



Research into Milk Collection Centers in Samtskhe-Javakheti

**For Mercy Corps
Conducted by GeoWel Research**

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Executive summary

This research project was conducted as part of the development and analysis of the Mercy Corps Project entitled *Market Alliances Against Poverty in the Samtskhe-Javakheti Region of Georgia*. The principle focus of the project is the development of the milk and dairy sector in the municipalities of Akhaltsikhe, Adigeni and Aspindze.

One key component of this supply chain is the operation of milk collection. Therefore, Mercy Corps contracted GeoWel Research to investigate the operation of milk collection centers (MCCs) and cheese producers in the region. This research included analysis of national statistics, expert interviews, field interviews in Samtskhe-Javakheti and two closed-questionnaire surveys.

General Overview

The general national context for milk and dairy offers opportunities and challenges. The number of milking cows has gone down by 1/3 in the last five years though milk production has only fallen by around 20% as the yield of cows has gone up. The price of milk and cheese went up by about 50% between 2005 and 2008 but fell in 2009. It has since recovered.

While most cheese consumption is already supplied by local production in Georgia, two opportunities seem to still exist nationally for Georgian producers.

Firstly, the dramatic changes in price, production and consumption that occur throughout the year clearly suggest that, out of season, there is still an under-served market demand.

Secondly, the nature of demand is shifting. Increasing incomes in certain sections of society, an increase in the role of supermarkets, a range of pressures to create improvements in phytosanitary standards - these factors suggest that a shift from home production of cheese to factory production is inevitable. Together, this seems to suggest that, across the country, the role of factory producers and milk collection centers is likely to grow even if milk and cheese consumption does not.

The region of Samtskhe-Javakheti is also a particularly interesting place where this shift could happen. It is responsible for 14% of the country's milk production and, according to national statistics, has the highest yield per cow in the country. It has also been 'reconnected' to the rest of the country relatively recently so that in the last few years it has become dramatically easier to transport products between the region and the rest of Georgia.

Milk Collection Centers

In our research, and through repeated closed- and open-ended interviews, we were able to generate abbreviated profit and loss statements for each of the businesses we assessed. These allowed us to distinguish between the more and the less successful businesses in terms of income generated and profitability. By connecting this information with an understanding of their general business operation we were able to identify some general conclusions about which business models work and which do not.

Our analysis also allowed us to investigate some of the commonly suggested explanations for poorly working MCCs. In our early discussions with experts at the beginning of the research we discovered a whole range of hypotheses to explain the challenges in the dairy sector, including seasonality, disease and unreliability of supply as well as changeable demand, poor technology and cultural attachment to cheese-making.

The first major division to be made between the different types of milk-buyers is between the MCCs that do not produce cheese and those that do. As such, both our investigation and the analysis below were divided along those lines.

For non-producing MCCs the single biggest determinant of success is volume of milk collected and sold. As many of the costs are essentially fixed, there are considerable economies of scale to be offered to MCCs that collect large volumes. From our interviews it seems unlikely that an MCC will survive if it collects less than 500 liters per day and 1000 liters is a good and realistic target that most should be able to aspire to. This seems to require a collection pool of 60 or 70 farmers.

Farmers face considerable price seasonality for milk during the course of the year. Conversely, while MCCs can negotiate different deals with customers/producers, they do not face this seasonality. Generally an MCC makes a fixed gross profit margin (the difference between the price of milk bought and the price when sold) on each liter of milk traded. This margin is generally 5-10 tetri per liter, depending on the producer with whom one deals and the terms of the contract. The consistency of price offered by the producer gives some security but also has a considerable negative side-effect: when milk is scarce MCCs do not gain any additional revenue from the milk they collect, even though demand is higher and the milk is harder to collect (because there is less of it).

On the basis of this simple volume calculation, three of the MCCs had been successful. Arali and Tskruti were the only two successful MCCs in 2010, though Parmagi (which only opened this year) seems set to do well, as it is collecting around 1000 liters per day. The Tsinisi MCC collected slightly less than the 500 liter cut-off, but is also viable because it has almost all of its costs covered by the Georgian Business Zone, the producer near Tsinisi.

For MCC/producers, volume was not the only factor determining success: some producers seemed able to employ different strategies to enhance profitability even when faced with low volumes. Uraveli and Ude MCC/producers are good examples of this. In the case of Uraveli, the producer does not have a milk refrigeration unit and so uses streams to provide natural refrigeration (and thus also avoids any electricity costs). He also produces unusual cheeses which attracts a higher margin. As a result, he was able to make profit with only a few hundred liters of milk collected and processed per day.

At Ude, the producer was hit by foot and mouth and wanted to make renovations to his factory so he stored as much cheese as possible, selling it later in the season. As a result, because of higher late-season prices, he was able to make a fairly good profit even though he only produced 5 tonnes of cheese.

Large volume businesses that can supply large retailers in Tbilisi nonetheless offer the simplest and probably the most successful model. The Georgian Business Zone factory in Tsinisi operates its own network of MCCs but also buys from independent MCCs like Arali. They offer a 5 tetri gross margin but pay petrol and electricity costs. They sell directly to big retailers in Tbilisi like the Goodwill supermarket. Mirashkhani produced 15 tonnes of mainly Georgian factory cheese and also bought from one milk collection center in its neighbouring village. It sells its cheese to middle-men who then sell it in Tbilisi.

In the case of the less successful producers, there was rarely a simple explanation provided, and there was a tendency (as one might expect) for producers to explain how failures were beyond their control in different ways. For example, the Patriarch's facility in Akaltsikhe blamed foot and mouth as well as ineffective MCCs. The producer in Sukaneti had produced a very small quantity of cheese and sold it at the immediate market price (due to lack of storage space).

Akaltsikhe Agro was one of the few producers to identify low demand as a problem, as they had sold most of their cheese to a Batumi restaurant but had not been able to work out how to break into other markets. They were also extremely inexperienced in the business and so did not take account of Arali's changeable supply of milk. It has been impossible to assess whether these problems are being fixed now, because delays to the completion of their renovation meant that they only had one month of production, in September of this year.

Khizabavra, on the other hand, despite having lost money last year may be on its way to recovery now. Its difficulties up until now seem to have been related to high labour costs and difficulties in finding a market for its Italian cheese. However, Khizabavra is also increasingly becoming an own-supplier, and so is outside the remit of this analysis.

In attempting to investigate the reasons for these difficulties we tried to look into the situation of the farmers who supply the MCCs, and so we also developed a farmer questionnaire. Over 2/3 of the suppliers were less than 20 minutes away from the MCC (by whatever means of transport that they or the MCC used to deliver the milk). Only 13% were more than 30 minutes away. 77% have the milk collected by the MCC, with 23% delivering the milk to the MCC themselves.

In addition to selling the milk to the MCC, they all make their own cheese. 77% of them say they sell their cheese as well, though most of them do not sell it very often. Of those that sell cheese, 88% said they sell it to middle-men and only 2 of the people we spoke to sell it on the market themselves.

35% of those we interviewed take their milking cattle to summer pastures. This is often given as one of the key reasons why milk collection centers have such a difficult time even though the most successful milk collection center manages to survive in spite of such difficulties.

The desire for farmers to take their cattle to summer pastures is driven by a range of motives. Most take their entire family and have houses in the mountains and so do not incur additional costs (this has a long tradition and takes them out of the summer heat). This also seems to be a good economic choice. Farmers claim that cattle in the mountains increase their yield through better summer grazing, lower temperatures and fewer insects. They also explain that because it is cooler, they can store cheese throughout the summer for sale in the autumn when the cheese prices are considerably higher.

We lacked the detailed information to assess exactly how much this improves their summer income but based on provisional information, income from this pattern of behavior could be 30-70% higher than it would be if the farmers sold milk to MCCs during the summer months. This benefit, combined with strong cultural attachment to this pattern of behaviour, seems to suggest that it is unlikely that the practice will change at any point in the near future.

Finally, the report tries to draw all of the information together to help understand why some MCCs and producers are successful and some are not. This analysis breaks down the possible sources of problems into problems of supply, demand, equipment and experience.

The main supply problem that we came across was simply the supply of milk from farmers to MCCs. One of the great confusions of the current pattern of cheese production is that it seems as though producing one's own cheese is not usually economically preferable to selling milk to MCCs, if the cheese is sold immediately and at market prices. In addition, selling the milk to MCCs provides free time for other economic activities. This seems something of a paradox and generates a simple question: if it is economically better to sell milk to MCCs, why do some farmers seem resistant to do so?

Many attribute the current pattern of cheese production to a simple cultural inclination towards making cheese, and this is certainly a possibility.

However, there seem to be more rational explanations. First, if the farmer/producer can store the cheese and sell it out of season, then it is far more economically viable. One of the surprise findings from our research was that far more of the people we interviewed were selling cheese out of season than selling it in season. Part of the reason for this is that they take their cattle to summer pasture and sell the cheese when they come back. As it is so much cooler in the mountain pastures, storage is not really an issue.

There is no doubt that the group of farmer/producers we interviewed is not representative of all of the farmer/producers in Samtkshe-Javakhet, as we only spoke to farmers who also sell to MCCs, but the ability to sell cheese out of season may help to explain some of the resistance about selling to MCCs. However, this requires further investigation.

The other reasons given for problems in supply were productive seasonality, the transportation of cattle to high mountainous pastures, erratic cheese production patterns and poor quality of milk/occasional disease. General seasonality is avoidable either with the shifts in cattle reproductive seasonality or with improved storage for cheese. Storage seems to present the easier of the two solutions for the time being, as a shift in cattle seasonality will require changes in patterns of milk-production, feeding, collection and cheese production.

