Strategies farmers use to shape supply chain: a comparative analysis of dairy and grain farmers in Latvia

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Abstract: *Grain and milk are two of the most significant products of Latvia's agriculture. The development pathways of the two sectors share many similarities. Both have long and somewhat similar history and thus – many of the problems faced are similar. Furthermore, after Latvia regained independence, both sectors have chosen to pursue the intensification route. Operational alternatives in the two sectors (for example organic farming) are weak and marginalised. Finally, both sectors face similar conditions (aspects defining the characteristics of the environment the sectors have to operate in) influencing farmers' possibilities. Still, despite these similarities, the two sectors illustrate contrasting results regarding global competitiveness and in ways how they are perceived by experts. The importance of grain sector has been growing, and the sector has in general been perceived as a success story. Meanwhile, the overall interpretation of dairy sector's competitiveness could be described as sceptical. To explain these differences, the paper compares two structural aspects characterising the sectors: 1) the structure of supply chains farmers of the two sectors operate in; 2) the strategies farmers choose to solve the socio-organisational challenges sector poses.*

Keywords: *dairy, grain, farmer's strategies, supply chain, SUFISA*

Introduction

Grain and milk are two of the most visible staple food items produced by the farmers in Latvia. In 2015, these products together accounted for more than a half of the total agricultural output. Both sectors claim to have a historical significance in the territory, they share a somewhat similar development history and currently - similar problems. Also, both sectors have chosen to pursue the intensification route, and any operational alternatives are weak and marginalised. Furthermore, many successful farmers are simultaneously operating in both sectors. Finally, according to experts, both sectors face similar policy and social conditions (the aspects defining the characteristics of the socio-political environment the sectors have to operate in) influencing farmers' possibilities.

Still, despite these similarities, the two sectors demonstrate contrasting results regarding competitiveness in global markets. The importance of the grain sector has been growing, and the sector has witnessed a rapid increase in productivity and the overall output during the last years. Meanwhile, the dairy sector remains with low productivity and has shown only minor changes in this regard over the last decade. Thus the sector has been losing its significance. Furthermore, although there are success stories even among dairy farmers, the overall interpretation of the sector's competitiveness can be described as sceptical.

This paper compares the two sectors to illuminate crucial interpretative differences transforming the meaning stakeholders attach to some of the key sectors' institutional and organisational structures. The transformations significantly change the role these institutions and organisations play and create new ways the sectors interact with the present socio-economic context and challenges. The paper suggests that similar institutional and organisational structures can behave differently depending on the dominating interpretations the stakeholders hold about the sector.

Data used

The report summarises findings from research conducted on the conditions that shape primary producers' actions, strategies, vulnerabilities and performances as well as the dominant frames that shape farmers' discourses and actions in Latvia. The analysis follows the SUFISA project's common guidelines and the so-called Conditions–Strategies–Performances (CSP) model. This model covers the conditions faced by farmers in the business environment at different levels (global, national, regional, local, firm, individual); strategies that producers choose to respond to and to manage external conditions (including the factors that enable a farm business to respond to changes in these conditions); and the consequential performance of farm businesses (as a result of strategies chosen and conditions face).

The analysis has been based, firstly, on an extensive review of scientific, policy, general and specialised agricultural media texts published over the past seven years and in particular during the last three years. In total, more than 140 texts from various sources were analysed. The media analysis has sought to establish and articulate conditions that influence the primary producers' situation and strategies under eight broader groupings of conditions: policy and regulative conditions; factors conditions; demand conditions; finance and risk management; socio-demographic conditions; technological conditions, socio-institutional conditions, and ecological conditions (for a more detailed explanation of the listed conditions consult SUFISA conceptual framework).

Secondly, this has been further complemented by more in-depth research on the nature of market imperfections, policy requirements and their implications for specific commodity groups, which for Latvia are represented by dairy and wheat sectors. For the exploration of primary producers' conditions and strategies in both dairy and wheat sectors our analysis applies to Latvia in general.

