal breeding should be in principle based on future prices, which complicates the choice of prices even more. Therefore, how sensitive were the results towards price changes? In Table 4 the re-ranking of bulls is presented by changing cost and prices. The base situation (E.I. base) with price levels used in the E.I. calculation is compared to a situation with changed prices (E.I.-changed).

Table 4. **Effects of different costs and prices on ranking of a group of 19 bulls of HF breed**

Yes if correlation between ranking "E.I.-base" and "E.I.-changed" < 0.99

Input	Price / cost level	
	-25% Re-ranking	+25% Re-ranking
Milk price	Yes	Yes
Value animal	Yes	No
Grass silage making	No	No
Labour	No	No
Concentrate	No	No
Veterinary	No	No

The ranking of sires is clearly the most sensitive to a changing milk price. Spearman rank correlations between rankings of HF-bulls based on the "E.I.-base" and on the "E.I.-changed" was 0.71 for a reduction in milk price of 50%, 0.94 for a 25% reduction, 0.97 for a 25% increase 0.87% for a 50% increase and 0.82 for a 75% increase in milk price. The milk prices used in this study are illustrated in an overview of EU and world prices over a period of time in Figure 1 to assess the reality of these prices in a global environment. As shown, the plus price scenario's (27.5 till 38.5 euro /100 kg) are in the range of past price levels, while the negative price scenario's (16.5 till 11 euro /100 kg) have only been experienced in some periods on the world market of milk and the lowest level in figure is even below this.

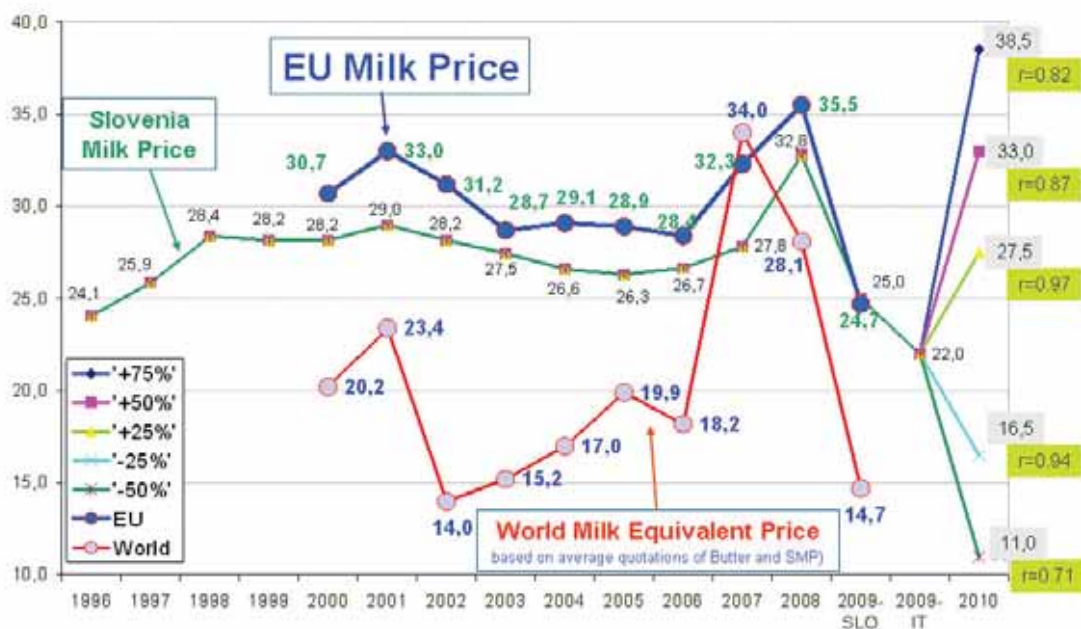


Figure 1. **Five scenarios in milk price level studied embedded in the trend in prices in last 12 years in Slovenia, EU and the world; the alternative scenarios are listed in right side of figure with prices in euro /100 kg and correlations (r) between TMI and E.I.**

The ranking of bulls on E.I. is also evaluated under various farming systems, like low-production vs. high-production, low-cost vs. high-cost per cow-place, organic vs. conventional and flat areas vs. hilly areas. When ranking of bulls is performed according to the calculated economic values, the first impressions indicate that $r_{TMI-E.I.}$ is insensitive for changes in farming system of Holstein-Friesians, only the organic and low cost system might cause a very slight re-ranking effect (see Table 5). Nauta *et al.* (2009) argue that the organic farming system may require an own index. Our calculations for HF-breed did not confirm this, but it should be noticed that milk price for organic and conventional milk is the same in Slovenia, resulting only in a higher return of organic milk because of additional subsidies.