For MCCs the movement to high-mountain grazing is a clear problem, though it is also manageable, as the most successful MCC that we covered (in Arali) operates in a village with significant summer migration. For an organization looking to support MCCs, the easiest course of action is to set up an MCC in villages where grazing does not take place, or where relatively few cows go for grazing. This may well be in a village that is already fairly isolated, as the closer the village is to good pasture the less likely the farmers are to take the cattle there as a summer 'migration'. Producers may, therefore, have to accept a trade-off between MCCs that are close to the production plant but have unreliable summer milk provision, or those further away but with more reliable production.

Therefore, while it might seem obvious to locate MCCs near to the producer, locating them further away and in more isolated areas might be a more effective way of ensuring supply. Another alternative would be to make sure that new factories are built closer to the more isolated villages. Both options would also have the pro-poor benefit that they would be helping households that find it hard to get to market anyway.

The unreliability of milk for reasons of disease is clearly a significant problem (as evidenced by last summer's foot and mouth outbreak) though in some cases early identification and vaccination can halt the problem, as was the case in the Georgian Business Zone plant in Tsinisi. The problem of poor quality milk provision from farmers can also be an issue but is hopefully something that MCCs overcome in the first few months of operation as they 'weed out' poor providers.

Problems of demand operate at all levels of the milk-to-cheese supply chain. The main problem of demand faced by the milk producers who want to sell unprocessed milk is the simple unavailability of MCCs. MCCs, in turn, face demand difficulties with producers. In our survey, a number of suppliers were considered problematic as they either tried to force margins below what the MCCs considered to be a reasonable level, or simply stopped demanding milk. The difference between the MCCs that survived last year and those (particularly start-ups) that did not seems to have been their ability of their managers to find new buyers when existing buyers either changed or cancelled relationships.

The demand situation facing producers is the most difficult to understand. Most producers describe the market as though demand is not a problem and they can sell whatever they produce. This may be true for unusual producers like the Patriarch who are not entirely driven by the need to sell, and who have a pre-organised network. It also may be true for the really big producers who sell in bulk to Tbilisi. But for the start-up and mid-size producers, finding a market that will pay reasonable rates is one of their key difficulties and Mercy Corps should treat with suspicion new start-ups who, without evidence, confidently assert a high-value demand for their products.

We did not generally find that poor equipment had been a reason for the difficulties faced by existing MCCs or MCC/producers, although a market case could probably be made for the expansion of storage facilities. Refrigeration is essential for most facilities (though all except one of the working MCCs already had it) and lactoscanners and acid testers seem extremely useful. Refrigerated trucks generally seem unnecessary.

The one reason for failure that came up in our investigation which had not come up in our provisional discussions was the inexperience of managers. In retrospect, this should have been obvious. Investors have for years argued that you ‘invest in the person and not the business plan’ and clearly that motto could be usefully applied to interventions in the dairy sector. The operations that faced the hardest times last year were all start-ups, while all of those that had done well were experienced in the market place. In particular, our discussions highlighted how difficult successfully running an MCC can be. It often involves long days and a fairly entrepreneurial outlook (to look for new cheese-producers to supply, to keep an eye on costs and to maintain relationships with farmers) for fairly low returns. As a result, it is important that people supported in their development of these businesses have sufficient idea of what they are getting into.

The Georgian cheese market as a whole is also challenging. As most of the market is already served internally it does not offer a great deal of opportunity for aggregate internal growth, but Samtskhe-Javakheti does have particular opportunities as a very productive milk region and one just recently connected to the network. Additionally, the continuing seasonal price variation suggests that there is ample opportunity for producers to do better by making use of more storage facilities. Perhaps most significantly, as Georgia develops it seems inevitable that factory-produced cheese will supplant home produced cheese and this will drive the need for more factories and MCCs.

Recommendations

The main aim of the project was to inform Mercy Corps on how to proceed in its support of MCCs and MCC/producers. Therefore the recommendations generally relate to that issue.

MCC or MCC/producer?

- The first main choice is between supporting MCCs or MCC/producers. Generally, it seems as though supporting producers to enhance their network of MCCs is a more reliable strategy than setting up entirely new MCCs.

Starting new non-producing MCCs

- **Experience** When setting up the MCCs it is clear that serious efforts have to be made to ensure that people understand what they are taking on. Milk collection is extremely hard work and brings with it a range of risks.
- **Finance** It would be helpful in the starting phase if the new MCC had the cash available to pay for the milk immediately, at least during the first few weeks. If we imagine that a new MCC collects 750 liters per day at 50 tetri per liter, then this would require GEL 5625 for the first 15 days. To cover 10 days would cost GEL 3750.
- **Location** Proximity to good milk supplies seems far more important than proximity to producers.
 - One should require of new MCCs that they have a list of at least 40 farmers who are willing to sell to them.
 - Ideally the one or two villages which form their closest catchment area should not have many cattle that leave the area for summer grazing
- **Equipment** Collection centers almost certainly need a refrigeration unit, though not one of more than 1 tonne capacity (and 750 liters would probably be enough). Lactoscanners and acid-tests seem useful but this research has not shown them to be essential. Transportation is probably essential for the MCC unless they can demonstrate that enough farmers live close enough to deliver themselves. This is something that new MCCs often imagine will happen, but it rarely does. Refrigerated trucks are not essential.

Helping existing MCCs

- Mercy Corps could keep a simple central list of MCCs and cheese producers in the region that could allow producers to connect with different MCCs depending on the time of the year.
- Producers should understand that if they want to extend the collection time in the year, then offering a percentage margin to MCCs will be more effective than offering a fixed margin. For example, offering a 12% margin (with 50 tetri as a floor milk price) would seem reasonable.
 - This would mean, for example, that if the price of milk goes up to 60 tetri, then the MCC would get 7.2 tetri per liter instead of 6.

Assessment of future project

- Business plans need to be assessed against the experience in this sector to date. It takes time for MCCs or producers to build up the network of suppliers and if they do not have existing markets for their goods, this also takes time. This fact is often not reflected in cash-flow projections
- Experience is crucial and it is almost always better to build on existing businesses than start new ones. BP's MCCs, Akaltsikhe Agro's difficulties and Khizabavra should all highlight the importance of experience.

Utilising existing capacity

- There is already significant over-capacity in cheese production. Even the most successful cheese producers are not close to capacity and with Akaltsikhe Agro, the Patriarch's facility in Akhaltsikhe, Ude and others hardly producing there should be considerable demand for milk.
- The BP-financed MCCs also represent a resource and effort should be made to utilize this resource; it is not clear why this has not already been done.

Overcoming seasonality

- Seasonality of milk production can be combated by moving the breeding cycle of cattle or by better storage of cheese. At the current time, storage seems the far easier option.
 - Storage facilities like the one that Mercy Corps has supported in Akhaltsikhe are clearly a good idea, though it will not be possible to assess whether the business-model works until it has regular customers.
 - Supporting the extension of storage facilities of existing producers may also help them to justify expansion of production.
 - It is certainly worth talking to banks to see if banks could use stored cheese as collateral for loans since the returns on storing and selling cheese later seem to be considerable and could justify fairly high interest payments.
- Seasonality of milk provision created by movement to high-mountainous areas is not necessarily debilitating, as the majority of farmers still do not do it. However, for the time being, the only way to avoid it is to locate MCCs near to villages where the practice is less common.

Methodology

The methodology for this research had four distinct phases. The first phase was a general review of the national data that exists on Samtskhe-Javakheti, plus discussions with Mercy Corps staff and farmers from the region to gain a general overview of the situation. This helped to frame our first round of field research and started to provide us with potential hypotheses about the hurdles that milk collection centers and cheese producers might face.

Second, the research team spent a week in Samtskhe-Javakheti conducting individual semi-structured interviews with MCC operators and former operators.

Third, we returned to Tbilisi and used the information gathered in the first two phases to develop a standardized questionnaire for MCCs, producers and farmers. This was intended to give us a detailed picture of these different agricultural businesses and, in the case of the MCCs/producers, it was also supposed to give us enough financial information to make provisional assessments about the success and sustainability of their business.

Finally, having conducted the interviews and coded and processed the results, we conducted considerable follow-up interviews in order to resolve questions that the research as a whole had produced.

Interviews with Milk Collection Centers and Collector/Producers

Mercy corps generated a list of 20 MCCs in the region. This combined MCCs that had ceased operations with those that are currently working. It also combined MCCs who only collect milk to sell to others and those that make cheese.

Our process of discussion with the MCCs had four stages. In the first step of the research we spoke to as many of these MCCs as we could (15 in total) using an open-ended interview process in SJ during the first week of July 2011. This allowed us to generate a general sense of each business and to clarify the issues they faced.

Second, we developed a standardized closed-answer questionnaire which allowed us to quantify and compare the different characteristics of the businesses. We used two different questionnaires, one for milk collection centers that do not include a cheese production facility and one for those that do. These questionnaires looked at:

- The level of milk collection over the course of the year
- The price they paid and the price they received for milk over the course of the year
- Any interruptions in milk collection and the reasons for it
- The type of technical equipment they owned/utilized
- The geographic pattern of milk collection
- The patterns of costs associated with milk collection

For the milk collectors who also make cheese we additionally asked about:

- Annual pattern of cheese production
- Costs in cheese production
- Prices and revenues for cheese produced
- Market for the final cheese

Third, we used the answers to the questionnaires to generate profit and loss statements for 2010 for all twenty businesses. This proved extremely difficult, as the financial information that companies provided was often wildly inconsistent. For example, in many instances cheese producers would often say that they had collected vastly more milk than would be suggested by their claimed cheese sales..

Fourth, we returned to the more effective-looking MCCs/producers to clarify some of our preliminary conclusions about why their business model seemed to be effective.

