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DAIRY INDUSTRY SUB-SECTOR REPORT

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**OVERVIEW OF DAIRY SUB-SECTOR IN PRESEVO AND
BUJANOVAC**

for

**SERBIA CONTINGENCY PLANNING AND ECONOMIC
SECURITY PROGRAM**

FINAL VERSION

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TABLE OF CONTENTS

LOCATION OF STUDY AREA	4
1 INTRODUCTION.....	5
2 EXECUTIVE SUMMARY	5
3 CONSULTANTS' TERMS OF REFERENCE	7
Tasks	7
4 SUMMARY OF RECOMMENDATIONS IN RESPONSE TO THE TERMS OF REFERENCE	9
4.1 Updated overview of dairy sub-sector and identify opportunities for SCOPES to assist sub-sector growth and strengthening	9
4.2 Dairy sub-sector in Bujanovac and Presevo	11
4.3 Milking	13
4.4 Dairies.....	14
4.5 Market	20
4.6 Identify opportunities for positive impact on vulnerable groups, including women	24
4.7 Meet with dairies to identify issues inhibiting their growth – analyze issues related to supply, processing, marketing and administration.....	24
4.8 Recommend technical assistance, training, development of cooperatives/associations, internships and other steps for SCOPES to consider to assist dairies and supplier groups.	27
4.9 Identify implementation partners for SCOPES' consideration	36
ANNEX 1. – DISTRIBUTION OF DAIRY CATTLE IN BUJANOVAC	37
ANNEX 2. – DISTRIBUTION OF DAIRY CATTLE IN PRESEVO	38
ANNEX 3 – DETAILED REVIEW OF DODA, PRESEVO.....	39
ANNEX 4 – DETAILED REVIEW OF FONTANA, BUKUREVAC	42
ANNEX 5 – DETAILED REVIEW OF RAZVITAK, BUJANOVAC	45
ANNEX 6 – DETAILED REVIEW OF AJKA, BUKUREVAC	49
ANNEX 7 – SENAD HOPIC - ITINERARY	52

Location of study area



1 Introduction

SCOPES, a multi-year project working on strengthening economic security in southern Serbia, is supported by the United States Agency for International Development (USAID). In early 2007, SCOPES launched its Economic Security activities in its seven targeted municipalities, including Presevo and Bujanovac. In addition to a pre-launch assessment and additional interviews, a SCOPES business plan competition has helped identify the dairy sector as an important sub-sector of the economy of the two municipalities. As a result, SCOPES has targeted this sub-sector for assistance. That assistance may include suppliers as well as processors.

2 Executive summary

The dairy sub-sector in Bujanovac and Presevo is characterized by low milk production and yields, typical of extensive farming to be found in Serbia, with small dairies competing for the low volume of milk produced. The competition for milk in this area is fierce because there are also dairies operating from outside these two municipalities in an effort to secure more milk supplies.

In these municipalities it will be necessary to *increase* either the number of cattle and/or their *productivity* through better selection procedures, improvement of rearing and mechanization of the milking process.

The milk *supply chain* needs to improve significantly, particularly in farm price policy, promptness of payments and legal contracts to supply. *Farm hygiene* and *raw milk cooling* are other important factors, which control in large measure the microbiological quality of milk upon arrival at the dairy.

Producers and dairies should work together on improving milk *collection* methodology, whilst dairies need to improve some of their organizational and *technological* processes, including rationalization of transport. It is considered more effective for purchasers and suppliers of milk (dairies and farmers) to work together, as in most cases the dairy has a greater financial resource and ability to purchase *milking machines* and *cooling tanks* to be used by producers in securing milk quality improvement.

Farmers are not yet widely organized into groups or *associations*. The support of the creation of one (for both municipalities) or two (each municipality) farmers' groups is considered to be an essential tool in achieving stability in the chain.

One major problem facing the milk industry in the region, and also in most of Serbia, is that of indifferent milk quality, especially in terms of microbiological numbers. Experience world-wide confirms that the most effective intervention is the supply of raw *milk cooling* equipment for farmers, whereby bacterial numbers are significantly reduced in milk delivered to dairies. In this region, there are few farms with sufficient cows to justify cooling facilities on an individual basis, therefore village *milk collection centers* (MCCs) need to be established.

There are nine villages in Bujanovac, (16% of them all) each of which has more than 100 cows and heifers, producing an estimated 10 tons of milk per day, representing 50% of all cows in the municipality.

In Presevo, there are eight villages (24% of them all) with more than 100 cows, representing 57% of the municipality total and producing an estimated 7.5 tons daily.

The above villages justify the provision of a MCC, but it is advised to survey the villages in detail prior to deciding on how many MCCs will be created and in which location. (ref. Annexes 1 and 2)

It is common that farmers do not like to 'mix their milk' with other suppliers'. This can be addressed by provision of basic *milk testing equipment* used to check each farmer's milk supply at the time of delivery to the centre. Farmers will then be assured by seeing the tests performed and receiving a copy of the results, prior to tipping milk into the cooling tank. Such equipment would cost ca. € 1,000 per centre, in addition to the cost of tanks, ancillary equipment and buildings. The tests performed would be in respect of fat content, specific gravity, temperature and acidity.

These four factors would significantly *reduce* the volume of 'poor' quality milk at the point of acceptance at the centre, where cooling will at least maintain the bacteriological quality during insulated transport to the buyer.

Confronted with new demands regarding milk production, as well as the upcoming EU integration process, milk producers need to address milk *quality* improvement. Improvement of quality should be the keystone of interventions in the sub-sector, but is dependent on, and constrained by a number of factors.

- There is no *coherent approach by the State* to inform producers and processors of what needs to be addressed and by which date.
- The MAFWM collects *data* which are almost entirely production-orientated and none of these involve milk quality assessment.
- The MAFWM continues to apply the state milk *premija* to those producers which supply milk to registered processors. This is applied regardless of quality considerations and the amount per liter is determined unilaterally by the State, without consultation of the industry. This is simply a volume bonus, a legacy of the former centralized system of increasing milk production.
- There are no effective means of monitoring and enforcing Serbian regulations, leading to at best an *ad hoc* approach to *milk quality* and at worst a state of anarchy.
- It is incumbent upon the first purchaser (EU Directive 92/46, but it is also good practice and common sense), in this case the processor, to ensure that milk conforms to current Serbian *milk standards*. This is practiced mainly by the Danube Foods Group (DFL) of dairies, which is composed of IMLEK dairies plus three others which have been absorbed into DFL.
- *Milk collection* is haphazard: few properly equipped collection centers, some rudimentary collection points, resulting in most milk collected at temperatures in excess of 8°C. Milk is a highly perishable commodity and requires cooling to at least 8°C within two hours of drawing from the cow. In some cases, milk is collected both in the morning and the evening, leading to increased transport costs and restricted processing operations.
- Many dairies, often the smaller ones, do not have the necessary *laboratory facilities* and equipment to check milk deliveries prior to acceptance or rejection.
- Milk is frequently purchased irrespective of quality issues, raising concerns of finished product quality and *public health*.

The study, therefore, provides an analysis of the factors that affect production, quality and the price of milk in Bujanovac and Presevo municipalities.

The study analyses factors in the production chain starting from the farm, through collection and transport up to the point where milk is delivered to and processed in the dairy.

The study should assist SCOPES staff to gain a better understanding of issues facing the dairy sub-sector in Presevo-Bujanovac.

The overall objective of the assignment is to support SCOPES Program Officers in identifying opportunities for assistance to the dairy sub-sector in Presevo-Bujanovac.

Before planning and executing any program, it should be noted that the basic structure of the dairy industry in these regions may have severe inherent limitations. It is likely that the industry in these regions will be subject to precisely the pressures that are driving change in the rest of the country, and which have driven change in surrounding countries.

It may very well be that outside of a limited number of farmers and dairies serving niche markets, that the highly decentralized system of collection and then processing in low-scale dairies will ultimately not be viable regardless of levels of state or donor support. Program design and impact assessment should take these sustainability issues into account. These negative trends are not currently evident given rapidly increasing demand for milk products and higher prices, leading to competition for supply. It is likely that this can continue for some time. However, some consideration should be made as to the extent to which the existing system should be supported or whether the transition should be facilitated.

This report focused on the current situation and improving immediate and short term livelihoods.

3 Consultants' Terms of Reference

The following is an extract of the Terms of Reference for the consultancy, as provided by SCOPES. These Terms of Reference have been used to frame the discussion and recommendations of this report.

Objective

The **overall objective** of this assignment is to support the SCOPES Program Officer in *identifying opportunities for SCOPES assistance to the dairy sub-sector/value chain in Presevo-Bujanovac.*

Tasks

The duties of the consultants may include (but not necessarily be limited to) the following:

- Prepare timeframe for completion of consultant's assignment
- Preview updated overview of dairy sub-sector and identify opportunities for SCOPES to assist sub-sector growth and strengthening
- Identify potential dairy partners through BPC entries as well as those buying raw milk in the Preševo-Bujanovac area

- Identify opportunities for positive impact on vulnerable groups, including women
- Meet with dairies to identify issues inhibiting their growth – analyze issues related to supply, processing, marketing and administration
- Recommend technical assistance, training, development of cooperatives/associations, internships and other steps for SCOPES to consider to assist dairies and supplier groups
- Identify implementation partners for SCOPES' consideration
- Work closely with the Business Plan/Dairy Consultant who is working with dairies on their winning business plans to coordinate meetings with dairies, information collection and recommendations
- Work with Senior Dairy Consultant to ensure identification of other potential opportunities in rural areas for SCOPES to consider

This report addresses the deliverables of the Terms of Reference related to a 'written overview of the dairy sub-sector in Presevo - Bujanovac, including opportunities, potential issues and recommendations' and a written report on dairies, including overview of each, identification of issues to be addressed, recommendations for SCOPES follow up and "next steps", assessment of impact on vulnerable groups, identification of potential partners and other relevant information.

4 Summary of recommendations in response to the Terms of Reference

4.1 Updated overview of dairy sub-sector and identify opportunities for SCOPES to assist sub-sector growth and strengthening

4.1.1 The national perspective

Serbia is not a large country but there are more than 200 registered dairies operating on a regular basis. Only 25 of these plants process on average more than ten tons daily, accounting for 85% of all milk processed in Serbia. Therefore the rest of about 175 dairies only handle 15% of milk, indicating that there is a *surfeit* of processing capacity, borne out by the majority of dairies operating at less than half their design capacity.

Added to this there are more than 400,000 farmers, presenting great problems in cooling and collection of milk, and many of these are in *difficult* locations above 500 meters altitude.

This leads to the conclusion that most of the 200 will *not survive* to operate under EU legislation, either because of the cost of conforming or simply due to the changing economic situation over the ensuing years. The experience of Slovenia, for example, shows that many *small dairies* are unlikely to survive the accession process. It is also likely that for similar reasons and due to the difficulty in transporting raw milk, that many of the 400,000 farmers will also not continue to produce milk for commercial purposes.

