

Agricultural Value Chains in Imereti and Racha Regions

Milk and Dairy Production

1 Introduction

The present research was carried out by the Association of Young Economists of Georgia in collaboration with Czech University of Life Sciences Prague (Faculty of Tropical AgriSciences) and People in Need from July 2014 to April 2015. This study is a part of regional value chain analysis for the main products of agricultural sector in Imereti and Racha region.

The goal of this analysis is to provide background information and baseline data for subsequent implementation stages of the project Enhancing Small Farmers' Cooperation and Productivity in Imereti Region financed in the framework of European Neighborhood Programme for Agriculture and Rural Development in Georgia (ENPARD Georgia) - Small Farmers Co-operation component.

This research would not have been possible without funding from the ENPARD Georgia.

2 Methodology

The research team followed an approach that allowed handling several issues concurrently. Data collection was organized and methods selected in order to assess specific issues from different angles supported by a triangulation of qualitative and quantitative methods. After the identification of the 8 local products with the highest development potential (based on local expert and government officials interviews), we carried out a more detailed survey thematically focused around each selected product. For dairy production value chain analysis following districts were covered:

- Khoni
- Terjola
- Baghdati
- Kharagauli
- Oni

The field data focused on agricultural product in the Imereti Region was collected in following stages:

March to June 2014 - gathering field data for main products

July 2014 – April 2015- finalization of reports

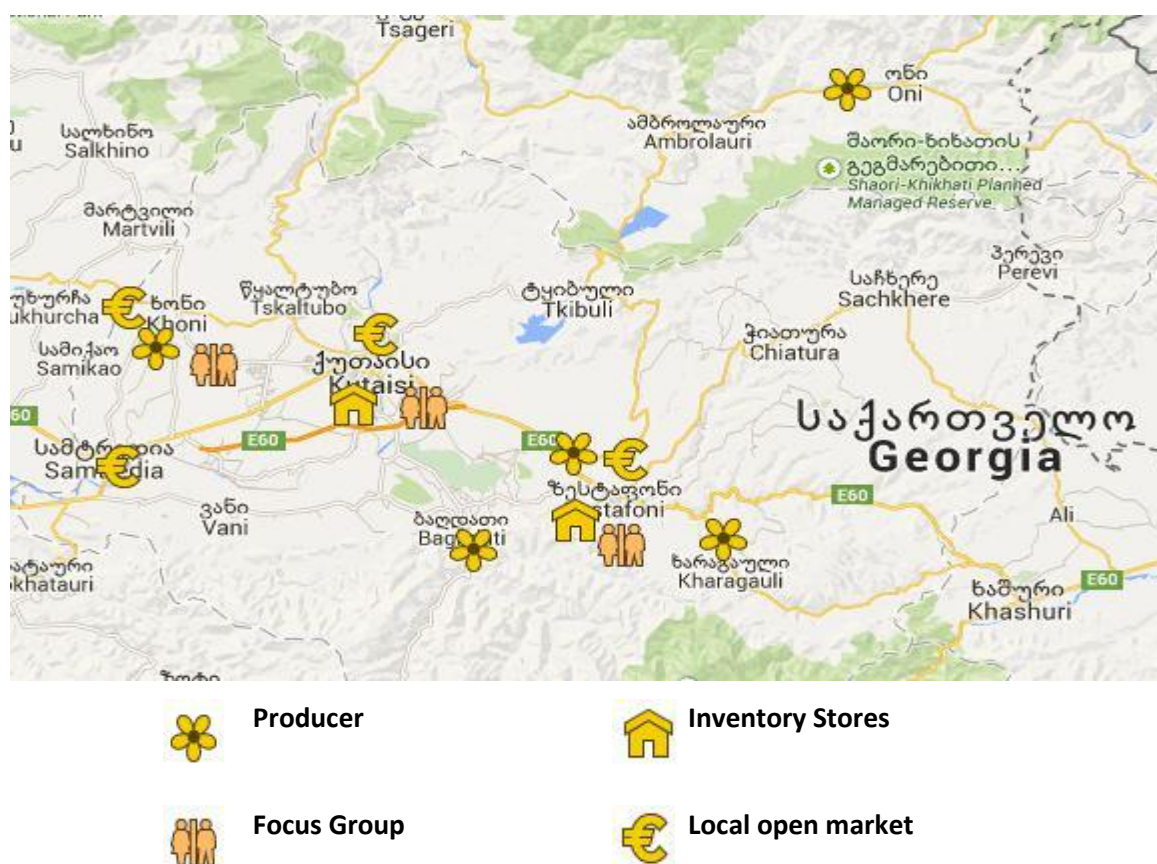
For the analysis mainly qualitative research based on key-informants and conveniently selected group of farmers is used, which is designed to reveal a target group's range of behavior and the perceptions that drive it with reference to specific topics or issues. As a main qualitative research method is used method of semi-structured in-depth interview. Interviews were conducted with small number of key informants who must have first-hand knowledge about examined issue. Each interview took from 1.5 to 2 hours. Diversity of key informants was important to cover whole value chain from suppliers to

the local market. It means to identify and interview different-sized farmers (from small subsistence to commercials), collectors, middlemen, processors, sellers on a local market, exporters, together with agro-shops selling seeds or seedlings and different kinds of tools, technology, pesticides, herbicides, fertilizers or other inputs.

Main field data collection instruments for dairy production included (spatial distribution is visualized in Figure 1):

- Focus group discussions with milk producing/dairy farmers
- Interviews with representatives of milk producing/dairy farms
- Interviews and observations of input supplier shops
- Milk and dairy market screening

Picture 1 - Map of locations for data collection in Imereti



But still, it is necessary to bear in mind, that the qualitative research is only partially representative and captures mainly general and the most frequent information. The secondary quantitative and qualitative data relies heavily on an examination of existing, accumulated research, combining official government data with studies conducted by international organizations such as FAO, EU, etc.

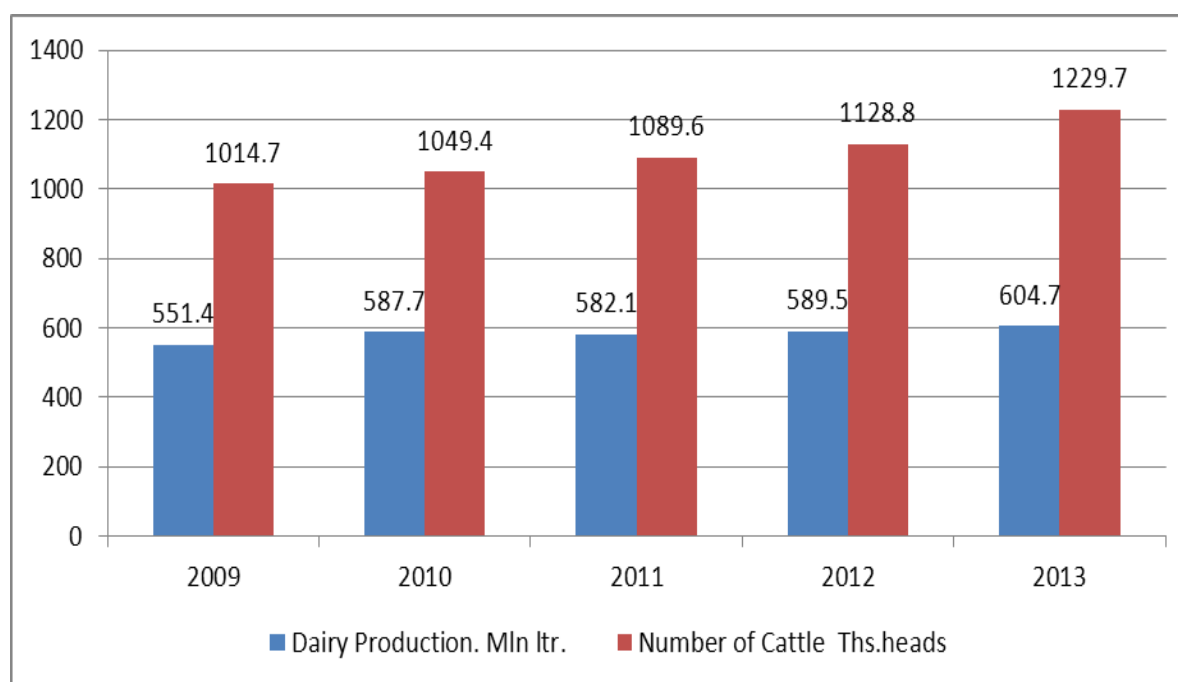
Due to the lack of agricultural activity in Racha region, National Statistical Bureau of Georgia does not publish any specific data regarding the agricultural sector.