Farmer interviews

From the MCCs we also asked for telephone numbers of farmers we could contact to talk to about their reasons for selling to MCCs. They provided a list of 44 farmers and from that number we were able to contact and interview 31. It had been our intention to then use the same strategy for contacting farmers in the same communities who did not sell their milk to MCCs.¹ To do this, we asked the farmers to give us names of other farmers in their community who were in a similar position to them but did not sell milk to the MCC. Unfortunately this only generated a list of 10 farmers and of these, we were only able to interview five. Because the number was so low, we did not include these results in our analysis.

We asked questions about the characteristics of cows and milk yield, relations with MCCs, prices of milk, cheese-making, and other agricultural activities. Where applicable, we asked for information for each month. This allowed us to analyse the seasonality issue of milk farming in Samtskhe-Javakheti.

1 Background

1.1 Patterns of milk and dairy production in Georgia

National statistics, though problematic in a range of ways, are the only source from which one can gain an insight into the aggregate national picture of the number of cattle, dairy cows, milk and cheese production and the dynamics of prices. In the table below we have summarized the situation for numbers of cattle and milking cows in Georgia as a whole for the last 6 years.

Figure 1: Number of cows and milking cows (2005-2010)

	2005	2006	2007	2008	2009	2010
Number of cattle (thousand head)	1,191	1,080	1,049	1,046	1,015	1,049
Of which milking cows (thousand head)	710	591	541	561	538	562

Source: GeoStat (2011), Agriculture of Georgia 2010, Tbilisi, p60

It is worth noting that while the number of cattle has fallen, the composition of cattle holding has not. A consistent 99.6% of these cattle are held by family small holdings, rather than large agricultural businesses.

As one can see, there was a fairly significant drop in the number of cattle from 2005 to 2006 and, as one would expect, this resulted in a similar drop in the production of milk and meat.

¹ We were particularly interested to contact people from the communities that COULD sell milk to MCCs, as we thought that they would make a more interesting comparison to those that do sell milk (as the vast majority of farmers do not sell to MCCs for the simple reason that there is no MCC close enough). But we found it very difficult to find this population.

Figure 2: Per Capita Milk Production 2005-2010

	2005	2006	2007	2008	2009	2010
Milk Production (thousand tonnes)	756	606	625	646	551	587
Meat production (slaughtered weight ths tons)	104.7	83.3	73	57.3	54.3	56.4
Beef production (slaughtered weight ths tons)	46.4	33	31.3	25.1	29.2	26.7
Average yield of milking cows and buffalo Kg per year	1040	960	1170	1172	1263	1270
Average daily yield over 6 month cycle (kg per day)	5.8	5.3	6.5	6.5	7	7

Source: GeoStat (2011), Agriculture of Georgia 2010, Tbilisi, p68 and GeoStat (2009), Agriculture of Georgia 2008, Tbilisi, p80.

Over the same period, according to official statistics, national prices have been increasing faster than inflation for milk and beef.

Figure 3: Prices of Milk and Milk products

	2005	2006	2007	2008	2009	2010
Price of fresh milk (GEL per liter)	1.12	1.14	1.4	1.77	1.82	1.4
Imeretian cheese	4.19	4.85	5.25	6.27	5.50	6.16
Price of cheese relative to previous year	-1.5%	+16%	+14%	+10%	-13%	+12%
Price of beef	+17.3%	+18.1%	+0.6%	+9%	+1.3%	+4.7%

Source: GeoStat (2011), Agriculture of Georgia 2010, Tbilisi, p20+21 and Geostat (2009), Agriculture of Georgia 2008, Tbilisi, p21+22

The Government also provides an account of milk/beef production, import and holdings and uses this to make estimations of levels of consumption and levels of Georgian self-sufficiency.

Figure 3: Supply and utilisation of milk and milk products

Indicators	2005	2006	2007	2008	2009	2010
Supply (ths . tons)						
Opening stocks	18	18	20	17	20	16
Domestic production	756	606	625	695	551	588
Import	268	136	77	51	50	48
Total supply	1042	760	722	763	621	652
Utilization (ths . tons)						
Feed	17	13	14	15	12	10
Food	988	711	678	712	581	613
Waste	15	14	12	14	11	8
Export	4	2	1	2	1	6
Closing stocks	18	20	17	20	16	15
Total utilization (incl. stocks)	1042	760	722	763	621	652
Per capita intake						
Population, ths. persons	4289	4401	4382	4385	4436	4469
Kg/year	230	162	155	162	131	137
Gr/day	631	443	424	445	359	376
Kcal/day	382	268	256	263	215	227
Proteins , gr/day	20.8	14.6	14	14.7	11.8	12.4
Fats , gr/day	10.1	7.1	6.8	6.9	5.7	6
Self-sufficiency ratio, %	74	82	89	94	92	93

Source: GeoStat (2011), Agriculture of Georgia 2010, p91 and Geostat (2009), Agriculture of Georgia 2008, Tbilisi, p101

Although production of milk has gone down by about 22%, according to government data imports have also gone down, suggesting that overall consumption of milk and milk products has declined in the years from 2005-2010. It also suggests that local production now accounts for a higher level of local consumption than it used to, represented by the self-sufficiency rate rising from 74% to 93%.

Figure 4: Supply and utilisation of beef

Indicators	2005	2006	2007	2008	2009	2010
Supply (ths . tons)						
Opening stocks	0.7	0.6	0.5	0.4	0.6	0.4
Domestic production	46.4	33	31.3	25.1	29.2	26.7
Import	7.3	8	11.5	12.1	9	7.8
Total supply	54.4	41.6	43.3	37.6	38.8	34.9
Utilization (ths . tons)						
Feed	0.1	0.1	0.1	0.1	0.1	0.1
Food	52.5	39.8	41.7	35.9	37.7	33.9
Waste	1.1	1.1	0.9	0.5	0.6	0.5
Export	0.1	0.1	0.2	0.5	0	0
Closing stocks	0.6	0.5	0.4	0.6	0.4	0.4
Total utilization (incl. stocks)	54.4	41.6	43.3	37.6	38.8	34.9
Per capita intake						
Population, ths. persons	4289	4401	4382	4385	4436	4469
Kg/year	12	9	10	8	9	8
Gr/day	34	25	26	22	23	21
Kcal/day	68	50	53	45	47	42
Proteins , gr/day	5	3.7	3.9	3.3	3.5	3.1
Fats , gr/day	4.2	3.1	3.3	2.8	3	2.6
Self - sufficiency ratio, %	87	81	73	68	76	77

Source: GeoStat (2011), Agriculture of Georgia 2010, p87 and Geostat (2009), Agriculture of Georgia 2008, Tbilisi, p97

Beef production has fallen even more dramatically over the period (dropping by 42%) and imports have fluctuated fairly significantly, though in 2010 they were fairly similar to what they were in 2005. As a result, the proportion of local production in local consumption has fallen from 87% to 77%. It is also worth noting that while there are no current national statistics on the most recent increases in beef prices, there have been fairly dramatic increases in the price of beef in the last 6 months or so, a fact often attributed to the enactment of new health and safety legislation.

1.2 Patterns of Production in Samtskhe-Javakheti

National statistics on production are broken down in a way which allows analysis of some regions, though not all. This information is probably less representative and more prone to error than the national data, but is still worth reviewing to provide a general overview and some information on trends.

Figure 5: Number of milking cows by region (as of end of year, ths. heads)

	2006	2007	2008	2009	2010
Georgia	591.2	541	560.6	537.6	561.7
Adjara	60	50.8	42.3	42.9	38.9
Imereti	97	95.9	97.9	94.9	101.1
Samegrelo and Zemo Svaneti	92.1	94.5	101.1	100.6	88.3
Shida Kartli	49.9	41.6	42.6	44.9	46.9
Kakheti	52.3	43.9	49.3	48.2	47.3
Kvemo Kartli	95.7	96.9	109	86.4	106.1
Samtskhe-Javakheti	60.4	54.8	49.5	56	61
Other regions	83.8	62.6	68.9	63.7	72.1

Source: GeoStat (2011), Agriculture of Georgia 2010, p62

As one can see, dairy cows are fairly well distributed across the country but are most highly concentrated in Imereti and Kvemo Kartli. About 11% are in Samtskhe Javakheti.

Figure 6: Production of milk by regions (ths. tons)

	2006	2007	2008	2009	2010
Georgia	606.1	624.8	645.8	551.4	587.7
Adjara	49.3	53.1	49.7	37.9	30.4
Imereti	121.1	122.7	135.4	112.4	111.2
Samegrelo and Zemo Svaneti	62.3	81.5	88.5	76.8	86.1
Shida Kartli	62.7	53	53.7	54.6	56.7
Kakheti	40	40.9	42.6	39.5	42.2
Kvemo Kartli	112.8	119	129.6	80.3	107.9
Samtskhe-Javakheti	75.9	81.5	75.6	78.2	79.6
Other regions	82	73.1	70.7	71.7	73.6

Source: GeoStat (2011), Agriculture of Georgia 2010, p72

As one would expect, the areas with the highest number of milking cows are generally the same (at least according to these official statistics), with 13.5% of milk coming from Samtskhe-Javakheti. This percentage of milk production is somewhat higher than the percentage of milking cows, a difference that is accounted for by yield. As one can see in the official statistics, summarized in Figure 7, the yield of milking cows in Samtskhe-Javakheti was the highest of any region in Georgia for the year 2010.

Figure 7: Average yield of milking cows and buffaloes by regions (kg/year)

	2006	2007	2008	2009	2010
Georgia	960	1170	1172	1263	1270
Adjara	950	1140	1054	1118	915
Imereti	970	1250	1328	1379	1373
Samegrelo and Zemo Svaneti	850	910	951	1027	1181
Shida Kartli	1030	1395	1165	1505	1444
Kakheti	900	910	807	1059	953
Kvemo Kartli	1080	1085	1274	1177	1312
Samtskhe-Javakheti	1075	1450	1388	1639	1566
Other regions	900	1440	958	1213	1237

Source: GeoStat (2011), Agriculture of Georgia 2010, p74

According to the statistics above, the average milking cow in Samtskhe-Javakheti would produce an average of 8.7 liters per day over a 6 month cycle. That is 24% higher than the average yield that the government statistics suggest nationally.

