Milk and meat sector study

Elaborated by the MOLI project in Kakheti, phase II

Sighnaghi/Telavi, autumn/ winter 2015/16

MOLI IN KAKHETI

HEKS EPER

ABCO Georgia

Table of contents

1 Introduction

The MOLI project aims to reduce poverty in the Kakheti region by developing the milk and meat sectors with the approach "Make Markets Work for the Poor - M4P"; an approach that focuses on promoting incomes in agriculture through improving the capacity and the efficiency of surrounding market players such as:

- veterinarians, artificial insemination providers, feedstuffs, fodder, seeds, fertilizer and other supporting functions in the market system;
- milk processors: primarily local artisanal dairies, secondarily industrial trusts (through milk collection points and intermediaries);
- slaughtering enterprises (together with the milk value chain players – the core of the market system);
- Market players dealing with the regulatory framework; mainly state representatives of administrative or food specific entities, but also existing (informal) rules.

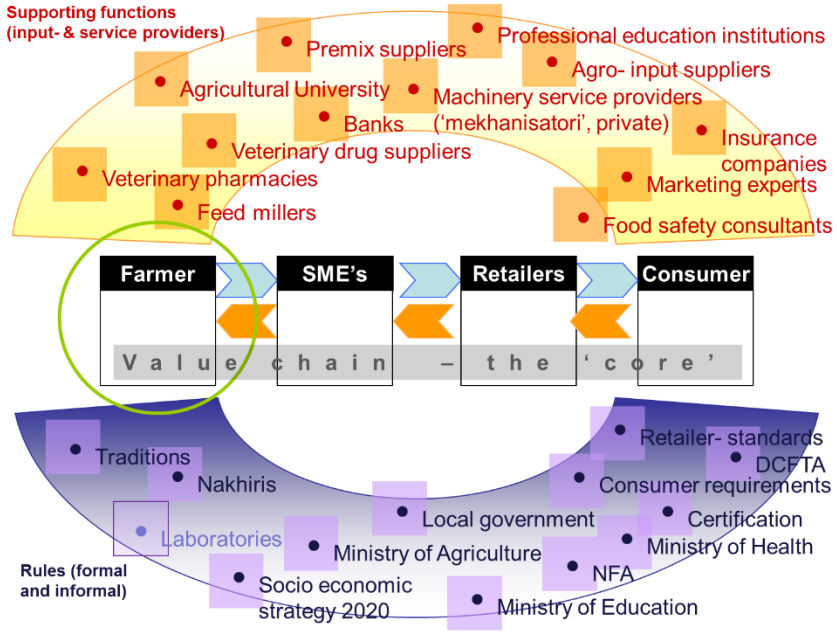

Figure 1 Main players of the livestock market system in Kakheti region

The document reflects the state of the art in the cattle and pig sector. It gives an insight into the properties of these markets. It helps to prepare a common understanding and serves as a fact base to devise, implement and monitor the project activities.

The research was done by a consortium of internal and external specialists of MOLI and ABCO in fall 2015 and then finalised during winter/spring 2015/16. The following authors contributed to the paper (in alphabetical order): Giorgi Beradze, Alexander Gogoberidze, Nino Markozashvili, Lavros Shevardnadze, Elene Tkhlashidze, Davit Varazashvili, Giorgi Zakaidze, Konstantin Zhgenti and were supported by Martin Raaflaub and Stefan Joss.

Working in four teams, they first compiled existing secondary data and completed them with pragmatic field research during the months of September and October. Based on these two main sources of information, the teams carried out thereafter first quantitative, then also qualitative analyses, figuring out some reasons of development in the past, respectively assumptions in which direction, future development might go. In December, MOLI completed the study with insights gained during the end of phase I survey, carried out mainly in the three districts of Dedoplistskaro, Sagarejo and Sighnaghi, respectively data collected during the baseline of phase II (remaining districts of Kakheti region).

2 Objective, expected outcomes and outputs

The **objective** of the study is to:

- understand the overall current market performance and conditions throughout the entire dairy and meat sub-sectors in Kakheti region with links to the national level, where applies;
- allow to the local dairy and meat industry to perform more effectively in an increasingly competitive environment;

The **purpose** of the study is to:

- show the current picture of milk and meat market performance and – based on recent development – draw scenarios for future development;
- enable producers, processors, traders and retailers to better prepare business plans for the future and to increase their sales, profits and position within the domestic market;
- enable MOLI to orient its facilitation endeavours accordingly;
- serve HEKS- EPER and SDC as a reference paper;

The **outcomes** are the following:

- Mapping production areas (Kakheti map)
- Mapping market system 2015 in quantitative and qualitative terms. This includes the profile of main players in the core of the system, their business and relationships with partners. It further covers inter- related service and supply markets as well as the regulatory framework. The map further locates underperformance and potentials of milks and meat market systems;
- Mapping current commodity flows (flow diagram) of milk and meat (products);
- Mapping current market chains (value chain map) for milk and meat
- Comparing the economic importance of meat and milk compared to other agricultural production in Kakheti;
- Characterize prevailing farming types ('survival' strategies of farmers);
- Characterise processing industries, line out growth potentials and constraints;
- Characterise end- user markets (segmentation, preferences, quantities and prices throughout the year);

3 Agriculture in Kakheti region

3.1.1 Geography and climate

In the climatic classification map according to Köppen- Geiger, the climate of Kakheti belongs to class Cfa, a climate class found also on the northern shores of the Mediterranean. Compared to Central Europe, it is relatively warm and dry, with a regular summer drought, most appropriate for fruit, particularly vine, and crops. In Western Europe, in these climatic regions, extensive cattle production prevails on marginal lands and on crop leftovers. There is also some intensive dairy production which is based on fodder crops rather than grassland.

According to the Soviet climatic classification, Kakheti is attributed to the "Upland Steppe Zone"[1]. Beruchashvili attributes the lowlands of the Alazani plain to the "thermo-moderate semi-humid plains", the lowlands of the Iori plains to the "subtropical semiarid plains" and "subtropical semiarid plains and hills" and the hills of Kakheti as well as the upper Iori valley to the "thermo-moderate and humid mountain" zone[2].

The different classification concepts coincide in the conclusion that the main agricultural surfaces of Kakheti are well adapted for crops and fruits. Grassland production is limited by lack of precipitation and the summer drought, for intensive cattle production, moreover, the temperature is more than optimal. Therefore, cattle production in Kakheti is limited to a secondary branch using non-arable secondary surfaces and crop leftovers. Intensive dairy production in stables using fodder crops is possible, however it requires big capital investment.

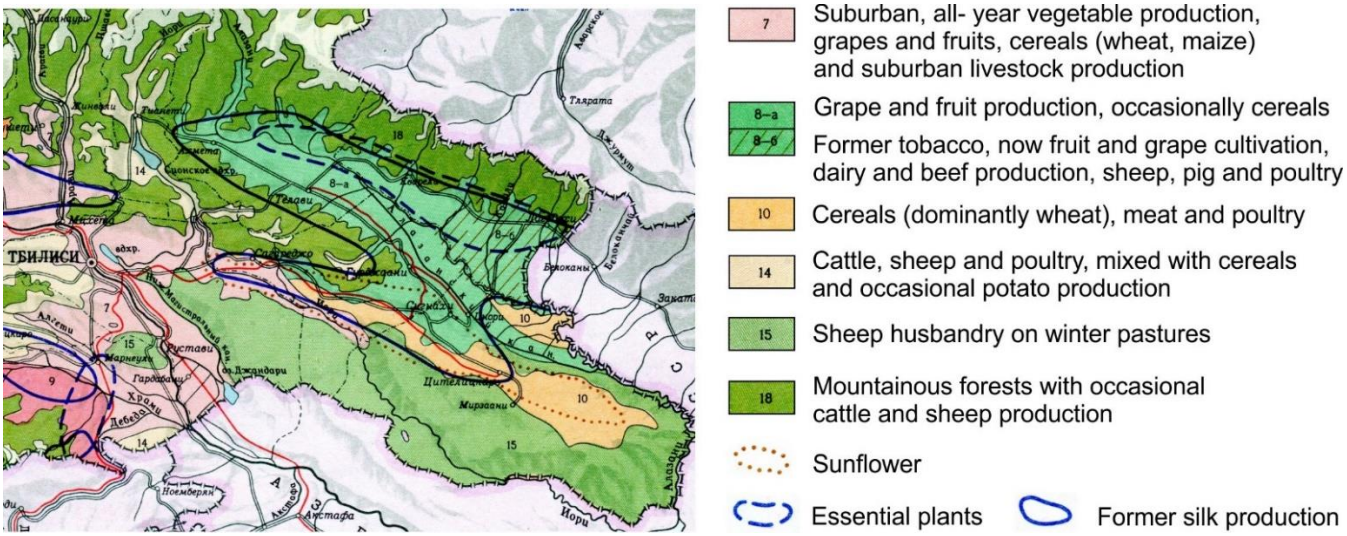

Figure 2 Agriculture in Kakheti region[3]

3.1.2 Population

The rural population of Kakheti region decreased within 15 years by one fourth (from 323'300 to 247'300 citizens), whereas Dedoplistskaro and Sighnaghi have seen the biggest changes; tendencies which are directly related to the perspectives in agriculture (drought prone, respectively hilly- handicapped areas). The drain was less in the plains of the rivers Iori (Sagarejo municipality) or Alazani (Lagodekhi, Telavi, Kvareli). The urban population of the nine towns of the region decreased by 20% to a total of 71'600 citizens (begin 2015). Statistics also show that 80% of the working population of Kakheti region are (self) employed in agriculture[4] - a share that has not changed fundamentally during the last eight years.

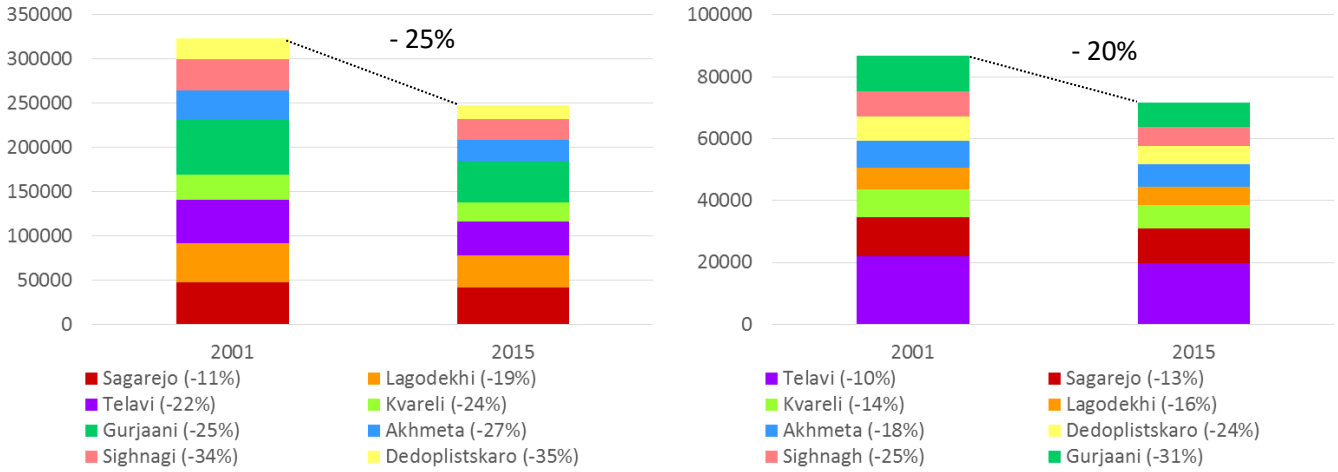

Figure 3 Number of rural (left) and urban (right) population in 2001 and 2015[5]

3.1.3 Land use

38 % of Georgia's agricultural land is in the Kakheti region, where arable lands and pastures occupy the largest area. Consequently Kakheti ranks first within Georgia in these categories of land and is therefore a leading region in the production of cereals and livestock.

Table 1: Land use[6]

	Agricultural land									
	[ha]	Thereof								
		Arable land				Permanent crops				Pastures
			thereof				thereof			
			temporary crops	fallow land	non cultivated		Orchards	berries	vineyards	
Georgia	839'709	56%	47%	1%	9%	12%	4%	0%	4%	32%
Kakheti region	254'137	52%	42%	0%	9%	10%	1%	0%	9%	38%
thereof municipalities:										
Akhmeta	39'201	24%	19%	0%	5%	3%	0%	0%	3%	73%
Dedoplistskaro	57'473	61%	55%	1%	5%	2%	0%	0%	2%	37%
Gurjaani	23'903	59%	37%	0%	21%	33%	7%	2%	25%	8%
Kvareli	16'263	61%	42%	0%	19%	26%	3%	0%	23%	14%
Lagodekhi	15'397	90%	67%	0%	23%	8%	1%	0%	7%	2%
Sagarejo	28'640	53%	42%	1%	10%	10%	0%	0%	9%	37%
Sighnaghi	56'453	41%	40%	0%	1%	5%	0%	0%	5%	54%
Telavi	16'807	66%	46%	0%	20%	25%	2%	0%	23%	9%

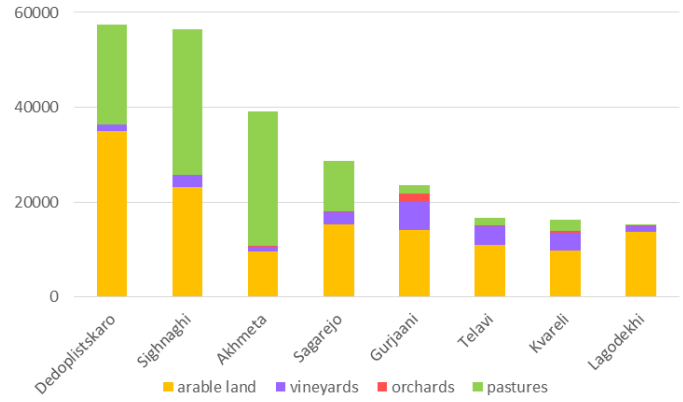

Figure 4 Use of agricultural land [ha]

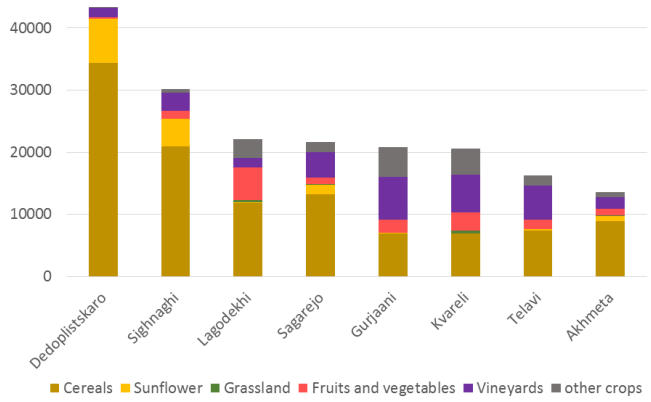

Figure 5 Main annual and perennial crops [ha]

The use of land is given in Table 1 and for comparison in absolute figures in the annex (Table 40). The two charts above give an idea of the total areas of agricultural land (Figure 4), respectively the structure of crops in each of the eight municipalities and reflect the regional agro- climatic conditions of the Kakheti region. Implicitly it also makes clear that a trade of roughage and cereals is necessary when milk and meat shall be produced in each municipality.

In detail, it can be observed that almost 70% of arable land in **Kakheti region** (except pasture lands) is used for crop production. Unfortunately, most of cereals produced in Kakheti (like in other parts of Georgia) are of low quality. The full amount of barley and oats produced here is used for feed production. Only 10% of maize produced is used for food and the rest for livestock feed production. Of low quality, still 80% of wheat produced in Kakheti is used for food production. All that is caused because of scarce knowledge in crop production by farmers, old machinery, mis-treat of soil and one of the main – not using of proper seeds.

In **Kvareli** Municipality, 50% of arable land is used for perennial crops (59% of it hold vineyards) production and al-most 75% of cereals produced here holds maize; this is caused by climatic conditions of the area more suited for maize production. Added to it, the area has natural advantage in terms of irrigation.

In **Sighnaghi** Municipality more than 80% is used for cereal production and more than 10% for perennial crops. This is mainly due to not irrigated land and climatic conditions, which narrows agricultural directions. 82% of perennial crops produced here hold vineyards. Though Sighnaghi is not “the best” place for grape production; it applies to cultural traditions of the region. Fodder grass production is new for the area, but the tendencies show that it is emerging direction.

Almost 70% of the arable land in **Sagarejo** Municipality is used for cereal production. This is caused by mainly having not irrigated arable land, which makes impossible to produce other crops there. In terms of perennial crops almost 75% of it holds vineyards. Mainly vineyards are in northern part of Sagarejo, where the area is more suitable. The irrigated part of arable land in Sagarejo Municipality is mainly used for fruit and a few for vegetable production.

In **Lagodekhi** Municipality, more than 50% of arable land is used for cereal production and almost 90% of it holds maize; this is (like in Kvareli Municipality) caused by climatic conditions of the area more suited for maize produc-tion. Added to it, the area has natural advantage in terms of irrigation and humidity. All above mentioned makes the Lagodekhi Municipality diverse in agricultural directions: 20.8 % perennial crops and 23.4% for fruit and vegetables. It is the only municipality where vineyards hold the least area in comparison to other agricultural crops.

In **Telavi** Municipality the share of cereals (46.7%) is almost the same as of perennial crops (43.5%). This is due to climatic conditions of the area. Fruit and vegetable production is common as well

As **Dedoplistskaro** Municipality has only little irrigated land at all, almost 96% of arable land is used for cereal pro-duction. Fodder grass production is new for the area, but the tendencies show that it is emerging direction. Eastern part of Dedoplistskaro (private sector) tries to produce perennial grass seeds – mainly sainfoin.

Gurjaani Municipality is most diverse in agricultural direction, which is strengthened with irrigation systems (rehabil-itated a few years ago), climatic conditions and productive soil. That’s why farmers here produce more perennial crops (56.1%) and vegetables (10.3%) with still quite share of cereals (33.6%): mostly maize and wheat.

In **Akhmeta** Municipality there is a scarce, low productive soil and climatic conditions are more severe compared to other municipalities of Kakheti region. In southern part farmers are busy with cereals, perennial crops and fruit pro-duction, while northern part is mainly busy with sheep breeding.

A comparison of **land use over time** is difficult, since two different data sources are taped. Table 41 in the annex compares the figures of arable land in 2005 provided by GEOSTAT with those collected ten years later from the local ICC's. One can observe a status quo in Kvareli, Sighnaghi or Telavi, an increase of arable land mainly in Lagodekhi and a decrease in Dedoplistskaro, Sagarejo or Gurjaani. All of them are remarkably high and were in the case of Gurjaani confirmed during the baseline survey 2015. Farmers in many villages reported how much of their land has been converted into vineyards in the last years. Even when using different data sources, one may say that land use, respectively agricultural systems are demerging in most areas of the Kakheti region and getting more specialised. Apparently farmers increasingly capitalise comparative advantages provided by land and climatic conditions for an increasingly market oriented production.

3.1.4 Land ownership

According to statistics, but also confirmed in discussions with farmers or authorities, only 20- 25% of land owners have registered their agricultural lands in the national agency of public register. The MOLI baseline survey of 2012 showed even that only 2-4% of land owners have registered land as their property. This figure is higher today and the forthcoming law on land registration is supposed to boost the registration process additionally. On the other hand, it will neither unleash dynamics since for instance cooperative development is slow, not leading immediately to more registered land.

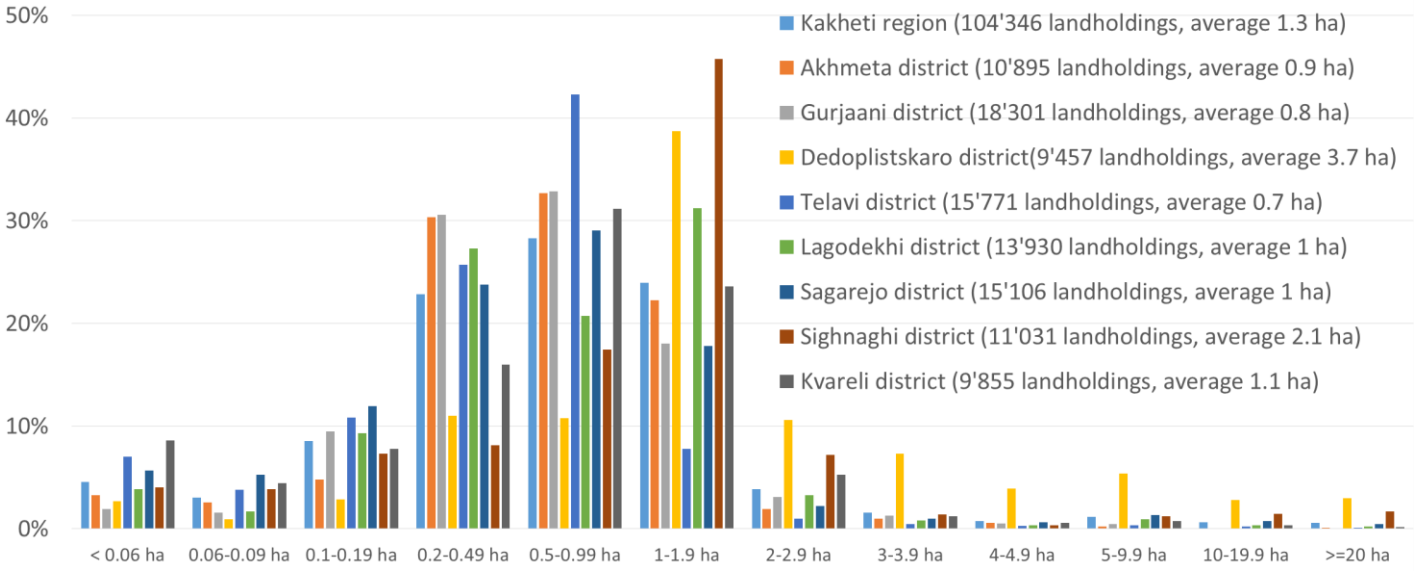

Figure 6: Holdings of arable land in Kakheti region[7]

As given in Figure 6, the average area of a family farm in Kakheti region was in 2005, 1.3 ha; with a variation from 0.7 ha in Telavi or 0.8 ha in Gurjaani up to 3.7 ha in Dedoplistskaro district. Although liberalised, the land market is not very dynamic and the size of holdings remained the same over the years[a]. Landholdings are in average split into two or more parcels[8]. According to GEOWEL, 'structural problems such as the size of land-plots does not create an insurmountable problem in the agricultural sector'[9].

3.2 Sector performance

3.2.1 Gross output

Nowadays, agriculture contributes some 9% to the national gross domestic product of Georgia[10]. In absolute terms, there was growth in the last ten years, as shown in Figure 8, but on national level mainly due to higher prices - not productivity.

[a] *GEOSTAT carried out in 2014 a pilot farmer census in some districts and was supposed upscale it to national level. After that, more recent data on landholdings will be available also from Kakheti region.*

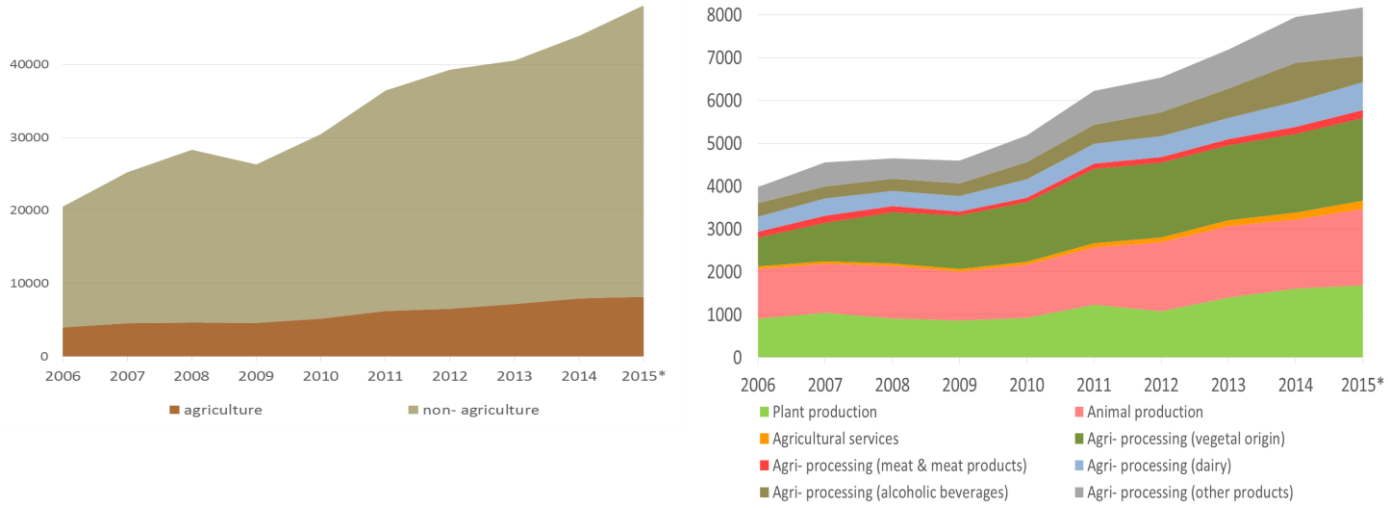

Figure 7 Agricultural gross output; as part of the total output of the GE economy (left), structured by production & processing (right)

In fact the national output of meat is today lower than ten years ago, milk is some 10% above the level of 2006. The gross outputs of processing (both, milk and meat) are low, which means there is little value added. On the other side, the farmer receives a relatively high part of the consumer's price. This rather archaic system contradicts with consumption habits of urban citizens who increasingly prefer readymade products, respectively supermarkets, which are streamlining their product- handling. The output of services tripled, but still is marginal in the overall picture (orange area in Figure 7). The services are linked to the (modest) production and (lean) agri- markets, reflecting an extensive and little diversified agriculture.