3 Dairy productions as a sector of Georgian agriculture

Diary production is one of the oldest and the most traditional agricultural sector in Imereti and Racha regions as well as in the whole Georgia. Approximately 150 million households around the world are engaged in milk production. In most developing countries, milk is produced by smallholders and it contributes to household livelihoods, food security and nutrition. In recent decades, developing countries have increased their share in global dairy production. This growth is mostly the result of an increase in numbers of producing animals rather than a rise in productivity per head. In many developing countries, dairy productivity is constrained by poor-quality feed resources, diseases, limited access to markets and services. In the last three decades, world milk production has increased by more than 50 percent, from 482 million tons in 1982 to 754 million tons in 2012. India is the world's largest milk producer, with 16 percent of global production, followed by the United States of America, China, Pakistan and Brazil. The countries with the highest milk deficits are China, Italy, the Russian Federation, Mexico, Algeria and Indonesia¹.

According to Geostat data, 604.7 million liters of milk were produced in Georgia in 2013. Milk production share in GDP was up to 2%. During recent years the number of cattle livestock is increasing. The milk production is also rising, but with relatively low trend (Diagram 1).

Diagram 1 - Cattle livestock and milk production in Georgia²



According to official data, in 2012 99% of country wide produced milk was received from cattle and only 1 % from goat and sheep. Hence, this assessment is focused on cattle milk production sector. 22% of Georgian milk production, representing 129.7 mln. Ltr, came from Imereti region – in 2013. It should be emphasized that in the year 2013 compared to 2007 the milk production increased only in

¹ http://www.fao.org/agriculture/dairy-gateway/milk-production/en/#.VRFLM_yUcjY

² Agriculture of Georgia, National statistics office of Georgia, 2013

3 regions of Georgia: Kakheti (by 33%), Imereti (by 6 %) and Samegrelo (by 10%), whereas other regions had slight decrease in the same indicator (Diagram 2 shows milk production trend by regions and diagram 3 illustrates the shares of regions in milk production in 2013).

Diagram 2 - Milk production in Georgia by regions, million liters,³

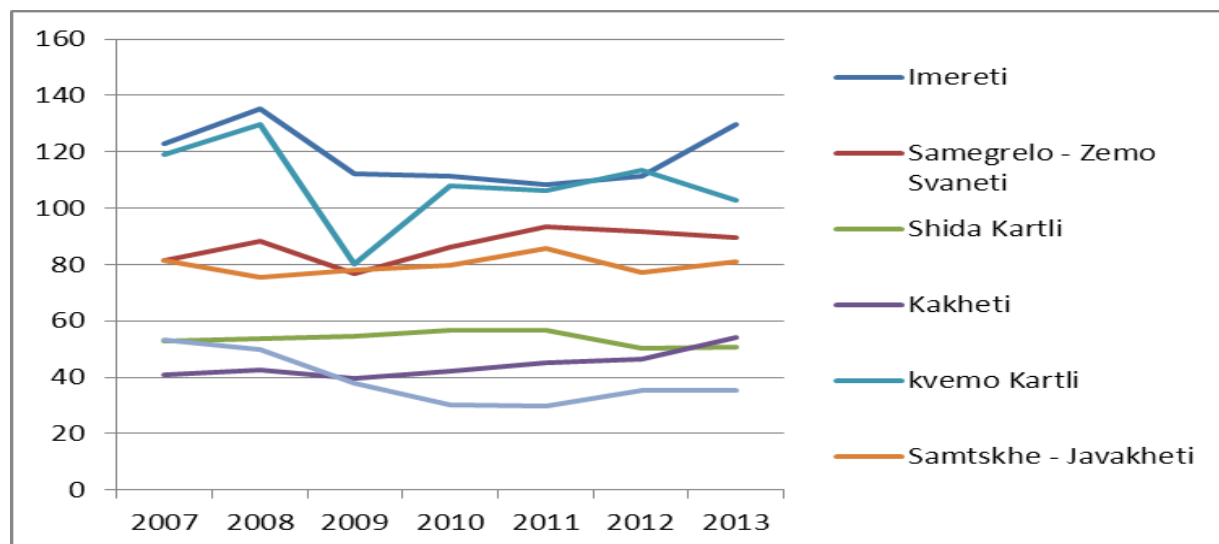
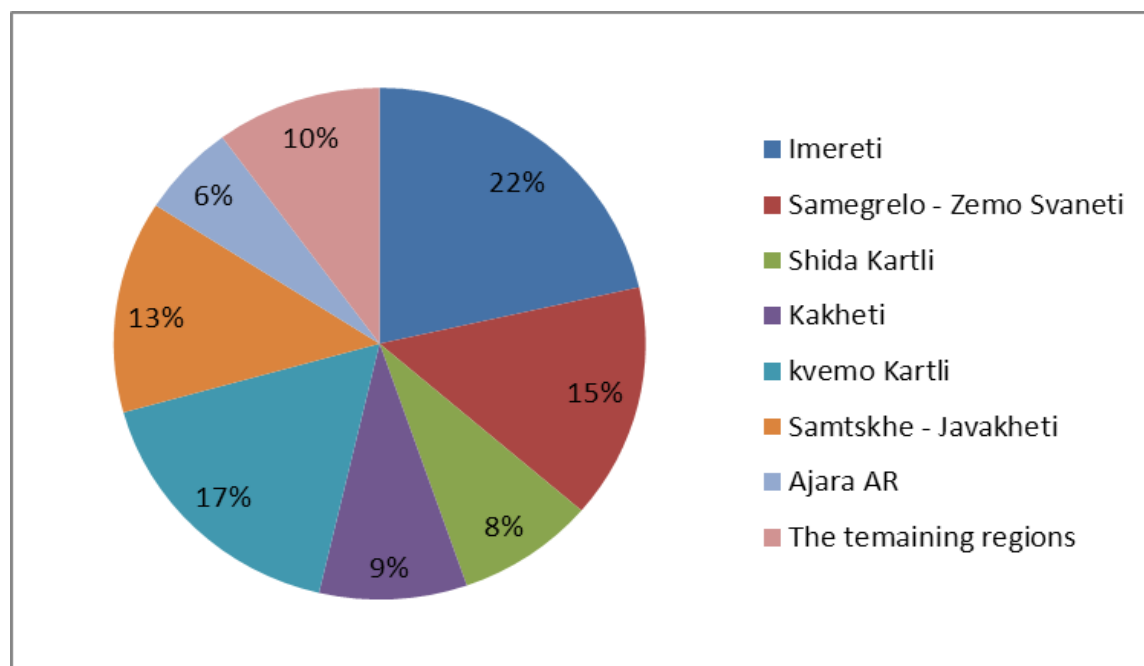


