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DAIRY LABORATORY SURVEY IN KOSOVO

KOSOVO CLUSTER AND BUSINESS SUPPORT PROJECT



June 2006

This publication was produced for review by the United States Agency for International Development. It was prepared by the KCBS project team of Chemonics International Inc. based on a Final Report prepared by Short Term Technical Advisor, Bafti Murati.

DAIRY LABORATORY SURVEY IN KOSOVO

THIS REPORT SURVEYS LABORATORY CONDITIONS AND THE LABORATORIES CAPACITIES TO PERFORM MILK AND DAIRY PRODUCT TESTING FOR THE NEEDS OF THE DAIRY INDUSTRY IN KOSOVO SO AS TO DETERMINE THE CURRENT SITUATION REGARDING THE COST OF TESTING, QUALITY OF TESTING AND HUMAN RESOURCES AVAILABLE FOR TESTING.

Kosovo Cluster and Business Support project "Development of Association Management Companies"
Contract No. AFP-I-00-03-00030-00, TO #800

This report submitted by Chemonics International Inc. / 19 Jun 2006

The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

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PURPOSE OF ASSIGNMENT

The purpose of this assignment is to produce a detailed survey of laboratory conditions and their capacities to perform milk and dairy product testing for the needs of dairy industry in Kosovo. Currently milk processors and producers through their associations KDPA and KAMP are interested in improving the quality of milk received and the quality of control in order to improve the overall quality of milk produced locally. This will help domestic processors compete with imported milk and milk products.

As a basis for conducting this survey the two dairy industry associations have coordinated their request together with KVFA and MAFRD as main stakeholders from governmental side. They are very supportive of this activity and interested in the results. The objective of this survey is to determine the current situation of laboratory testing in Kosovo regarding the cost of testing, quality of testing and human resources available for testing.

BACKGROUND

Kosovo's dairy sector is one of the key sectors in development of an agriculture continuing to recover after the 1999 war when at least half of the livestock production was decimated. The year 2006 is the year when all stakeholders decided to focus on improving the quality of raw milk produced and processed domestically. The number of commercial farms, milk collection centers and milk processing facilities is constantly increasing resulting in a rapid increase in the amount of milk processed. Quality assurance and food safety are critically important for the dairy industry to provide safe, competitively priced products for consumers. It is also important in order to ultimately meet the requirements of the EU. In total 18 dairy processors are licensed by MAFRD (Ministry of Agriculture, Forestry & Rural Development) and KVFA (Kosovo Veterinarian & Food Agency). In order to implement GMP, HACCP and ISO standards the dairy industry needs to have a sustainable laboratory system to monitor and control the quality of milk and dairy products.

In order to have a clear understanding of the laboratory testing situation in Kosovo, it was felt there was a need to conduct a detailed survey covering all laboratories available in Kosovo. This was to include operational and non-operational laboratories to better understand the current situation and propose further development of these facilities and their human resources.

There is no private laboratory in Kosovo that has proper equipment, capacities and human resources to test milk products. It may be necessary to establish one private lab for testing of milk products in order to monitor the quality situation of dairy products. Presently all testing services for the dairy industry are offered by governmental institutions such as: KVFA, NIPH (National Institued of Public Health) and KIA (Kosovo Institute of Agriculture). That includes microbiology and physical chemistry analyses of dairy products.

KVFA has purchased sophisticated testing equipment for measuring total bacteria count and total somatic cell count in milk but it is still not in use because of lack of technical staff and human resources. The same situation regarding staff exists in the Agriculture Institute in Peja and the Public Health Institute in Pristina.

The Faculty of Agriculture also conducts some laboratory tests but mainly for education purposes. However they are also interested in providing services to interested customers.

Lab testing prices in Kosovo are among the highest in the world. In spite of this high cost, their testing methods are old with variable results creating confusion sometimes. This does not provide a reliable basis for dairy processors to evaluate the quality of their milk and milk products to more effectively compete with imported products.

There are laboratories active at dairy training centers in Kosovo and Milk Collection Centers (MCCs) with limited testing capability. This survey included some of them to identify what testing methods they are implementing and the type of testing equipment used. KVFA and the dairy industry have spent more than 50,000 Euro annually for licensing needs of dairy processing plants in testing dairy products at the Land O Lakes Laboratory in Macedonia. Another 40,000 Euro have been spent for testing imported milk and milk products at the Veterinary Institute in Macedonia. KVFA also spent approximately 5,000 Euro at the Pristina NIPH with a tendency to increase the expenditure if the NIPH could provide quality service with reliable results. This will be necessary in order to continue the collaboration.