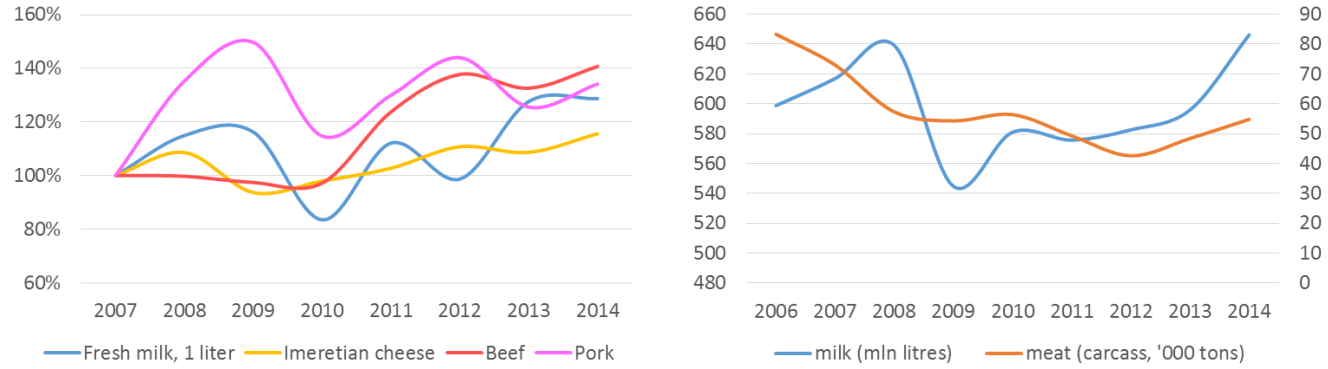

Figure 8 Price development (inflation adjusted) of main livestock products between 2006 and 2014 (left) and the development of national milk and meat production (2006 - 2014) – right

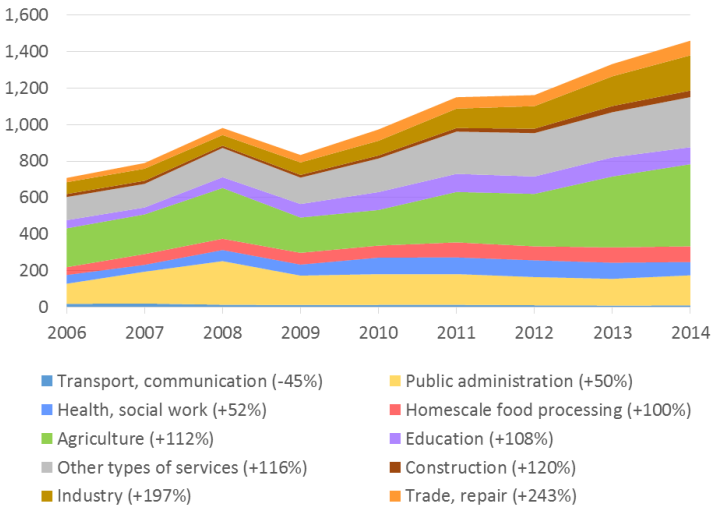

Figure 9 GDP of Kakheti region (at current prices, mil. GEL)

Figure 9 shows the change in the gross domestic product of Kakheti region, whereby the percentage in the legend indicating the change between 2006 and 2014. One can note a growth before 2008, then a cut due to the Samachablo ('South Ossetia') crisis and after that a continuous growth. Nowadays agriculture contributes 29% to the gross product of the region, which is among the highest in Georgia. Livestock production increased by 38% between 2006 and 2014 and plant production by 77%, whereas wine contributed most to the growth. Like on national level, the gross output of agricultural services is marginal in Kakheti region and – as on national level – one can observe a standstill in processing. The latter however might change since many projects have been launched recently.

3.2.2 Productivity

As mentioned above, two factors build the gross domestic product outputs and prices. Prices are mentioned above. In terms of produced outputs (volumes), the performance of the sector is given in the annex (Figure 27). While comparing the milk numbers of 2006 and 2014, one can see that Kakheti increased the output by 32% (from 37.4 to 49.2 mln litres), but mainly thanks to a production increase (from 900 lt/ cow and year in 2006 to 1'072 lt in 2014) rather than the number of cows, which in fact reduced by 21% to 53'900 heads in 2014. However, 1000 lt per cow and year are a low level and far behind the 2014- figures of Imereti (1'415 lt) or Samtskhe-Javakheti respectively Shida Kartli with both more than 1'600 lt of milk per cow and year.

Meat outputs of Kakheti region decreased between 2006 and 2014; beef by 55% and pork by 15%. In beef, the number of cattle increased (by 23% to 119'500 heads in 2014), but productivity decreased drastically from more than 100kg carcass - weight in 2006 to 70 kg in 2014. With hogs and pork meat, the opposite is the case; the number of animals decreased due to the African swine fever outbreak in 2007/2008 and was in 2014, 37% lower than 2006. On the other side, pig fattening has seen a productivity increase from 71kg to 94 kg meat per animal, which is mainly due to the increased availability of concentrate feed.

In plant production, it is interesting to observe that yields in Kakheti are generally lower than other regions of Georgia (Table 2). In wheat for example, the average yield of 2013 (1.8t/ha) and 2014 (0.9 t/ha) is 31% below the level of Shida Kartli or 13% below the Georgian average.

Table 2 Average yields in Kakheti and other regions of Georgia[11]

	Average yield[b] in Kakheti [t/ha]	Compared with		Georgia
Wheat	1.35	-31%	Shida Kartli	-13%
Barley	1.05	-46%	Samtskhe-Javakheti	-19%
Maize	2.45	-40%	Guria	4%
Beans&peas	0.5	-33%	Samtskhe-Javakheti	-9%
Vegetables	7	-38%	Samtskhe-Javakheti	-10%
Gourds	26.25	-3%	Kvemo Kartli	12%

3.2.3 Self sufficiency

As given in Table 3, Kakheti is self-sufficient only in grapes, maize, vegetables, milk/ milk products and pork. In wheat it is in a better position than Georgia as a whole, but still falling short by 29%; a percentage that in reality might be even bigger, given the fact that much local wheat is used for feeding. Alike wheat, there is a deficit in barley. Calculated for cattle alone, it makes more than 80%. If pig feeding would be considered as well, it would be even higher. In maize the provision is fine, but also here one should take the feeding – mainly of poultry – into account.

[b] *Average yields of 2013 and 2014*

Table 3 Production of main food commodities, consumption and self-sufficiency in Kakheti in 2014[12]

	Production	Human consumption		Cattle feed	Balance	Self sufficiency	
	[t/y]	Per capita [g per day]	Total Kakheti [t/ y]	[t/y]	[t/y]	Kakheti	Georgia (for comparison)
Wheat	25'900	312	36'274		-10'374	71%	8%
Barley	6'400			36'552	-30'152	18%	
Maize	75'000	66	7'636		67'363	982%	92%
Vegetables	46'000	153	17'819		28'180	258%	70%
Grapes	171'300	82	9'546		161'754	1'794%	141%
Beef	2'100	17	8'591		-6'491	24%	70%
Pork	2'800	22	2'545		254	110%	42%
Milk (products)	54'600	394	45'820		8'779	119%	91%

While table 3 indicates the overall performance of the agricultural sector of Kakheti region, it is important to note that these outputs still were produced by a minority of all farms. Referring to Figure 6: Holdings of arable land in Kakheti region - where one can see that 2/3 of farmers have less than one hectare of arable land – or Figure 11, which shows that only one third of farmers have cattle, the figures of undp (Table 4) might be correct for 2005. As statistics also show, the number of market oriented farms has increased, however the majority of rural households might be rather considered as rural citizens than farm (entrepreneurs).

Table 4 Kakheti Farms producing for Self-Use by Municipalities in 2005[13]

Municipality	Number of 'farms'	Producing for self-consumption	Share [%]
Akhmeta	11'100	10'800	98%
Telavi	20'300	18'700	92%
Sagarejo	16'900	15'600	92%
Dedoplistskaro	10'200	9'300	91%
Kvareli	10'700	9'400	87%
Gurjaani	22'700	19'100	84%
Lagodekhi	14'500	11'100	76%
Sighnaghi	12'200	4'500	37%

3.3 Plant production

Table 42 in the annex provides detailed figures of areas cultivated with main agricultural crops, confirming also the information provided in the map above (Figure 2):

Dedoplistskaro	is a region with predominantly cereals (wheat barley) and sunflower.
Gurjaani, Kvareli and Telavi	are wine regions, with extensive orchards, but Kvareli having also considerable areas under maize
Lagodekhi	predominant are maize, fruits and vegetables
Sagarejo and Sighnaghi	have a more diversified plant production; cereals, sunflower (Sighnaghi) and wine (Sagarejo)

Compared with the national level (see also Figure 25 in the annex), Kakheti contributes lions shares in grape and gourd production to the national outcomes. As can be seen in Figure 10, wheat was one of the major crops. The harvested quantities however are in decrease as also areas are decreasing. In wheat regions like Dedoplistskaro, fields are often so much infested with weeds that a harvest does not pay or where farmers got unsettled due to losses during years of drought (e.g. 2014) and increasingly refrain from sowing technical crops. Yields of grapes and gourds tendentially keep increasing and thus the share of Kakheti among the national production. Also yields of maize and vegetables keep increasing, however on a much lower level than for instance grapes.

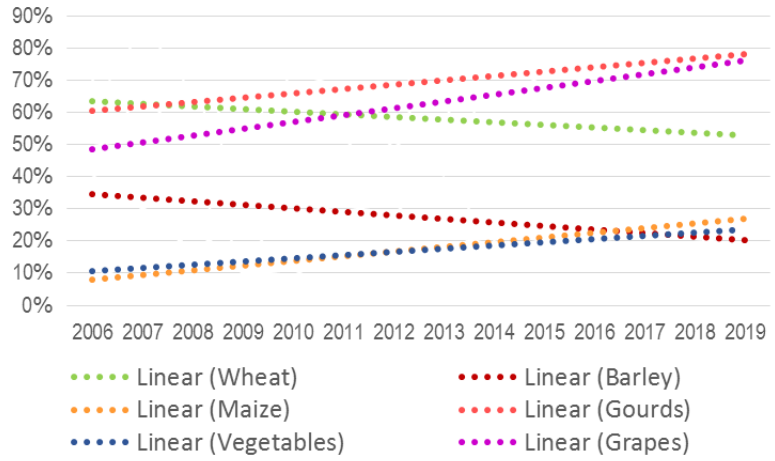

Figure 10 (linear) tendencies of plant production in Kakheti (shares of national production as facts 2006-2014 and projected trends 2015 - 2019

The standard widespread wheat varieties in Kakheti are: *triticum vulgare* 1, *copper*, *spartanka* and others. As other cereals, many farmers use to resow some of the wheat of the previous years, which make it susceptible to seed borne disorders such as loose smut (*ustilago nuda*), bunt *(tilletia tritici)*, blights (*microdochium*) or types of *Septoria,* respectively *Fusaria.*

Among autumn cereal crops of Kakheti, barley is the second most important used primarily for animal feed. As Kakheti is one of the largest producer of livestock, barley production is quite important here so there is a great potential for its growth. Farmers in the Dedoplistskaro and Sighnaghi municipalities produce a relatively large amount of barley for selling, whereas farmers in the other municipalities of Kakheti produce barley for feeding their own livestock.

Since 2006 Kakheti has become the third region in Georgia in terms of area under corn, preceded only by Imereti and Samegrelo- Zemo Svaneti.

It is noteworthy that farmers do not take good care of soil and do not apply the necessary amounts of mineral or organic fertilizers. Due to the poor management of soil (e.g. crop rotation, sub- optimal cultivation), lands are often infested with weeds. Due to a large number of animals grazing on pastures there is a process of desertification, especially in Sagarejo and Dedoplistskaro. Most agricultural lands are affected by soil erosion caused by wind and water.

Table 5 Wheat Production by region, 1999 - 2007 (t)[14]

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Georgia	226	89	307	200	225	186	190	70	75	80.3	53.9	48.4	96.8	80.7	81.0	50.2
Kakheti	93	43	193	84	105	87	97	43	62	52.7	22.2	23.6	47.1	53.0	60.1	25.9
Kakheti share	41%	48%	63%	42%	47%	47%	51%	61%	83%	66%	41%	49%	49%	66%	74%	52%

Table 6 Wheat Production by Municipalities, 2001-2005[15] and 2015[16] [tons]

	2001	**2002**	**2003**	**2004**	**2005**	**2015**	Average wheat yield in 2004 '05 [t/ha]
Dedoplistskaro	68850	14430	40000	31544	35354	41750	2.0
Sighnaghi	29680	22000	18500	18000	26260	59524	2.0
Sagarejo	15813	6 300	10100	8365	13389	11730	1.55
Kvareli	2 000	8 235	11000	6207	6655	10008	1.8
Telavi	13668	11800	4216	5600	5300	3471	2.15
Akhmeta	17180	11 415	12650	8600	3840	9716	1.8
Gurjaani	13268	7000	5720	6750	3900	5443	1.75
Lagodekhi	6754	2875	2847	2210	1918	3506	1.55

3.4 Animal husbandry in Kakheti region

Unlike suggested by the title, the present chapter deals with cattle and pig production only. Sheep, poultry or other types of animal husbandry are not in the focus of MOLI II.

3.4.1 Number of animals – cattle

The number of cattle gradually increased during 2010-2014, both on National and Kakheti level. The sharpest increase in cattle numbers occurred in 2013 (both in country and in Kakheti as well, increased by 100.9 thousand heads in total and by 18,000 heads in Kakheti), which coincided with the highest volume of live cattle export from Georgia. The drop in cattle numbers in Kakheti region in 2014 was produced by drought occurred in 2013, which forced Kakheti population to decrease number of cattle due to lack of animal feed.

Among the other municipalities of Kakheti, Gurjaani has the smallest stock of cattle – 9.3 thousand, and Sagarejo has the largest – 32.3, followed by Dedoplistskaro Lagodekhi, Akhmeta and Sighnaghi (see also Table 43 in the annex).

Table 7 Number of livestock in Kakheti region[17]

	Cattle	thereof milking cows	Sheep	Pigs	Poultry
Kakheti region	152’375	98’000	438’784	41’918	1’291’641
Thereof Municipalities:					
Akhmeta	20’900	18’810	45’050	8’200	146’065
Dedoplistskaro	23’000	8’225	30’000	6’840	73’540
Gurjaani	9’301	5’574	21’300	5’325	105’690
Kvareli	14’920	13’100	40’150	4’230	100’580
Lagodekhi	21’568	19’331	14’200	2’800	100’300
Sagarejo	32’370	14’220	230’034	4’740	601’890
Sighnaghi	20’426	14’310	49’285	5’073	39’740
Telavi	9’890	4’430	8’765	4’710	123’836

Table 8 Number of animals per farm on national level

	2006	2011	2012	2013	2014	2015	Change[c]
Cattle	1.2	1.2	1.3	1.5	1.5	2.4	124%
Pigs	0.6	0.2	0.3	0.4	0.4	0.7	65%

The structure of cattle ownership is shown in Figure 11, and the corresponding numbers can be found in the annex. Both, figure and table show that from the total 118’559 rural households (’farms’) in Kakheti region, only 34% have cattle. These numbers are contested by specialists, arguing that for instance in Akhmeta more farmers have more cattle and that it is not clear, why Lagodekhi has such high number of farmers in the cluster of 3-4 animals. As MOLI applies a stratified sampling in its baseline- and farmer- survey, no reference data is available and the statistical information on one side and observations in the field on the other, shall remain for the time being in this report as they were collected.

[c] *Taking into account a decrease of the rural population (and thus parallel the number of farms) by 25%*

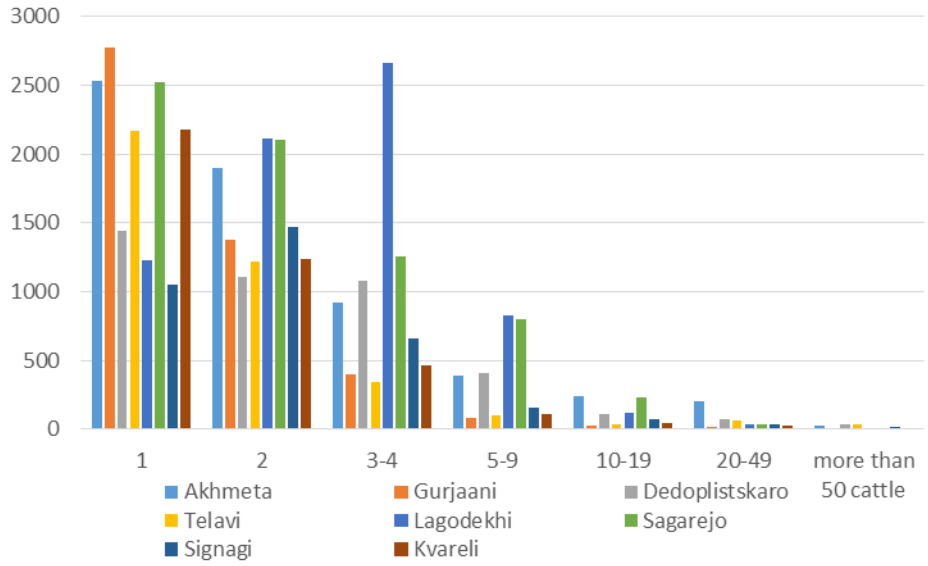

Figure 11 Number of cattle owners by herd- size[18]

3.4.2 Number of animals - pigs

After the spread of severe disease – pig flu in 2007, which was raging throughout Georgia, almost 90% of pigs in Kakheti region died and farmers were reluctant to restart pig breeding; but for the last 2-3 years this direction started emerging. In the beginning of 2016, a new outbreak was reported (11 cases of swine flu by the end of January)[19].

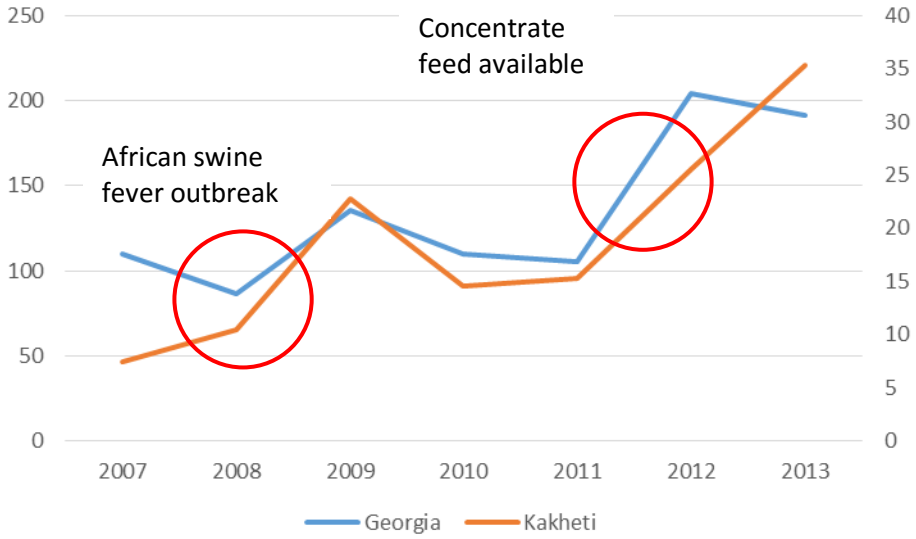

Figure 12 Number of '000 heads of pigs in Georgia (left scale Georgia, right – Kakheti) between 2007 and 2013

As for the farm types and sizes, peasants usually have 1-5 pigs, small and medium sized farms have from 20 up to 150 heads. There is only one large pig farm in Georgia located in in village Akaurta of Bolnisi municipality (Kvemo Kartli region) belonging to "ABD Georgia Ltd". The breeds used by the ABD Georgia pig farm originates from Denmark, and consists of the piglets of Landrace, Yorkshire and Duroc breeds. At the farm are raised more than 20'000 heads of pedigree piglets.

Small-scale pig farmers usually feed their animals on food leftovers. In Kakheti one may find exceptionally small farms, which leads to complicated structure including high cost for logistics for traders and slaughterhouses, as well as contains high risks of epidemic diseases. Implementing and controlling of epidemics prevention measures is more complicated with a big number of small, widely scattered farms.

3.4.3 Feeding

One of the major problems exists in poor feeding ration and improper livestock care practices common among local livestock farmers. Farmers in their majority are feeding their cows with only half of the necessary rations. As a result, the output of milk is low and lactation period is short. For instance, the average annual output of one cow in Kakheti

region is 1000 litres of milk and average lactation period is 7, 5 months. Another problem is related to calves' feeding. The majority of farmers feed their calves by the so called method of "free suckling" which means that after milking of a cow, the calf is set to mother cow for suckling. In such case, farmer loses twice as on one hand, the most nutritious fraction of milk is utilized by calf and on the other hand, it remains absolutely unknown as how much feed (milk) is consumed by a young calf per day. As result of such practice, in most cases, young calves from the very first days of their lives suffer from insufficient feeding which is further negatively reflected on their future healthy development

3.4.4 Cattle feed production

Basically, livestock feed consists of roughage (pasture/ grass or hay) and concentrates.

The majority of local farmers have no idea about which particular period of summer is specifically optimal for preparation of hay and mistakes are frequently made during the drying and storing of hay. There is no practice for grass silage production existing in Georgia. Also, over the recent period, nobody has been producing such effective crops as beetroot, turnips, forage potato, corn for silage etc. The concentrated forage is not used at all or used only in small quantities by the majority of farmers.

Pasture biomass grows follows the rainfall patterns and is therefore very unequal between seasons and years. As no buffering measures (excluding areas for haymaking in periods of high growth and feeding it in dry periods) are applied on pastures, the nutritional status of cattle and pasture utilization vary greatly through the year and over the years. This makes defining or implementing a carrying capacity difficult or even futile.

There exists crop fodder production based on sowed alfalfa and sainfoin, based on plural- annual use. For shorter inter-crop intervals, farmers prefer to leave fields fallow than planting a fodder crop, because the seeding cost is considered prohibitive.

Cattle farming practices

There are three methods of feeding cattle for beef production:

1. **Grazing Method** - when in spring and summer, calves are usually kept in grazing areas and not given any additional food. Then 5-6 months calves are sold in autumn;
2. **Non- or zero grazing Method** - when in autumn and winter calves are usually kept in winter sheds and given hay, mixed fodder and additives;
3. **Mixed Method** - unites both above-mentioned methods;

Feeding of milking cows: depending on the region 212 hay feeding days, 153 grass feeding days. However many farmers don't have hay at all and are in severe winters – buying it.

- Peasants use only Grazing Method;
- The rest two methods are used by small and medium farmers having relatively large farms (from 20 up to 200 heads);

3.4.5 Pasture management

There are serious problems in the local pasture management. To provide the required quality of fodder, it is necessary to ensure the rational utilization of natural grasslands. In this respect, over the last 20-25 years there have not been conducted any relevant agro technical actions (seeding of beneficial grass, fertilization, control weeds, etc.) for increasing productivity of natural grasslands within the targeted area. As a result, productivity in some areas has reduced to 5-10 centres/hectare and productivity of 1 kg of green mass has reduced to 0.02-0.05 feeding units

The alternation of pasture plots could be an alternative option. It implies the split of a natural pasture owned by a farmer (a community of farmers or peasants) into four to five equal plots and putting of cattle to graze in them in turns; the periodicity of the each grazing should make a period of five to seven days. Such an approach guarantees the increase of the pasture productivity. It is stated that during free grazing, an animal consumes only 60-70% of the total pasture crop (the rest is treaded down or remains unused), while at grazing with alternation of plots, this indicator achieves 83-85 %; it promotes the normal vegetation, increase of the specific portion of beneficial grass in it and a rational application of natural pastures. It also allows application of measures for pasture improvement and enables avoidance of a threat of propagation of parasitic diseases of the intestinal system of animals. Further information can be found in the MOLI pasture report.

3.4.6 Animal health

Apparently, all the three South Caucasus countries keep struggling to epidemics (swine fever, food and mouth disease, Newcastle diseases, different types of bird flew). OIED provides the information as given in Table 9).

Table 9 Current situation of cattle diseases[20]

	Domestic		Wild	
Disease	Notifiable	Status	Notifiable	Status
Anthrax	Y	Disease present	y	Absent since 2001
Brucellosis *(Brucella abortis)*	Y	Disease present	y	Absent since 1998
Ecchinococcus granulosus	Y	Disease present	n	Absent since 2003
Rabies	Y	Disease present	y	Disease present
Trichinellosis	Y	Disease present	y	Absent since 2004

Figure 13 illustrates the situation of brucellosis and echinococcosis in Georgia. Experts even report, 'the highest human incidence of brucellosis in the country of Georgia is in the eastern region of Kakheti'[21]. Brucellosis figures are also provided in

Table 50, which is part of a study of the University of Colorado in 2011 (unfortunately not providing the economic dimension linked to the brucellosis cases). According to MOLI staff the situation has improved for the last five years and also this information would need an update. As Brucellosis keeps virulent for decades, it is important to keep vaccinating and controlling the animals (blood tests) and also assure a safe processing (pasteurization of milk, no crossing in slaughterhouses, and no consumption of raw meat).

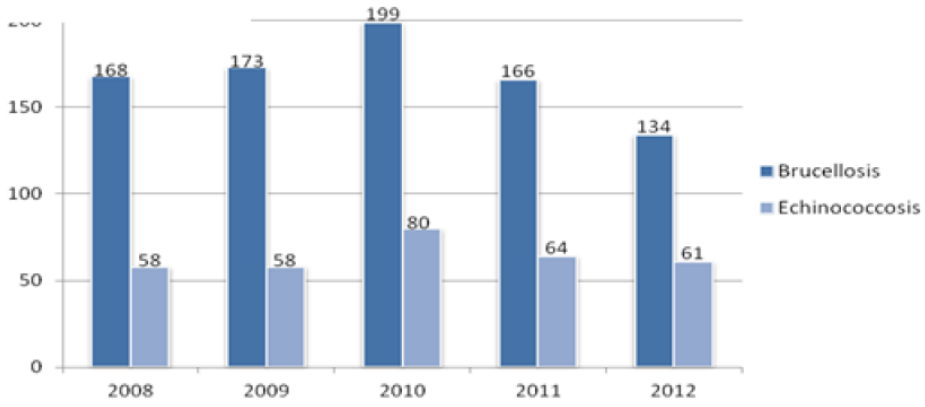

Figure 13 Occurrence of brucellosis and echinococcosis in Georgia[22]

Linked to the diseases are issues related to proper veterinary services and the care to livestock. Non-existence of supply and distribution system of necessary veterinary medications and other markets to obtain veterinary products of acceptable quality. This, in combination with high prices, makes veterinary products unaffordable for a great number of local farmers.

It is also true that proceeding from the already mentioned insufficient general level of education and awareness among farmers, many of them do not even contemplate to apply necessary veterinary means until they are faced with problem of losing their livestock.

Another problem relates to the veterinary specialists available in the target region. Generally they are over 50 of age and their majority are not familiar with modern effective methods of diagnostic and treatment of cattle diseases and do not have information on effective medicaments which are available in the country. For further information about the veterinary service, see chapter six.

3.4.7 Genetics/pedigree

Currently, majority of local farmers employ the method of natural insemination which becomes the frequent cause of transferring disease from one cow to another. At the same time, local bulls have quite low genetic potential. Low level of the cattle breeding practice remains to be another major problem. After the proper feeding, rising of the livestock genetics is the main important guarantee for ensuring the increase of dairy production and it is basically connected with improvement of bloodstock. In average, approximately 50 % of the milk yield is due to breeding pro-

gress. A very important part of a successful breeding is avoiding of an in-breeding. An in-breeding of 1 % corresponds to the same level of decrease in milk yield. There are herds in Georgia where rate of in-breeding can be as high as 20-30 % which is expected to give 1 litre less milk per cow and day. Besides inbreeding, juvenility (the age at the first calving) and stress are factors which equally decrease productivity [23]

Besides feeding or health care, the introduction of artificial insemination method will have positive impact on improvement of breed characteristics and productivity of local livestock and the increase of the current volume of milk yield. Having health and feeding at the state of the art, then a better breed can increase productivity by the double.