The Government of Serbia has a long tradition of supporting the production of milk by the application of a bonus, or *premija*, to all producers who supplied registered dairy plants. This bonus varies for highland and lowland farms and has been systematically reduced over the last two years.

At the time of writing, the Serbian milk industry is in an increasing state of turmoil and uncertainty, possibly triggered by the sharp reduction in *premija*, and now influenced by other factors beyond the control of industry or government:

- The *world market* for dairy products has been affected over the last year by adverse climatic conditions in Australia and New Zealand, both major dairying nations. World prices for dairy products have risen quite sharply in response to these influences and farm gate prices started to rise in Europe from mid-2007.
- *China* is rapidly emerging as a major consumer of dairy products, concomitant on its economic progress, thus placing further strain on the market for dairy products.
- Serbia has recently *suffered* an abnormally hot and dry summer, causing loss of winter feed for livestock and reduction of milk production at the summer's end. Farmers in Vojvodina poured their milk in the streets rather than suffer inadequate prices from dairies, which are now reacting to market forces and unable to pay the premium prices the farmers seek. It is reported by many dairies that there is a shortage of milk compared to previous winters.

Most dairies have little appetite to face the necessary changes that EU Accession imposes, concentrating on availability and price of raw material whilst ignoring its *quality*.

The *Danube Foods Group* is virtually alone in looking to support producers whilst they achieve quality improvement. They are indeed a force for stability which is not present in the remainder of what is rapidly becoming a chaotic industry. *Farm-gate prices* are now changing almost daily as processors vie with each other to maintain former levels of raw milk *supply*. Small dairies are unable to match raw milk prices offered by larger ones and face a bleak future, particularly during the coming winter.

4.1.2 The regional perspective - Capacities and milk collection from Pcinjski region

The dairy sub-sector in Bujanovac and Presevo is characterized by low milk *production* and *yields*, typical of extensive farming to be found in Serbia, with small dairies *competing* for the low volume of milk produced. The competition for milk in this area is *fierce* because there are also dairies operating from outside these two municipalities in an effort to secure more milk supplies. Whilst 'small' may be difficult to define, for the purpose of understanding the Serbian industry in particular and dairying in general, anything less than *10 tons* of milk purchased daily falls into this category. Dairies in the vicinity of the study area are all in the group of 'small' dairies, which are usually the most vulnerable to economic change, unless they have developed a successful *niche* product, or products, or secured a defined market.

This region is characterised by a large number (10) of registered dairies. Total production capacities for milk processing in Pcinjski region are large, amounting to 130,000 tons per annum, but actual utilisation capacities are significantly lower.

The largest processing capacities are possessed by Mlekara Han, (68.1% of regional capacities). On the other hand, there are six operational dairies with a capacity less than 6,000 tons annually and even three dairies with a capacity below 2,200 tons.

Table 1 – Registered dairies in Pcinja region with amount of collected milk from January to June 2006

Dairy	Capacity In tons	Share	Tons milk Collected	% of all collection
Mlekara Han, Vladičin Han	88,000	68.1%	862	30,6
Veličković, Alakince	12,000	9.3%	360	12,8
Vihor, Vranje	10,000	7.7%	351	12,5
Fontana, Bukurevac	6,000	4.6%	619	22,0
Fabrika hleba i mleka, Vranje	5,000	3.9%	76	2,7
Doda, Preševo	3,000	2.3%	217	7,7
Razvitak, Bujanovac	2,200	1.7%	124	4,4
David Dado, Korbevac	2,000	1.5%	-	-
Ajka, Bukurebac	1,000	0.8%	145	5,1

* source of data MAFWM – December 2006

4.2 Dairy sub-sector in Bujanovac and Presevo

4.2.1 Livestock production

There are no exact data about number of cattle because some cattle are still not identified with ear tags. Official data about number of head are presented in table 2.

Table 2 – Livestock (number of head)

	<i>Bujanovac</i>	<i>Presevo</i>
Cattle, total	5,082	3,419
Cows and in-calf heifers	3,470	2,146

Source of data – Statistical annual book 2006.

The chief characteristics of cattle production are:

- Low number of cows for the number of dairies and households.
- Small number of cows in structure of cattle population.

4.2.1.1 Number of cows and pregnant heifers in Bujanovac municipality

Villages with more than 100 cows and in-calf heifers and potential for the development of milk production in Bujanovac municipality are: Veliki Trnovac, Žbevac, Lopardince, Biljača, Samoljica, Rakovac, Končulj, Oslare and Rekovica.

There are 17 villages with less than 20 cows and pregnant heifers which have limited potential for development of milk production.

A detailed table of dairy cattle distribution in Bujanovac is given in Annex 1.

4.2.1.2 Number of cows and pregnant heifers in Presevo municipalities

Villages with more than 100 cows and in-calf heifers and potential for the development of milk production in Presevo municipality are Miratovac, Oraovica, Zujince, Rajince, Buštranje, Slavujevac, Preševo, Strezovac.

Miratovac has a realistic potential for further development of milk production. Almost 15 villages have a limited potential to develop milk production.

A detailed table of dairy cattle distribution in Presevo is given in Annex 2.

4.2.2 Livestock breeding

Households which are market oriented regarding milk production often have three to five cows with followers. Only a few producers own 10-20 cows, but they are not specialized for milk production and in some cases have different breeds (Simmental, cross-breeds and Busha).

There are large numbers of small, mixed households with one or two dairy cows, where the housing conditions, as well as feeding, differ widely.

The dominant breed in households is the domestic Simmental. This breed is crossed intensively with the local Busha breed, and at the moment a number of Simmental cows

have a variable percentage of Busha blood. In the field there are also Black and White breed as well as a mixture of pure breeds and their crosses.

The Public Veterinary Station, Bujanovac (further PVS) is authorized for identification of cattle and has the exclusive right to implement artificial insemination in Bujanovac municipality. The PVS has 35 full time employees and offices in eight villages, one located in Presevo, and is securing pure Simmental semen from the Centre for Artificial Insemination in Velika Plana. Few private veterinary services are active in the field.

Natural mating of cattle is significant in almost all villages. Some villages have up to four reproductive bulls, which are neither proven nor tested. Mainly they are from local herds and they are not necessarily Simmental (Busha, crosses etc.). Even larger holdings are using natural mating or have reproductive bulls. In highland areas, natural mating is "safer", easier for farmers and is less costly. In more intensive lowland farms, farmers are using bulls when a cow cannot be inseminated (after third insemination). In general, reproductive bulls are a potential source of infection.

Registered Simmentals have on average 4,000 – 4,500 kg of milk per lactation (source of data PVS, Bujanovac).

In practice, often, as a result of poor nutrition and body condition, increased number of inseminations per conception (3-4), disturbed sex cycle and diseases of the reproductive tract, the duration of the service period is considerably longer. Consequences of this are longer intervals between calving, longer duration of lactations and decrease of milk production in the standard lactation of 300 days.

Most of the cowsheds are not in compliance with stated requirements. Stables are mainly old, located next to the house, with low ceilings, small or absent windows and without vertical ventilation shafts. On a certain number of new facilities (built without any technical documentation) the same mistakes were made similar to older buildings from the past. Farm practices are on a low level and they are contributing to low production of milk and short productive life of cows.

The meals which are given to cows on farms often do not ensure enough nutritive matter for production which the cows, according to their genetic capacities could achieve, primarily because the quality of feed is unsatisfactory and non-balanced in regard to the nutritive matter.

Cows are mainly fed on pastures and meadows of poor quality during the summer months (70% of all cattle), and to a lesser extent hay and fresh mass produced on fields.

The basis for meals during the period of winter feeding (November – April) is hay. Medium quality hay, which is produced from natural meadows, is mostly present. Good quality hay made of alfalfa, clover and grass-legumes mixtures produced from planted meadows is also part of meals for dairy cows, apart from hay from natural meadows. The concentrated portion of meals is usually made of bruised corn grain in combination with wheat grain or feed flour. Protein feed which can be found on the market as well as mineral feed and vitamin-mineral premixes are insufficient or absent.

Organized production and use of fresh fodder from fields is present on a small number of households. Silage is solely prepared and used on households which have a larger number of dairy cows. Silage from whole corn plants is exclusively produced and used. Silage use in feeding of cows is more developed in lowland villages in Bujanovac municipality, when there are four silo combines. In Presevo municipality a small number of households (6) have recently started with silage preparation (one combine).

The most common situation is that compressed silo mass is covered with a plastic sheet and some kind of load (earth, sand, old tyres). In a few cases ensiling of plant mass is performed in provisional silo buildings. There are no new or properly technically built silo objects in the region.

The lack of agricultural machinery is a limiting factor in the improvement of forage production.

The main health problem for cattle breed on pastures and meadows during the summer months are ecto- and endo-parasites, particularly liver fluke. The second problem in health protection of animals is mastitis in both clinical and sub-clinical forms. Other problems are present but they are not so significant - digestion disorders, irregular fertility, repetition of insemination, infections, difficult calving, problems with hooves etc. These, in certain situations can be causes of premature exclusion of cattle from the herd and slaughter.

4.2.3 Estimated milk production

In 2007 to date, 3,635 cows and pregnant heifers are kept in Bujanovac and 2,429 in Presevo municipality. It is estimated that there are around 4,800 cows in the region, determined by a standard herd replacement rate. This number of milking cows has an estimated milk production of 14,400 t of milk per year, or 39.5 tons per day (with seasonal variations). Estimation of milk production per cow during the standard lactation was calculated at 3,000 kg.

Total amount of milk collected from Bujanovac and Presevo is 4,167 tons per year, or ca. 11 tons of milk per day, representing 29% of produced milk.

The prime reasons for small quantities of milk offered for collection are:

- The length of calf suckling period. Calves are raised on fresh milk for 60-90 days, performing “fattening” of calves using milk. It is thought that calf-milk replacer is a cheaper alternative to this practice.
- In small mixed households with one or two cows and low milk production, there are no surpluses of milk owing to domestic consumption and calf feeding.
- Traditional domestic cheese production is significant, and many households are producing, packing and selling milk in Presevo and Bujanovac. This practice is common for one of the most populous dairy villages in the examined region, Veliki Trnovac.
- Dairies are not collecting milk every day out of “production season”.
- Dairies are not collecting milk from all villages.
- Some dairies are not paying regularly for collected milk.

4.3 Milking

4.3.1 Milking

Farmers are milking cows twice a day in the morning and evening, mostly manually. A small number of farmers are milking with machines in stalls, using small milking apparatus – milking into buckets. The apparatus is mainly of poor quality, without pulsation which is a serious concern. Application of this milking apparatus can lead to

udder damage which can be permanent, rendering the animal useless. There are no farmers using milking systems with pulsation and no farms with milking parlours.