The methods of data collection and analysis of the two case studies included: integrated and consolidating analysis of insights from the media analysis; review of policy and regulative documents; desk study of scientific publications and researches about dairy and wheat market and political regulation (due to rather small academic community in Latvia there were quite a limited number of relevant scientific studies available); scanning of websites and public documentation of agricultural organisations; interviews with a range of stakeholders who represent dairy farmers, crop farmers, agricultural cooperatives, agricultural associations and farmer organisations, policy makers, financial institutions, agricultural advisory services, state controlling and regulative institutions; two focus groups with farmers per sector and a workshop to discuss the results of the study for each sector. A broad range of stakeholders – such as policymakers, farmers, processors and representatives of farmers associations and cooperatives, scientists, media and other relevant groups were represented in the workshop.

3. The two sectors

This section of the paper summarises the main characteristics of the two compared sectors.

3.1. The dairy sector

Dairy production in Latvia has deep historical traditions, given the suitability of the geographical and climate conditions of the country for cattle breeding (Lauku tīkls, 2011). Presently dairy farming represents the major livestock farming sector in Latvia and the second largest agricultural sector (22 % in 2013). Its production value has been growing steadily. In 2014, the value of production for the dairy sector made up 24.1 % of the total Latvian agricultural output (Ministry of Agriculture, 2015). According to expert estimations, the dairy business sector – milk production and processing together – in Latvia accounts for around 1 % of GDP (Miglavs, 2015). In 2015 the share of milk in the final agricultural output dropped to 17.8 % (CSB, 2016b).

The productivity is increasing (5.9 kg per cow in 2015, which is still less than EU average, though), and so is the total output (978,1 thousand tons in 2015) (CSB, 2016b). Latvian self-provision with milk exceeds 135 %, and dairy products are a crucial export product: 60 % of the produced milk is exported, and milk forms 13 % from the total food export making the dairy sector the second largest regarding export volumes (Miglavs, 2015) (see Figure 3). Latvia is among the top three EU countries that export the highest share of domestically produced milk. But this makes it also more sensitive to dynamics in external markets.

Latvia features rich land resources for growing herbivorous animals with 60 % of total agricultural land used for herbivore fodder crops. This could be sufficient for 550,000 cattle units, while in 2014 the actual number of cattle in Latvia made up 422,000 units, incl. 166,000 dairy cows (Miglavs, 2015) (see Figure 4). In 2015, there were 162,000 dairy cows registered in Latvia, demonstrating a slight decrease in comparison to the previous years (CSB, 2016a), which can be indicative of the difficulties the sector is undergoing. It should be noted that presently the number of dairy cows is four times smaller than it used to be back in 1938 (during the first independence period before the Soviet occupation) and three times smaller than in 1990 (before separation from the Soviet subsidised agricultural production system) (Miglavs, 2015).

The structure of dairy farms has been fragmented – dominated by small farms, thereby potentially contributing the comparatively low efficiency of the dairy sector in Latvia (Miglavs, 2015). In 2014 there were 21,800 dairy farms with the average herd size of 7.6 cows, and there were 40 competing milk processors (Ministry of Agriculture, 2015). This fragmentation is considered to be responsible also for the producers' weak position in the milk food chain (dominated by big processors and retail chains), and overly high competition in the processing sector. The weakness of the dairy sector is also attributed to the high dependence on the Lithuanian milk processing industry (Miglavs, 2015).

It is assumed the volume of produced milk per farm and the corresponding market force of each producer has had an impact on the fact that Latvia is among the EU countries with the lowest milk purchase price in the common EU market (Miglavs, 2015). The average purchase price for milk in Latvia decreased from €291 per ton in 2014 to €216 per ton in 2015 (a drop of 25.7 %) (CSB 2016b) (see Figure 5). For some producers, the recent price crisis is the most severe one ever (Krauze and Unāma, 2015).

At the same time over the recent years there has been an ongoing consolidation and concentration in the sector, mostly at the expense of smaller farms – while in 2010 the number of dairy cows was more or less evenly distributed among large, medium-sized and small farms (33 %, 32 % and 35 %, respectively), in 2015 the share of dairy cows in small holdings had fallen to mere 17 % (49 % now owned by large ones) (CSB 2016b). There has also been a reduction in the total number of dairy farms (from 25,740 in 2012 to 19,048 in 2015) with a simultaneous increase in the average herd size (from 6.4 in 2012 to 8.6 in 2015) (Ministry of Agriculture 2015; CSB 2016b). To coordinate and consolidate their market force, farmers have joined cooperatives (20 in total). Some of those cooperatives operate as milk collectors; others have developed their processing and retailing network.