Table 5. **Spearman rank correlations between ranking of Holstein-Friesian sires based on the economic index E.I. and rankings of these sires based on indices for different farming systems**

Farming system	Correlation with rank on E.I.
Current TMI	0.39
Organic	0.98
Hilly	1.00
Cow place 1000€	0.98
Cow place 4000€	1.00
Milk yield 8000kg	1.00
Milk yield 10000kg	0.99
Milk yield 12000kg	0.99

Conclusions

- Economic index ranks bulls differently compared to current TMI
- Economic index appears to be robust towards most of prices and costs on the farm; the milk price level is important for results and the value of animals affects index only slightly
- Economic index appears to be also robust towards a change in farming system for Holstein-Friesian cows
- Several research questions remain:
 - Do we need a separate milk index and beef index, especially for the BS and SIM breed, as they have now as well?
 - Testing programs and derivation of economic weights for beef from economic farm model for dual purpose breeds need more attention
 - Can somatic cell count (SCC) be added to the economic index as an udder health trait? Derivations of economic weights are not considered to be straightforward since the payment system for bulk tank SCC is binary, and also because breeding values are estimated based on log-transformed SCC, whereas the economic weight will be derived for real SCC.

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Guidelines for management of grassland and landscape

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Milk quota regulate the milk production in Slovenia since a short time, which limits the farm income and changes the objectives of grassland management. Decisions of the farmers and the advisers should take place: Farm income can be increased either by widening the production (buying quota), by receiving higher product quality for milk or beef (if this gets better prices per product unit) or by a strict decrease of production costs. Two general feeding strategies in milk production are possible and the farmers have to follow clear targets. The choice of the feeding strategies influence moreover the grassland use, because with the 1st described way, grassland area will be not used in an intensive way. Extensive grassland production or even only landscape management will take place in unfavourable areas. Only best grassland sites are still in use and growing of silage-maize follows this. Changed management strategies will have great effects to the farmers income and also to the self-evidence of the farmers. It is a other feeling for them, in order to produce nutrients at the one hand or to maintain landscape, bio-diversity and flower-rich meadows on the other. Both described ways are possible, but the economic success needs a clear decision between:

Way 1: Concentrate based feeding strategy

- Roughage gives only structure for stable forage intake
- Concentrates are mainly responsible for energy and nutrients
- No specific needs on botanical composition of grassland sward

Optimum nutrient contents

- 5,7 –6,0 MJ NEL/kg DM for grass-silage
- 25 – 28 % crude fibre
- other nutrients have no significance milking performance is not limited

Way 2: Roughage based feeding strategy

- Roughage is the main forage with maximum intake
- Concentrates only for balancing nutrient needs
- Grassland is *Lolium-Cynosuretum* with 4 to 5 cuts per year

Optimum nutrient contents

- 6,0 - 6,5 MJ NEL/kg DM for grass-silage
- 20 – 23 % crude fibre
- 14 - 16 % crude protein
- well balanced minerals. Milking performance per cow is limited at 7000 (8000) kg.

While strategy 1 is nearly independent of grassland quality, the second strategy is based on grassland and there is a need of good grassland management. Therefore the second way can be limited by the given ecological conditions like climate (no typical drought or flood – restrictions therefore in Karst region), vegetation period or slopes in mountainous or hilly areas of Slovenia. In general both strategies are possible for Slovenia, because between the average milk production of 5000 kg milk/cow and 7000 / 8000 kg as the maximum for strategy 2 are a lot of possibilities in order to improve grassland production. The second way seems to be well suited for Slovenia, because it is a land with a high percentage of grassland and very big role of the tourism, which needs open landscape for different kinds of activities and agriculture as a part of animated nature.

- As a result of the organized workshops in Domžale, it could be shown, that roughage production has to be based on the utilisation possibilities of the different grassland locations in Slovenia. This ecological need should be exactly defined and the land is to subdivide in "favourable" or "unfavourable" areas for agricultural production. Limits can define by the use and productive planting of *Lolium perenne*, as the main grass species for high production. In unfavourable areas, higher production intensities cannot take place. These different levels of production intensity can exist in different levels: on farm level, on areal level or even in regional level. The potentials for intensive production should be defined of local grassland experts and ecologists. If grassland shall be obtained in unfavourable areas, a change of grassland function from forage production to landscape maintenance is predetermined. This gives the need of additional subsidies and governmental programs for the farmers in order to maintain grassland in such areas. The production intensity will vary under regard of different factors like field to farm distances, topography, ecological situation etc.. Land in the near of the farms can be used easily as pasture, fields in medium distances are suitable for silage preparation and fields far away should be used as extensive meadows or pastures for young stock.