4.3.2 Cans

A special hygiene problem relates to cans in which producers store and deliver milk. There are no stainless steel cans, usually of plastic and aluminium of 10 to 40 litres capacity. Plastic cans are not suitable for transport or storing of milk, while plastic and aluminium cans cannot be washed with caustic detergents, especially if they are used over a long time.

4.3.3 Cooling

Farmers cool milk by placing the milk cans into the refrigerator, using cold water in the summer, or cans are kept outside in a suitably cool location during the rest of the year. These methods cannot acquire a temperature below 8°C, causing a rapid increase of total bacterial count and subsequent milk spoilage. *There are no farms with cooling tanks.*

The CRDA programme has donated two cooling tanks (500 liters each) to a farmers' cooperative in Letovica village and these are the only examples in these municipalities. The farmers' cooperative has located the tanks in a separate room, which needs to be adapted according to the regulations for collection points. Vehicles have a good approach road to the collection point.

4.4 Dairies

4.4.1 Dairies from Bujanovac and Presevo

There are four registered dairies in Bujanovac and Presevo:

- SZR Doda, Presevo;
- Fontana d.o.o., Bukurevac
- SZR Ajka, Bukurevac
- Razvitak d.o.o., Bujanovac

Detailed analysis of each dairy is given in Annexes 3-6.

4.4.1.1 Structure

All dairies are small family owned businesses. Only Ajka does not have full time employees but other dairies have 6 to 15 full time employees plus seasonal workers.

Fontana and Doda have sister dairies in Kosovo, while Razvitak is receiving significant income as a regional distributor of food products such as Delta ice cream.

Excepting dairy Razvitak d.o.o. other dairies do not have technologist and are located in house.

4.4.1.2 Amount of collected milk

Table 3 – Total milk collection in 2006.

	Doda	Fontana	Razvitak
Total tons	453	1,407	263
Average tons/day	1.2	3.9	0.7
Max. tons	48	151	27
Max. month	May	August	March
Min. tons	25	72	17
Min. month	January	January	January

Fontana is the only dairy that collects a significant amount of milk in the municipalities, collecting 3,500 to 4,000 liters per day. The other two dairies are smaller and collect around 1,000 liters per day.

Table 4 - Milk collection (tons) in period January - May 2007

Months	Doda	Fontana	Razvitak
January	40	107	21
February	42	94	19
March	50	102	18
April	53	111	16
May	49	117	16
Total	234	531	89
Monthly	47	106	18
Daily	1.6	3.5	0.6

Doda dairy increased the amount of collected milk per day in 2007 in comparison with 2006, while Razvitak noticed a constant decrease from 2005. Such a trend continues in 2007 where the dairy collected an average 0.6 tons per day.

4.4.1.3 Milk collection and transport

Direct purchasing of milk is organized according to the so-called system of “line collection of milk” which is not an efficient procedure as it involves collecting from individual producers on a door-to-door basis. The owners of Doda and Ajka dairies are collecting milk personally, and in the case of Fontana, farmers from Bukurevac are delivering milk to the dairy.

Dairies are collecting milk in their municipality once a day in the morning, although at certain times of the year they do not buy milk, for example during adverse weather and low winter milk volumes.

Collection distances are up to 80 km per round trip, but average around 20 km. In the region, villages are located fairly close to one another, but dairies do not buy milk from all villages, sensibly being orientated towards larger ones with higher milk production.

Fontana is collecting milk from more than 20 villages, while other dairies are collecting milk from 5 to 10 villages.

Dairies are collecting milk from 85 (Doda) to 500 farmers (Fontana). The largest farmers are delivering 150-160 liters of milk during the season. Dairies do not possess the resources (human, technical and financial) for formation of a regular suppliers' network. They collect milk from small producers, but they also have medium sized producers who are in the process of specialisation in milk production. This trend is likely to continue if these dairies remain viable.

During milk collection the utilisation of truck capacities is over 80%.

Dairies possess one or two trucks or vans, and even cars are used for milk collection. The trucks are not designed for milk collection, are usually second-hand and often used for other purposes as well. Period of truck usage is not limited and they can be used whilst they are in a good working condition. Poor road maintenance is one reason why dairies are not interested in purchasing new trucks.

Excepting Razvitak, dairies do not use stainless steel cisterns for milk transport, mainly using plastic barrels. In this case there is no thermal insulation or correct cleaning after use. The barrels and cisterns are of capacities between 100 and 2,000 litres.

Milk quality is visually checked on the spot by the truck driver who acts as the milk quality controller. However, no dairy is reliably checking milk temperature at the moment of collection.

4.4.1.4 Milk price

The price of milk depends on the current situation in the field, i.e. on supply of and demand for raw milk.

Farmers are receiving 3.90 (Razvitak) to 5.00 RSD (Fontana) per fat unit (15-20 RSD per liter + 3 RSD of state subsidies), and payment is once or twice a month, but which suffers from a degree of irregularity. Last year Razvitak delayed payment to farmers for five months, while Ajka still owes significant amounts to farmers for milk delivered in 2006.

Farmers are not generally given legally-recognised contracts by dairies, and there is no guarantee that milk delivered will be paid for promptly. Milk payment is occasionally irregular, plus farmers do not receive any bonus payment to deliver better quality milk, resulting in stagnation of quality. This is exacerbated by dilatory payments of *premija* by the Ministry.

4.4.1.5 Milk quality

Legal regulations for milk and dairy products produced in Serbia are defined according to the rule book on quality and other requirements for milk and dairy products and starter cultures, dated 2002. The book is not completely in compliance with EU regulations (European Commission Directives No. 89/362/EEC and 92/46/EEC), but is based on the needs of the dairy sector in Serbia at that time, and sets out the requirements that must

be obeyed in the transitional period. The new rule book, in total compliance with EU standards is in its preparatory phase, expected to be completed by early 2008.

Although, as stated above, legislation regarding the quality of milk is clearly defined, standards relating to quality of milk as raw material are today determined by the producers, where control and inspection in the field are poor or absent.

Milk quality is visually checked on the spot by the truck driver or owners (SZR Ajka and SZR Doda) who act as the milk quality controller. However, no dairy is reliably checking milk temperature at the time of collection.

Milk quality is rarely assessed and is not a prerequisite for collection from a producer, and apart from the alcohol test for developed acidity and occasional testing for added water there are effectively no controls in the study area. Milk quality is barely controlled in dairies' laboratories, who usually only require that milk contain a minimum of 3.2% milk fat.

Milk is purchased and paid for based on quantity and milk fat content. Microbiological quality of milk is very rarely assessed, nor are the contents of other components, such as protein and total solids determined on a regular basis. Also, contamination of milk with substances which reduce its quality is not checked, for example antibiotics and blood. These factors influence significantly milk quality as raw material suitable for further processing.

Farmers, and also many dairies, state their disquiet with the lack of control and the antiquated payment methods. Farmers are not informed of their milk quality, marketing of raw milk is uncertain, and they are not stimulated to improve the quality they produce. But, dairies *do* purchase milk of poor quality, effectively putting them in the position of prime offender. Poor quality of raw milk is the major factor affecting the quality and shelf-life of finished products.

Bearing in mind these statements, it is also well to understand that the Serbian Government continues to pay milk subsidy – *premija* it is called but is still a subsidy – *irrespective* of any quality parameter apart from fat content.

4.4.1.6 Plants

With the exception of Razvitak, dairy plants are located in a house with poor approach roads for trucks and with small working areas. In such conditions it is impossible to organize sound milk processing practices and separate the different processes. Cooling equipment in storage rooms is old and in some cases overdue for replacement.

Plants have reasonable stainless steel equipment, some of it new, but each dairy is missing some item of equipment to complete the production process. For example Doda does not have separator, precluding its ability to produce products of varying fat content, while Fontana does not have a machine for automatic packing of yogurt and acid milk.

Fontana is increasing production and storage capacities at the moment, but the problem is that the new working area will be on the first floor. The owner did not consult with experts before deciding to increase capacity, but nevertheless the facility is expected to be operational in October 2007.

Razvitak has very good facilities (1,100m²) including production space for milk (350 m²) and two storage rooms (300 m²), and the plant is located in the industrial zone of Bujanovac. It is only dairy surveyed that is not located in part of a dwelling, has office

space, adequate product storage and a suitable approach for vehicles. Whilst the dairy has a lot of equipment, more than Doda and Fontana, there is the strong impression that some of the equipment is not functional. The process plant has enough space and there are possibilities to reorganize the process in a better manner. The storage area is not organized, with products mixed and stored on the same pallet.

Hygiene

Except Ajka, other dairies have satisfactory hygiene, with floors and walls tiled in ceramic while facilities have good headroom.

Waste water is going to public sewerage system or septic tank (cleaning 4 times per year), while public truck is regularly collecting garbage from dairies.

The only dairy in the region to achieve a HACCP certificate is Doda. Razvitak and Fontana are intending to introduce HACCP in the near future.

4.4.1.7 Milk products

Basic characteristic of milk and dairy product production is a low level of dairy product processing (table 5).

Table 5 Summary of milk and dairy products in the districts

Products	Number of dairies
Regular production	
Yogurt	4
Acid milk	4
Feta cheese	2
Production from time to time	
White cheese	1
Yellow cheese	1
“Urda”	2
Pasteurized milk	1

Mass production of sour milk and yoghurt indicates low quality of milk collected by examined dairies, which leads to low quality of these products.

4.4.1.8 Packages

In general yogurt is packed in plastic pots (0.18 and 0.50 l) and bottles (0.5 and 1 l).

Acid milk is packed in plastic pots of 0,18 and 0.5 l.

Feta and white cheese is packed in plastic buckets from 0.5 - 4 kg.

Other products are packed in film, such as yellow cheese, pasteurized milk and ground white cheese (known as Urda).

Products in Razvitak dairy do not have one common mark. The same product, for example cheese, is labeled in different ways, making it hard to realize that products are from the same dairy. Again, labels on yogurt are different from other labels.

In Fontana, the label on feta cheese packages is different from those on yogurt and acid milk.

4.4.2 Other dairies active in Bujanovac and Presevo

Han, Vladicin Han

Dairy was privatized in 2006.

Han is the biggest milk buyer in the examined region. In Bujanovac the municipality dairy is taking milk alone, through its own supplier network. Han is collecting around 4.000 liters of milk per day from Bujanovac.

Fabrika hleba i mleka, Vranje (further Vranjska mlekar)

Dairy was privatized in 2006 and collecting milk from Bujanovac and Presevo municipality. Dairy is taking 200-300 liters of milk per day from Presevo (villages Zuinci and Miratovac) and the same amount of milk from Bujanovac municipality (mainly from Rakovac). Dairy is focused on northern part of Bujanovac and this part of the Bujanovac municipality is traditionally giving milk to Vranjska mlekar. In Presevo municipality Vranjska mlekar is cooperating with Doda dairy. Doda is delivering milk surpluses to Vranjska dairy. In compensation Doda is getting yogurt.

