

Regoverning Markets

Small-scale producers in modern agrifood markets

Agrifood Sector Series

The dairy sector in Poland

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Warsaw University
Warsaw Agricultural University

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Regoverning Markets

Regoverning Markets is a multi-partner collaborative research programme analysing the growing concentration in the processing and retail sectors of national and regional agrifood systems and its impacts on rural livelihoods and communities in middle- and low-income countries. The aim of the programme is to provide strategic advice and guidance to the public sector, agrifood chain actors, civil society organizations and development agencies on approaches that can anticipate and manage the impacts of the dynamic changes in local and regional markets.

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Summary

The general research questions covered in this report are: (1) What is the nature of the restructuring of the food industry? (2) What are farmers' marketing channel choices? (3) What are the practices / behaviours related to farmers' marketing channel choices? (4) What is the impact of these practices / behaviours on factor markets?

General information on restructuring in the dairy sector

The share of total milk production being delivered to dairy-processing companies in 2005 was 76 per cent, has increased continuously since 2000. The share of milk producers who are delivering milk to the processing sector was only 41 per cent in 2005 (48 per cent if we include direct milk sales to the market), meaning that more than half of milk producers in Poland are outside of the commercial dairy supply chain.

We observed a rapid consolidation process in the milk-production sector. With the number of dairy cows decreasing continuously since the start of the transition period, the share of dairy cows on farms with a herd size of at least 10 cows increased from only 15 per cent in 1996 to 40 per cent in 2005. The share of milk delivered by this group of farms already exceeds 50 per cent of total milk deliveries.

Consolidation is also occurring in the dairy-processing sector. From 1994 to 2004 the number of dairy processors decreased by 30 per cent (to about 300). In 2004 there were six dairy companies that purchased about 27 per cent of total milk deliveries, and about ten per cent of all dairy companies purchased 60 per cent of total milk deliveries.

Results of the survey

The study sites selected are the Podlaskie and Warminsko-Mazurskie regions, both in north-eastern Poland. This choice was based on the importance and the extent of restructuring of the dairy sector in both these regions. Analysis of the rapid and considerable restructuring of the dairy-supply chain in these regions will provide valuable insights for other regions that are behind in the restructuring process, and will lead to useful policy recommendations.

The Modules 1 and 2 interviews were conducted in May and August 2006. In total 36 semi-structured interviews were conducted with players from all different dairy supply-chain segments, both at national and regional level. In addition five regional focus group interviews were organized.

The EU accession and integration process – including CAP implementation – has

been the main driving force behind dairy sector restructuring in Poland.

Improvements in the quality and variety of the dairy products and improvements in the quality of the raw milk were the main changes in the processing sector during the last ten years. The concentration process was also acknowledged, and was particularly important during the last five to six years. Large dairy companies were often initiators of the consolidation process. There were also important changes in the profitability of the sector at that time and during the period following the accession process.

Barriers to further restructuring of the dairy processing sector were identified, including the restrictions of the milk quota system, the co-operative ownership form of most dairy companies, farmers' low incomes, and the poor economic efficiency of the processing sector.

The retail sector expansion (including internationalization and consolidation) has created new outlets for dairy processors, but at the same time imposed new requirements (in terms of quality and variety of products, volume and consistency of deliveries, etc.). The importance of this expansion increased in the last five years. However, only 5 per cent of total milk produce is channelled through the super- and hypermarket sector, although in the case of yoghurts, special cheeses, and UHT milk this share is about 20 per cent. It should also be emphasized that large dairies may be selling a much higher average share of their output through this channel.

The most important changes in the wholesale sector have been: concentration and specialization; changes in profitability; improvement in the dairy product variety; and technical innovations. The changes in wholesalers' strategies (such as specialization, vertical integration, and the introduction of 'own-brand' labels), as well as the rapid consolidation in the sector, have been driven by the transformation of the retail sector in recent years.

The increase in average herd size and decrease in the number of milk producers were the main changes in the milk production sector in the past decade. The factors underlying this development were the need to invest in quality improvement (and a profitable investment often required a sufficient scale), the encouragement farmers received from dairies to increase their herds.

The main constraints to further restructuring at the farm level are the milk-quota system and the lack of land to rent or buy (both issues are attributed directly and indirectly to the Common Agricultural Policy).

There are three channels through which milk producers can deliver milk to dairy processors: (1) direct collection from the cooling tank at the farm; (2) delivery to a collection station operated by the dairy; (3) milk delivery to a collection station operated by a third person (but the dairy still collects the milk). Direct collection at

the farm is primarily an option for larger milk producers with a minimum herd size (which justifies the investment in a cooling tank). Both of the latter options are 'chosen' by smaller producers and there are risk involved, including 'freeloading', and loss of quality during transport from individual farms to the collection station, etc.

Dairy processors offer several incentive programmes for their suppliers to upgrade their production systems. For example, special premiums exist for high-quality milk, for farms that have earned certain certificates, and for farmers delivering larger quantities (or for having a cooling tank). Apart from these, addition price premiums incentives are given in the form of extension services, farmer training, consultancy services, and low-interest loans to enable farmers to buy forage and even quotas.

Policy recommendations

The following preliminary policy recommendations can be made:

- Various scenarios need to be prepared to cover the situation of the dairy sector from the perspective of more open and liberal markets. Polish dairy market actors should be more active at the EU level in promoting the interests of Polish producers and processors. Different forms of cooperation, both within and between different food-chain segments, should be supported.
- There is a strong need to develop non-agricultural income sources in rural areas in order to encourage and enable less efficient farmers to quit milk production.
- There is a strong need to strengthen rural development measures, especially concerning the production and promotion of niche and regional products, as well as cooperation between farmers.
- Lack of funds is one of the most important barriers to development at farm level, so financial education should be promoted among farmers.
- The reorganization of the milk-quota distribution in the country should be considered, because the current system negatively influences the performance of both milk producers and processors.

1 Introduction

1.1 The role of the agricultural economy¹

In Poland agriculture plays a far more important role in the economy and society than in any other European Union country. This is mainly a historical legacy, especially from the socialist period of 1945–89. Unlike in other socialist countries, in Poland most agricultural holdings were not collectivized, but remained in private use. Only small private farms were allowed in socialist Poland, however, and the average size of a private farm was around 6 hectares. Large farms of more than 50 hectares were collectivized or divided into smaller units. Only 25 per cent of agricultural land was operated by the state or cooperative farms before 1990.

During the socialist period private agriculture was a major source of agricultural products and for millions of people an important source of income. Polish farmers also hung on to their land with great determination because of its sentimental value, and because it gave them a degree of independence, often combining farming with other sources of income. This was particularly common in southern Poland. Millions of villagers commuted to the cities where they worked in manufacturing, construction, or services, but this industrialization was not followed by a sufficient degree of urbanization.

After the collapse of the socialist system and as a result of systemic transformation (the privatization and commercialization of the economy), many so-called peasant-workers lost their jobs in the cities and had to return to their villages and rely on their agricultural income. The unfinished restructuring and modernizing of agriculture that had been taking place under the socialist system, as well as the hard time the farm sector had during the post-communist transformation, have together 'frozen' Poland's small-farm structure. More than 50 per cent of farms are less than 5ha, and average size of a farm in 2005 was 9.4ha.

¹ Data in this section are based on *Polska Wieś* 2006.

Table 1. Changes in the structure of farms in relation to area size, 2002–05

	Farms				
	2002	2005		Change (2002–05)	
	Number of farms ('000s)	Structure (%)	Number of farms ('000s)	%	
Total number of farms	2,916.3	2,707.8	x	-208.5	-7.1
Below 1ha	960.1	921.1	x	-39.0	-4.1
Over 1ha	1,956.1	1,786.7	100.0	-169.4	-8.7
of which:					
1-2ha	517.0	447.0	25.0	-70.0	-13.5
2-3	281.2	258.7	14.5	-22.5	-8.0
3-5	348.7	326.7	18.3	-22.0	-6.3
5-7	216.8	197.2	11.0	-19.6	-9.0
7-10	210.1	191.3	10.7	-18.8	-8.9
10-15	182.7	167.8	9.4	-14.9	-8.2
15-20	83.9	77.2	4.3	-6.7	-8.0
20-30	64.3	64.4	3.6	+0.1	+0.2
30-50	31.7	34.7	1.9	+3.0	+9.5
50ha and over	19.8	21.5	1.2	+1.7	+8.6

Source: GUS, 2005

The following facts and features characterize the role of agriculture in the Polish economy and society:

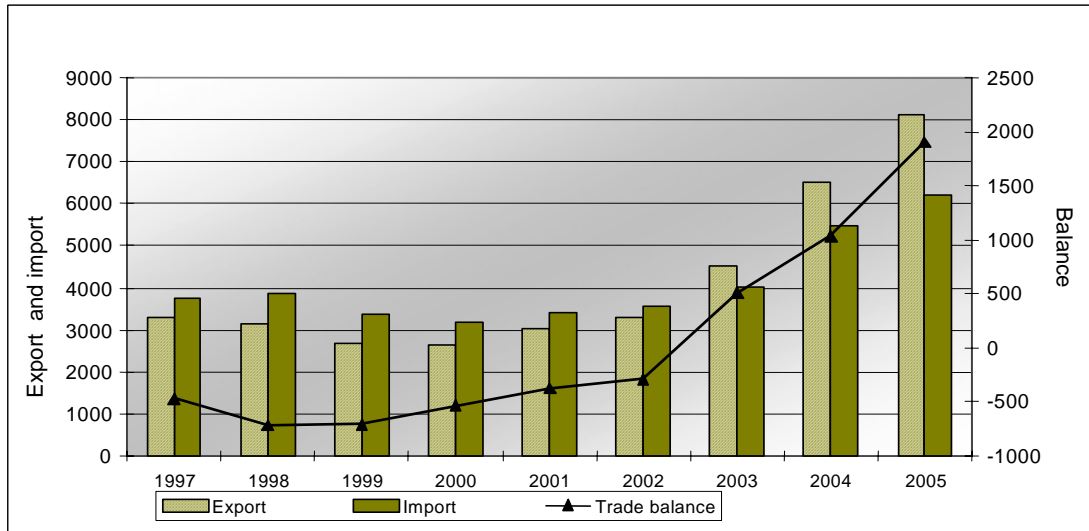
- Rural areas, measured according to Polish criteria, cover 93 per cent of Polish territory, and 14.8 million people (38 per cent of the population) live in the countryside. Only 60 per cent of rural households farm agricultural land and earn agricultural income.
- At the beginning of the systemic transformation, in 1990, agriculture's share of GDP was 8.4 per cent, which declined to 4.5 per cent in 2005. Agriculture still absorbs a significant part of the workforce, however, and in 1990 more than 27 per cent of the labour force worked in agriculture. This share had dropped to around 15 per cent by 2005.² For more than 10 years after 1990 the outflow of employment from agriculture was restricted by the high general unemployment rate, which reached 19 per cent in 2004 and declined to 15 per cent in 2006.

² For the whole European Union, agriculture's share in employment is 5.5 per cent on average.

- Agricultural land covers 62 per cent of Polish territory, the third highest rate in the EU. It is dispersed among 1.9 million farms larger than 1ha, of which 55 per cent are smaller than 5ha. Recently there has been a concentration of land and the number of farms with more than 20ha is growing while the number of smaller farms declines. There are another 960,000 households with agricultural landholdings of less than 1ha.
- There are significant regional differences in farm size. The largest farms were established on lands that had belonged to the state farm sector, and they are mainly in northern and western Poland. In these regions the average farm size is 22–24ha, while in southern Poland it is only 3.3–3.8ha.
- It is estimated that 27 per cent of all Polish households have some ties to agricultural land, which they regard as valuable property, a source of income, a hobby, etc. Agricultural land is very often treated as a kind of safety net. This is a typical phenomenon in peasant societies, and Polish small-scale agriculture still has some features of peasant economy. This attitude to farmland limits land transactions and the concentration of land into larger holdings.
- Most farmers are not specialized producers. They usually combine livestock, mostly to produce pork and milk, with crops: grains, sugar-beets, potatoes and vegetables. Larger farms are more specialized. Almost half of farms produce mainly for household consumption, not for the market.
- Economic reforms initiated in early 1990s hit agricultural sector heavily. Prices have been unfavourable for agricultural producers for almost all of the post-communist transformation period.
- Poland's accession to the EU in 2004 improved economic conditions in Polish agriculture. The prices increased for the main agricultural products, except grain, and farmers got access to Common Agricultural Policy measures, especially direct payments. About 85 per cent of Polish farmers received these payments in 2004 and more than 90 per cent in 2005. There are also other support measures available for farmers under Pillar I and Pillar II of CAP.
- During the economic transformation period, the agrifood sector attracted foreign direct investment, and was the second-most important destination of foreign capital in Poland in the 1990s, after the automobile industry. Foreign capital has played an important role in modernizing the food industry and food retail sectors.
- The growth of agrifood exports from Poland is very high. It reached 33 per cent in 2003, 43 per cent in 2004, and over 25 per cent in 2005. Agrifood's

positive trade balance reached US\$1.9 billion in 2005.

Figure 1. Agrifood trade in Poland, 1997–2004 (million US\$)



Source: Poczta, 2006

1.2 Important agrifood sub-sectors

Gross agricultural production in 2005 was as follows:

- Crop production, 49.5 per cent (cereals, 16.5 per cent; vegetables, 5.8 per cent, fruits, 5.1 per cent; potatoes, 4.9 per cent; sugar-beets, 3.2 per cent)
- Livestock production, 50.5 per cent (milk, 16.8 per cent; pork, 15.1 per cent; poultry, 7.1 per cent).

The food industry contributes more than 20 per cent of all the manufacturing output of the Polish economy. The main branches of the food industry are as follows:

- meat and fish, 30.1 per cent
- dairy, 14.4 per cent
- beverages, 12.3 per cent
- grain products, 10.3 per cent
- fruits and vegetables, 8.2 per cent

The food industry is developing rapidly, with an average growth rate of 4.7 per cent in 1996–2004. Poland is the sixth-largest food producer in the EU-25 and its share of the EU market is growing. After joining the EU in 2004, Poland got free access to a huge market of 450 million customers and prices for their main agrifood products

increased. These factors stimulated the development of the food economy. Poland still has large potential for growth for agricultural and food products.

1.2.1 Selection of commodity for this research project

Milk production is one of the most important sub-sectors of Polish agriculture. In 2005 milk's share of total agricultural production was 16.8 per cent, and of agricultural commercial production 19 per cent. In the early 1990s more than 80 per cent of farms produced milk. The number of milk producers has declined from 1.8 million in 1990 to about 0.7 million in 2005. The dairy sector was selected for this analysis because:

- milk is a very important product in Polish agriculture and the food industry;
- the dairy industry is one of the most successful cases of restructuring and modernization during the post-communist transformation;
- it is an interesting case to study the impact of European integration on Polish agriculture;
- the development of dairy sector is a fascinating area for research in terms of how small-scale producers adjusted to the market economy and modern food-chain structures; and
- the development of the dairy sector has a strong regional dimension.

1.3 The objectives and key research questions of the study

The change in the economic system and the adjustment to the market conditions affected small milk producers drastically. The dairy sector plays an important role in the policy agenda in Poland, so there is a strong need for policy recommendations. The restructuring of the dairy sector in Poland is also an important research field for agricultural economists.