It has also be noted that important issues for the future development of the dairy sector in Latvia have to do with rising efficiency (and competitiveness) of dairy farms (incl. increasing the size of herds and reducing the number of employees per cow), increasing cow productivity in terms of average milk yield, and improving milk quality, as well as promoting production and consumption of biological milk and dairy products (Ministry of Agriculture, 2012). Equally important are measures to be taken in advancing the knowledge of farmers through specialist training, efficient information flow and popularisation of good practices, as well as promoting processing efficiency, value added of the produce, and export of milk and dairy products (Ministry of Agriculture, 2012).

3.2. The grain sector

Crop production, and wheat production, in particular, has been another traditional branch of agriculture in Latvia. The utilised agricultural area covers 38% of Latvia's territory, and this is the second largest area after wooded area (woods cover 45% of Latvia's territory). Grain farming makes up around half of the land used for agricultural purposes (LLKC 2012).

In 2014, different crop varieties made up 57 % (655,200 ha) of all cornfield area in Latvia, and there were 23,253 farms involved in grain production (Ministry of Agriculture 2015). Summer and winter wheat populated almost 2/3 of the whole cornfield area of crops – 36.4 % and 25 % respectively. These were followed by summer barley (17.8 %), oats (10.2 %), and rye (4.9 %). Minor areas were used for buckwheat (1.6 %) and triticale (1.6 %), as well as winter barley (0.5 %) a. o.

Wheat is the primary agricultural commodity produced in Latvia regarding number of farms, cultivated area (402.5 thousand hectares or 2/3 of grain sowings), export volume – €304m in 2014 (import was €74m), and total farm income (Ministry of Agriculture 2015). Wheat growing is more developed in medium and large-scale specialised grain farms with intensive methods of cultivation and use of modern agro-technologies. Year 2014 turned out to be a highly successful one for grain producers in Latvia in terms of the gross yield (over 2 million tons; average yield – 39.5 t/ha), with yield of spring crops exceeding that of winter crops due to less favourable climate conditions for the latter and the following sowing of spring crop cultivars as a replacement for the one not having managed to winter (Ministry of Agriculture 2015). Winter wheat, which usually takes around 40-45 % of all cornfield area of crops, was among the ones to suffer the most notable losses. At the same time, summer wheat was the most productive crop cultivar with the highest average yield. Weather conditions bear a noteworthy impact not only during the growing but also at the harvest time – if crops are harvested after the period of incessant rain they no longer meet the requirements for high-grade food and can only be used as grain forage.

In 2013/2014, there was an 8 % decrease in the crop production volumes, a 28 % decrease in crop consumption, and a 9 % decrease in crop import, while an 11 % increase in crop export. Self-supply had increased by 28 %, reaching 252 % (Ministry of Agriculture 2015).

The structure of crop production in Latvia is largely influenced by the price levels in the world stock market (LLKC 2012). Crop prices both internationally and in the EU between 2012 and 2014 have been fluctuating notably, yet with mostly decreased price levels – on average minus 30 % for food wheat, food rye, and wheat forage (Ministry of Agriculture 2015). Between 2012 and 2014 the average purchase price for food wheat in Latvia decreased by 21 % (190.40 EUR/t) and in the EU by 32 % (176.61 EUR/t).

Wheat is the main crop regarding both import and export in 2014 making up 62 % and 86 % of all crops respectively (Ministry of Agriculture 2015) (in 2011 the respective shares were 39 % and 75 % (LLKC 2012)). Latvia is a net exporter of grain. Given the high capacity of crop production and the small size of the local market, export is of utmost importance in the grain sector. It has also been noted that export is crucial also given the low discipline of payments among buyers in the local market (Bahšteins 2015b).