Diagram 3 - Milk production by Regions' share, 2013⁴

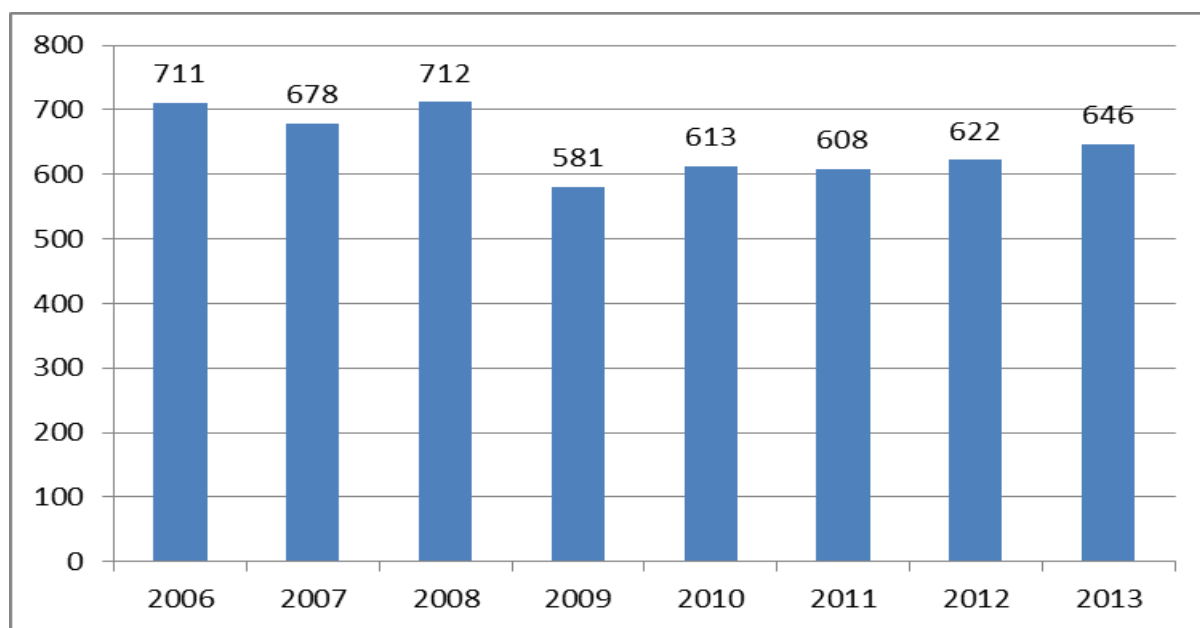


During 2006-2013 years the level of dairy products intake in the country has slightly decreased in total as well as per capita (diagram 4). At the same time, during the last five years the self-sufficiency ratio of dairy products has been stably high and remained between 92- 93%.

³ National statistics office of Georgia, <http://geostat.ge>

⁴ National statistics office of Georgia, <http://geostat.ge>

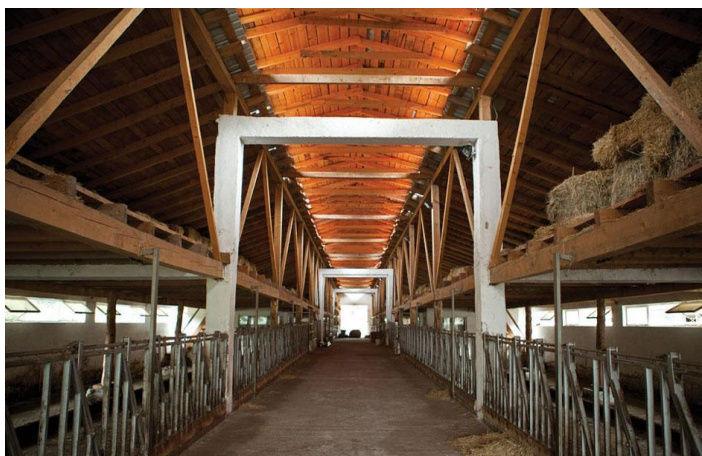
Diagram 4 - Dairy products annual intake in Georgia (1000 tons)⁵



According to official data, in 2013 family holdings produced 99.7% of milk in Georgia, consequently, 0.3% came from agricultural enterprises. these family holdings either do farm gate milk sales or more frequently transform it directly to the cheese. Considering existing context, the research is focused on milk and cheese production.

4 Dairy Value Chain

4.1 Production Systems



Picture 2. Commercial Farm in Racha Region

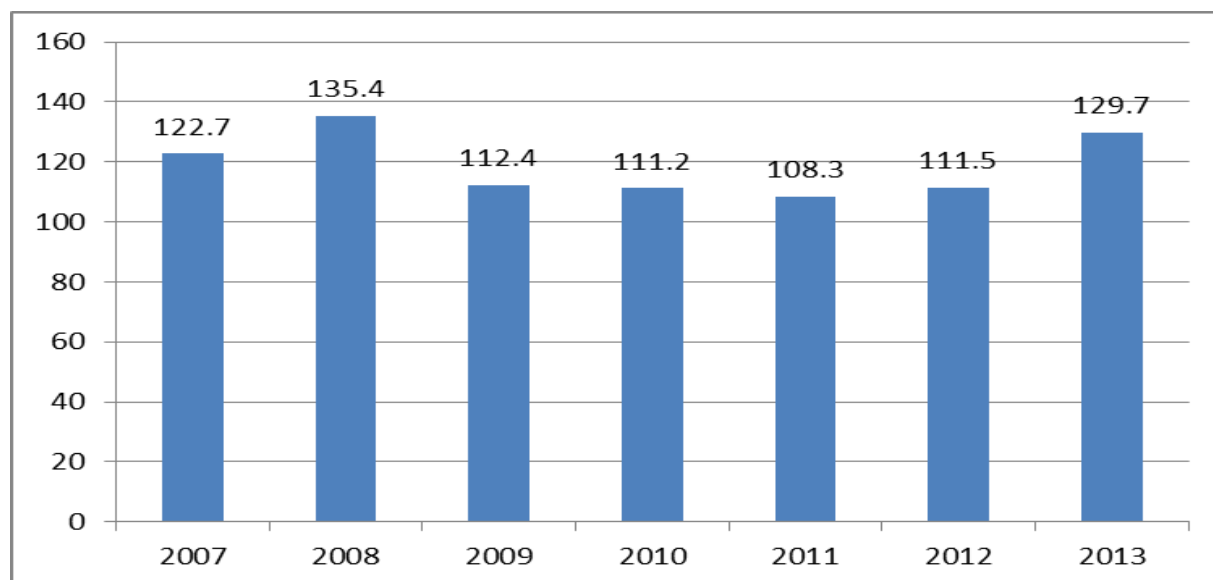
In Imereti and Racha regions, majority of family holdings which are involved in cattle breeding, follow traditional approaches. They produce milk, some dairy products and also meat. However, cheese production is the main source of income from livestock production. Officially, in 2013 there were 106 500 heads of cattle in Imereti region. That is 16% of total livestock of Georgia. It should be also mentioned here, that due to very low indicators the official dairy related data is not available for

Racha -region. During last 5 years in Imereti as in the country the number of cattle has slightly

⁵ National statistics office of Georgia, <http://geostat.ge>

increased. Compared with 2007 the number of cattle in Imereti has increased by 12% in 2013. 129.7 million liters of milk was produced in 2013 in Imereti region. Diagram 5 shows the milk production trend for Imereti region)

Diagram 5 - Dairy production in Imereti Region (million liters)⁶



In both regions, the majority of households have from 1 to 10 animals. Approximately half of the received milk and dairy products are used for self-consumption and the second half is sold on the market. In specific cases, households have developed family farms with 10 to 100 cattle. These farms totally produce for selling. There are also several large-sized livestock farms in the targeted region – agricultural enterprises (one in Racha, which has more than 400 livestock; and 7 farms with 50-100 livestock in Racha and Imereti), that are created with solid foreign and/or local investment. All small-sized family farms and agricultural companies mainly produce milk and dairy products. However, the older cattle are gradually substituted with the newborns and the former are used for meat production. Small-sized family farms favor extensive systems of animal care when all work related to cattle breeding is conducted by hand, with out-of-date equipment. The production process is primitive and is mainly dependent on natural environment. In winter time livestock is fed poorly and that leads to low productivity. Large-sized farmers intensively use mountain pastures during the summer and food concentrates during the winter time.