This report presents the results of exploratory research conducted within Component 1 of the Regoverning Markets 2 project. The key goal of Component 1 in Poland is to prepare evidence-based policy advice concerning the implications and opportunities for small dairy producers with regards to agro-food market restructuring and to promote inclusiveness. Hence the research in Component 1 concentrates on the determinants and consequences of restructuring the dairy sector in Poland. The analysis is conducted on three levels: macro (the policy issues and the national business environment), meso (the segments of the production chain) and micro (household level). The linkages between these levels are also analyzed.

The research is structured into three modules: (1) the national-meso level; (2) the local-meso level; and (3) the micro level. In Module 1 key policy issues, broad dairy

supply chain issues, and key stakeholders are identified to set the context for Modules 2 and 3. The goal of Module 1 is to analyze the evolution of the restructured dairy supply chain at a national level over a period of 10 to 15 years. Module 2 is devoted to studying changes in the products and markets, and the institutional, social, and organizational context at the community level. The main objective of Module 2 is to complement Module 1 and create context for the micro-level study. In particular, the segments of the dairy industry (retail, processing, wholesale/brokering) at the local level are analyzed. Module 3 will comprise a farm-level analysis. This report presents the results of the first phase of the project – the macro and meso surveys (Modules 1 and 2).

The research carried out within Component 1 attempts to extend and deepen the results of other recent projects carried out in Poland. It presents an overview of the changes within the dairy supply chain, including both the results of the main research recently carried out in the Polish dairy sector and new empirical research to update and extend that project. The valuable contribution of the research in Component 1 in Poland is that it sets out the broad context for the dairy sector analysis. The Component 1 research concentrates on the problems of small-scale producers' inclusion in dynamic markets, and the institutional and social aspects of changes in the dairy sector structure. These issues have not been analyzed in depth in Poland.

The main goals of Modules 1 and 2 are to answer research questions about the restructuring of the dairy industry in Poland. The general research questions are:

1. What is the nature of the restructuring of the food industry? What are the implied changes in farmers' situation?
2. What are farmers' market channel choices?
3. What are the technological, managerial, and organizational practices or behaviours related to farmers' market channel choices?
4. What are the interactions between the market and the production practice behaviours of producers and local food industry segments, labour, land, and other inputs and financial services markets? (Reardon and Huang, 2005).

Therefore, the aim of the Modules 1 and 2 studies is to verify three hypotheses specific to the Polish dairy sector:

- Integration with the EU in general, and preparations for EU accession in particular, was the main driver of dairy sector restructuring.
- In order to facilitate adjustments at the farm level, as required by EU norms, dairies have actively engaged with assistance programmes that help farmers to adjust. Therefore, the processing sector (that is, the dairies, rather than the

farmers) has played the most important role in accelerating the restructuring process at the production level.

- Patterns of restructuring were influenced by regional differences (for example job opportunities, natural resources, etc.).

1.4 Organization of this report

Section 2 of this report presents general information about food marketing restructuring, and characteristics of the milk production and processing industry in Poland. In addition, market regulations covering the dairy products' market are described. Section 3 describes the study's methodology for Modules 1 and 2. The selection criteria for the two regions (Podlaskie and Warmińsko-Mazurskie) and survey methods are outlined. Section 4 presents the results of the study. First, the restructuring process in the processing, wholesale, and retail segments, as well as the power relationships in the downstream segments are presented. The section goes on to describe changes in production and marketing at farm level. It includes the study's results concerning trends, services, and constraints in milk production, marketing channels, incentives, institutions and infrastructure, and power relationships in the upstream segments of the supply chain. Finally, Section 4 outlines the implications for the Module 3 study

2 Restructuring of the dairy sector and food marketing in Poland

2.1 Characteristics of the milk-production and milk-processing industries

2.1.1 Milk production

The change in the economic system and the adjustment to market conditions during the transition period in the 1990s influenced milk producers drastically. During the first six years after market reform the dairy herd declined by about 28 per cent. Milk yield per cow also decreased significantly, by more than 4 per cent (see Table 2). These changes resulted in serious consequences for milk output. Milk production, additionally adjusted to real demand, dropped by 28 per cent to reach its lowest level of 11.3 million tonnes in 1995 (GUS, various years). Since 1996, after the first shock period,³ the situation has stabilized. In that time the Agricultural Market Agency⁴ openly intervened and purchased butter and skimmed milk powder and introduced the first measures to protect the internal market. Real milk prices then started to increase, and so did milk production (IERiGŻ, 2005).

³ During 1990-95 nominal milk purchase prices increased about 11 times, but at the same time nominal farm input prices increased about 38 times and the prices of consumption goods 35 times. Real milk prices only increased by 32 per cent, which caused a significant decrease in the profitability of milk production (IERiGŻ, 2005, p.55).

⁴ The Agricultural Market Agency is an intervention agency for agricultural markets. Its main role is to manage all the government's intervention measures.

Table 2. Characteristics of milk production in Poland during 1989–2005

	1989	1990	1994	1998	2000	2001	2002	2003	2004	2005
Number of dairy cows (‘000 heads)	4,994	4,919	3,863	3,471	3,098	3,005	2,873	2,897	2,796	2,795
Index %	100	98.5	77.4	69.5	62.0	60.2	57.5	58.0	56.0	56.0
Milk yields (litres/cow/year)	3,260	3,151	3,121	3,491	3,668	3,828	3,902	3,969	4,083	4,200
Index %	100	96.7	95.7	107.1	112.5	117.4	119.7	121.7	125.2	128.8
Milk production (million litres)	15,926	15,371	11,866	12,178	11,494	11,538	11,527	11,546	11,478	11,600
Index %	100	96.5	74.5	76.5	72.2	72.4	72.4	72.5	72.1	72.8
Milk deliveries (million litres)	11,385	9,829	6,269	7,070	6,583	7,025	7,219	7,316	7,997	8,831
Share of deliveries in total milk production %	71.5	63.9	52.8	58.1	57.3	60.9	63.2	63.4	69.7	76.1

Source: Rynek mleka, Stan i perspektywy 1,21,22; IERiGŻ, 2005; and GUS, various years

During the EU pre-accession period the restructuring of the dairy sector in Poland accelerated. The execution of EU standards (especially sanitary and veterinary norms, and milk quality requirements) as well as the implementation of the CAP instruments (see Section 2.2) (mainly preparations to implement the milk quota system), stimulated producers to start modernizing their processes and increasing their scale of production. Investments, financed by farmers’ own sources and pre-accession support, resulted in an outstanding improvement in milk quality. In the period 1999–2005 the share of ‘extra’ class milk (according to the EU standards) in total milk deliveries increased from 35 per cent to 92 per cent. For dairies with an EU certificate this share was even higher, and accounted for 98 per cent of milk deliveries (IERiGŻ, 2005). These strict quality requirements also brought about negative social consequences, however. A lot of mainly small, inefficient producers were not able to adjust, and were forced to either quit milk production or change to semi-subsistence farming. In effect, in 2005 there were 712,000 farms with dairy cows, but only about 48 per cent of them were delivering milk or milk products to the market (see Table 3).

Table 3. Number of dairy producers in Poland 1990–2005

	1990	1996	2002	2003	2004	2005
(A) Number of producers ('000)	1,831	1,309	876	810	735	712
% of producers left compared to 1990	100	71.5	47.8	44.2	40.1	38.8
(B) Number of producers delivering to processors ('000)	835	560	376	356	312	294
As % of total producers	45.60	42.78	42.92	43.95	42.45	41.29
(C) Number of producers delivering directly to the market * ('000)	n.d.	n.d.	n.d.	n.d.	76	50
Share of producers delivering to the market (B+C) as % of total producers (A)	-	-	-	-	52,8	48,3

* according to the EU Milk Quota System, who are since 2004 official owners of the direct sale quota (see Section 2.2).

Source: GUS, various years; ARR – Biuletyn Informacyjny, various years

Accession to the EU in 2004 resulted in a rapid increase in milk purchase prices. Among the several factors that played a role here the most important were: an increase in export demand for Polish milk products, market stabilization instruments, gradual increase in internal demand, and export subsidies. Other factors that contributed to this situation were: increase in production costs after accession, and improvement in milk quality. In 2005 milk prices reached their highest level ever, of €23/100 litres; in 2003 they were 25 per cent lower.

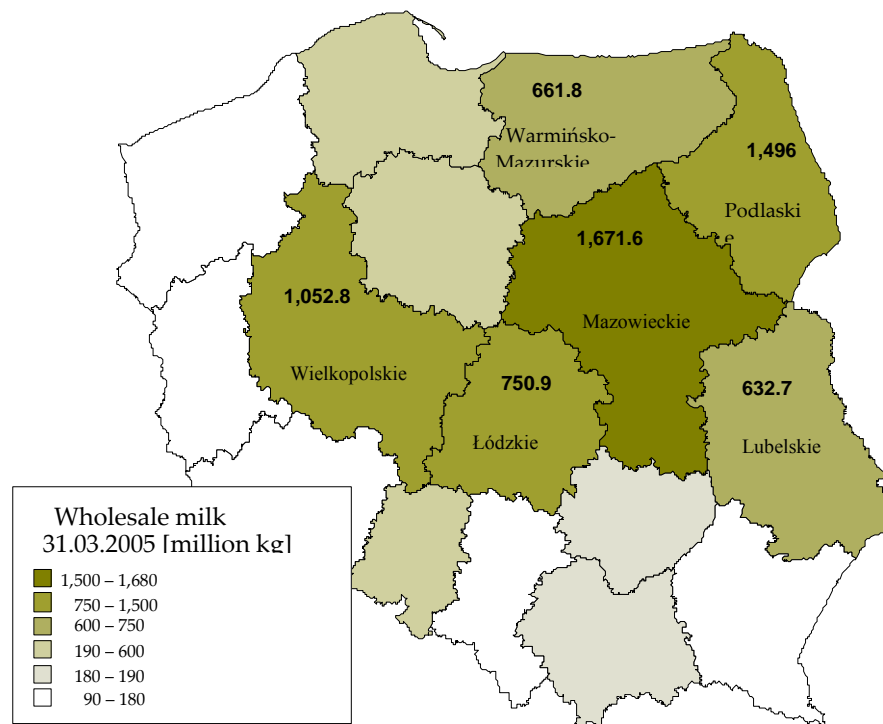
Although these changes affected the whole country, there were significant differences between regions with respect to the rate and scope of restructuring. There are five regions⁵ with large and increasing production, accounting in 2005 for 67 per cent of milk delivered to dairies. These are: Warmińsko-Mazurskie, Podlaskie, Wielkopolskie, Mazowieckie and Łódzkie (see Figure 2). Milk deliveries to dairies increased most significantly in the first three regions (by 20 per cent, 16 per cent, and 13 per cent respectively in 2004/05) where very good natural conditions, a long

⁵ According to the national classification there are 16 regions in Poland.

tradition of milk production, and a favourable agrarian structure facilitated development (Parzonko, 2006).

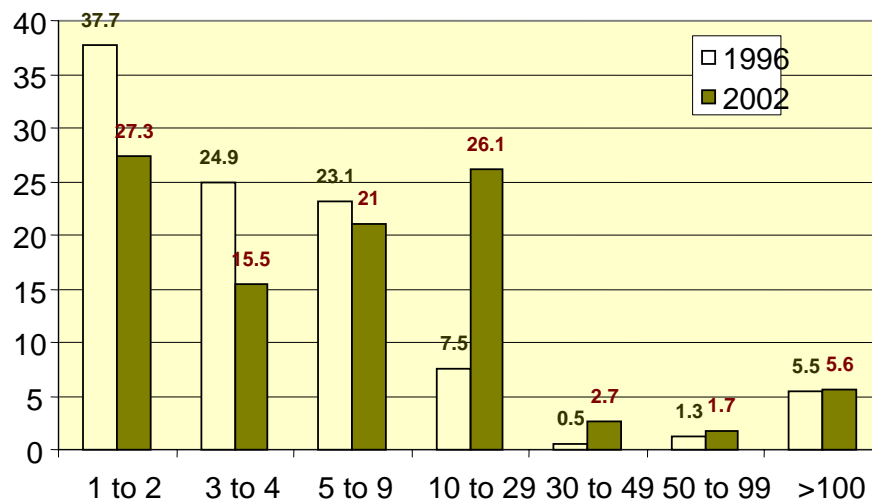
Together with the regional concentration of milk production, there were other significant changes to the production structure. During 1996–2002 the number of dairy cows kept on the smallest farms (1–9 cows) decreased by 37 per cent, mainly due to 34 per cent of those farms giving up milk production. Hence, small farms' share of total dairy cows diminished from 86 per cent in 1996 to 64 per cent in 2002. At the same time, the share of dairy cows kept by medium-sized farms (10–49 cows) tripled from 8 per cent to 29 per cent (see Figure 3). During the past three years (2003–2005) the process of farm concentration has accelerated further. The number of dairy farms decreased by 19 per cent, whereas dairy cow numbers only decreased by 2.7 per cent. In 2005 the share of farms selling milk and with more than 10 cows exceeded 50 per cent, and that group's share of the total dairy cow herd was 40 per cent (IERiGŻ, 2005).

Figure 2. Milk deliveries to dairies per region 2004/2005 (million kg)



Source: Parzonko, 2006

Figure 3. Share of dairy cows with respect to herd size 1996–2002



Source: Powszechny Spis Rolny 1996, 2002 Main Statistical Office, in IERiGŻ, no 21/2005

2.1.2 Dairy-processing segment

From the very beginning of the 1990s economic transformation together with changes in the milk production base, high inflation and limited access to external capital significantly influenced the financial situation of the dairy industry in Poland. Obsolete production technologies and equipment together with poor quality milk as well and high transaction costs resulted in low productivity and inefficient processing. Depending on the product, only in 20–60 per cent of production capacities was used. Dairy plants also had to adjust to new realities in structure and in the quantity of consumer demand. After overcoming a deep crisis in 1989–1993, the processing situation began to improve progressively. The restructuring process was possible mainly thanks to investments in new technologies that facilitated adjustments to consumers’ new demands with respect to quality and packaging. Large investments in processing were supported mainly by the preferential crediting system introduced by the government in 1994 (in 1995 47 per cent of investment value was financed by preferential credits (IERiGŻ, No 21/2005)). Since 2002 dairy companies also used EU funds effectively. Those investments resulted in significant efficiency improvements; labour effectiveness measured by processed volume per labour unit increased by 71 per cent and sales value doubled between 2002 and 2005.

Despite the significant changes that occurred in the processing segment during the past 15 years, ownership structure has not changed a lot. In 1989 all the processing companies were farmer cooperatives. That form of ownership still dominates, and in

2005 was responsible for the purchase of 80 per cent of milk delivered to processing and 70 per cent of sales value. During the past 10 years the number of dairy processors has decreased by 30 per cent to about 300 in 2004 (including about 220 cooperatives) (IERiGŻ 2005).

Together with the decreasing number of companies, milk processing became more concentrated. In 2004 there were six dairy processors who together purchased about 27 per cent of the milk delivered to processing. Yearly processing volumes of those companies ranged from 180 to 850 million litres. At the same time in 2004 about 10 per cent of all dairy companies processed more than 75 million litres per year and purchased together 60 per cent of milk procured in Poland. By contrast, in 1996 the share of those companies in milk deliveries was only 15 per cent. As with farms, concentration in the dairy industry is regionally differentiated. The largest companies are in regions where milk production has very good natural conditions and has been increasing dynamically, that is in Podlaskie, Mazowieckie, Warmińsko-Mazurskie, Wielkopolskie, and Łódzkie.