- The workshops show also, that there is a need to increase the knowledge of the farmers mainly in the subject of fertilization and the application of farm - yard manure. In Slovenia are the effects of slurry treatment methods, like addition of water or slurry additives not very well-known. Also the efficiency of different slurry application methods and their different risk of volatilization of ammonia and nitrate leaching potentials should be disseminated. Moreover weed problems are existent and there is a need of knowledge transfer in the use of herbicides or integrated plant protection methods.

- Reactions to the introduction of the milk quota systems forced farmers more and more to produce under regard of market conditions. The decrease of costs for milk production is therefore a main target. There is a need for analyzing the cost structure of the agricultural production. Helpful aspects can be:

- the preparation of silage instead of the very cost and work intensive hay making; introduction of better conservation methods;
- increase of farm sizes;
- higher forage qualities and the more frequent use of grassland in suitable areas;
- the resignation of own machinery and the common use of machines by "machinery rings" or private contractors;
- the transformation of meadows into pastures, if the farm yards are suitable for grazing.

This gives partly the need of consolidation of scattered fields or voluntary field exchange. Fields far away are economically not suitable and should not stay longer in production. They can be used as extensive flower rich grassland fields and they need additional money from the government.

- Frequent cuts with an early use of grassland growths and the preparation of silage instead of hay making should take place. Late cut and hay making are part of more extensive farming systems with grassland swards of high biodiversity in nature reserve areas. This can stay the way of farming, if the government is able to give additional subsidies to the farmers for grassland swards with bio-diversity and high ecological values.

- Forage production in favourable grassland areas should be based on *Lolio - Cynosuretalia* with *Lolium perenne* and *White clover* as main plant species. Additionally better grassland production should be considered. Aspects can be: Fertilisation: Increasing nitrogen efficiency; - use of nutrient margins; - optimisation of the use of farmyard manure; - reasons for the use or non-use of slurry additives; - date of fertilizer application
- Grassland improvement: Restricted use of chemicals for plant protection; - use of higher yielding grass varieties, with high adaptation to the Slovenian ecological situation (sea level, drought resistance); - local examination of plant species under different ecological situations
- Farm management: grazing instead of mowing is a suitable way to reduce production costs. - Higher milk yield per cow; - equalizing of nutrient balances on farm level.

Successful milk production needs best forage quality of roughage. This reduces the use of concentrates. The success of grassland farming should be measured not longer by the individual milk production rate per cow, but with the factor milk production per ha.

Possibilities for improving farm – income

Increase of milk yield per cow

Results of observations in Germany show, that increase of individual milk yield per cow is economically valid.

Limitations can be

- High performance dairy cows need best forage quality – The question is, if the quality of roughage is good enough (early cut, botanical composition of grassland swards or do the farmers need a high percentage of concentrates? High portions of concentrates are followed by high nutrient input in the farms and a lack of equivalent nutrient balances?)
- How do a high milk performance influence utilisation duration of cows and in consequence how high are costs for replacement? It is to assume, that veterinary costs increase.
- High portion of concentrate feeding or maize silage decreases the grassland areas, which are typical for the Slovenian landscape and necessary for the tourism. The next question is: How much grassland areas can still be in use? Are there some alternative utilisation possibilities?

Common use of farm machinery

Beneath the costs for buildings, the use of technical progress with own machinery is the main cost factor in farm management. Mainly the equipment is not adequate to the land area. Only consequent decrease of costs by common use of farm machinery in machine rings or the dispatch of work by private contractors can save farm costs under milk quota restrictions.

Experiences in South Germany and Austria sign up a very positive picture of this common use of farm yard techniques. The possibilities in Slovenia should be good enough, but the structures have to be developed. The next step can be common use of techniques in two or more farms together or the leasing of special machines.

Grazing instead of forage conservation

Observations in many countries show, that forage conservation and mostly the preparing of hay has high costs per feed unit (Table 1). Slovenia is a typical hay country, where until now the traditional hay harps are mostly used for forage conservation. This form of hay drying needs high man power and is not up to date any more. Grazing instead of forage conservation could decrease costs very quickly, if the land and the farmers are ready to change the system and if a consequent use of pasture management can take place.