The geographical profile of beef production is fairly similar to milk production, with Imereti, Samegrelo and Zemo Svaneti as well as Shida Kartli as the big producers.

Figure 8: Breakdown of beef production by region in slaughtered weight (thn tonnes)

	2005	2006	2007	2008	2009	2010
Georgia	46.4	33	31.3	25.1	29.2	26.7
Imereti	8.7	5.1	5.6	4.9	5.6	5.4
Samegrelo and Zemo Svaneti	7.3	3	3.4	2.2	4.3	4.5
Shida Kartli	3.5	3.7	3.5	1.7	1.6	3.5
Kakheti	5.7	4.7	3.3	3	4.1	2.5
Kvemo Kartli	7.6	7.4	4.8	5.9	6.3	3.6
Samtskhe-Javakheti	5.4	3.2	4	2.8	2	2.8
Other regions	8.2	5.9	6.7	4.6	5.3	4.4

Source: GeoStat (2011), Agriculture of Georgia 2010, p70

In speaking to the farmers, we tried to quantify the pattern of milk and cheese production. The pattern of collection and production in the region was fairly consistent. Farmers start selling their milk in mid-April and milk collection generally started at that time, though it sometimes did not start until May. Collection would then go on until mid-October, though in some cases it finished a couple of weeks earlier or later. Two producers and one MCC we spoke to continued their collection into November/December but with very diminished volumes.

2 Milk Collection Centers (MCCs)

Perhaps the biggest distinction when discussing MCCs is between MCCs that only collect milk for sale to dairy-product producers (mostly cheese production) and MCCs that also engage in cheese production themselves. For reasons that will be discussed later this is not always a clear dividing line, but because it means that the MCCs are facing fairly different problems we have divided the MCCs in this way for this part of the report.

We spoke to nine non-producing MCCs. Four were currently in operation, one was delayed in its operation and the other four were closed. Of the 11 MCC/producers, six were working, three were delayed in their operation and two were closed.

For each of the producers we contacted, we used their questionnaire to construct a simplified profit and loss statement for 2010. This became both one of the prime mechanisms for evaluating how successful a given MCC/producer had been and also a key jumping-off point for the discussion of their different business-models.

2.1 Non-cheese producing MCCs

The MCCs that do not produce cheese face the most inherently difficult business model, as their product is largely seen as a commodity; they are offered a very low margin for the collection of that commodity and there is very little opportunity for them to ‘add value’. The one issue they face regarding the quality of the milk is whether it is ‘bad’ (either watered-down or spoiled): if the cheese producers test the milk and find that it is bad, they will not pay for it. Beyond that, quality does not seem to be considered very much by their consumers (the cheese producers). The best way from MCCs to distinguish themselves from their competitors is in terms of reliability of supply.

The business model employed by the MCCs is, at first glance, a fairly simple one. MCCs generally collect from the farmers in their village and maybe from one adjacent village. They then usually sell that milk to a producer of cheese. Each producer has a fixed ‘mark-up’ (of between 5 and 10 tetri per liter) that they allow the MCC to charge. This means that the MCC faces a fixed per-liter margin, regardless of the price of the milk.

This has its benefit for the MCC because it means that they do not face price uncertainty. However, it also means that when milk is scarce (as the milk season comes to an end) MCCs do not gain any additional revenue from the milk they collect, even though demand is higher and the milk is harder to collect.

Volume of milk collected is the biggest immediate determinant of overall profitability of the MCC. 500 liters a day (which gives revenue of at least 25 GEL per day) seems to be more-or-less the minimum point below which it does not matter how costs are structured or what business model one employs, since one simply won’t generate enough revenue for the business to be viable.² Four of the milk collection centers failed in terms of this simple calculation. The MCC in Minadze was collecting around 150 liters per day, the one in Smada between 50 and 200 liters, the one in Varkhani 200 liters in its one week of operation and the one in Vale around 325 liters for 10 days.

volume of

The reason why there is a natural cut-off of collection below which MCCs are not viable is the simple factor of fixed costs. There are three main costs related to running an MCC apart from the cost of the milk: electricity for refrigeration unit, fuel for trucks to collect the milk and the salary for the truck driver. Cleaning materials are also a cost, but not one large enough to be considered material. Of these costs one is essentially

² For some MCCs this would also not be enough because they have a higher cost base, but this does act as a fair across-the-board minimum.

fixed, another is stepped and the third is truly variable. Milk refrigeration is not technically a fixed cost, as there is no cost when the unit is turned off, but it is significantly more expensive per liter to cool 1/2, 1/4 or 1/10 of a container than it is to cool a full one.

Labor costs for collecting the milk are not always an issue, as the person who runs the MCC often carries that out themselves. But assuming one employee on a 300 GEL full-time salary, this salary will probably remain fairly fixed, regardless of how much milk he/she collects. Of course, there will come a point where milk collection will require the hiring of a second driver, but that is very much a 'stepped' cost.

Fuel costs are the one properly variable cost in this calculation and may put an upper limit on the optimal size of a particular MCC. This will be discussed later.

The MCC in Tsnisi is the only one to have survived while collecting less than 500 liters per day but that is only because the Georgian Business Zone, the factory in Tsnisi, pays all of the MCCs expenses. As a result, in Tsnisi, any volume of production is profitable as the MCC faces no fixed costs.

Conversely, and using our rough calculations, the MCCs that were the most viable were those that collected the most milk. Arali collected 850 liters in May, June, July and October. Tskruti collected an average of 880 from March to September and Pamagi (which only started operating this year) is collecting 1000 liters a day.

Of course, perhaps the more important question is *why* some were able to collect so much and some so little. This question will be discussed later.

As one would expect, the volume collected by MCCs generally tallied with the number of farmers from whom they collected. The MCCs generally collect their milk from as many as 80 farmers and as few as 20 farmers but, like the collection levels, the three most profitable MCCs have a significantly higher number of providers than those that do not. Arali has 80 suppliers, Tskhruti has between 60 and 80 and Pamagi has 70. The other MCCs all have fewer than 30 suppliers.

The other main determining factor in revenue is, of course, price. More important than absolute price is gross profit margin per liter, or the difference between buying price (from the farmers) and selling price (to the producers). Among the MCCs we spoke to there was considerable difference in gross margin, but the gross margin tended to stay the same with each MCC-Producer relationship regardless of the fluctuations in milk price. Most MCCs get a gross profit margin of 5 or 6 tetri per liter, though a couple managed to get as much as 10 tetri (though this included transporting the milk to the factory). This means that if the cost of milk goes up, the price to the producer goes up by the same amount. If the price goes down, that saving is immediately passed on to the producer.

Facing a constant margin has both positive and negative implications. It is a good thing for the MCC because it means that they do not face price uncertainty. This price constancy does however have one negative side-effect: when milk is scarce (as the milk season comes to an end) MCCs do not gain any additional revenue from the milk they collect, even though demand is higher and milk is harder to collect. If MCCs are to be encouraged to slightly extend their seasons, they should receive a higher per-liter margin when the price of milk is higher.

From our analysis, this gross profit margin is important, but does not as important as volumes collected, as a determinant of success. The success of Arali can be partially attributed to their ability to get a 10 tetri gross margin, though this brought other transportation costs with it. However, this margin is not a guarantee of success. Some of the short-lived MCCs also received a 10 tetri margin but this did not help them survive when collection was very low. Conversely, while 5 tetri is a fairly thin margin, Tskhruti and Pamagi do fairly well from a 5 and 6 tetri margin respectively.

Part of the reason why the low margins can be consistent with a fairly positive business is that they sometimes reflect cost-sharing with the producer. The Georgian Business Zone pays all of the costs of the Tsinisi MCC and this year the Arali MCC has accepted a lower margin in the milk it sells to Tsinisi in exchange for them covering some of the MCC costs. In particular, the Tsinisi factory is covering daily fuel costs (three liters a day) and electricity costs for the refrigerator. Also, the Tsinisi factory takes care of transporting milk from the Arali MCC to the factory.

Of course, the fact that the volume of milk is the key determinant of the success of an MCC does not help us to understand why some MCCs are more successful than others in their milk collection. We will look at the different reasons why some MCCs seem to be more successful than others in the final section.

2.2 Producers and MCCs that produce

We interviewed 11 local producers in the Samtskhe region. As with the non-cheese producing MCCs, we conducted open-ended interviews with most of these producers during our week in the region then conducted a closed-question phone interview from Tbilisi, later following up in order to try and generate approximate profit and loss statements for the year 2010.

The factories generally offered a very confusing picture of their own operations, regularly offering information that was sufficiently internally inconsistent as to make it hard to give detailed assessments. For example, it was common for producers to claim milk collection rates which would suggest a FAR higher level of cheese production than they had said they produced.³

Also, it was extremely hard to provide an aggregate picture for the different cheese factories as they are incredibly different from one another. As a result, whilst we could provide average information for the producers we spoke to, such information would be more or less meaningless. Part of the reason for this is that they vary greatly in productive size, with final cheese production between 2.5 tonnes and 52 tonnes produced in 2010. On top of this, they differ in business model and in the kind of cheese they produce.

However, while there is clearly a relationship between profitability and volume of cheese produced, the relationship does not have a well-defined cut-off point as it does with the non-producing MCCs. The reason why there is no consistency in this area is that the different businesses are utilising incredibly different business models. For that reason, in the descriptions that follow we will group the different types of producers into ‘small successful producers’, ‘large successful producers’ and ‘less successful producers’.