Over the recent years, export volumes have also been increasing due to the development of several rather strong cooperatives in the field of crop production in Latvia. The wheat sector is presently characterised by high degree of vertical market integration and globalisation of trade (Ministry of Agriculture 2015). Marketing is organised through a national wide cooperative Latraps which is the largest farmers' cooperative in Latvia uniting around 1,000 members from all regions. The cooperative has well-developed collection, primary processing and marketing infrastructure and also provides advice and finances to farmers. Its turnover in 2013 was €167m, which ranks Latraps among the biggest enterprises in Latvia. The cooperative mainly unites specialised professional farmers; however, their services are also available for small producers.

Wheat is a strategic cash crop for farmers' income. Productive, marketing and export capacities in the sector are well developed, which in case of small farmers also generate positive local development effects. However, in the recent years controversial developments have affected wheat sector: there in an on-going farm concentration process; competition for

land aggravates between grain and energy crop producers; agro-ecological management of large farms is increasingly questioned; unstable weather conditions and climatic change (warmer summers, rains, mild winters) require adjusting cultivation methods and reformulating sustainable intensification approaches.

Some of the specific problems seen to be faced in the field of crop production include the following (LLKC 2012): (1) reduced land areas for crop production due to increased production of biomass for power stations (biogas); (2) damage made to crop fields by wild animals (especially wild boars) and birds (especially cranes); (3) expansion of weeds such as silky bent grass and wild oat reducing crop yields; (4) notable share of hidden economy in the agricultural sector leading to unfair competition and reduced tax collection.

Potential in future development trends is seen in a shift from selling plain grain to the development of processed innovative export products with high value added (for example using grain to extract protein, producing bottles from grain starch) (Bahšteins 2015b). Another pressing need has to do with boosting the capacity of pre-processing, storage, and logistics of grain (Bahšteins 2015a) to level out the harvesting pace and reception capacity (Latraps 2015).

4. Two supply chains

In the following section of the paper the supply chains of the two commodities are illustrated.

4.1. The dairy supply chain

The discussions and interviews with dairy farmers and stakeholders reveal that the opportunities available to various groups of farmers differ. There is what could be described as two tracks of opportunities. Bigger farmers seem to be much better off than smaller farmers. These farmers have closer relations to processors, and they have more resources to allocate to facilitate development. These farmers also frequently operate in other agricultural sectors as well thus diversifying their income. Meanwhile, most of the farms remain small and have only limited opportunities in Latvia. Being less structured than for example grain sector, the dairy sector on its own poses more challenges to farmers. However, representing small or medium-sized farm can be the reason farmers are forced to deal with an additional list of problems. As respondents report - smaller farmers might have fewer opportunities to get a loan, might face more problems if they were to decide to acquire additional agricultural land, might have fewer opportunities to discuss their role in the supply chain.

The fragmentation of the sector is caused by the limited support among farmers to farms' growth and distrust in cooperation. On numerous occasions, during the focus groups and interviews, farmers claimed that cooperatives are not working to protect farmers' interests. Instead, cooperatives are fighting to raise income for a small group of managers who are exploiting farmers work to boost their profits. Cooperation is mainly about trust and shared responsibility. From the discussions held it seemed that farmers had neither of the feelings. This distrust and predominance of small farmers have led to the emergence of some small cooperatives serving just as a middleman among farmers and processors. These cooperatives are helping farmers to sell their milk for a better price, yet does not require from farmers permanent and deep engagement. Meanwhile, among the experts, cooperation is seen as the only real solution considered when it comes to discussing sector's future.

Due to the distrust to cooperatives, many farmers keep selling their milk to the highest bidder and therefore tend to switch partners often, provoking considerable discontent with peers among those in favour of collective action, loyalty, and solidarity. This is a short-term individual strategy that allows earning more today but does not resolve problems in the long run. However, to understand the motivation of the farmers, it should be placed in the context: due to the low prices many of them were facing bankruptcy which would mean losing family farm, house and land. Some farmers reported having left cooperatives, others – temporarily

adapting a wait-and-see strategy before committing themselves to new collective arrangements.

Meanwhile, the current situation has allowed processors to grow and to gain ever more strongly in the supply chain. Dairy market is dominated by few big processors that are tightly connected (three of the five biggest processing factories have same owners). Farmers are speculating that processors are using their dominance to impose rules on them. However, they do not have any practical evidence that would prove it. According to farmers – processors dominance is one of the reasons why prices were remaining low. Processors were well aware that farmers will not have other channels to sell their product and thus jointly kept the prices low. Processors' dominance is also the reason why processors can impose contracts on farmers that are contradicting farmers' interests. This line of logic also suggests that it was foreign processors who managed to keep the local processors in check – their willingness to purchase the milk from Latvia forced local processors to raise the prices.