3.4.8 Animal housing

Existing cattle housing also presents quite a problem. Within the commonly used facilities, ventilation of air is generally poor and there are no mechanical manure excavating systems used. As a result, cattle stand and lay in a mix of manure and slurry, i.e. a moist atmosphere of Ammonia, which negatively affects both the milk output and general animal health. Practically, no farmer organized a walking yard for cattle. Accordingly, during the winter time, the majority of them are sending their cows "for pasturing". It is some sort of day - long distance (10-14 km) promenade, during which cows are losing energy and farmers are also paying for herdsman services, the so- called Nakhiris.

Unfortunately no research have been carried out what benefit improved housing can bring. With healthier animals (e.g. less claw disorders, less udder infections from unclean bedding) and which are less stressed, the gain is at least ten percent).

3.5 The economy of livestock farming

3.5.1 Key data on farm economy

Data on the origin of household income clearly show the importance of farming in Kakheti region; the sales of agricultural products contribute much more to the household income than in Georgia generally, also more than in any other region of Georgia (data not published here), while the share of wages is much lower. This is due to the great amount of agricultural activity and further accentuated to the production of agricultural products with high market value (wine, fruit).

Table 10 Origin of household income, in % of the total income[24]

	Kakheti	Georgia in total
Wages	21.8	37.8
Self-employment other than agriculture	9.1	8.8
Sales of agricultural products	20.0	8.2
Property income (interest from capital, …)	0.3	1.1
Pensions, scholarships, assistances	22.7	17.5
Remittances from abroad	2.6	4.2
Gifts	9.6	12.0
Non-cash income	13.8	10.4

According to Geostat, the unemployment rate in Kakheti has decreased from 11.1% in 2010 to 5.2% in 2014, far below the national average (12.4% in 2014). This low number is, however, strongly biased by the practice that apparently every person owning more than 1 ha of land is considered to be self- employed as a farmer[d].

3.5.2 Farming systems and agricultural income in Kakheti region

As mentioned above, there are a few specialised farmers in Kakheti region and especially small scale farmers keep a wide range of animals. In its phase II baseline survey, MOLI deviated from stratified sample 15 different combinations of cattle, poultry, pig and sheep farming (see diagram in Figure 14). The numbers are given as absolut figures of the survey, i.e. a generalisation, let alone an extrapolation to the entire Kakheti region is not possible. Still interesting is the observation that 105 farmers keep three or more types of livestock, which is almost every second of the 218 interviewed farmers.

[d] *No data on beneficiaries of social payments are available as these data are mixed with pension payments, confounding social status with age pyramid.*

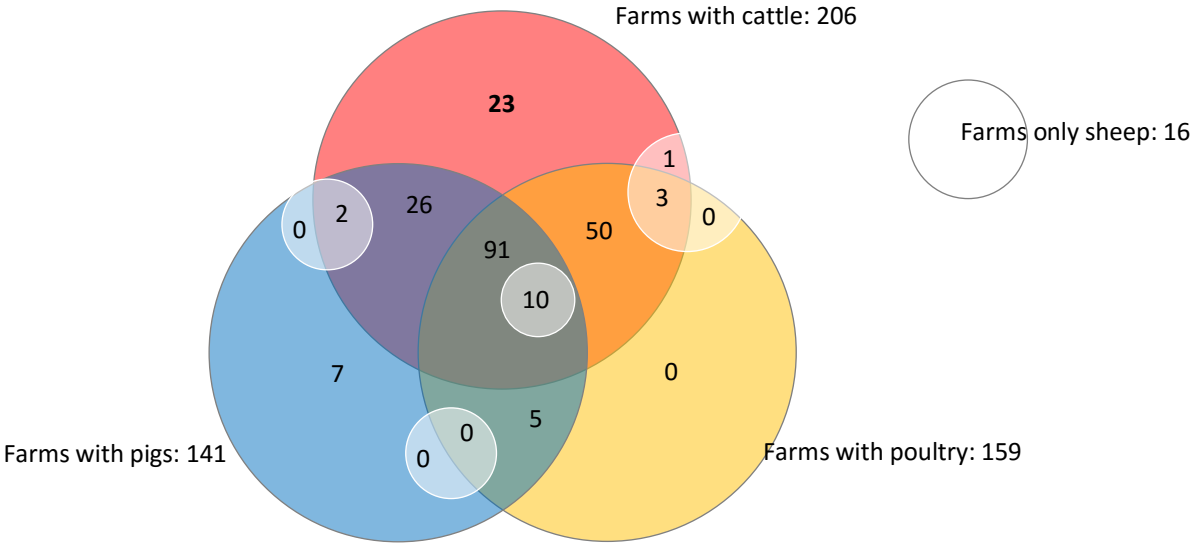

Figure 14 Variation of livestock farms encountered during the MOLI baseline [absolute numbers of respondents]]

Ranking the incomes, one notices that ten farms, which raise cattle& pigs& sheep & poultry managed an average gross income of more than 12'000 GEL per year, whereas cattle & pig- farmer managed 4'000 GEL less. The most popular combination is cattle & pigs & poultry (81 farmers), which however brings barely 5'000 GEL per year. Again, these numbers reflect the outcome of the MOLI II baseline and may provide at its most tendencies.

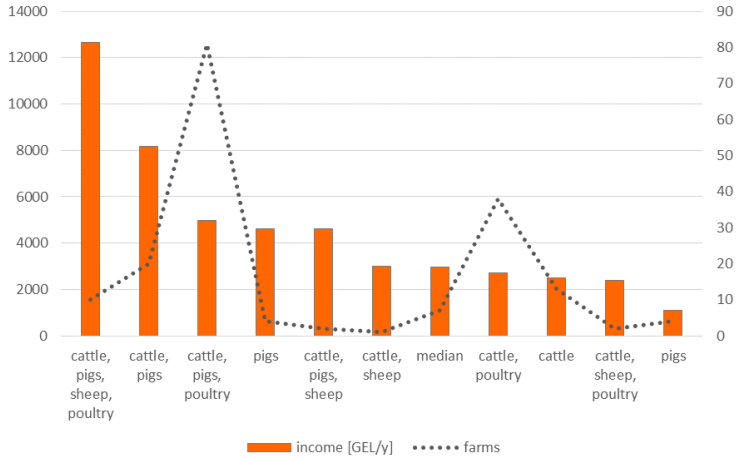

Figure 15 Gross income in various combinations of livestock farming

For a comprehensive understanding of the performance respectively the attractivity of the different farming types, one in principle has to taken the degree into account to which the livestock share is contributing to the total farm income. The first five columns in table 11 show the observed incomes, clustered by the importance as per information of the interviewed farmersof the baseline II usrvey. The second part of the table is an estimation of the total farm income. If for instance the 2'854 GEL from cattle production represent 10 – 25% of the income (17.5% in average), then the total farm income might be around 16'306 GEL.

Table 11 Income from livestock farming, clustered by shares of total farm income an estimation of total farm income

	income by importance (GEL/y)					Estimated total farm income (GEL/y)				
	<=10%	10- 25%	25- 50%	50- 75%	> 75%	<=10%	10- 25%	25- 50%	50- 75%	> 75%
Cattle	600	2'854	710			12'000	16'306	1'893		
cattle, pigs	1'850	3'505	23'244	3'475	1'400	37'000	20'026	61'984	5'560	1'600
cattle, sheep			3'000					8'000		
cattle, poultry	821	2'225	3'160	5'448	12'400	16'410	12'716	8'426	8'716	14'171
cattle, pigs, sheep			4'605					12'280		
cattle, pigs, poultry	1'862	3'455	5'955	11'654	8'179	37'233	19'745	15'880	18'646	9'347
cattle, sheep, poultry				4'200	600				6'720	686
cattle, pigs, sheep, poultry		1'785	9'424	14'215	34'623		10'200	25'130	22'744	39'569
Pigs	1'860	7'390				37'200	42'229			
pigs, poultry	1'083	1'200				27'969	20'204	19'085	12'477	13'075

MOLI is aware of the shortcomings of such calculations, still some conclusions can be drawn:

- The combinations of cattle & pigs, together with poultry or fattening pigs seem to be successful models for annexed income, i.e. contributing less than 50% of the farm income.
- In cases, where livestock contributes 50% or more of the farm income, attractive combinations are cattle & poultry, or doing the two together with pigs. The non plus ultra seems to be a farm type that raises all types of animals (cattle, pigs, sheep, poultry) – a finding, which however has to be seen in the light of the sample selection, i.e. selecting purposely small scale farmers with a highly diversified production.

If MOLI would have interviewed any combination and size of livestock farmer, then the picture would look differently. In this sense table 11 gives some orientation for smallscale farmers who have a maximum of 10 cattle.

It also is important to underline that the figures above are gross incomes. Taking the rate of return into account, we may roughly divide the average of the gross incomes (18'658 GEL/y) given in table 11 by two, which results in 775 GEL per month or some 300 EUR – a figure that is low, but seems to be realistic.

Also in the second phase, cattle production will be one of the main pillars of the MOLI project. Interesting therefore is a comparison of gross incomes based on the number of cattle, either producing milk or meat. Knowing that farmers often have local cows, which are a simple form of a two end breed, there is still a tendency that meat generates a higher gross income than milk as can be seen in Table 12.

Table 12 Gross income depending on the number of meat and milk cattle

	Number of cattle for meat						
Cattle for milk	0	1	2	3	4	5	>5
0		900				3800	
1	744	366	490	15400		2000	
2	436	531	646	760			
3	747	864	533		0		3000
4	1431	1710	540		1368		
5	3649	856	2100				
6	1371	2650	2874				
7	3000				1120		
8	3300		3220	2492	3150		25200
9				3600			
10	6000	700	3213				6067
>10							

Legend

0 - 500 GEL
500 - 1000 GEL
1000 - 2000 GEL
2000 - 5000 GEL
5000 - 10000 GEL
>10'000 GEL

Table 12 also shows that a higher number of animals does not necessarily lead to a higher income. This is due on one side on the quality of data (farmers who are not knowing the project and the interviewer well, reluctantly provide

sensitive economic information) but also on the fact that 39 farmers have animals but apparently no income, which blurrs the numbers additionally.

3.5.1 Empiric economic data on livestock farming in Kakheti region

MOLI monitors in each of its surveys economic data. However, as economic information is often difficult to obtain from farmers who don't know the project sufficiently, MOLI elaborated separate standard gross margin calculations. Figure 16 illustrates those of an average Kakheitan farm, whereby differentiating in plant production between three levels of intensity and in animal production, calculating the margin per one animal (cattle, pigs) respectively 100 hens.

Highest margins per heactare can be achieved – under optimal conditions – with maize, oats and wheat, but also legume crops such as alfalfa or sainfoin. Maize or sainfoin are capital- intensive and have therefiore a rather low rate of return[e] (Table 1), sainfoin or oats are capital extensive.

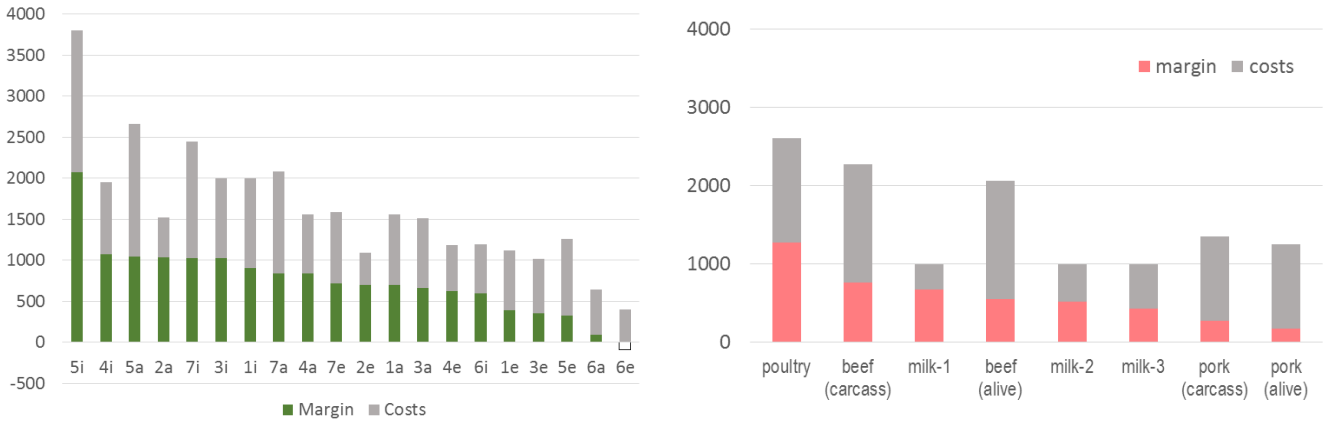

Figure 16 Comparison of gross margins in plant[f] and animal production [GEL per unit and year]

A direct comparison with margins achievable in plant and livestock production is not possible, even if the scales in Figure 16 tempt to do so. With 100 chicken a farmer manages in the first year a margin of 1'277 GEL, which makes compared to the costs of 1'327 GEL a rate of return of 96%. As the hens start laying eggs in the ninth month only, farmers are advised to keep the hens for another year, the award for the investment is higher (130%) and also the margin is considerably higher (2'882 GEL). In milk production, margins are between 150 GEL (hay, concentrates purchased, herdsmen hired; milk 3) and 400 GEL (own hay & herding, only concentrates are bought; milk- 1). The milk-2 margin is a mix between the two. In meat production, a difference occurs through the way of selling. Figure 16 distinguishes between live weight and carcass weight, the second leading to a better margin, since the weight is measured and not estimated, lifting the farmer in a more powerful position. The beef calculation is based on a scenario where the farmer buys a 6-7 month old bull and feeds it from the 9th to the 12th month intensively. Doing this two times in a year and selling as carcass, results in a total gross margin of 765 GEL, Pork bases on the practice of buying piglets- 2.5 cycles per year. The margin of 277 GEL (carcass), respectively 178 GEL for live weight are low. However, as most farmers fatten two, three or more pigs at once, the earnings come into the range of beef and milk.

As local farmers are not using effective ways of cattle breeding and are seldom cooperating with each other, outcomes are low. However scale cattle rearing can be profitable, partially because the access to pastures is free of charge and because free family labour is used. During the dairy conference in spring 2016 a calculation was presented that showed the effects of good feed quality, i.e. an increase of profitability by 50% alone from improved roughage (hay), respectively 75% at a low level of intensity, more than 200% with a more sophisticated feeding system.

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[e] *Rate of return = gross margin in % of the total costs (the amount that each invested GEL generates). MOLI is careful with the notion 'profitability' since operating with the gross margin (i.e. neglecting fix costs and also ignoring the salary of the farm- owner).*

[f] *Abbreviations: **i** = intensive, **a** = average, **e** = extensive level or production, **1** wheat, **2** sainfoin, **3** barley, **4** oats, **5** maize, **6** sunflower, **7** alfalfa*

Table 13 Profitability of milk production based on the quality of the feed[25]

Feed quality	Live weight [kg]	Feed intake per 100kg of live weight [kg]	Dry matter intake [kg]	Dry matter intake for maintenance [kg]	Dry matter intake per litre of produced milk [kg]	Potential milk production [l]	Feed intake per 1l of produced milk [kg]	Daily milk yield [l]	Milk price [GEL/l]	Gross revenue, GEL (per daily milk yield)
low	600	2.8	16.8	6	10.8	21.6	0.78	21.6	1	21.6
good	600	3.5	21	6	15	30	0.7	30	1	30
high	600	4.2	25.2	6	19.2	38.4	0.66	38.4	1	38.4

Cost of 1 kg of dry matter [GEL]	Dry matter intake per 1l of milk	Cost of feed intake [GEL]	Additional expense of current assets [GEL]	Gross costs per cow per day [GEL]	Cost price for 1litre of milk [GEL]	Daily profit per cow [GEL]	Profitability of milk production [%]
0.25	0.78	4.21	3.67	7.9	0.36	13.8	175
0.27	0.7	5.67	4.5	10.1	.0.34	19.8	196
0.29	0.66	7.35	5.39	12.7	0.33	29.6	232

Gross margins get also interesting when producing for instance alfalfa seed (more than 5'000 GEL/ ha) or when a farmer has a sow, which throws two time a year (1'900 GEL). When the farmer is additionally is fattening the 2 x 10 piglets of the sow up to slaughter weight of 90kg, the margin gets as high as 4'500 GEL.

Table 14 Rate of return of different crops[g]

	Intensity of production		
Rate of return	Intensive	average	extensive
Highly profitable (>250%)		sainfoin	sainfoin
Profitable (150-250%)	oats, maize, barley, sunflower, wheat, alfalfa,	oats, wheat, barley, alfalfa, maize,	oats, alfalfa, wheat, barley,
Likely profitable (100-150%)		sunflower	maize
Break- even (around 100%)			
not profitable			sunflower, oats

As also can be seen in Figure 16, livestock production is generally more capital intensive than plant production, whereby fattening needs higher investment than milk production. MOLI is aware that it would be more informative to analyse the economic (and organisational) dimension of typical farming systems, rather than reflecting isolated gross margins. Such endeavour however would go too far and exceed the focus of this study. MOLI therefore will commission a study, that not only shall reveal optimal combinations of production branches in a farm, but also investigate successful models of inter- farming, respectively analyse out grower schemes of milk and meat buyers. Thereby the aspect of capital mobilisation again will play a central role; renting assets if often more beneficial than owning them.

3.6 Constraints and potentials of the cattle and pig sub- sectors in Kakheti region

Strengths: The livestock sector in the Kakheti region can profit from a cheap fodder base of crop leftovers, hay grown between wine plants and fruit trees, and alfalfa and sainfoin on cropland. Due to its main orientation towards self-sufficiency of the farmer families, it is less exposed to the fluctuations of the dairy market. The mountains in Kakheti allow, to a certain degree, to avoid summer heat and drought by a limited transhumant movement.

Since the new government came into power in October 2012, agriculture has been declared a main priority and a lots of legislative and financial changes are currently taking place or have been announced (see chapter 7). The Ministry of Agriculture, via introduction of the Sector Strategy, proposes to develop the sector through promoting cooperation between small scale farmers.

Weaknesses: Problems existing in the whole Livestock sector of the country are as well typical for Kakheti region and particularly to target communities. Among the most common problems should be mentioned the following:

Since the break-up of the Soviet Kolkhoz system and as a result of 1992-96 land privatization process, in Kakheti as in Georgia generally, small-holder farmers have been dominant groups in rural areas. About 27% of the total arable

[g] *Given the relative low importance of fix costs, MOLI compares with the rate of return, the gross margin in % of the direct costs*

land was divided among the farmers and each household was given a maximum 1.25 ha, which allows to keep no more than 5 milking cows. Currently, small scale farmers make 95% of all farmers in Georgia and Kakheti (see figure 11) and they are largely focused on subsistence farming, with low levels of production. Based on the surveys conducted by MOLI/ABCO during the last years[h], the average monthly income of small farmers' households currently equals to GEL 350-400 per month, which is low compared to the average Georgian household income (985 GEL/month, 2014). Since the mentioned land privatization, the land, the structure of Georgian agriculture has not changed. The smallholder farming structure seems to be quite stable – both because its potential to grow is limited due to the small size of the farms and because basic needs are provided for.

Over the last two decades, proceeding from the existing financial, supply and other urgent problems, local farmers have been purchasing and utilizing cheap seeding/planting materials and failing to observe the elementary agri-technical norms in their operations. Results of such a wrong management is negatively reflected on the quantity and quality of the farmers' outputs (figures see chapters 4 and 5). It is true that most of the farmers do not have access to updated information on the modern, environment-friendly and effective agricultural technologies, new types of machinery and technical solutions, etc. Accordingly, they cannot move to the next stage of development and therefore prolong their usual way of subsistence farming.

Apart from the above, farmers in most cases do not have enough economic qualifications to calculate risks, production costs, income and profit to ensure sufficient profitability. Low general level of education in agricultural technologies continues to create serious obstacles for further development among local farmers. The way of running works, which they are used to, in most cases do not provide sustainability in conditions of contemporary market.

The situation remains to be rather unfavourable also in the financial-crediting area. Georgian banks are active in rural areas, e.g. with mobile counters, but their activity is largely limited to collecting savings. Commercial banks still meet only a very minor part of the total demand of the agriculture lending market. Among various reasons for that should be mentioned the under-developed system of agricultural insurance. In rural areas, the Loan Guarantee institutions as promoted by the Georgian state have not yet been implemented. Their implementation would motivate commercial banks to orient their activities towards the agricultural sector.

One of the most principle problems with respect to all the above mentioned is that private farmers/peasants do not have a clear idea as from where and how they can attract necessary funding for their operations. They lack information not only about new technologies, know-how, etc., but also on possible sources of financing for their activities. They also have no awareness and knowledge about how to formulate their business ideas into proper business plans in order to make them acceptable for potential investors or financial institutions.

[h] *Baselines surveys conducted in Kakheti region under SDC funded MOLI project. The results are confirmed through the current rapid assessment in Kakheti region.*

4 Milk subsector analysis

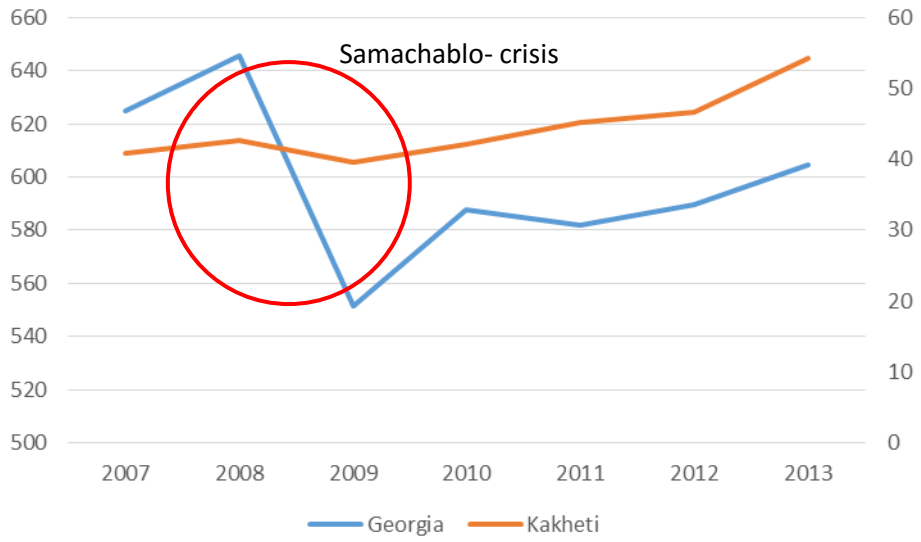
4.1 Importance of milk

4.1.1 Economic importance of the milk sector

Table 15 Raw milk production in Georgia and Kakheti region (Million litres) in 2007 - 2014[26]

	2006	2007	2008	2009	2010	2011	2012	2013	2014
Georgia	606.1	624.8	645.8	551.4	587.7	582.1	589.5	604.7	656.2
Kakheti	40	40.9	42.6	39.5	42.2	45.2	46.6	54.3	54.6
% of national production	*6.6%*	*6.5%*	*6.6%*	*7.2%*	*7.2%*	*7.8%*	*7.9%*	*9.0%*	*8.3%*

Table 15 shows that the production of raw milk on the country scale as well as in Kakheti region has increased year by year since 2009[i]. However, at national level, this growth has only caught up with the declines observed between 2007 and 2009. The drought in 2014 has halted the increase in milk production that year.



The import of raw milk into Georgia is insignificant. On the other hand, Georgia imports considerable quantities of milk powder which can replace locally produced raw milk to produce cheese, matsoni and other dairy products.

Table 16 Powder milk import in Georgia (in tons) in 2010-2014[27]

	2010	2011	2012	2013	2014
Import to Georgia	3'765.2	3'884.9	4'068.1	4'508.8	5'228.8

Table 16 shows that the imports of powder milk are increasing.

Milk price: Given that the price of whole milk powder was between 2.5 and 3$/kg in 2015[28] and 125g of whole milk powder are needed to reconstitute 1 kg of milk, one kilogram of milk reconstitute from milk powder costs currently 0.7.5-0.9 GEL. The figures for 2014 are higher, since the price of whole milk powder reached 5$/kg, and the price for one litre of 'powder-' milk was 1.4 GEL/kg.

During the FAO conference in spring, specialists confirmed: the production of re- combined milk products by adding water to skim milk powder is[29]:

- Impacting flavour of dairy products
- Increasing production cost by increasing raw milk consumption for production
- Decreasing competitive advantages in comparison with imported dairy products

[i] *It is not known to what extent milk consumed within the farm household and milk sold informally within villages/neighbours enter the national milk production statistics. It is possible that the milk production numbers in figure 14 mainly reflect milk delivered to major dairies.*

Milk prices are fluctuating over the year, since volumes of winter- milk are up to 5 times lower than summer- milk. Compared to international level, the prices are too high in Georgia, fluctuating in Kakheti region in 2015 for instance between 0.5 GEL in summer and almost 1 GEL in winter (Table 17), which is about 0.4 EUR, whereas farmers in the EU got 0.2 EUR.

Table 17 Average milk price in Kakheti in 2015

Months	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Price in GEL/kg	0.7	0.7	0.6	0.55	0.5	0.5	0.55	0.6	0.7	0.8	0.8	0.95

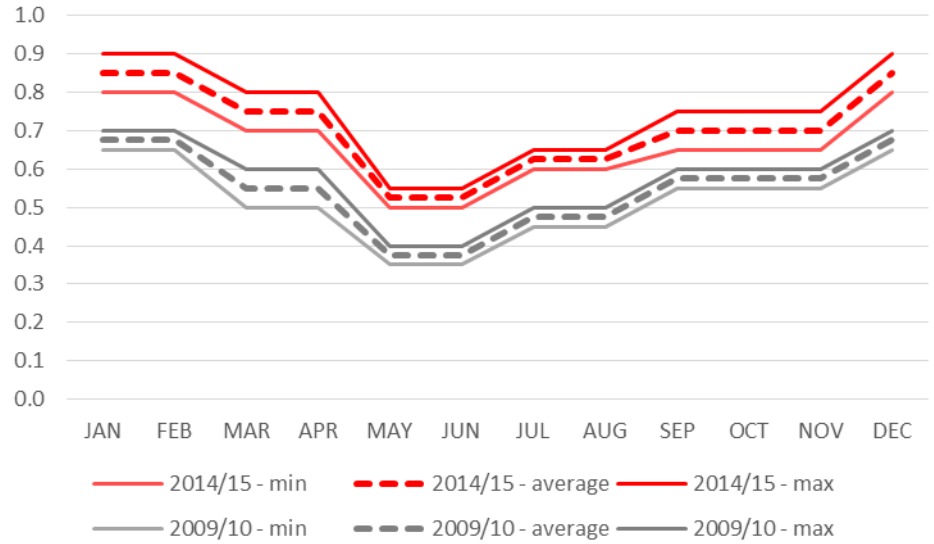


Figure 17 Bandwidth of farm gate milk prices in three districts of Kakheti region in 2009/10 and 2014/15

The price of locally produced milk is lower than the cost of milk reconstituted from milk powder during most of the year. However, if the price difference isn't too great, dairies may prefer powder milk to locally produced milk because of the cost of collection and because of its better hygienic status.

In any way, the price of reconstituted milk, depending of the current world market price of whole milk powder, defines the price ceiling (price maximum) that dairies may be ready to pay for local milk. Of course, the seasonal price variations, depending on the quantity of milk offered, matters also.