2.2.1 Small successful producers Uraveli and Ude

It is worth looking at the profile of the small successful producers separately from the large producers because the smaller producers employ different strategies to maintain their profitability in the face of difficult circumstances. Uraveli and Ude are both operated by individual cheese makers (occasionally supported by a driver). In 2010 they both had relatively low volumes of production but were able to make relatively high profits by utilizing different strategies.

The Uraveli factory collects several hundred liters of milk per day and made about 2 tonnes of cheese in 2010. It would not be possible for an MCC to have made a profit with this level of collection, but Uraveli is unusual for two main reasons. First, the producer of cheese at Uraveli does not own a refrigeration unit and so has been forced to come up with a range of innovative strategies for keeping milk cool while he collects enough

³ To correct for this we often worked backwards from the volume of cheese to the implied collection rate of milk collected. This is clearly far from ideal but, assuming they were not simply being untruthful, we considered that it was far more likely that the producers would misremember daily collection averages (as this required the interviewee to calculate an average) over the course of a year than they would cheese production totals.

milk to make cheese, such as leaving containers of milk in a river while he goes off to collect more. It also means that he has not been able to make cheese in July and August as the weather is too hot.

The second way in which Uraveli is unusual is in the type of cheese manufactured. The Uraveli producer has, in an effort to increase his margins, made considerable effort to produce unusual cheese (like smoked cheeses). As a result, even though the producer does not collect enough milk to remain viable producing normal Georgian cheese, the current model he utilizes is surprisingly effective. According to our calculations, this producer has generated profits of around 9,000 GEL under extremely difficult circumstances.⁴ He has also done this with relatively little equipment and no refrigeration unit.

The Ude cheese factory is also a small producer, largely run by one producer with the help of a driver. It only produced cheese for 3 months in 2010. In that time it collected around 40 tonnes of milk and produced around 5 tonnes of cheese. The producer gave a number of reasons why he stopped producing when he did. Among these were foot and mouth, local seasonality and the desire to renovate his facility.

Whatever drove the strategy, it seems to have been reasonably successful. As the price was around 50% higher on average in late autumn and winter, this meant that the business generated GEL 10,800 profit for the year (not including the main producer's salary).⁵ If he had sold his cheese as he produced it, it would have made slightly over 1/3 that profit level.

2.2.2 Successful big producers

There are a few relatively large successful producers in the region and their strategies seem to be very different from one another. All factories have been able to access larger markets in Tbilisi and produce cheese in large quantities. Mirashkhani factory has produced over 15 tons of mainly Georgian factory cheese, Alatuman over 20 tons, and Tsnisi over 50 tons.

In the Mirashkhani model, the milk is collected from the same village where the factory is located. Jambul Khozrevanidze, a senior consultant at the factory, said that travelling to other villages and collecting milk is not efficient since it takes a long time and, given that villages are not very close to each other, the milk might spoil. However, they plan to install milk refrigeration units in some villages. Their expectation is that the population will bring milk themselves and then the factory will pick up milk from several refrigeration units in one collection route.

Tsnisi factory already operates this model. Tsnisi factory either owns MCCs or is cooperating with them on a cost-sharing basis. For example, Tsnisi factory pays the fuel cost associated with milk collection and the electricity required for refrigeration. They also pick up milk from MCCs. As a result, Tsnisi has large enough quantities to supply its buyers. Saba Sabakhtarishvili, a brand manager at Goodwill, noted that Tsnisi always has sufficient stocks when Goodwill wants to buy cheese from them.

⁴ We collected enough detailed information from company representatives to generate simplified profit and loss schedules. As we found more than once, these numbers changed on the different occasions we spoke to the representatives of the company. For example, in the case of Uraveli the profit figure was deduced from information provided by the owner, but when we tried to confirm the level of profitability the owner denied having any profits, suggesting that they may have been wiped out by 'distribution costs'. In later discussion, he revised the costs and revenue estimates so that profit was reduced to 5,000 GEL. However, in either case, he would classify as a fairly successful small producer.

⁵ Again, while this was deduced from the producer's figures, the producer himself claimed lower profits of 6-7,000 GEL. Having reviewed the P+L the producer was not able to explain the discrepancy between our figures and his but suggested that there may be other minor costs that he/we have missed.

The Alatumani cheese-making model is very different from both Tsnisi and Mirashkani. They own over 100 cows which they milk throughout the year. Thus, collection of milk from external sources is not necessary for them.

Vardzia MCC/producer started operating in May 2011 and is run by local cleric Father Anton. They have their own farm and also collect milk from about 50 farmers in 3 villages. By the end of July (after 2.5 months) they had collected almost 48 tons of milk and produced almost 6 tons of Imeretian cheese. They do not have any sales yet, but are going to start selling the cheese in late autumn when prices are higher. According to their model, if they sell cheese for 6.5 GEL, the lowest possible price for late autumn, they would make about 2000 GEL profit after only 2.5 months of operation.

2.2.3 Less successful producers for different reasons

As with the ‘successful’ MCC/Producers, classifying some of the producers as ‘less successful’ is extremely provisional due to the difficulties of data collection and business analysis in this situation (as previously discussed in the ‘methodology’ section). This classification is, of course, largely retrospective and so what it says about their future prospects is unclear. All of the producers who we classify as ‘less successful’ accept that 2010 was a bad year and most have plans for how to do better this year. However, we feel that these plans need to be judged first and foremost in light of historic experience.

If the more successful producers used varied strategies for becoming successful, the unsuccessful MCC/producers were also less successful for a range of reasons. These reasons are illuminating and it is important to keep them in mind when considering investments.

The cheese factory in Akhaltsikhe, run by the patriarchate, was clearly unsuccessful in its first year. There seems to be common agreement that the main problem was one of production and supply of milk rather than demand for the cheese.⁶

As a result, most of the Akhaltsikhe Patriarch Producer’s problems seem to relate to supply and production that faltered in the first year. Unfortunately, as with any of the less successful producers, identifying the key source of the problem is far from easy. Two questions are paramount. Firstly, how much of their difficulties were attributable to circumstance rather than organizational failings on the part of the MCCs or producers? Secondly, who was more at fault: the MCCs or the producers?

Initially, the factory was set up with financial support from BP, together with support for six MCCs in different villages. It was thought that with this set-up there would be no shortage of milk supply. Simultaneously, the church also seems to have little shortage of demand as it can sell its cheese through its church-related outlets at a premium price.

As it turned out, 2010 was a very difficult year. Production was incredibly low relative to the capacity of the plants. They collected between 500 and 800 liters of milk per day while they have the capacity to process 2500 liters for each production run, with the possibility of two or even three production runs in a day. Five of the six MCCs that were started under the BP project were closed at the time of our research. We spoke to the managers at the Akaltsikhe plant and the MCCs themselves, and each blames the other for the failure.

⁶ The reason why demand is not presented as an issue for the Patriarch’s shops is that they already claim to have a ready sales outlet through the church shops and because they do not expect to sell all of it. Valiko Murvanidze, the director, said that the idea was to sell the cheese in Patriarchate shop ‘Baraka’ in Tbilisi to cover expenses and other cheese which could make profit was to be distributed to different monasteries free of charge. But Natela Ghudushauri, who managed cheese distribution last year, said that they do not have any absolute rule as to how much cheese they should give away. They give away as much cheese as they think they should. The overall picture seems to be obscure, but the fact is that last year most of the cheese was distributed as charity and the company made a huge loss.

According to the managers of the Akaltsikhe plant, milk supply was a big problem. They attribute the poor collection to three main causes. First, there was a severe foot-and-mouth outbreak in the region during the summer of 2010 which seriously damaged the quantities of milk supplied. The second problem is the issue of summer pastures. According to Natela Ghudushauri, research conducted when the factory and MCCs were set up suggested that only 7% of cows are taken for grazing. As it turned out, she says, the proportion of cows taken for summer grazing is much higher; Ghudushauri suggested that over 50% may go to summer grazing. Third, she suggested that people who were assigned to run MCCs were expecting an easy source of income: “they thought that milk would come to them, but didn’t realize that, in fact, they have to actively try to collect milk in their village”.

On the other hand, the MCC managers who we interviewed claimed that the Akaltsikhe plant had not supported them in the way that they had expected. First, they suggested that the Akaltsikhe plant offered a margin of only 5 tetri per liter which, as we have suggested above, is low. Second, they point out that, particularly in the set up phase, the 15-day wait for payment is too long and discourages farmers from selling their milk.

The patriarchate representatives believe that the locations for MCCs were not properly selected and plan to relocate some of the refrigeration units in the spring (though they offered no explanation for why this shift has not been made already). However, there was no indication of any research conducted which would suggest better locations than the existing ones. Currently, the factory is closed due to the lack of milk supply.

The producer in Sakuneti offers perhaps the clearest indication that cheese production usually relies upon some scale. The Sakuneti factory produced 2.5 tonnes of cheese in 2010, a small scale they largely attribute to problems associated with foot and mouth. However, as their cheese was generally sold immediately and at local market prices, they barely broke even and have since ceased operation.

Akhalsikhe Agro had difficulties in 2010 because production and sales were simply too low to support their fairly large production operation. They produced about 8 tonnes of cheese and most of it was sold immediately, as they had only two tonnes of storage space. Another reason for their low production is that they seem to have been testing the markets (they were not entirely sure about demand). They sold most of their cheese to one restaurant from the *Machakhela* Khachapuri restaurant chain in Batumi but were unclear how to break into other markets. They had to change milk suppliers in the summer when Arali’s supply lessened, but then moved to Tskruti.

In spite of this fact, they have been bullish about their prospects for the coming year. Akhalsikhe Agro started operating on September 1st after renovation their building during this summer. They collected more than 7,000 litres of milk from one local individual farmer and from Tskruti MCC (which was supplied by 28 farmers). They produced about 1000 kg of cheese which will be sold in winter when cheese price goes up. According to their profit and loss statement, even if they sell the cheese now, with current prices the profit will be about 750 GEL for September production.

