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Dairy Supply Chain in Belarus

Bottlenecks and the scope for improvements

Dr. Oleg Nivievskiy and Prof. Dr. Stephan von Cramon-Taubadel

 Berlin
Economics

Consultant:

BE Berlin Economics GmbH

Schillerstr. 59

10627 Berlin

Germany

Tel: +49 30 206 134 640

Fax: +49 30 206 134 649

service@berlin-economics.com

Client:

Federal Ministry of Food, Agriculture and Consumer Protection, Germany

Mandatory:

GFA Consulting Group, Germany

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Executive Summary

The dairy sector has been playing a visible role in the national economy of the Republic of Belarus. The share of dairy farming in total agricultural output in Belarus was 19% in 2010, and production of raw milk has increased almost by 50% over the last decade, reaching 6.6 mln tons in 2010. The dairy processing industry in Belarus has experienced a tremendous growth by a factor of 2.45 over the last decade. More than a half of the processed raw milk in Belarus is exported, accounting for 5.8% of the country's total exports in 2010. Moreover, dairy products have been the country's major agricultural export over the last years, accounting for 48% of total agricultural exports in 2010.

Further growth of the sector appears likely due to the bullish outlook for world dairy markets. Russia, - a key Belarus' trading partner, which has been a destination for over 90% Belarus' dairy exports, is projected to remain a key and growing importer of cheese and butter in the world. The demand for dairy products is also expected to remain especially strong in the North Africa, Middle East and East Asia - potential markets that are not so demanding in terms of food security and quality standards as those in the EU.

At the same time the international prices for feed crops, fuel and fertilizers are likely to increase as well. The net impact of high dairy output and input prices on dairy sector competitiveness will depend on how efficiently inputs are converted into output along the dairy value chain, i.e. on efficiency and productivity growth. The majority of the current dairy policy measures in Belarus, however, do not foster efficiency improvements in the sector. Minimum raw milk farm-gate and dairy export prices and the division of raw milk zones among dairy processors hinder the restructuring processes in dairy farming and processing, allowing inefficient operators to remain in production. Consolidation of assets is mainly driven by administrative/political considerations rather than by competition based on greater efficiency incentives. Moreover, it has been mainly a 'top down' process. Even the apparently advantageous unified agricultural tax contains hidden threats for efficiency and productivity growth in the long run. The Belarusian agricultural education and research system fails to supply agriculture and dairy sector in particular with adequately trained young Belarusians at all levels of qualifications.

Policy makers in Belarus should permit dairy farms and processors to engage in deep restructuring by adjusting their sizes and structures. In this regard the following steps will boost efficiency and productivity in the dairy sector:

- i) The abandonment of minimum farm-gate dairy prices would force inefficient farms to improve their production efficiency and reduce costs or exit.
- ii) The liberalization of movements of raw milk within the territory of Belarus would allow one of the most important market mechanisms - market integration - to integrate raw milk supplies into one common market. Raw milk supply would then gradually shift from the less to the more efficient processors, thus squeezing the former from the market. This would accelerate the restructuring of the dairy processing industry and would lead to a 'natural' consolidation of the industry, eliminating inefficiencies up- and down-stream of the dairy processor.

- iii) Taxing the profits of agricultural enterprises rather than supplying them with preferential unified agricultural tax would have positive long-run effects, as it is impossible to efficiently manage a modern agricultural enterprise without detailed and accurate accounting. Also, the current privileged taxation of agriculture imposes a large cost on the rest of the economy since other sectors must be taxed more to maintain a given level of budget revenues.
- iv) The abandonment of minimum export prices would allow the dairy sector to reap the greatest benefits from the bullish world dairy market and contribute to the development of the Belarusian Universal Commodity Exchange.
- v) Re-assessing the role of the agricultural education and research system in Belarus as well as assessing the scope for reforms would have positive long-run effects as in modern agriculture human capital plays a vital role in determining productivity and competitiveness.
- vi) Harmonization with international food safety and quality standards is critical for penetrating other dairy markets and diversifying Belarusian dairy exports.
- vii) The diversification of Belarusian dairy exports is urgently needed to reduce the current very high degree of dependence on the Russian market. The market for milk products is forecast to grow rapidly in Northern Africa, the Middle East and East Asia, which are export destinations that Belarus could target in the coming years.

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1. Introduction

The dairy sector has been playing a visible role in the national economy of the Republic of Belarus. Production of raw milk in Belarus has increased almost by 50% over the last decade, reaching 6.6 mln tons in 2010. The share of dairy farming in total agricultural output, though, decreased from 35% in 2000 to 19% in 2010, reflecting the overall rapid growth of agriculture in Belarus. The dairy processing industry in Belarus has experienced a tremendous growth by a factor of 2.45 over the last decade. More than a half of the processed raw milk in Belarus is exported, accounting for 5.8% (4.7%) of the country's total exports in 2010 (2009). Moreover, dairy products have been the major agricultural export of the country over the last years, accounting for 48% (47.4%) of total agricultural exports in 2010 (2009).

Further growth of the sector appears likely due to the bullish outlook for world dairy markets. Moreover, one of Belarus' key trading partners, – Russia, which has been a destination for over 90% Belarus' dairy exports, is projected to remain a key and growing importer of cheese and butter (OECD, 2011). This will be observed especially in the cheese segment where import demand is projected to grow at an annual rate of 1.6%. The demand for dairy products is also expected to remain especially strong in the North Africa, Middle East and East Asia - potential markets that are not so demanding in terms of food security and quality standards as those in the EU.

The government of Belarus is also very positive about the sector development prospects as it established high goals in its Republic Program for Dairy Sector Development for 2010-2015¹. The main objectives of the Programs could be summarized as: i) improving efficiency and competitiveness of the dairy value chain, ii) increasing the productivity of cows; iii) improving the quality of raw milk and dairy products. The Program contains the following targets to be achieved by the end 2015: i) expansion of the dairy herd to 1.6 mln cows, ii) production of 10 mln tons of raw milk, iii) construction of new 875 dairy farms with at least 800 dairy cows each; iv) an average annual yield of 6.3 t/cow. According to the Program parameters, the export potential can be increased to 5.5 mln tons (3.3 mln tons in 2010). Also the Program defines a series of problem areas and these include i) the need for new industrial dairy farms, ii) increasing the genetic potential of Belarusian cow breeds, iii) training of dairy farms' personal and specialists, extension services, iv) focus on increasing the volume and quality of fodder, v) increasing annual processing capacities to 9.2 mln tons, vi) increasing the quality of raw milk and dairy products, vii) creating vertically integrated structures that combine dairy farming and processing, fodder production, marketing and financing institutions in one structure.

Although one might question the targets of the Program, it is difficult to challenge its objectives. While the Program identifies crucial issues in the dairy value chain, it misses a number of critical points, especially related to the organization of the dairy market in Belarus. In this paper we look at dairy production and processing and at the organization of the dairy market in Belarus to reveal the bottlenecks and the scope for increasing efficiency and the international competitiveness of the country's entire dairy value chain.

¹ Resolution of the Council of Ministers of the Republic of Belarus # 1678 'On measures for implementing the Republic Program for Dairy Sector Development for 2010-2015' as of November 12, 2010

In the following section we discuss the main problem areas in Belarusian dairy farming. We then discuss the state of the arts in the dairy processing and trade sectors in section 3. In section 4 we look at the organization of the dairy market in Belarus and section 5 focuses on main policy measures that would facilitate efficiency and improvements in the competitiveness of the dairy value chain.