Dairy is paying regularly for collected milk and has better milk price than other dairies (18 RSD per liter).

New owner has ambitious to increase amount of collected milk from the region.

Although Vranjska mlekar is big dairy, conditions of milk collection and handling are bad and more or less same like other dairies have.

Velickovic, Surdulica

Velickovic dairy is collecting milk in some parts of the Bujanovac municipality. Dairy has stable business relations with farmer groups.

Estimated amount of collected milk is 500-600 liters per day.

Vihor, Vranje

Dairy is not regular buyer of milk in Bujanovac and Presevo. In some periods of the year Vihor is taking milk from some villages. Estimated amount of collected milk is 200-300 liters of milk per day.

Leskovacka dairy, Leskovac

Leskovacka dairy was privatized in 2006 and tried to collect milk from Bujanovac and Presevo but without success. Leskovacka dairy was present last year in Bujanovac and Presevo but did not pay regularly for milk. Ajka dairy collected and supplied Leskovacka dairy with milk.

Other dairies

Glozane dairy is not present in the region nor Niska mlekarica and IMLEK group of dairies.

4.5 Market

The proximity to the Kosovo border leads to additional constraints in operating a dairy business, especially in the marketing segment. These include

- 'Grey market' activities where VAT is avoided or products are sold across political or national borders, therefore not officially recorded as 'exports'.
- 'Opaque trading', whereby milk collected by one dairy and transferred to another is rewarded in product, not cash, for sale by the first milk buyer, possibly on the market mentioned above. Such barter trading is a retrograde step, preventing an accurate, transparent assessment of business operations and viability.
- Direct sale of raw milk by producers, in second-user plastic bottles, to local consumers at attractive prices for both, in one example at 30 RSD per liter.

These activities are not necessarily *illegal*, but serve to illustrate that the raw milk market in southern Serbia is at its most unstable in recent years.

4.5.1 Milk delivered to home

Farmers are selling their own milk locally direct to consumers, who are willing to buy milk this way because they are sure that they are buying full fat milk. In some cases buyers are obtaining milk direct from the farm, a common practice for almost all villages in Presevo and Bujanovac, but Veliki Trnovac is the hub of home delivery.

4.5.2 Green market

Some farmers are selling white cheese, urda and other milk products significant amounts in green markets which are open only once a week. There is a covered and specially equipped section in Bujanovac market for selling milk products. In Presevo, its green market is under reconstruction and soon farmers will have a specialized area for selling milk products.

The market is well-established and shows no sign of becoming saturated, as white cheese is a prime staple in most households. The product is largely uncontrolled in quality or specification, is unpacked and sold direct from the producer, on green markets or in the few specialized shops that deal with regional varieties. However, the poorest quality milk is frequently used for this type of cheese, apparently without effect on demand. As white cheese is often used in catering or cooking, the heat-treatment involved will negate most pathogenic occurrences.

4.5.3 Retail stores and bakeries

Small amounts of yogurt, acid milk, feta cheese and other products are sold in Bujanovac and Presevo. The only dairy focused in these municipalities is Ajka. Fontana and Doda are selling only 10% of their milk products at local retail stores and bakeries, whilst Fontana is selling higher amounts of products in Bujanovac.

4.5.4 Markets out of the area

The main market for Fontana and Doda dairies is Kosovo, where they have sister dairies and developed distributive chain, and approximately 90% of milk products are sold there. Fontana supplies retail outlets in Bujanovac, and also in Pirot, Jagodina, Cuprija, Leskovac and Belgrade.

4.5.5 Analysis of supply chain, including an assessment of the knowledge of the management of the dairies of issues with supply and strategies for addressing these issues

In order to address this item, a SWOT analysis is presented as an overview of the two municipalities' dairy sub-sector. Comprehensive details of each dairy surveyed are to be found in *Annexes 4 - 6*, in support of recommendations given in the narrative.

Strengths	Weaknesses
<p>Tradition / experience in dairy sector</p> <p>Family – owned businesses</p> <p>Land areas for production of livestock food are large</p> <p>Trust between farmers and dairies – regular payment (exception is Razvitak)</p> <p>Regular personal contacts with farmers</p> <p>Relatively short milk collection distance</p> <p>Sound capacities for milk processing</p> <p>Desire of dairies to improve production process</p> <p>Milk products have a good, competitive, market price</p> <p>Safe market for milk products – Distribution chain in Kosovo</p>	<p>Extensive livestock production</p> <p>Dairies are not working with farmers</p> <p>Some dairies do not collect milk every day out of season</p> <p>Small amount of processed milk per dairy</p> <p>Dairies do not take care of cooling of milk</p> <p>Milk hygiene during the collection process is at a low level</p> <p>Milk quality control is not in accordance with present legislation</p> <p>Poorly organized milk supply and processing chain</p> <p>Dairies do not have full equipment necessary for milk processing</p> <p>Mixed production – dairies are working with different products depending on market demand</p> <p>Milk products do not have attractive packaging</p> <p>Weak marketing approach – no brand development</p> <p>Lack of knowledge in all parts of the milk chain</p> <p>Weak management structure</p> <p>Lacking cooperation with different institutions – Institutes, faculties ,etc.</p> <p>Isolation – lack of relevant information</p> <p>No farmers associations and / or cooperatives</p>

Opportunities	Threats
<p>Young farmers</p> <p>Enough labor</p> <p>Cheap labor</p> <p>Farmers could specialize in dairy production</p> <p>To increase amount of collected milk</p> <p>To work on milk hygiene and milk quality</p> <p>To start to pay milk based on quality</p> <p>Attractive milk prices and milk premiums can encourage producers to deliver milk to dairies</p> <p>New, quality products</p> <p>To enter into new markets</p> <p>Foreign projects can support development, of the dairy sector</p> <p>MAFWM finances rural development, development and educational projects</p> <p>Municipalities have agricultural budgets and can support development to some extent</p> <p>Increase knowledge in all parts of milk supply chain</p> <p>Mutual work of regional dairies on establishing coherent milk supply chain – dairies are not competition to each other</p> <p>Create development and marketing strategies with action plans</p> <p>To develop regional strategy of development of dairy sector with action plan</p>	<p>Farmers are selling own milk direct to consumers</p> <p>Competition – too many dairies present in the region</p> <p>Low amount of produced and delivered milk to the dairies in the region</p> <p>Farmers are not interested to specialize in dairy production</p> <p>National standards for milk quality are very high</p> <p>Low financial potential in comparison with competitive dairies</p> <p>Politically non-stable region</p> <p>Herd book and advisory services do not exist</p> <p>Dairies do not have clear business vision</p> <p>Poor infrastructure</p> <p>Local and district authorities are not interested to support development of milk production in region</p> <p>The region is characterized by low milk production</p> <p>The Ministry will cancel milk premium</p> <p>The milk price will not rise</p> <p>Migration of work force</p> <p>Lack of educated persons – especially food technologists and managers</p> <p>Credit lines are not available</p>

- Farmers should be encouraged to associate in creating machine rings. For such a ring it is necessary to have a group of producers from one or more villages, to define the requirements, working practices, financial aspects etc.
- Related to cattle feeding, it is recommended to facilitate purchasing of silo combines and other machinery necessary for farmers and villages with the greatest potential for dairy production. In some cases it would be useful to develop the concept of machine rings within farmer groups. Standard construction projects can be created for different types of silo items for interested farmers.
- It is recommended to approach Reka Mleka and Mercy Corps to discuss with them the producer group formation processes they have developed in southern Serbia over the previous five years. The processes include a machinery ring

- concept, with a cost-share component, and municipal involvement, which have proved successful
- In the short term, in these two municipalities it is recommended to facilitate the following:
 - Increase the number of milch (those giving milk) cows
 - Increase productivity per head by improving the milking process
 - Organize appropriate transport facilities, cooling and handling of raw milk
 - Improve process efficiency of existing dairies, including waste and stock controls
 - Form expert services
 - Selection service
 - Advisory service
 - Raw material department
 - Support the establishment of farmers' groups, associations or cooperatives

4.5.6 Analysis of each dairy's marketing strategies – do they exist, what is their timeframe, how do they relate to the supply chain analysis;

Dairies in the vicinity of the study area are all in the group of 'small' dairies, which are usually the most vulnerable to economic change, unless they have developed a successful niche product, or products, or secured a defined market.

Marketing is probably the weakest link in the dairy chain, from a commercial aspect, none of the dairies working to a coherent strategy. This is mainly true for the whole of Serbia's small dairies, which continue to operate on an *ad hoc* basis for sales. Whilst sales and marketing are separate parts of the distribution process, they are interdependent. Recommendations are;

- Each dairy needs to be examined to assess its financial capability and any subsequent benefits of investment in new packaging machinery, linked to the development of a marketing strategy.
- Development of a brand and package design for all products that will communicate to the consumer the quality and origin of each product.
- Collection of information from the market, concerning availability and price from competitors. This will help to place products where competitive advantage can be secured.
- In some cases, it is clear that products would benefit from a more consumer-friendly package, lending added value to the product. However, packaging equipment is often too expensive for small dairies to consider, but there are many sources of second-user items available, at an average cost of 40% of new plant.
- Improvement of merchandising at the point of sale, to ensure that products are prominently displayed and under the appropriate conditions, such as in chilled cabinets. Expiry dates must be clearly marked on products, and it is the

responsibility of the sales representative or van driver to check daily that products offered for sale are still within that date.

- Dairies should provide some product information to retailers regarding storage and display, and the importance of expiry dates.

It is understood that the retail business in the locality (and presumably in parts of Kosovo) is not well developed, but this should not discourage dairies from making the effort to make the best of what there is. As regulations are increasingly enforced and consumers switch to brands they can trust, many small dairies will find it difficult to adapt.

4.6 Identify opportunities for positive impact on vulnerable groups, including women

It is recommended to approach Reka Mleka concerning the work it has done on gender involvement in the dairy sub-sector, and the methods it has used in group formation processes to increase gender balance in group formation, farm management and other activities. It should be borne in mind that most of milking of cows is undertaken by women, and this is one significant area for training, in hygiene and milking practices, which will directly benefit women on a large scale.

4.7 Meet with dairies to identify issues inhibiting their growth – analyze issues related to supply, processing, marketing and administration.

4.7.1 Growth inhibitors – supply, processing, marketing - recommendations

- Establishment of collection points in certain villages, involving:
 - Assessment of financial cost and benefits of establishing and maintaining a collection point that meets currently established and EU health standards
 - assessment - where, when and how to establish cooling tanks
 - design of premises to be used as a collection centre according to current or EU standards,
 - association of farmers from one village into the action group,
 - definition of the means of cooperation between farmers and dairy
 - definition of procedures at the collection point according to legislation,
 - equipping collection points with cooling tank/s and other necessary equipment and tools, especially can washing facilities.
 - establishing milk quality control on site,
 - establishing and maintaining accurate record keeping and
 - education and training of staff working at the collection centre.