Demand for raw milk: If we take into consideration the fact that from 1 kg of powder milk we can receive 8 litres of milk, Georgia consumes the following amount of milk per year:

Table 18 Market share of imported powder milk[30]

Year	2010	2011	2012	2013	2014
Local production of raw milk in Georgia (1000 tons)	581	576	583	596	646
Milk produced from imported milk powder (1000 tons)	30	31	33	36	42
Total milk (raw + powder) produced in Georgia (1000 tons)	611	607	616	632	688
% of powder milk from total milk	4.9%	5.1%	5.4%	5.7%	6.1%

The share of milk powder in the national milk supply has constantly been increasing since 2010. However, its market share remains modest. The milk supply of Georgia depends overwhelmingly on locally produced raw milk.

Seasonality - consumption and demand of raw milk by dairies: The seasonality influences the price of the farm milk with respect to the product's availability during the winter period. Proceeding from natural and climatic conditions of Georgia, the season of maximum milking yield continues from May to August. Further on, milking yield gradually decreases from December to May. During the low milking period, farmers utilize the received milk for own consumption and at this time, sales price on farm milk reaches its maximum level.

Cheese: In 2014, Georgian farmers produced 59'900 tons of homemade cheese[31]. Assuming that from the 688'000 tons of milk used (raw milk and powder), 80% were transformed to cheese and that 8 kg of milk produce 1 kg of cheese, 86'000 tons of cheese were produced nationally, whereof 26'000 (30%) were produced by local and regional dairies and 70% were homemade at the farm households.

Table 19 Development of cheese imports[32]

Year	2010	2011	2012	2013	2014
Imports in tons	781.7	881.1	1'078.3	1'451.4	1'648.2

The import of cheese in Georgia is insignificant. Imports account for less than 2% of the national cheese consumption. Georgia mainly imports Swiss types of cheese, Mozzarella, Gouda, Feta, Brinza, melted cheese, cheese with herbs and artisan cheeses.

To mention also the butter deficit in Georgia. As Suluguni and Imeruli types of cheese are full fat, there is little fat to be gained from cheese production. Producing butter alone does not pay. It is necessary to underline that many Georgian small and medium dairies are equipped with basic equipment and they need not so big additional investment to start production of different varieties of cheese, which are currently imported. Some Georgian companies already started production of Swiss type cheese, Mutschli, Mozzarella, cheese with herbs. "Santé" produces a few types of melted cheese. European type cheese may be an interesting, but small, niche for dairies who manage to produce according to the logistic and hygienic requirements of retailers from Tbilisi.

The situation with important imports and almost inexistent export, will hardly change in close future, since:

- The traditional Georgian cheese types are – except neighbouring regions in Azerbaijan or Armenia - unknown outside of Georgia.
- It is doubtful that Georgia will become competitive in the markets of Turkish and Arab type soft cheese in neighbouring countries, against the established competitors from New Zealand and Denmark.
- Even if Georgia becomes competitive, import substitution in the home market will be more profitable than conquering export markets.

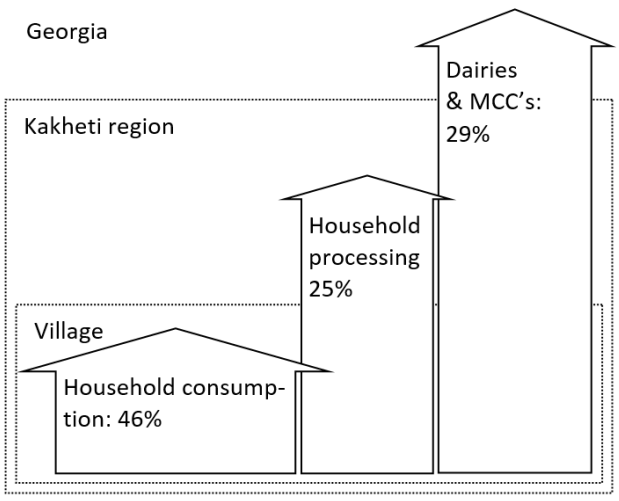
Challenges of the dairy sector of Georgia[33]

- Fragmented (low share of commercial firms)
- Insufficient supply of fresh milk of good quality and safety
- Falsification and lack of consumers' confidence
- Outdated infrastructure and equipment
- Lack of milk production specialists, zoo technicians, veterinarians
- Insufficient knowledge of private sector on food safety requirements, legislation
- Low capacity of private sector for food safety risk management

4.1.2 The milk market performance of Kakheti region

Taking into consideration, that raw milk annual production in Kakheti is 49'200 tons, means that volume of raw milk left at farms is about 35'000 tons. If we assume, that about 2/3 of that milk (and homemade dairy products) is consumed by farmers themselves, means that about 12'000 tons of raw milk is used for homemade dairy products production for sale. This is in about the volume, which the registered dairies produce in Kakheti. Informal market players are important players. Not controlling them (e.g. NFA) puts registered dairies into unfair competition conditions

Table 20 Production and use of milk in Kakheti region



	Milk [tons]	
Dairies	11'440	23%
MCC	3'000	6%
Rural households:	34'760	71%
- consumption	22'566	46%
- processing	12'194	25%
Total	49'200	

Milk collection and processing in Kakheti region

After the collapse of Soviet Union and the following privatization process, all dairy enterprises were privatized. The majority of them then soon stopped operation and sold their assets. All cheese processing equipment existed in regions mainly went into possession of farmers and small scale production workshops which appeared practically in all regions of Georgia. As for large dairy enterprises, some of them changed their profile, some disappeared, but some of them still exist and operate successfully on the market. According to information provided by NFA, there are currently 141 dairy enterprises and milk collection centres registered in Georgia - within Kakheti region, 39 dairy enterprises, including 11 milk collection centres, 2 ice-cream production enterprises and 26 cheese processing enterprises. These figures contradict with the ones collected from ICC's in autumn 2015 (table 23).

Table 21 Number of milk collection points (MCC's) and dairies in each of the Municipalities of Kakheti region (2014)

	MCC's	Dairies
Akhmeta	0	1
Dedoplistskaro	2	9
Gurjaani	0	1
Lagodekhi	1	0
Sagarejo	1	1
Sighnaghi	2	1
Telavi	1	7
total	**7**	**20**

Obviously the most of dairies are in Dedoplistskaro municipality where the cost of milk is lower than in other district of Kakheti and other regions of Georgia. This is caused mostly by remoteness and the relatively high milk production volume. Currently, the majority of small and medium cheese processing enterprises in Kakheti are producing "Imeruli" and "Suluguni" types of cheese. At the same time, many cheese processing enterprises, especially in Dedoplistskaro district can easily start production of other cheese types. For this, they need special cheese storages, where temperature will be kept within the range of 8-12 degrees of Celsius and have to be equipped with stainless steel vats for aging the cheese. Such facilities need medium size investments - between 10'000 and 35'000 USD, depending on the capacity.

Table 22: Indicative prices for milk and cheese

	2005	2006	2007	2008	2009	2010
Fresh milk (GEL/lt)	1.12	1.14	1.4	1.77	1.82	1.4
Imeretian cheese (GEL/kg)	4.19	4.85	5.25	6.27	5.5	6.16

4.1.3 Supply analysis – existing practices of quality control

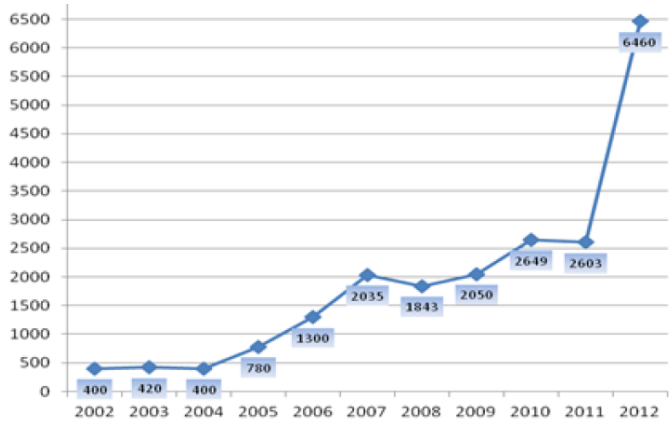


Figure 18 Bacterial foodborne intoxications[34]

Figure 18 shows a dramatic picture according to which food intoxications almost tripled between 2011 and '12 (however the figures reflect food poisoning of any type of products). It likely that with the start of the SIDA support to the NFA, data collection was done in a different way than the years before.

In general, most of the operators - especially the smaller ones - do not pay enough attention to the safety control of received supplies. In best cases milk processors only focus on testing the quality parameters of received raw milk (fat, acidity, added water), slaughterhouses do visual inspection of the cattle. Safety checks of incoming supplies are frequently ignored by the smaller processors (large dairy / meat processors have some control practices in place), the supporting safety records/certificates are not requested by the companies to be provided by the suppliers either. This applies to the ingredients as well as the supporting material, tools and packaging.

At present the private sector, especially the smaller players (processors, retailers) of the food chain still experience difficulty in understanding the need (and their primary requirement) to establish some control mechanisms for their suppliers. They believe that it is the state's sole responsibility to control the whole food chain, including one-two cow owning farmers (who in 100% of cases are not registered as the food business operators). The processors are reluctant to educate their suppliers. Neither they are willing to effectively cooperate with their direct competitors (companies of the same size and ability) to agree on the common requirements for incoming materials and work on supplies' awareness increase. The larger companies are exceptions; they allocate efforts and resources to establish long-term relationship with the selected suppliers (e.g. milk collection centres) to ensure some kind of control of the incoming supplies.

4.1.4 Outlook – perspectives of local dairies

According to the food safety regulations, all cheese enterprises should apply the pasteurization process to their production and the majority of the existing enterprises are already equipped with appropriate equipment. Dairies equipped with pasteurization facilities can produce soft type cheese (Mozzarella, Feta, Brinza etc.). However, all of them need small or medium size investments (between 500-3'500 USD) for installation of special rooms, where they can mature cheese.

Three dairy enterprises, which were interviewed in Kakheti region, are positive that in case of more raw milk supply (especially during the autumn spring period), they can produce and sell much more cheese than they are currently producing and selling. Even more, during the summer period, when milk supply is high, they do not have problems with the sale of cheese and one enterprise declared that currently, they have already started selling their cheese in Batumi and that the demand from the side of local customers is much higher than they can supply.

Also, all interviewed dairies mentioned that in case of more raw milk supply, they can increase production by four to five times and more.

4.1.5 Outlook: The potential of the Free Trade Agreement with the European Union

The Free Trade Agreement with the European has basically two consequences for the dairy sector:

- The remaining import tariff are being eliminated between the European Union and Georgia. Imported European dairy products become more competitive in the Georgian market, and Georgian export products become more competitive on the European market.
- European food standards become valid in Georgia

Export potential: Georgian dairy specialities (mainly Suluguni and Imeruli cheese) are unknown on the European market. It can moreover be doubted that they are suited to European tastes. It is doubtful that the Georgian dairy sector can become competitive in the market of industrial cheese in the same way as, e.g., Baltic countries did after they joined the European Union. The export potential for dairy products will therefore remain inexistent. However, there is no export need, either: Even if the Georgian dairy sector sees a spectacular growth, import substitution will remain more lucrative.

Import pressure: Georgia knows only 3 tariff rates: =0%, 5% and 12% of value. All of them are relatively modest, therefore, in consequence of their abolition, the increase in import pressure is expected to be modest, too.

- Milk, cream and butter can be imported free of tariff unless they are packaged in unit weights of less than 2.5 kg, in which case a tariff of 12% is applied.
- To yoghurts, kefir etc. for all types of dairy products, a tariff of 12% applies
- To most cheeses, a tariff of 5% is applied. For selected cheese types (fresh cheese, blue cheese, sheep cheese) a tariff of 12% applies.

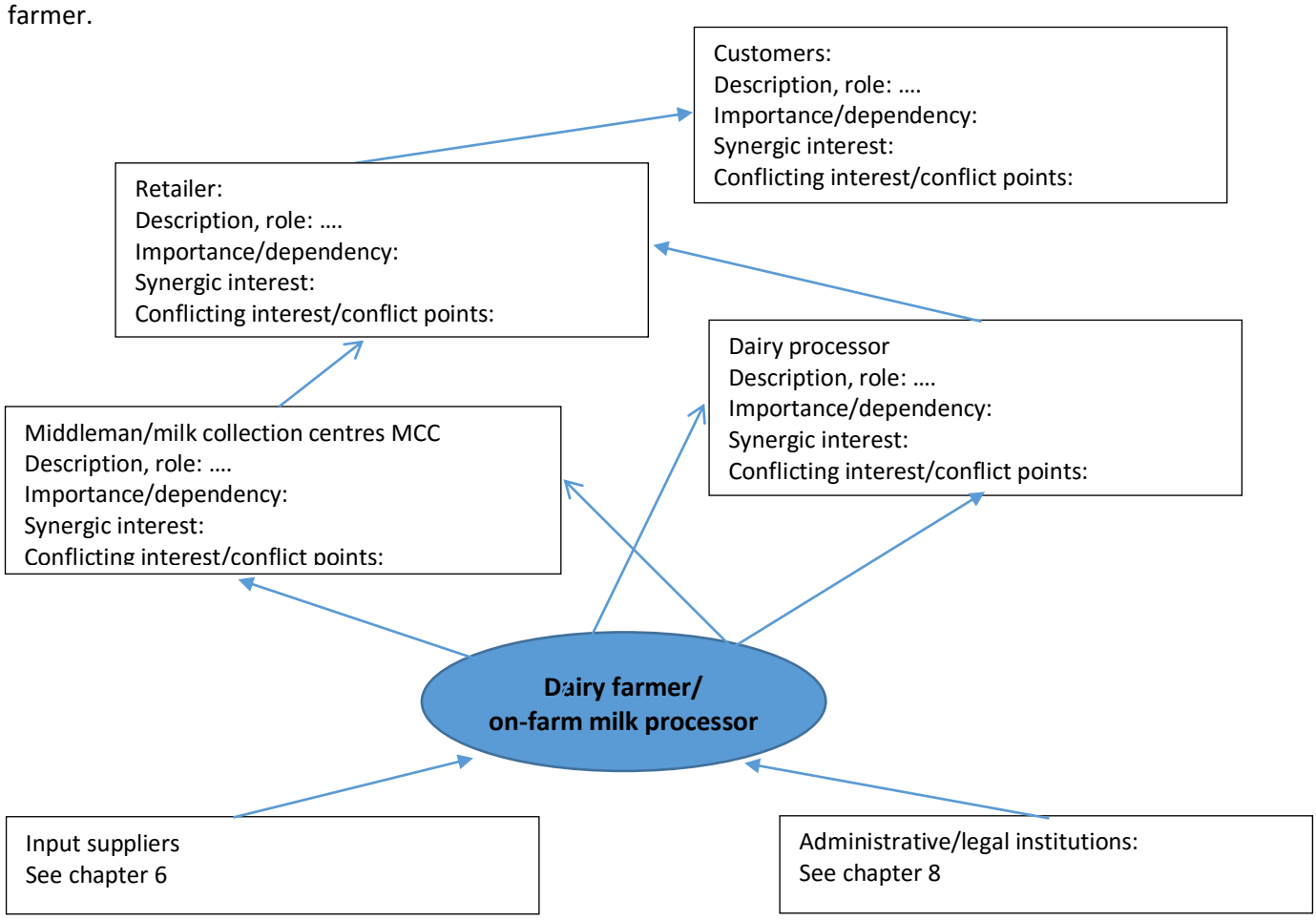
Accordingly, the import pressure will increase most for yoghurts and kefirs. However, the fact that the price of cheese imported cheese in all Georgian supermarkets is double the prices in the European Union, shows that there are informal import barriers. Whether the Free Trade Agreement will have the power to eliminate the informal barriers is unsure.

The **adoption of European food standards** will cause the need to upgrade production practices in many dairies and may provoke the closure of many dairies, which in turn may cause critical shortages in processing capacities and a great investment needs for the dairies intending to survive. A price hike for dairy products can also be expected, similar to the one that was observed for meat when the regulation that meat sold publicly must be slaughtered in recognized slaughterhouses was implemented. Insecurities remain about how strictly and over what time period the new regulation will be implemented.

4.2 Stakeholder analysis

4.2.1 Approach

The following scheme shows how the stakeholder in the dairy value chain are grouped relative to the milk producing farmer. Furthermore, a list describes the interests of the various stakeholders relative to the interests of the dairy farmer.



4.2.2 The diary processer's function and interests relative to the farmer

Description/role: There are small diaries at village level and regional dairies who sell milk products nationwide.

Local dairies uniquely process locally produced raw milk, they don't have the equipment and means to buy milk powder and process milk produced from milk powder, or to set up a far reaching milk collection scheme.

Importance/dependency: Because raw milk transport is expensive (great volumes, storage before transport is limited to 1–2 days), there is a tight interdependence between milk producers and dairies. Finding another dairy processor if they don't agree with the conditions offered is impossible for the single farmer and difficult for farmer groups. But finding other milk providers is equally difficult for the dairy if the milk producers in his surrounding don't

deliver the quantities the dairy needs. In principle there is a mutual interests in each other's growth and prosperity, alone communication and short term frictions blur the principle.

Synergetic interests:

- **Quantity:** high produced quantities by farmers boost incomes of farmers and slaughterers
- **Value:** high value/good quality of dairy products sustain the customers demand and willingness to pay
- **Efficiency:** The lower the production costs of the farmers, the more they make profit at a given price and the more they will be motivated to keep up or increase production. The lower the processing costs, the more competitive is the milk processor in relation to his/ her customers, the more he or she is able to make a profit.

Conflicting interests:

- **Price:** compromises must always be looked for
- **quality:** the quality expectations of the milk processer may require costly efforts by the farmers; the quality requirements often being in clinch with quantities;
- **Steadiness/ predictability of supply:** The milk processor would like to have a steady milk supply throughout the year that matches his demand. The ability of farmers to adapt to this is limited, particularly due to the seasonal influences.

4.2.3 The local trader's and the milk collector centre's function and interests relative to the farmer and the processor

Description/role: Middlemen buy dairy products from small dairies and farmers who produce their own dairy products and deliver them to public markets in the cities and to retailers. The wholesaler who keeps a storehouse where retailers or restaurants come to shop or who delivers shops and restaurants with a complete assortment of food doesn't seem to exist in Georgia. Middlemen with a specific product offer seem to take their place.

Milk collection centres gather the milk produced in a village and keep it ready for efficient transport to the major dairies. Sometimes, raw milk middlemen with their truck can have the function of a mobile milk collection centre. Particularly small dairies source milk from other villages through raw milk middlemen.

The middlemen's role: to group the scattered offer for the demand of dairies/retailers, to link demand and supply over distances, to manage the financial fluxes between customer and provider, often including providing advance financing.

Importance/dependency:

Milk collection centres and raw milk middlemen: high. There is usually only one milk collection centre per village and delivering to the neighbour village is no option. Therefore, there is a strong mutual dependence between farmers and milk collection centres, where they exist. As raw milk middlemen are more interchangeable, the mutual dependence between them and the farmers is less pronounced.

Diary product middlemen: medium. Dairy product middlemen are interchangeable. However, if a middleman has some exclusivity regarding access to a market / a key costumer, his bargaining position is quite strong.

An information advantage, vertical collusion or collusion e.g. with public institutions can, however, can in both cases give specific middlemen disproportionate market power.

Synergetic interests:

- **Quantity:** high produced quantities by farmers boost incomes of middlemen and dairies
- **Value:** high value/good quality of the produced milk/dairy products sustain demand and willingness to pay and thus benefit also the middlemen
- **Efficiency:** The lower the transaction costs, the more competitive is the middleman in relation to his customers/ the more is he able to make a profit
- **Constant sales potential:** the potential to dispose of different outlets/sales channels which enable continuously that most of the time all products offered be placed is a common interest of all partners.

Conflicting interests:

- **Price:** compromises must consistently be negotiated
- **quality:** quality levels must constantly me monitored and negotiated

- **steadiness/predictability of supply:** middleman would prefer a predictable supply, which, - due to seasonal effects - is not easy to guarantee for farmers and dairy processors

4.2.4 Retailer's function and interests relative to the farmer and the dairy

Description/role: retailers present the product in a form and in a place convenient for the consumer to buy it. In Georgia the market share of supermarket chains (Goodwill, Smart, Spar, Carrefour…) is relatively small, they only have branch offices in the major cities. Small independent shops are predominant. Also, the share of public markets is relatively high. Prices in supermarkets are higher than in small shops, supermarket capitalize on the vaster choice/one-stop-shopping opportunity offered to the consumer and the better quality control over the supply chains.

Importance/dependency: medium: No Georgian retailer attains a market share even remotely in the dimension Western European retailers do. However, being listed in the major supermarkets is still indispensable for the major food processors, in order to be visible in the market, for reputation reasons and because of the logistic advantages compared to supplying a great number of small shops.

Synergetic interests:

- **Quantity:** readiness to produce the quantities that the retailers can sell is an indispensable condition for getting or remaining listed as provider of a supermarket. High sales make the retailer attractive for the provider.
- **Efficiency:** The more efficient the retailer, the more he or she is able to attract sales, which increases equally his profitability and his attractiveness to suppliers. According to the strategy of the retailer, efficiency can be reached in different ways: By being able to offer low prices, the largest offer, the best quality, a much focussed offer, occupying the best sales locations …

Conflicting interests:

- **Price:** compromises must always be looked for
- **quality:** quality is constantly an issue of discussion with partners upstream and downstream the value chain
- **Flexibility of supply:** the ability to react on short term on variation of consumer demand is a constant matter of negotiation, particularly for products with a short shelf life.
- **Brand popularity/implantation:** Brand popularity sustains sales, which is in the interest of the retailer. However, popular brands swing the power balance from the retailer to the producer, which may be why retailers are sometimes reluctant to participate in brand promotion. This means branding and sales promotion are mainly a task of the dairy.

4.2.5 Other stakeholders: farmers, Input suppliers, customers

- **Farmers:** The structure of the farmers is described in the baseline study.
- **Input suppliers:** see chapter 6
- **Institutions:** see chapters 6 and 7

Consumers: Statistic and other data gathered scientifically on the Georgian consumer are mainly lacking. Qualitatively, it seems that

- the spending power of the great majority of the Georgian consumers is low
- the readiness to pay bonus for extra quality is low
- the consuming behaviour is conservative
- A preference for Georgian products is being expressed, but the readiness to pay higher prices or accept qualitative shortcomings is limited.

There is a relatively small high-end market of well-off consumers and expats, mainly in Tbilisi. The market would be lucrative, however it may be difficult for small dairies to access the necessary information to tailor their products to the market's needs. Moreover, the penetration of local products in the high-end market may be hampered by the prejudice of many consumers that imported products have better quality.

4.3 Summary

- Raw milk production in 2014 reached the level of production in 2008;
- Very little temp of raw milk production increase, that mainly is due to increase of number of cattle, rather than its productivity, as - in 2008 645 million tons of milk were produced by 561 thousand cows (1'140 litre per head), while in 2014 646 million tons of milk were produced by 665 thousand cows (970 litre per head);
- If temp of import of milk powder will increase in such a stable manner, by 2020, in 5 years % of powder milk from total milk will be 10% (doubled compare to 2010);
- Seasonal fluctuation (from GEL 0.50 to GEL 0.95 per litre) of milk price remains unchanged;
- Despite the fact that import of cheese doubled its share remains less than 2% of the national cheese consumption;
- The traditional Georgian cheese types are – except neighbouring regions in Azerbaijan or Armenia - unknown outside of Georgia;
- Even if Georgia becomes competitive, import substitution in the home market will be more profitable than conquering export markets;
- Five out of eight municipalities (Akhmeta, Sagarejo, Sighnaghi, Lagodekhi and Dedoplistskaro) traditionally remain as largest milk producers in Kakheti;
- According to the food safety regulations, all cheese enterprises should apply the pasteurization process to their production and the majority of the existing enterprises are already equipped with appropriate equipment. However, all of them need small or medium size investments (between 500-3'500 USD) for installation of special rooms, where they can mature cheese;
- In general, most of the operators, especially the smaller ones, do not pay enough attention to the safety control of received supplies. In best cases milk processors only focus on testing the quality parameters of received raw milk (fat, acidity, added water);
- At present the private sector, of the food chain still experience difficulty in understanding the need (and their primary requirement) to establish some control mechanisms for their suppliers. They believe that it is the state's sole responsibility to control the whole food chain, including one-two cow owning farmers;
- The Free Trade Agreement with the European has basically two consequences for the dairy sector:
- The remaining import tariff are being eliminated between the European Union and Georgia. Imported European dairy products become more competitive in the Georgian market, and Georgian export products become more competitive on the European market.
- European food standards become valid in Georgia.

5 Meat sub- sector analysis

5.1 The importance of meat production

5.1.1 Trade balance

The trade balance for any meat type is negative (Table 23); self-sufficiency decreased in beef within four years from 77% in 2010 to 70% (Table 24, table 47) in the annex), in pork during the same period from 49% to 42% (Table 25).

Table 23 Balance sheet of meat (all types) in Georgia by years (million USD)[35]

1000 tons	2010	2011	2012	2013	2014
Domestic production	26.7	21.3	16.2	20.2	19.6
Import	7.9	9.9	10.6	8.3	8.8
Self-sufficiency ratio - %	77	68	61	71	70

Production and imports are also reflected in Figure 19, whereas stocks and leftovers at the end of the year are neglectable (see also detailed table 47 in the annex). Noticeable are the two downward trends of beef and pork, whereas the latter is regaining shares from 2012 onwards and according to latest figures, also beef is in increase. As shown in this report, locally produced pork meat is popular among consumers and on producers side, access and affordability of feed concentrate as well as acceptable sale's prices make pig raising also for farmers interesting. The most significant change however are the increase of poultry and pork imports, levelling out decreasing indigenous production. While the per capita consumption for poultry doubled (from 16g/day in 2006 to 33g in 2013), pork remained with 8-9 g/capita/day more or less stable (Figure 24). The meat consumption per capita in Georgia was in

2013 less than 75 g per and day, which is European average and compared with countries like Argentina (113 g/day)[36] even low. But also here one can observe an upward trend and as indicated by the ratios in table 47 for 2014 and 2015. Growing meat consumption is commonly a reliable proxy for increasing living standards.