Khizabavra seems to have been less successful than some of the others, mainly because they are trying a new product on the Georgian market and are still working out the business model. They also have extremely high labour costs which, unless they increase production and sales dramatically, seem to make their business unsustainable.

Khizabavra farm was developed under a Caritas program that built a farm building and bought 20 cows and GEL 72,000-worth of equipment in 2010. Khizabavra factory also took a GEL 100,000 loan from ProCredit bank to support the business. The co-owner of the factory went to Italy to learn the technology of Italian cheese production and, with the assistance of Italian cheese-maker Batista, they started producing an Italian-type cheese which they call Khizabavruli Batista.

In the summer of 2010 they collected milk from their 30 milking cows and from about 50 local farmers. In total, they produced 4 tons of Italian cheese and 2 tons of Georgian cheese. The Italian cheese was priced at 10 GEL per kilo, but only 2.2 tons was sold of the 4 tons of Italian cheese. The rest was given away as samples at festivals and cheese exhibitions in Georgia. They also produced 2 tonnes of Georgian factory cheese which was sold at 5.5 GEL.

By our calculations, in 2010 they lost about 6000 GEL on their cheese producing activities, not including any interest payments on the loans. However, this loss was the simple result of giving away so much of their product. If they had sold all 4 tonnes, by our calculation they would have made almost 12,000 GEL profit.

This year they have bought an extra 50 milking cows and do not have enough finances to buy milk from other farmers (as the cheese has to be preserved for 6 months before selling), but they have capacity to produce much more. They also doubled the price of Italian cheese to 20 GEL. They claim that this is seeing them return to profit. Their explanation suggests that their costs are 6 GEL per kilo of cheese, suggesting a 14 GEL profit, though this figure does not seem to take a full account of the costs involved.

In addition, their plan for this year involves doubling both sales and price at the same time. This may be possible, given the unusual profile of the cheese, but certainly seems very ambitious.

3 Farmers

As part of our effort to better understand the environment facing the MCCs, we also conducted closed interviews with 31 farmers whose names and contact information were provided to us by the MCCs themselves.

Figure 9: Breakdown of number of cows per household

Number of milking cows	Number of households	% of total households
1-3 cows	12	39%
4-7 cows	14	45%
8-10 cows	3	10%
More than 10 cows	2	6%
Total	31	100%

Almost half of the interviewed households have 4 to 7 milking cows, while 39% have fewer than 4 and 16% more than 8. We also asked the households if they had bought cows since January 1, 2010. In total 13 households had bought 18 cows during the previous year and a half.

Before trying to get month-specific data we asked the farmers for their estimation of current daily yield.

Figure 10: Total and average yield per cow in September 2011

Average yield	
No milking cows	177
Total yield	1282
Average yield per milking cow	7.7

We also looked at the level of variation that exists in this yield across the interviewed households.

Figure 11: Range of average yield per milking cow in September 2011

Volume of milk yield daily	Number of households	% of total households
Less than 6 litres	5	16%
6-7.5 litres	8	26%
7.5-9 litres	11	35%
More than 9 litres	7	23%
Total	31	100%

The interviewed households were also asked to estimate the average lowest and highest yield per cow per day over the last 12 months.

Figure 12: Yield per cow per day

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Share of interviewed households milking their cows	52%	65%	94%	97%	100%	100%	100%	100%	97%	74%	45%	16%
Average lowest yield per cow (in liters)	5.8	5.7	6.0	6.7	9.0	9.2	8.4	6.8	5.5	4.6	3.7	2.4
Average highest yield per cow (in liters)	6.1	6.3	6.5	7.3	10.1	10.2	9.4	7.6	5.8	4.7	3.9	2.4

We also asked the farmers to estimate the volumes they had sold.

Figure 13: Average volume and price of sold milk by months in 2010

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average milk sales per month in litres (for those who sell milk)	226	229	282	557	663	759	614	509	291	229	77	50
% of those who sell	19%	29%	58%	71%	94%	77%	81%	71%	55%	45%	19%	3%
Average milk sales per month in litres (for all interviewed households)	44	67	164	395	620	587	495	361	159	104	15	2
Average price of milk (GEL per litre)	0.59	0.5	0.5	0.49	0.51	0.49	0.51	0.54	0.57	0.54	0.58	1

Generally, milking reduces in winter and farmers use the reduced volume of milk for their own use and usually do not sell it. In November 6 out of the 31 farmers we interviewed sold between 20 and 150 litres of milk and only one farmer sold milk in December. In January 6 farmers said that they sold milk, 5 of them were big farms.

In order to get a sense of the physical operation of the MCCs as they are seen by the farmers, we also asked the farmers to tell us how the milk was collected and how far away they were from the MCC. In the overwhelming majority of cases, the MCCs collected milk from the farmers. The farmers were, on average, 20 minutes away.

Figure 14: Breakdown of time needed to get milk from farm to the MCC or MCC/producer.

Time to get milk to MCC	No of households	% of total households
0-10 minutes	12	39%
11-20 minutes	9	29%
21-30 minutes	6	19%
Over 30 minutes	4	13%
Total	31	100%

Figure 15: How is milk delivered to MCC (factor, market)?

	No of households	Average time needed to deliver milk to MCC (min)
MCC where a vehicle comes and picks up the milk	24	23
MCC where farmer carries milk and so no transport involved	3	17
MCC where milk is delivered by wheelbarrow	1	10
MCC where milk is taken by farmers car	3	16
Grand Total	31	21

The table above shows that 77%, or 24 households from the 31 interviewed, do not have to carry milk themselves but an MCC vehicle comes and picks up the milk. 23% carry milk to the MCC/factory with their own car, their own wheelbarrow or without any means of transportation.

In addition to the milk they sell, we also asked the farmers what else they made with the milk and how much of it they made.

Figure 16: Average volume of dairy products produced in a year

Dairy products	Average volume of products (of those who make) (kg)	% of who make
Cheese	377	100%
Matsoni	23	19%
Butter and similar	38	35%
Other	4	13%

All of the households we spoke to make cheese. We asked them what kind of cheese they make. Some make more than one type but in the table below we listed the main types of cheese they make.

Figure 17: Types of priority cheese produced by households

Types of priority cheese	No of households	% of total households
Georgian cheese	17	55%
Imeretian cheese	11	35%
Chechili	2	6%
Missed answer	1	3%
Grand Total	31	100%

The main cheese produced in Samtskhe-Javakheti is Georgian cheese, though 35% of interviewed households make Imeretian cheese.

We also asked if they sold cheese in 2010. 77% answered that they sold cheese and a further 19% said that they did not.

Figure 18: Number of interviewed households who sold cheese in 2010

Did you sell cheese in 2010?	No of households	% of total households
Yes	24	77%
No	6	19%
Missed answer	1	3%
Grand Total	31	100%

We asked how much cheese they sell.

Figure 19: Cheese sales and price in 2010

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
% of those who sell cheese	26%	35%	35%	32%	29%	16%	19%	16%	32%	35%	39%	16%
Average volume of sold cheese (for those who sell)	141	144	91	50	49	52	94	53	142	82	112	59

Though 77% of the farmers we interview sell cheese at some time of the year, their pattern of sale is both unusual and interesting. The biggest sale seasons, in terms of proportion of farmers who sell, are outside of the summer season. The main reason for the dramatically high average sales in September, November, January and February is that 6 out of the 9 biggest farmers who have 150 kg or more of cheese sales in one month's period sold the cheese in late autumn and 2 farmers sold their cheese in winter.

Those who sold cheese in late autumn said that they usually keep cheese in summer while staying in summer pastures and sell when the price is higher in late autumn. Two of the biggest farmers, who had 450kg and 1200kg sales in January-March, said they were selling milk during the summer. However, some of their cows calved in the November-December period; with the help of good feed they managed to get a high yield and make cheese and sell it for a high price in winter.

Figure 20: Breakdown of modes of sales for cheese sales

Modes of sales	No of households	% of total households
Middle-men who come to house	21	88%
On the market	2	8%
To supermarkets and shops	1	4%
Grand Total	24	100%

The majority of households interviewed sell cheese to middle-men who come to their houses. Only 8% sell cheese on the market themselves and only one household sells to supermarkets and shops.

Another issue that had consistently come up as a source of potential problems is the use of summer grazing for cattle. This, as has already been mentioned, is sometimes considered a problem because it means that some cattle is too far away from villages to be taken to the milk collection centers.

35% (or 11 of the households interviewed) mentioned that they take their cows (milking and other) to summer grazing. A further 23% send only dry cattle and the remaining 42% do not send their cattle to the grazing area at all. Those 11 households who send milking cows together with other cows send, on average, 6 milking cows to summer grazing.

The households which say they send their cattle to summer pastures have houses near the pasture and move there for several months with all or part of their family. They usually make cheese there and sell when they return, usually at the end of autumn.

All farmers who go to pastures suggest that they have very good conditions there. The grass is good, the cattle are not disturbed by flies and it is a lot cooler. So as a result they get two main benefits: first, the milking cows produce a higher yield of milk with higher concentration of fat and second, the cattle get fatter. Summer pastures are also good for cheese production: there is always cool weather so milk can easily be kept for some time before being used in cheese-making and the cheese can be stored for a couple of months before returning to the village.

The farmers we spoke to said that they only sell cheese during the summer if they need money urgently - they keep most of the cheese to sell in autumn when the prices are higher.

These households taking their cattle to pastures say there are three main reasons why they prefer to go to summer grazing rather than to stay in the village. First, there are not enough pastures in the village. The farmers say that there is poor grazing near the village and the better grazing further away requires long daily trips for the cattle, which makes them tired and less productive. Second, getting away from the summer heat is good because when it is hot, insects disturb the cattle and, as a result, they do not feed well and their yield goes down. Third, if they stay in the village, they lose out whether they make cheese or sell milk. The households who make cheese during the summer period in the villages cannot store the cheese for several months because of the heat, and so are forced to sell at the lowest price relative to the time of the year. If they decide to sell milk they are not usually paid more than 50 Tetri, which they think is very low.