For example, a new 1,000-litre lactofreezer would cost in the region of € 3,500. Assuming the tank is full every day, a RSD 0.40 per litre deduction would secure full

repayment after two years. This deduction would be offset by the cooling bonus paid under a new quality payment scheme.

The CRDA programme has donated two cooling tanks (500 liters each) to a farmers' cooperative in Letovica village and are the only examples in these municipalities. The farmers' cooperative has located the tanks in a separate room, which needs to be further adapted according to the regulations for collection points.

- Dairies should be encouraged to support larger producers by providing cooling tanks.
 - Tanks supplied should be subject to an agreed financial and volume commitment by the producers.
 - The ideal solution is that the tanks (or other equipment) be paid for by producers by deduction from their milk price, on a per litre basis.
 - This will lead to eventual ownership of the equipment, until when the dairies' milk supply will be subject to contract.

4.7.1.1 Milk payment

During the next two years, it is certain that Serbia will introduce a national quality payment scheme for milk. It is advised that;

- Control of raw milk should be established as a first step and hygienic quality should be introduced as a parameter in the payment system as a stimulus to milk producers (production of milk of better bacteriological quality). This is dependent upon the establishment of milk cooling units on a wide scale.
- Secondly, dairies should introduce a quality payment scheme based on the content of both protein and fat, bacterial count, somatic cell count, absence of adulteration and antibiotics.
- The program should organize workshops with dairy representatives where potential for the introduction of new payment systems for milk should be examined.

In the meantime, it is the responsibility of the dairy as first buyer to monitor raw milk quality, without which processors cannot assure consumers of their product quality, a keystone of any marketing strategy. Therefore, ways of introducing quality payment, beyond fat content only, need to be discussed between producers and processors and facilitated by SCOPES.

4.7.1.2 Contracts with farmers

- Dairies should start to work on creation of permanent chain of milk suppliers. The program should support this process by;
 - creating farmer associations,
 - defining the legal status of contracts between farmers and dairies during workshops etc.

4.7.2 Entrepreneurial possibilities, blocks, development strategies

4.7.2.1 Business strategy

Dairies do not have a clear business vision. At the moment feta cheese has a good price, market demands are high and many dairies in the area have started to produce feta cheese. Eventually, the market will become satisfied, resulting in lower asking prices for Feta.

Low quality of raw milk forced dairies to focus production on sour milk and yogurt, which is not the response needed during the build-up to EU accession.

First and most important document that should be developed is strategy of development of dairy production in Bujanovac and Presevo with clear action plan. This document should define strategic goals in dairy and agriculture in general, and closely examine the longer term viability of the current mode of operation and what steps need to be taken to improve chances of survival and their costs. The action plan should: show how to reach strategic goals but also to define necessary steps on regional level in following few years; prevent overlapping or wrong steps caused by lack of knowledge; identify main stakeholders; way of financing, time framework for each action etc. A regional strategy with an action plan should be developed together with all relevant stakeholders like municipalities, veterinary stations, farmers, dairies, regional and republic representatives etc.

After this document, each dairy should develop own business strategy that will correspond with state policy in agriculture sector and defined and accepted regional strategy for dairy development. Dairies should make this strategy with relevant experts in this field. In this way dairy will get long term business vision and strategic goals for further development.

Finally, as a result of regional strategy and business strategies each dairy should develop marketing strategy. Development of marketing strategy without previous documents will not give any success.

Dairies could benefit if business strategies could be developed in cooperation with relevant experts. The preparation of business plans as *bankable documents* (in case of the need for credit) should be considered an essential prerequisite to any significant SCOPES financial intervention.

4.7.3 Market understanding at a dairy level – knowledge of their market, positioning, specialization.

Marketing issues and concepts are poorly understood by the dairies in the area of study, particularly in positioning of products and their pricing. Customer service has yet to be developed in this rather unstructured market, which is divided between Serbia and Kosovo, each offering different challenges. Specialization is not yet possible, owing in part to the current economic situation, but mainly because the study area is one of the poorest in Serbia.

The dairies appear to have sufficient knowledge of their market as it stands today, and should be sufficient for most of them to survive in the short term. The longer term perspective is less certain, and it will take innovative approaches in product development to secure a niche outside the current field of distribution, to more affluent markets.

One area to be examined is that of securing distribution rights for other, even non-dairy products, which Razvitak has already started for ice cream.

4.8 Recommend technical assistance, training, development of cooperatives/associations, internships and other steps for SCOPES to consider to assist dairies and supplier groups.

4.8.1 Assistance to farmers – supplier groups

4.8.1.1 Breeding and reproduction

Two methods for breeding improvement are recommended:

1. Breeding Simmental through growing in pure race/breed The genetic potential of the Simmental race of dual-purpose animals should be improved by a constant promotion and application of artificial insemination and widening the application of insemination on the entire cow population. Introducing the gene of more productive Simmental animals, possibly from Velika Plana and also where agreed, imported from Europe.

This will require a strong education process to farmers and the establishment of free insemination, where municipalities want to promote artificial insemination. It would be beneficial to enter into cooperation with PVS and other veterinarian pharmacies that are working with insemination and define priorities in increasing results of artificial insemination in the field (better quality and availability of semen, necessary equipment, education and study visits to AI Centers in Velika Plana, Temerin and Kranjaca).

2. Import of high quality in-calf heifers from Austria and Germany – a recommendation for larger farms. In the researched areas, breeding Simmental race with Red Holstein can be recommended to households which have a more intensive production (better breeding conditions) and specialize in milk production, whereas in contrast, the income from the sale of calves for further breeding is marginal.

4.8.1.2 Demonstration farms

- The simplest way for farmers to learn is from their neighbours. In that context it is recommended to establish demonstration farms with different goals. Each demonstration farm should be specialized in a specific topic of livestock production.

These farms should be developed with full expert assistance and monitoring, and linked to farmers in Bujanovac and Presevo:

One suggestion is to establish demonstration farms focused on:

- Reproduction results
- Breeding in general (housing, manure disposal, milking etc.),
- Optimal utilisation of pastures (lowland and highland) and meadows (optimal grassy-leguminous mixtures, cultivation of meadows, silage preparation and silo objects etc.)

4.8.1.3 Breeding/Rearing

The European Union has recommended the loose housing system for cows, which means that farmers in the EU must adjust (or change) their housing system of cows by 2012. After this period, the tied system of housing cattle should be prohibited.

Recommendations;

- Awareness programmes
 - All interested farmers should be introduced to the principal demands in building and/or reconstructing of sheds.
 - Standard construction plans for cowsheds of different capacities should be drawn up and made readily available to farmers intending to build new premises.
 - Information and workshops on how to establish a proper dairy farm should be organized from time to time.
 - It would be ideal to gather farmers that are intending to build or reconstruct cowsheds and organize practical assistance accordingly.
 - Potential advisors should be educated in the field of cattle production through study visits. Also, it is possible to organize seminars and conferences with the goal of transferring knowledge to farmers but also local veterinarians, municipal officers, potential advisors etc.

4.8.1.4 Feeding

Education

Improvements in cattle feeding can be achieved through broad and intensive education processes (lectures, trainings, workshops, conferences, and seminars), plus organized study tours, printed brochures, leaflets, on-field demonstrations, etc.

The most important topics for farmers and advisors education are recommended to be:

- Agro-technical measures on pastures and meadows,
- Planned and systematic usage of pastures and meadows,
- Optimal starting and ending time for grazing,
- Optimal grassy-leguminous mixtures on meadows,
- Advantages of silage, i.e. haylage, from green matter from meadows,
- Optimal mowing time.
- Optimal recipes for meals for cows according to their yield
- Advantages of green fodder conveyor and silage use.

4.8.1.5 Health care

In order to achieve high production results and regular fertility, it is recommended to organize:

- Education of farmers through lectures, workshops and practical trainings
- Conferences and seminars for local veterinarians

- Define, in cooperation with local veterinarians, action plan regarding prevention and reduction of diseases and general health improvement of cattle
- Promotion activities in order to promote artificial insemination
- Study tours for local farmers and veterinarians
- Provide modern literature to veterinarians
- Production of leaflets with information on mastitis prevention and other important diseases.

4.8.2 Milking practices

Machine milking increases productivity by two to three times compared to manual milking. Machines facilitate especially women's work in households, and it is recommended that:

- Larger farmers should have access the supply of portable machines of good quality (cost participation). *It is important to note that the purchase of local and/or unknown types of milking machines should be undertaken with care, because this can create more problems than solutions.*
- One other option is using a milking parlour. The possibility of establishing milking parlors should be examined, which can also be used by a farmers' group in a village, given the correct approach.

4.8.2.1 Education

Lectures, training and practical demonstrations should provide answers and information to farmers and dairy representatives to the following questions:

- Which are the most common causes for an increased number of micro organisms/mastitis?
- Proper hygiene during the milking process – cowshed, milkers, cows, procedures, cleaning, washing and disinfection etc.
- Milking with machines – types, advantages and disadvantages.

4.8.2.2 Demonstrations

- Milking machines – promotion of companies that are producing milking machines (i.e. De Laval, Westfalia)
- Mastitis – milk controls on mastitis

4.8.2.3 Cans

- Plastic and aluminium cans should be replaced as soon as possible with cans of stainless steel with the international standard designation 18/10 or 304.

4.8.2.4 Cooling

- Larger farmers should be first to be supplied with cooling tanks.

- Those farmers delivering more than 100 liters of milk per collection should receive a cooling tank of at least 150 litres capacity, which allows for an increase in production of 50%. Most of them will realise such an increase when quality stimulation leads to them to increase milk production.
- Dairies should be encouraged to support farmers with providing cooling tanks.

4.8.3 Appropriate technical assistance for the dairies – individually and/ or as a group

4.8.3.1 Establishment of collection points in certain villages. (see also 4.4.1)

4.8.3.2 Dairy staff

It is recommended that staff employed at milk collection centres shall:

- be trained in and have the necessary knowledge of milk composition, quality control and milk hygiene;
- analyse results, give advice to farmers, etc.;
- have valid sanitary control documents;
- be in close contact with the dairy and farmers;
- keep accurate records;
- conduct necessary measures and steps in controlling milk quality;
- ensure that all cans in which milk has been transported are rinsed with water following cleaning with an approved detergent.

Villages with potential for dairy production development are defined in the annexes but one focus of the SCOPES work should be in Miratovac. Miratovac village is the only village in the two municipalities with the realistic potential for milk production development.