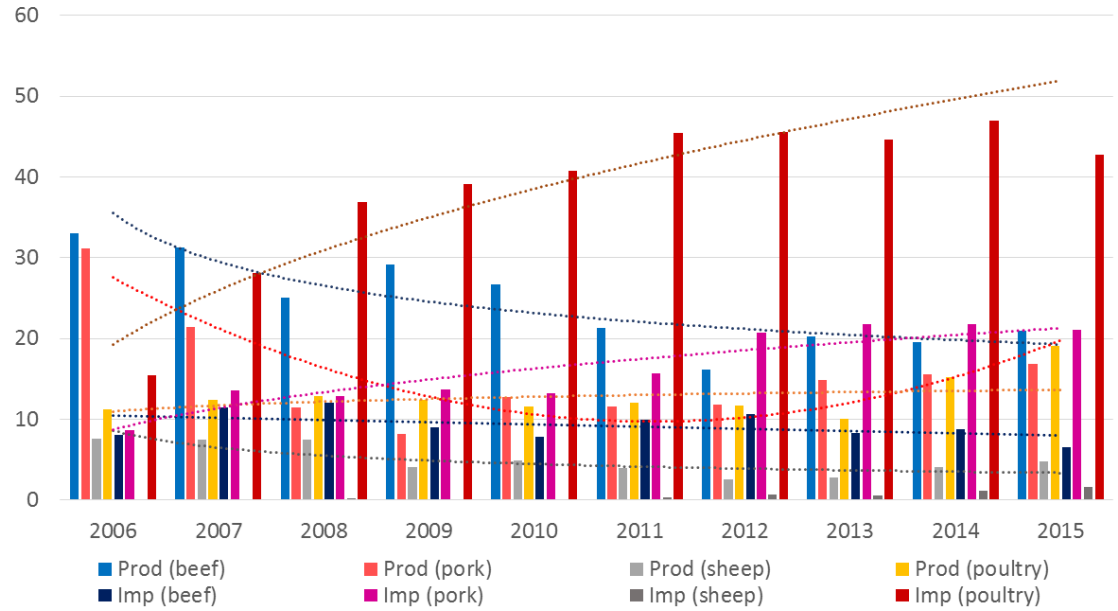


Figure 19 Production and import of beef, pork, sheep/goat and poultry in Georgia 2006 – 2014 (thousand tons)

Table 24 Balance sheet for beef products [37]

In thousand tons	2010	2011	2012	2013	2014
Opening stocks	0.4	0.4	0.3	0.3	0.3
Domestic production	26.7	21.3	16.2	20.2	19.6
Import	7.9	9.9	10.6	8.3	8.8
Total available resources/ utilization	35.0	31.6	27.1	28.8	28.7
Self-sufficiency ratio - %	77	68	61	71	70

The self-sufficiency ratio for beef fluctuates, but remained between 2010 and 2014 always between 60 and 77%. These numbers, however, don't include the exports of live animals towards Azerbaijan. In beef and lamb, meat production has reduced and imports of foreign meat have gone up, while this has coincided with a rise in exports of live animals. The average annual beef prices in Georgia increased from GEL 6.8 (USD 4) per kg in 2007 to GEL 11 (USD 6.5) in 2011[38].

Table 25 Abbreviated balance sheet for pork products in Georgia [39]

Pork indicators ('000 tons)	2006	2007	2008	2009	2010	2011	2012	2013	2014
Domestic production	31.1	21.4	11.4	8.2	12.8	11.6	11.8	14.9	15.5
Import	8.6	13.6	12.9	13.7	13.2	15.7	20.7	21.8	21.8
Self-sufficiency ratio - %	79	61	47	37	49	43	36	41	42

The most significant dynamic in pork is the decrease in domestic pork production and increase in imports. This can be attributed to the African swine fever outbreak that struck Georgia in 2007. As one can see from the data above, pork production during this time dropped by around half and experts usually acknowledge that more than 50%, and even up to 80%, of the pigs died. As a result, pork imports went up significantly[40]. The self-sufficiency ratio with pork dropped sharply and has remained stable since, even though domestic production recovered somewhat. The imports increased parallel to the increase in domestic production.

5.1.2 Level of production

Beef and pork production in all the countries of the South Caucasus (Georgia, Armenia and Azerbaijan) happens predominantly in small family farms. In Armenia, a few commercial pork farms are in operation, while in Georgia only one commercial farm exists. In Azerbaijan, a few rather big commercial beef farms are in production, while in Geor-

gia there is one commercial farm and in Armenia, no commercial beef farm is known. However, in none of the countries the market share of commercial farms reaches 10%.

Kakheti ranks fourth in meat production after Imereti, Samegrelo, Kvemo Kartli and Shida Kartli (see also Figure 26 Balance sheet for beef (left) pork (middle) and milk (right) [all indications in thousand tons]

Table 48 in the annex). There was a decline in meat production in 2006-2011 until 2010, with an upward trend in 2011, which is due to the Improvement of state registration service. It is surprising to note that, according to the statistical data, the number of pigs is 20% of the number of cattle, but the pork production is about 75% of the beef production. This is even more surprising taking in account that the carcass weight of a pig is much less than the carcass weight of cattle. This may hint at great numbers of home slaughters of cattle or cattle export, or particularities in the statistic (counting e.g. only mother sows).

5.1.3 Import of meat and meat products

Meat products (all categories) have second place after wheat in top food products total import

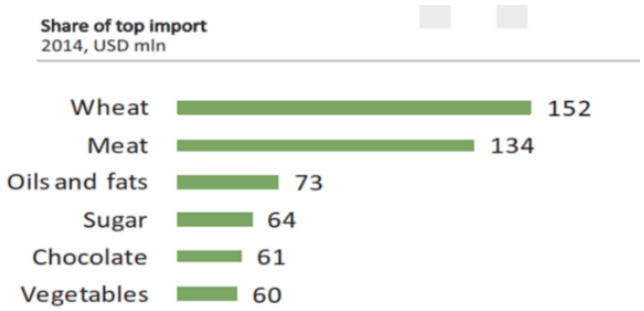


Figure 20 Top import commodities of Georgia in 2014[41]

Table 26 Value of food imports to Georgia (million USD)

Products	2010	2011	2012	2013	2014
Wheat	174	184	240	185	152
Meat	77	111	128	128	134
Oil and fats	72	88	85	88	73
Sugar	75	94	85	68	64
Chocolate	48	53	55	63	61
Fruits	26	38	37	48	49
Milk and dairy products	30	34	37	47	50

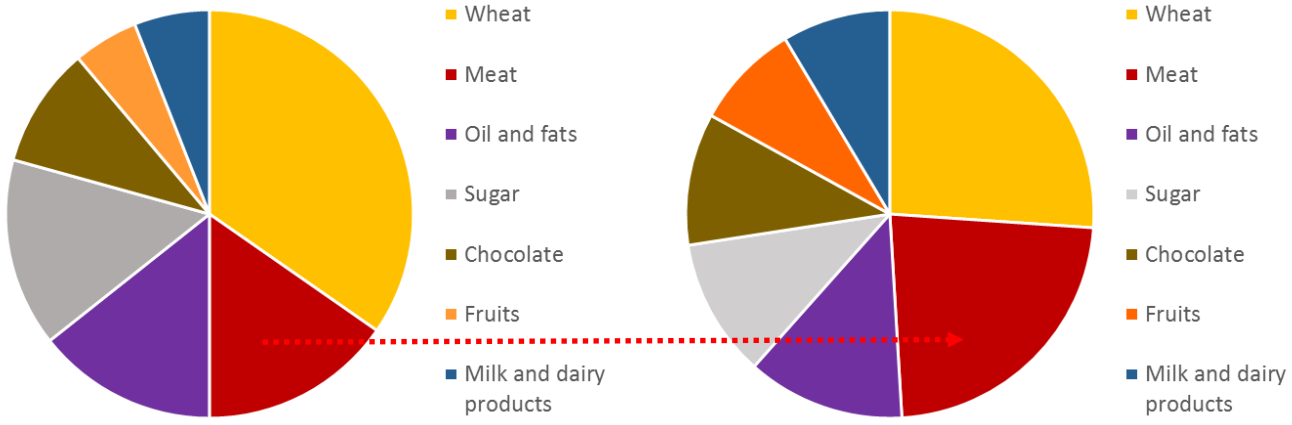


Figure 21 Share of meat in 2010 and 2014 among the top seven imports of Georgia

Table 27 illustrates the value of most important food products imported to Georgia. As shown already in Figure 20, imported meat (beef, pork, poultry, sheep and goat meat) takes the second place after the value of imported wheat. Thereby the share increased from 15% to 23% within five years (Figure 21).

Table 27 Import of different types of meat in Georgia by years (mln. USD) 42

Products	2010	2011	2012	2013	2014
Beef	13	21	22	17	18
Pork	13	19	29	34	38
Poultry	48	66	70	71	72
Sheep and Goat meat	0.004	0.005	0.018	0.010	0.264
Total	74	106	121	123	128

According to the statistical data provided in table 27, poultry has a leading position among total meat imports, the second and the third place are taken by pork and beef. According to the above figure, the value of imported poultry and pork gradually increases by the years, whereas for beef, no tendency can be observed.

Beef and pork production in all three countries of the South Caucasus (Georgia, Armenia and Azerbaijan) is practiced predominantly in small family farms. In Armenia, a few commercial pork farms are in operation, while in Georgia only one commercial farm exists. In Azerbaijan, a few rather big commercial beef farms are in production, while in Georgia there is one commercial farm and in Armenia, no commercial beef farm is known of. However, in none of the countries the market share of commercial farms reaches 10%.

5.1.4 Export of animals, meat and meat products

Live animal exports seems to be one of the great success stories of the Georgian agribusiness in recent years, as it increased from about USD 1 million in 2008 up to USD 34 million in 2009, in the process moving from 90th to 9th in the list of Georgia's most important export categories, overtaking wine or mineral water.

In 2009, the shares of sheep and cattle in total live animal exports were as good as USD 17 million each. Later, in 2010, live sheep export dropped drastically to USD 8 million,

While cattle export only dropped to USD 16 million. In 2011, the value of exported live animal almost doubled in both categories and reached USD 28 million for cattle and USD 15 million for sheep[43].

Beginning from 2008 up to 2014 export of live bovine animals were increasing gradually, in 2014 compared to previous year where we had highest volume of live cattle export, volume of live bovine animals export dropped by 37% (from 19 to 12 thousand tons). Based on the export data of the first 9 months of 2015 it can be assumed that live bovine animals export will decrease in the current year as well. It also should be noted that the largest importer of live bovine animals from Georgia is Azerbaijan, where the economy largely depends on oil, that is strategic and main income generator resource for the country. Since oil prices have dropped recently (and price fall is in progress) which therefore decreased income generation in the country, it can be assumed that live bovine animals export to Azerbaijan will have decreasing trend in short-term and mid-term future.

While the strong demand and high prices received for exported live cattle are a boon to farmers, particularly in the Kakheti region which borders Azerbaijan, exporting live animals and importing processed meat from abroad destroys economic value creation and jobs in the slaughtering and meat processing industry

Table 28 Live Animals Export from Georgia ('000 USD)44

Categories	2007	2008	2009	2010	2011
Live horses, hinnies, mules	41	54	7	18	5
Live bovine animals	-	585	16'903	15'932	28'213
Live sheep and goats	-	463	17'054	7'843	14'944
Live poultry	-				274
Other live animals	2	0	22		9
Total live animal export	43	1'102	33'985	23'793	43'443
Share of total exports	0.003%	0.07%	3.0%	1.5%	2.0%
Total Exports	1'232'110	1'495'345	1'133'622	1'575'067	2'189'136

Table 29 Live bovine animal exports from Georgia by years45

	2011	2012	2013	2014	2015 (JAN – SEP)
Tons (in live weight)	9'759	12'987	19'088	12'112	7'621
Thousand USD	28'213	39'252	47'567	30'067	14'801

According to the data provided above (Table 28, table 29), the export of live bovine animals increased from 2008 onward for five consecutive years and then dropped by 37% (from 19 to 12 thousand tons). Based on the analysis of export data for the first three quarters of 2015, one may assume that the export of live bovine animals will decrease in the current year as well. It also should be noted that the largest importer of live bovine animals from Georgia is Azerbaijan. The Azeri economy largely depends on oil, which is a strategic and main income generator resource for the country. Since oil prices have dropped recently consumers might buy less meat and it therefore can be assumed that live bovine animals export to Azerbaijan will decrease on short- and mid- terms.

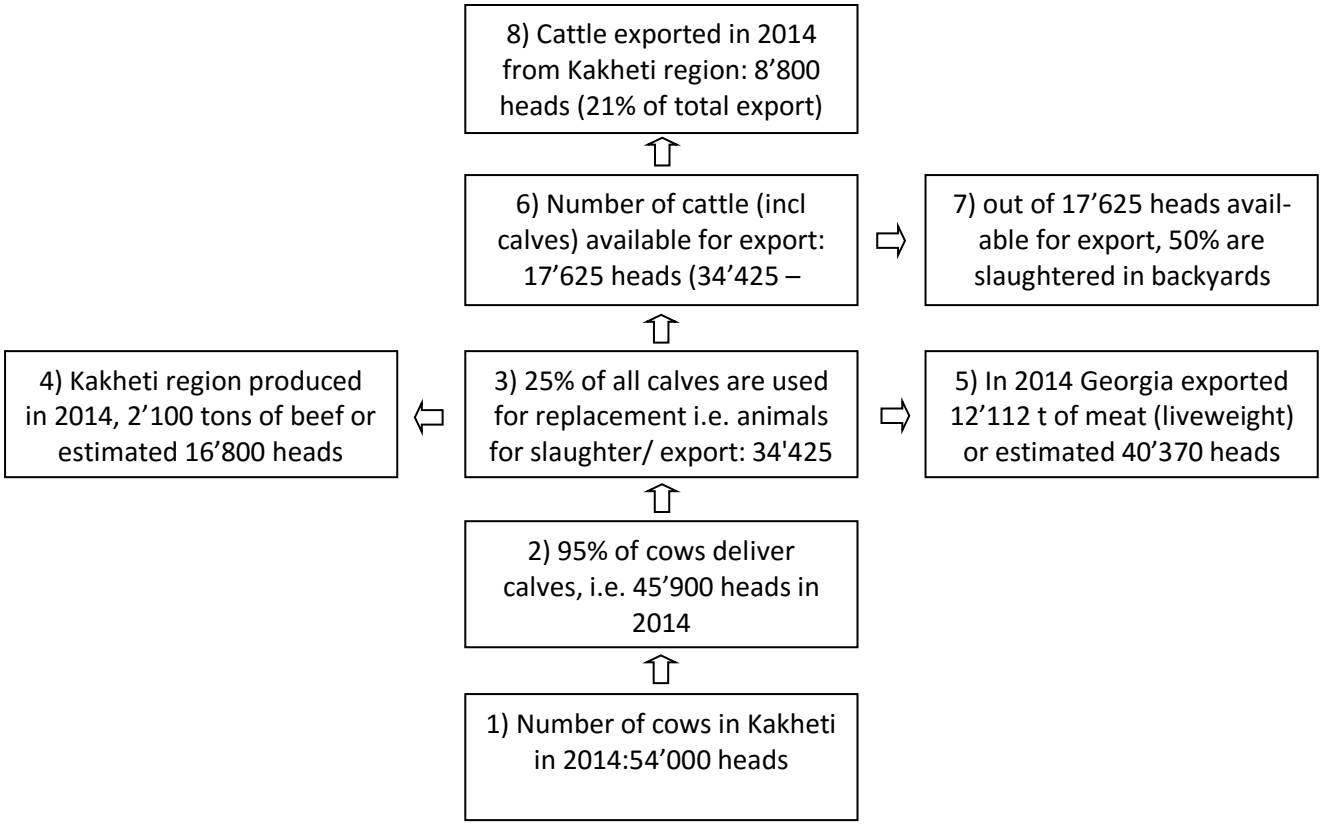


Figure 22 Calculation of the share of Kakheti region in total export of live bovine animals from Georgia in 2014

Explanations

1) Number of cows in Kakheti in 2014 – 54'000 heads[46]

*2) In average 95% out of total cows deliver calves, i.e. number of calves delivered by cows in Kakheti region in 2014 equals to 45'000 heads (54'000 *0.95).*

*3) From the total output of calves, 25% is kept at households/farms for replacement of old animals, i.e. Number of calves available for slaughtering and export equals to 34'425 (45'000 heads*0.75).*

4) In 2014 in Kakheti was produced 2'100'000 kg of beef[47], in average 2'100'000 kg of beef (slaughtered weight) equals to 16'800 heads of cattle (in average meat output after slaughtering of live bovine animal equals to 50% of live weight, i.e. 2'100'000/0.5= 4'200'000 kg of live weight, in average live weight of live bovine animal available for local slaughtering equals to 250 kg, i.e. 4'200'000 kg/250kg = 16'800 heads)

5) In 2014 from Georgia was exported 12'112'000 kg (in live weight) of live cattle[48] in average live weight of live bovine animal purchased for export equals to 300 kg, i.e. 12'112'000 kg/300 = 40'370 heads.

6) Number of calves /cattle available for export are 17'625 (34'425 heads – 16'800 heads).

7) Since back yard slaughtering in Georgia is a still common practice we should assume that 50% out of total number of cattle available for export goes to back yard slaughtering for local consumption i.e. 17'625/2= 8'800 heads.

8) Taking into consideration above made calculations and assumptions number of live cattle exported from Kakheti region in 2014 equals to 8'800, i.e. 21 % out of total export

5.2 Meat production practices

5.2.1 Main meat value chains

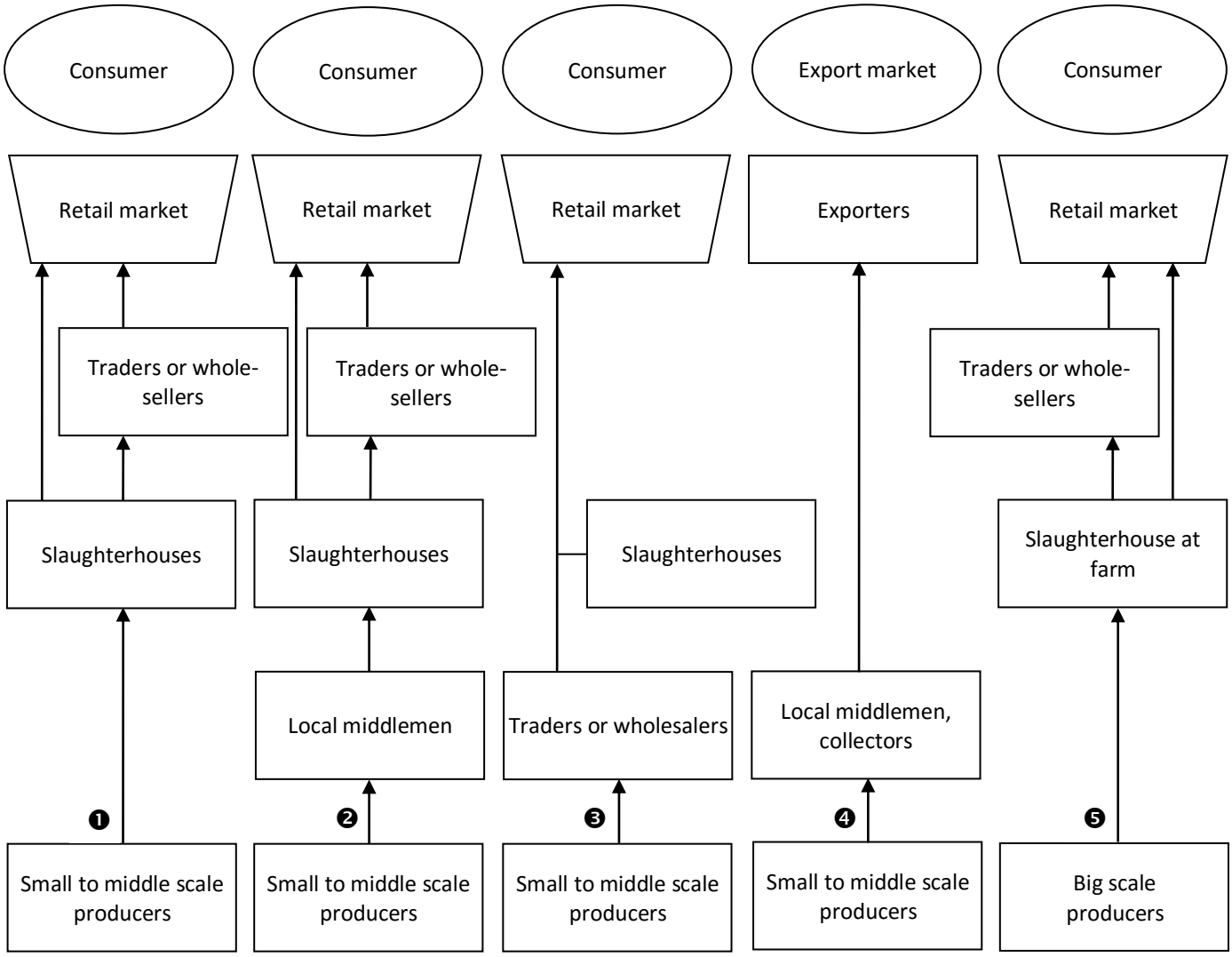


Figure 23 Main meat market chains in Kakheti region

Meat from Kakheti region follows typically five different chains, whereby ❹ is valid only for cattle, ❺ refers to big farmers, so far there is one in Akaurta village, Bolnisi Municipality (outside of Kakheti region). However it is a matter of time till this chain also will play an important role in Kakheti.

5.2.1 Consumption (trends)

The Georgian population stays roughly constant. The consumption trends of beef and pork are opposite: beef consumption is decreasing while pork consumption is increasing. It is supposed that pork (and poultry, not included in the chart) substitute beef due to its lower price. Physically, locally produced beef animals are increasingly exported alive to Azerbaijan. The thus exported meat is replaced by increasing imports of pork and poultry.

- Self-sufficiency ratio in case of beef equalled to 70% i.e. 30% of total consumption was imported frozen beef (all categories);
- Self-sufficiency ratio for beef was 42% i.e. 58% of total consumption was imported frozen pork (all categories);

Table 30 Total consumption of beef and pork in Georgia ('000 tons)[49]

	2010	2011	2012	2013	2014
Beef	34.9	31.6	27.1	28.8	28.7
Pork	27.2	29.1	34.2	38.1	38.9

Table 31 Total consumption of beef and pork in Georgia ('000 tons)[50]

	2010	2011	2012	2013	2014
Consumption in kg per capita					
Beef	7.9	7.1	6.0	6.4	6.4
Pork	6.1	6.5	7.6	8.5	8.7
total national consumption in 1000 tons					
Beef	34.9	31.6	27.1	28.8	28.7
Pork	27.2	29.1	34.2	38.1	38.9

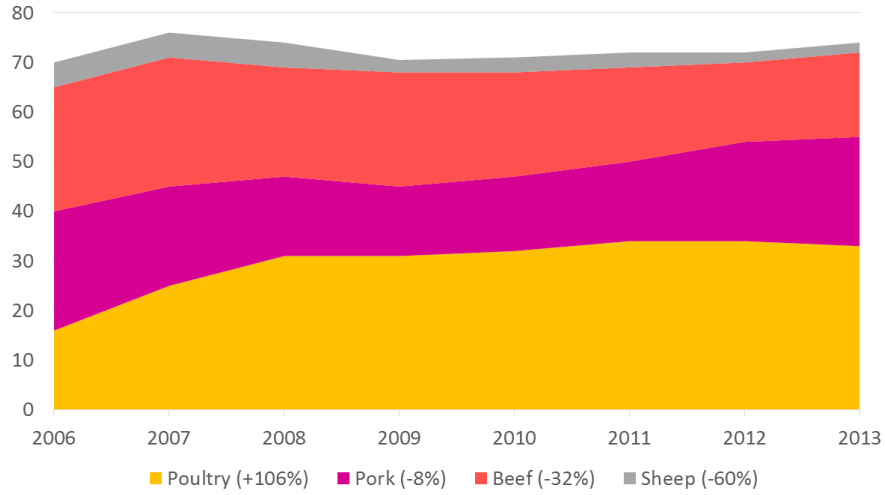


Figure 24 Meat consumption in Georgia between 2006 and 2013 [gram/capita/day]

While prices increased in absolute terms by 60% (beef), respectively 29% (pork), volumes decreased less (27% in the case of beef), respectively increased by 21% (pork) during the same period. Increasing volumes and prices mean a) pork is wanted by consumers and they have the purchase power to pay for it and b) there is low elasticity, which means there are as good a no alternatives to pork meat.

Table 32 Beef and pork annual average retail prices in Georgia during 2010-2014 (GEL/ kg)[51]

	2010	2011	2012	2013	2014
Beef	7.94	10.97	12.10	11.59	12.68
Pork	9.07	11.15	12.24	10.62	11.70

5.2.1 Retail- and whole sale trade

The cattle commerce is mainly done by individual middlemen. One part of the animals passes through periodic public markets, another part is conveyed by middlemen directly from the farm stable to the slaughterer or end user. As good as no trader in the different value chains developed so far integration activities. However, cattle trade seems sometimes to be prone to informal control of the market by key stakeholders[52].

5.2.1 Processing and storing

Slaughtering is done in slaughtering facilities of different sizes (informal slaughtering at home and on markets, medium and big formal slaughtering in slaughterhouses). While the implementation of stricter hygienic standards in view of the integration into Europe has led to a certain settlement of structures in Georgia, this has not yet happened in Armenia and Azerbaijan.

Meat is processed by officially operating slaughter-houses that have the required permit. The slaughterhouse of Karajala village in Telavi funded by USAID sells 2-4 tons of meat per day. We should also mention the slaughter-houses of Lagodekhi, Velistsikhe, Iormuganlo and Vardisubani including Butcher shops along the Bakurtsikhe-Tbilisi highway which slaughter and sell cattle.

Currently eleven slaughter houses are operational in five out of the eight districts of Kakheti region (Sagarejo-4, Lagodekhi-3, Telavi- 2 and Sighnaghi and Gurjaani each one). Four out of the eleven have a pig slaughter line,

whereby two out of the seven which do not have such line are located in Azeri villages. Three slaughterhouses are HACCP conform or in the process of obtaining the certificate in close future. The number of slaughtered cattle ranks from 1-2 per week up to 50 per day. Most of the slaughterhouses in the region are renting out services to farmers or local butchers and most also have a veterinarian who is checking the carcasses and inner organs.

The hygienic situation in other slaughter-houses of the region is often very poor: hygiene practices are not followed; there are neither proper water supply nor sewage, cooling chambers are – if existing – not functioning properly, let alone laboratories which are regularly missing at the sites. In some cases, the slaughter-houses are even not separated from retail sale areas. Experts see the main problem in the absence of local oversight agencies and the inability of the Food Standard Agency to control the quality of production.

In 2010, the Government of Georgia enforced a regulation according to which beef could only be sold if cattle was slaughtered at special designated slaughterhouses. Previously, there were four such slaughterhouses for Tbilisi- Aspindza, Natakhtari, Karajala and Tsikisdziri. In the beginning of summer of 2011, new regulations were introduced, according to which beef sold in Tbilisi can come from only two slaughterhouses - Natakhtari and Teleti. Although slaughtering costs were not very high, it was one GEL per kilo, transporting animals to and from slaughterhouses blew the beef prices up.

It was widely reported in the Georgian press that the institutionalisation of the slaughtering process in 2010 led to a sharp increase of beef prices at agricultural markets from about GEL 7-8 (USD 4-4.5) to about GEL 12-13 per kilo. Decreasing the number of slaughterhouses that were allowed to serve Tbilisi to two, led to further shortage of beef in the city and prices additionally hiked up (up to GEL 16-18). However, in summer the prices gradually started to stabilize[53]

5.2.2 Production

Beef is by far the largest category of meat production in Georgia. However, in some parts of the country, it is produced almost as a by- product of milk production. When farmers focus on milk production, they sale male calves as cash generators, while females are kept or sold as potential sources of milk. Male calves are not kept for very long and are often killed for veal as intensive feeding – and thus reaching maturity with a short period to time - would require the use of high-energy feed that is expensive. In the absence of this means for quick maturation, raising a beef cow to adulthood means keeping it for 2-3 years and investing time and financial resources, which are scarce. It also involves taking risks, as the animal may die or be killed. Finally, it requires space in a winter shed and sufficient feed (usually hay) for it to survive the winter. All of these factors may be extremely scarce.