This does seem to suggest that on top of the improvements in living conditions for the family, moving cattle to the summer pastures is economically beneficial for the household. It is hard to say by exactly how much, since one would need precise information on differences in yield of cattle, differences in milk needed to make cheese and accurate autumn prices for the cheese, but it seemed to us as though the farmers are making anything from 30-70% more by going to the pastures and making cheese to be sold in autumn than they would make selling it in the summer as milk to an MCC.

On average, the farmers feed their cattle for 5.5 months. All households primarily use hay to feed the cattle. 29 out of 31 households interviewed buy feed for cattle and the average cost for feed is 1700 GEL in a year in total for those who buy – this covers an average of 6 cows.

In order to try and get a more general sense of the farms, we also asked the households what other animals they kept.

Figure 21: Animals other than milking cows owned by households

	Number of households	Average number of animals (out of those who keep animals) (unit)
Chicken	23	16
Pig	16	3
Sheep/goat	3	8

In addition to animals, we asked them about the plants they grow. The average area of land where farmers can grow plants is 1.6 hectares and the breakdown of products they grow and annual production of those plants is listed in the next table.

Figure 22: Agricultural products grown by households

Products	Number of households	Average volume of agricultural products (out of those who grow the crop) (kg)
Potatoes	31	4084
Maize	18	724
Vegetables	15	1067
Beans	14	107
Wheat	4	3245
Garlic	1	1500

In total, 26 households (or 84% of those interviewed) sell agricultural products other than milk.

4 Reasons for successes and failures

Up until now most of the analysis has simply recounted the different experiences of farmers, MCCs and producers, but the objective of the research was not simply to show who was successful and who was not, but also why.

A range of different hypotheses arose in the initial discussions with Mercy Corps, with farmers and with experts on dairy. It was generally understood and accepted that MCCs and producers both have an extremely varied track record. Very few MCCs or producers have a long experience of commercial success (without the help of NGO financing) but there was very little agreement on the reasons for the failures. For the purpose of the analysis that follows, the main arguments for the failure of milk production will be divided into issues that relate to the supply of milk, to the demand for milk and to the infrastructure for collecting, storing or processing milk and cheese.

4.1 Supply of Milk

A common complaint we heard is that there was simply not a reliable enough supply of milk for milk collection centers to operate consistently and predictably. This complaint was sometimes made in very general terms, so it suggests that people just prefer making and selling cheese, regardless of simple economics.

At the core of this explanation is a sense that there is little market justification for making cheese oneself rather than selling milk to an MCC and having a factory sell the milk. To investigate this argument, Mercy Corps collected milk and cheese prices as they were presented to farmers on a weekly basis in 2010. The milk price was the price offered by MCCs for the milk that was sold. The cheese price, combined with knowledge about the amount of milk required to make cheese, allows us to deduce an 'implied milk price' which is the value of milk which is turned into cheese (if the only cost of cheese production was the milk). This in turn allows us to compare the value received from the milk if the producer sells to an MCC, versus the value received from the same milk if the milk is made into cheese.

Figure 23: Comparison of actual milk price and milk price implied by cost of cheese (2010)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Required milk amount for cheese making	6.0	6.0	7.0	7.0	8.0	8.0	8.0	8.0	7.0	7.0	6.0	6.0
Milk Prices (Monthly) 2010 (collected by Mercy Corps)	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6
Average monthly cheese price 2010 ⁷	4.6	4.5	3.6	3.5	2.6	2.7	3.6	4.3	5.6	6.0	6.1	6.2
Implied milk price 2010	0.8	0.8	0.5	0.5	0.3	0.3	0.5	0.5	0.8	0.9	1.0	1.0
Basic milk price profit from cheese production	0.2	0.2	0.0	0.0	-0.1	-0.1	0.0	0.1	0.3	0.3	0.4	0.4

As one can see, even if we ignore the time involved in cheese production (which our study suggested was about 14 minutes per kilo on average) there seems to be more or less no benefit from producing cheese rather than selling milk to the MCC from March to July. If these numbers are correct, it even suggests that in May and June making cheese would be less profitable than selling the milk directly. This may be slightly wrong, as our farm survey suggested somewhat higher cheese prices, but it would not lead to a significant benefit in making cheese.

Added to this, when we conducted a focus group with a group of women who sold milk to an MCC, a number of them were adamant that not making cheese gave them additional time to engage in other economically productive activities. One woman who sold milk to the Arali MCC said that with the time saved she had been able to plant 0.2 hectares of potatoes from which she expected to yield 2-3 tonnes. Another had planted beets which she planned to use as animal food in the winter.

Therefore, it seems as though from a simple profitability point of view, the households would generally be better off if they sold their milk to milk collection centers.

The exception to this seems to be a situation in which the farmer can store the cheese and sell it out of season. Wherever that is possible the farmer will make more money producing cheese than selling milk. The most common circumstance in which this happens is the movement to high-mountainous pastures and the shift in

⁷ The cheese price presented here is an average based on weekly cheese prices that MCC collected from Akhaltsikhe Agrarian market. As a comparison, the prices presented here are 20-30% lower than the summer price reported by the farmers we interviewed.

production/sales that goes with it. The combination of higher yields and cooler temperature, which allows for sales of cheese in autumn when the prices are better, seems to make it preferable to selling to an MCC, particularly given that summer milk prices are so low.

One possible explanation for why farmers would not want to sell, suggested by the MCC expert, is that in selling the milk they also lose the by-product of cheese production; a fatty residue called 'shrati' that can be made into butter or fed to animals. We asked the MCC-providing households if they get the shrati back. 22 out of a total of 31 households (or 71%) mentioned that they get shrati back when selling milk.⁸

To try and put a value on this product, we also asked them what they would pay for 100 liters of shrati. On average the interviewed households would be prepared to pay 5.8 GEL for 100 litres of shrati or 5.8 tetri per liter.

The one other factor which had been suggested for why milk producers might not want to sell to MCCs is cash-flow. Supplying to an MCC means that one has to wait until the MCC is paid before the farm is paid. This means payment will not occur in fewer than 15 days.

This creates two related issues. The first is that the farmer may need the money immediately. The second is that the MCC is accumulating a debt to the farmer which, by the time of payment, is 15 times one day's milk production. If a farmer has 4 milking cows producing 9 liters per day and sells 75% of the milk produced for 50 tetri per liter, then by the time you reach day 15 (the first day you get paid) the MCC will owe you 203 GEL. That is a fairly large debt, particularly if one did not have a relationship with an organization before.

It was difficult to investigate these issues since the farmers we spoke to already had relationships with MCCs but, from our interviews, farmers did not consider that reliability of payment was a problem. 22 (or 71%) out of 31 farmers interviewed assess the nearest MCC as 'very reliable', another 8 farmers (26%) say MCCs are 'fairly reliable' and only one farmer mentioned that the nearest MCCs are 'fairly unreliable'.

For some MCCs/producers, even more problematic than low supply is *inconsistent* milk supply. This inconsistency was usually attributed to a number of features:

- Simple natural patterns of milk production which result in April calves and saleable milk production from May/June to September/October;
- Cows taken away to high mountainous pasture in the summer, dramatically reducing the milk production in some villages in July and August;
- Patterns of cheese production changing over the course of the season to reflect how busy people are. April/May is quiet so people have time to make cheese; therefore they don't want to sell as much milk. When there is a lot of farming work (in June/July) then people don't have as much time to make cheese so more milk is available;
- Production being routinely interrupted by disease, with the 2010 example of foot and mouth clearly present in people's minds;
- Production being regularly tampered-with, watered down or simply tainted.

However, while there clearly are supply issues, none of them is debilitating. The fact that there is no production in the winter reduces the production year, but this clearly does not make cheese production unprofitable, as all cheese producers face the same problem.

⁸ Arali, Patriarchate, Tskruti, Tsnisi, Ude and Vardzia all say they get the shrati back. Alatuman, Pamaji and Smada are uncertain, because some say 'yes' and some say 'no'. And from Zanavi and Mirashkhani all say no.

Seasonality of milk and cheese production does create an extremely skewed market. However, whether the solution to this problem is to extend the productive year or simply improve storage is unclear and will be dealt with separately below.

The fact that some villages send their cattle to summer pasture also certainly makes life more difficult for some MCCs. As suggested in the previous section, taking cattle to summer pastures seems to make economic sense and has a long tradition. From our interviews with the producers we were able to gain a list of the villages covered and identify which of them sent their cattle to summer grazing and which cattle they sent.

Figure 24: Villages covered by MCCs and MCC/producers and whether they go for summer grazing?

No	Name of villages collected from	Does village take cattle away in the summer?	How far away is summer grazing? (km)	What proportion of cattle leave?
1	Abakhevi	Yes	9	30%
2	Adigeni	Yes	10	50%
3	Agara	Yes	30	50%
4	Alatuman	Yes	5	50%
5	Arali	Yes	20	50%
6	Aspindza	Yes	13	40%
7	Aspindza	No		
8	Chacharaki	Yes	25	10%
9	Chobareti	No		
10	Didi Smada	Yes	20	90%
11	Dzveli	No		
12	Gareti	No		
13	Gomaro	Yes	3	70%
14	Gumbati	No		
15	Iveria	No		
16	Karabulagi	No		
17	Khizabavra	No		
18	Lebisi	No		
19	Minadze	Yes	25	10%
20	Mirashkhani	Only dry cattle	7	
21	Mlashe	Yes	15	70%
22	Nakalakevi	Only dry cattle		
23	Niala	No		
24	Orgura	Yes	50	60%
25	Pamaji	No		
26	Patara Smada	Yes	20	90%
27	Pia	Only dry cattle		
28	Plate	Yes	15	70%
29	Sakudabeli	Yes	50	60%
30	Sakuneti	Yes	46	50%
31	Tmogvi	Only dry cattle		
32	Tsarbastumani	Yes	17	50%
33	Tsinubani	Yes	9	30%
34	Tsira	No		
35	Tskaltbila	No		

36	Tskruti	Yes	20	25%
37	Tsnisi	Yes	4	10%
38	Ude	Yes	25	25%
39	Vale	Yes	12	50%
40	Varkhani	Yes	30	50%
41	Zanavi	Yes	3	70%
42	Zarzma	Yes	3	70%
43	Zikilia	Yes	30	50%

As we can see from table above, only 30% of villages (13 villages from the 43 listed) do not send cattle to summer pastures and those villages which send cattle to pastures send an average of about half their cattle. 35% of those who provided milk to MCCs took their cattle to summer pasture.