Limitations can be

- Not suitable land and too small and scattered fields. A field reform should take place.
- Reservations by the farmers against grazing systems are existent.
- New grazing systems like *adapted continuous grazing* should be introduced.

The target is a percentage of 65 to 70% of grazed forage per year. In order to reach this, an optimal synchronisation of feeding with grass growth is needed. Therefore as guidelines for good grazing, the seasonal calving at the end of winter; the high stocking rate (minimizing trampling and grazing losses, maximizing of sward performance); the extension of grazing period; the minimization of stable feeding are factors for the successful pasture management.

Better forage quality of roughage

Forage costs take part of total costs by 40-50%. Therefore farmers tend to feed more maize-silage as a cheap and energy rich food for milking cows. Maize cannot be planted in Karst (Canterbury hoe) areas because of the short vegetation period and the lack of varieties adapted to this situation. It is assumed, that Maize silage is mostly the cheapest forage for cows, but if the crude protein content of grass silages is taken into account, maize is becoming more expensive.

In adaptation to the situation in Slovenia it is to conclude, that if farmers react to quota with increase of milk yield per cow, better quality of roughage is urgently needed. Therefore earlier cuts, at least for the first and second re-growth, and a more frequent use of grassland should take place. Latest cuts in the year can happen with lower forage quality and this could be a feed for young stock. In consequence, this could lead to new grassland types with a lower biodiversity.

Limitations can be

- The general question, if intensification of grassland hits the wishes of the consumers to healthy products and a open landscape with environmentally friendly agricultural production?
- Does this lead to conflicts with Natura 2000?
- Is the State of Slovenia in a position in order to give subsidies to the farmers, which continue with extensive farming management?
- Intensification should be done in an adapted way. It is not the aim to adopt receipts of other European countries without transformation to the Slovenian conditions (former intensification of grassland under regard of Dutch conditions in the area of Maribor in Ptuj lead to destroyed grasslands after the long and hard winter 2005/2006). Adapted varieties of foreign alpine countries should be used, if Slovenia is not able to prove different breeds and varieties of grassland species.

In consequence, better forage quality has also the need of clean roughage and high portions of crude ash cannot be tolerated. Avoiding of mouses and moles for getting higher forage and silage quality should be done as a permanent task. Better transformation of knowledge to the farmers should take place.

Use of fertilizers with a higher efficiency

An urgent cost factor in grassland management is the use of fertilizer. Nowadays the use of fertilizers with a higher nutrient efficiency is a main target. Particularly the rules of an efficient use of slurry and stable manure should be considered. It was not to see in the short period of my stay in Slovenia, how the farmers use their farmyard manure.

Table 1 gives a calculation based on a real experiment of South - Germany. It could be shown, that better suited plant varieties gave an increase of N efficiency of 18 % compared with worse varieties.

Use of grassland on farm and regional level with different intensity

Observations in South-Germany show that around 20 % of used roughage in milk production can be produced from extensive managed grassland. The use of such forage leads not necessarily to decreasing farm profit, if extensive materials are used for dry cows and in the raising period of the cows. Therefore grassland swards can have different intensity levels on single farms and of course in whole regions. This fact can be of great interest in Slovenia, when extensive grasslands on wet land or on mountains in the Alps or Karavanken Mountains are used mainly as pastures for young stock. Grazing of young stock must not be necessarily linked very closely to the home farms and different herds can be mixed up like in old alp grazing traditions. The existence of such farming systems in the future can help for keeping the landscape open.

Table 1: **Effects of yield increase by higher productive grassland swards (for example high yielding varieties of *Lolium perenne*; experiment in Kisslegg, South Germany and model calculation; N fertilized: 366 kg/ha)**

	Mean	Minimum	Maximum
DM-yield (tons/ha)	16,3	13,8	18,0
Crude protein (g/kg)	160	160	160
N withdraw (kg/ha)	260	221	287
N efficiency (%)	71	60	78

Use of grassland for production of biomass

Biomass production from grassland can be a sustainable alternative to milk production if there are possibilities to use the growth in biogas plants or for burning of hay. Decreasing roughage consumption as a result of changed agricultural structures in combination with the need of higher forage quality for dairy cows, lead to problems in landscape maintenance. Extensive grazing could be a suitable alternative, but coherent pasture areas are seldom available in areas with high settlement density. There is a need of better suitable alternatives for the use of grass from landscape management, but they are not yet fully developed and their application depends upon various site attributes which are not easy to resolve. Alternatives like combustion of hay or biogas production are described in an article from Elsaesser (2004). It is shown, that each processing method needs different attributes of grass. So grasses are generally well suited for **fermentation** with liquid manure, but high efficiency gas production needs intensively used grassland swards for successful fermentation processes. **Combustion** needs materials with high lignin and dry-matter contents and is therefore more suitable for the late mowed materials from landscape management areas. For both production lines, sites must be easy reachable by machines. This can be a major problem in the hilly and mountainous landscape of Slovenia.