2.2 Market regulations

Before presenting the main results of the Module 1 (M1) and Module 2 (M2) surveys it is relevant to describe the main market regulations at the national level. They are particularly important for the dairy market, which is one of the most heavily policy-supported sub-sectors in EU countries.

Dairy market support accounts for 7.7 per cent of budget of the European Agriculture Guarantee and Guidance Fund (Guarantee section), and 28 per cent of the budget for animal products.⁶ Support for the dairy market in 2005 amounted €3.8 million and is the third largest sector after support for beef production⁷ and direct payments for crop production (*EAGGF Financial Report 2005*). Nevertheless, in comparison with other agricultural markets, the EU dairy market is controlled by the largest range of instruments (about 12, as described below). These regulations secure market stabilization and allow for the delivery of support to producers at a level acceptable to the EU.⁸

⁶ Taking into account only Common Agricultural Policy budget dairy market support constitutes ca. 9 per cent (*EAGGF Financial Report 2005*).

⁷ in 2005 expenditures for beef production (including intervention measures and direct payments) amounted to 7.9 milliard Euro, when direct payments for arable crops – ca. 17 milliard (*EAGGF Financial Report 2005*).

⁸ In 1970s costs of the milk market support reached over 40 per cent of the EAGGF budget and amounted ca. 5 milliard Euro (*EAGGF Financial Report 2005*).

The change in market regulations introduced after EU accession had a very significant impact on the milk supply chain in Poland, particularly at the farm and processing levels. Adjustment to strict EU requirements, especially sanitary and veterinary norms for milk production and processing, was a strong factor in the dynamic restructuring of the milk production base. The obligation to get veterinary certificates forced farmers to make crucial decisions – invest or quit milk production, deliver milk to the market or just supply the household. After accession dairies also had to obtain EU authorization to market their products. In order to fulfil all the requirements huge investments had to be made. The weaker position of smaller dairies, with limited funds at their disposal, forced them either to consolidate or accept being taken over by stronger companies. Only a few of them survived on their own.

According to EU requirements, the law ‘Polish Regulation on the Organisation of the Dairy Market’⁹ introduced the legal basis to implement the support measures in the EU Common Agricultural Policy on the dairy market. Before introducing that regulation the Polish dairy market was supported by a much simpler range of instruments. Since 1992 the dairy market was protected by high import levies and balanced by interventions such as the purchase and storage of butter and skimmed milk powder (SMP). The main function of that system was to reduce the effects of the seasonal butter supply fluctuations on the world market and to protect against the price variations of SMP (Malak-Rawlikowska, 2005).

In July 2002, a special direct payment for ‘extra’ quality milk production was implemented as an additional support for dairy producers. This measure aimed to encourage dairy farmers to improve milk quality in the pre-accession period. During its first year purchases of ‘extra’ class milk increased in Poland by 33 per cent. The measure was abandoned after EU accession but it made a significant contribution to the milk quality development (IERiGŻ, 2005), a fact also emphasized by our research respondents.

The other support measure crucial for dairy market development was a system of preferential credits introduced in 1994. As was mentioned in Section 2.1, funds from that source were extremely important for restructuring of the processing segment in 1990s. Expenditures under this measure have doubled since 1995, from €6.1 million to €14.8 million in 2003 (IERGiŻ, 2005). During the negotiation process Poland was approved to continue to receive that support after accession, but only on condition that national credits finance different aims than the EU structural programmes.

⁹ Regulation on Organization of Dairy Market from 06. IX. 2001, with following changes.

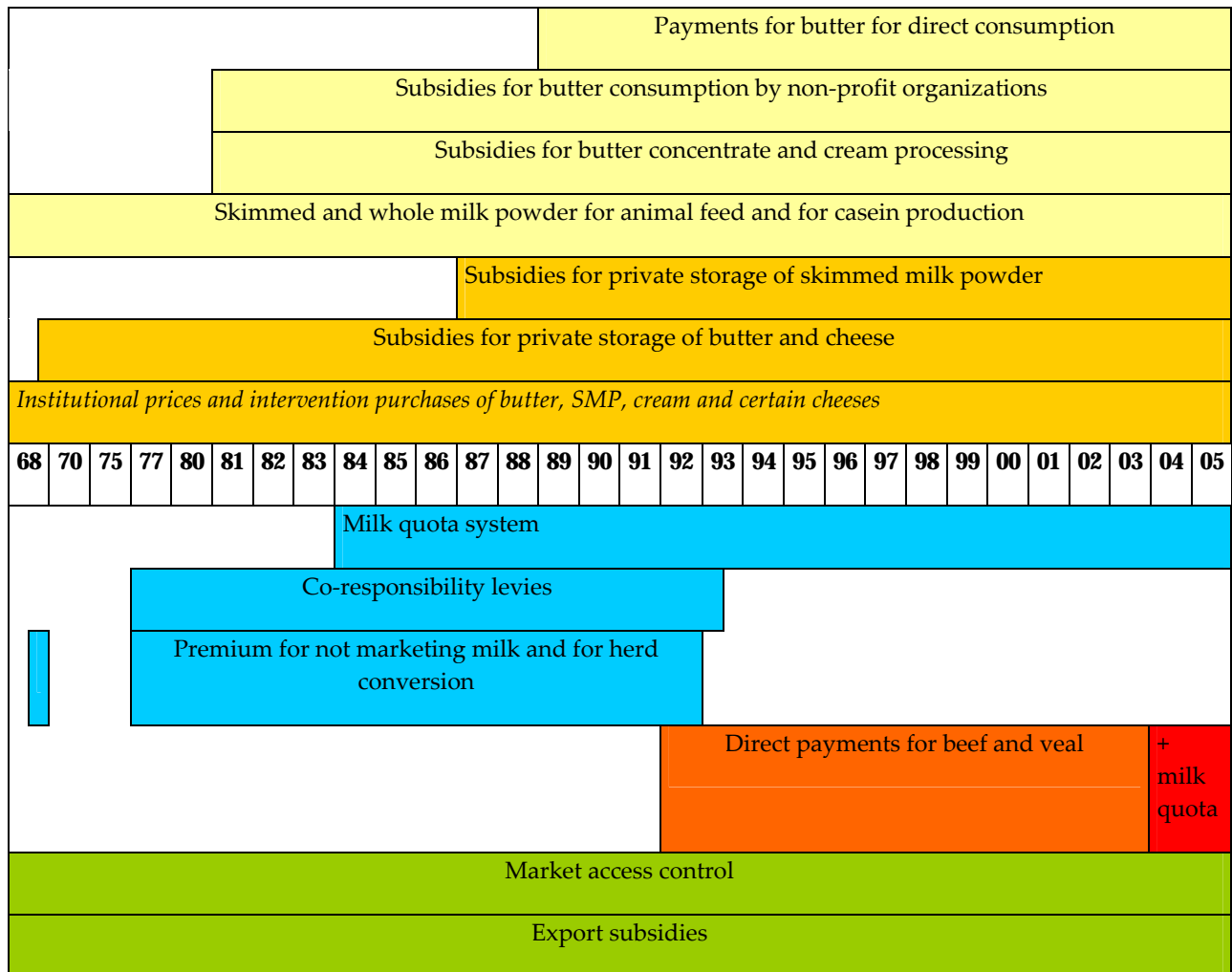
When Poland joined the European Union, the Polish dairy market became covered by the Common Market Organization for milk and milk products, part of the EU Common Agricultural Policy.

The basic regulations establishing the Common Market Organization for milk and milk products dates back to 1968 (Reg. EEC 804/68). The support system introduced within the Common Market Organization, which has been in effect in Poland since 1 May, 2004, comprises three groups of measures (see Table 4). The first group consists of market support measures, which should stabilize the market and support internal prices. This includes: measures stimulating demand (special disposal measures for butter, milk powder, cream); measures stabilizing the market (market intervention for butter and skimmed milk powder, private storage systems); and international trade control measures (border protection and export subsidies). The second group of measures includes direct payments, introduced in 1992, which directly support farmers' incomes by covering the losses caused by decreases in intervention prices (Malak-Rawlikowska, 2005).

The third group of measures are supply-control regulations, i.e. the milk quota system. The main purpose of the milk quota system, introduced in the EU in 1984, was to restrict milk production to a certain level in order to bind market support to the limited quantities of milk, which can be financed by the EU budget. The central element of the system is the referenced quantity of milk and milk products that can be delivered each year to the market by each country. Each producer in each country has their own individual referenced quantity (IRQ) to deliver to processing (wholesale quota), and/or for direct sales to consumers (direct sale quota), which they should not overrun. If the national quota does overrun, every farmer who contributed to that excess has to pay the super-levy. Each individual quota consists of the referenced volume of milk at a certain fat content. So if milk deliveries contain a higher fat content than referenced, then the IRQ is used up faster. IRQs can be traded within any country but not internationally (in certain countries it is also restricted regionally). Every EU country, based on the common regulation,¹⁰ introduced its own system of quota transfers. The potential of quota transfers and their administrative restrictions are very important for the structural development of milk production. The more restricted the milk quota transfers, the fewer stimulating effects they have on the concentration process and structural changes (Oskam and Speijers, 1991). Inappropriate management of quota mobility can inhibit the development of milk production and its restructuring (Malak-Rawlikowska, 2005).

¹⁰ Currently Reg. EEC 1788/2003.

Table 4. Evolution of the Common Regulations for the EU Dairy Market since implementation of the Common Agricultural Policy in 1968



- Market support: Internal market – demand support measures
- Market support: Internal market – market stabilizing measures
- Market support: International trade – market access and export subsidies
- Supply control measures
- Direct payments

Source: Malak-Rawlikowska, 2005

In Poland the milk quota system has been implemented and administered by the Agricultural Market Agency (AMA) with the support of its 16 regional branches (one in every administrative region). In the final pre-accession negotiations Poland received 8.96 million tonnes of the milk quota (8.5 million tonnes as wholesale quota and 0.464 million tonnes as direct sales quota). In addition, it was assigned 0.426 million tonnes for the restructuring reserve to be used as of 2005/2006 (AMA data in Malak-Rawlikowska, 2005). The first quota allocation was made at the beginning of 2004, directly to producers, in respect of their deliveries during the reference year (01.04.2002 – 31.03.2003).¹¹ Deliveries to processing during the first milk quota year (2004/5) were 13 per cent lower than the quota assigned, hence the quota was not binding production.¹² Moreover, according to the accession treaty, in its first year in the milk quota system (2004/5) Poland was not charged the super-levy payment. However, due to very dynamic developments of marketed milk production in Poland the milk quota in 2005/2006 was exceeded, and farmers had to pay for overrun deliveries. Even though the quota will be enlarged by restructuring reserves in 2006, it will continue to hamper farm development. In addition, the quota trade is restricted to regions, which creates barriers to the regional concentration of milk production (see Section 3.2).

In June 2003, the EU Council agreed on a reform of the Common Agricultural Policy (CAP) which maintains the direction of the EU dairy policy decided under Agenda 2000. The CAP reform extended the life of the milk quota system until 2014/15. Direct payments have been increased but de-coupled from production and cuts in butter and SMP intervention prices has been implemented (by 25 per cent and 15 per cent respectively). While this reform of the EU dairy policy is a positive step towards more market-oriented and less trade-distorting policies, the EU border measures remain high and continue to hinder foreign access to the EU dairy market (OECD, 2006). Further changes in this respect are expected in the future in light of the WTO negotiations. Therefore farm organizations, dairy associations, and other food-chain stakeholders in Poland should more actively engage in the ongoing process of shaping EU dairy market organization. It is necessary to prepare various scenarios for the dairy sector situation from the point of view of a more open and liberal market. Polish dairy market actors should prepare a strategy to adjustment to this new institutional framework. These organizations should be more active at the EU level in promoting the interests of Polish producers and processors.

¹¹ The milk quota year in all European Union countries is established for the period from 1 April to 31 March of the following year.

¹² Total milk market deliveries (wholesale and direct sale) were about 1.3 per cent lower than the quota assigned, but total milk production in Poland (marketed and used on farm) was about 26 per cent higher than quota in 2003, because of the large amount that was used[consumed?] on farms (AMA data, IERiGŻ 2005).

2.3 Overall national food-market restructuring

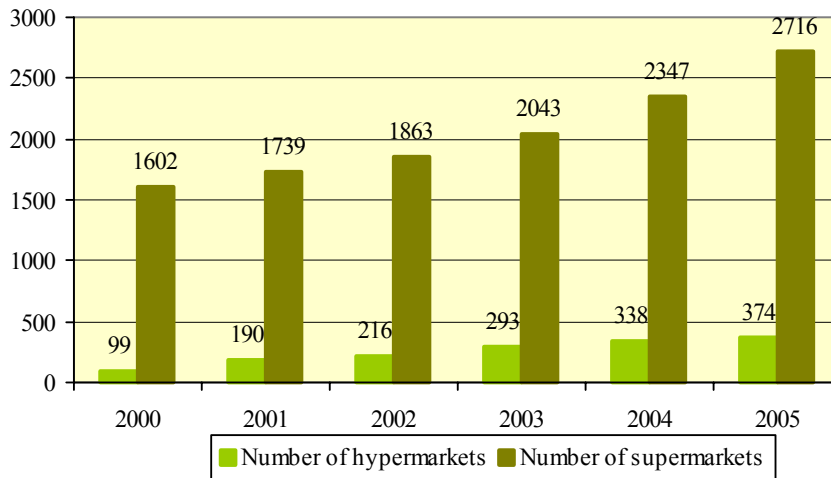
The food market has been dramatically transformed since 1989. The main factors that led these transformation were:

- price liberalization;
- opening the market for free domestic and foreign competition;
- privatization of productive assets;
- inflow of foreign capital, especially in the form of FDI;
- expansion of large international food companies and retail chains; and
- preparation for joining the European Union.

The number of general grocery shops increased significantly in the 1990s (by over 90 per cent in 1991–2000). In 2005 there were over 116,000 shops specializing in general foodstuffs, out of 384,000 retail outlets (*Rynek wewnętrzny*, 2006).

The national grocery trade is currently strongly dominated by Western retailers. Foreign retail companies began operating in Poland at the beginning of the 1990s and brought a wide range of modern store formats into the country, such as hypermarkets, supermarkets, modern discount stores and cash and carries. The number of super- and hypermarkets and their share in total retail area has increased significantly (in 2005 more than 83 per cent of hypermarkets and more than 56 per cent of supermarkets belonged to foreign companies (*Rynek wewnętrzny*, 2006) (see Figures 4 and 5). Currently, the largest share of the retail market belongs to the following companies: Metro Group (from Germany), Jeronimo Martins (Portugal), Tesco (United Kingdom), Schwarz Group (Germany), and Carrefour (France) (*Planet Retail*, 2006).