2. Dairy farming

Production of raw milk in Belarus has increased almost by 50% over the last decade. The average annual output growth has been 4% since 2000. The share of dairy farming in the total agricultural output, though, decreased from 35% in 2000 to 19% in 2010, reflecting the overall rapid growth of agriculture. This development is in stark contrast to Belarus' neighbours Russia and Ukraine, where raw milk production has been stagnating or even decreasing over the last decade. The pronounced growth in Belarus has been driven mostly by yield improvements. Against a background of a dairy herd that has fluctuated around 1.5 mln over the last 5 years, the annual milk yield per cow increased from 3.7 t to 4.6 t, i.e. by almost 25%.

Table 1: Belarus' dairy farming profile, 000 t

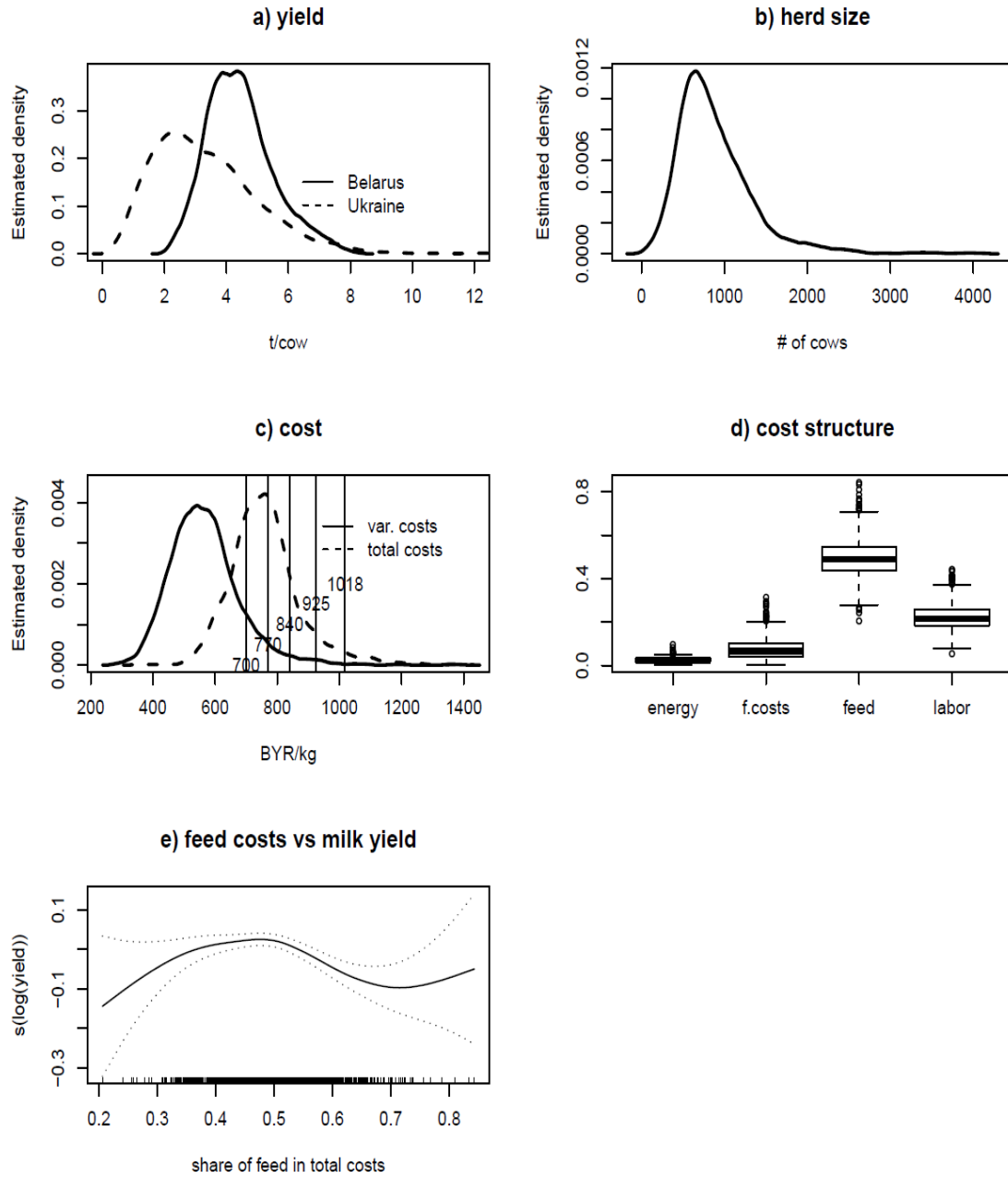
	2000	2005	2006	2007	2008	2009	2010
Stocks, beginning of year	266	154.6	151.6	178.9	200.1	439.4	225.8
Production	4489.6	5675.6	5895.4	5903.5	6224.6	6576.9	6626.7
Dairy farms	2676	4181.4	4543.4	4705.2	5150.5	5578	5748.1
Households	1820	1521.4	1352	1199	1074	999	879
Imports	54.4	49.8	85.9	65.3	60.6	40	49.2
Total Supply	4810	5880	6132.9	6147.7	6485.3	7056.3	6901.7
Utilization							
Consumed in the country	3729.9	3362.3	3277.4	3222.7	3061	3073	3324.4
Ind. consumption	2952.8	2529.8	2472.4	2417.1	2258.2	2166.5	2347.9
Exports	785.7	2366.1	2676.6	2724.9	2984.9	3757.5	3307.5
Stocks, end of year	294.4	151.6	178.9	200.1	439.4	225.8	269.8
cows in milk, 000 heads	1247.4	1565	1506	1459	1452	1445	1478
Dairy farms	598	1202.5	1202.2	1205.9	1226.1	1243.8	1309.7
Households	1845	363	304	253	226	202	169
yield, t/cow	2.413	3.711	4.006	4.125	4.438	4.69	4.631
Dairy farms	2.154	3.685	4.019	4.112	4.456	4.719	4.64
Households	2.936	3.799	3.979	4.199	4.362	4.542	4.594

Source: Statistical Yearbook 'Agriculture of the Republic of Belarus 2010'

Despite this impressive growth, the productivity of cows in Belarus is still very low per lactation compared with western standards. The average productivity of a cow in Germany, for example, is in the range 6-7 tons/year; in Israel it is 11-12 t/cow. As Figure 1a) shows, some dairy farms in Belarus are able to reach average German yield levels, although Israel's levels appear difficult to achieve. Another interesting feature of Figure 1a) is that it demonstrates a clear Belarusian advantage in cow productivity vis-à-vis Ukraine. The distribution of milk yields in Belarus is less variable and centered over higher yields. The maximum milk yields in Belarus, however, are currently reached at approximately 9t/cow per year, while some dairy farms in Ukraine exceed 12 t/cow.