Raising cattle for beef production is rare in Georgia. Beef producers buy calves in spring, when they are 2-3 months old, or in autumn, when the age of calves is about 5-6 months. In summer, calves are usually kept in grazing areas and not given any additional food. In the winter period farmers usually buy hay and also prepare feed from the by-products of food processing (like beer production) combined with maize and bran. After two years, young bulls reach 300-350 kilos and are often sold as live weight. The largest beef market in Georgia is in Tbilisi.

Structure

Table 33 Shares of family holdings and agricultural enterprises in meat production in Georgia (in percentage)[54]

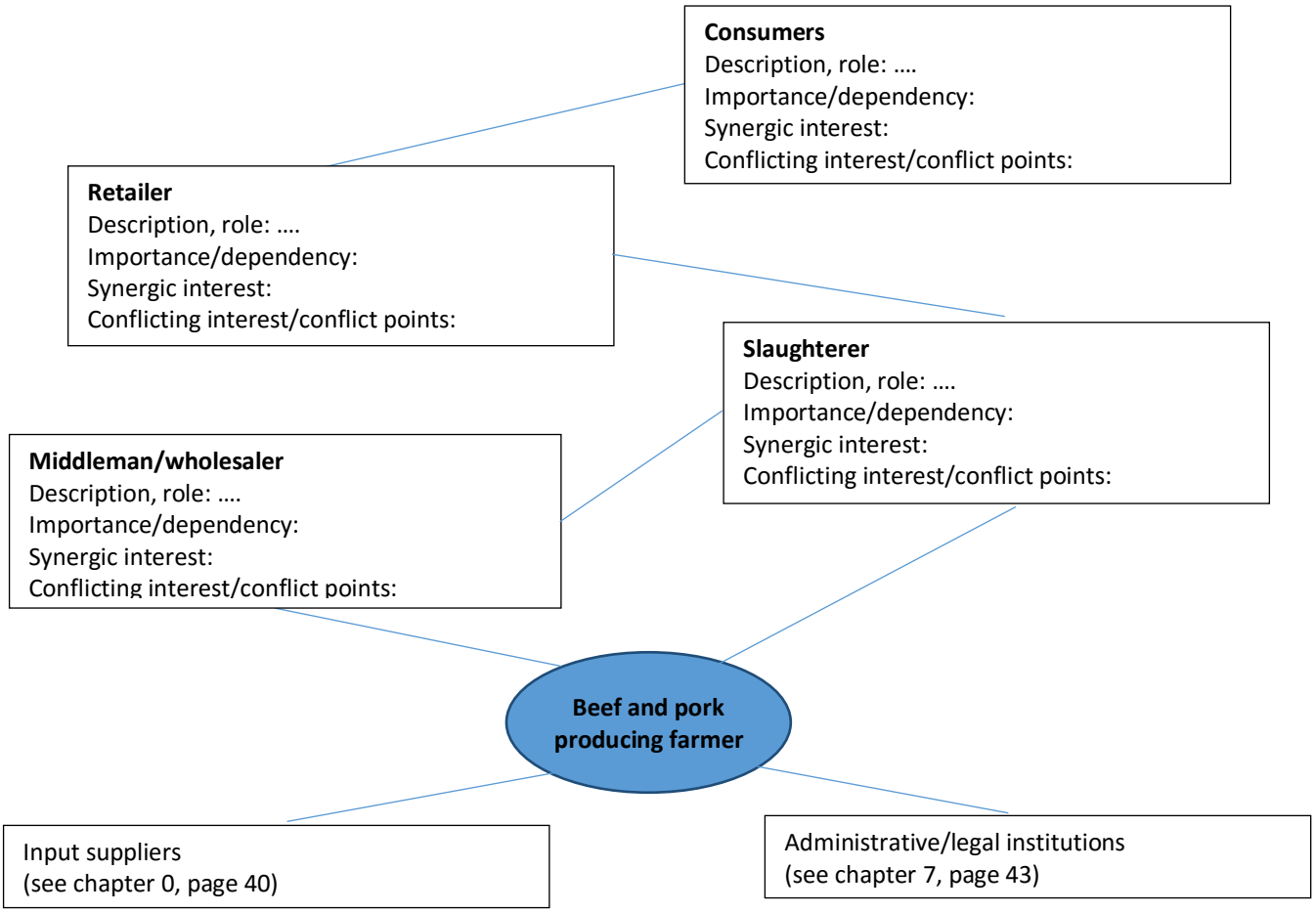
	2011	2012	2013	2014
Share of family holdings				
Beef	99.9	99.2	98.4	91.6
Pork	99.5	99.4	93.8	94.3
Share of agricultural enterprises				
Beef	0.1	0.8	1.6	8.4
Pork	0.5	0.6	6.2	5.7

According to the structure given in Table 33, 91.6% of total output in beef sub sector was produced by family households and only 8.4% by agricultural enterprises in 2014. In the case of pork, the share of family households equals to 94.3%. One also can observe a relatively sharp increase of agricultural enterprises in 2013 (increased by 5.6%) that was caused by establishment of two big pig farms in Kvemo Kartli region (Kalanda Ltd & ABD Georgia Ltd). A similar increase can be observed in beef production in 2014 (increased by 6.8%) but we cannot analyse the reasons of the change, since nowadays there are not any big cattle farms in Georgia specialized in beef production.

5.3 Stakeholder analysis

5.3.1 Approach

The following schema shows how the stakeholder in the meat value chain are grouped relative to the beef and pork producing farmer. Furthermore, a list of content is given how the stakeholders will be described, with particular reference to their interests relative to the interest of the meat farmer.



5.3.2 Function and interests of the slaughterer relative to the farmer and the middleman

Description/role: There are small slaughterers at village level and major slaughterhouses who supply meat to supply the cities. Informal slaughtering in backyards seems also to be frequent. In reality it may be difficult to establish a clear line between informal slaughtering and formal local slaughtering.

Local slaughterers either are tasked by farmers to slaughter their animals for a fee, meat is then delivered back to the farmer. Or, the slaughterer buys the animal and sells the meat to village residents or middlemen, eventually presents it at a market for sale. City slaughterhouses buy animals from the countryside through middlemen or employed buyers and resell to retailers.

Importance/dependency: medium: driving the animal to a slaughterer in a neighbour village is always a viable option. The market power of city slaughterer seems to be higher. The reduction to 4 major slaughterhouses around 2010 has led to a sharp increase in prices[55].

Synergetic interests:

- **Quantity:** high produced quantities by farmers boost incomes of farmers and slaughterers
- **Value:** high value/good quality of the produced animals/meat sustain demand and willingness to pay of the customers
- **Efficiency:** The lower the production costs of the farmers, the more they make profit at a given price and the more will they motivated to keep up or increase production at a given price. The lower the slaughtering costs, the more competitive is the slaughterer in relation to his customers/the more is he able to make a profit.

Conflicting interests:

- **Price:** compromises must always be looked for
- **quality:** the quality expectations of the slaughterer may require costly efforts by the farmers
- **Steadiness/predictability of supply:** The butcher would like to have a steady supply of animals that matches his demand. The ability of farmers to adapt to this is limited.

5.3.3 Middlemen and traders' function and interests relative to the farmer and the slaughterer

Description/role: Middlemen buy individual animals in the villages or on markets and group thus the animals offered to supply big slaughterhouses or exporters of live animals. Whether it is current that middlemen buy carcasses or meat parts to deliver them to wholesalers or retailers in cities is unsure.

The wholesaler who keeps a storehouse where retailers or restaurants come to shop or who delivers shops and restaurants with a complete assortment of food doesn't seem to exist in Georgia. Middlemen with a specific product offer seem to take their place.

The middlemen's role is: to group the scattered offer for the demand of the slaughterhouses, to link demand and supply over distances, to manage the financial fluxes between customer and provider, in Georgia usually including providing advance financing.

Importance/dependency: medium: usually, farmers have a choice of several middlemen to cooperate with. An information advantage, vertical collusion or collusion e.g. with public institutions can, however, give specific middlemen disproportionate market power.

Synergetic interests:

- **Quantity:** high produced quantities by farmers boost incomes of middlemen and slaughterers
- **Value:** high value/good quality of the produced animals/meat sustain demand and willingness to pay of the customers and benefit also to middlemen
- **Efficiency:** The lower the interaction costs, the more competitive is the middleman in relation to his customers/ the more is he able to make a profit
- **Constant sales potential:** the potential to dispose of different sales channels which enable continuously that most of the time all type of products offered can be placed is a common interest of all partners.

Conflicting interests:

- **Price:** compromises must consistently be negotiated
- **quality:** quality levels must constantly me monitored and negotiated
- **steadiness/predictability of supply:** middleman would prefer a predictable supply, which is not easy for farmers and slaughterer to provide

5.3.4 Retailer's function and interests relative to the farmer and the slaughterer

See corresponding chapter in the milk section.

5.4 Key findings of the meat subsector

- Live animal export is the success story of Georgia in the meat production sector
- The effect of the swine flu on the pork production had a significant affect
- Georgia still depends on imports of meat and in there is a fluctuation in production of meat by years, especially pork, which was affected by the spread of infectious diseases
- Meat consumption in Georgia is stable.
- Beef and milk production in Georgia is still not professionalized. Despite the fact that beef production is quite important, it is still a by-product of the milk production.
- The hygienic state of slaughterhouses is still poor in Kakheti, despite the process of HACCP implementation. The backyard slaughtering seems to be a practice still.
- Georgian meat production does not have a potential to penetrate EU market, but there is a potential to substitute imports of frozen meat.

6 Analysis of supporting functions in the market system – input and service providers

6.1.1 Key figures of input- and service providers

The following chapter shows characteristics of different input and service providers and their distribution in the region. Table 41 provides some ratio related to farmers resources. Thereby one can see the strategic importance for instance of Gurjaani, hosting more shops and services than more remote and/ or less important Municipalities. Interesting also to observe the relative low coverage in Sagarejo - the Municipality closest to Tbilisi. Numbers of shops and service providers alone do not say the complete truth, since their profile and size is as important. One therefore may assume that the few agro- and vet shops in Akhmeta or Dedoplistskaro will be rather big and highly diversified shops, whereas Gurjaani or Telavi have many similar shops. Breaking down the number of input providers by farmers, animals or hectares of land, the Kakheti figures are - compared to international data - rather high, which at first sight looks like a poor coverage. Disclosing the figures then in detail, one has to be aware that they are broken down per rural households (population divided by five), respectively are referring to statistical data (number of animals or hectares of land). Needless to say that only a small percentage of these farmers or land is used for market oriented production. In other words, one might even say the number of input- and service provider being a better indicator for agricultural entrepreneurship than statistical figures.

Table 34 Coverage with inputs and services in Kakheti region

	Livestock[j] units per vetshop	ha of arable land per machinery service	Farms per agro- & vet shop	Pigs per feedmill
Akhmeta	16527	369	383	410
Dedoplistskaro	5078	3183	278	244
Gurjaani	1873	353	232	533
Kvareli	4010	1641	370	106
Lagodekhi	8365	2766	359	942
Sagarejo	20280	564	1024	790
Sighnaghi	5624	1054	252	317
Telavi	2772	1223	361	140

6.2 Access to inputs and services in Kakheti region

6.2.1 Veterinary service providers

The following issues which limit the effectiveness of the veterinary service providers could be identified:

- Professional veterinarians' availability/coverage: In some regions, veterinarian services seem to be unavailable. Many veterinarians being elderly, some of their knowledge may be outdated. It seems that there are not enough young veterinarians entering the profession.
- The readiness to pay for veterinary services seems to be very limited among farmers. The opinion that all veterinary services are a public service seems to be prevalent.

6.2.2 Veterinary drug supply

Telavi is the centre of Kakheti and Akhmeta Municipality residents in most cases buy drugs in Telavi. That is why there is the biggest number of vet-shops there, followed by Gurjaani, the most densely populated region with possibly the smallest number of cattle among Kakheti municipalities. The cattle, however, is allocated among the whole population. There are enough shops in other municipalities and accordingly access to veterinary inputs, even in Sagarejo Municipality, which has the biggest amount of cattle, is granted. The little number of shops in Lagodekhi can be explained, because of number of mobile vet shops.

The picture with veterinary services differs from the veterinary shops. Sometimes even veterinarians themselves complain about the lack of professionals in the area.

[j] *A livestock unit (LU) is a comparable figure that allows to compare feeding or manure characteristics across different categories of animals. For our case, one livestock unit is: 1 cow or bull, 3.3 calves, 2.5 sows, 5 pigs, 10 sheep or 25 chicken*

Table 35 Number of vet shops centres in Kakheti region by municipalities[56]

Municipality	Vet-shops
Akhmeta	2
Dedoplistskaro	6
Gurjaani	9
Kvareli	6
Lagodekhi	2
Sagarejo	4
Sighnaghi	5
Telavi	10
Total	44

6.2.1 Feed mills

Main issues of feed mills:

- Raw materials
- Marketing

Main issues of feed additive providers:

- Import of components, price of components

Table 36 Number of feed- mills and combined feed producers by Municipalities[k]

	Feed mill	Combined
Akhmeta	20	0
Dedoplistskaro	26	2
Gurjaani	10	0
Kvareli	40	0
Lagodekhi	5	0
Sagarejo	6	0
Sighnaghi	16	0
Telavi	20	0
Total	143	2

6.2.2 Agro-shops

Obviously there are most agro-shops in Gurjaani. The Gurjaani Municipality is most diverse in terms of agriculture directions and is most densely populated. In other municipalities the numbers of agro-shops that are needed to cover the area is lower. The lack of shops in Sagarejo municipality can be explained by the proximity to Tbilisi.

The following main issues which limit the effectiveness of the veterinary service providers could be identified:

- Prices: farmers often lack the purchasing power to buy the inputs in question.
- Know-how: many suppliers lack the know-how to explain and promote the adequate use of their products.
- The ICCs, which have the task in providing advice that the product suppliers cannot provide, are themselves insufficiently qualified to do so.

There are number of chemicals supplier companies presented in Kakheti region (AgroGeo+, Invet, AgroSphere, Georgika, Mofer, etc.). Their products are diverse and vary in quality and price accordingly. Still they do not meet the farmer's requirements. Though most of the companies provide terms of use through advising or leaflets, the misuse of chemicals is common. ICCs are not of help, because in most cases they need retraining and or their advice is influenced by prejudice. Added to that, farmers are not taking soil tests which results in low yields, what farmers blame the inputs for.

[k] *Unfortunately the information provided by ICC's is not applicable to the reality; there are much more feed mills and Combined Feed producers in Kakheti region.*

Table 37: Number of agro- shops in Kakheti region by municipalities

Municipality	Number of agro- shops
Akhmeta	16
Dedoplistskaro	10
Gurjaani	45
Kvareli	13
Lagodekhi	26
Sagarejo	6
Sighnaghi	24
Telavi	17
Total	157

Source: Kakheti Regional ICC office, own stakeholder interviews

6.2.3 Seed suppliers

For the last 5 years a number of new types of seeds have been imported in Georgia within state programs (hybrid maize seeds, etc.) or by private sector. The funding of the seed testing in the Ministry of Agriculture has been cut, but restarted in 2013 under the new project which will last for 3 years in cooperation with the private company Ltd "Grain Logistics Company". Although other companies are busy with high quality seed production (Ltd "Lomtagora", etc.), still the farmers tend to use their own seed, which is of low quality, in most cases is not processed and therefore has low yield.

The main issues influencing the business and efficiency of seed suppliers is

- whether farmers prefer to use part of last year's harvest for reseeding, accepting lower yields and lower quality
- whether the seed supplier sells seed that he produced himself
- whether he sells high quality seeds from breeding firms at a high price.

6.2.4 Mechanisation services (for fodder production)

Table 38 Number of machinery centres in Kakheti region by municipalities

Municipality	Machinery centres
Akhmeta	26
Dedoplistskaro	11
Gurjaani	40
Kvareli	6
Lagodekhi	5
Sagarejo	27
Sighnaghi	22
Telavi	9
Total	146

The little number of Machinery Centres in Lagodekhi and Kvareli Municipalities can be explained with the lack of arable land. In Dedoplistskaro municipality, at first glance, the number of centres seems small, but they are bigger in most cases (more machinery and technicians). Moreover, the number of villages in Dedoplistskaro district is small. Gurjaani municipality is most densely populated, has a big number of villages, and therefore a big number of machinery centres.

"Mechanizatori" centres are centres equipped with modern equipment financed by the Georgian state. They are spread all over Kakheti region. Their prices are higher than the prices of private mechanization services, which is why private mechanization services are often preferred. Private MSPs have lower prices but the machinery is scarce and old, and needs permanent reparation which consumes a lot of time. Though it is crucial for crop production to the work at the appropriate moment, because of above mentioned problems missing the appropriate time windows is frequent. Added to it, most of the famers are not attentive to the issue.

6.2.5 Providers of information and expertise

There is number of international organizations/projects (CNFA REAP, EBRD, IFC, Mercy Corps, Elkana, etc.) supporting the local agriculture sector. This support includes wide range of activities such as provision of technical assistance, international experts, trainings, participation in trade fairs, co-financing of consulting and/or certification services, etc.

To support the local private sectors several sector specific food safety manuals have been issued by the agriculture supporting projects (manuals for dairy, hazelnuts, fresh fruits and vegetables sectors).

6.2.6 Testing and certification services

The following supporting services have been developing during last 10+ years in relation to the food sector: consulting, lab tests, metrology, and certification. Compared to the situation 7-10 years ago, the private sector has been gradually acknowledging the need for those supporting services. The lab sector has been developing offering practically complete range of required tests for the dairy and meat sector. Compared to product lab tests, the need for metrology services is not well understood by the small companies (and since this is not yet officially required, the companies do not consider this issue).

The issue of certification of management systems in accordance with the international standards is mostly considered either by larger companies or by those who focus on exporting of their products. Therefore the food safety management systems certification at the moment is not of importance for the smaller dairy and meat products. At present their primary challenge still is to comply with basic regulatory requirements (sanitary, traceability, basic practices, personnel education, etc.).

7 Regulatory functions in the milk and meat market systems

7.1 Legal framework

7.1.1 National policies

Georgia has taken the responsibility to harmonize its legislation with the EU regulatory requirements. This is applicable to the food safety too. The Government Decree #783 on “The Comprehensive Strategy and Legislative Approximation Program in Food Safety” has been first issued in 2010 and then revised in May 2014. The NFA together with the Ministries of Agriculture and Health is involved in upgrading the legislative basis for the food sector with specific emphases on food safety.

Description and assessment of the state of the art in national regulations

The ENP Country Progress Report 2011 – Georgia, May 2012 states that "in 2011 the EU and Georgia made progress in deepening and broadening EU Georgia relations within the Eastern Partnership framework. Negotiations for a Deep and Comprehensive Free Trade Area (DCFTA), an integral part of the future Association Agreement, were launched in December. Georgia made good progress in implementing the Visa Facilitation and Readmission agreements, which entered into force in March 2011". The memo further states that "After progress made by Georgia towards implementing the remaining "key recommendations" was considered sufficient, the EU decided to launch negotiations for a DCFTA in December".

The following legislative documents are in place:

- The Food Safety Law, Law on Veterinary,
- Law on Licensing and Permissions, Law on Pesticides and Agrochemicals,
- Law on Water,
- Law and Wine and Viticulture,
- Code on Production Safety and Free Movement.

A Food Safety Strategy was approved by Prime Minister’s office in 2011 and the structuring and capacity building is conducted with strong support from the EU and SIDA. The Law of Georgia on Food Safety was adopted back in 2006; however it did not go into force. The duties of the inspection service duties are defined under this law, which will be enforced from 2013, when around 800 enterprises are scheduled for inspection in the first year.

Constraints

Increasing trend for food safety control is apparent in the country, however the veterinary control and reliable animal health it is still the huge problem. Therefore it is of utmost importance to start the relevant actions to effectively control the animal health.

Potentials

On the policy level, there is still a need for the training of relevant personnel, those who are involved in the regulatory requirements development (the development is basically translation of relevant EU regulations). Although many international organizations provide the respective governmental bodies with the training opportunities, the local officials still experience the difficulty in understanding the basics of modern food safety and transforming it to the local reality. There is still significant need for the state inspectors in terms of technical knowledge (food safety principles, HACCP, etc.) as well as inspection procedures, stated by food safety consultants, GDCI.

7.1.2 Socio-economic development strategy 2020

Priority Government Intervention to support the production and export development strategy in order to improve the investment and business environment

According to the Social-economic Development Strategy of Georgia 2020, several steps have been and are foreseen to be developed by the Government to support the production. Below are provided some information in this regard as well as link to the strategy for 2020.

Favourable entrepreneurial and investment environment has a great impact on productivity as it has a direct impact on the efficient distribution of resources in the private sector. Business requirements generally experience rapid change due to fierce global competition and dynamic economic processes and constant work is therefore needed to improve the entrepreneurial and investment environment.

Reforms aimed at liberalizing Georgia's economy were launched in 2004, resulting in the removal of bureaucratic barriers and reductions to the overall tax burden. According to the 2014 edition of the World Bank's Doing Business Report, Georgia has been one of the world's leading reformers for the past several years; the country currently holds the 8thplace out of 185 in the "Doing Business" rating.

Despite this, however, serious problems remain in certain areas, which hinder long-term economic growth and improvement of the private sector's competitiveness. Ensuring free market competition is still a problem, and concerns remain in terms of bankruptcy regulation and the resolution of commercial disputes as well as various other issues relevant to doing business.

Existing difficulties generally worsen the entrepreneurial environment, reduce investor trust, and make effective mechanisms established in other areas less effective: Georgia, for example, holds the 1st place in the 2014 edition of the World Bank's Doing Business Report in terms of ease of property registration, but this achievement loses its importance if property rights are not properly observed and if disputes concerning property ownership are not resolved quickly.

Improvements to the regulatory environment are also reflected in the 2014 edition of the World Bank's Doing Business Report, according to which Georgia has one of the best performances in the world, but improvements remain to be made in certain areas (e.g. issues concerning bankruptcy and meeting creditor requirements).

In order to ensure attractive entrepreneurial and investment environment the implementation of various legislative and institutional changes are required, including efforts to strengthen the judiciary system—particularly as a strong and independent judiciary is essential to efforts to improve the country's business and investment environment, especially in terms of protecting property rights. The Government of Georgia will protect business from illegal interventions; in that regard, the Government's goal is to eradicate existing deficiencies while preserving achieved results.

Policies that are to be implemented in order to improve the investment and business environment according to "Social economic strategy of Georgia 2020"

- Strengthening the protection of property rights
- Government support for development of entrepreneurship
- Strengthening mechanisms for the efficient resolution of commercial disputes
- Improving investment legislation

- Improving legislative and institutional mechanisms for free market competition
- Improving mechanisms for the regulation of bankruptcy and the closing of businesses
- Improving public services and enhancing the transparency of public administration
- Ensuring flexible regulations

Potentials and perspectives

Taking the above-mentioned steps should significantly improve the country's business and investment environment, which will lead to the opening of new businesses, the expansion and diversification of existing enterprises, an increase in foreign investment, increased productivity rates, and improvements in the country's standings in relevant international ratings and evaluations.

Targets for improving Georgia's investment and business environment

Target	Baseline*	2017	2020
Total investments (% of GDP)	24	30	35
GCR (Georgia's rank)	72	58	40
Regulatory quality (WGI) (points)	0.68	0.72	0.78

* Most recent available measure.

7.1.3 Government policy for the agriculture and rural development sectors[57]

In the past two decades the Government policy has paid little direct attention to the agriculture sector particularly since the Rose Revolution of 2003. Priority was given to sectors requiring urgent reform, such as good governance and the promotion of free trade. Agriculture has become a development priority in Georgia since 2010-11. The need for change was highlighted by drought based restrictions of grain exports from traditional supplier countries (2007), spikes in food prices causing an agri-inflation of 27% in food price rises in 2010. This new emphasis on the agriculture sector was emphasised by a number of announcements by the President, and reflected in the '10 Points Plan 2011/2015', which proposes development of a business oriented agriculture in addition to traditional household based agriculture. This approach has been supported by the business sector, NGOs and donors.

Once agriculture became more dominant on the Georgian political agenda, support was provided by the business sector, civil society sectors, NGOs and the Orthodox Church (a substantial land and property owner in Georgia). This stimulated the preparation of the Agriculture Sector Development Strategy, 2012 – 2022. Support to the Ministry of Agriculture for the development of the strategy has also been a priority of the EU, a specific condition in the EU-FSP 2007 programme and more recently of the 2012 ENPARD Programme. USAID had also committed significant resources to produce a comprehensive strategy in 2003, which was not adopted as power and priorities changed at that time, an indication of the changes in policy and direction that follow elections.

EU support actions have continued to support the strategy development process, coming through such mechanisms and agencies as TAIEX and by the FAO, backed up by interaction between the Ministry of Agriculture and the EUD. The Ministry of Agriculture developed its Agriculture Sector Strategy through a Working Group, commencing August 2010. The preparation of the strategy was driven, controlled and owned by the Ministry of Agriculture. The strategy covers the period 2012 to 2022. In February 2012 the Government of Georgia adopted the Agriculture Sector Strategy. Donors were also involved in the process and a donor coordination committee was formed, however only few of the recommendations were adopted.

In order to implement the strategy, the Ministry of Agriculture, in collaboration with the EU, FAO and other partner organizations, is developing a 3 to 4 year Action Plan, which will describe the specific results, activities, projects, budgets, timeframe and evaluation criteria. A primary objective of the Agriculture Strategy is the development of agriculture through strengthening of the small households and forming of profitable production chains.

An adopted Agriculture Sector strategy has been a pre-requisite, for the Georgia Sector Budget Support Programme. This SPSP will support the implementation of the agriculture sector strategy. It aims to increase food production and reduce rural poverty. The specific objective of the SPSP is to improve the agriculture sector in Georgia by supporting the implementation of the sector strategy and to strengthen small farmers' organisations.

The defined development directions of the Agriculture Strategy are:

- Vision: Effective, competitive and sustainable agro-food sector
- Mission: Development of agriculture through improving value chain

The main goals of the Agriculture Sector Strategy are:

- Enhancing competitiveness of entrepreneurs and farmers
- Institutional development of the sector
- Development of the value chain
- Development of the regional and agriculture infrastructure
- Ensuing food security

The Government of Georgia planned to achieve those goals through job-creation and reduction of unemployment, while at the same time providing for persons with limited abilities and pensioners with an improved social assistance system. Accordingly the "10–Point Plan" for Modernisation and Employment 2011 – 2015, targets these two goals: how to create more and higher-paid jobs, and; how to improve the social status of citizens. The ten points are:

1. Macroeconomic Stability
2. Improvement of the Current Account Balance
3. Creation/Maintenance of a Favourable Investment and Business Environment
4. Formation as a Regional and Logistical Hub
5. Improvement of the Infrastructure
6. Development of Agriculture
7. Improvement of the Education System
8. Fine-Tuning Social Policy
9. Establishment of an Affordable, High-Quality Healthcare System
10. Urban and Regional Development

The chapter on Development of Agriculture in the Strategic "10–Point Plan" for Modernisation and Employment 2011 – 2015 states that the main aim of the Government of Georgia is to facilitate, in parallel with a traditional and self-sufficient type of agriculture, modern primary production and processing enterprises based on the principles of entrepreneurship, to create agricultural logistical centres with the potential to create jobs, and consequently to improve the quality of life in rural areas.