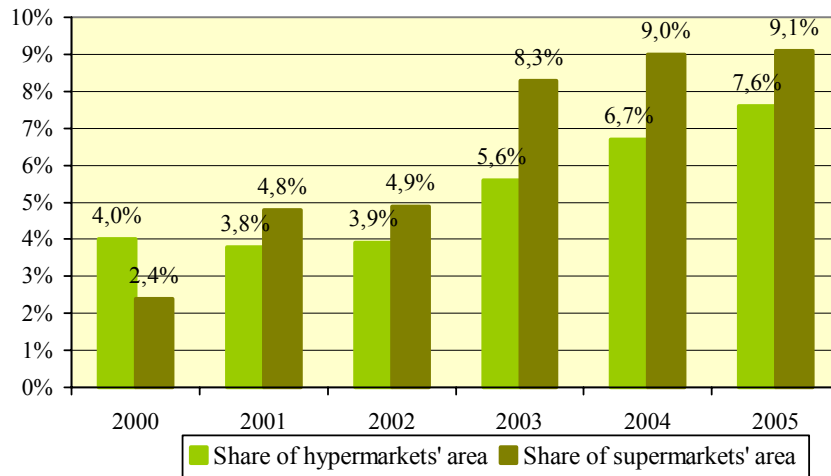
Figure 4. Number of super- and hypermarkets* in Poland in 2000–2005



* Supermarkets are defined as shops having an area of between 400 and 2,499m², and hypermarkets as having more than 2,500m².

Source: Based on data from *Rynek wewnętrzny*, 2006.

Figure 5. Super- and hypermarkets* share of total retail sales area in Poland in 2000–2005



* Supermarkets are defined as shops having an area of between 400 and 2,499m², and hypermarkets as having more than 2,500m².

Source: Based on data from *Rynek wewnętrzny*, 2006.

Local companies mainly operate in small cities and rural areas or in the tens of thousands of small independent shops.¹³ They usually cooperate with Western-

¹³ It is also worth mentioning that many supermarkets are operated by local companies and cooperatives (for example the national private company Eldorado runs the Stokrotka supermarkets).

owned and domestic cash and carry outlets as well as wholesalers who deliver locally. Even in the large cities, however, where modern store formats play an important role, independent shops have managed to hold on to their niches (*Planet Retail*, 2006).

Food shops with 300m² or less still account for 98 per cent of all food stores in Poland. This is also why market concentration continues to be low compared with the other European countries. The five largest retail companies in Poland capture around one-fifth of the national modern grocery distribution, while in countries like Germany and France this share exceeds 80 per cent. It is estimated that the large retail networks' share in Poland will rise steadily, but that the concentration level will remain lower than in other European countries due to the country's largely rural structure and generally low population concentration.¹⁴

The expansion of large international retail chains generates conflicts in some places with representatives of small, traditional stores. There were several national and local actions aimed at stopping the establishment of new hyper- and supermarkets and restricting their Sunday operations.¹⁵ These actions have not achieved noticeable success and the national food retail market is largely liberalised. Opening large grocery stores has recently become more difficult, though.

Due to the deregulation of the storage sector at the beginning of 1990s, there was a dynamic development of small, independent wholesale companies, which currently dominate the market. However, the fragmented Polish wholesale sector has seen strong signs of consolidation over the last few years. The entrance of super- and hypermarket chains has increased competition in the distribution sector. Super- and hypermarket chains started to purchase products directly from producers and to

¹⁴ Recently, the consolidation process of large retail chains has accelerated. Some Western players have decided to sell all or at least part of their operations. For example, Casino sold its Géant hypermarkets to Metro Group and discount stores Leader Price to Tesco in July 2006; Ahold announced divestment in November 2006 and sold its network to Carrefour. Also local national chains have made efforts to consolidate their distribution system. For example the Polish Społem ('co-operative') organisation (being a very loose umbrella group of 340 regional and local societies) started joint buying along with other operations (*Planet Retail* 2006).

¹⁵ There were several political attempts to improve the situation of national small retailers. According to one of last draft bills, supermarkets with a surface area of over 400m² should not be opened in towns with populations lower than 15,000 inhabitants. In larger towns and cities, such projects would have to be approved by the local authorities. However, the expert opinion is that limiting this segment (outlets over 400m²) could result in foreign investment inflow into the smaller shops segment, which is currently dominated by national retailers. Foreign retailers are expected to increasingly target smaller cities (of around 50,000–150,000 inhabitants). Tesco, for example, launched their smaller, compact superstore format in 2004 and is expanding its operation (*Detal Dzisiaj*, 2006; *Planet Retail*, 2006).

import directly from their countries of origin while neglecting national wholesale companies. Delivered wholesale continues to play a very important role in the Polish food sector, nevertheless, with independent shops in the small towns and rural areas especially dependent on such partners.

The structure of dairy products' sales has changed significantly in recent years.¹⁶ Traditional dairy shops were replaced by super- and hypermarket chains, as well as discount shops. Sales of dairy products in modern retail chains make up over 40 per cent of total dairy products sales. Only traditional products (like traditional cottage cheese) are sold more often by independent shops. This has been caused mainly by the introduction of own-brand (that is, with the supermarket's name) products and lower prices in super- and hypermarket chains, as well as in discount shops.¹⁷ Since the share of own-brand products is much lower than in other European countries, it is expected that this share of dairy products in modern retail chains will further increase. The opposite trend is also possible, due to changing consumer preferences.¹⁸

¹⁶ Milk, eggs, and cheese are an important group of products in retail sales. According to data from the Central Statistical Office sales of milk, eggs, and cheese amounted to over 8 per cent of total retail sales of foodstuffs, alcoholic and non-alcoholic beverages, and tobacco products (*Rynek wewnętrzny*, 2006).

¹⁷ The number of own-brand is growing rapidly, especially in outlets run by foreign operators. In 2004 about 59 per cent of dairy products were sold as own-brand products in discount shops, 7 per cent in hypermarkets, and 3 per cent in supermarkets. Dairy own-brand products are usually 20-40 per cent cheaper than the equivalent name-brand products. For UHT milk this difference can exceed even 70 per cent (*Detal Dzisiaj* 2005).

¹⁸ According to AC Nielsen, however, the popularity of own-brand products has decreased recently. Consumers in large retail chains prefer good quality at a reasonable prices instead of the cheap own-brand products. They also look for regional products that are not carried by the large retail chains but rather supplied mainly through central distribution centres (*Detal Dzisiaj*, 2005; *Planet Retail*, 2006).

3 Methodology for the Module 1 and 2 studies

3.1 Selection of study sites

After the reforms introduced in 1999 Poland was divided into 16 administrative regions (which correspond to NUTS 2 (Nomenclature of Units for Territorial Statistics) according to the European Union classification). For the purposes of this research two regions were selected: Podlaskie region and Warmińsko-Mazurskie (both in north-eastern Poland, see Figure 2).¹⁹ The choice was based on the specific characteristics of the restructuring process in these two regions.

As it was described in Section 2.1, the process of farm concentration differed between regions. A dynamic increase in milk production in the selected regions was followed by intensive changes in herd structure. Currently, Podlaskie and Warmińsko-Mazurskie have the best dairy herd structure in Poland (see Figure 6), which mainly developed during the last 10 years. Only about 7 per cent of dairy cows there belongs to very small farmers (1–2 cows), when the average for Poland is 22 per cent. More than 80 per cent of milk produced is sold.

In general, Podlaskie is a case of successful dairy sector development in Poland. It grew from a poorly structured (dominated by small farms) and rather poor region to become the most important dairy region in Poland. A strong concentration of dairy production and processing is underway. The factors that have made the dairy sector a success in Podlaskie have been: efficient development of cow-feed production (using natural resources); technological evolution; and development of an efficient land-leasing system (increase of land mobility).

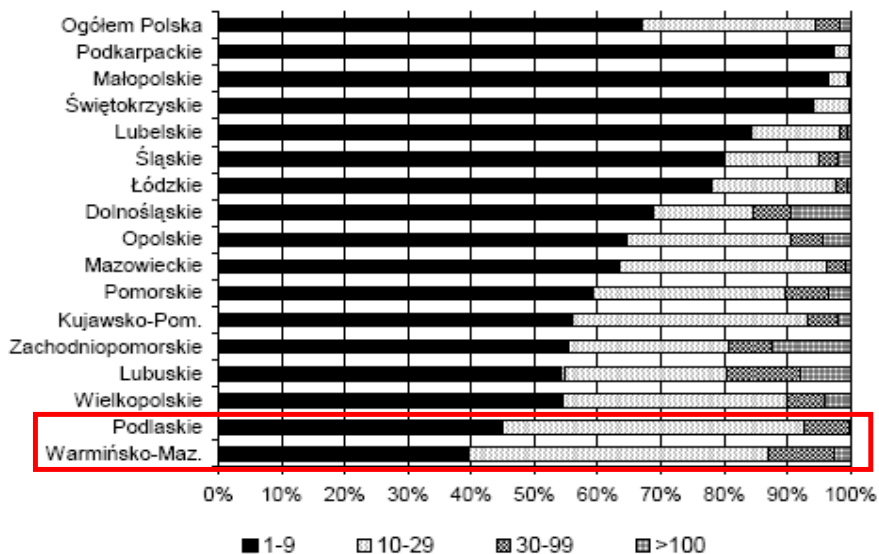
Warmińsko-Mazurskie is another important dairy region. It has a rich natural environment and cheap milk production. It has a good farm structure, based on the privatization of the old state farms and restructuring. Like the situation in Podlaskie, a strong concentration dairy production and processing is underway. The dairy sector plays also an important role in the sustainable development of agriculture and the local economy.²⁰

¹⁹ Podlaskie region is 20,180km² (about 6.5 per cent of the total area of Poland) with a population of 1,224,000 (about 3 per cent of the total population). Warmińsko-Mazurskie is 24,202km² (about 8 per cent) with a population of 1,460,000 people (about 4 per cent of the total population).

²⁰ Another important reason for selecting the Warmińsko-Mazurskie region is the fact that similar studies were conducted there by the University of Leuven in 2001 and 2004 (see for example Dries and Swinnen, 2004). This research is therefore a great opportunity to complement those studies.

The two regions chosen are the most successful dairy regions, in which the restructuring process started first. It is reasonable to assume that regions that have fallen behind in terms of restructuring should follow the path already taken by these two regions. Therefore, understanding the changes that took place here may provide valuable insights and useful policy recommendations.

Figure 6. Dairy herd structure according to farm size, by regions in 2002



Source: IERiGŻ, No 21/2005, p.113.

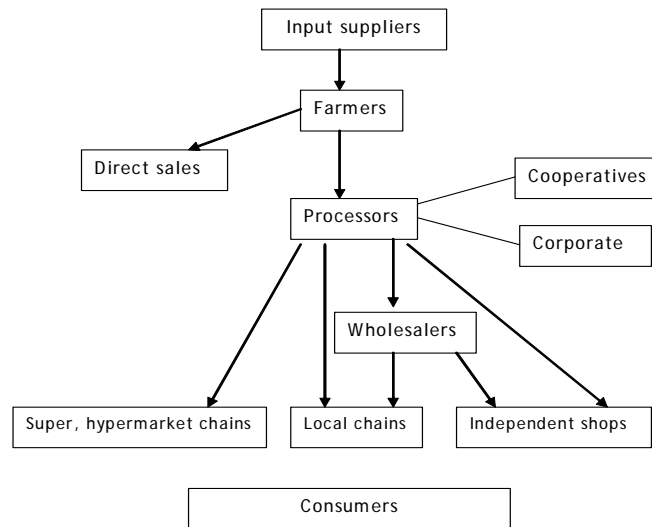
3.2 Survey methods

Section 2 presented the general information about the restructuring process in the dairy sector. The analysis that followed showed the most important segments of the marketing channel in the Polish dairy sector and enable us to choose groups of respondents for interviews.

Figure 7 presents a scheme of the marketing channel in the dairy sector in Poland. In the upstream segment the most important input suppliers for milk producers are fodder suppliers, machine suppliers, and banks. Dairy processing companies play the most important role for milk producers in the downstream segment. Currently, after the introduction of the quota system (see detailed description in Section 2), most farmers (who have so-called 'wholesale quotas') sell milk to processing companies. Farmers can also sell milk and milk products directly to consumers (provided they have 'direct sales quotas'). According to their legal status, dairy processors are usually cooperatives (80 per cent of all processors in Poland) and

incorporate companies (with foreign and national capital shares). Dairy processors²¹ sell their products directly to the retail sector (to super- and hypermarket chains, local chains, and independent shops) or to wholesale companies, who usually work with local chains and independent shops.²²

Figure 7. Marketing channel in the Polish dairy sector



Source: Study data.

The main goal of the Module 1 and 2 surveys is to answer the research questions on the restructuring of the food industry (as presented in Section 1.4). Therefore, the interviews with representatives of different stages of the supply chain as well as market experts included questions on changes in dairy sector in Poland, potential factors influencing these changes, and relationships between segments of the sector. Interviews also covered specific questions for seven different groups of respondents: experts, associations, processing procurement, sales processing, wholesalers, retailers, and producers. For example, interviews with dairy processing representatives included questions on: production, sales, logistics, quality and food

²¹ Second-stage dairy processors do not play an important role in the Polish dairy sector. Usually dairy processors produce both final dairy products and products for further processing.

²² Super- and hypermarket chains also purchase dairy products from wholesalers, but to a lesser extent smaller degree (see discussion in Section 3).

safety issues, product innovation, contracts with farmers and purchasers, credit programmes, and assistance to farmers.

The Module 1 and Module 2 surveys were conducted in May and August 2006. They were both carried out at national and regional levels (in two regions – Podlaskie and Warmińsko-Mazurskie – also chosen for the Module 3 survey). In all 36 semi-structured interviews were completed (10 at the national level, 15 in the Podlaskie region, and 11 in the Warmińsko-Mazurskie region). In addition, five focus group interviews were organized (two in the Podlaskie region and three in the Warmińsko-Mazurskie region). The respondents' characteristics are presented in the Appendix.

The sample chosen for the purposes of the current study was not aimed to be statistically representative. The main goal was to interview the most important stakeholders in the dairy sector and obtain the information necessary to prepare a quantitative study (within Module 3).

4 Results of the Module 1 and 2 studies

4.1 Restructuring the downstream segments in the supply chain

This section describes the most significant changes found in the downstream segments of the milk supply chain (processing, wholesale, and retail).

4.1.1 Processing segment

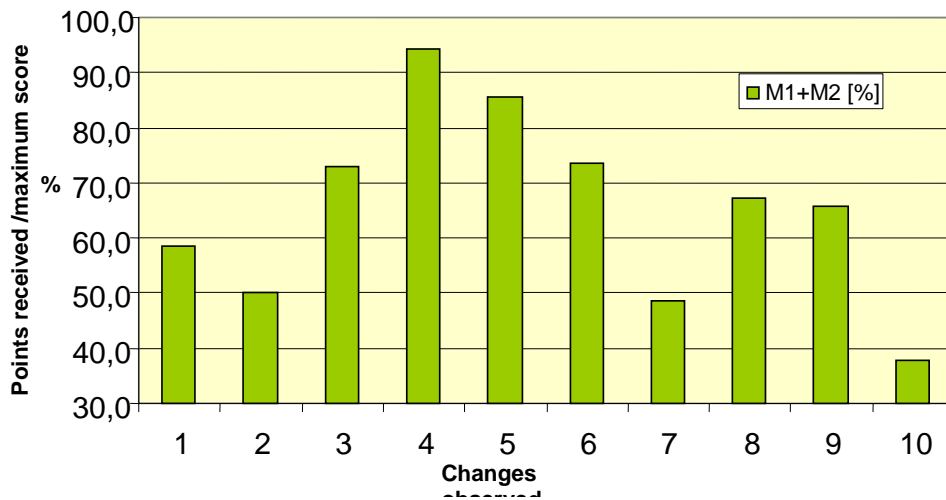
The analysis of the processing segment is based on interviews with experts (at national and regional levels) and interviews with representatives of the dairy processing companies (at national and regional level) described in Section 3.2.