Reaching of higher prices via better or different product quality

Findings in various countries gave impressions, that it is possible to reach higher product prices by higher product quality. This could be existent for preparing cheese as a on farm product, the production of pasture milk with higher percentage of omega 3 lipid-acids; with better market strategies like for example the better taste of cheese from mountains etc.. The success of this way depends from given market situation.

Recommendations for future actions

It seems to be very helpful for better grassland management to characterize different grassland types of Slovenia and to map them. For this reason, a monitoring system should be established with yields, botanical composition of grassland types and using possibilities of the grassland swards. Special workshops for farmers should be established, where they could learn more about different grassland management practices, botanical knowledge and forage conservation. This could be realised by **on farm courses** in different areas of Slovenia in 2007 or 2008.

Web-based advising systems should be developed or existing systems could be transformed. A very good example is the **gruenland-online** system from Baden-Wuerttemberg, which could be transformed to the Slovenian relationships (copyright Dr. Elsaesser and Dr. Thumm, Baden-Wuerttemberg).

- Production of leaflets and papers for better consultancy of the farmers as a help for the extension services
- Adaptation of the German grassland service system "gruenland-online" to the relationships of Slovenia could take place
- **On field training** of advisers, farmers and students in botanical knowledge, in grassland typologies and in sward judgement is urgently necessary. These courses are useful for the integration of theoretical knowledge into the agricultural practise.

In order to demonstrate the change of grassland knowledge to farmers and advisers, applied research with an adequate number of experimental stations and grassland experiments is necessary. The obviously lack of experimental fields or the only small number of experiments dealing with grassland subjects in Slovenia should be improved. If this is not possible or too expensive, experts from other countries with similar agricultural conditions should get a platform for workshops or speeches with farmers and consultants.

The transformation of special grassland knowledge via leaflets or newspapers especially for farmers should be improved. A selection of leaflets from South Germany was already given to the farmers and the local influencers.

Acknowledgement

I have to thank very much Mrs. Dr. Marija Klopčič for the splendid organisation of the short stays, the arrangement of the many contacts to grassland experts, influencers and farmers and the very friendly care during the stay with a fundamental view into the Slovenian history and civilization. She took a great part of the success of this short time stay.

I thank also Mr. Dr. Ab van Buiten for the official winding-up of the stay and last but not least Mr. Dr. Abele Kuipers for the commission and the good contact since a very long time.

Annex: Impressions of grassland in Slovenia



Image 1: Specific conditions of grassland sites in Slovenia - steep slopes prohibit intensive grassland production



Image 2: Extensive, late cut grasslands with problems in forage conservation, if weather is unsuitable or drying. The stage of growth of this forage hinders ensiling



Image 3: Grassland experimental field of Maribor University (Prof. Dr. Branko Kramberger)



Image 4, 5 and 6: Extensive grasslands with high biodiversity and a high botanical and faunistic value



Image 7: There seems to be a need for good, well adapted grassland consultancy

Animal welfare

Providing a cow comfortable indoor climate

Gelein Biewenga, expert dairy housing

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The last 30 years milking cows showed a high increase in milk production. A higher milk production requires as well a higher demand of ventilation. One of the conditions to be realized to obtain this higher milk production is that cows have to consume more roughage. By converting roughage into milk cows produce a lot of heat, which has to be removed quickly. A lot of barns did not change their ventilation system while the cows did change in body constitution together with their production.

The temperature in the barn has to be good from the view of a cow. Therefore, the best ambient temperature for a dairy cow is between -10 and +22°C. When the temperatures become higher than 22°C, cows need energy to cool them through heat loss by the skin and through respiration. At the moment the temperature increases, it becomes more difficult for a cow to cool herself. High producing cows are more sensitive to heat stress because of their high feed intake. Conception rates are also lower in hot periods due to less activity and also to reduced follicular activity and embryonic death. Keeping cows comfortable is the key to keep them eating and keep them eating is critical in keeping them productive.