In Racha region the medium and large farmers transfer livestock during the summers to alpine pastures which have high quality green grass and return their livestock back in autumn to farms. During the nights on alpine pastures, livestock is kept in the specially designed open areas (with fences) to protect them from wild animals. The farm buildings that are usually used to accommodate livestock during winter are solidly built from stone or in rare cases constructed from wood.

Stone as well as wood is used for the construction of animal barns. In Racha and Imereti regions, family farms usually have wooden barns, the construction of which is relatively cheap but its exploitation period is also shorter. For wooden barns it is recommended to warm it up by using bicost to ensure a stable temperature regime (average 15-18 degrees Celsius) during the winter time. During

summer, the barn should be well ventilated. Conducted research revealed that the construction price of a stone barn (without equipment) for 30 animals is approximately 8,000-10,000 GEL. The construction cost of a wooden barn with the similar capacity is approximately 3,500-4,000 GEL.

The State conducts preventive vaccination of livestock to prevent the spread of certain diseases. Vaccinated animals are marked in yellow with an assigned unique number on one ear. This enables the registration of each animal in a special database, which should contain comprehensive information on each of them. It should be noted that the mentioned database is not functional yet.

Local farmers sometimes buy calf. The price of calf depends on its age and ranges from 300 GEL (up to one month old) to 800 GEL (one year old). A cow should reach three years of age for reproduction. The structure of annual costs per head of cattle expended by family-led and large sized farms is following: food - approximately 500 GEL (a big share of expenses goes for the purchase of hay, straw and other mixed food); medicines - 20 GEL; workers - 240 GEL.

In family-led farms, which hold from 1 to 10 livestock, work is mainly done by the members of the household. They usually do not hire external workers, whereas medium and large farms hire external labor force. The largest farm in the target regions is located in Racha, Shardometi, where 42 persons are hired to take care of more than 400 heads of cattle. Other relatively large farms (in Imereti and Racha regions) with up to 100 cattle need to hire about 15 persons

4.2 Productivity

Globally, the number of livestock is more than 1.3 billion, among them milk producing cows are dominating. Out of the milk producing countries, Israel is the leader in terms of the highest rate of milk productivity per cattle – with annual average of 9105 kg, while in USA the same indicator is 7464 kg. Among the leading milk producing countries, the annual medium rate of milk producing ability is higher than 6000 kg, i.e., more than 20 kg per day.

Table 1 - Milk productivity and chemical composition by cattle breed in developed countries

<i>Breed</i>	<i>kg/milk</i>	<i>fat %</i>	<i>protein%</i>
Holstein	12700	3.1	3.2
Brown Swiss	9525	4	3.5
Jersey	7260	4.9	3.7
Milking Shorthorn	6990	3.8	3.3
Guernsey	6350	4.5	3.5

Out of above mentioned breeds, Holstein and Brown Swiss are also spread in Georgia and

⁶ National Statistics office of Georgia www.geostat.ge

consequently in Imereti and Racha regions. It should be emphasized that the productivity indicator of these breeds in Georgia is much lower. For instance, Georgian Brown Swiss's milk annual productivity is just 3600 kg, which is 37% of same indicator for the same breed in developed countries.

The milk producing period (lactation period) under intensive conditions starts with the birth of a calf and in the best case lasts for 305 days, followed by 60 days of dryness, during which the cow's body is being prepared for the new birth and lactation. In Georgia, the milk producing period is significantly shorter and lasts from seven to nine months due to ineffective breeds and insufficient care of the livestock.

The milk producing ability of a cow depends on its breed and the conditions in which it is taken care of. Insufficient feeding reduces the milk producing ability two to three times. Generally, the specific micro-climate is needed to be ensured in the places where cows are kept: the temperature of the air should be between 15-18 degrees, relative humidity of 75% should be observed, the speed of air movement in winter should reach 0.5m per second and the concentration of carbonic acids should

not exceed 0.25%. Failure to meet the mentioned standards leads to reduction of milk productivity.



Picture 3. Swiss brown in Racha - region

There are more than 1000 breeds of cows around the world. They are divided into the milk producing, meat producing and combined breeds. In Georgia there are widely spread only milk producing and combined breeds. During soviet time in Imereti and Racha regions following breeds were disseminated among rural population: Georgian mountain; Caucasian Brown; Holstein; Veli's red breed.

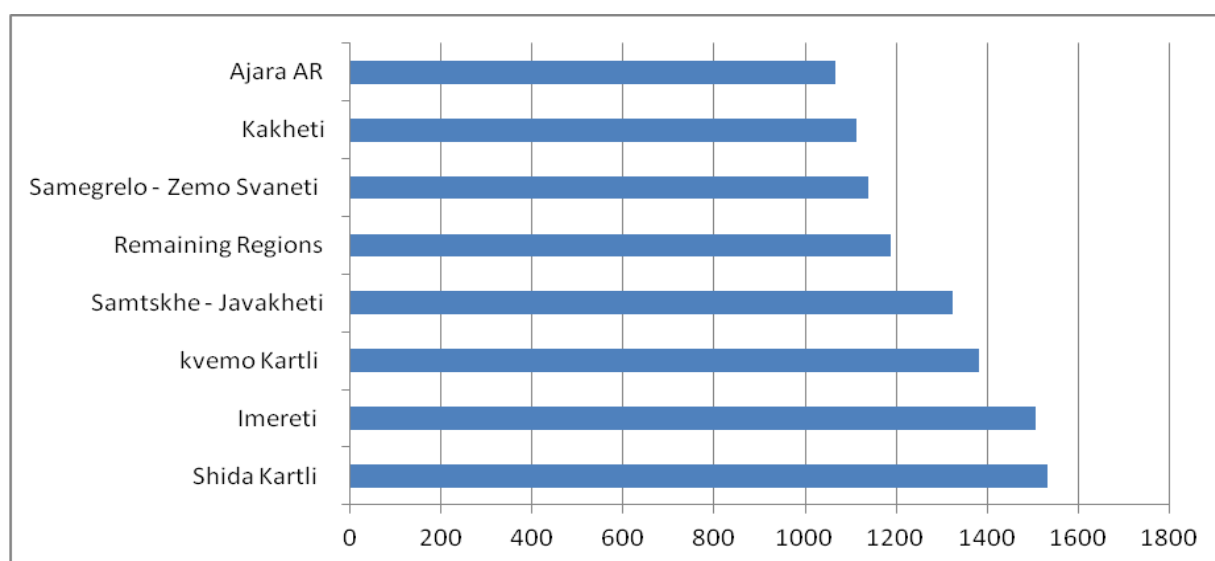
A for today, apart from few large-sized farms in Imereti and Racha regions, the majority of farmers do not possess cattle of any specific breed. The cattle are usually bred in a natural (uncontrolled), not artificial way. Thus, it is impossible to define the breed structure for Imereti and Racha regions, since there is no any selection process and reproduction takes places in chaotic way. Hence, almost all cattle is kind of "half-breed" combination of various local types. As mentioned above, few large farms control breeds via artificial insemination. One of them is farm in Racha shardometi, where they have milk and meat combined breed Swiss Brown.

Swiss Brown was emerged approximately 1000 years ago in the mountains of Switzerland. It is also combined breed is of dark brown color. It has a good, proportionally built body and is characterized with high adaptability towards local environment. Due to its high productivity it is found in many countries around the world and new species are being developed on its base. In Racha region this breed was developed in Shardometi farm via artificial insemination. Initially they had Caucasian Brown breed (which was similar type) and through artificial insemination and breed selection, in the fourth generation this farm received typical Swiss Brown breed. They have 400 cattle of this breed. The mass of a bull reaches 900 kg, a cow reaches 550 kg, milk producing ability is 3600 kg, and the

amount of fat in the milk is 3.6%. In some countries, the results are even higher. Summer is the period when the biggest amount of milk is produced in Georgia. Specifically, the peak season for milk production is during May, June and July. On the contrary, in winter - during December, January and February – the production of milk is lowest. According to expert evaluation, the milk producing ability in winter time is approximately 30-35% less compared with the summer period.