As Figure 1b) demonstrates, dairy farms in Belarus are relatively large, with herd sizes reaching 4000 heads per farm. The most frequently observed herd size of dairy farms is in the range between 700 and 800 cows. Unlike in Ukraine and Russia (Table 1), where the share of households in total raw milk output exceeds 80%, the great majority of raw milk in Belarus is produced by dairy farms. As Table demonstrates, the share of dairy farms in the total volume of raw milk increased from 60% in 2000 to 87% in 2010. The prevalence of dairy farms in total raw milk supply imparts a significant cost advantage to the entire dairy value chain in Belarus vis-à-vis Ukraine or Russia, and makes this chain more competitive internationally. The prevalence of households in total raw milk supply in Ukraine and Russia adds costs to the dairy value chains in these countries because it implies a failure to capture economies of scale both in dairy farming and in the industries up- and -downstream from dairy farming. Many small households are not able to guarantee a large and stable supply of high quality milk to dairies in the same way that a small number of large farms can.

Figure 1: Dairy farm economic in Belarus, 2010



Note: the dashed curves on the panel e) are pointwise 2*standard-error bands, which can be viewed as approximate 95 percent pointwise confidence intervals.

Source: Own presentation using Ukrainian and Belarusian farm-level data.

Table 2: Quality standards for raw cow milk for food production in Belarus, the EU and the USA

	EU*	USA		Belarus			
		Federal	California	Extra grade	Highest grade	1st grade	2d grade
Plate count 30 oC ('000 per ml)	≤100	≤100	≤50	≤100	≤300	≤500	≤4000
Somatic cell count ('000 per ml)	≤400	≤750	≤600	≤300	≤500	≤750	≤1000

Source: (EU Council Directive 92/46/EEC, Chapter IV, A); (Grade "A" Pasteurized Milk Ordinance revised 2003), Meleschenia and Klimova (2011); STB2 1598-2006; differs among the Member states, e.g. the requirements in Germany are at ≤ 100 000 plate count and ≤ 400 000 somatic cell count, while France requirements are two times stricter, i.e. ≤ 50 000 and ≤ 200 000 respectively.

The quality of raw milk has been one of the major problems in Belarus. Table contrasts the milk quality standards for food production in Belarus, the EU and the USA. Second grade milk is not used for food production at all in the EU and USA. As Meleschenia and Klimova (2011) report, the share of such milk in total raw milk deliveries in Belarus has dropped from 7.6% to 2.4% over the last 5 years. The share of the Highest grade milk has increased from 46.5 in 2005 to 60.8% in 2010. To increase the quality of raw milk, the Extra grade, which is comparable to EU standards, was introduced in 2008 (see Table 2). At the moment the production of the Extra grade milk is stimulated via price premiums of about 15% vis-à-vis Highest grade milk, and its share in the total raw milk deliveries increased from 1.9% in 2008 to 13.3% in 2010 (Meleschenia and Klimova, 2011).

Another issue with the quality of raw milk is milkfat and protein content. The content of fat is important in butter production, while protein content is important in cheese production. As Table 3 demonstrates, the fat content of raw milk in Belarus is 0.4 percentage points (roughly 11%) lower than in Germany and 0.6 percentage points (16%) lower than in the Netherlands. The protein content in Belarus is 0.4 percentage points (13%) lower than in the EU and New Zealand. This adds costs to the entire dairy value chain as it increases processing costs per unit of output by roughly the same proportion. For example in 2009/10 in the Australian dairy industry, 1000 litres of milk contained on average 41.5 kg of fat, 33.4 kg of protein, and 88 kg of non-fat solids (Dairy Australia, 2010), i.e. 15% more of fat and 11% more of protein than in Belarus. If we consider the butter/skim milk powder (SMP) production process, in Australia 1000 litres of milk yielded on average 89.2 kg of SMP, 50.1 kg of butter and 5 kg of buttermilk powder (BMP) in 2009/10. Applying Belarusian coefficients, we receive the following approximate breakdown: 79 kg of SMP, 42.4 kg of butter and 4.3 kg of BMP. According to UN Comtrade data, Belarus exported 46.3 t of butter and generated \$208 mln of export revenues in 2010. So the butter export revenues of approximately \$31 mln were foregone due to the poor quality of raw milk in Belarus in 2010. This figure increases if we also consider the forgone export revenues from SMP and BMP.

² STB – abbreviation for the Standards of the Republic of Belarus

Table 3: Fat and protein content of raw milk

	Ukraine	Russia	Belarus	Poland	Latvia	Germany	Netherlands	New Zealand
Milkfat, %	3.4	3.4	3.6	3.7	3.7	4.0	4.2	4.2
Protein, %	3.0	3.0	3.0	3.4	3.4	3.4	3.4	3.4

Source: www.milkua.info

Dairy farming is a capital intensive enterprise that needs ‘long’ money. The payback period is at least 3 years long in the sector - this is the duration of the period from the insemination of a mother cow until her offspring starts producing milk. Other investments (e.g. milking parlors and cooling equipment) have horizons of over one decade. So the costs incurred by a dairy farm to grow a heifer until it starts milking are fixed costs in dairy farming. In this respect it is important to allocate these fixed costs over the larger volumes of milk or, in other words, over the longer lifespan of the dairy cow to decrease the herd replacement costs. This would, therefore, decrease the total costs per litre of milk and make dairy farming more competitive internationally. According to information from dairy farmers, the average lifetime of a cow in Belarus is 1.5 lactations, which is more than two times shorter than in the United Kingdom (FAWC, 2009), where cows are slaughtered after an average of 3.6 lactations. Higher fixed or herd replacement costs or shorter lifespans of dairy cows in Belarus imply a series of additional critical issues in Belarusian dairy farming that we cover below.

As the Figure 1d) shows, feed accounts for the largest share of milk production costs. In most of the cases its share in total costs is in the range of 40-60%, with the average about 50%. This is somewhat lower than the world average share of feed reported by the IFCN (2011), which was 55% in 2010, but higher than that in Western Europe, which was 46% in 2010. Moreover interesting, however, is that not only does feed account for the highest share of total costs, it also appears to account for a highly variable share of the costs from farm to farm. This suggests that some farms are able to reduce their feed costs considerably compared with others, which implies potential efficiency gains. This becomes clear from the following empirical observation. The non-parametric estimates of logged milk yields against shares of feed in total milk in Figure 1e) demonstrate that milk yields increase as the dairy farms increase the share of feed in total milk production until approximately 0.5 (or 50%). Above this threshold and until approximately 0.7 (or 70%) the relationship between milk yield and share of feed turns negative, indicating either that these farms are spending too little on other inputs, or that they are feeding very inefficiently. Above a cost share of 70%, the relationship with milk yield becomes positive once more, but is not significant, as very few farms are actually observed in this range.

Farms mostly produce their own feed, which is often of low quality (Meleschenia, 2011). Fodder production for dairy cows on Belarusian farms generally takes place on a very extensive basis. Crop yields in Belarus are at least two times lower than in the EU (e.g. barley and corn yields were 2.8 t/ha and 4.9t/ha, respectively in 2010), so the land requirements for dairy farming are relatively high in Belarus. Optimising feed production for dairy cows could reduce the corresponding land requirements by roughly 30-50%. So the opportunity costs of this poor management and in feed production are high.