Thus at this point in time the dairy industry is not able to analyze microbiology content of dairy products. The results of this survey will help the dairy industry identify the needs for laboratory testing of milk and milk products.

Finally bulk purchasing would reduce the cost of laboratory supplies, transportation and quality storage. This would help provide the conditions necessary for permanent quality control of imported and locally produced dairy products. KCBS, KDPA and KAMP need to help identify the best sources of laboratory supplies in order to assist the dairy industry in achieving quality laboratory testing.

EXECUTIVE SUMMARY

Laboratory facilities in Kosovo are still developing step by step, but due to the circumstances in the 90's and after the war in 1999 reconstruction and modernization of infrastructure did not concentrate in food quality analysis since there were other things more important.

Currently in Kosovo several laboratories exist but two of them are important enough to be mentioned here. The National Institute of Public Health (NIPH) and the Kosovo Institute of Agriculture (KIA) are conducting different tests on milk quality and other food quality tests. However it is clear that the quality of laboratory food testing in Kosovo is not at the proper level to support food industry demands and meet the consumer's rightful expectations for safe food in Kosovo.

FIELD ACTIVITIES TO ACHIEVE PURPOSES

Visits to Laboratories

In order to have a clear understanding of the current situation in the sector of laboratory control the consultant visited all existing laboratory facilities in Kosovo. The consultant also discussed the current situation in the sector with the main stakeholders in an attempt to understand the main issues that need to be addressed through this report.

There are four potential laboratory facilities that can be used for quality control in Kosovo. They are:

- NIPH in Pristina,
- KIA in Peja,
- Faculty of Agriculture in Pristina, and
- KVFA laboratory in Pristina.

There are some other small laboratories but none of them fulfill basic criteria regarding equipment and human resources.

21.03.2006.

Meeting with officials of National Institute of Public Health (NIPH)

The National Institute of Public Health is one of the laboratories where the testing of food of animal origin can be conducted. This laboratory serves medical purposes as well as food and drinking water testing. They work under the Ministry of Health and conduct tests for Inspectorates, Border Control and sometimes for producers in Kosovo.

Based on some discussions it was proposed that microbiological section be responsible for testing food of animal origin and food of non-animal origin for microorganisms. At the same time the laboratory can conduct chemical analysis as well but for the moment their main task is to serve for medical analysis. The total number of employees is 27 linked with regional laboratories for basic tests.

The existing equipment in the microbiological section consists of 4 incubators for food and 3 for water, 2 digesters, 2 water baths, 1 refrigerator, 1 deep freeze, 1 safety cabinet (not adequate), 1 microscope, 1 computer, 2 membrane filters (6 part) complete with vacuum pump, 1 colony counter, 1 laboratory balance (Sartorius) and 1 vibromix.

The program of food testing covers total mesophilic bacteria, Salmonella, Staphylococcus aureus, Sulfite reducing Clostridia, Proteus, Streptococcus faecalis, Escherichia coli, Lipolytic bacteria, yeast and mould.

Around 3000 tests were received during the first eight months of 2005 from the Border Inspectorate, Veterinary and Sanitary services, French KFOR and the Swiss Dairy project. The same number was tested during all of 2004. There is a lack of properly trained staff for microbiological lab testing.

Cost for all analysis in the NIPH are:

- Physical -Chemical Analysis – price 30 Euro
- Microbiological Analysis - price 38 Euro

Physical - Chemical analysis – Organoleptic standards

- Consistency, Taste and aroma - specific for milk
- Color white to yellow
- Foreign Matter - none
- Percentage of (%) water in milk - H₂O(AOAC 925.09)
- Acidity (AOAC 947.05)
- Fat (%) (AOAC 945.38; 920.39)
- Liquidity (AOAC 925.09).

Currently the samples taken by veterinary inspectors from the border inspectorate are taken to the NIPH for testing. The cost is covered by the importer. Regular samples are taken from each third or fourth truck at the border and sometimes every truckload is tested.