We asked our respondents (experts and segment representatives) what changes had occurred during the past 10 years, at both national and regional level. According to them the most significant changes in the dairy processing segment were: (1) improved quality and variety of final products; (2) improved raw milk quality; (3) technical processing improvements; and (4) changes in the demand for processed products. These changes occurred at both national and regional levels (see Figure 8).

It was stressed in the interviews that the concentration process of dairy processing had accelerated significantly during the past five to six years and that it had been initiated by the large dairies. The research confirmed that this process differed between regions. In Warmińsko-Mazurskie the concentration was far less intensive than in Podlaskie, where the two largest processors in Poland are located. Compared to other regions, however, especially the southern ones, the concentration process in Warmińsko-Mazurskie is more advanced.

In addition to the changes already mentioned, representatives of the processing industry pointed out that last 10 years had brought about significant changes in terms of the *profitability* of milk processing. They stressed that profitability, after being modest in the 1990s, increased the year of the EU accession, which was a result of increased export demand and very good euro exchange rate for the Polish zloty. The following year, however, the profitability again progressively decreased, while raw milk prices and production costs both increased.

Figure 8. The main changes in the processing sector according to the opinions of the respondents at national (M1) and regional (M2) level. (% of points received vs. maximum score possible for every change*)



1. Concentration; 2. FDI; 3. Demand for processed products; 4. Quality and assortment improvement of final products; 5. Quality of raw milk (support for farmers); 6. Technological changes; 7. Regional specialisation; 8. Profitability changes at the processing level (input/output prices); 9. Sales options for processors (exclusion/inclusion from the chain); 10. Procurement options,

*Each respondent was allowed to give 1–5 points to express the importance of each change. The number of points received by each change option was totalled, then expressed as a percentage of the maximum points they could have received (maximum: 5 points x number of respondents).

Source: Study data.

Increased competition in the dairy market forced dairy processors in to product specialization. Large companies have specialized dairy plants (for example they produce cheeses, milk powder, and butter in one plant and fresh milk products in the other). They can afford to produce a large variety of products and compete on the market thanks to their well-developed marketing systems and substantial capital funds. They can more easily introduce innovations and quickly adjust to the consumer (or retail) requirements. Smaller processors, who are not able to compete with the larger companies (with respect to volume or variety of products), try to find their niche and produce unique products or products for further processing (such as SMP). There are some small processors who are specializing in exports. We saw that smaller processors are less flexible with respect to adjusting to new retailers' requirements (for example new packaging or flavours), mostly because of investment barriers. However, they are usually more willing to do so than larger dairies.

In the opinion of both experts and segment representatives, the most significant

factors that influenced the changes in the processing industry were: the transition period (which influenced the situation mainly in 1990s); the pre-accession process (since 1998²³); and EU integration. All these aspects required significant adjustments for institutions and to policies. The necessary legal adjustments were introduced, and support programmes for processors and producers were launched to help them to meet consumer's quality requirements. Survey respondents also mentioned that the transformation of the retail segment (together with its internationalization and consolidation) was an important factor. Retail expansion opened new outlets for dairy products, but at the same time imposed new requirements on dairies, who had to adjust. Experts emphasized that the importance of that factor had increased especially during the past five years, when the expansion of the large-scale retailers intensified.

Barriers for the processing segment

Difficulties and development constrains at the processing level are very important not only for dairies but also for producers delivering to them, for whom the dairy processors are the most important segment of the market chain. We saw that dairy processors not only play the role of milk purchaser, but also help in farm development, for instance by organizing traineeships or offering short-term loans (see Section 4.2). Economic problems, poor efficiency, shrinking sales, or problems with the production base at the processing level therefore have a direct effect at the farm level. According to our respondents, the main problems that processor face when competing on the market can be divided into two groups: (1) barriers arising from the legal regulations, and (2) barriers concerning the low economic efficiency of companies.

According to our interviews with experts and dairies, one of the most frequently mentioned legal barriers for both the milk-processing segment and producers is the organization of the milk quota system (see also Section 2.2). There are two main problems concerning milk quotas: first, the limit which binds production and in 2005/06 was oversupplied, and second, the quota trade restrictions, which result in high quota prices and inhibit the restructuring of milk production. The quota can be traded only between farmers that have their holding in the same administrative region. That rule is extremely unhelpful for dairy production restructuring. In the regions where milk production develops very quickly, there is a very high demand for production quotas. This demand cannot be met by existing supply, hence quota prices are twice as high as in other regions. Producers who want to increase their production have to bear very high investment costs or pay the super-levy for

²³ Despite the fact that the Polish pre-accession agreement was signed in 1994, the most significant arrangements concerning milk market regulation were prepared in the end of 1990s, therefore the importance of that factor for dairy sector restructuring increased.

overrunning the quota. This transfer organization also creates a huge barrier for processing companies, who have to search for raw milk outside the region, increasing their transaction costs. The arrangement inhibits the transfer of quotas from the less-favourable milk-producing regions (mainly in southern Poland) to those with good milk-producing conditions.

The other barriers relate to the factors that influence the low economic efficiency of dairy processing. The main constraints here are:

- A weak position in the chain (except for the largest companies), which is a consequence of the pressure on both producers (especially those with large deliveries) to get a good price for their milk, and on retailers to buy as cheaply as possible. 'Only a few dairies can negotiate or dictate conditions to the large retailers', said one of our respondents. Another said: 'We have to attract large producers by paying higher prices, otherwise they will switch to competitors and we will lose the milk'. That situation results in low processing margins (added value) for dairies, which affects their financial situation
- The low level of management skills and the mentality of dairy employees (especially in dairy co-operatives). 'The success of a milk processor depends on the people who are managing it' – said our respondent – 'but there is still a lack of good managers in dairies'.
- Low labour efficiency, which negatively affects the dairies' comparative advantage.

Respondents' also emphasized that a significant barrier is consumers' low incomes and consumption; they can't afford to buy more expensive products. A small dairy representative said: 'the demand for dairy products is a significant barrier; we are competing by lowering prices; it is a condition for selling the products on the local market. Here society is rather poor, and when buying still take price into account more than the quality of the product'. Smaller dairy processors in particular have to compete in the local markets by lowering their prices, which is extremely difficult given the low profit margins.

Some experts also said that a significant barrier to the development of processing is the cooperative form of ownership. Unclear, shared ownership rights result in more difficult management and more complicated decision-making processes. Some experts pointed out that the problem is in the cooperative law, which hampers the flexible management and restructuring of dairy cooperatives. Cooperative ownership also affects the managing board's thinking, since the main purpose of the cooperative is to protect farmers' interests and ensure satisfactory purchase prices for milk. The other obstacle to restructuring is co-owners' shares, which have to be

paid out when a farmer wants to deliver to another company or to resign, or have to be paid in when a producer wants to join the cooperative. The first situation affects liquidity and weakens the financial situation of the cooperative (especially small ones), However, the reality is that cooperatives can survive and be successful in the market and, as was mentioned earlier, are still the dominant ownership form. The two largest dairy processors in Poland (who process respectively more than 900,000 and 600,000 tonnes of milk) are cooperatives. Therefore, perhaps the opinion of one of our respondents was most appropriate, when he said that 'the most important is management, when it is efficient, it doesn't matter if it is cooperative or corporate firm'.

Structure of sales in large and small dairy processing companies

Large-scale processors usually look for opportunities to deliver their products to super- or hypermarkets, where they can easily sell a lot of their products. Large-scale retailers are also more stable partners for these processors than wholesalers, but dictate stricter trade conditions and negotiate lower prices. The importance of the large-retail channel has been growing since the end of 1990s, when the dominant form was wholesale, local cooperative chains, and independent shops. But according to our experts still only about 5 per cent of milk produce is channelled through the super- and hypermarkets, although for fresh milk products (yoghurts), special cheeses, and UHT milk it reaches 20 per cent. Their share of the total wholesale segment has decreased, but they still play a significant role in dairy products' sales. Wholesale companies tend to specialize in dairy products and distribute from the large processors to the traditional shops and local retail networks (see Section 4.1.2). According to our research, in both regions large dairies are selling from 30 per cent to 60 per cent of their products to the large retail chains, about 35–50 per cent is channelled through the wholesale segment, and about 5 per cent is delivered to local chains or independent shops. In the case of small dairies, the wholesale segment has dominated sales, along with independent shops. Some small processors were also delivering to one or two regional shops of large retail chains. Smaller dairies usually have insufficient volume of production to deliver to super- and hypermarkets. They have to look for sales opportunities in the traditional independent shops, either on their own or through wholesalers. Often, if they have an EU allowance, small processors try to specialize in a few products for export. In that case, their structure of sales is dominated by exports.

Logistics

Both large and small processors prefer to outsource the transport of their products to private companies. This is because transport costs are lower, as the logistic company takes over the maintenance of the transport fleet and responsibility for delivering the

product. Processing companies prefer small private transporters to big logistics companies, because the smaller one are more trustworthy and allow for direct, personal contact, and always have the same driver. There are many cases where a transport company services only a particular dairy plant and its drivers used to work for the processor fleet before. Dairy processors who deliver to large retailers are sometimes obliged to use the logistics company chosen by the retailer, or prepare separate deliveries specially for that particular super- or hypermarket or distribution centre. The pressure by large retailers to use their 'contracted' delivery companies is progressively growing. One of our respondents said: 'there is strong pressure from the logistic centres of the large foreign retail chains to take over the transport of our products. They would like to take over the margins. So far we have been defending them, but some day they will succeed'. Regarding the wholesale segment – dairies usually cover the transport costs to the wholesaler, and then the wholesale company has its own transport (owned or outsourced) to distribute the products further.

4.1.2 Wholesale segment

Our analysis of the wholesale segment is based on interviews with experts, and representatives of the wholesale, retail, and dairy-processing segments at national and regional level. All the wholesale companies surveyed specialized in dairy products (see Section 3.2 for a description of the people interviewed).

According to the respondents, the most important changes that took place in the wholesale segment were: the concentration and specialization processes; changes in profitability; improvement in the variety of dairy products available; and technical innovations. These changes began with the transition process at the beginning of 1990s (when new private companies entered the market) and were further stimulated by the entrance of foreign retail chains in the mid-1990s. The regional experts also stressed the influence of dairy-processing concentration, which allowed wholesalers to make the most of economies of scale.

Decreasing profitability and a change of wholesalers' strategies

Strong competition between the wholesale companies hit profitability. Profitability also decreased because of competition from foreign super- and hypermarkets chains. Our respondents (the wholesale companies) perceive large retailers as important competitors. One of them said: 'Theoretically retail chains are not our competitors. However, when they open distribution centres our position becomes weaker because they are taking over our suppliers.' Another wholesaler said: 'We do not cooperate with super- and hypermarkets chains. We are their competitor. We cannot help competitors!'

Super- and hypermarket chains have recently become important direct purchasers of

products from dairy companies. All the processing companies interviewed were selling their products directly to super- and hypermarket chains (the share ranged from 2 per cent to 60 per cent of total sales, and has been increasing in recent years).

During the past 10 years many small wholesale companies, unable to face stiff competition, went bankrupt. In addition, the number of wholesale companies selling dairy products decreased because many consolidated to survive in a highly competitive environment. One respondent said that number of wholesale companies decreased from around 40 to five in Warsaw. Another said that he had received several offers to join other wholesalers.

Thanks to this concentration, wholesalers extended their operation. One of the experts interviewed described this phenomenon: 'During the past five years one wholesale company took over several other wholesale companies and it has become one of the main players, not only in the Podlaskie region but also in the whole eastern Poland. Another large wholesaler from Podlaskie region has extended its network to western Poland.

Another strategy adopted in response to strong competition was specialization in dairy products. Wholesale companies benefited from growing demand for dairy products, as well as from increased competition between dairy processors. Both these processes resulted in better quality and a better variety of dairy products (see Section 4.1.1.). During the past 10 years the number of dairy product units sold by wholesalers increased significantly (the wholesalers interviewed have on average 2,000 dairy SKU. However, one of the experts said that currently one can see a 'retreat from specialization in dairy products', that is, the wholesale companies are tending to specialize in other food products (see an example of a food holding below).

It is also worth mentioning that large wholesalers introduce their 'own-brand' products. Both interviewed wholesalers in Podlaskie region have own-brand products and they control the quality of these products at the processing level. As one of respondents said: 'The entrance of super- and hypermarket chains, as well as lowering prices, has resulted in an extended variety of dairy products.' Therefore, expanding their operation profile by introducing own-brand products has been another wholesalers' response to increased competition.

Our information tends to indicate that strong competition with super- and hypermarkets chains has also accelerated the vertical integration of Polish-owned companies. Last year one of the wholesalers interviewed joined a large food wholesale holding. A company that owns a supermarket chain plans to join this holding in 2006. One of the experts said: 'The distribution channels of this retail

company will probably be opened to the wholesaler and it will conquer other [regional] markets.’ Thus, in our opinion, the wholesaler could become a distribution centre for dairy products in the future.

Concentration and specialization has allowed wholesale companies to reduce costs. Another important factor in costs reduction, according to our respondents, was technical development. For example, wholesale companies introduced technology that enabled their customers to order over the internet or using their palmtops. In addition, technical developments in the processing companies allowed for longer expiry dates for dairy products. This allows wholesalers to lower both their storage costs and their risk (of products spoiling before being sold).

‘The wholesale segment is an important intermediary for local chains and independent shops.’

These changes have occurred at both national and regional level. However, several differences between the two regions were noted. In Podlaskie region the wholesale sector still plays an important role in dairy products distribution. This is partially caused by the strategy of the local government, which is very reluctant to allow super- and hypermarket chains to enter the market (see below). In Warmińsko-Mazurskie, where there were no such regulations, the role of wholesalers in dairy products’ distribution is much less important.

In general, the experts interviewed felt that the role of the wholesale sector is diminishing in the dairy industry market chain. The government representative even said that ‘the wholesale sector is of marginal importance’. These statements, however, are contrary to our findings. In the surveyed regions the role of the wholesale segment has changed significantly during the past 10 years, but it is still an important intermediary between processors and small retailers.

In both regions the share of wholesalers’ turnover with large retail chains and with processing companies has decreased significantly. Both foreign and national large retail chains have started to open their own distribution centres²⁴ and large processing companies tend to sell directly to retailers. One large processing company with foreign capital even has its own distribution system. However, in the opinion of one of the interviewed wholesalers, ‘The processing companies who do not work with wholesalers lose a lot, because they are not able to deliver their products everywhere.’ Some large processing companies are aware of that. A

²⁴ For one foreign super- and hypermarket chain that we surveyed, who do not have own distribution centre, deliveries from large wholesalers amounted to about 10 per cent, from large processing companies about 80 per cent, and from imports about 10 per cent of total deliveries in 2005.

representative of a large dairy²⁵ said that 'We work with large wholesalers that deliver our products to sub-wholesalers (smaller wholesalers). Before we were selling our products on our own, even to local retailers, but we were not able to serve the whole region as it was too costly. Individual deliveries are too expensive. However, since delivering to local chains and independent shops is very important for us, we decided to work with wholesalers and we do not regret that.'