The feed rations are far from optimal in Belarus. The energy level of any feed ration can be evaluated in fodder units (FU). The reference here is barley, i.e. 1 kg of barley corresponds to one FU. In feed management the general rule is that a good farmer requires less feed per litre of milk than a poor one (Belloin, 1988). In Belarus, the average current FU requirement per litre of milk is at 1.16 FU/litre (Iliina et al, 2009), and some leading dairy farms achieve 0.82FU/litre. In contrast to Belarus, the average feed/energy requirement in dairy farming for Holstein breeds in the West is 0.62FU/litre. Improving feed rations and feeding practices could increase milk yields and decrease the production costs of dairy farming.

In interviews, the managers of agricultural enterprises and agribusiness firms emphasize a glaring shortage of human capital in the sector (also see Meleschenia, 2011). They complain about the shortage of adequately trained young Belarusians at all levels of qualifications. In most cases the current farm managers adhere to agronomic practices that are far from optimal or rarely make the best possible use of the scarce capital that is at their disposal. This results in inadequate cows' welfare and lifespan, low productivity and low quality output, waste and environmental damage. Poor management also contributes to a lack of capital, because creditors will be very hesitant to lend money to a farm that has consistently underperformed and is manifestly poorly managed. Trying to respond to this challenge, some farms have their own on-the-job training and one farm is even planning to launch its own agrarian school.

The shortage of human capital not only detracts from competitiveness at the farm level. Producers and agri-food businesses lack knowledge of markets and marketing, including quality requirements in target markets and how to work towards fulfilling these requirements on the farm and in the food chain. And public institutions, such as the ministries responsible for identifying policy needs and formulating and implementing appropriate responses, suffer from a lack of the necessary analytical capacity and in particular the ability to distinguish between private and social costs and benefits.

Von Cramon-Taubadel and Nivievskiy (2011) review all 244 papers on the topic of agricultural transition in Central and Eastern Europe that were published in the top international peer-review journals in agricultural economics between 1989 and 2008. They find not a single paper with Belarusian authors. Only one paper was dedicated to agriculture in Belarus (Csaki and Lerman, 2000), but its authors are non-Belarusian. At the most recent triennial meetings of the International Association of Agricultural Economists (IAAE) held in Beijing in 2009 and of the European Association of Agricultural Economists (EAAE) held in Zurich in 2011 there was not a single representative from Belarus. While the journals and conferences referred to here are largely academic, the fact that Belarusian scientists are entirely absent from them does suggest that the agricultural research and education system as a whole in Belarus has not managed to keep up with international standards.

3. Dairy processing industry and trade

Dairy processing in Belarus has experienced a tremendous growth by a factor of 2.45 over the last decade. The average annual output growth has been 9.7% since 2005, though it decelerated to 5% and 4% in 2009 and 2010, correspondingly. The total output of dairy

products is produced by 45 dairy processing plants with the overall annual processing capacity of more than 6.5 m tons. Processing capacity utilization has been at 85-90%³.

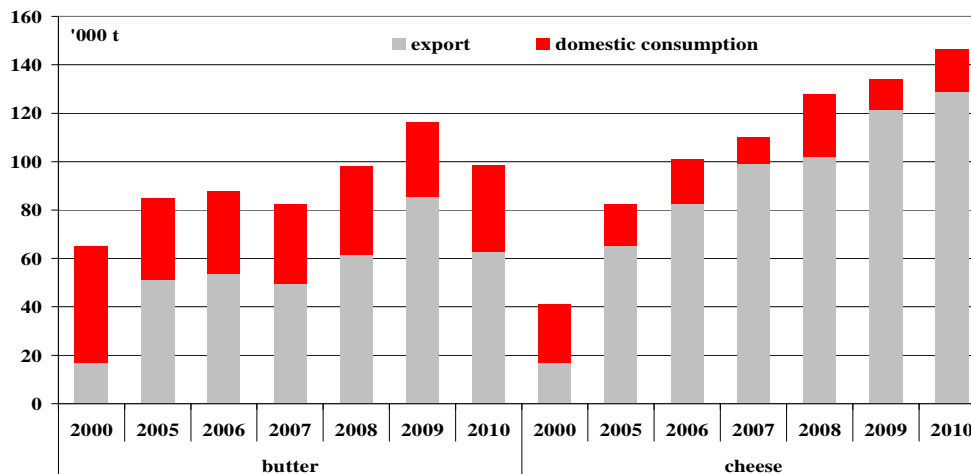
Table 4: Dairy products output in Belarus, 000t

	2000	2005	2006	2007	2008	2009	2010
Butter	65.1	85	87.6	82.3	98	116.1	98.6
Cheese	41	82.3	101	110	127.6	134.1	146.3
Whole-milk products (in milk equivalent)	954	1122	1282	1326	1332	1306	1494
canned milk, mln cans	94	140	220	214	252	221	286

Source: Statistical Yearbook 'Agriculture of the Republic of Belarus 2010'

More than a half of the raw milk in Belarus is exported in processed form (see Table and Figure 2), giving dairy sector a visible role in Belarusian foreign trade, accounting for 5.8% (4.7%) of total exports in 2010 (2009). Moreover, dairy products have been the major Belarusian agricultural exports in recent years, accounting for 48% (47.4%) of total agricultural exports in 2010 (2009)⁴. Figure 3 demonstrates that cheese (code HS 0406), butter (HS 0405), and milk and cream condensed and sweetened (HS 0402) have been dominating the country's dairy export structure. As Figure 2 shows, about 88% of the cheese and 64% of the butter production in Belarus was exported in 2010. Imports of dairy products to Belarus are almost negligible compared with exports, amounting to only 3.2% (3.8%) of exports in volume terms in 2010 (2009). Yogurt, buttermilk, and kefir dominate the structure of imports, comprising almost 40% of the dairy imports in 2010. At the same time cheese and curd took up 30%, while whey and natural milk products accounted for another 17% of dairy imports in 2010.

Figure 2: The share of domestic consumption and exports in Belarusian dairy production



Source: own presentation using the National Statistical Committee of Belarus

³ See the Republic Program for Dairy Sector Development for 2010-2015

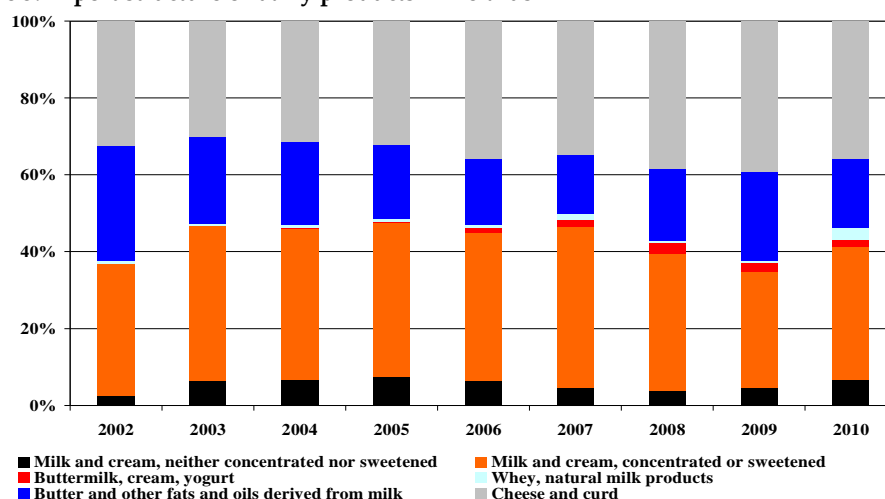
⁴ The percentages were calculated using UN COMTRADE database, SITC Rev. 3 nomenclature, codes '0' for all agricultural products (food and live animals), codes 022-024 – for dairy products.