4.8.3.3 Milk quality control

It is recommended that;

- Each dairy plant should define the quality of milk (number of micro-organisms, somatic cells, milk acidity, presence of water, presence of inhibitors, etc.) which will be received in accordance with valid legislation.
- This requires a significant education process of dairy representatives as well as purchasing adequate equipment for milk quality control.
- Dairies will need assistance in establishing milk quality controls in the field and in routine practice.

4.8.3.4 Organization of the dairy work

- The programme should support the introduction of HACCP systems in Razvitak and Fontana dairies.

- It is important to provide technical assistance to Fontana dairy with the goal to establish proper technological organization in the newly established facility. This type of support would benefit Razvitak and Doda dairies because there is potential for improvements in operational management of these dairies.
- Another important organizational aspect is to standardize milk processing technology for dairy products.
- A recommendation is to hire experienced technologists on a contract base, to supervise the development of new products and monitoring of standard production processes.
- Dairy representatives should be educated through study tours to successful small dairies.

4.8.3.5 Specific recommendations for dairies

Doda

- The largest producer at 150-160 liters per day needs a small cooling tank of 200 liters.
- 10 -15 other smaller farmers need stainless steel cans of 40 liters capacity.
- Plastic cisterns on loan and van need to be replaced with stainless steel cisterns of 1000 liters.
- Separator is necessary in the process line to control fat content of products.
- Establish a collection centre in Miratovac of 1,000 liters capacity, either a single lactofreezer in one location or 2 x 500 liters tanks in two locations.
- Implement a training program at all levels – management, processing, milk hygiene, financial control, marketing.

Fontana

- Replace existing loans with stainless steel cisterns with thermal insulation.
- Pack acid milk and feta cheese automatically.
- Organize collection points in selected villages for example in Bratosavce and Miratovci (2 x 500 l cooling tanks), Aligerce, Reljane and Bilaca (cooling tanks of 200 liters).
- Farmers should replace plastic and aluminum milk containers with stainless steel cans.
- Support the introduction of HACCP
- Assist in reorganization of the dairy processing line
- Implement a training program at all levels – management, processing, milk hygiene, financial control, marketing.

Razvitak

- Assist in planning a properly equipped laboratory.
- Implement a training program at all levels – management, processing, milk hygiene, financial control, marketing.

4.8.4 Courses of action directed at improving their access to the supply chain

Transport

Direct purchasing of milk is organized according to the so-called system of “line collection of milk” which is not an efficient procedure as it involves collecting from individual producers on a door-to-door basis.

Advantages of this purchasing system are:

- direct contact of the buyer with producers,
- prompt information about problems and
- no loss of producers’ time in collection.

Disadvantages of this system are:

- the extra time necessary for collection,
- too many obligations for the driver,
- frequency of stops of the vehicle,
- poor control of milk quality,
- limited possibility for straining or cooling of milk.

Recommendations;

- Introduce collection points and centres (see also 4.4.1)
- Assist with replacement of plastic barrels with stainless steel cisterns with thermal insulation
- In some cases it will be necessary to acquire specialised trucks for transport of milk

4.8.5 Courses of action directed at improving their marketing strategies and activities

4.8.5.1 Develop packaging, labelling and marketing approach

- Packages should be replaced with more attractive and consumer-friendly types. Dairies should examine packages of larger dairies, for example IMLEK, Mlekara Šabac, Mlekara Zrenjanin, Niška Mlekara.
- Each dairy should introduce one common brand label for its products.
- SCOPES can facilitate this process and assist in making a suitably attractive design of future labels. Attractive, modern packaging adds value to the product which in turn necessitates a review of ex-factory prices.

4.8.6 Interventions for SCOPES in the provision of training, market analysis, networking that have the potential for real impact with dairy management.

4.8.6.1 Milk technology training (for farmers and advisors)

Recommendations;

- Extensive education of farmers through lectures, workshops and practical training
- Conferences and seminars for local veterinarians
- Define, in cooperation with local veterinarians, action plans regarding prevention and reduction of diseases and general improvement of cattle health.
- Promotion activities regarding artificial insemination
- Study tours for local farmers and veterinarians
- Provide modern literature to veterinarians
- Production of one page leaflets with information on how to prevent mastitis and other important diseases.

4.8.6.2 Serbian Dairy Forum

- It is recommended that the dairies in the study area consider joining this organisation. The benefit of this would allow them to present the specifically local problems to a wider audience, and also allow access by all donors operating in the sub-sector to information held by a central source i.e. the Forum.

The Serbian Dairy Forum is a peak industry body formed earlier this year, to represent the needs of the industry at the national level. Its activities are largely funded at present by Reka Mleka, with regular contributions from its processor membership. The Forum will best function if many dairies join, with the intent of preparing a national dairy strategy whilst offering support and advice to its members on a wide range of issues.

The Forum has links with the MAFWM and is thus able to direct concerns to the ministry from its members. Individual dairies have no voice beyond their narrow field of operations, and therefore activities tend to be disparate rather than concerted. When more dairies agree to become members, the Forum voice becomes stronger, and enables concerns to be expressed at a national level.

Already, the Forum is working with IMLEK in the preparation of a national dairy strategy, which must include the interests of small dairies wherever they are located.

- It is recommended that the dairies in these municipalities are encouraged to seek the Forum's guidance in preparation of the strategy.

EU accession is on the national agenda. During the interim period, the dairy industry will face severe challenges, and now is the time to consider how these challenges can best be addressed. The Forum can provide the background on these challenges and help to prepare a concerted approach.

4.8.6.3 Advisory and extension service

- Make use of existing initiatives in relation to the development of advisory services and advisors. Seek information, advice and assistance from Reka Mleka on the work it is doing with:
 - technical training
 - development of peer networks with advisors.

Important in this are;

- The creation of advisory and extension services as well as raw material departments per dairy. Related to conditions at Bujanovac and Presevo, recommendation is to establish an advisory service at the beginning. Possibly, extension services could be organized within the advisory service, later, or as a part of the Public Veterinary Station at Bujanovac. The role of the above service should be to educate and advise farmers, and advise on breeding programmes.
- Each of the dairies covered by the survey should have an expert either in animal husbandry or in veterinary medicine in the field and in direct contact with producers. If agreed, dairies can form one common raw material department that can work on a commercial basis for all dairies and according to the Law. This department can also work as part of an advisory service.

4.8.6.4 Associations and cooperatives

- Make use of existing initiatives in relation to the development of advisory services and advisors. Seek information, advice and assistance from Reka Mleka on the work it is doing with:
 - Facilitation training
 - Development of producer group 'coaches' at a municipal level
 - Group formation processes.
 - Farmer associations should be created on village level.
 - Both dairies and SCOPES should work on creating farmers' associations.
 - Special focus should be on villages with the highest milk production, for example Miratovci and Veliki Trnovac.
 - These associations should facilitate communication between farmers on one side and dairies and municipality on the other side.
 - creation of the "main farmers association" for Bujanovac and Presevo municipalities.
 - In the context of Bujanovac and Presevo it would be better first to establish this association and after that to start establishing village associations.
 - this newly formed association should take responsibilities for advisory and extension work in the field, by networking with veterinarians, municipal officers responsible for agriculture, dairy representatives, regional and Republic institutions, projects and funds (credit lines, state subsidies).

- It is recommended to approach Reka Mleka about the work they did in the formation of the Farmer's Union in Aleksinac, in order to understand the processes involved. To organize an annual livestock/agriculture show in Bujanovac and Presevo

Municipalities can give adequate open space in each municipality and invite all companies interested for promotion of their equipment, seeds, livestock, machinery etc. Companies will be interested to attend and display their products but may not yet have developed contacts and researched the possibilities. This could be a suitable opportunity for them to present and sell different products but also an opportunity for farmers, advisors and veterinarians to gain new knowledge and select the most appropriate and cost-effective products.

4.8.6.5 Agriculture hours on local TV

All events, lectures, promotions etc. should be followed by local TV stations. It is common practice that local TV stations record agricultural lectures and events and to broadcast them once a week (mainly on Sunday mornings in the case of the B92 channel).

4.8.6.6 Livestock exhibition

In livestock regions, a livestock exhibition (show) is very important for farmers and is always strongly supported by local communities. It is also a day out and a chance to discuss with others the problems of the day.

4.8.6.7 To develop sheep milk production

At the moment sheep are being reared because of lamb sales for meat production. Production is extensive and with some efforts and financial support it is possible to develop sheep milk production. This type of production is especially important because mainly old and small households are involved sheep production. However, any effort in this direction should be focussed on the development of niche products which will command high added value. Secondly, dual purpose sheep yield less than one litre a day and only for a reduced period compared to cows. Any development will need specific, economic justification.

4.8.6.8 Organic production

There are no possibilities to develop traditional production (geographically protected products) at the time of writing, because the region is not yet renowned for any traditional product, but there exists possibilities for certified organic production.

4.9 Identify implementation partners for SCOPES' consideration

Recommended partners;

- Reka Mleka project, Niš
- Serbian Dairy Forum, Belgrade
- Public Veterinary Station, Bujanovac
- De Laval, Serbia
- Westfalia, Serbia
- Hemma, Novi Sad
- AI Centres, Velika Plana, Temerin, Kranjaca
- Agriculture Faculty – Belgrade
- Institute for livestock production, Zemun Polje
- Veterinary Institute, Belgrade

Annex 1. – Distribution of dairy cattle in Bujanovac

<i>Village</i>	<i>Number of cows and heifers</i>	<i>Village</i>	<i>Number of cows and heifers</i>
Veliki Trnovac	479	Baraljevac	42
Žbevac	187	Božinjevac	40
Lopardince	185	Bogdanovac	36
Biljača	181	Košarno	35
Samoljica	179	Brnjare	34
Rakovac	163	Žuželjica	33
Končulj	155	S. Petka	33
Oslare	149	G.Starac	32
Letovica	133	M. Trnovac	30
Ljiljance	96	Kuštica	30
Karadnik	90	Bratoselce	28
Klinovac	89	Buštranje	25
Spančevac	87	Bujanovac	19
Nesalce	86	Dobrosin	18
Levosoje	78	Drežnica	17
Krševica	74	Turija	15
Srpska Kuća	71	Pretina	13
Sebrat	68	Klenike	11
Breznica	67	Vogance	10
Trejak	61	Muadžiri	9
Čar	61	Lukarce	8
Borovac	55	Uzovo	7
Muhovac	53	Rusce	7
D. Novo Selo	52	R.Bučje	6
Jablanica	48	Vrban	5
Sejace	47	Jastrebac	3
D. Starac	46	Negovac	2
Lučane	45	Gramada	2
	Totals	56	3,635
	> 100 cows	9	1,811
	% of all	16.1%	49.8%

* Source data - Public Veterinary Station, Bujanovac - 13.09.2007.