Although its role in supplying large retailers has diminished, the wholesale sector has become an important intermediary for local chains and independent shops. The main supplier of a chain of village shops that we surveyed in the Podlaskie region is a large wholesaler. Occasionally, the owner of the chain also buys dairy products from other wholesalers and from one dairy processor. Several wholesalers are also the main suppliers for a local supermarket chain from Warmińsko-Mazurskie. In addition cooperative chains of supermarkets in both surveyed regions rely extensively on working with wholesalers, even though both of them have their own food wholesale stores. One of chain's representatives said that 'Wholesale is still important thanks to their diverse variety [of products].'

Wholesalers also prefer large suppliers

When describing the relationship between the wholesale and other sectors it is important to mention that both dairy processors and retailers prefer to work with large wholesale companies. According to our respondents, the main reason is the potential to reduce transaction costs, including transport and negotiation costs.

The wholesalers interviewed pointed out that these costs constitute the main barriers to dealing with small processors. Another important reason is the cost of marketing. As one of wholesalers said 'Marketing has to be active and this is costly. Large suppliers participate in different kinds of marketing campaigns, whereas small processors cannot afford that. Therefore, we try to eliminate small processors whose products could be replaced with those delivered by larger processors. Thus dairy products from large processors constitute the majority of the turnover of large wholesale companies.

On the other hand, dealing with small processing companies does have certain advantages. They offer wholesale companies access to specific and original dairy products or to regional products with trademarks that are recognized by consumers in the region. Dairy goods produced locally are delivered mainly to the relevant regional retail segment, but also to several super- and hypermarket chains in the

²⁵ This dairy's share of 2005 sales to wholesalers amounted to 35 per cent of total sales, and to super- and hypermarket chains 60 per cent.

region. Thus, consumption patterns could provide opportunities for small dairy producers (see more detailed discussion in Section 4.1.4.).

4.1.3 Retail segment

Analysis of the retail segment is based on interviews with experts and interviews with representatives of retail segments at national and regional level.

According to those interviewed, the most important changes that have taken place in the retail segment are: growth and geographical expansion of large retail chains; concentration process; increased competition; increased demand for dairy products; and improvement in the variety of dairy products. Representatives of retailers in both regions also stressed organizational changes. As was the case for the restructuring of the wholesale sector, these changes were mainly caused by transition processes at the beginning of the 1990s.

Growth of large retail chains from a regional perspective

The growth and geographical expansion of numerous super- and hypermarket chains was the most important change that occurred in the retail segment in Poland. This resulted in very strong competition between the large retailers and the position of the local chains and independent shops became weaker.

According to a representative of a retail association, Poland has the highest number of large retail chains in Europe. Every chain is opening new outlets – even tens per year. Therefore stiff competition forces them to invest heavily. One can also see the retail chains ‘spread out’ from the large cities.

The largest competitors for the surveyed national retail chains in both regions are the super- and hypermarkets chains. There are some differences between the regions, however. Local government in Podlaskie has limited the development of foreign super- and hypermarket chains. For example, it did not allow one of the super- and hypermarket chains to open a store in a particular location because of the possible environmental damages. This is why the foreign chains of discount shops are perceived as the main competitors for the surveyed retailers in Podlaskie. Super- and hypermarket chains are the most important competitors for the surveyed retailers in Warmińsko-Mazurskie, however. A director of the local supermarket chain in Warmińsko-Mazurskie said that, ‘This is a life-and-death fight. We have already been in the market nine years. During that time four super- and hypermarket chains have opened shops in the vicinity of our outlets.’

These differences between regions show the importance of government policies (introduced at both the local and national level) in determining the structure of the

retail segment (see discussion in Section 2.3). It is worth mentioning that these policies also have indirect impacts on the other food chain segments, because of the retail sector's bargaining power (see Section 4.1.4). Despite these clear linkages, none of our respondents mentioned government policy or state intervention as one of the most important drivers of restructuring in the dairy sector.

Due to the strong competition, both super- and hypermarket chains and local chains have begun to concentrate recently. For example, national cooperative chains²⁶ (selling under the same brand throughout Poland), whose representatives were surveyed in both regions, have started to consolidate their distribution systems. However, their legal status could slow down the concentration process. As a representative of a cooperative chain in Warmińsko-Mazurskie said, 'The autonomy of cooperative presidents is very considerable. They are afraid of losing power.' Concentration is also part of the strategy of the previously mentioned local supermarket chain in Warmińsko-Mazurskie. The company recently joined together with two other local chains and currently has 16 outlets (in 1997 there was only one). They also plan to expand geographically. Their strategy is to specialize in fresh products.

Quality improvement and increased demand for dairy products

All the retail representatives interviewed stressed the improvements in quality and the increased demand for dairy products. According to the director of a local supermarket chain in Warmińsko-Mazurskie, even though prices drive consumption decisions, the pattern of dairy products' consumption has been changing. He said that, 'People are becoming aware of what they eat. In the last few years, demand for traditional dairy products²⁷ has increased 20–30 per cent per year'.

In local shops the majority of dairy products are produced within the region. The owner of a chain of village shops said that in his chain this share amounts to around 80 per cent.

According to the retailers interviewed, the dairy product attributes most sought by consumers are quality, price, and packaging. In the opinion of large retailers, only large processors can meet such requirements, since only they can afford to cover to. In addition, marketing plays a very important role. Thanks to marketing campaigns by dairy processors in national television and newspapers, demand for particular

²⁶ Which operated before transition process and which was privatised and split at the beginning of 1990s.

²⁷ Dairy products without artificial flavours that are common in Poland include cottage cheese, sour cream, etc.

products may increase significantly, which improves the bargaining position of the dairy processor.

4.1.4 Power relationships in downstream segments

According to the opinion of one of the experts, consumers are looking for modern, good-quality products. Processors have to follow the changes in demand and adjust their milk products to customers' requirements. Therefore customers, through the retail/wholesale segment, forced the dairies to improve the quality of their products. A similar statement was made by one of the representatives from a dairy-processing companies, 'Buyers are always those in the best position', but he also added that, 'in an era of milk shortages [in Podlaskie region], large producers can negotiate the conditions, while small producers are in the weakest position'.

Dairy-processing companies have historically had a dominant position in the dairy industry. But their position is progressively diminishing. Notwithstanding this fact, cooperation between processors, although in general assess as positive, could still be strengthened further.²⁸ Despite continued rapid consolidation in this sector, it is increasingly the retail sector that dictates the rules, shaping the structure of the processing industry and thereby influencing milk producers' production decisions. Large retailers often set high requirements and dictate what, when, how, and how much is to be produced. Nevertheless, even these food retailers are under strict and constant pressure – the ultimate power is increasingly in the hands of consumers, who are ever-more demanding with regard to factors such as nutrient definition, organic status, traceability of products, etc. (OECD, 2005).

Consumer preferences

All the people interviewed stated that there is a new trend in consumption patterns. Consumers are paying more attention to dairy products' quality. One of the respondents said that, 'Before consumers wanted to buy yellow cheese, now they want to buy, lets say, Gouda, and more often than not they want to buy Gouda from a given dairy processor'. Consumers also look for fresh products, and have started to avoid dairy products with long expiration dates. In addition, regional products have become more and more popular (even in some super- and hypermarket chains). According to those interviewed, this could be an opportunity chance for small dairy processors.

Contracts

Dairy-processing respondents said that generally they have contracts with all the main buyers of their products. Contracts are usually signed for a long period, but

²⁸ The respondents particularly stressed the need for common efforts to influence government policy more efficiently.

sales conditions such as prices, discounts, and promotions are negotiated separately and added as annexes to the contract. Often sales conditions differ from one purchaser or product to another, and depend on the negotiations, volume of purchase, and sometimes region of sale.

Respondents from dairy-processing companies who deliver to the small retail shops said that they used to have contracts with those shops but stopped that practice because payments were frequently late and financial transaction were difficult. Now dairies prefer to be paid cash on delivery when they sell to small shops.

Large retailers (both foreign and national retail chains) have written contracts with all suppliers. Contracts include such requirements as volume and delivery terms, and minimum levels of marketing expenditure. One owner of a chain of small village shops said in his interview that he had no written contracts with his suppliers. This information was confirmed by the wholesale representatives, who admitted that they have contracts with large retailers, but not with small and independent shops.

4.2 Changes in production and marketing at farm level

This part of the paper aims to shed some light on the restructuring that has taken place in the upstream segments of the dairy supply chain, with an emphasis on changes at the farm level. The picture presented was built mainly using information gathered during focus group meetings with farmers and interviews with the dairies' purchase managers (see Section 3.2).

4.2.1 Production trends

Milk specialization

According to experts interviewed, milk production has recently become the main agricultural activity in both surveyed regions. Although milk production has a long tradition, especially in Podlaskie, in the past households tended to also have other agricultural activities, including keeping pigs and sheep and growing tobacco. Today local farmers specialize in milk production. In the opinion of our respondents this dependence holds true for both small and large producers, although the small-scale farmers do also need to combine earnings from farming with some other non-agricultural income, while large farmers can rely on agricultural income alone.

According to our respondents, there are several reasons behind the specialization in milk production. To begin with, the dairy industry is one of the few processing industries in these regions that survived the transformation to a market economy. Second, after shutting down rural collection points during 1990s, the selling

opportunities for agricultural products other than milk became significantly constrained.²⁹ Third, farms with mixed production need access to machines for specific work in the field such as ploughing, harvesting, etc. The collapse of communism resulted in the liquidation of many farmers' organizations that had provided such services, so today mixed production requires a substantial investment in machines, which only a few farmers could afford. Finally, the increase in both internal and external competition forced farmers to look for the most efficient use of their resources. Both these regions have relatively poor quality land that is most suitable for grassland and hence milk production. The importance of the 'milk sector' in these areas is illustrated by the following quotes:

- 'When there were rural collection points you could sell everything you wanted no matter whether you had small or large quantities. Later on you could sell only milk and people saw that [...]. It is good that these dairies remained, otherwise we would not have anything.'
- 'If there were no milk here we would have nothing, those who have cows are in the twenty-first century with a PC and internet, and those without cows are still in the nineteenth century.'

Increase in herd size and production

On average our respondents thought that the minimum size of a herd should be at least 20 to earn living from milk production. Larger producers thought 30 cows about right, whereas smaller producers felt that a herd of 15–20 would be enough. In the areas under study the average herd size equalled 25-35 cows, however farmers with less than 10 cows were still present. There were no significant differences between the two regions.

An increase in the average herd size was seen as one of the main changes in recent decade. Farmers mentioned several reasons for this increase. First, investments in quality improvement, if they were to be profitable, required sufficient scale of production. Second, farmers were encouraged to increase their herds by dairies aiming to maximize their deliveries. Extra payments for large quantities delivered or low-interest loans for heifers and cows were among the most common policies adopted by the whole industry (see Section 4.2.5). Third, another strong impetus to increase herd size was anticipation of the quota system introduction. In order to

²⁹ During communism state-owned rural collection points were the only place for farmers to sell their goods, and played a very important role. Once the old system collapsed, however, they lost their significance and most of them went bankrupt. For farmers this meant establishing new ties with market institutions, a task that many of them failed to achieve. In the case of milk, there were separate collection points. After the market economy was introduced farmers' ties with the dairy industry were not broken, since it was processors who managed the milk collection points. Consequently, compared to other farmers, milk producers were in a relatively better situation.

ensure high allocations, farmers aimed to maximize their production before the reference year. Finally, the increase in herds has been driven by a deterioration in profitability. As one of the respondents said, 'Nowadays the milk price is the same as it was in the mid-1990s (about 1 zloty/litre) but production costs have gone up by 100 per cent. Two years ago profitability was much better, now you need to use economies of scale'.

This increase in herd size naturally led to an increase in production. According to our respondents, local producers have increased their production four- to sevenfold.

Polarization

The increase in average herd size was accompanied by the polarization of producers' wealth. 'On the one hand there are those who invested in modern machines [...], and on the other those who stayed in 1980s with obsolete machines and no investment in buildings, and who are still selling their milk from a can'. This process is surely connected with households' access to capital (see below) and farmers' mentality. During the interviews two other explanations were given. In the opinion of the respondents the division of farmers into 'modern' and 'backward' often has a lot to do with age, since the latter are frequently older than the former. Their reluctance to invest stems from the fact that they are just waiting to be eligible for their pensions, and intend to quit production once they retire.

Furthermore, respondents pointed out that the lack of investment in the farm might also be connected with having no heirs who want to continue farming. Farmers simply see no point in modernizing if there is no one to leave their farm to. This observation is not surprising, given the number of young people moving to the cities (see Frenkel, 2006). It seems that farmers do, however, prefer their children to work in urban centres rather than on farms (see Hardt, 2006). In this context the lack of invest on the farm could be seen not as a consequence of having no successors but as a conscious choice to withdraw from milk production.

Alternatives for those who quit milk production

The radical changes described above have forced many small producers (with herds of up to ten cows) to quit milk production. Since alternative employment opportunities in rural areas are very limited most of these farmers either shifted to other agricultural activities or took advantage of the earlier pensions provided within the 'structural rents' programme. The most common agricultural activity undertaken by those who left milk sector is beef production. It is interesting to note that because of the fines for exceeding the milk quota it is quite possible that larger producers will also have to consider producing beef alongside milk. Some of those who ceased marketing their milk still use it for feeding purposes, for which they do

not need to have any quota.³⁰ Those who left agriculture for good rented out their land or, less frequently, developed agro-tourism.

4.2.2 Production services (input service)

Investment opportunities

Since the recent revolutionary changes in quality standards, access to financial capital has been recognized as a crucial factor determining the development of a household. Several options for raising funds were mentioned, and the slight differences of opinion between smaller and larger producers were noticeable. The former placed a lot more significance of using your own funds, whereas the latter attached greater significance to preferential credits from the state and low-interest loans from the dairies. Smaller producers also mentioned as a potential source of funding bank credit. The larger producers, on the other hand, appear to try to avoid taking out commercial loans, and seemed to be more active in taking advantage of EU funds, both before and after accession.

It is difficult to assess from the interviews whether herd size was a result of accessing particular sources of funding, or whether it simply made it easier. Statements from the dairies' representatives do not give a clear answer. On the one hand there is evidence that credit was given to all households willing to modernize, including those with only three to five cows. On the other hand, providing loans to smaller producers is regarded as risky, since they do not have sufficient collateral. Moreover, as one of dairy representatives notes, 'you cannot be sure that smaller producers will not shift to other purchasers'.

It is notable that those who decided to invest, regardless of the source of funding, would like to develop further. Smallholders, however, are more sceptical about their future opportunities than larger producers.

Input use

The respondents agreed unanimously that there have been enormous changes in technology and forage use during the past decade. One farmer said that 'ten years ago I did not even think that I would ever have a "western" tractor'. All our respondents had cooling tanks on their farms and larger producers had started to think about buying milking machines. As for forage, producers had switched from hay to hay-silage. Although it is more demanding in terms of machines and thus involves higher expenditures, it is much easier to manage and certainly pays off. One of the respondents described this change as '[It is like] moving from a carriage

³⁰ In such case they do not have to have individual quota.

to a car'. Green feed is mainly produced on the farm, and the concentrate is bought at the market. The larger the producer, the more forage is needed.