According to the State's statistical data, the average annual milk producing capacity per cow in the country equals 1302 liters. The situation in Imereti region is better in this respect and the annual milk producing average indicator is 205 liters greater in comparison to the situation in the rest of the country. Diagram 6 shows average milk production by regions; A total of 1507 liters of milk per cow is produced in Imereti region.

Diagram 6 - Average yield of milking cows and buffaloes by regions in 2013 (ltr per year)⁷



Apart of official statistics, which unifies household and enterprise survey data, field research revealed more detailed picture on milk productivity. Large and medium commercial farms in Imereti and Racha regions, which follow certain standards of cattle care, reported average productivity of 1800-2000 liters per cow, whereas the same indicator in family holding small farms do not exceed 1500 liters. In addition difference in productivity is observed by the municipalities, for instance productivity is relatively higher in Oni and Khoni municipalities with average 1700 liters, and lowest indicator - 1400 liters per cow was identified in Kharagauli and Tergola municipalities.

4.3 Product Chain typical for Imereti and Racha regions

85% of obtained milk is usually used for cheese production, while the biggest part of the remaining 15% is used for self-consuming needs of the family. Only a minor amount of fresh milk is sold on local markets and mainly by those farmers that are located in close proximity to the agricultural open markets. A small amount of milk is usually given to the local supermarkets for further selling in plastic containers. The reason behind this is the fact that milk can spoil quite quickly and its storage and

⁷ National statistics office of Georgia, <http://geostat.ge>

transportation requires availability of the necessary cooling means. However, according to the clarifications provided by the producers, if they get the possibility to sell milk instead of producing and selling cheese, it will increase their income. Anyway, currently the sales of fresh milk are extremely low and unimportant in terms of business cycle.

Several villages of the Khoni municipality located in Imereti region are exceptional. In these villages, a small group of farmers established a cooperative, - “Lelo 2014”, which collects milk from local family farmers and produces Sulguni (a type of Georgian cheese) out of it. The greatest part of this product is currently being sold in western Georgia, however, step by step the cooperative is trying to widen the area of distribution and encompass eastern Georgian markets as well. For the transportation of milk, the cooperative uses own car quipped with small reservoirs for milk, and a mobile device for measuring milk quality. Milk is collected twice per day – once in the morning and once in the evening, at times preliminarily agreed with producers. This cooperative collects 100-150 liters of milk per day and plans to reach 200 liters indicator. They produce 11-14 kg of Sulguni per day.

Milk and dairy production sector in Imereti and Racha regions is actually represented by one product - cheese production and sales. Family holdings sell average 65% of produced cheese, while the rest is used by the families for own consumption. Medium and large farms, as well as cooperative “Lelo 2014” sell all the produced cheese. Some small producers sell cheese themselves at local markets, others sell the product to wholesaler either locally (on the territory of a farm itself) or on the regional agricultural markets. Key players of the Cheese value chain are as followings:

Milk and cheese producing farmers – The framers despite their size produce cheese from received milk and store them in refrigerators or in special containers. Only exception is family farms in villages of the Khoni, which deliver milk to local cooperative. The latest on its hand produces the cheese.

Wholesalers/middlemen – There are two types of wholesalers. One group go door to door and collect cheese from family farms and later deliver them to open market, restaurants and or groceries as within the region, also in other parts of Georgia. Another group of wholesalers work in regional agrarian markets and farmer deliver to them cheese in any amount they have and/or want to sale. Generally, there is no any regular system on place. The ad hoc decisions about sales are received chaotically. Famer may sell open door in one month and next time may take cheese to agrarian market. Large farms are more orginized and they work with several wholesalers, also deliver the cheese to certain groceries and restaurants on regular basis.

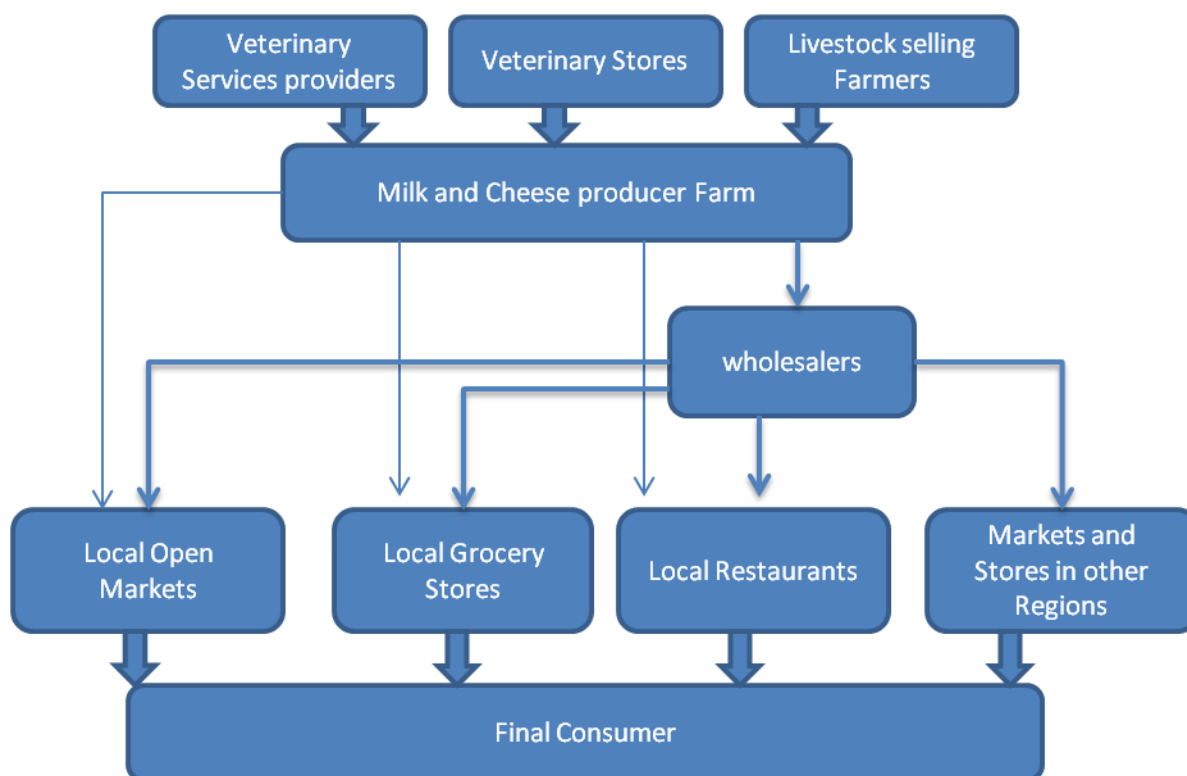
Agrarian open markets – Usually resellers sell cheese to final consumers in agrarian open markets. These resellers buy cheese from wholesaler, who collect sufficient amount of cheese from producer farmers. Rarely, family member sell cheese by themselves on open markets.

Groceries/restaurants – these entities also apply various ways of receiving the cheese stock for further resale. In some cases farmers deliver to them cheese directly (mainly large and medium size ones). As usually, wholesaler delivers them cheese in agreed amount on regular basis.

Input providers – Input providers, such as veterinary stores, veterinarians, and farmer which sell cow or calf also have their impact on the value chain. Since they directly influence on such issues, like artificial insemination, prevention from deceases, breeds, etc. For Imereti and Racha regions

veterinary stores are relatively more developed, as they can provide majority of needed drugs. Veterinary services' quality lack modern knowledge and in addition, despite many of veterinarians knows how to perform artificial insemination, there is no such demand from small scale farmers. In the target regions there is no singular farm which offers to other farmers the concrete breed of cow. They sell cows or calves that just "look good" and actually are "half-breed" received as a result of natural and at the same time chaotic reproduction.