Annex 2. – Distribution of dairy cattle in Presevo

<i>Villages</i>	<i>Number of cows and heifers</i>	<i>Villages</i>	<i>Number of cows and heifers</i>
Miratovac	390	Čukarka	54
Oraovica	219	Ilince	46
Zujince	148	Mađere	40
Rajince	143	G.Dol	35
Buštranje	141	Depce	28
Slavujevac	122	G Šušaja	23
Preševo	117	Bukovac	23
Strezovac	110	Z. Stanica	21
Trnava	95	Bujić	21
Alidjerce	92	Ranatovac	20
Reljan	86	D.Šušaja	20
Svinjište	84	Cakanovac	16
Bukurevac	82	Mamince	13
Crnotice	78	Ljanik	12
Norča	67	Stanevce	6
Kurbalija	56	T.Reka	5
		Gospođince	2
	Totals	33	2,429
	> 100 cows	8	1,390
	% of all	24.2%	57.2%

Annex 3 – Detailed review of Doda, Presevo

SZR Doda, A.Krasnica 59, Presevo

Owner – Museref Memeti

Structure

Owners	Family-owned business Three brothers are owners Museref is in charge of milk collection and processing Other two brothers are responsible for distribution of milk products in Kosovo
Technologist	No
Full time employees	6
Other	Family has “sister” dairy at Pristine, Kosovo Plant is located in a house, in the Presevo suburb.

Raw milk:

Collection	1600 liters per day Variations – 1200 - 2200 liters
Collection sites/Villages	Miratovac (35 farmers; 700 - 800 liters of milk per day), Cukarka, Zuince (22 farmers), Orahovica No collection points Line collection
Number of farmers	85 Farmers have contract with dairy
Largest milk supplier	150 - 160 liters of milk during the season
Milk price	4.15 RSD per fat unit (fixed price) Farmers are receiving 16-17 RSD per liter + 3 RSD of state subsidies
Milk collection	Plastic cans of volume 5 - 20 liters No stainless steel cans
Milk tests during the collection	Alcohol test Added water Visual control
Transport	Truck with plastic barrel – 1,000 l Van with plastic barrel – 750 l A loan and van belongs to dairy
Collection distance	Truck – 10 km Van – 10 km
Cooling	Dairy does not control milk temperature
Collection frequency	Once a day in mornings
Remark	Dairy is collecting milk every day during the season. Out of season dairy has a free, non-working day.

Owner is collecting milk, together with one worker. His task is to control collected milk.

Laboratory tests

Type	Yes/No	Frequency
Fat	Yes	3-4 times per month samples from each farmer – connected with payment Once per month sample for Veterinary Institute, Nis Every day – sample of the bulk milk
TBC	No	
SCC	No	
Antibiotics	No	(Yes, if there is a suspicion)
Density	Yes	Every day but on sample of bulk milk
Alcohol test	Yes	As described above
Protein	No	
Other		

Dairy has equipment for alcohol test and to check added water. Dairy has basic equipment to check milk fat, milk protein, density etc, but this equipment is not in common, everyday use.

Processing

Product	Liters or tons
Acid milk	Main product 400 liters per day – ca.144,000 liters per year
Yogurt	Second product Amount of yogurt produced depends on season Annual production – 400 - 450 tons per year

Plant

Equipment	Capacity	Age	Condition
Cooler – 2 cooling tanks	2 - 5 tons	New	Good
Storage	16 m ³	1996	Good; controlled climate; small space; Unnecessary items were present in storage area.
Pasteurizer		1994	Good, stainless steel
Separator	No		
Homogenizer		2007	Brand new
CIP		2007	Not yet in function – recently bought

Plant has good and new equipment. A shortcoming is the lack of a separator. Working and storage space is small. In theory it is possible to separate different processes, but in practice this is not possible.

Packaging

Type of package	Size
Plastic bottles	0,5 and 1 liter
Plastic glass	0,18 and 0,5 liter

Hygiene

Floors	Good – ceramics tiles, dark color
Walls	Good – ceramics tiles, light ones
Drains	Good - -good height
HACCP	Yes

Effluent disposal

Waste water	Public sewage system
Garbage	Public truck is collecting refuse daily

Market

90% of products are sold in Kosovo, where dairy is facing competition.
10 % of production is distributed in Presevo

SWOT analysis

Strengths New equipment HACCP Fixed market – Kosovo Dairy has contracts with farmers Owner is collecting milk Owner is ready to improve dairy work Short distance for milk collection – 10 km	Weakness Dairy does not have separator Small working and storage space Plastic barrels are used for milk collection Lack of knowledge No technologists Out of season dairy is working 6 days per week Milk control (quality demands) does not exist
Opportunities To improve milk quality To increase amount and quality of collected milk To expand market at Kosovo	Threats Dairy is located in Presevo township Competition with Fontana, Bukurevac dairy No possibilities to expand production

Annex 4 – Detailed review of Fontana, Bukurevac

Fontana d.o.o., village Bukurevac, Presevo

Owner – Zejnulla Ibrahim

Structure

Owners	Family-owned business Ibrahimi's brother is responsible for distribution of products in Kosovo
Technologist	No
Full time employees	8
Part time workers	5
Other	Plant is located in a house.

Raw milk:

Collection	4500 l per day Variations - 3500 – 6000 liters per day		
Collection sites	Line collection No organized collection points		
Dairy is collecting milk from	Bukurevac Bustranje Reljane Golemi Dol Aligevce Slavujevac Nasalci	Bilaca Srezovce Asanja Cukarka Zuinci Miratovac Letovica	Bratosavce Trnovac Presevo Orahovica Sosaja Crnotince Raince
Most important villages for collection	Miratovac	1,000 liters per day	
	Bustranje	800 liters per day	
	Bukurevac	Farmers are delivering to the dairy	
	Presevo	Only two producers but delivering more than 100 liters of milk	
Number of farmers	Around 400 Variation between 300 and 500 Farmers do not have contract with dairy Largest farmers are delivering around 100 liters of milk during the season		
Milk price	Old milk price was 17-18 RSD per liter Newest price is 5.00 RSD per fat unit (fixed price) Farmers will get around 20 RSD per liter + 3 RSD of state subsidies Consultant is not sure that this is a realistic price Dairy has monthly payment to producers		
Milk collection	Plastic cans – 5 - 25 liters No stainless steel tanks.		
Milk tests during the collection	Alcohol test Added water Visual control		
Transport	2 loans with 3 plastic barrels – 1,000 l/barrel 2 vans with plastic barrel – 200 l A loan and vans belongs to dairy Vehicles are not suitable for milk transport (closed vehicles, wooden floor etc.)		
Collection distance	Loans – 15 km in one direction		

	Vans – 5 km in one direction
Cooling	No control of the milk temperature
Collection frequency	Morning collection of the milk Dairy is collecting milk every day
Remarks	In winter months there are some days when vehicle cannot enter some villages
Other	Dairy has a good approach for vehicles.

Laboratory tests

Type	Yes/No	Frequency
Fat	Yes	Veterinarian Institute Nis – once per month
		Sample from each milk delivery
		Each producer is checked 3 times per month
TBC	No	
SCC	No	
Antibiotics	No	
Density	Yes	As described above
Alcohol test	Yes	As described above
Protein	No	
Other		Dairy has refractometer (for density) and Gerber kit.

Processing

Product	Liters or tons	Comment
Cheese – Feta cheese	600 - 800 kg per day	Feta cheese is the main product (80% of total milk processing)
Acid milk	800 kg per day	Regular product
Yogurt	200 - 300 kg per day	Regular product
Cheese – mature cheese, slices		Working from time to time
Yellow cheese		If there is enough milk
Grinded cheese – urda		If there is enough milk and market demand

Plant

Equipment	Capacity	Age	Condition
Cooler with pasteurizer	1,200 kg	1995	Stainless steel
Storage places			
+10°C storage place	200 m ³	1995	Decent conditions
+ 4°C storage place	100 m ³	Old one	For replacement
Separator	1,500 kg per hour	1995	Stainless steel
Homogenizer	300 liters	More than 30 years old	For replacement
Vats and CIP	No		

Plant has decent equipment, but working space is small. In theory it is possible to separate different processes, but in practice this is not possible.

Dairy is increasing capacities at the moment. Problem is that new dairy working space will be on the first floor. Owner did not have any consultation with experts before deciding to increase capacity. The new part of the facility will be operational in October 2007. Company financed this investment from own financial sources without loans.

Dairy is using water from own well.

Packaging

Product	Type of package	Size
Feta cheese	Plastic buckets	0,5; 1; 2; 3 and 4 kg
Acid milk	Plastic pots	0,18 and 0,5 l
Yogurt	Plastic pots	0,18 and 0,5 l
Mature white cheese	film and buckets	0,8 – 4 kg
Yellow cheese and grinded white cheese	Film	

Plastic buckets with feta cheese are closed manually with plastic clover as well as acid milk plastic pots of 0.5 liters.

Label on feta cheese package is different from those on yogurt and acid milk.

Hygiene

Floors	Good – flat floor
Walls	Good – ceramic tiles
Drains	Good - -good height, no protection
HACCP	No – Intending to introduce HACCP

Dairy is increasing processing capacity and building a new part on the first floor.

Workers, garbage and construction equipment are everywhere. General hygiene is on a low level, but it is impossible to conclude is it because of the construction works or this is the common situation.

In production section, water is leaking everywhere.

Effluent disposal

Waste water	Public sewage system
Garbage	Dairy is taking refuse to the village collection point, which in reality does not exist in Bukurevac
Energy	Fuel (oil) and woods

Market

90% of products are going to Kosovo. Dairy does not have a problem with distribution of milk products in Kosovo. Fontana milk products are 5-10% cheaper than competitor's products. 10 % of production is distributed in Presevo retail stores and bakeries. Fontana does not have any problem with competition.

SWOT analysis

<p>Strengths</p> <ul style="list-style-type: none"> Bigger capacity Fixed market – Kosovo Dairy has regular payment to farmers Dairy has a lot of farmers Bigger production Low distance for milk collection 	<p>Weakness</p> <ul style="list-style-type: none"> Lack of knowledge – no technologist Disorganized process Weak milk quality control Badly organized collection and transport of milk Some products are manually packed Unsatisfactory vehicles for milk collection
<p>Opportunities</p> <ul style="list-style-type: none"> Owner is ready to improve dairy work Owner is financially capable to participate in modernization of the dairy work To improve milk quality To increase amount of collected milk To expand market in Kosovo 	<p>Threats</p> <ul style="list-style-type: none"> Competition with Doda, Presevo dairy Farmers do not have contracts with dairy Poor organizational and technological solutions in new, increased, capacity

Annex 5 – Detailed review of Razvitak, Bujanovac

D.O.O. Razvitak, Bujanovac, Industrijska zona bb

Structure

Owners	Family business – Three owners
Technologist	Yes – full time employee
Full time employees in dairy	6
Part time workers	Yes
Other	Company is regional distributor of a range of food products (Delta ice-creams is one) Important segment of the company work is trading

Plant is located in industrial zone of Bujanovac. This is only dairy that is not located in a house.