4.2.3 Production constraints

Quota system and access to land

Our respondents mentioned several barriers to increased production. The most important two are the quota system and the lack of land. The former is especially binding in Podlaskie, where quota prices are the highest in the whole country, but farmers elsewhere also face fines for exceeding their individual limits. The lack of land also seemed to concern all the areas studied. According to our respondents, either there was no free land in the neighbourhood or it was very expensive. The increase in prices and farmers' reluctance to sell land was commonly associated with the impact of EU direct payments. The farmers in the focus group meetings felt that direct payments not only negatively affected land sales, but also had a negative impact on land rentals. Farmers eager to rent out their land are also worried about losing their profits from direct payments, so do not want to formalize a contract. This in turn makes the potential transaction uncertain, and thus it is rarely accepted by those looking for opportunities to expand

Another issue is veterinary certificates. By the end of 2006 every producer, in order to be allowed to sell his goods on the market, must have the appropriate document from a veterinary inspector, otherwise he will be forced to quit milk production. Since getting this certificate means implementing strict sanitary and veterinary norms, it requires substantial investments. Therefore, farmers who are currently doing alright because of the transitory period, and these are mainly small producers, may have serious problems meeting this obligation unless they get access to external funds. Moreover, by October 2008 farmers have to comply with regulations concerning manure management and animal welfare. These issues will again require substantial investments from farmers, and thus may seriously impede their production.

Dairy representatives also pointed out that further development at the farm level is likely to be hampered by producers' mentality and lack of initiative. One farmer said 'You do not encourage farmers to invest, you have to force them to. When approaching the problem they do not act on their own but wait, hoping that everything will be fine. They cannot calculate costs and rationally think ahead.' This statement shows clearly that despite observable achievements, further efforts – including financial education – are needed to convince farmers about the need to modernize.

Among the other problems that might constrain production respondents mentioned lack of successors, lack of knowledge, excessive herd fragmentation, and lack of alternative employment opportunities in rural areas. In the context of further restructuring at the production level, the lack of alternative employment is particularly important. On the one hand it will facilitate the outflow of people from agriculture and thus provide room for the consolidation of holdings and more efficient use of resources, but on the other it has a great potential to help improve rural inhabitants' purchasing power, strengthening at the same time the markets for the goods produced by those who stay in farming (Lanjouw and Lanjouw, 2001). Finally, as a production constraint respondents also mentioned drought and other weather-related risks, which indicates that farmers still have insufficient access to appropriate insurance schemes.

4.2.4 Marketing channels

All milk delivered to dairies

According to our respondents, there are no direct sales in either region and all milk is sold to dairies (an issue to be explored further in Module 3 of this study). Some farmers used to sell milk and milk products direct to consumers, but they either converted their 'direct sales quotas' into 'limits for deliveries to dairies' or quit production altogether.³¹ They used to sell homemade cream and cheeses in the nearest town, or supply households with agro-tourism facilities.

Deliveries to dairies: three channels

There are three channels through which milk goes from farm to dairy. The most common, both in terms of quantities and number of farmers, is direct collection from the cooling tank located at the farm. Transport is organized by the dairy, who either has its own truck or outsources this service to an independent firm.³² Milk is collected every two days. Milk is collected from several farmers, and a separate sample is taken from each of them. The sample and analysis costs are partially paid by the farmers. This channel was set up in the mid-1990s and since then has gradually grown in importance. According to our respondents it is just a matter of time until it becomes the only way milk is delivered to the dairy. Some dairies

³¹ Milk quota system distinguishes between two types of producers who are allowed to market their goods. On the one hand there are those with limits dedicated to direct sales to consumers. On the other hand there are producers with limits allowing for deliveries to dairy industry. For more on milk quota system see Section 2.2.

³² Usually the larger the dairy the higher the probability that transport services will be outsourced. Very often dairies, while they are expanding, sell their own trucks to an independent firm, which becomes in charge of milk collection and fleet.

already collect 100 per cent of their milk this way. Unless otherwise stated, in the rest of this paper this channel will be referred to as the 'modern channel'.

The second channel involves two stages. First farmers deliver their milk to a collection point in the village. This milk is later delivered (every two days) to the dairy. The second stage is organized just like the modern marketing channel. A milk sample is taken from every farmer when the milk is delivered to the collection point. Each collection point receives milk from more than 20 producers. Collection points are run by the dairies, who own all the equipment. In general, there is no serious investment being made in the collection points, and it is expected that dairies will gradually withdraw from this channel and switch to direct collection only. The reason for this is milk quality. The farmers said that 'sometimes more than 20 farmers deliver to one collection point, one washes their cans well and another does not, one lives 1km from the collection point and the other 5km, so the temperature is different'. It is important to note, however, that from the dairies' perspective this channel also has a certain advantage: 'for milk delivered to collection points we do not pay extra for large quantities, and thus it is cheap' (for more on this see Section 4.2.5). Today in our study regions the share of milk delivered through this channel ranges from 0 to around 37.5 per cent, depending on the dairy. In general, collection points are used by dairy cooperatives but not by corporations relying solely on direct purchases.

The third and least popular channel is very similar to the second one, except that the collection points are private, usually located on a farm where the farmer owns a cooling tank. The costs of administering this type of collection point are spread among all the farmers who deliver to it. In the study regions the share of milk delivered through this channel ranges from 0 to around 12 per cent, depending on the dairy. Similar to the second channel, this channel is perceived to be used by those who have fallen behind in terms of farm investments (cooling tanks, barn, herd) but not necessarily in terms of improvements in milk quality (see Section 4.2.5). It is used mainly by smaller producers. This channel was set up when direct collection from farms first appeared, but did not really grow for a number of reasons, including: 'in order to have something like that you need to have confidence in your partner; maybe for three or four farmers it can work but not for more'; 'the problem is that a farmer with three or four cows does not take care of quality – his main income comes from other sources – and he may easily spoil the milk of the others'. The other constraint is the competition from collection points administered by the dairies. It should also be noted that collection points, whether private or a dairy's, are sometimes perceived as mechanisms that make extra profits from being a kind of 'middleman' between the farmers and the processing industry. Therefore, farmers' confidence in them might be relatively weak. A dairy representative described this

phenomenon: 'Farmers leave the collection points since they do not want to have another middleman. They think that without this intermediary they could obtain higher prices, and therefore perceive the collection point as a "thief".'

Bearing in mind the discussion above, in the opinion of our respondents, both channels involving collection points should be treated by farmers as temporary, in that 'either you are preparing to buy your own cooling tank or you have decided to quit once the collecting points are closed'. Unless otherwise stated, in the rest of this paper channels involving deliveries to collection points will be referred to as 'traditional channels'.

4.2.5 Marketing incentives

Special premiums regardless of marketing channel

Within all three channels there are special premiums for higher quality milk. It is worth noting that significant progress has been made not only by farmers using the modern channel, but also by those using the traditional channels. In the study regions the share of 'extra class' milk in total deliveries ranges from 94 to 100 per cent, depending on the dairy. In general the best performance comes from the most competitive dairies, regardless of whether they are private or cooperatives.

Cooperative dairies pay special premiums to their members. Membership, however, is not essential for taking advantage of a particular channel.

Some dairies also offer an extra payment for having a veterinary inspection certificate or for producing milk on an organic farm.

Premiums encourage farmers to shift to direct collection

Compared to producers delivering through collection points (dairy-owned or private), farmers using the modern marketing channel profit from several extra payments. To begin with, some dairies provide special premiums to farmers with a cooling tank. Second, all dairies pay extra for large deliveries. There are no such payments in the traditional channels because the quantities are too small. Finally, some dairies offer special premiums to farmers with formal agreements, but only farmers with cooling tanks. So there is a double incentive for farmers to switch to direct collection. It not only ensures a higher price for their milk, but also reduces their sales uncertainty.

Dairy assistance to farmers

As noted by the farmers surveyed, in order to reduce transaction costs, 'dairies prefer to deal with larger producers'. Therefore, during the past decade the processing industry has undertaken a wide range of activities to encourage farmers

to increase production. The most successful in attracting large producers were the largest processors (see Table 5).

Table 5. Milk deliveries to dairies, by small and large producers, via modern and traditional channels (2005)

	Modern channels		Traditional channels %
	Small producers (<25,000 litres/year) (%)	Large producers (>120,000 litres/year) (%)	
Large dairies	34–42	11.5–14	9–21
Mid-size dairies	37–46	5–11	0–24
Small dairies	46–67	2–6.6	3.6–18

Source: Author’s calculations based on ten interviews with dairies’ representatives.

While encouraging farmers to increase their production, dairies have also – directly or indirectly – provided them with additional incentives to shift to the modern marketing channel, because once farmers reach a certain level of production it makes no sense to deliver to collection points. The programmes and assistance offered to farmers takes various forms. All dairies, in cooperation with local extension offices or veterinary inspectors, have offered farmers training in new techniques in milk production or on sanitary and veterinary issues. Most dairies also give producers consultancy services and low-interest loans to buy cooling tanks and heifers or cows. In many cases cooperation between the dairy industry and producers has involved credit to buy machines and modernize buildings. Some processors have also provided producers with both loans to buy forage, quotas, or land and access to machines and veterinary services. Finally, dairies have played a very important role in disseminating information. They have told farmers about opportunities to buy or rent quotas (in order to keep the quota within the company). They have given producers analyses of their milk so they can fix problems quickly, and advised them how to solve quality problems. The dairies surveyed said that they planned to continue to offer these services in the future.

As described in Section 2.2, milk producers can also access state preferential loan programmes – another incentives to shift to the modern marketing channel.

As a result of these policies in the dairies surveyed, the share of milk purchased through the traditional marketing channel decreased between 2003 and 2005 from 46 to 28 per cent.

4.2.6 Market institutions and marketing infrastructure

Actors in the market

The Polish dairy sector comprises many different actors. Beside those directly involved in the dairy supply chain (see Figure 7), several other institutions merit special attention. The Agency for Agricultural Markets is in charge of administering the quota system in Poland (see Section 2.1). There are also local institutions that provide farmers with consultancy and extension services, free of charge, including but not restricted to filling out applications for various funds, creating fertilizer use plans, and helping plan insemination or prepare forage. These institutions also disseminate important information concerning courses and prices for milk or quotas, and they organize meetings and excursions for farmers during which they can learn about best practices and from the experiences of other producers. Other institutions bring together representatives from particular stages of the supply chain. According to our respondents the dairy sector is relatively well organized compared to other sectors. Nevertheless, cooperation within and between players from different stages of the food chain leave a lot to be desired. A dairy representative described said that 'cooperation is very weak, we compete rather than cooperate, and this will not lead us to any solution'. Mentality and lack of trust are to blame for this state of affairs.

Improved sales opportunities for larger producers

From the farmers' perspective sales opportunities have improved during the past decade for larger producers. This is mainly a result of removing regional purchasing. Under communism any given processor's activity was confined to a certain area, so farmers' sales opportunities were seriously limited. Today such restrictions are gone so producers can choose between different purchasers. The other positive change is the introduction of the modern marketing channel, which larger farmers find much more convenient.

On the other hand, according to our respondents sales opportunities for smaller producers have worsened. This is mainly because of the gradual disappearance of milk collection points, so smaller producers have to deliver their milk to less convenient collection points. This not only increases their transport costs, but also lengthens the time needed to arrange the sale. Moreover, as was noted by one of the farmers, 'opportunities to sell products other than milk are very poor'. This, in turn, leaves milk producers without any reasonable alternative.

Milk deliveries

As was stated earlier, the modern marketing channel is organized by the dairies. Direct collection not only requires the farmer to have a cooling tank, but also to produce an agreed quantity of milk. If the farmer is unable to fulfil this obligation for

a long period of time he is charged extra to cover part of the transportation costs.

With traditional channels, on the other hand, the farmers themselves must deliver to the collection point, usually in one of three ways. He can deliver his own milk; or he can deliver his milk collectively with other farmers (each one taking turns doing the collecting/delivery. His third option is to work with the other farmers to contract and pay one man to collect and deliver for all of them. The fact that some farmers deliver to collection points on their own shows the difficulty producers have cooperating with each other even on such 'simple things' as transport, let alone negotiations with dairies or input suppliers.

Cooperation between farmers

In general cooperation between farmers when negotiating terms of trade with dairies or input suppliers is very rare, as is the collective use or rental of machinery. The main barriers to cooperation according to our respondents are farmers' mentality and lack of trust, although the interviews showed that cooperation between farmers is not only possible, but has led to measurable benefits. Examples included negotiations with dairies regarding milk collection times, and negotiations over the withdrawal of shares from a dairy cooperative when the purchaser changes. Cooperation through negotiation mainly involved rather larger producers. In terms of sharing machinery, respondents saw potential for cooperation, especially among smaller producers since 'only on those [smaller] holdings will there be machines that are not fully used'.

4.2.7 Marketing constraints

Difficulties with changing purchaser

In theory every farmer is allowed to change which dairy they sell to once a year without any consequences. In practice, however, such changes happen very rarely. One reason for this is that prices have stabilized. 'Since annual price differences are too small to attract anyone, the 'battle for farmers' ended about two years ago', said one respondent. According to our surveyed farmers, most of the producers who change purchasers do so because they have not adjusted to quality requirements: 'Nowadays the only farmers who change dairies are those who have fallen behind with quality adjustments, but this will change in the near future because no one will buy their milk. They will have nowhere to go, and will finally quit producing'.

The biggest constraint to changing dairies concerns the withdrawal of shares from cooperatives and difficulties with understanding contracts. The following comments highlighted this problem: 'If you want to change [the dairy] you have to pay for shares, as well as an introduction fee to the new dairy. The problem is that the old

one might take three years to give you your money back!', and 'Every farmer should have their own lawyer to cope with all of it [interpreting the contract]'.

In effect, even though there are plenty of purchasers on the market, farmers cannot fully access all the potential benefits that should arise.

4.2.8 Power relationships in upstream segments of the supply chain

When asked about the power relationships in the upstream segments of the supply chain, respondents were not unanimous in their opinions. From the farmers' point of view, it is the dairy that sets all the conditions regarding the terms of transactions. This opinion was also shared by representatives of other stages in the food chain, except for the processors. The latter said that it is the producers who can dictate conditions, especially the larger ones. In their opinion, due to the undersupply of milk, dairies are constantly having to seek out potential suppliers, and they need to compete for larger producers. For this reason the large producers have real bargaining power. Moreover, many processing industry representatives emphasized that dairy cooperatives are obliged to meet the demands of their shareholders, i.e. farmers. This seriously impedes processors' restructuring, since it constrains more determined action that aims to improve the delivery structure. This issue was also raised by the experts interviewed, who underlined that very often 'farmers do not understand that their high demands with respect to milk prices influence the condition of their cooperative, which has to face stiff competition in the market'. These observations incline towards the hypothesis that farmers' bargaining position is stronger if they deliver to dairy cooperatives rather than to private companies.

The interviews seem to show that farmers' bargaining position could be stronger if they cooperated with each other. However, as already noted in Section 4.2.6, this happens very rarely. Farmers' approach to cooperation is particularly surprising given that they seem to be aware of the profits it may bring. They admit that smaller producers left on their own will, sooner or later, have to quit production. They also appear to agree that the bargaining power of larger holdings could be much stronger if they presented their interests together.