Scheme 1. Cheese value chain map for Imereti region



As the result of the research approximate portions of the cheese distribution by channels for Imereti and Racha regions is as followings: up to 60% of the produced cheese is sold by wholesaler, remain 40 by the farmers themselves; wholesalers' deliver 10% of obtained cheese to other regions; 50% to agrarian open markets within the regions and 40% to grocery stores and restaurants; Small farmers sell cheese to final consumer in very rear cases. The greatest part of direct sales comes on medium and large size farms, which on their hand sell about 40% of cheese to local open market resellers, 20% - to grocery stores and another 40% to restaurants and other organizations, like kindergartens, military units, etc.

There are three small-sized dairy producing factories located in Imereti region (in Kutaisi, Samtredia and Terjola) which produce sour cream, yoghurt, cottage cheese, butter, ice-cream and other dairy products. However, these companies do not use natural milk. Instead, they substitute it with milk powder. The latter product is not produced within Georgia but entirely imported, mainly from Belarus. According to the producers, the usage of milk powder significantly lowers the price of the product. At the same time, while they are always satisfied with the quality of milk powder, it is

problematic to collect quality natural milk. The annual turnover of the mentioned factories is approximately to 2.5-3 million GEL and the products are exclusively sold in Imereti region. They have their own system of product distribution. But they do not actually impact the cheese market and cannot be considered as players that can change the picture of the value chain.

4.4 Product Prices

Milk producing farms usually sell two types of products: fresh milk and cheese. The average selling price of milk is 0.7 GEL per liter. The price reaches a maximum of 1.2 GEL in December and January, when the milk producing capacity is at its lowest rate. The minimum price is 0.5 GEL during May, June and July. In this period, the milk productivity is at its highest level, which is due to the availability of grass on pastures. From August grass starts to dry and the quantity of available food diminishes. However, during the winter, the fat quantity in milk is much higher than in the summer period and, therefore, if in winter for the production of 1 kg of cheese one needs 6-7 liters of milk, in summer one needs 8-9 liters. Medium-sized producers use most of their produced milk for cheese production, or sell their milk to the milk processing factories. Only a small portion of milk is sold directly to consumers on local open markets (in this case the price is usually 0.15-0.2 GEL higher).

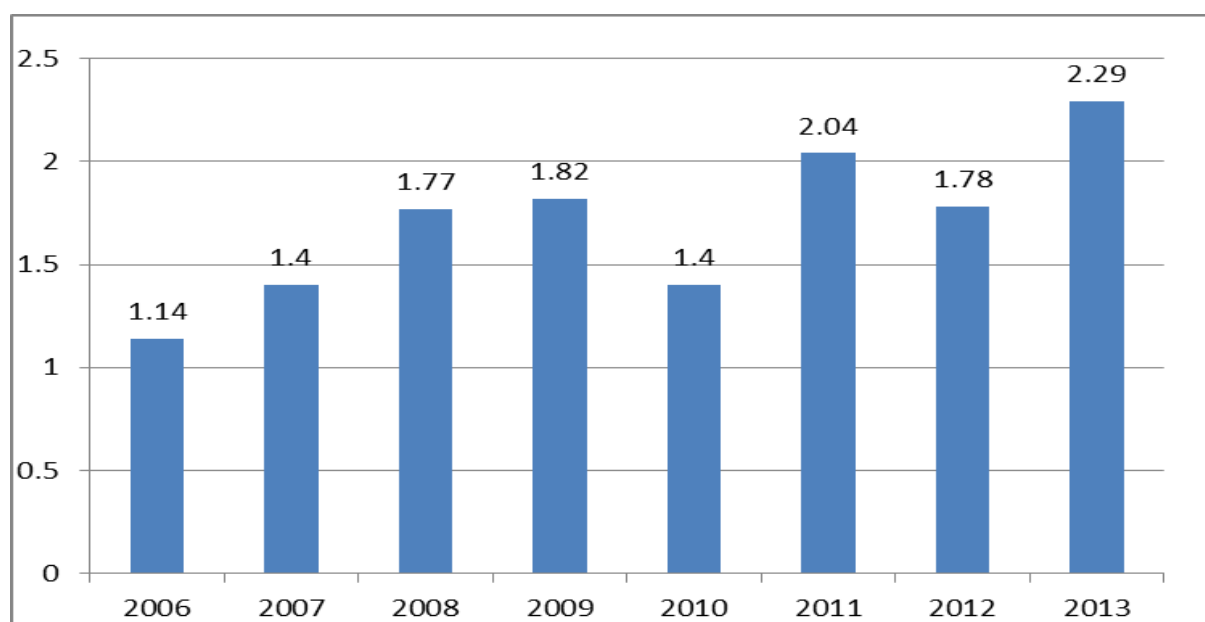


Picture 4. Sulguni produced in Imereti

The price of cheese is directly dependent on the amount of produced milk and its price. This varies depending on the season and increases during the autumn-winter period. The maximum price for cheese is 7-8 GEL per kg and the minimum is 4-5 GEL. The price of sulguni (Georgian type of cheese which requires a further stage of production) is in direct correlation with the price of cheese. Approximately 800 grams of sulguni is produced from 1 kg of cheese, and the average wholesale price is 10 GEL per kg, although this depends on both the time of year and the price of cheese itself. As a next step, some producers develop smoked sulguni, the price of which is higher by 1-1.5 GEL compared with ordinary sulguni.

Processed cheese and sulguni are usually delivered to resellers operating on local markets or wholesalers who sell cheese at 0.5-1 GEL and sulguni at 1-1.5 GEL higher than the original price. The research revealed that the first link of dairy value chain – milk producing farmer – received per liter of milk up to 1.2 GEL, whereas the last link – final consumer paid for the same product – average 2.29 GEL in 2013. Diagram 7 shows milk retail average price trend for Georgia.

Diagram 7 - Milk retail average price (GEL per ltr) ⁸



5 Competitiveness diamond – input conditions, demand conditions, related industries, context

5.1 Input conditions

Several important components are needed for the development of dairy production, all of which are outlined below.

Food: Preservation of an animal's feeding ratio is necessary for both its normal development and also for the production of the proper amount of milk. Families that possess several animals usually feed them with grass in summer and corn, hay and straw in winter (produced on their own farm). Relatively large-sized farms and agricultural enterprises usually purchase the necessary food (wheat, corn, hay) in eastern Georgia. Family farms, as a rule, are not able to ensure necessary food ratios. Consequently, the productivity of their animals is low. The average annual costs for food products per one head of cattle are as follows: 1kg wheat – 0.65 GEL; 1 ton hay – 220 GEL, 1kg corn – 0.5 GEL. Some farmers cultivate corn on their own land and it costs 0.22 GEL for 1kg. The research revealed that around 1.7 ton hay, 270 kg cereals, 7 kg salt, 18 kg straw is necessary per one head of cattle per year. If we assume, that a farmer purchases all the above components, then his/her approximate feeding annual expenses per cattle will sum to GEL 500.

Drugs. Drugs needed for animals are purchased in veterinary pharmacies located in Tbilisi and Kutaisi. Their prices and quality are more or less similar in all pharmacies. Medium and large-sized farms have their own veterinarian. The small-sized farms receive necessary services from veterinary pharmacies

⁸ National statistics office of Georgia, <http://geostat.ge>

or from veterinarians working for large-sized farms. Drugs are imported from various countries, mainly from Russia, Ukraine and the Netherlands. Local veterinarian pharmacies purchase drugs at wholesale prices in Tbilisi directly from importers. Highest demand for drugs comes during spring and summer periods as animals are more exposed to diseases at these times. Widely used drugs are: Albendazole and Gitox – drugs used against parasites, 1 tablet – 1 GEL, dose - 1 tablet is used for every 100 kilograms of life mass, usually in spring and autumn; Lomoxin – an antibiotic, 1 cup costs 5 GEL, 1 cup is needed for every 100 kilograms of life mass. One animal needs drugs with total approximate cost of 20 GEL per year.