Dairy has proper approach for vehicles.

Dairy has very good facilities (1,100m²) including production space for milk production (350 m²) and storage with two chambers (300 m²).

Facility also has office space and storage for other products.

Raw milk

Collection	2,500 – 3,000 l per day		
Remark – Official data shows that Razvitak is buying around 700 liters of milk per day			
Collection sites	No collection points		
Dairy is collecting milk from	Spancevac Klinike Sv. Petka Krsevisa	Srpska kuca Karadnik Ljiljance Leosave	Silovo Kusce Milenovo Oslare
Most important villages for collection	Srpska kuca	500 liters per day	
	Karadnik	500 liters per day	
Number of farmers	160 - 170 Farmers do not have contract with dairy		
Remark – With 700 liters of collected milk it is realistic that company has around 50 - 60 farmers			
Milk price	Still valid milk price is 3.90 RSD per fat unit (15.00 - 16.50 RSD per liter). New price will be 4.5 RSD per fat unit		
Remark - Farmers are not satisfied with milk price. According to them Razvitak is paying 14 - 15 RSD per liter of milk.			
Payment	Once per month		
Remark - Filed visits showed that dairy is not paying regularly for collected milk. In Ratkovac village delay was 3 - 5 months and a number of farmers started to deliver milk to Vranjska dairy instead			
Milk collection	Farmers are collecting milk in aluminum and plastic buckets of 10 - 25 liters Dairy supplied farmers with aluminum buckets two years ago. No stainless steel tanks.		
Milk tests during the collection	Alcohol test – alcohol gun Added water – 5 refractometers Visual control		
Transport	2 loans with 2,000 liters stainless steel cisterns (no thermal isolation) Dairy has two more stainless steel cisterns that		

	are not in use
Collection distance	Loan I – 40 km in one direction Loan II – 32 km in one direction
Cooling	Dairy does not control milk temperature
Collection frequency	Once per day in the morning Dairy is collecting milk every day

Dairy is facing severe competition in milk collection. Main competitors are Han dairy, Velickovic and Vranjska dairy. All of these dairies are paying higher milk price to farmers and have more regular payment than Razvitak.

Laboratory tests

Type	Yes/No	Frequency
Fat	Yes	Veterinary Institute Nis – once per month
		Sample from some of the milk deliveries
		Each producer is checked twice per month
TBC	No	
SCC	No	
Antibiotics	Sometimes	In a case of suspicion, dairy is checking milk with anti diagram test
Density	Yes	At the moment of delivery and in dairy (to check drivers)
Alcohol test	Yes	At the moment of delivery and in dairy (to check drivers)
Protein	No	
Other	None	

Processing

Product	Liters or tons	Comment
Cheese – Feta cheese	500 kg per shift	Feta cheese is main product
Yogurt	1,000 kg per shift	Regular product
Acid milk	300 - 400 kg per shift	Regular product
Pasteurized milk		When vehicle is going to Vranje
Ground cheese – urda		By product

There is no regular processing of milk.

Feta cheese is produced every second or third day.

Pasteurized milk is produced before vehicle is going to Vranje (once a week).

Yogurt also has specific days for production.

Acid milk is produced when there is enough milk.

Plant

Equipment	Capacity	Age	Condition
Cooler – two	1,000 kg per hour	1996	Stainless steel
Cooling tanks for reception of milk	2 x 1,700 l	1996	It seems that they are not in function
Storage places			
+ 4°C storage place	Yes		Decent condition
Pasteurizer		1996	Stainless steel
Separator	2,500 kg		Second hand bought in

	per hour		1996
Homogenizer	,4000 l	1995	Stainless steel
Vats and CIP	No		
Other – There is a space predicted for laboratory			

Dairy has a lot of equipment, much more than Doda and Fontana, but strong impression is that part of the equipment is not in use.

Plant has enough space and there are possibilities to reorganize process.

Storage place is disorganized. Products are mixed and all of them are stored on one pallet.

Packaging

Product	Type of package	Size
Feta cheese	Plastic buckets	0,5; 1 and 2 kg
Acid milk	Plastic pots	0,18 and 0,5 l
Yogurt	Plastic pots	0,18 l
Yogurt	Plastic bottles	0,5 and 1 l
Pasteurized milk	Film	1 l
Yellow cheese and ground white cheese	Film	

Products do not have one, common mark. The same product, for example cheese, is labeled in different ways. It is very difficult to recognize that products are from the same dairy. Again, labels on yogurt are different from other labels.

Hygiene

Floors	Good – flat floor, light color
Walls	Good– white ceramic tiles
Drains	Good - good fall
HACCP	In the process of introduction

Effluent disposal

Waste water	Septic tank – cleaning 4 times per year
Garbage	Container – Public service is taking garbage every second day
Energy	Fuel (oil) In the process of transferring to gas

Market

Dairy supplies local retail shops in Bujanovac, but also in Pirot, Jagodina, Cuprija, Leskovac, and Belgrade.

Razvitak dairy does not have problems with competition and/or prices.

Important comments

In the business plan, company highlighted machine for the production of plastic bottles for yogurt and acid milk as most necessary.

Also, dairy would like to establish mini-laboratory to check milk quality.

SWOT analysis

Strengths Enough working space Dairy is not located in a house Experience Dairy has full time employee technologist Stainless steel cisterns for milk transport	Weakness Low milk price for collected milk Irregular payment to farmers Lack of knowledge Weak milk quality control Small amount of collected milk
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Low distance for milk collection (40 km)	Dairy is collecting milk from small farmers
Opportunities Company can use better existing trading channels Use one common label for milk products There are possibilities to improve milk quality To make proper technological organization of the dairy work	Threats Farmers are not interested to cooperate with Razvitak Existing farmers do not have potential to specialize in milk production (small farmers) Competition - Vranjska dairy, Han and Velickovic Bad reputation of the dairy

Annex 6 – Detailed review of Ajka, Bukurevac

STR Ajka, village Bukurevac, SO Presevo

Owner – Munir Arifi

Structure

Owner	Family-owned business
Technologist	No
Full time employees	No
Part time workers	No
Other	

Ajka is small dairy located in a household. Part of the livestock shed (small room) is adapted into dairy (20m²).

No adequate entrance for vehicle.

Raw milk

Collection	800 l per day Variation – 600 – 1,000 liters per day		
Collection sites	No organized collection points		
Dairy is collecting milk from	Bukurevac Slavujevac	Golemi Dol	Samoljica
Most important villages for collection	Slavujevac	400 liters per day	
	Reljan	150 liters per day – one farmer	
Number of farmers	35 Dairy does not have contracts with farmers		
Milk price	No valid data		
Milk collection	Farmers are collecting milk in plastic buckets 10 - 20 liters No stainless steel tanks.		
Milk tests during collection	Alcohol test Added water Visual control		
Remark – It is evident that there are not any milk controls in the field or at the dairy			
Transport	Car Plastic barrels – 1 x 300 liters, 5 x 60 liters		
Collection distance	13 km in one direction		
Cooling	No control of milk temperature;		
Collection frequency	Morning collection of milk		

Dairy is collecting goat's milk together with cow's milk. Goat's milk is not separated from cow's milk.

Farmers do not trust Ajka dairy. Ajka did not pay to farmers for a significant amount of milk in 2006.

Ajka had agreement with Vranjska and Leskovacka dairy to collect milk for them, but because of their unacceptable behavior (did not pay for milk to farmers), both dairies canceled cooperation with Ajka.

Ajka is collecting milk mainly from small farmers. These farmers are not interesting for big dairies and most of them probably belong to the category of non commercial households.

Laboratory tests

Type	Yes/No	Frequency
Fat	Yes	Veterinarian Institute Nis – once per month
		Sample from delivered milk
		Each producer is checked twice per week
TBC	No	
SCC	No	
Antibiotics	No	
Density	Yes	In the field
Alcohol test	Yes	At the moment of delivery
Protein	No	
Other		

Dairy does not have equipment for precise estimation of milk fat.

According to the owner dairy has lactodensimeter and Gerber kit, but these tools are not in function.

Processing

Product	Liters or tons	Comment
Acid milk	240 liters per day	Regular production
Yogurt	Up to 200 liters per day	If there are milk surpluses

Plant

Equipment	Capacity	Age	Condition
Pasteurizer	1,000 l	No available data	Second hand, stainless steel
Duplicator			
Storage places			
Heated storage place (incubator) for fermentation of acid milk.			
Moveable cooled storage place for fruit – used for cooling and storage of final products			

Dairy does not have any equipment.

Dairy has very specific technology of milk fermentation in acid milk production. Technology is based on heating of the packed milk (in plastic pots) in incubator with electric heater of 2.5 KW. It seems that there are no packaging machines in dairy.

Packaging

Product	Type of package	Size
Acid milk	Plastic pots	0,2 and 0,5 l
Yogurt	Plastic pots	0,2 and 0,5 l

Hygiene

Floors	Good – flat floor
Walls	Good – ceramic tiles
Drains	Good - -good fall, no protection
HACCP	No

Effluent disposal

Waste water	Public sewage system
Garbage	Dairy is taking garbage to the village garbage place which in reality does not exist in Bukurevac
Energy	Electricity

Market

Presevo and Bujanovac

Important comments

Owner is not so interested to continue with milk processing. Primary ambitions are related to construction of a livestock farm. Room where dairy is located at the moment should be part of the shed.

SWOT analysis

Ajka, Bukurevac does not have any realistic chance to survive the near future. Owner is completely aware of his position and his ambitions are to quit milk processing and to start with livestock production. These are the reasons why SWOT analysis was not attempted.

Annex 7 – Senad Hopic - Itinerary

<i>Date</i>	<i>Activity</i>	<i>Comments</i>
2007.09.09.	Arrival to Samoljica	
2007.10.09.	Meeting with DAI field officers, Rexhep Ilazi and Armend Aliu Visit collection point in Letovica	
2007.11.09.	Meeting with Museref Memeti, Doda dairy Meeting with Ibrahimi Zejnulla, Fontana dairy Meeting with Fontana d.o.o. manager Meeting with Munir Arifi, SZR Ajka	
2007.12.09.	Meeting with manager of Letovica cooperation Meeting with Slobodan Petrovic, farmer Meeting with Nikolic Milorad – farmer	Some visits were cancelled during the day
2007.13.09.	Meeting with Miodrag Miljkovic, General Manager of PVS, Bujanovac Meeting with Idriz Ebibi, farmer Miratovac Meeting with group of farmers, Miratovac Meeting with Dragan Nedeljkovic, Local vet in Presevo Debriefing meeting with DAI field officers Departure to Belgrade	