However, while farmers are critical towards processors, the national government has somewhat different opinion about this group of actors. The government has been desperately looking for competitive products to export, and strong dairy processors could come up with such products. Thus, investing in processing is seen as a promising way to sustain dairy sector and to raise its global competitiveness. Although the government has supported cooperatively owned processors as well, only privately owned processors have managed to succeed in establishing stable foreign demand. Meanwhile, the biggest cooperative project government used to support once more illustrated that stakeholders operating in dairy sector distrusts cooperation – the project dismantled.

Still, despite this, there are some smaller cooperatively owned niche processors that have successfully occupied niches in the local market, and recently there is one growing cooperative that has found an outlet market abroad as well. Still, despite these attempts privately owned processors remain to be most promising actors if global competitiveness is considered. This has convinced national policy-makers to support the processors. Also - other niche markets have been slowly developing for dairy products. While most farmers were struggling to raise sufficient income, organic farmers received around 10 cents more for a litre of milk. Furthermore, organic farmers receive higher subsidies which also served as a foothold in the difficult economic situation. For farmers – biological farming was an option. However, farmers did not had the knowledge, the willingness, the trust, nor the funds to reorient their production.

4.2. The grain supply chain

Grain farming is considered to be the most successful agricultural sector in Latvia – with few successfully functioning cooperatives, strong farmers' organisations and several huge enterprises operating in the sector it has shown that it has the potential to grow as well as to protect farmers' interests. This is what also focus groups and workshops illustrated – that there are successful farmers operating in the sector being able to make farming a profitable activity.

The focus groups and interviews also demonstrated that there are different ways of organising farming that sets apart groups of farmers. To start with – there is a group of farmers who are operating on noteworthy plots of land and who have been investing in their farms hoping to increase their profits and efficiency. This is the group of farmers with diverse beliefs yet involved in communication, participating in the life of farmers' community and being relatively open to innovations (or at least willing to learn). Presumably, this drive has allowed them to grow. Investments and loans taken from banks forced this group to learn and to adopt new and more responsible practices. Among them, there were both family farms as well as larger farms organised as enterprises. The second group is farmers who are significantly less involved in farming. Most of them decided to go into farming in the nineties. The kolkhozes were dismantled at the period, and that allowed many farmers to acquire cheap machinery. Meanwhile, agricultural land was being redistributed which ensured that some rural inhabitants had easy access to land. Thus this group of farmers had all the

resources farmer needs. However, they never made the jump to the next level – to more competent and more involved farming. This group of farmers are slowly leaving the sector. However, for now, they are still playing a role by being less environmentally aware, less efficient as well as being less aware of the risks their practices might pose to other farmers.

Meanwhile, another distinction between farmers can be made along the lines of loans and financial reserves farmers have. Those who are in debt or have to open any credit line to pay the current expenses are bound to less risky involvement in the supply chain. It means that these farmers have to use at least some of the services provided by insurance, are required to use official technical services (support services that are recognised by lenders) and have to choose safer strategies when it comes to selling their harvest. This means that these farmers often have to choose harvest-selling strategies that offer lower prices. These farmers cannot take any risks. The group of farmers who have managed to climb out of the debts and can cover their expenses without using a credit line have more options to benefit from diverse ways how grain can be sold and thus at the end – this group is better off. This is, of course, assuming that the grain is of the right quality.

For farmers, an important turning point that has been mentioned both in focus group discussions and in the stakeholder workshop is the emergence of grain farmers' cooperatives. Participants use cooperation to explain many of the processes observed all across the supply chain. Founded in the early 2000s the largest cooperatives have grown and now represent a notable share of farmers. Furthermore, the leading cooperatives are closely collaborating which allows them to gain even more bargaining power. Finally, the cooperatives have introduced several novelties that have allowed farmers to gain more control over the bargaining process.