Artificial insemination. . As a rule, the family farms for reproduction use traditional, natural methods, which lead to absence of any controlled breeds. Some of medium and large-sized farms apply artificial insemination. Most of the Veterinarians can provide artificial insemination services service in Imereti and Racha regions. There is just one organization - Caucasus Genetics Ltd, that provides such services. Genetic material, supplements, equipment and accessories needed for artificial insemination are usually imported from Europe. Artificial insemination in Imereti and Racha regions costs 50-60 GEL per cow.

Milking and processing equipment. Except of 4 large farms in the target regions, all other farmers use by hand milking method. Hand milking requires an individual approach to each animal... . From an economic perspective, machine milking is appropriate for a farm holding more than 30-40 cows. In Imereti and Racha regions large 4 farms located in Bagdadi, Kharagauli, Khoni and Abrolauri are using mobile milking machine. They possess milking machine produced in Ukraine, which costs 600-800 USD. These machines serve 2 caws simultaneously and up to 16 cows per hour.

Rennet: Rennet (substance which is added to milk for cheese production) is used for the production of cheeses - traditional Imeruli and sulguni. One pack of rennet (250 grams) costs 11 GEL, which serves 250 liters of milk.

Production line. According to the modern standards, the high technology and complex production line is needed for processing of milk and other dairy products (cheese, pasteurized milk, cottage cheese, etc.). Currently, no company possesses such technology in the region due to its high cost and scale of production.

Cheese processing and storage. In the target regions farmers not not use any specific equipment, also production lines for producing and packaging cheese. As for today stainless steel enameled pots are widely used by farmers. Before being sold, cheeses are kept in specially prepared salted water or in a refrigerator (small farms use family refrigerators). While kept in these refrigerators, cheeses are not packed. Later they pack cheese for sale in regular plastic bags by hand.

Labor. In family led farms, which hold from 1 to 10 livestock, work is mainly done by the members of the household. They usually do not hire external workers. Medium and large farms hire external labor force. As a result of the research, it was identified that hired workers monthly receive 20 GEL per one head of cattle.

5.2 Demand

According to Geostat data, in 2013 annual milk intake in Georgia was 642 ths. tons, and only 10% of the consumed milk was imported. Greatest share of imported dairy products comes on processed dairy. Due to the higher prices on imported dairy products, the demand is not high. However, import share may increase in a long run period, if local production will not become more developed and diversified. So far milk procession is conducted using primitive means and it is less likely that technological and sanitary-hygienic norms are fully followed. In addition, even large dairy enterprises cannot deal with producing products with high quality and wide assortment. Official data indicate that the share of import is being slightly increasing during last years. (Diagram 8 shows dairy intake trend with shares of import and domestic production)

Diagram 8 - Dairy products intake in Georgia , share of imported and domestic production⁹.



Milk and milk products produced in regions are exclusively sold within the country, mainly at local agricultural markets and groceries. Small-scale farmers usually sell their products at local agricultural open markets, medium and large-scale farmers are also oriented on delivering their products to relatively bigger trade chains and other legal entities (kindergartens, army etc.).

Milk and dairy products produced by family farms do not have any potential to access foreign markets and even Georgian supermarket chains. In fact their production cannot meet any standards or legislative requirements in regard of processing or food safety issues. Also it is of crucial importance to ensure accessibility to international level laboratories and packaging opportunities.

Generally, dairy products are very popular and demanded among Georgian consumers. Especially high demand is on traditional cheese types. Fresh milk is very popular in families with newborns and children. Apart from cheese and milk, cottage cheese, sour cream and butter are most demanded products in Georgian Market.

⁹ National statistics office of Georgia, <http://geostat.ge>

5.3 Related industries

Medium and large-sized industries mainly depend on revenues received from cattle breeding. However, in some cases, they also perform additional activities. Particularly, the majority of them have their own mills that are used to satisfy their own needs and simultaneously provide services to other small-scale farmers. However, income received from such activity is substantially lower than revenues received from cattle breeding.

Actually, the farmers do not have much diversification opportunities, since it depends a lot on access to finance. Developing of corn and hay production could be considered as an important additional sector for farmers. Thus they can reduce the costs for cattle breeding, and also attract additional income by selling these products to other farms. Local farmers fail to identify and utilize new opportunities.

5.4 Competition

Competition in the milk and milk products market in the country and in the selected region is high. However, the competition is mainly between local producers and not between local producers and importers as the latter's share on the local market is small.

Competition between local producers considerably determines local prices. In this regard, small family farmers are in an advantageous position. They, as a rule, do not use a hired workforce and practically do not pay any taxes (land, property, revenue, etc.). Small family farmers also use their own production to feed their animals – corn, soya, hay and straw cultivated on their own lands. Medium and large-scale farmers think that small family farms greatly influence local prices and often unconsciously sell products with dumping prices (lower than self-cost). Small family farmers, as a rule, are not able to properly calculate the cost of production mainly because they do not include their work in a production cost structure. Large farms favor the advantage of economy of scale and as a result, and thus all sizes of farms are operating with similar market prices.

None of the milk and cheese producers in the region have any developed marketing strategy or related action plan. Therefore, the selling of their products is mainly done based on the reputation of producing farmers and trust towards them. None of the farmers have marketing budgets and the majority does not consider such a need, as the products are already popular on local markets. Its quality is acceptable for consumers.

6 Strategic productivity and quality

6.1 Dairy in relation to food safety and quality

Milk contains plenty of vitamins useful for the human body. Standard composition of cow milk is as follows: protein – 3.3%, fat – 3.8%, milk sugar lactose – 4.7%, ash – 0.7% and water – 87.5%. It also contains vitamins and ferments.

Dairy sector does not require any license or certification¹. According to Georgian legislation producing and selling of milk and dairy products is regulated by 18 legislative acts. This legislation determines basic veterinarian norms, packaging, transportation, labeling and other related issues. But, all the above mentioned norms and regulations do not cover family holdings, and they stay beyond rules.

According to study results, there are no efficient quality control system for dairy products that would prevent market from low quality milk and dairy products. National Food Agency of Georgia (Agency) is eligible to control the quality of milk and dairy products. The Agency intensified its work since 2013, and only in 2014 it has inspected 142 dairy factories, and 35 milk collection centers. 21 factories and 3 milk-collecting centers were imposed with penalties of 400-1000 GEL. The agency controls veterinarian and sanitary norms in terms of processing, packaging and storing. The agency's scope is to inspect and impose penalties for legal entities, whereas its scope does not cover household activities. In addition, it is crucial of importance that there is very limited access to relevant laboratories, that makes almost impossible for small and medium size farmers to permanently control the food quality, even if such desire is on place.

7 Operational productivity– processing, movement, diseases, biological threats

7.1 Processing

Newly obtained milk is cleaned through filtration, for which an extractor in the form of several layers of gauze, cotton, double canvas or other materials is 4 mechanized large farms perform milk filtration with specific equipment.

Newly obtained milk is bactericidal, contains biologically active substances, which limit the spread of bacteria. Those substances are usually active for the first two hours. Following this timeframe, bacteria starts to spread quickly and the quality of milk deteriorates. Due to the latter process it is important to cool milk to +5 degrees, or process it quickly after being obtained. Milk is pasteurized through being warmed up to 72-76 degrees for 15-30 seconds.

Since family farms produce a small amount of milk, they cannot afford to follow all the above mentioned norms of processing in terms of equipment and finances as well. For the same reason local farmers cannot provide transportation of milk to milk collecting centers. Consequently, the only option for farmers is to locally produce cheese, which is easy to store and have high demand on local markets. The medium and large-sized cattle breeding farms also do not use modern technologies for milk processing. Hence, the major dairy products produced within the region are fresh milk and two types of cheese (traditional Imeruli and Sulguni); the processing in most cases is makeshift and the products are targeted for local regional market only.