Disease can fundamentally disrupt production and this can hit milk availability hard. One problem with the current model is that it does not take into account the price of the final product in the margin gained by the MCC. In total, 3 MCCs and 4 MCC/producers out of 18 interviewed which operated last year claimed that they were significantly influenced by the foot and mouth problem last summer.

Valiko Murvanidze from the Patriarchate milk processing factory said that one of the reasons for the factory's not operating well last summer was foot and mouth disease reducing the volume of milk. This is partially supported by statements from the MCCs that were supposed to provide them with milk. Dzveli MCC, which started in June 2010, worked only 2 weeks and stopped collecting milk, allegedly because foot and mouth disease spread through their village. Foot and mouth disease also had a very negative impact on Smada MCC, which operated only in March-May last year, stopped milk collection in June and did not continue during the season.

The Sakuneti MCC/Producer Jambul Khachaturov also explains his unusual production pattern as partially caused by foot and mouth. "We started producing in March last year, and in the beginning of June foot and mouth disease started to spread through the villages we were collecting milk from. We had to stop production for three months and continue from September, when the disease had almost stopped".

Akhaltshikhe Agro, the cheese factory, also had problems related to foot and mouth disease. They didn't stop operating but Ilia Zardiashvili – the director - claims that farmers with healthy cattle increased the milk prices.

However, for some the impact was short-lived or manageable. Leila Chilingarashvili – the director of Arali MCC - mentioned that they had to stop milk collection for only two weeks in July last year because of the disease. Beso Babunashvili - the director of Tsnisi milk processing factory - said that when foot and mouth started to spread, they bought medicines and inoculated the cattle in the village. As he said, "foot and mouth disease would have a very serious impact on our production, so we inoculated almost all the cattle in Tskruti village free of charge".

4.2 Demand for Milk/Cheese

Another routine explanation provided for the difficulties of farmers and MCCs is that the demand for milk is extremely varied. At the beginning of the research we were presented with the following different explanations for varied dairy demand in Georgia:

- Demand for Georgian milk depends upon the international price of milk powder which, when low enough, is used as a substitute for Georgian milk;
- Milk and cheese buyers are unreliable and will regularly change their suppliers based upon price;
- Producers of milk products are unforgiving of inevitable failures of supply;
- Producers of milk products are not reliable payers.

Demand issues did not seem to be a prominent area of discussion for most of our interviews. For a start, the international markets were never mentioned. While factories in Tbilisi may use powdered milk for certain products, there was no indication that powdered milk is used as a substitute for locally produced milk in cheese production in the region.

At the farmer level, the difficulty of MCC demand is due to the fact that there are very few functioning MCCs and each one has a very small catchment area. For most farmers, therefore, selling to an MCC is simply not an option. That said, given the problems created for the BP milk collection centers, it is clear that MCCs are also difficult to establish. Therefore, before opening a milk collection center it would certainly be worth undertaking due diligence and ensuring that the resources (suggested in the last section) are in place to attract/ensure supply.

MCCs face uncertain demand from producers, who were not seen as reliable or consistent. The MCC's problem was not usually that the producers failed to pay their bills, but rather that they applied unreasonable pressure on the price margin that MCCs could gain. Several of the BP-funded MCCs that closed identified inconsistency of demand from the Patriarch's factory in Akhaltsikhe as well as very thin margins as key sources of their problems. On the other hand, the only two independent MCCs that do not produce cheese are Arali and Tskruti and they have both needed to be fairly nimble and to know the market. In particular, both of them have been successful in changing customers when faced with demand or price fluctuations.

The average level of payment reliability of buyers assessed by supplier MCCs was 3.9 (ranked from 1 to 5, where 1=not reliable at all and 5=very reliable). The MCCs assessed two main buyers they used to supply milk: the Tsnisi cheese factory and the Patriarchy factory. All Tsnisi suppliers assessed payment reliability of their buyer with '5' (or 'very reliable'), while the average score for the Patriarchy factory in payment reliability was '3'.

Demand concerns for the producers were also not usually at the forefront of their discussions. Usually, the producers suggested that they could sell as much cheese as they produced, and their focus in the discussion was on supply and production of milk.

This seems initially odd. Georgia already produces almost all of the cheese it consumes locally. Therefore, while there may be opportunity for increasing margins on existing cheese production by producing more efficiently or selling more expensive cheese, it seems unlikely that the market as a whole is likely to expand significantly.

That said, it seems likely that cheese production will inevitably shift from people's homes to factories. Factory-produced cheese already garners a far higher price and, as incomes go up, it seems likely that more consumers will be prepared to pay a higher price to ensure the higher phyto-sanitary standards that factory production tends to bring. Second, the expansion of supermarkets in Georgia clearly reflects an overall shift in food buying patterns which will also push consumers towards industrially produced cheese.

4.3 Poor Equipment

Another area of concern often highlighted by the different MCCs and producers was the poor level of their equipment. When talking to the MCC/producers, we therefore asked them what equipment they had. They provided the following answers:

Figure 25: Equipment of MCCs and MCC producers

	MCC/Producer (11)	MCC (9)	Total (20)
Refrigeration Unit	9	8	17
Lactoscan	8	5	13
Acidity Tester	8	1	9

The study of MCCs shows that refrigeration units are essential for their operations. Nana Gvritshvili, who collects milk in Tsnisi for the Georgian Business Zone, said that last year she had to stop working for two months in summer because they didn't have a refrigeration unit and the risk of spoilt milk was high. She was collecting milk from her neighbors in the evenings, saving the milk in a relatively cool place at her house, collecting more milk in the morning and then delivering it to the factory. Since even the nights are quite hot in summer, keeping milk without refrigeration overnight became impossible.

From a processor's point of view, it is also very important to collect milk from places where there is a refrigeration unit. For example, Mirashkhani factory stopped collecting milk from other villages because there were no refrigeration units. They now collect milk only in the village of Mirashkhani, and people bring milk to them so they don't have transportation costs. Their plan is to install small refrigeration units in different villages to which people will bring milk, and then the factory's truck will go to different places and bring milk to the factory.

While transportation is usually essential for the MCC, a refrigerated or insulated vehicle seems less essential. Usually, milk is delivered to an MCC within 2 hours for refrigeration. A processing factory vehicle also needs to pick up milk from MCCs and deliver it to the factory in under 2 hours. Thus, insulation and refrigeration is usually not necessary due to the relatively small distances and the amount of time required.

Lactoscan and acid testers are necessary for a factory. From last year's experience, Natela Ghudusahrui from the Patriarchate's factory said that the lack of these tools had a serious negative impact on the factory's production. Because the factory could not measure the level of water in milk, it would often receive milk which would have high concentration of water. As she said, "because of this, we often needed to use ten or more liters of milk to produce one kilo of cheese."

The MCCs also say that it is very important to have lactoscans and acid measuring devices because once spoiled milk is mixed with other milk, all of it will become unusable and a factory will not buy the milk. In most cases, the factory provides MCCs with these tools to ensure the quality of the milk supply.

However, this does not mean that the technology is used all the time. Testing a farmer's milk takes up about 1-2 minutes and so the collectors tend not to do it unless they have suspicions. Of six MCCs who have access to lactoscan, 33% test about one in every five farmers and 67% test fewer than one in ten farmers from whom they buy milk. There are four MCCs who have access to acid testers, and half of them test at least one in every five farmers, while the other half test fewer than one in ten farmers. Those who do not have an acid tester claim that they can detect whether the milk is spoiled merely by smelling it.

4.4 Inherent difficulties in the work

Milk collection from farmers is a tiresome and difficult task. MCC owners have indicated that high labor and time demands come with running this business. A person who used to run an MCC in Vale, for example, told us that collecting milk is very hard because you always have to find ways of buying milk from farmers, and the price given by the milk producer is not worth the level of work.

Stepan Saparyan, who runs MCC in Tskruti, also comments that “nobody expected that milk collection would require such hard work, that’s why most MCCs stopped... we continued to work but often we have to get up at five in the morning and go to bed only after midnight... People who signed up for this milk project wanted to be involved in business but had not realized that it would be this hard.”

Natela Ghudushauri, a representative from the Patriarchate factory, where many of the closed MCCs were supposed to sell milk, also made a similar comment. She said that people were expecting “to make easy money” initially, but then were not able to keep up. As she explains, “milk collection requires going around the village and trying to find the milk... just sitting at home and waiting for farmers to bring the milk to you will not work.” According to her, the lack of experience and knowledge of milk business are the main reasons why almost all MCCs designated to deliver milk to the Patriarchate factory were shut down.

In this context, it is interesting to look at an example of a successful MCC. Leila Chilingarashvili, who runs an MCC in Arali, underwent quite serious training. Prior to starting her business, she, together with other participants from the region, were taken to Tetrtskaro district, where such MCCs were already in place. In addition, Leila has an undergraduate degree in food expertise, so has a good theoretical foundation and had realistic expectations when starting the milk business.