At the moment the temperature decreases below minus -10°C, a cow needs energy to warm her. At the moment the temperature decreases, cows use energy out of the food to stay warm. Therefore, the milk production can also be lowered during very cold periods. Most problems arise in the barn when temperature becomes minus zero: water troughs will freeze and problems with milk equipment may occur. From this technical view farmers try to keep the temperature above 0°C. In cold periods the windspeed is a critical factor. High windspeed combined with low temperature gives a higher demand for energy. Temperature and windspeed are combined in the so called wind-chill factor.

The impression exists that most housing in Slovenia is rather poorly ventilated. High temperatures and humidity are common in barns. So improvements in this field are surely possible.





Picture 1. **Open side wall combined with a windbreak curtain**

The climate in Slovenia makes it difficult to create a good indoor climate. This is caused by a combination of cold winters and hot summers. The goal is to find out how it's possible to arrange the best climate indoors and to check if the indoor climate is good or not. It is advised that farmers and advisors should periodically check the conditions in the barns. Needed is a fresh barn where it's dry. Barns with a really good ventilation have quite a small difference between the indoor and outdoor temperature of less than 4 degrees. When the ventilation is good the inside of the roof is not wet. A good ventilation also results in a minimum of spiderwebs in the barn. To realize these conditions, it is advised that the walls of the barns should be open to maximize the ventilation capacity. A good solution is placing a windbreak curtain instead of a solid wall. When there is a lot of wind, rain or snow it is practice to close the curtain. With normal weather the curtain is opened (lifted up). During summertime when the air exchange from outside is not high enough, it is recommended additionally to install ventilators to help the cow to lose her heat.



Picture 2. **Ventilators for reducing heat stress during hot periods**

Well ventilated barns take care that the temperature and relative humidity stay in control. Cows do not have problems to lose their heat production. A dry barn makes sure that diseases or bacteria's have less chance to develop. A well ventilated and dry barn is good for the well being of the animal. The biggest obstacle to realise such a barn is often the farmer himself. He likes a comfortable temperature in the barn to have a pleasant work environment for himself, especially in the winter time.

A farm where it's possible to try out and to demonstrate such a ventilation and housing system in Slovenia would be helpful in stimulating to create a good indoor climate for cows in Slovenia, instead of an indoor climate that is adjusted to the farmer's personal needs.

Some examples of elements of "newly developed" housing systems are provided in Figures 3 till 9.



Picture 3. **Open side wall with plastic curtains that can be blown up automatically**



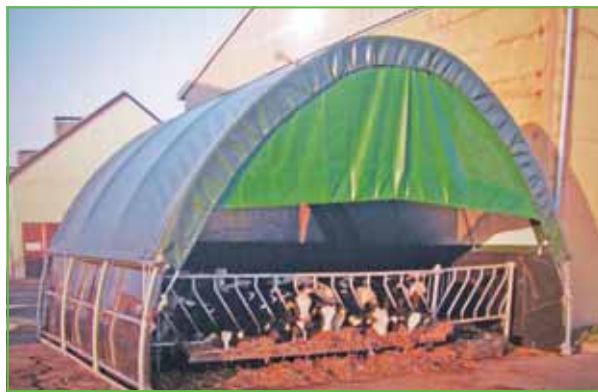
Picture 4. **Traditional roof with open sides in the Netherlands**



Picture 5. **Isolated roofs take care for good indoor climate**



Picture 6. **Test with artificial smoke to check the amount of ventilation and the pattern of the air flow**



Picture 7. **Relatively cheap tent barn for healthy cows and calves**



Picture 8. **Simple, effective and also cheap curtain option**



Picture 9. Cowshed with greenhouse roof with open side walls

Appendices

Economic calculations as guide for dairy farmers

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REPUBLIKA SLOVENIJA

MINISTRSTVO ZA KMETIJSTVO,
GOZDARSTVO IN PREHRANO



Ekonomski izračuni za pomoč pri prireji mleka

Stane Kavčič, Damjan Jerič in Co Daatselaar



SUMMARY

The dairy husbandry sector in Slovenia is rapidly changing under EU circumstances since 2004. Most farmers will look for possibilities to maintain or even improve income. However, structures as well as circumstances of farms are very diverse and abilities of farmers differ. This results in a huge spread in farm economic results as is also noticed in other countries. At the same time this provides opportunities. Farmers' skills resulting in good management practices and the choice of beneficial strategies affect income in a positive way. Guidelines can be of great support in helping farmers dealing with this. Discussing changes in farm management, farmers are best served when suggested adaptations in management are fitted to their specific situation. However, for a first orientation it is presumably enough when a range of alternatives is compared by using an "imaginary" farm. In this study, 7 "imaginary" farms have been chosen which are believed to stand as a model for most of the farms present in Slovenia. The supporting calculations for the various alternatives are based on gross margins. The gross margin is expressed as the result of the total revenues minus the direct calculated costs. In this booklet, choices between different strategies for the future are discussed. Because investments are also part of choices for the longer run, labour costs, costs of investment in milk quota and investments in buildings per ha have been included in the calculations, resulting in a "net income" per ha per year. A summary of results is given in the table below.