7.2 Transportation and transhumance

According to the study results, there are two major ways of cow transhumance in Imereti and Racha regions. If the pasture is situated far away from the farm, farmers use special trucks to move their cattle. There is spread old Russian trucks in the region, that can move up to 10 cows on each route. Average price for one route is from 200 to 450 Gel (depends on distance). Long distance transportation has negative effect on cattle, they lose fat and reduce milking. Due to its expensiveness majority of small scale farmers do not use above method.

The second way of cattle transhumance is traditional method, when the shepherd takes cattle and they move itself. The small scale farmers don't have sufficient funds to hire truck for transhumance, so they have to take cows to mountain pastures by themselves. Mostly shepherds are owners of cattle, and they choose the destination which does not need more than one day walking. Due to those problems, there are lots of farmers who don't take their cattle to mountain pastures at all.

As a rule, the small-scale producers deliver their products to merchants working at markets (resellers) by themselves in plastic or glass containers using public transport or ordinary cars (not specially designed for such purposes). When it comes to medium and large-sized farms – they usually have special automobiles designed to transport milk and milk products.

7.3 Diseases and chemical threats

The major threat farmers face are diseases spread among animals that cause their massive decline and non-usability of meat and milk obtained from such animals. In order to prevent the spread of various types of epidemic disease among animals, first of all it is necessary to follow sanitary-hygienic standards, conduct disinfection and systematically use necessary medication.

large-sized farmers have their own veterinarians that permanently control the situation on farms. They target the prevention of disease. Small and medium-sized farms receive similar services from veterinarian pharmacies and individual veterinarians.

In order to prevent the spread of various diseases, the State is conducting preventive vaccinations against anthrax and Turkish disease, as well as laboratory testing to reveal cases of brucellosis. The spread of other diseases are prevented by farmers themselves through on calling the veterinarian, which provides relevant vaccination of animals. Necessary drugs are purchased at wholesale prices by medium and large-sized farmers from Tbilisi.

the level of veterinary services in the country has dramatically declined in recent decades. In practice, there are no qualified veterinarians available, specialists are not re-trained periodically and the system that educates new professionals is not well developed. In addition, due to existing strict environmental regulations, the number of wild animals have significantly increased in the forests of highland regions (Kharagauli, Racha), mainly wolves. As a result the risk of cattle killing or distribution of infectious diseases increased.

8 Supply chain Management – flow of goods and information in the chain

Small-scale farmers either sell their products at local markets themselves or to the wholesalers/resellers via verbal agreements. Resellers store a sufficient amount of products for several days in refrigerators at markets to keep products unspoiled.

Owners of medium and large-sized farms in addition to business relationships with the above described category of traders also established direct contacts with other types of trade entities and public catering services (including kindergartens, prisons, army etc.) delivering products regularly in the agreed amounts. As mentioned by these farms, the agreements are not sustainable as in terms of volume, also time frame. One time they may sell 20kg of cheese and next time up to 200 kg may be required.

There are few wholesaler that transport cheese (Traditional Imeruli and sulguni types) to other regions, mainly to Adjara, Samegrelo, and Tbilisi.

Product and informational flow in the chain takes place mostly in informal way. Negotiations and business deals are arranged just verbally, without any type of documentation. Assessment of product quality is based on farmers' reputation and simple degustation of the product.

9. Human resources, social capital and know-how

9.1 Know-how and access to extension services

The transfer of knowledge in the region in the area of cattle breeding is conducted between farmers based on personal relationships. There are no organized training-educational courses of any type available in the region that would give basic education in the mentioned field to interested farmers. Since the sector in region is traditional, the farmers' knowledge and practice is based on what they learnt from their ancestor. In addition, mainly small farmers' motivation to obtain information and introduce new technologies is very poor.

Despite various donors are time to time organizing trainings in concrete aspects of cattle breeding, the majority of producers have no information on such training opportunities. Therefore, they get free of charge consultations from more experienced farmers, veterinarians or through informational consultancy centers established in every municipality by the Ministry of Agriculture of Georgia

The study demonstrated that despite the interest of some farmers, they have limited access to receiving knowledge and experience in modern technologies enabling intensification of milk production as well as new technologies of milk processing.

9.2 Opportunities of formal education

Veterinary services are the closest field to cattle breeding. Veterinary education can be obtained at various universities across the country (Agricultural University – Tbilisi, University of Akhaltsikhe – Akhaltsikhe) at Bachelor and Masters level programs. However, there are no relevant educational institutions in Racha and Imereti regions.

It is also not possible to take related vocational courses, such as: farming; cattle breeding; butcher; milk technologist, etc.

9.3 Social capital and cooperation

The study demonstrated that the interest and trust from small-sized family farms toward uniting in cooperatives is low.

The quality of cooperatives functioning in a given area is extremely low. However, there are informal ties and relationships among individual farmers in the frames of which they exchange information on food, medication, buyers and other relevant issues. A good and practical example of farmer's cooperation is a joint delivery of animals to summer pastures

10 Institutions and business environment

10.1 Business environment

Despite natural condition in the region is favorable for cattle breeding, this field of business is extremely underdeveloped. It is characterized by extensive rather than intensive development. The amount of production is increasing at the expense of increased numbers of animals and not because the breed has improved.

When it comes to the milk and milk products market in the region, it is characterized by a large quantity of suppliers and consumers, out of which no side is able to influence the price of the product and therefore the latter is determined exclusively through the interaction of supply and demand.

Informal barriers at market are either non-existent or extremely weak. Current dynamics make it possible for a product to easily enter the local market if its quality and price are acceptable for consumer.

10.2 Governmental Support

There is no any declared state policy or program targeted directly on development of dairy production sector. However, certain governmental programs run by the Ministry of agriculture may positively influence and contribute to the dairy sector's development, among these programs are: Produce in Georgia; Concessional agro credit project; co-financing of agro processing enterprises, etc.

Research identified the key areas in which milk and dairy producing farmers require state assistance:

- Access to concessional credit resources. Farmers in general fail to access credit resources,

that they needed for development of farms, particularly for the purchase of breed of animals with higher productivity, installment of modern technologies, purchase of modern equipment, development of food processing etc.

- Increased access to modern veterinary services. Veterinarians shall play crucial role as in terms of animal care and disease protection, also breeding selection. In addition, they are main consultants of the farmers.
- Modern education. Farmers also consider it is important to receive information on ongoing developments in the sector, issues related to breeding of animals, food, medicaments, manufacturing production, etc.

11 Conclusions and Recommendations

11.1 SWOT

S <ul style="list-style-type: none"> • Natural Products • Extensive cattle breeding experience • Existence of alpine pastures (Racha) 	W <ul style="list-style-type: none"> • Low productivity • Lack of modern equipment and technology • Limited access to finance • Lack of managerial experience and low qualification
O <ul style="list-style-type: none"> • State policy targeting local production development • Implantation of highly productive breeds • Developing milk collection cooperatives 	T <ul style="list-style-type: none"> • Usage of milk substituting powders for producing dairy products • Risk of the spread of epidemics

11.2 Prospective for improving and upgrading dairy products value chain

- **Enlargement of farming holding.** The study demonstrated that small-sized farms are less profitable in comparison with relatively bigger farms. Nevertheless, the majority of farms, approximately 90%, are of small-sized (up to 10 cows in each). As a result of enlargement diversification opportunities will also increase.
- **Development of artificial food production practices** and their introduction to farms. Sufficient feeding of an animal substantially influences its productivity. Therefore, there is a need to develop latter field that supplies farmers with high quality food.
- **Implantation of highly productive breeds adapted to local conditions.** Currently, the majority of animals at local farms has very low productivity. Therefore, it is necessary to establish breeding farms in the country. Farmers will then be able to breed highly productive cows. In addition artificial insemination should be widely introduced and accessibility to

farmers increased. Thus small farmers will gain opportunity to improve own cattle breed step by step.

- **Improvement of the quality of veterinary services** and increasing the accessibility of such services thought the country. On these terms, existence of qualified veterinarians and availability of quality medication is essential.

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