As far as contact between farmers and input suppliers is concerned, in both fields, i.e. technology and forage, farmers have no problem approaching a supplier: 'there are plenty of them; you can stay at home and they come to you trying to convince you to buy their product, they will even open an account for you'. Taking into consideration the stiff competition in the inputs market, surveyed farmers perceived that neither they nor the input suppliers could exert any special bargaining power. Slightly different opinions were presented by the other respondents. The dairies and experts' representatives inclined rather toward the statement that producers seemed

to enjoy the most favourable terms.

It is also worth mentioning that sometimes the dairies negotiate with the input suppliers on behalf of the farmers. This certainly improves the farmers' position. Our respondents say that this is not very common, however. It is more common for contacts between farmers and input suppliers to take the form of cashless transactions. Input suppliers get their money from the dairy and farmers pay the dairies for their input supplies via milk purchases. It seems that this type of arrangement has no effect on the power relationships between the parties involved.

5 Conclusions

5.1 The survey's main findings

EU accession and the integration process – including CAP implementation – have been the main driving forces behind dairy sector restructuring in Poland during the last decade. Some of the main elements of this process were:

- obligatory quality improvements;
- pre-accession investment assistance;
- export opportunities;
- milk price increases;
- the introduction of direct payments; and
- the introduction of a milk production quota system.

Strict requirements with respect to the quality of dairy products in the EU obliged the processing industry to undergo a thorough modernization. Simultaneously, new sanitary and veterinary standards had to be met by milk producers, requiring additional on-farm investments. It is important to note that in order to facilitate the adjustments at farm level the dairies have actively engaged in assistance programmes to help farmers to adjust. So the processing sector played the most important role in accelerating the restructuring process at production level.

This process of policy-driven restructuring is expected to continue in the near future as new regulations become binding, requiring additional investment from either the processing or the milk-producing sectors. For example:

- By the end of 2006, all milk producers delivering to the market will have to have a certificate of compliance to veterinary (hygiene) rules.
- At the same time, the transition period for dairy companies who were not in compliance with EU regulation at the time of accession will expire.
- In the coming years, new regulations will appear with respect to environmental requirements (e.g. manure storage) and animal welfare, among other things.

Policy-driven restructuring will also be caused by the reform of the EU dairy market, which will be affected by both future debate on the Common Agricultural Policy and WTO negotiations.

Of particular interest in the two study sites are the dynamics caused by the milk quota system. Both regions have a large and rapidly growing milk-production sector, but the regional allocation of quotas puts an artificial limit to the ongoing restructuring process. The fixed level of production at the regional level puts a

ceiling on the further expansion of total milk production, so farmers are finding it increasingly difficult to increase their herd size. This effect is worsened by the difficulties in finding land for sale or even for rent, as the direct payment allocation (which is linked to land endowments) discourages farmers from parting with their land. The quota system may also influence the speed of restructuring at the dairy-processing level. If individual farmers can no longer expand, dairy companies that wish to increase production will be forced to attract more of the farmers already in their supply base. But in the already highly competitive environment where there are few incentives to attract farmers away from other processors, the quota system also limits dairy processors' expansion.

The restructuring of the wholesale and retail segments has influenced the situation of dairy processors and, indirectly, the situation of milk producers. In general, the concentration process in both segments has resulted in an increased demand for large deliveries from dairy-processing companies.

The relative size of all actors plays an important role. All respondents said that the size of processors, wholesalers, and retailers is important. Large retail chains and wholesalers search for large deliveries to lower transport and marketing costs in the face of strong competition. Large dairy processors may achieve better quality after investing in improvement and they can negotiate higher prices with retailers. Size also matters for farmers, because they are offered higher prices for large deliveries.

There are three channels through which milk producers can deliver milk to dairy processors: (1) direct collection from the cooling tank at the farm; (2) via a collection station operated by the a dairy; (3) or via a collection station operated by a third person (but the dairy still collects the milk). The first channel can be called the 'modern' marketing channel, while the two are considered to be 'traditional'. Several sources said that role of the traditional marketing channel is likely to decrease in the future. The question then remains, which small farms can make the switch from the traditional to the modern marketing channel and how can this switch be facilitated (or stimulated)? The obvious investment decision (related to size) necessary to gain access to the modern marketing channel is the purchase of a cooling tank. Apart from this physical capital investment, the quota system puts an additional financial constraint on small farmers wishing to expand, as the cost of buying one extra unit of quota is relatively harder on smaller producers than on larger ones.

5.2 Policy implications from the M1 and M2 studies

The agricultural market, including dairy production, is subject to the rules of the Common Market Organization, an important part of the EU's Common Agricultural

Policy. There is limited scope for domestic policy to influence this market. However, there are some suggestions and implications for policy formation at the country and European level concerning the dairy sector. A more comprehensive set of policy recommendations will be formulated after the Module 3 and Component 3 studies are complete. At this stage the following suggestions can be made:

- Farm organizations, dairy associations, and other food-chain stakeholders in Poland should engage more actively in the process of shaping EU dairy market organization and accompanying WTO negotiations. Various scenarios for the dairy sector need to be prepared in the context of a more open and liberal market. Polish dairy market actors should prepare a strategy to adjust to these new institutional frameworks. These organizations should also be more active at the EU level in promoting the interests of Polish producers and processors. In order to facilitate this process, different forms of cooperation both within and between different food-chain segments should be supported.
- There is still a low level of consolidation in the dairy sector in Poland, both at the milk-producers and milk-processor levels. There is room to improve the structure and efficiency of the sector to enable it to compete with global market forces.
- Government policies directed at any given food-chain segment exert a significant impact on its structure (e.g. retail sector). These policies also have indirect impact on other food-chain segments (because of the retail sector's bargaining power). Therefore, policies development should take into account a broader perspective.
- There is a strong need for the development of non-agricultural income sources in rural areas in order to encourage and enable less efficient farmers to quit milk production. This will become the most important factor in determining the pace and scope of further restructuring of the dairy sector in the nearest future.
- There is a strong need to strengthen rural development measures, especially the production and promotion of niche and regional products, as well as cooperation between farmers. This could allow small-scale farmers who wish to stay in farming to survive.
- The lack of funds is one of the most important barriers to development at farm level (e.g. to meet sanitary and veterinary requirements). Therefore, there is still a need to further facilitate farmers' access to funds (especially when one remembers that current forms of state assistance must end in April 2007³³). Financial education should also be promoted among farmers, to improve their skills in financial planning.

³³ On joining the EU all new member states were allowed to adjust their state assistance to new regulations during a transition period (until April 2007). Therefore, it might be that current forms of state assistance will not be approved by the European Commission and will have to be abandoned.

- Drought and other weather events were mentioned as a production constraint at farm level, which indicates that farmers still have insufficient access to appropriate insurance schemes.
- Until 2007 local advisory organizations are providing farmers with consultancy and extension services free of charge. This will change, however, and the advisory system will be based on a 'bond scheme'. Given the role of these organizations in the farm modernization process, more effort should be spent to inform farmers about the new system.
- Given the current limited milk-supply quotas in the regions surveyed, farmers who exceed their limits need to diversify their production to escape paying the super-levy. This is likely to have negative impact on production efficiency. In order to relieve this problem, regional specialization should be a subject for agricultural and rural policy. Taking social aspects into account, the reorganization of milk quota distribution in the country should be considered. This is particularly necessary, as the current milk quota system negatively affects processors' performance.

5.3 Implications for the Module 3 study

The research in Modules 1 and 2 allows us to formulate the preliminary research questions to be addressed in Module 3:

- Which factors determine inclusion in the modern marketing channel?
 - Has inclusion in the modern marketing channel been determined by endogenous factors (such as age, education level, etc.)?
 - Has it been determined by exogenous factors (such as access to land, access to capital, etc.)?
- Has dairy assistance been the main driver of restructuring at the farm level?
 - Will the processing segment play an important role in further stimulating restructuring in the future (through credits, assistance for quota conversion, etc.)?
 - Are larger dairies attracting larger producers?
- What are the main future barriers for milk production development?
 - How important is the quota system in slowing down the restructuring process? Are small farmers (in some areas) kept in business because of the quota system?
 - How important is the lack of alternative employment opportunities for farmers in slowing down the restructuring process?
 - What will be the impact of quota systems changes on small farmers (for example the liquidation of regional trade restrictions)?
 - Is a legal status of the processing companies a barrier to sector restructuring?

- What other (endogenous and exogenous) factors may play a role?
- What are the alternatives for specialization in milk production?
 - Do farmers try to diversify production?
 - Do they combine milk production with other non-farm activities?
- Which types of institutional arrangements can help farmers to adjust to the new market conditions and to enter the dynamic market?
 - Does cooperation (negotiating with the dairy processors and services) allow small farmers to be included in the modern marketing channels and to survive in a strongly competitive environment?
 - Does the production of niche products (regional, traditional, ecological products) allow for that?
 - Is there a potential for private collection points to become important once the dairy collection points are closed?
- What are the changes in the traditional marketing channels resulting from market restructuring?

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Appendix. Characteristics of respondents

Table A1. Characteristics of experts and representatives of associations interviewed

	<i>Level of analysis / region*</i>	<i>Relevant segment</i>
Expert 1	National (M1)	All
Expert 2	National (M1)	Milk producers and processing
Expert 3	Regional (M2) / R1	Milk producers and processing
Expert 4	Regional (M2) / R1	Wholesale
Expert 5	Regional (M2) / R2	All
Expert 6	Regional (M2) / R2	All
Government representative	National (M1)	All
Association representative 1	National (M1)	Milk producers
Association representative 2	national (M1)	processing
Association representative 3	national (M1)	retail

* R1-Podlaskie; R2-Warmińsko-Mazurskie

Source: Author

Table A2. Characteristics of wholesale and retail sector representatives interviewed

	<i>Level of analysis / region*</i>	<i>Type / size of company**</i>	<i>Scope of operation</i>	<i>Legal status /capital</i>
Wholesaler 1	National (M1)	Medium (1 warehouse)	National	Private / national capital
Wholesaler 2	Regional (M2) / R1	Large (9 warehouses)	National	Private / national capital
Wholesaler 3	Regional (M2) / R1	Large (6 warehouses)	National	Cooperative
Wholesaler 4	Regional (M2) / R2	Medium (2 warehouses)	Regional	Private / national capital
Retailer 1	National (M1)	Super- and hypermarket chain (19 outlets)	National	Foreign capital
Retailer 2	Regional (M2) / R1	Chain of supermarkets and discount stores (37 outlets)	Regional	Cooperative
Retailer 3	Regional (M2) / R1	Chain of village shops (10 outlets of average size of 70 sq m)	Regional	Private / national capital

Retailer 4	Regional (M2) / R2	Chain of supermarkets and discount stores (57 outlets)	Regional	Cooperative
Retailer 5	Regional (M2) / R2	Chain of supermarkets and discount stores (16 outlets)	Regional	Private / national capital

* R1-Podlaskie; R2-Warmińsko-Mazurskie

** Size of the wholesale company was based on subjective estimate.

Source: Own presentation

Table A3. Characteristics of dairy-processing representatives interviewed

	<i>Level of analysis / region*</i>	<i>Type of interviews carried out</i>	<i>Size of company</i>	<i>Scope of milk purchase-- maximum distance from interviewed plant</i>	<i>Scope of sale</i>	<i>Legal status /capital</i>
Dairy processing 1	National (M1)	Procurement	Large (2 plants)	Eight regions, up to 350km	National	Private/ foreign capital
Dairy processing 2.1	Regional (M2) / R2	Procurement	Large (3 plants)	110km	National	Private,/ foreign capital
Dairy processing 2.2	Regional (M2) / R2	Procurement		92km	National	
Dairy processing 3	Regional (M2) / R1	Procurement sales	Large (7 plants)	100km	National	Cooperative
Dairy processing 4	Regional (M2) / R1	Procurement	Large (7 plants)	70km	National	Cooperative
Dairy processing 5.1	Regional (M2) / R2	Procurement sales	Large (5 plants)	160km	National	Private/ national capital
Dairy processing 5.2	Regional (M2) / R2	Procurement		350km		
Dairy processing 6	Regional (M2) / R1	Procurement	Medium	60km		Cooperative
Dairy processing 7	Regional (M2) / R1	Procurement	Medium	40km	National	Cooperative
Dairy processing 8	Regional (M2) / R1	Procurement	Medium	95km		Cooperative

Dairy processing 9	Regional (M2) / R1	Procurement	Small	100km		Cooperative
Dairy processing 10	Regional (M2) / R2	Procurement sales	Small	81km	3 regions	Cooperative
Dairy processing 11	Regional (M2) / R1	Procurement sales	Small	50km	3 regions	Cooperative

* R1-Podlaskie; R2-Warmińsko-Mazurskie

Source: Author

Table A4. Characteristics of focus-group meeting participants

<i>No. of group</i>	<i>Region*</i>	<i>Herd size</i>	<i>No. of participants</i>
1	R1	Larger	6
2	R1	Smaller	4
3	R2	Larger	3
4	R2	Smaller	4
5	R2	Larger	3

* R1-Podlaskie; R2-Warmińsko-Mazurskie

Source: Author

There were 17 interviews with representatives of 11 dairy processing companies. In the case of four plants there were two interviews in each – with the sales and procurement managers. Large dairy-processing companies are understood as those who in 2005 processed more than 180 million litres of milk, medium size 80–180 million litres, and small less than 80 millionlitres. (see Table A1).

Focus-group interviews (FGI) with farmers aimed to see how the restructuring of the dairy sector is perceived from milk producers' perspective. The choice of respondents for these interviews was based on one criterion, namely the size of the herd. This was because we wanted to see if larger and smaller producers have different perceptions of the changes that have happened, determinants of these changes, and future perspectives. Since milk production remains very differentiated both between and within regions, no strict definition of 'small producer' was imposed. Instead, it was decided each time in cooperation with the organizers of the study and local experts to most accurately suit local conditions. In effect, FGIs with smaller producers comprised farmers with from 11 to 25 cows and FGIs with larger producers comprised farmers with from 19 to 65 cows. In total five FGIs were organized (see Table A4 above).

Due to time limitations FGIs were only organized with farmers who have their own cooling tanks, that is those from whom the dairies purchase milk directly at the farm. Therefore, while reading this report, one has to bear in mind that the opinions presented do not include farmers who deliver to the collection points or sell directly to consumers, or subsistence farmers.

Regoverning Markets

Regoverning Markets is a multi-partner collaborative research programme analysing the growing concentration in the processing and retail sectors of national and regional agrifood systems and its impacts on rural livelihoods and communities in middle- and low-income countries. The aim of the programme is to provide strategic advice and guidance to the public sector, agrifood chain actors, civil society organizations and development agencies on approaches that can anticipate and manage the impacts of the dynamic changes in local and regional markets. The programme is funded by the UK Department for International Development (DFID), the International Development Research Centre (IDRC), ICCO, Cordaid, the Canadian International Development Agency (CIDA), and the US Agency for International Development (USAID).

Agrifood Sector Studies

These studies look at specific agrifood sectors within a country or region. Research studies have been carried out in China, India, Indonesia, Mexico, South Africa, Turkey, Poland and Zambia covering the horticulture, dairy and meat sectors. The sector studies describe the observed market restructuring along the chains, and the determinants of that restructuring.

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