Based on legislation it is regulated that NIPH should test the milk products and raw milk from dairy plants and dairy farms. We are not sure about the adequacy of current quality control in the dairy industry. We do not have enough information as well that the samples are taken regularly from NIPH nor about the quality of these results.

22.03.2006.

Meeting with Kosovo Institute of Agriculture (KIA)

The main task of Kosovo Institute of Agriculture is to support agricultural research, advisory services, and analytical services to the farming community for all aspects of agriculture. KIA has very well equipped laboratories that can be used for chemical residue testing in crops.

KIA has a lot of under utilized facilities and laboratories. Now they would like to establish a Microbiological Food Control laboratory for which they have adequate space but without proper human resources to do this job.

The expertise of KIA laboratories is more on chemical testing related to food safety together or in collaboration with NIPH and Faculty of Agriculture. Currently there are 32 people working in KIA under the supervision of MAFRD.

The Institute has an Analytical central Laboratory where they employ 4 people, 1 manager (B. Begolli) assisted by 1 biochemist, 1 chemist and 1 laboratory technician.

The equipment available is not appropriate for quality control of all aspects required for the control of milk and meat as just simple tests can be conducted. The number of tests conducted on milk and meat is not significant.

Price for physical – chemical analysis is 25 Euros

Microbiological analysis can not be conducted as explained previously due to the lack of a food microbiologist. But basic equipment and conditions for microbiological analysis exist.

Physical-chemical Analysis conducted in KIA - Peje:

- Percentage (%) of added water, Acidity - PH, Percentage (%) of fat, Dry Matter
- Percentage (%) of proteins.

Meetings at the Faculty of Agriculture - Pristina

The Agriculture Faculty of Pristina (AFP) operates under the Ministry of Education and Science and the Faculty's main functions are education, research, transfer of knowledge and extension.

The Faculty houses six teaching laboratories including the laboratory for microbiology and food hygiene and the laboratory for food technology.

Laboratory for Microbiology and Food Hygiene:

The main function of the laboratory is the education and training of students. However, at present it does not possess either the necessary equipment or trained staff.

Laboratory for Food Technology:

The head of the laboratory is Dr. Zef Ndoja and Dr.sc. Xhavit Ramadani assists him. There is Lacto Star equipment for the physical and chemical testing of milk and milk products. In general the laboratory equipment is old and is only suitable for carrying out basic tests.

Apart from the education and training of students there are very few samples to test, and these are mainly animal feed samples from farmers. The laboratory has previously done some testing of food but only in limited amounts. Again, training in the operation of this equipment is essential for delivering credible results.

Finally, it is recommended that the AFP laboratories should assist KIA more closely when needed.

Meetings at Kosovo Veterinary Laboratory

The Kosovo Veterinary Laboratory (KVL) has very limited space for its laboratories and offices and is not sufficiently staffed with academic and technical personnel.

Additional equipment is still needed and academic and technical staff need to receive training and upgrading in modern laboratory techniques, methods, technologies, quality management and the use of equipment.

The KVL's four laboratories received equipment from a World Bank donation in 2001. FAO arranged for its installation and implementation, although not all of the equipment is in use at the present time.

Currently the size and structure of the existing KVL does not meet the requirements of a Central Veterinary Laboratory but with further development it might. On the basis of accepted international standards there are serious deficiencies with respect to Good Laboratory Practice, Quality Control and Bio-Security.

The technical qualifications of the laboratory staff need to be improved through training and upgrading in Laboratory Management and Quality Management System (QMS).

The KVL is staffed by 5 veterinarians, 2 technicians and 7 support personnel. Academic, technical and support staff need to receive training and upgrading in recent laboratory technologies, safety and quality management. The KVL is not sufficiently staffed with academic, technical and support personnel and needs to recruit more staff to conduct a surveillance program and to achieve required results.

The KVL academic personal are required to use 4 hours per week to lecture at the AFP.

There are no staff health and safety procedures, no quality control procedures, and there is no system of Good Laboratory Practice (GLP).

The available equipment and media only enable screening for bacteria in different groups e.g. Salmonella, E. coli, Clostridium. Specific species identification is not possible.

Other field visits

Several field visits were organized to different stakeholders that will be using the laboratory services and their opinions are described below.

20.03.2006

MIRADI E EPERME

Meeting with Mr. Ymer Berisha – Owner of Dairy Bylmeti

Dairy Bylmeti is one of the main dairy processors in Kosovo. They work mainly in the region of Kosovo with MCC (Milk Collection Centers) and directly with farmers. Currently Bylmeti is working with 6 MCCs and a large number of independent farmers.