While this remarkable growth in dairy exports is very encouraging, the structure of Belarusian dairy exports and agri-food trade in general (see World Bank, 2009) reveals a serious weakness, namely a strong focus on the CIS and especially on Russia as a trading partner. As Figure 4 shows, the share of Russia in Belarusian dairy exports has been almost always more than 90%, with a remarkable exception in 2009, when due to the 'milk war' between Russia and Belarus, the volume of Belarusian exports to Russia fell and the Russian share in Belarusian dairy exports declined to 82%. In 2010 year, after the milk war was over, the share of Russia increased back to the pre-war levels of 91%. This underlines the dependence on Russia and that fact that the 'milk war' has, at least so far, not lead to any diversification of Belarus' dairy export portfolio.

The dependence of Belarusian dairy exports on Russia appears quite natural for a number of reasons. First, Russia is a large market with a deficit in dairy products. Demand in Russia is projected to increase further. The most recent OECD-FAO Agricultural Outlook foresees that world dairy prices will remain high and that Russia will remain a key and growing importer of cheese and butter (OECD, 2011). This will especially be observed in the cheese segment where import demand is projected to grow at an annual rate of 1.6%. The import demand for butter and SMP is expected to remain mainly stable.

Second, Russia and Belarus are traditional trading partners with similar and in some respects identical quality and food safety standards. Finally, the economic integration between Russia and Belarus that has been under way over the last decade has further facilitated between these countries. The Customs Union between Russia, Belarus and Kazakhstan began operating as of July 1st, 2011 and the Single Economic Area (SEA) will be introduced on January 1st, 2012. The experts and market players in the sector expect that the integration of Belarus and Russia into the SEA will significantly reduce the risk of future 'milk wars' as it will formalize the trade relations between the two countries and decrease the discretionary powers of the trading parties in different issues, including compliance with safety and quality standards.

Figure 3: Export structure of dairy products in Belarus



Source: Own presentation using the trade data from UN Comtrade (www.comtrade.un.org); Note: the following commodity groups were used - HS 0401 - Milk and cream, neither concentrated nor sweetened; HS 0402 - Milk and cream, concentrated or sweetened; HS 0403 - Buttermilk, cream, yogurt etc; HS 0404 - Whey, natural milk products; HS 0405 - Butter and other fats and oils derived from milk; HS 0406 - Cheese and curd

The EU market is the largest single market in the world and it directly neighbours Belarus. Hence, it could represent an alternative for the Belarusian dairy sector to expand and diversify its dairy exports. However, policy makers and consumers in the EU are extremely concerned about food quality and safety and will under no circumstances make concessions to non-EU countries with regard to quality and food safety standards (Hess et al, 2009). Moreover the EU dairy sector is able to supply more milk than is currently consumed in the EU. To be able to export dairy products to the EU, Belarus would have to attain so called 'third country' status. At the moment Belarus does not have this status in dairy products for food consumption (Commission Regulation (EU) # 605/2010) thus it cannot export dairy products for food consumption to the EU. The procedure for getting this status is well defined and described by the EU Commission⁵ and the Government of Belarus has initiated this procedure⁶.

Figure 4: The destinations of Belarusian dairy exports: Russia and the rest of the world



Source: Own presentation using the trade data from UN Comtrade (www.comtrade.un.org)

In this situation, Belarus would be well-advised to diversify and expand its dairy export structure by targeting developing and emerging economies that are less demanding in terms of food security and quality standards. The demand for dairy products is expected to remain especially strong in the North Africa, Middle East and East Asia (OECD, 2011). In this regard, it would be important to take into account the changing paradigm of the world dairy markets. Domestic and international trade policy reforms (e.g. WTO, changing CAP in the EU) have shifted international dairy markets from a supply driven paradigm (with oversupply and depressed prices) to a more demand driven paradigm (OECD, 2011).

⁵ See http://europa.eu/legislation_summaries/food_safety/veterinary_checks_and_food_hygiene/sa0020_en.htm

⁶ Bulletin of the Belarusian Universal Commodity Exchange #5(22), July 2011; p.50.

Growing global population and increasing incomes (especially in developing and emerging economies), increase food demand but also shift it towards higher valued food and to livestock products (including dairy products). In addition, dairy markets are driven by westernizations of diets and the increasing range of dairy products (OECD, 2011). In particular, dairy producers nowadays have to account for a growing awareness of consumers regarding their health and wellness; as a result low-calories dairy products with less fat content are gaining popularity. The range of dairy products is increasing in the EU. For example convenience products (like cheese sticks, frozen deep-fried Camembert etc), ecological dairy products and functional foods (e.g. probiotic dairy products) have been gaining market share (Hess et al, 2009). In Belarus the range of dairy products is quite limited to about 10-15 conventional dairy products.

Against the background of an international dairy market that is shifting from a supply to a demand driven paradigm, it is important to mention the ongoing concentration/consolidation of food retailing on a global scale. Global retailers mostly target consumers in developed and emerging economies of high purchasing power. Among other things, they basically accumulate consumers' preferences/demand and pass them on to dairy processors and farmers via their own in-house standards and requirements for quantity, quality, assortment, logistics etc. Only large dairy companies will be able to retain a bargaining power in negotiations with these global retailers when it comes to questions of price, delivery details and quality.

Dairy industries across the globe have been responding to the consolidation and globalization of the grocery trade with mergers and acquisitions, making the dairy business increasingly multinational. Another driving force behind this global development has been the pursuit of higher efficiency and cost saving in manufacturing, distribution, R&D, and brand development. At the beginning (in 1970s-90s) consolidation took place mainly because of efficiency considerations along national lines, reaping cost savings in manufacturing and distribution. Then successful national operators rapidly expanded to become regionalized, again mostly because of cost savings in manufacturing and distribution efficiency considerations. Higher efficiency and global retailers spurred the next stage of dairy consolidation, as regional companies became global (e.g. Danone, Parmalat etc). In some product categories, globalization has already taken place. Nestle and Unilever dominate ice cream, and Danone, Yoplait and Nestle dominate yoghurt (Jackson, 2001; Shields, 2010). A recent example is the merger of Danone and Unimilk in Russia and the CIS in 2010, with Danone controlling 57.5% shares and Unimilk 42.5%.⁷ By the time of the deal, Danone operated 160 dairy plants in 120 countries on 5 continents, whereas Unimilk operated 32 dairy plants in Russia, Ukraine, and Belarus, For Belarus dairy market it did not have much impact since Danone did not have assets in Belarusian dairy industry by the time of merger, while Unimilk operated only 2 dairy plants and exported 99% of its dairy products abroad⁸.

Belarus has also been experiencing consolidation of the dairy industry, albeit mostly administratively (Meleschenia, 2011). State controlled small and unprofitable enterprises have been merged with more large and effective enterprises. In the same vein, the Government of Belarus is planning to create a large national dairy company with an annual

⁷ Bulletin of the Belarusian Universal Commodity Exchange #3(15), July 2010; p.56.