The major achievement of the cooperatives was introducing transparent pricing. Being transparent about the prices quickly became a standard in the sector. Cooperation as a mechanism has also allowed farmers to benefit more from the collective bargaining and – cooperatives have managed to connect the product pricing to prices set in stock exchange. Much of the cooperatives' capacity has been allocated to improve the prices farmers receive for their product (next section will discuss pricing principles cooperatives propose in detail).

However, there are also other functions cooperatives have taken. Cooperatives have hired agronomists (presumably, mainly to facilitate the competitiveness and more thoughtful farming through addressing the smallest and least involved farms), have taken the role of mediator in negotiating the relations between banking sector and farmers (again, mostly to assist smaller farmers that might lack information or might have difficulties to communicate with bank), are investing in infrastructure, etc. During the discussion, some activities are mentioned that cooperatives have been doing just out of good will. After discussing the low quality of professional agricultural schools, one of the participants recalled that the cooperative was involved in resolving this and on one occasion gave the professional farming school tractors for students use. In overall, cooperatives have been a help to farmers on many fronts, and this can be felt in all the discussions held. It seems a common belief that the sector is where it is due to the successful cooperation.

However, from the discussions and interviews, it seems that there could be a need to look for other ways to cooperate, other things to cooperate around and other roles cooperatives could take. Currently, cooperatives are functioning and are successful in dealing with the issues they have been built to solve. However, they could be more involved in pushing farmers to insure their harvests, to look for ways to certify the modes of production, to invest more in the risk assessment. All of these suggestions are illustrating genuine problems farmers have faced.

5. Strategies used

At farm level in the dairy sector, the adaptation strategies and related actions and attitudes in the face of the crisis and farming decline in the dairy sector has involved, for instance, shifting branches, reviewing and optimising existing practices, diversification, adopting a

wait-and-see policy, future-oriented planning in case of positive developments, abandonment or farm business, as well as political protesting. One can also observe continuous search for new export markets of dairy products – an activity mainly undertaken by food companies and assisted by the government. There is also a quiet shift from milk production to beef production increasingly taking place in Latvia. Contradicting to pessimistic forecasts, some dairy farmers continue investing in new dairy premises, milking robots and productive breeds looking for quality production and niche markets worldwide. More recently (autumn 2016) many dairy farmers have applied for the EU funded government compensation programme to reduce milk production. However, the effects of this programme still have to be seen. Media texts and interviews signal that professionally managed and market-oriented dairy farms rather look forward to preserving their production capacity during the crisis and look forward to further modernisation and growth.

Meanwhile, in the grain sector farmers mainly pursue agro-industrial competitiveness and intensification strategies. Farmers' finance and risk management are associated in particular with the neo-institutional frame as conducive to financialisation path, commercial borrowing and farm investment, to a lesser degree – subsidies seeking. The farmers' ability and skills to manage financial resources and deal with risks is of key importance for farm's long-term development. Navigating in finance and risk markets is helped by prudence and farmer wisdom – a combination of intuition, intelligence, and precariousness. Personal qualities of a farmer, his/her values and outlooks on agriculture are an inherent component of profound farming knowledge and skills. Under the same macroeconomic conditions, there are farmers who go bankrupt and who innovate and expand production. Striking differences in performance are often determined by farmers' wisdom, knowledge, long-term planning, and financial planning skills.

Table 1. Strategies identified in Dairy and Grain sectors

Strategy level	Dairy	Grain
National/ EU	Subsidising	Subsidising
	Intervention	
Group	Cooperation	Cooperation
	Investment seeking	Strong associations
		Lobbying
		New contracts
		Collective investments
Individual	Intensification	Learning
	Individual sells	Intensification
	Diversification	Insourcing
	Leaving	
	Upscaling	
	Short term contracts	
	Insourcing	

6. Conclusions

The paper has analysed two agricultural sectors - the dairy and the grain sectors in Latvia. The paper illustrates that although the two sectors have had quite similar starting grounds and development paths, they have reached different results. It is most likely that these differences can be explained by the farmers' strategies dominating in the sector. The grain sector farmers are mainly using collective solutions to approach the problems at hand. Meanwhile, farmers representing the dairy sector look for individual solutions to tackle issues they face.

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