The MCCs that are directly working with Bylmeti are situated in:

- Lipjan
- Podujevë
- Vushtrri - 2 MCCs
- Shtimje
- Orllan

Bylmeti has direct contact with the farmers and is contracting the quantities of milk directly from them. Based on the discussions we had it seems that the main problems that the dairy is currently facing is the quality of milk and quality control that is creating a lot of problems with payments to farmers. Quality control must start on the farm and continue in the MCC and finally in the dairy factory. As elsewhere in the world, there is a need to have independent laboratories that will confirm the results based on testing methods that are more credible and acceptable to the farmer and dairy processor. The cost of the test might be sometimes high but the long term impact will be very positive for the dairy industry in general.

Analysis of milk in MCC

- Acidity test (PH),

Analysis at the delivery of milk

- Acidity test (PH),
- Test of fat content %,
- Test of percentage of dry matter, protein and water (%),
- Test of specific weight.

Very rarely do they conduct ATB (antibiotic) test, hormonal test and remaining (the price of test is too high)

Needs:

- There is no equipment for exact control of number of micro organisms (bacteria count) and total somatic cells count.
- Lack of thermograph (for pasteurization), Lack of lacto fridges for cooling milk
- There is no microbiology lab testing in the dairy plant

21.03.2006

Dairy Processor “ABI” Prizren

Meeting with Mr. Allajdin Fusha – Owner of “ABI”

Dairy processor “ABI” from Prizren is one of the first dairies in Kosovo well organized and well known in Kosovo. Currently he is producing a variety of different dairy products and selling mainly in local market. They have some exports in neighboring countries. One of the main issues mentioned during our discussion was the quality of milk and control in order to increase the competitiveness of the local dairy industry and reduce the imports from other countries.

Milk Collection Centers:

ABI has a good network of 18 MCCs in the region of Dukagjini mainly but there is a need of further improvement of milk quality delivered from farmers in those MCCs.

Analysis conducted in these MCCs are:

- Acidity (PH) - (with – Amino Alcohol)
- Specific weight

Analysis conducted in Dairy plant:

- Acidity (PH), percentage (%) of fat
- Test on ATB, hormone presence test
- Specific weight, percentage of water added

Missing:

- Raw milk microbiology testing of total bacteria count and somatic cells count.
- Total Count of E. coli and other specific number of bacteria
- Thermograph on pasteurizer doesn't show exact temperature of pasteurization
- The pasteurizing equipment needs to be replaced and synchronized with the separator and homogenizer.

KDPA is contracted to take samples from each product at least once per month and to send them for analyses to the Land O Lakes laboratory in Macedonia. The cost is covered 50 % by KVFA and 50% by dairy plants. KDPA is covering the cost of one employee to collect the samples and take them to Macedonia. This activity is intended to follow up on the seal of quality project started by the Swiss project KSDP (Kosovo Swiss dairy project) in order to continue the lab testing of final dairy products. KSDP continues to cover some of the cost of testing.

KDPA is interested in the future to contribute to establishing a commercial private lab facility in order to improve the quality control of the dairy industry.

27.03.2006

Meeting with “Vita – Devolli” Dairy plant, Peja

Dairy Company “Vita-Devolli” is one of the main dairy processors in Kosovo. Their only dairy product is UHT milk which they market under the brand name “Vita”. Currently they have organized a large number of MCCs and they are increasing the number everyday.

Devolli is the only dairy plant involved on microbiology lab testing. Devolli is paying for milk based on total bacteria count using the agar culture method..

They are missing the somatic cell count test of raw milk.

The laboratory at Devolli is an advanced lab with proper testing methods for internal needs. Devolli has stricter criteria for accepting and paying for milk than the industry average. They have their own laboratory where laboratory testing is taking place on a regular basis and they are collaborating closely with KIA in Peja when necessary.

24.03.2006

Meeting with “KABI “ Dairy , Rogana - Kamenica

Dairy “KABI” is one of the dairies in Kosovo working for a long time in the region of Kamenica and Gjilan primarily. KABI has recently built a new processing plant near Gjilan and has potential to increase its market share. This dairy is an average dairy that is collecting most of its milk directly from farmers and some from MCCs. The MCC network is not developed very much in this region. However, it can improve since this region is very well known as a livestock region. The problems on farms are similar with other regions of Kosovo and the problems in KABI similar with other dairies.