⁸ <http://www.belgazeta.by/20110207.5/020017061/?mode=print>

processing capacity of 1 mln t (or 1/6th of the total republic's milk supply) by merging some smaller dairies (JSC 'Beresa butter and cheese making factory', JSC 'Kobrin butter and cheese making factory' and JSC 'Luninets dairy factory') with the largest one in the republic (i.e. with the OJSC 'Savushkin Product')⁹ in Brest oblast and two dairy plants in the city of Minsk (i.e. OJSC '1st City dairy plant' and OJSC '2d City dairy plant'). Savushkin Product is by far the largest dairy producer in Belarus, with a market share of 16.2% in 2010¹⁰. Savushkin Product's daily processing capacity is 1800¹¹ tones and it processed 0.4 mln tones of raw milk in 2010. This is equivalent to 34% of the total raw milk supply in Brest oblast, where Savushkin Product is located. The market share of the JSC 'Beresa butter and cheese making factory' was 9% in 2010, with daily processing capacity of 600 t of raw milk. Daily processing capacities of other two dairy producers in Brest region are 390 tones and 210 tones, respectively. Dairy capacities of the 1st City dairy plant and 2d City dairy plant in Minsk are 370 tones and 400 tones, respectively. Hence, the creation of the national dairy company does not raise immediate concerns about market power on the national level, as its market share will not exceed 20-25%. However, it does raise concerns about monopsony power on local raw milk supply markets. Consolidation of dairy processors is expected predominantly in Brest oblast, and the national company will be processing 0.7 mln tones of raw milk or 58% of the total raw milk supply in Brest oblast.

Market power and efficiency concerns are usually manifested when it comes to consolidation. The primary concern is that consolidation could reduce competition and result in market power at a disadvantage to farmers or consumers. In other words consolidation may increase consumer prices and/or decrease farm-gate prices. Concentration may also result in efficiency gains, whereby cost savings are passed on to consumers through lower retail prices, which in turn can result in additional demand for commodities and benefit farmers (Shields, 2010). Reviewing empirical literature on this issue, the U.S. GAO (2009) concluded that concentration in dairy processing had little or no adverse impact on commodity or food prices in the USA. The outcome of this survey is that it generally confirmed the hypothesis that consolidation leads to the market power, but that efficiency gains were greater than the market power effects of concentration leading to a little or no adverse impact on prices. However, consolidation is likely to increase in the future with a high probability of making the market power effect stronger than efficiency gains effect (U.S. GAO, 2009). While the GAO study refers to the US dairy industry, if consolidation in the dairy industry raises so much concern in large countries like the US, smaller countries like Belarus should be very concerned too. As we have shown already above, there is a risk that the new national dairy company will exercise considerable monopsony market power on local raw milk supply markets in Belarus, especially in view of the administrative way in which it is being established. Of course, if Belarus opens its markets, then even if it only has one processor itself, the domestic market can remain contested.

As in the dairy farming sector, dairy processing also suffers from shortage of human capital. Managers in the industry complain especially about the lack of knowledge of markets and

⁹ Bulletin of the Belarusian Universal Commodity Exchange #3(15), July 2011; p.50.

¹⁰ Dairy Industry Overview, Uniter; as of 13 Jul 2011.

¹¹ Capital Times (2011). Belarus dairy industry: what are consequences of creating a national dairy company, Analytical report (in Russian). <http://capital-times.com.ua>

marketing, analytical capacity, including quality requirements in target markets and how to work towards fulfilling these requirements. Another critical bottleneck underlined by industry participants is the lack of adequate information systems. Many simply do not believe in official statistics.

4. The organization of the dairy market in Belarus

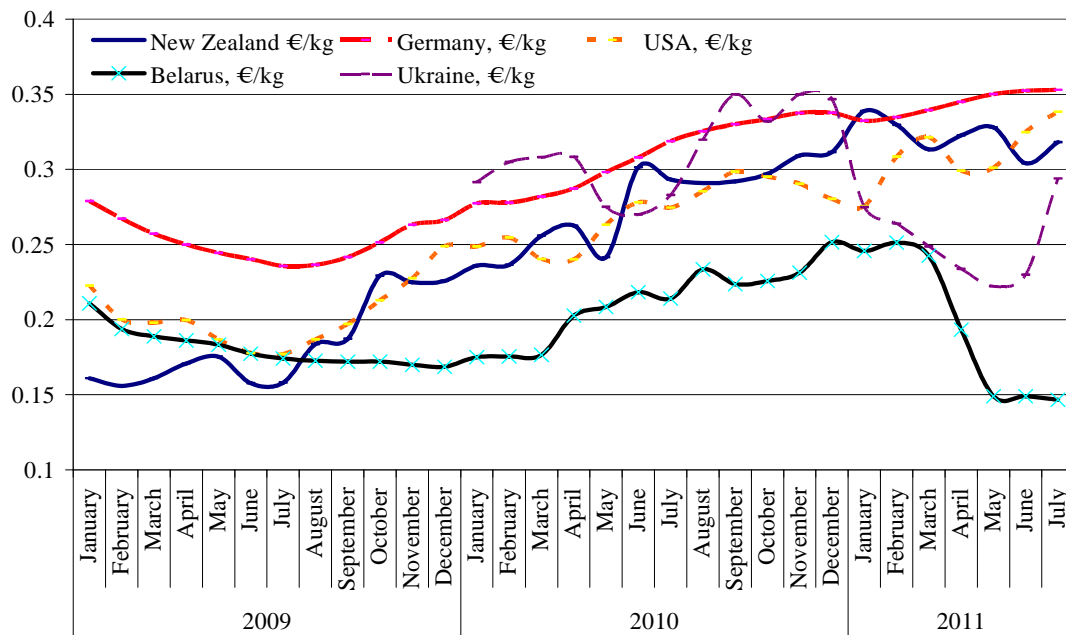
The main elements of the organization of the dairy market in Belarus include: 1) the administrative division of raw milk zones between dairy processors and barriers to movement of raw milk between the zones; 2) minimum prices for raw milk; 3) a special tax regime for agricultural enterprises; 4) various budget support programs for the sector; 5) minimum or indicative dairy export prices; 6) moderate protection of the dairy market.

Administrative division of raw milk zones between dairy processors. Here local governments essentially forbid the movement of raw milk among the raw milk zones (see e.g. Meleschenia, 2011), i.e. dairy farms are obliged to supply raw milk to particular dairy processors. Effectively this eliminates one of the most important mechanisms by which markets can help to absorb or dampen shocks. This mechanism is market integration, by which trade and arbitrage between regions can spread the impact of a shock evenly, ensuring that each regional market bears its share of the burden. In the absence of market integration, each regional market bears the burden of a shock fully. For example, in periods of high prices some dairy processors might experience a shortage of raw milk, while there might also be an oversupply of raw milk when dairy markets are low. It is somewhat ironic that Belarusian policy makers has been negotiating a common market arrangement (Customs Union and the SEA) with Russia and Kazakhstan, but at the same time Belarus fails to be a common market itself, at least as regards raw milk supplies.