Table 1. **Gross margins for different alternatives assuming that the amount of land remains the same in € per ha per year - year 2009 and 2007 (only for gross margin and result) - extensive (e) and intensive (i) situations are presented within diversification**

Alternatives ¹	Gross margin		- costs of investments in quota/ha 2009	- costs labour/ha 2009	- costs of investments buildings/ha 2009	Result including costs of investments and labour	
	2009	2007				2009	2007
Diversification²							
e Breeding heifers	185	218		-131	-92	-38	-5
e Suckler cows	-146	107		-100	-108	-354	-101
e Bulls for meat kept on grass	-94	160		-107	-128	-329	-75
e Bulls for meat kept on maize	159	390		-110	-136	-87	144
e Sheep	82	236		-140	-33	-91	63
i Breeding heifers	382	449		-270	-190	-77	-10
i Suckler cows	-301	221		-206	-223	-730	-208
i Bulls for meat kept on grass	-194	330		-222	-264	-680	-155
i Bulls for meat kept on maize	358	877		-248	-306	-195	323
i Sheep	205	590		-350	-83	-228	157
Renting out land	100	100		0	0	100	100
Selling crop	-227	-110		-70	0	-297	-175
Specialization in milk production for seven model farms							
Small farm	285	367	-73	-71	-196	-55	62
Average farm	428	510	-89	-94	-218	27	134
Part time farm	781	807	-117	-139	-239	186	321
Small professional farm	901	910	-129	-163	-239	370	382
Professional Simmental farm	811	896	-131	-150	-283	247	345
Professional Holstein-Friesian farm	1.106	1.116	-157	-200	-283	466	486
Commercial farm	1.101	1.067	-156	-206	-261	478	430

¹ Calculations for alternatives are independent of farm types.

² Options of diversification are divided in extensive (e) and intensive (i) situations and the most likely situations are printed in bold figures.

These results clearly demonstrate that the absolute level of the gross margins and net returns are different between years as can be expected, but that the ranking of the various alternatives in economic result has not so much changed. For an orientation concerning various alternatives and strategies, the ranking of the alternatives is the main criteria to use.

Method of Interactive Strategic Management

Case: how do farmers plan the future?

Marija Klopčič¹, David Postma² & Abele Kuipers³

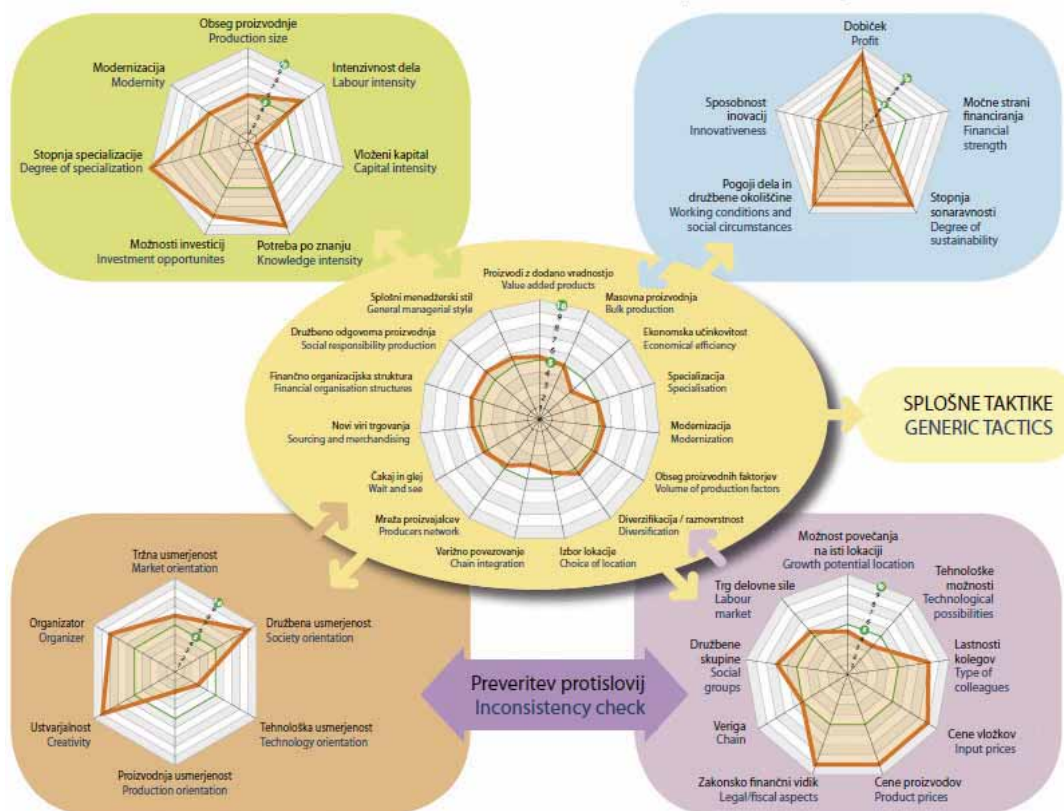
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Summary