Incentives are also being offered to investors as part of an initiative "100 New Enterprises in Rural Areas" to acquire state-owned agricultural land (75% of total agricultural land) at 20% of the market price for agricultural processing projects; 0% tax burden for primary agricultural processing, and; 100% depreciation allowance on investments.

In parallel to the Ministry of Agriculture, the Ministry of Infrastructure has been in charge of most large scale investments projects in rural areas, apart from irrigation. In an effort to more closely address the priorities of rural communities the Village Development Fund was established. The fund operates on the principle of applications from communities as well as investment support with matching funds rather than grants. The areas of intervention were also very open ended, setting almost no limitation to the possible interventions. Due to the limited funds available in the local communities (for matching funds), as well as the low maximum amounts for fund participation in projects, it has not yet supported any initiatives on irrigation, focusing on other community social priorities such as social buildings renovation.

7.1.4 Innovation and new technologies

Goods produced in Georgia score low in added value. At this stage, only the processing industry is relatively developed. This is directly linked to the country's natural resources and local agricultural production. The major reason for these patterns is the low level of technological development and innovation, which, at the same time, causes irrational use of natural resources and jeopardizes the country's natural wealth. @

Both government and private sector spending on research and development remain low, which is reflected in various international evaluations and ratings: the 2013 edition of the Global Innovation Index (GII) ranks Georgia 73rd, the 2012 edition of the Innovations Capacity Index (ICI) ranks Georgia 44th (out of 131 countries), and the 2013-2014 edition of the World Economic Forum's "Global Competitiveness Index" (GCI) ranks Georgia in the following positions (out of 148 countries surveyed):

- Capacity for innovation—118th; and
- Company spending on R&D—128th.

Both Georgia's access to the latest technologies and overall level of technological development remain low: according to the GCI, Georgia holds the following positions:

- Availability of latest technologies—100th; and
- Firm-level technology absorption—117th.

Levels of protection of intellectual property—a major factor in the implementation of innovations—are also unsatisfactory: Georgia currently holds the 124th place in terms of protection of intellectual property.

7.1.5 Support to export growth[58]

Reduce barriers

Georgia's exports increased 4.5 times between 2004 and 2013, yet despite such impressive growth, the diversification of exports remains low both in terms of the countries Georgia exports to as well as in terms of the products it exports. In recent years, Georgian products have penetrated new markets, and the export of services has seen significant growth. Between 2010 and 2013, Georgia's most exported commodities were vehicles (mainly re-exports), Ferro-alloys, copper ore, mineral water, fertilizers and some other agricultural products.

The Government of Georgia will work to reduce remaining technical barriers to trade in order to facilitate export development and integration with international and European markets and to increase the competitiveness of Georgian products and services; this will make Georgian legislation more compatible with European norms. In this context, national quality infrastructure will be developed and national quality institutions will be integrated with international and European systems. Georgia will also consistently meet the obligations it assumed under the EU-Georgia Association Agreement including the obligations concerning harmonization of metrology, standardization, accreditation, compliance evaluation, technical regulation and market supervision national systems with European systems.

Besides the above-mentioned actions, Government of Georgia will be actively cooperating with region's other countries and existing trade partners in order to resolve the problems concerning the access to neighbouring countries' markets for Georgian entrepreneurs. To that end, a Centre for Protecting Exporters' Interests has been formed, which will collect information on the problems that Georgian export-oriented entrepreneurs face in international trade.

Facilitating agricultural exports

Government of Georgia will facilitate sector modernization and competitiveness. In order to increase the export potential of the country's agricultural products, food safety, the veterinary and phytosanitary systems will be developed in accordance with international and European norms through the gradual implementation of obligations assumed under EU-Georgia Association Agreement obligations.

With a view to meeting the obligations assumed under the EU-Georgia Association Agreement and increase benefits from other preferential trade regimes and to ensure the penetration and establishment of Georgian agricultural products in international markets, the Government of Georgia will introduce measures to increase the awareness of Georgian entrepreneurs of food safety, veterinary and phytosanitary issues; of the steps that are to be taken according to the EU-Georgia Association Agreement; of the requirements of international and European markets; and of relevant export procedures.

A geographical provenance certification scheme will also be expanded, and the further development of Georgian brands will be facilitated.

Creation of systems facilitating export development

In order to increase the competitiveness of Georgian products and services and support their establishment in international markets, the Government of Georgia will support the creation of systems facilitating export development, which will raise entrepreneurs' awareness of Georgia's export products and export markets. In this context, a special role will be played by legal entity of public law – Entrepreneurship Development Agency, which will be working on strengthening the export potential. Legal entity of public law Entrepreneurship Development Agency will inform the entrepreneurs about potential export markets, requirements existing in those markets and supply international markets with information on products and services offered by Georgia.

Developing and deepening international trade relations

In order to increase the export potential and competitiveness of Georgian products and services, the Government of Georgia will deepen co-operation with existing and potential trade partners in order to develop preferential trade regimes.

Besides, intensive work will continue with a view to starting negotiations with the United States on a free trade agreement and deepen trade links existing in the region. Government of Georgia will cooperate with neighbouring countries in order to make sure that Georgian products don't encounter artificial barriers in foreign markets

Constraints

Raw materials currently dominate the country's exports. Both the rate of market diversification and that of new market penetration by concrete products remain low.

Problems concerning technological sophistication and innovation mentioned above are the main reason for low diversification, and are also partially responsible for existing difficulties in terms of access to new markets. Besides, several other factors are also impeding exports in terms of access to new markets: technical trade barriers render the effective use of existing preferential regimes impossible; the absence of infrastructure necessary for boosting exports causes a lack of awareness of potential export markets on Georgian products; better trade regimes are necessary for accessing certain markets and inadequate trade and logistical infrastructure increases the cost of exports.

7.2 International agreements

7.2.1 European Union's Agreement on Deep and Comprehensive Free Trade Area (DCFTA) and Georgia[59]

Trade balance in agricultural and related products, as well as in trade turnover as a whole, between the EU and Georgia has been largely negative

Table 39 Trade volumes with EU partners in the frame of the DCFTA agreement (1'000 USD)[60]

	2009	2010	2011	2012	2013	2014
Export	67.7	80.1	141.0	105.9	182.6	216.4
Import	115.1	147.2	180.3	203.1	202.5	250.4
Trade balance	-47.5	-67.1	-39.3	-97.2	-19.8	-34.0

When it comes to milk and meat products, there is no export of those. However Georgia imports frozen pork from European countries and milk powder from Germany. The department of statistics of Georgia provides general information on imports that is why exact numbers are difficult to quote.

The EU has been by far rather protective of its domestic agricultural and food industry and has been imposing tariff and nontariff barriers in trade. The DCFTA shall see many tariffs disappear, however the nature of reductions shall differ among the product categories. For example in agriculture one product – garlic- shall see the tariff-rate quota, while a number of others shall maintain the market entry prices. Moreover, complying with the less clear-cut nontariff, TBTs shall be a greater challenge.

EU will remove import duties for basic agricultural products worth of worth € 5.7 million and € 0.5 million on processed agricultural products.

As for animal origin products, and among those dairy and meat products, Georgia has to first bring its SPS (sanitary and phytosanitary) legislation in line with EU's.

The process leading to recognition of equivalence of SPS standards is based on the principles of the WTO SPS Agreement and covers:

- an undertaking from Georgia to bring its SPS (sanitary and phytosanitary) and animal welfare legislation in line with the EU's and to maintain the institutional/administrative capacity to implement it;
- a rapid consultation mechanism to address trade irritants in SPS-related goods and
- a rapid alert and early warning system for veterinary and phytosanitary emergencies; under certain conditions, Georgia could participate in the relevant EU early warning systems.

The implementation of the DCFTA shall be beneficial for Georgia in terms of increased welfare for the citizens who will have access to better quality products on the domestic market on one hand, and facing the challenge of cheap European imports during the transition period on the other. Since there will be a pressure on domestic production - increased costs due to stringent compliance requirements with the EU, especially in the short run.

As mentioned above, dairy and meat products belong to animal origin products, and here to be able to export Georgia will have to ensure the welfare of these product, and under current circumstances it is not foreseeable in the nearest 5 years.

There is still number of challenges on both private and public sector side. Entire agricultural sector should be assessed for the export potential or if agricultural strategies are targeting particular sectors. It is not yet clear which sectors have more comparative advantage. And Georgia in fact is still focusing on import substitution, rather than on export potential assessment. The access to information is still the key and the major challenge. It is producers who in the end need to improve production to be able to export. The import substitution is more likely to continue, since there is still a limited milk and meat production in Georgia. Financial and infrastructural resources are available to producers; however the increase of production (to target export market) is unlikely as mentioned above.

Constraints/ potentials

The government recognizes the importance of SPS (Sanitary and Phytosanitary) control as an important aspect of preparation for the EU DCFTA (Deep and Comprehensive Free Trade Area). The Agency for Food Safety, Veterinary and Plant Protection (MoA) and the Division of Veterinary, Sanitary and Phytosanitary Control Organisation of the Department of Custom Control of the Revenue Service (MoF) appear to be poorly equipped to implement SPS control and further reform is required to align Georgian legislation with international standards.

Although Georgia has signed the DCFTA and this agreement considers certain benefits to international trade of the local produce, export of dairy/meat products to European countries is not feasible in nearest 5+ years. This is mainly due to questionable animal health situation in Georgia, still ineffective state control and unreliable food safety of locally produced products of animal origin.

Implementation of AA is the process, which is regulated by EU Association Agreement Annual Action plans. For the agricultural sector for example some activities have been fulfilled, like:

- Preferential Agro Credit Project;
- Strategy for Agricultural Development 2015-2020;
- Approximation of food safety, veterinary and phytosanitary spheres.

7.3 National regulatory framework

7.3.1 Government financial support programs (subsidies)

Regulations of Georgia in food safety within the alignment with EU legislation[61]

- Food / Feed Safety, Veterinary and Plant Protection Code (2012)
- Decrees of the Government of Georgia
    - Food/feed general hygiene rules"- №173, 25.06.2010
    - On special hygiene regulations for food of animal origin - №90, 7.03.2012
    - Rules of sale of food and animals at agricultural markets - №417, 31.12.2013
    - Rules of recognition of business-operators - №722, 26.12.2014
    - Rules of cattle identification and registration of their stalls - №764, 31.12.2014
    - Special rules for state control on food of animal origin - №55, 12.02.2015
    - Procedures for registration and state control of veterinary medicines both imported and produced in Georgia - №327, 07.07.2015
    - General principles and requirements of traceability in food/feed safety, veterinary and plant protection - №577, 10.11.2015
    - Technical regulation on food microbiological indicators - №581, 10.11.2015
- Ministers' orders on sanitary rules and norms on food quality and safety
- Technical Regulation on milk and milk products - №152, 03.04.2015

Shared responsibilities in food safety

- Government: food safety policy, food safety requirements, standards and norms, information
- Farmers, processors, retailers:
    - Knowledge and capacity to comply with standards, food safety and quality requirements
    - knowledge and capacity to apply good practices: agricultural, veterinary, hygienic, manufacturing
    - Knowledge and capacity to implement HACCP-based food safety management systems

Agriculture has been announced as a priority by recent Georgian Government and number of programs has been initiated, to support Georgian producers and to increase the domestic production. Below are several financial programs that are supporting agricultural activities in Georgia with the short description.

Cheap agro-credit program[62]

The program has been initiated by the Ministry of Agriculture in 2013. 11 major banks are involved in this program, where part of loan interest payments is subsidized by Agricultural Projects' Management Agency (APMA)63 under the Ministry of Agriculture of Georgia.

Cheap agro-credit program includes two types of loans:

- Credit for capital assets (USD 12,000 - 600,000) - rates are between 12-15% and APMA covers 11%;
- Credit for working capital (GEL 2,000 - 100,000) - rates are between 14-15% and APMA finances 8%.

Grants for agro processing companies – new agriculture processing factories (minimum value of project USD 200,000) can get grant (maximum GEL 500,000 and 40% of total project) from the APMA. However grant should be used only for purchasing of capital assets (excluding land and buildings) and/or training & technology implementation. Additionally factory should use local raw materials and labour. The project supports only specific sectors and specific regions (production of wheat flour, wine and other alcohol beverages aren't covered by this scheme).

Credits within state subsidised programs are given by private banks. This is within the agreement between private banks and the state. Partner commercial banks of the program are Bank of Georgia, Bank Republic, TBC, Procredit Bank, Basisbank, Liberty Bank, Korstandard Bank, Investbank, Cartu Bank, Halik Bank and Progressbank.

But only major banks have regional and municipal branches throughout the country that could be accessible to farmers and agro SMEs in Kakheti. Within concessional agro credit project 9, 646 loans were disbursed in Kakheti region, which is GEL 271,062,156. There was no co financing into agricultural processing done in Kakheti region in 2014.

The program 'Enterprise Georgia'[64]

The program shall be implemented by - The Ministry of Economy and Sustainable Development of Georgia and the Ministry of Agriculture of Georgia.

Goals:

- Facilitating development of the industries focused on production;
- Facilitating establishment of new enterprises and extension / upgrade of the existing ones.

Scope: Agriculture

The enterprise financed under the state program must meet the following minimum requirements: The loan / leasing must be used only to establish a new enterprise or to extend / upgrade the existing one;

The enterprise must meet safety, environment protection, sanitary and food safety requirements determined by the legislation of Georgia;

The facilities and the nearby territories of newly established or extended / upgraded enterprises must have aesthetic external appearance.

The loan / leasing must be granted for the following purposes:

1. Financing the primary agricultural enterprises

- high-technology and intensive animal farms (dairy farms);
- high-technology and intensive pig farms;
- high-technology and intensive farms of animals with precious coats;

2. Financing the enterprises that process agricultural products

- processing meat and milk;
- arranging slaughterhouses;
- Production of agricultural feed for animals, birds and fish.

3. Financing infrastructural enterprises:

- warehouses for agricultural products;
- Coolers for the preservation of agricultural products.

Loan / lease conditions

Under the program, the volume of one loan / lease must not be less than USD 600,000 and must not exceed USD 2,000,000 or its equivalent in GEL. The grace period on the principal amount of the granted loans / leases is:

- for fixed assets – not less than 24 months;
- For current assets – not less than 18 months.

The interest rate determined by the program is from 11 to 13%.

Small Farmers Spring Works Support Program

The beneficiaries of the Small Farmers 2015 Spring Works Support Program are:

- Farmers who own, use or actually possess the arable land for annual crops, the aggregate area of which does not exceed 1.25 hectares;
- Farmers who do not have the arable land intended for annual crops, but have plots of land where perennial plants are growing and the aggregate area of which does not exceed 1.25 hectares;

At the same time, the arable land and the plot of land, where perennial plants are growing, that is owned, used or actually possessed by the farmer must not exceed 5 hectares.

Under the Project, beneficiaries shall be provided with benefits by charging points on their agricultural (ploughing) cards or Agro Cards.

Benefit is the Ploughing cards that are used for providing ploughing works at the plot of land that is intended for annual crops. With the ploughing card beneficiaries may be provided with plough services by the entities performing the work.

In Kakheti, 59,364 farmers received spring work support from the state, and 45,160 ha of land was cultivated in 2014. Spring work agricultural program was designed for three years 2013-2015, with declining support (GEL 190 million in 2013, GEL 90 million – 2014, and GEL 50 million in 2015).

As a result the area of the land cultivated has increased by 25% since 2010 and farmers were encouraged to use chemicals. Production of crops has increased in 2013, and it is seen as a short run effect on farmers' productivity.

It is also important to note that the program is likely to have achieved longer-term impacts as well. In particular, any capital investments made by the project beneficiaries as a result of ACP – e.g. by using money saved on inputs and cultivation services – will have a lasting positive effect on productivity. The same is true about permanent improvements in farmers' awareness about the benefits of modern agricultural inputs (e.g. seeds and chemicals) and practical experience in their application.

Finally, another impact of the program is concerned with improvements in farmers' access to inputs as ACP has visibly increased both the number of suppliers and the variety of inputs available to farmers.

First, the program's design failed to take into account that the vast majority of agricultural plots are not properly registered. Since Georgia's cadastral map is far from complete, data on land ownership (the basis for determining the size and type of subsidy to be provided) was in many instances collected informally, with the help of "village elders" and based on unverified information volunteered by the households. On the other hand, many farmers were denied government subsidy because they did not formally own the land they cultivated.

The long-run effect of this program is not clear. Most farmers still have hopes about the continuation of the program and claim that it is a necessity. However, it is doubtful that the main message of the program was understood by majority of farmers: they were supposed to get significant support during the first year of implementation followed by a gradual reduction of support leading to less dependence on the project. (ISET Report, 2015)

Preferential credit[65]

The project has been initiated by the Ministry of Agriculture of Georgia and has been implemented by the Agricultural Projects Management Agency since 27 March 2013.

The purpose of the project is to improve the processes of primary agricultural production, processing, storage and sale by providing farmers and entrepreneurs engaged in agriculture with cheap, long-term and preferential funds.

Under the 'Preferential agro credit' project, credits will be granted by commercial banks and financial institutions participating in the project according to the conditions determined by the Agricultural Project Management Agency. The Agricultural Project Management Agency is not engaged in the process of reviewing credit applications and allocating credits.

The 'Preferential agro credit' project consists of the following financial products:

1. The 'Preferential Agro Credit' project

- for current assets;
- For fixed assets.

2. Preferential Agro Leasing

3. The state programme 'Produce in Georgia'.

The state program "Produce in Georgia"[66]

The program is being implemented at the Government of Georgia's initiative. The program aims at developing and supporting the entrepreneurship, encouraging creation of new enterprises and increasing export potential in the country.

The Program is coordinated by the Ministry of Economy and Sustainable Development of Georgia and all LEPLs falling within the Ministry's structure are involved in it: "Entrepreneurship Development Agency", "National Agency of State Property" and "Technology and Innovation Agency of Georgia.

The Project provides the following support:

- Access to finance;
- Access to infrastructure;
- Technical assistance;

Within the frame of this project one property in Gurjaani was given to the business names AgroTsalka, and the facility will be used to establish cold storage. No other cases registered for Kakheti. In total 54 properties were transferred to private sector all over Georgia.

7.3.2 Registration of juridical bodies (e.g. business entities, enterprises)

To start the dairy, meat or in general food operation, a license or any kind of official permission is not required. The infant formula and baby food production/packaging is the exception (however, I am not aware of any such operation in the country). The only regulatory requirement for food entrepreneur is to be registered as the "food business operator" (Clause 13, Georgia Law Code of Food/Feed Safety, Veterinary and Plant Protection). The registration is done at the National Business Registry. This practice has been introduced since the early 2000's. The entrepreneur, who does not register as business operator, is subject to fine in the amount of GEL 500. The fine has become effective since January 1, 2015. Nevertheless, there is certain segment of food chain players who are not yet registered as the food business operators, such as small processors/ consolidators/ trader.

When establishing the food facility, the selection of location, development of facility layout, arranging the infrastructure and other related issues are not the subject to any kind of official approval either. NFA is a controlling institution, not consultative. And therefore their competence is only to inspect and check. Regulations, rules are described by the law, therefore the entrepreneur in the eyes of NFA should search for information and make decisions independently

Formally NFA has the consulting service (fee based) for the entrepreneurs, however this service is not useful for the entrepreneurs. When an entrepreneur applies to the NFA with specific inquiry (in relation to layout, location selection, neighbouring business, distances from other locations, etc.), the official answer is never explicit. Since there is no requirement for official permissions/approvals prior to starting the business, frequently entrepreneurs establish the facilities based on their or neighbours' private preferences and knowledge neglecting the general food safety requirements, which later creates the need for reconstruction/rearrangement of already built structures.

7.3.3 NFA (veterinary services, food safety)

Once the food operation is functional in an enterprise (and registered as the food business operator), the National Food Agency is responsible for the company's inspection. The state inspection covers the infrastructure, basic sanitary and some record-keeping requirements and is performed in accordance with the General Hygiene Rules of Food/Feed Manufacturer/Distributor (Government Decree #173 dated June 25, 2010). For the animal origin productions the Government Decree #90 (dated February 12, 2015) on "Special Rules for State Inspection of the Products of Animal Origin" is also applicable.

The NFA develops the annual inspection list of the companies based on the food business operators' database and the risks assessment. Therefore, until now the NFA has been more focusing on high risk productions, such as prod-

ucts of animal origin, catering establishments, etc. Since the list of companies to be inspected is created based on the official list of food business operators, those small processors/distributors/traders who are not on the list, drop out from the actual scope of national control system. In addition to the annual inspection plan, NFA also performs unplanned inspections based on any detected emergency case (complaint, food poisoning outbreak, finished product testing results, etc.) and market monitoring program (taking samples of products from the retail chain for lab tests).

Technical Regulation on Milk and Dairy Products has been issued on July 9, 2015 governing the requirements for quality and food safety specifications for the dairy products as well as the definitions used naming the products on the labelling.

Dairy processors (those who thermally process raw milk) and slaughterhouses have been required to have HACCP systems (Clause 5, Special Hygiene Rules of the Products of Animal Origin, Government Decree #90 dated March 7, 2012). Although the HACCP requirement has been officially enforced the state inspectors did not fine the companies for neglecting this requirement until January 1, 2015 (in accordance with the Code of Food/Feed Safety, Veterinary and Plant Protection until January 1, 2015 during the state inspections the entrepreneurs were given the recommendation to implement the systems). In reality there is still significant number of operators who are not compliant with this requirement. The state inspectors still give the time to introduce the systems to the operators when detecting this non-compliance during the inspections. Even at those companies who have the system introduced, the state inspectors have not yet started the verification of HACCP documents. The HACCP requirement is not applicable to those operators who hold the small business operators' status (whose annual turnover does not exceed GEL 200,000).

Based on the results of HACCP verification the NFA is responsible to provide the business operators with the status of "recognition". It is forbidden to perform production/processing of products of animal origin without holding the status of "recognition". At present this requirement is not yet actually fulfilled. Applicable regulations: Code of Food/Feed Safety, Veterinary and Plant Protection and Government Decree 722, dated Dec. 26, 2014 "Rules for Recognition of Business Operators".

Quality and health standards; past, current and future role of NFA

The modern concept of food safety management and related best world practices started to be introduced in Georgia in 2003-2004, following the decade of almost no state control over the food sector. In 2005 the National Food Agency (under the auspices of the Ministry of Agriculture) was established becoming exclusively responsible for performing state control over the food chain. First Food Safety Law was adopted in 2006. Several years later it was substituted with the present Code of Food/Feed Safety, Veterinary and Plant Protection. This document draws the overall legal framework for the food/feed safety, animal health and plant protection. During last 5+ years various regulatory requirements have been developed. As for the food products safety parameters, they are still managed in accordance with the Order #301/N of the Minister of Labour, Health and Social Protection issued in 2001. This document is already outdated and misses modern requirements for the food safety parameters in terms of hazards (e.g. listeria) as well as acceptable limits.

At present the personnel health check is the issue which on one hand is formally required to be done by the business operator (General Hygiene Rules require that the personnel health condition should not compromise the food safety), however on the other hand there is no regulatory document which manages the health check requirement for the food personnel (list of all required medical examinations is not yet defined, the formerly existing regulation had been cancelled several years ago). Therefore, getting the health check documents at present is just a formality and not the effective means of verification the health condition of the workers.

At present the Ministry of Agriculture, NFA, Ministry of Health are involved in developing updated requirements for the food safety parameters. The requirements for the personnel health check is being expected to be developed by the Ministry of Health among those documents which fall under the responsibility of this Ministry to develop (such as food/feed safety parameters, food poisoning outbreak managing procedures, etc.). The NFA is also involved in developing sector specific technical regulations, such as requirements for dairy products, honey, wheat flour, bottled water, hazelnuts, etc.

The finished products are not required to be supported by the quality / conformance certificates when dispatched from the company. The certification of the products is the entrepreneur's voluntary action during last 5+ years. The larger manufactures may have their own internal labs for testing their products while the smaller ones neither have their internal labs nor use external labs for testing the products, unless they are asked by their customers (retail

chain outlets) to present the lab test results or the conformance certificates. The local labs are in majority accredited by the National Accreditation Centre.

Potentials and perspectives

It is obvious that the NFA will continue showing the growing efforts in terms of inspecting the local companies and developing the state inspection system. Depending on the thoroughness of the inspection it may happen that the certain links of the food chain will drop out, e.g. cheese traders.

Milk collection centres / processors /retailers will be pushed to better control their suppliers. In long run perspective one cow owner-farmers will be probably substituted with larger farms.

Competitors have to start thinking of establishing the common requirements for their suppliers (especially small and unorganized ones) as well as their customers (e.g. small retail chain outlets who neglect the sanitary and temperature control requirements when keeping the products in the shops.) The present practice with the retail chain: expired locally produced products of animal origin with the short shelf life (such as sour cream, cottage cheese, etc.) are substituted by the producers/distributors with the similar fresh products, therefore the retailer never experiences the financial loss if the product is expired / not stored properly.

Processing and packaging, labelling requirements

Each enterprise is responsible to be complaint with Georgian Law, which is regulating various areas of business operations. Labelling is the responsibility of the enterprise. Selling labelled product is the responsibility of the retail point. NFA is once again to check that the law is applied correctly.

Labelling requirements are managed by the Government Decree #441, dated December 31, 2013 “Additional requirements of food labelling”, Georgian law on “Labelling of GMO food /feed” (dated Dec 2014, enforced on July 1, 2015) and Government Decree #320, dated July 7, 2015 “Labelling of GMO food/feed”. In addition, sector specific technical regulations (such as Dairy Products Technical Regulation) specify certain requirements for the labelling of the specific products. As of August 1, 2015 adequate labelling is required for all dairy products placed on the market.

7.3.4 Certification

There is a special state institution which is called: Georgian National Agency for Standards and Metrology. The agency is LEPL and functions under the ministry of economy and sustainable development of Georgia. The entity is the successor of GOST. But this institution is not working on standards of food production,

National Intellectual Property Centre SAKPATENTI - which is the agency that registers intellectual property is also works in the field of Geographic indication. SAKPATENTI has already registered various Georgian cheeses with geographic indication. Ex. Suluguni, Megruli suluguni, Svanuri suluguni and etc.

There is also a number of private accredited/certified companies that provide cheese quality certificate to dairies. This certificate is essential for dairies to be able to sell cheese. The main criteria checked is microbiology of the cheese.