This mechanism might also be regarded as an indirect subsidy to less efficient dairy processors and as a tax on more efficient ones. Without this mechanism dairy processors would compete for the raw milk supply and this supply would gradually shift from the less to the more efficient processors, thus squeezing the former from the market. This would accelerate the restructuring of the dairy processing industry and would lead to a 'natural' consolidation of the industry, eliminating inefficiencies up- and down-stream of the dairy processor. For example, more efficient dairy processors would drive changes on dairy farms by requiring better quality and stable supplies of raw milk. Administrative consolidation, by contrast, does not fully eliminate inefficiencies as the affiliated inefficient enterprises are not closed down but rather continue to operate within the new structure.

Minimum prices for raw milk. Minimum raw milk farm-gate prices are enforced administratively in Belarus and set at levels that allow dairy farmers to generate 'normal' profits. Figure 1c) demonstrates the distributions of variable and total costs per kg of raw milk on dairy farms in Belarus. The vertical lines demonstrate the minimum prices for raw milk set by the Government of Belarus in different periods in 2010. As the figure shows, the minimum prices changed 5 times in 2010, adjusting to world market trends (Figure 5). These are the average prices for all sorts of raw milk, but they are very close to the minimum prices for milk of the Highest grade since this grade accounts for such a large share of Belarusian milk supply. Extra grade milk is usually at 15% premium. Local governments can set their own minimum prices at a premium from these basis minimum prices.

Figure 5: Raw milk farm-gate prices in the world



Source: www.clal.it and www.milkua.info; prices adjusted for fat and protein content in Belarusian raw milk.

Figure 5 demonstrates that Belarusian dairy farmers generally receive low prices compared with many other major producing countries, which demonstrates the cost competitiveness of Belarusian production. In euro equivalent, Belarusian prices for raw milk follow the European trend, i.e. the prices in Germany. The drop in Belarusian farm-gate prices in mid-2011 was driven mainly by the devaluation of Belarusian currency.

Nevertheless, Figure 1c) demonstrates a basic problem with the minimum prices. For example, consider the price of BYR770/kg that was applied from March to June 2010. This price covered the variable costs of almost all the dairy farms and the total costs of more than half of the dairy farms in 2010. So the minimum price system was basically a subsidy to dairy farming, allowing very efficient farms to generate 'above normal' profits, while inefficient dairy farms generated some profits but remained in the sector rather than being forced to improve their production or exit. This prevented the sector from restructuring thus adding the costs to the entire value chain, reducing its international competitiveness and passing the burden of this regulation onto consumers. Moreover, the minimum price regime were shown to be the least efficient policy instrument for increasing the incomes of producers and it became incompatible with WTO standards (Kuhn and Nivievskiy, 2005)

Special tax regime for agriculture. Since 2000 Belarusian agricultural enterprises enjoy preferential tax treatment, i.e. they can pay a so-called 'unified agricultural tax' - UAT. The UAT replaces all taxes except VAT and payments to the Social Protection Fund and the Innovation Fund by a uniform turnover tax of 2% (World Bank, 2009). Agricultural enterprises that derive no less than 50% of their gross revenues from sales of self-produced agricultural products are eligible to pay UAT.

The UAT has one major advantage. It is simple to implement so it reduces the costs of tax administration. Agricultural enterprises do not need to maintain detailed bookkeeping

systems for tax purposes, and the tax is very low. However, the UAT has a number of important weaknesses. It is not based on profits but rather on revenues. This is adequate if the profits and revenues are tightly linked, otherwise it risks being non-equitable. For instance, if profit growth surpasses revenue growth due to improved utilization of resources, the more profit an enterprise makes, the lower its relative UAT burden will be. The UAT is especially biased against those producers operating at a small margin. Although UAT is small, one can easily imagine situations in which an enterprise operates with only a 2% profit margin. If profits were taxed, only a certain share of this margin (currently 23%) would go to the budget. If, however, the UAT is applied, the whole margin goes to the budget, essentially leaving the enterprise with zero profit.

Furthermore, on closer examination the main advantage of the UAT - that it eliminates need for detailed bookkeeping systems for tax purposes - is actually a disadvantage. It is impossible to efficiently manage a modern agricultural enterprise without detailed and accurate accounting. In the long run, the introduction of international bookkeeping standards would benefit farmers since it would help them make better production and marketing decisions, increase their efficiency and productivity, and thus increase their outputs and revenues.

The UAT also encourages the formation of vertically integrated enterprises that combine agricultural and non-agricultural activities to effectively escape taxation within such a structure with no reference to increasing efficiency of operation whatsoever.

Finally, the privileged taxation of agriculture does not come at no cost since other sectors must be taxed correspondingly more to maintain a given level of budget revenues. The dairy processing industry, for example, does not benefit from tax concessions and bears some share of the cost of providing privileges to producers.

Other support measures to the sector. Several budget programs have recently been downscaled because of the recent devaluation of the currency and the tight fiscal situation in the Republic. Nevertheless, the programs remain available to agricultural enterprises. Input supply programs are the financially largest part of budget expenditures on agriculture (World Bank, 2009). The programs included in this category compensate the costs of fertilizers and pesticides, machinery and machinery maintenance, breeds, land melioration, fuel and energy. The main problem with these programs is that farm managers are limited in choices if they opt for the support from the government, because the state determines from whom a farmer should purchase specific inputs and at what price (World Bank, 2009). Moreover, participation in the program does not guarantee the timely delivery of inputs on a farm, which is critical for farm management as delays in the applications of certain inputs can lead to significant losses for farms. Agribusiness representatives report this to be one of the most serious disadvantages of these programs.

There is an investment support measure, whereby enterprises can accredit investment costs on profit tax payables. Duty free import of equipment is possible but with special permission of the government.

Minimum or indicative export prices. As of the second half of 2010, the Government of Belarus introduced minimum export prices for dairy products to increase the profitability of

domestic dairy industry¹². The prices are regularly monitored and adjusted by the Working Group for Monitoring of Dairy Products' Sales at the Ministry of Agriculture and Food of the Republic of Belarus. This policy has had a clear impact on the volumes of deals on the Belarusian Universal Commodity Exchange. In most of the cases the minimum export prices are set above the corresponding world prices thus decreasing significantly the number and volumes of deals on the Exchange and forcing the traders to opt for direct deliveries which enable the partners to evade the minimum export prices¹³. So the minimum export prices achieve just the opposite of their intended purpose and create additional transaction costs in the dairy value chain. They also hinder the development of the Belarusian Universal Commodity Exchange. Moreover, the experience with export prices in Belarus indicates that the government has not been able to react in a timely manner to developments on the world dairy market.

Moderate protection of the domestic dairy market. The dairy sector in Belarus currently benefits from moderate tariff protection; especially for high value cheese products (see Table 5). Although the absolute component of combined dairy import tariffs increased slightly when the Custom Union tariffs came into effect, this did not increase protection of the Belarusian dairy sector, due to high dairy product prices.