Because of the rapid changing environment a stronger appeal is made for entrepreneurial qualities. We call persons, who are market oriented, entrepreneurs. Strategic thinking can help to develop the right strategy that fits with the entrepreneur, the firm and the environment. The Method of Interactive Strategic Management has been developed to support entrepreneurs in the process of finding their own strategy. The Method of Interactive Strategic Management is applicable to all persons and organisations, firms and farms dealing with business. In this book, the word entrepreneur is used to express the wide applicability of this method, while the method is applied in this case to farmers. Strategic thinking is quite important for the initial phase of developing ideas and plans for the future. It will become more and more important since an increasing number of companies focus not only on the product but also on the process. The focus on the process is caused by a growing influence of external factors, which were not so relevant in earlier days. Examples of this trend in the society are concepts such as “licence to produce” and “socially responsible entrepreneurship”.



“Interaktivni strateški management”

Primer: kako kmetje načrtujejo prihodnost?

Method of

Interactive Strategic Management

Case: how do farmers plan the future?

Marija Klopčič, David Postma in Abele Kuipers



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Since Slovenia became a new member of the European Union, farmers and organisations worked on adjustments to the European environment and rules. Three EU Twinning projects and a bilateral project were executed from 2005 through 2009 dealing with this adaptation. The cooperation focussed on good farming practices, food quality products, entrepreneurial strategies and sector development. However, agricultural products are meant to feed the consumer. Therefore, processors, retailers and consumers were also addressed as focus groups. Slovenian and 66 experts from various European countries worked closely together participating in 126 open educational meetings and workshops. A series of studies was performed mostly using questionnaires to collect data. The farming community was questioned regarding availability of information, future plans, opportunities and threats, entrepreneurial characteristics, and on breeding traits. To examine opportunities for special local and organic products, interviews with producers and processors were held. Too, consumer perceptions towards home made, mountain, organic, traditional and industrial produced cheeses and sausages were examined. The results of these studies are reported in this book.

Odkar je Slovenija postala nova članica EU, se kmetje in različne organizacije prilagajajo evropskemu prostoru in evropski zakonodaji. V letih 2005 do 2009 je v Sloveniji potekalo več EU Twinning projektov ter bilateralni projekt, katerih glavni cilj je bil prilagajanje novim razmeram. Aktivnosti so bile usmerjene zlasti na področje dobrih kmetijskih praks, kakovosti prehrabnenih proizvodov, podjetniških strategij in razvoja kmetijskega sektorja. Kmetijski proizvodi so namenjeni predvsem prehrani ljudi. Zato so pri teh projektih sodelovali tudi živilsko predelovalna industrija, trgovina in potrošniki. 66 tujih strokovnjakov iz različnih Evropskih držav je skupaj z domačimi strokovnjaki sodelovalo pri izvedbi 126 javnih izobraževalnih srečanj in delavnic. V času omenjenih projektov je bilo izvedenih več študij s pomočjo različnih vprašalnikov, s katerimi smo poskušali pridobiti zelene podatke. Kmete smo povprašali glede razpoložljivosti informacij, njihovih bodočih načrtov, možnosti in nevarnosti, karakteristik podjetnikov in katere lastnosti v rejskih programih so pomembne zanje. Glede možnosti lokalno tipičnih in ekoloških proizvodov, smo opravili intervjuje tako s proizvajalci kot tudi z živilsko predelovalno industrijo. Poleg tega smo izvedli študijo percepcije potrošnikov o domačih, planinskih, ekoloških, tradicionalnih in običajnih sirih ter klobasah. Rezultati teh študij so predstavljeni v tej publikaciji.