Annex A Statistical data

Table 40 Land ownership and use[67]

	Territory [ha]	total agri-cultural land [ha]	own land	rented from state	rented from a private person	Agricultural land [ha]	thereof			Out of arable land			Out of permanent crops			
							arable land [ha]	Perennial plantations	pastures [ha]	temporary crops	fallow land	non culti-vated land	orchards	berries	vineyards	other perm. crops
Georgia	6'970'000	88'6766	57'8281	295'911	12'573	839'709	472'120	100215	267'062	391'058	8'210	72'852	36'988	735	37'419	4'833
Thereof'																
Kakheti region	1'137'800	26'1676	12'7409	129'817	4'447	254'137	131'812	25573	96'750	107'727	833	23'251	2'861	458	22'227	27
thereof:																
Akhmeta	224'800	3'9871	1'1081	28'400	390	39'201	9'592	1145	28'464	7'606		1'986	90	3	1'043	9
Dedoplistskaro	253'100	5'8137	1'7504	40'221	411	57'473	35'011	1340	21'123	31'602	330	3'078	1	0	1'339	0
Gurjaani	84'900	2'5479	2'1533	3'878	68	23'903	14'108	7984	1'811	8'962	72	5'074	1'620	372	5'991	0
Kvareli	100'000	1'6740	1'2772	3'839	129	16'263	9'843	4204	2'216	6'794		3'049	507	19	3'660	18
Lagodekhi	89'000	1'6394	1'2928	3'332	133	15'397	13'830	1283	282	10'334	9	3'488	173	2	1'108	0
Sagarejo	151'500	2'9584	1'5647	13'737	199	28'640	15'227	2770	10'643	11'957	399	2'871	115	12	2'643	0
Sighnaghi	125'100	5'7324	2'1436	33'039	2'849	56'453	23'191	2632	30'630	22'779	4	408	42	1	2'589	0
Telavi	109'400	1'8147	1'4508	3'371	268	16'807	11'010	4215	1'581	7'693	19	3297	313	49	3'854	0

Table 41 Change of arable land area between 2005 and 2015

	2005 (GEOSTAT)	2015 (ICC)	Change	Comment
	[ha]	[ha]	[%]	
Akhmeta	9'592	8'042	84%	Reduction by more than 10% due to i) different data source, ii) increased area of pastures? Iii) … ?
Dedoplistskaro	35'011	18'896	54%	Reduction by almost 50% to i) different data source, ii) … ?
Gurjaani	14'108	5'224	37%	Reduction by 2/3 due to i) different data source, ii) increased acreage of vineyards, iii) … ?
Kvareli	9'843	10'726	109%	Increase by almost 10% due to i) different data source, ii) …?
Lagodekhi	13'830	20'032	145%	Increase by almost 50% due to i) different data source, ii) increase of vegetable and gourds production, iii) …?
Sagarejo	15'227	10'800	71%	Reduction by almost 1/3 due to i) different data source, ii) increased acreage of vineyards, iii) … ?
Sighnaghi	23'191	24'164	104%	Slight increase due to i) different data source, ii) …?
Telavi	11'010	10'694	97%	Slight decrease due to i) different data source, ii) …?
Total Kakheti	131'812	108'578	82%	All in all a decrease of almost 20%; the conversion of arable land into permanent crops (mainly vineyards, but also walnuts or orchards) might be the main reason. More detailed analyses of areas would provide more certainty

Table 42 Use of agricultural land by main crops in 2014[68]

	Wheat	Barley	Maize	Oats	Sunflower	Grassland	vineyards	others	Fruits & vege-tables	Total crops
Kakheti region *thereof:*	58'109	13'977	38'158	383	14'180	1'348	30'434	16'809	15'118	188'516
Akhmeta (*in % of crop*)	3'851 *(7%)*	487 *(3%)*	4'630 *(12%)*	3 *(1%)*	709 *(5%)*	185 *(14%)*	1'899 *(6%)*	789 *(5%)*	988 *(7%)*	13'540 *(7%)*
Dedoplistskaro	27'000 *(46%)*	6'763 *(48%)*	580 *(2%)*	25 *(7%)*	7'164 *(51%)*	13 *(1%)*	1432 *(5%)*	180 *(1%)*	236 *(2%)*	43'393 *23%*
Gurjaani	2'521 *(4%)*	460 *(3%)*	3'980 *(10%)*	0 *(0%)*	29 *(0%)*	0 *(0%)*	6'880 *(23%)*	4'774 *(28%)*	2'141 *(14%)*	20'784 *11%*
Kvareli	1'523 *(3%)*	210 *(2%)*	5'146 *(13%)*	10 *(3%)*	85 *(1%)*	434 *(34%)*	6'095 *(20%)*	4'269 *(25%)*	2'868 *(19%)*	20'640 *11%*
Lagodekhi	793 *(1%)*	211 *(2%)*	10'721 *(28%)*	165 *(43%)*	43 *(0%)*	406 *(31%)*	1'605 *(5%)*	2'983 *(18%)*	5'168 *(34%)*	22'095 *12%*
Sagarejo	5'685 *(10%)*	2'055 *(15%)*	5'498 *(14%)*	10 *(3%)*	1'483 *(10%)*	167 *(13%)*	4'140 *(14%)*	1'525 *(9%)*	1'021 *(7%)*	21'584 *11%*
Sighnaghi	16'100 *(28%)*	3'690 *(26%)*	1'062 *(3%)*	94 *(25%)*	4'427 *(31%)*	50 *(0%)*	2'941 *(10%)*	651 *(4%)*	1'196 *(8%)*	30'211 *16%*
Telavi	636 *(1%)*	102 *(1%)*	6'541 *(17%)*	76 *(20%)*	240 *(2%)*	93 *(7%)*	5'442 *(18%)*	1'638 *(10%)*	1'500 *(10%)*	16'269 *9%*

Figure 25 Yields of crops and perennial cultures (in thsd tons) in Georgia and Kakheti (2006 – 2014 as per statistical data, and projection 2015 – 2017)

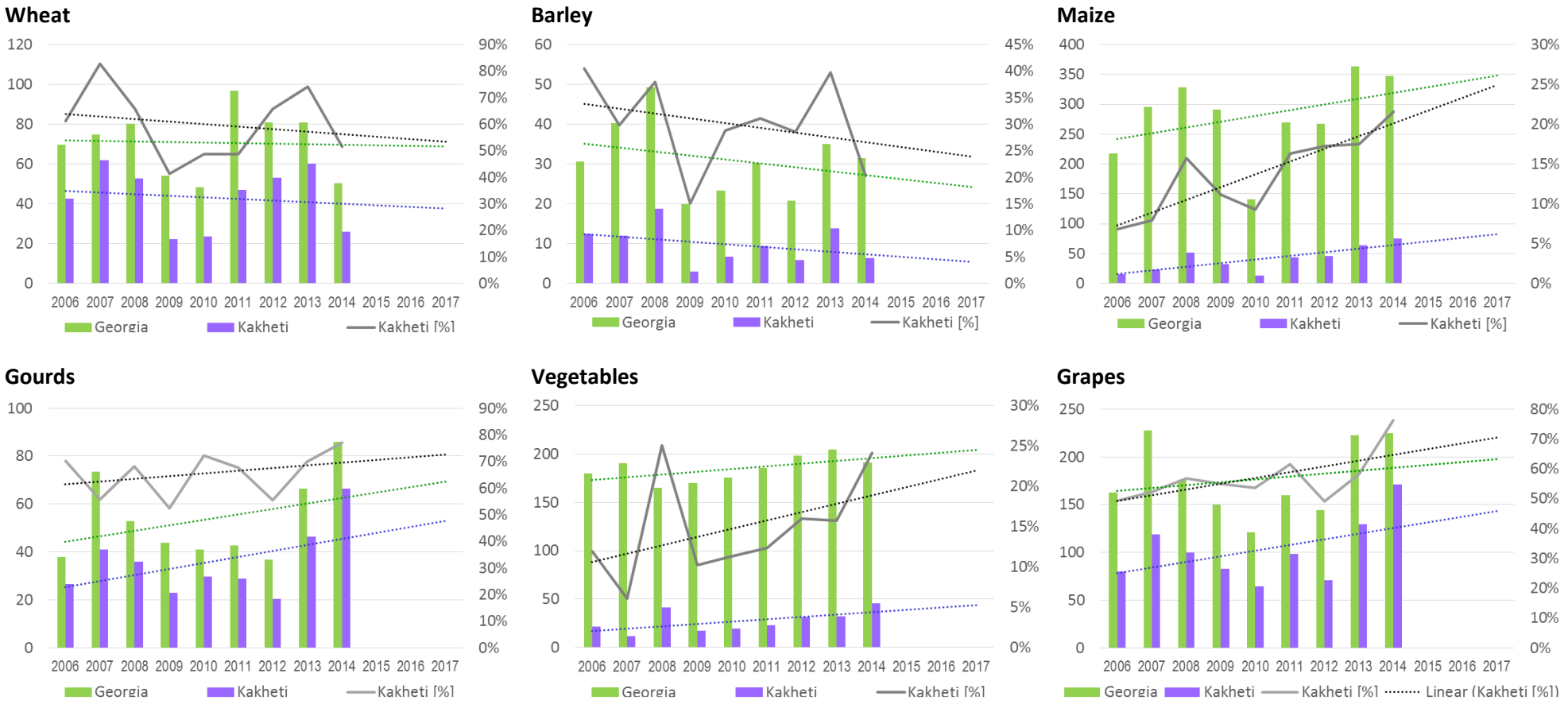


Table 43 Number of animals in Kakheti region in 2015[69]

	Cattle		Pigs	Sheep & goat		Poultry					Beehives
	total	Th'of cows			Th'of goat	total	Chicken	Turkey	Goose	Others	
Akhmeta	20'900	18'810	8'200	45'050	1'665	146'065	140'800	3'840	50	1'375	6'110
Dedoplistskaro	23'000	8'225	6'840	30'000	1'590	73'540	67'100	5'250	295	895	2'354
Gurjaani	9'301	5'574	5'325	21'300	1'340	105'690	94'470	7'850	610	2'760	5'398
Kvareli	14'920	13'100	4'230	40'150	2'540	100'580	92'950	4'300	835	2'495	14'790
Lagodekhi	21'568	19'331	2'800	14'200	1'565	100'300	88'000	6'870	2'150	3'280	4'370
Sagarejo	32'370	14'220	4'740	230'034	7'230	601'890	587'950	12'190	465	1'285	3'825
Sighnaghi	20'426	14'310	5'073	49'285	1'610	39'740	35'600	3'330	625	185	2'345
Telavi	9'890	4'430	4'710	8'765	685	123'836	118'841	3'310	1'150	535	3'280
Total Kakheti	152'375	98'000	41'918	438'784	18'225	1'291'641	1'225'711	46'940	6'180	12'810	42'472
statistics 2013	123'200	63'000	35'300	468'600	20'800	1'117'200					46'900
statistics 2014	119'500	53'900	29'700	494'100	16'900	1'263'300					55'100

Table 44 Numbers of cattle in Georgia by regions ('000 heads)[70]

	2010	2011	2012	2013	2014
Adjara AR	79.3	87.7	86.1	86.7	95.0
Imereti	192.6	197.9	194.3	208.6	211.6
Samegrelo and Zemo Svaneti	180.1	197.4	245.4	280.7	278.4
Shida Kartli	79.2	83.4	81.3	77.6	86.0
Kakheti	87.2	94.1	105.7	123.2	119.5
Kvemo Kartli	188.0	167.3	160.0	168.3	196.1
Samtskhe- Javakheti	111.3	135.6	131.8	149.4	156.7
The remaining regions	131.7	124.2	124.1	135.1	134.7

Table 45 Numbers of pigs in Georgia by regions ('000 heads)[71]

	2010	2011	2012	2013	2014
Imereti	26.3	20.0	38.8	31.4	31.6
Samegrelo and Zemo Svaneti	29.4	30.4	73.5	54.1	64.3
Kakheti	14.6	15.3	25.5	35.3	29.7
Kvemo Kartli	15.4	10.1	16.3	11.6	28.6
The remaining regions	24.4	29.3	50.2	58.8	50.6

Table 46 Balance sheet for milk and milk products

	Indicators	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Supply (ths. tons)	Opening stocks	18	20	17	20	16	15	14	15	16	17
	Domestic production	606	625	646	551	588	582	590	605	656	667
	Import	136	77	51	50	48	43	53	64	71	92
	Total supply	760	722	714	621	652	640	657	684	743	776
Utilization (ths. tons)	Feed	13	14	15	12	10	9	10	11	12	12
	Food	711	678	663	581	613	608	622	646	699	735
	Waste	14	12	14	11	8	7	7	7	7	8
	Export	2	1	2	1	6	2	3	4	8	4
	Closing stocks	20	17	20	16	15	14	15	16	17	17
	Total utilization (including stocks)	760	722	714	621	652	640	657	684	743	776
Per capita intake	Population, ths. persons	4401	4382	4385	4436	4469	4498	4491	4487		
	Kg/year	162	155	151	131	137	135	138	144		
	Gr/day	443	424	414	359	376	370	379	394		
	Kcal/day	268	256	251	215	227	224	230	239		
	Proteins, gr/day	14.6	14	13.7	11.8	12.4	12.2	12.5	13		
	Fats, gr/day	7.1	6.8	6.6	5.7	6.0	5.9	6.1	6.3		
	Self-sufficiency ratio, %	82	89	93	92	93	93	92	91	91	88

Table 47 Balance sheet for beef and pork[72]

		beef										pork									
	Indicators	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Supply (ths. tons)	Opening stocks	0.6	0.5	0.4	0.6	0.4	0.4	0.3	0.3	0.3	0.2	0.4	0.8	3.2	1.7	1.2	1.8	1.7	1.4	1.6	1.8
	Domestic production	33	31.3	25.1	29.2	26.7	21.3	16.2	20.2	19.6	20.9	31.1	21.4	11.4	8.2	12.8	11.6	11.8	14.9	15.5	16.9
	Import	8	11.5	12.1	9.0	7.8	9.9	10.6	8.3	8.8	6.5	8.6	13.6	12.9	13.7	13.2	15.7	20.7	21.8	21.8	21.1
	Total supply	41.6	43.3	37.6	38.8	34.9	31.6	27.1	28.8	28.7	27.6	40.1	35.8	27.5	23.6	27.2	29.1	34.2	38.1	38.9	39.8
Utilization (ths. tons)	Feed	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	38.4	31.9	25.5	22.2	25.1	27.0	32.3	35.7	36.6	37.4
	Food	39.8	41.7	35.9	37.7	33.9	30.9	26.4	28	28.1	27.1	0.8	0.6	0.3	0.2	0.3	0.3	0.4	0.4	0.4	0.4
	Waste	1.1	0.9	0.5	0.6	0.5	0.3	0.2	0.3	0.1	0.1	0.1	0.1	0	0	0	0.1	0.1	0.4	0.1	0.3
	Export	0.1	0.2	0.5	0	0	0	0.1	0.1	0.2	0.1	0.8	3.2	1.7	1.2	1.8	1.7	1.4	1.6	1.8	1.7
	Closing stocks	0.5	0.4	0.6	0.4	0.4	0.3	0.3	0.3	0.2	0.2	40.1	35.8	27.5	23.6						
	Total utilization	41.6	43.3	37.6	38.8	34.9	31.6	27.1	28.8	28.7	27.6					27.2	29.1	34.2	38.1	38.9	39.8
Per capita intake	Population, ths. persons	4401	4382	4385	4436	4469	4498	4491	4487			4401	4382	4385	4436	4469	4498	4491	4487		
	Kg/year	9	10	8	9	8	7	6	6			9	7	6	5	6	6	7	8		
	Gr/day	25	26	22	23	21	19	16	17			24	20	16	14	15	16	20	22		
	Kcal/day	50	53	45	47	42	38	33	35			53	44	35	30	34	36	43	48		
	Proteins, gr/day	3.7	3.9	3.3	3.5	3.1	2.8	2.4	2.5			2.9	2.4	1.8	1.5	1.8	2.0	2.4	2.6		
	Fats, gr/day	3.1	3.3	2.8	3.0	2.6	2.4	2.0	2.1			6.9	5.8	5	4.3	4.5	4.8	5.7	6.3		
	Self-sufficiency ratio, %	81	73	68	76	77	68	61	71	70	77	79	61	47	37	49	43	36	41	42	45

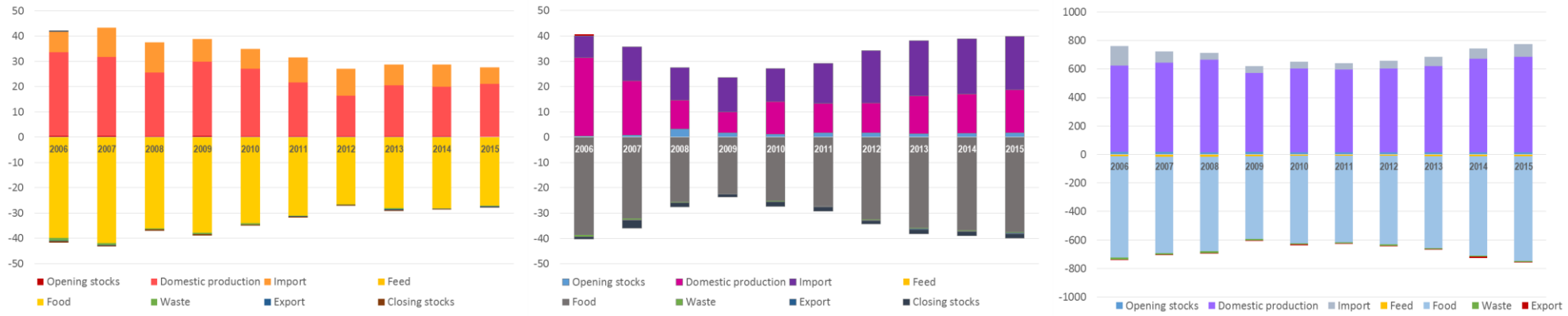


Figure 26 Balance sheet for beef (left) pork (middle) and milk (right) [all indications in thousand tons]

Table 48 Production of beef and pork in Georgia and major regions during 2010-2014 ('000 tons)[73]

	Beef					Pork				
	2010	2011	2012	2013	2014	2010	2011	2012	2013	2014
Georgia	26.7	21.3	16.2	20.2	19.6	12.8	11.6	11.8	14.9	15.5
Thereof Imereti	5.4	3.5	3.0	3.6	4.5	3.9	2.7	2.8	3.0	3.1
Samegrelo and Zemo Svaneti	4.5	6.1	2.5	3.0	3.1	2.0	2.2	2.0	3.4	2.9
Shida Kartli	3.5	1.4	1.3	2.1	2.0	1.5	1.5	1.0	1.2	1.7
Kakheti	2.5	2.5	2.5	3.0	2.1	1.8	1.5	2.2	3.2	2.8
Kvemo Kartli	3.6	3.1	1.8	3.5	2.3	1.7	1.9	1.1	0.6	2.4
Samtshke Javakheti	2.8	1.8	1.4	1.1	2.3					
Remaining regions	4.4	2.9	3.7	4.0	3.3	1.9	1.8	2.7	3.6	2.5

Table 49 Number of cattle owners in Kakheti region[74]

	HH's without cattle	Holdings with cattle													
			Of which number of cattle												
			1	2	3-4	5-6	7-9	10-14	15-19	20-29	30-49	50-69	70-99	-199	-299	>=300
Kakheti	78'021	40'538	15'898	12'526	7'779	2'112	748	641	232	282	191	73	31	20	4	1
Akhmeta	4'879	6'204	2'530	1'902	923	293	93	161	80	133	65	15	5	2	1	**1**
Gurjaani	18'024	4'682	2'777	1'377	402	61	17	23	6	12	2	3	1	1		
Dedoplistskaro	5'942	4'256	1'444	1'106	1'076	285	126	83	30	38	32	13	8	13	2	
Telavi	16'324	3'959	2'170	1'214	343	78	21	23	8	17	48	28	7	1	1	
Lagodekhi	7'490	6'981	1'229	2'113	2'662	639	184	94	22	23	12	3	0			
Sagarejo	9'968	6'952	2'525	2'107	1'254	554	243	189	45	25	5	4	1			
Sighnaghi	8'704	3'452	1'047	1'467	660	118	37	41	28	17	21	5	8	3		
Kvareli	6'690	4'052	2'176	1'240	459	84	27	27	13	17	6	2	1			

Productivity

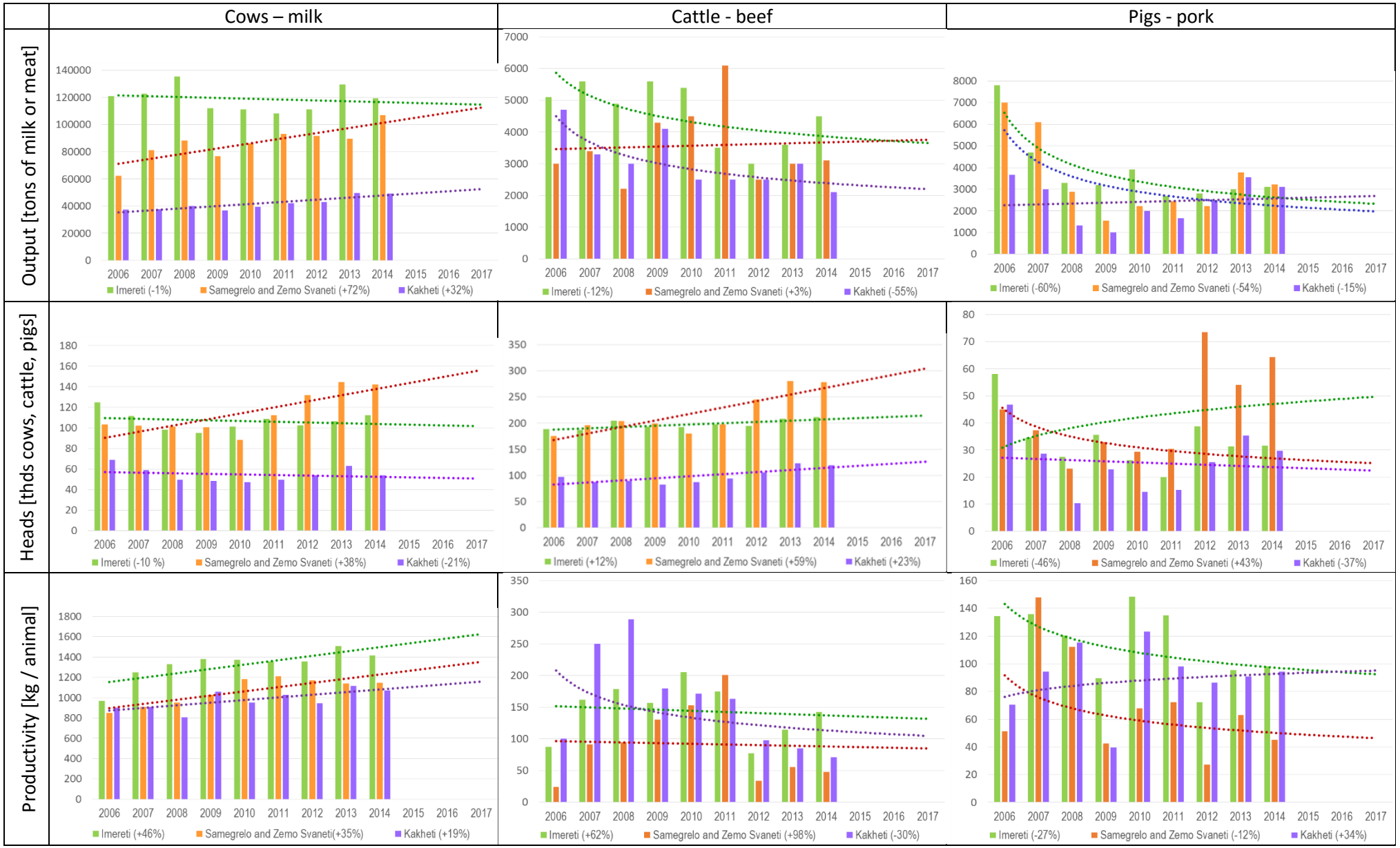


Figure 27 Number of animals, output of milk and meat (beef, pork) and the productivity per animal in three regions of Georgia (2006 – 2014, and projections till 2017)

Table 50 Occurrence of brucellosis in Kakheti region [75]

Municipality	Annual Incidence per 100,000*	Rural population that own sheep [%]	Ag. pop[l] that own cattle [%]	Total population (citi-zens)	% citizens involved in agriculture	Number of flocks	Number of herds
Akhmeta	63	8	53	42,000	94	976	6,837
Dedoplistskaro	98	10	40	30,500	95	907	3,809
Gurjaani	31	3	20	69,900	95	606	4,332
Kvareli	16	4	36	37,100	95	438	4,187
Lagodekhi	45	3	45	51,800	94	444	7,296
Sagarejo	7	7	40	59,400	98	1,236	7,468
Sighnaghi	10	10	23	43,300	83	1,343	3,134
Telavi	3	3	18	70,500	90	575	3,942

* Per 100'000 persons from 2004 to 2008

[l] *Ag. Pop. is abbreviated for the agricultural population. The incidence of human brucellosis reports the maximum incidence reported in the municipality between 2004 and 2008*

Annex B List of legislative acts regulating food safety and hygiene standards in Georgia

List of the key regulatory documents applicable to the dairy and meat sectors[76]:

1. Code of **food safety**, veterinary and plant protection;
2. Law on **labelling** the GMO food/feed;
3. Rules for implementing preventing measures in relation to **animal infectious diseases** (Decree of Government of Georgia N348, July 14, 2015)
4. Technical **regulation on milk and dairy products** (Decree of Government of Georgia N342, July 9, 2015)
5. Labelling of **GMO food/feed** (Decree of Government of Georgia N320, July 7, 2015)
6. Rules for state registration and control of the locally produced and imported **veterinary drugs** (Decree of Government of Georgia 327)
7. Rules for issuing the veterinary forms required for **transportation of animals and products of animal origin** on the territory of Georgia (Decree of Government of Georgia N325, July 7, 2015)
8. Technical regulation on **veterinary-sanitary rules of cattle driving on seasonal pastures** (Decree of Government of Georgia N422, December 31, 2013)
9. Special rules for performing the **state inspection of the products of animal origin** (Decree of Government of Georgia N55, February 12, 2015)
10. The Comprehensive Strategy and Legislative Approximation Program in **Food Safety** (Decree of Government of Georgia N783, May 5, 2014)
11. Rules for **stamping the meat** (Decree of Government of Georgia N 9, January 9, 2014)
12. Additional requirements for **food labelling** (Decree of Government of Georgia N441, December 31, 2013)
13. Rules for veterinary inspection of **animals to be slaughtered** and **veterinary-sanitary inspection of meat and meat products** (Decree of Government of Georgia N444, December 31, 2013)
14. Rules for **animal quarantine**. (Decree of Government of Georgia N420, December 31, 2013)
15. Special **hygiene rules for products of animal origin** (Decree of Government of Georgia N90, March 7, 2012)
16. Simplified **hygiene rules for the food/feed manufacturer/distributor** (Decree of Government of Georgia N282, September 10, 2010)
17. **General hygiene rules** for food/feed manufacturer/distributor and Rules for implementing state control in the area of food safety, veterinary and plant protection (Decree of Government of Georgia N173, June 25, 2010)
18. **Quality and safety parameters of the food products** and ingredients (Order N 301/N of the Minister of Labour, Health and Social Protection, August 16, 2001)

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