Table 5: Customs Union tariff rates (MFN) for Belarusian dairy imports

	Before Customs' union	Customs union
HS 0401 - Milk and cream, neither concentrated nor sweetened;	15%	15%
HS 0402 - Milk and cream, concentrated or sweetened;	15%	25%
HS 0403 - Buttermilk, cream, yogurt etc;	15% but not less than €0.18/kg	15% but not less than €0.18/kg
HS 0404 - Whey, natural milk products;	15%	15% but not less than €0.35/kg
HS 0405 - Butter and other fats and oils derived from milk;	15% but not less than €0.22/kg	15% but not less than €0.4/kg
HS 0406 - Cheese and curd		
<i>Fresh (unripened or uncured) cheese, including whey cheese, and curd</i>	15% but not less than €0.3/kg	15% but not less than €0.3/kg
<i>Grated or powdered cheese, of all kinds</i>	15% but not less than €0.3/kg	15% but not less than €0.3/kg
<i>Processed cheese, not grated or powdered</i>	15% but not less than €0.3/kg	15% but not less than €0.6/kg
<i>Blue-veined cheese</i>	15% but not less than €0.3/kg	15% but not less than €0.3/kg
<i>Cheese except fresh, grated, processed or blue-veined</i>	€0.65-€0.7/kg	15% but not less than €0.6/kg

Source: The Customs Tariffs of the Republic of Belarus

¹² Bulletin of the Belarusian Universal Commodity Exchange #3(15), July 2010; p.54.

¹³ Bulletin of the Belarusian Universal Commodity Exchange #3(15), July 2011; p.50.

5. How to improve international competitiveness of the dairy value chain in Belarus

International competitiveness is driven by two main groups of factors: i) technology/efficiency/productivity and ii) prices (von Cramon-Taubadel and Nivievskyi, 2010).

According to the 2011 OECD-FAO Agricultural Outlook, dairy prices on world markets are currently high and projected to remain strong in the foreseeable future. At the same time the prices for feed crops are also expected to remain strong, and combined with strong livestock products prices this will likely further boost the prices for fuel and fertilizers. So the net impact of high agricultural output and input prices on competitiveness of dairy sector is not clear. Moreover, as the discussion above demonstrated, dairy input and output prices in Belarus are currently significantly distorted. For example, the minimum export prices that are currently applied prevent the dairy sector from benefiting fully from the bullish situation on world dairy markets.

The net impact of high dairy output and input prices on the competitiveness of the dairy sector will to a great extent depend on how efficiently the inputs are converted into the output along the dairy value chain, i.e. on efficiency and productivity growth. As has been discussed above, the majority of the current dairy policy measures in Belarus do not foster efficiency improvements in the sector. Minimum raw milk prices and the division of raw milk zones among dairy processors hinder restructuring processes in dairy farming and processing, allowing inefficient operators to remain in production. Consolidation of assets is mainly driven by administrative/political rather than competition based on greater efficiency incentives. Moreover, it has been mainly a 'top down' process. Even the apparently advantageous UAT contains hidden threats for efficiency and productivity growth in the long run. For example, it is impossible to efficiently manage a modern agricultural enterprise or get a loan without detailed and accurate accounting, and banks and other commercial lenders will not consider providing loans to enterprises that do not have appropriate accounting systems.

Policy makers in Belarus should permit dairy farms and processors to engage in deep restructuring by adjusting their sizes and structures. In this regard the following steps should be taken to boost efficiency and productivity in the dairy sector:

i) The abandonment of minimum farm-gate dairy prices. Minimum farm-gate prices allow inefficient dairy farms to generate some profits but remain in the sector rather than being forced to improve their production efficiency and reduce costs or exit. This prevents the sector from restructuring, thus adding the costs to the entire value chain and diminishing its international competitiveness. Moreover, in the economics literature the minimum price regime has been shown to be the least efficient policy instrument for increasing the incomes of producers, and it is incompatible with WTO standards.

ii) The liberalization of movements of raw milk within the territory of Belarus. Administrative division of raw milk zones between dairy processors and obliging dairy farms to supply raw milk to particular dairy processors effectively eliminates one of the most important market mechanisms - market integration. Trade and arbitrage between regions/zones can distribute the impact of a shock, ensuring that each regional market bears its share of the burden. In the absence of market integration, each regional market bears the

burden of a shock fully. It is somewhat ironic that Belarusian policy makers have been negotiating a common market arrangement (Customs Union and the Single Economic Area) with Russia and Kazakhstan, but at the same time Belarus fails to be a common market itself, at least as regards raw milk supplies.

The raw milk zones also act as an indirect subsidy to less efficient dairy processors and as a tax on more efficient ones. Under a liberal raw milk supply regime, dairy processors would compete for the raw milk supply and this supply would gradually shift from the less to the more efficient processors, thus squeezing the former from the market. This would accelerate the restructuring of the dairy processing industry and would lead to a 'natural' consolidation of the industry, eliminating inefficiencies up- and down-stream of the dairy processor. Administrative consolidation, by contrast, does not fully eliminate inefficiencies as the affiliated inefficient enterprises are not closed down but rather continue to operate within the new structure.

iii) The government should aim at taxing the profits of agricultural enterprises and should treat agriculture/dairy farming the same as other sectors. Belarusian agricultural enterprises enjoy a preferential 'unified agricultural tax' – UAT, which is equivalent to a 2% turnover tax. Its main advantage is it eliminates the need for detailed bookkeeping systems for tax purposes. On a closer examination, however, this advantage of the UAT is actually a disadvantage. It is impossible to efficiently manage a modern agricultural enterprise without detailed and accurate accounting. In the long run, the introduction of international bookkeeping standards would benefit farmers since it would help them make better production and marketing decisions, increase their efficiency and productivity, and thus increase their outputs and revenues. Also, the privileged taxation of agriculture does not come at no cost since other sectors must be taxed correspondingly more to maintain a given level of budget revenues.

iv) The abandonment of minimum export prices. The experience with minimum export prices in Belarus indicates that in most of the cases the minimum export prices are set above the corresponding world prices and substantially reduced the number and volumes of deals on the Belarusian Universal Commodity Exchange. Also the government has not been able to react in a timely manner to developments on the world dairy market. The abandonment of this practice would allow the dairy sector to reap the greatest benefits from the bullish world dairy market and contribute to the development of the Belarusian Universal Commodity Exchange.

v) Critically assess the role of agricultural education and research system in Belarus as well as the scope for reforming this system. Investing in training, education, extension services and applied agricultural research. Modern agriculture is increasingly capital intensive, and especially human capital plays a vital role in determining productivity and competitiveness. The entire agriculture education system, from apprenticeships to technical colleges and universities needs to be overhauled as the managers of agricultural enterprises complain about the shortage of adequately trained young Belarusians at all levels of qualifications. Belarusian scientists are entirely absent from international scientific community, suggesting that the agricultural research and education system as a whole in Belarus has not managed to keep up with international standards.

vi) Harmonization with international food safety and quality standards. Standards play a vital role in agri-food systems, and they are especially demanding in livestock production

and trade and for accessing the common markets of the EU. To penetrate the EU dairy markets, Belarus government should continue the process of attaining a 'third country' status with the EU. Moreover, Belarus should harmonize its legal base with the EU Acquis and adopt technical regulations based on the relevant EU Directives. This will help Belarus to diversify its dairy exports to a certain extent.

vii) The diversification of Belarusian dairy exports is urgently needed to reduce the current very high degree of dependence on the Russian market. The market for milk products is forecast to grow rapidly in Northern Africa, the Middle East and East Asia, which are export destinations that Belarus could target in the coming years. The ongoing shift of global dairy markets from an supply-driven to a demand-driven paradigm presents Belarus with attractive opportunities, provided it continues to improve the competitiveness of its entire dairy chain from milk production to processing and marketing.

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