There is no microbiology lab testing of raw milk and final products. The samples are being sent regularly to the Land O lakes lab in Macedonia through KDPA.

Laboratory analysis conducted in MCCs:

- Acidity

Analysis in Dairy Plant:

- Acidity
- Percentage % of fat
- Percentage % of water
- Test on ATB (antibiotic)

25.03.2006

Meeting with Mr. Skifter Ajvazi – “Rona” Dairy Plant (Cheese production)

After the discussion we had about the collection of milk we understood that no analysis are conducted on milk that is being delivered from farmers to this Dairy Plant.

Mr. Skifter gave us the following data. They collect around 4.000 liters daily from 100-150 farmers and they do not have payment system according to microbiological quality. Due to the problems with the quality of raw milk they showed interest in establishing a system for payment according to the microbiological quality.

Analysis conducted in Dairy plant:

- Acidity
- Fat percentage %
- Probe on ATB, hormones
- Specific weight
- Percentage of water

No microbiological analysis are conducted. The pasteurization process uses a thermograph but an old model so usually they have to confirm the temperature and time of pasteurization

27.03.2006

Meeting with Mr. Bujar Ejupi - Lipjan Veterinary Dairy training center

The equipment exists as a donation of one Austrian NGO, but there is no possibility to conduct microbiological analysis and the staff is not adequately trained.

There is no condition for any lab testing of raw milk and final products.

29.03. 2006

Meeting with Dr. Ardian Purrini and Dr. Flamur Kadriu – KVFA

Meeting the officials from KVFA to discuss the situation from point of the public sector in relation to laboratory and testing development.

KVFA have equipment in storage for testing total bacteria and somatic cell counts in milk. The FOSS (Denmark Company) model “Fossomatic Minor” can do 50 samples/per hour. The FOSS “Baktoscan” that can test for total bacteria in milk at up to 200 samples per hour. Additionally they have equipment in storage for drug residue testing. KVFA currently lacks laboratory space for this equipment. The laboratory has available a deionizer for water but they need one Inverter to produce required electricity for normal function. KVFA also lacks staff training necessary to run all the equipment they have.

30.03.2006

Meeting with Dairy Farmer – Milazim Berisha, Miradi e Eperme

During the visit we had constructive discussion related to milk hygiene, use of cleaning chemicals and maintenance of equipment.

At the this time I gave a demonstration on use of the California Mastitis Test (CMT) to estimate the number of somatic cells in raw milk.

There is obviously a need for further training of farmers in order to improve the quality of milk on the farm and start the quality control from the point of production.

31.03.2006

Biolab – Dairy Consulting Company, Pristina

Based on the discussions we had it is obvious that company doesn't have appropriate facilities to conduct microbiological analysis, but they say that they could do physical-chemical analysis. For the moment they have small private laboratory that doesn't fulfill the requirements to be licensed.

03.04.2006

Meeting with Mr. Zijadin Gojnovci - USAID – KCBS

The meeting was organized in order to inform KCBS on current situation on data collected regarding milk laboratory analysis in the field. We have discussed as well current situation on laboratory analysis and how they can be improved through time.

Further discussion will take place in order to finalize the tasks and propose some conclusions on how the sector should look in the future.

The prices of services are very expensive and not reliable. One option to this is to develop a private laboratory with a new, adequately trained staff in the basics of how to conduct laboratory analysis and at the same time assist KVFA in their development.

For the moment there is a lack of proper Institutions that will conduct microbiological analysis.

05.05-06

Visit to the warehouse of KVFA

KVFA has two sophisticated pieces of FOSS equipment for microbiology lab testing to analyze total bacteria count and somatic cell counts in milk. KCBS wanted to verify the presence of this equipment as a potential resource to use in implementing a raw milk quality decree. Because the equipment is already purchased and here in Kosovo, KCBS is working closely with KVFA to find the opportunity to activate and use it to serve the Kosovo dairy industry as part of an authorized reference laboratory.

Meeting with Dr. Shyhreta Omeragiq – Food microbiologist

Finally we had the meeting with Dr. Shyhreta Omeragiq, a specialist of Food Microbiology. She could serve as a starting point for the future development of new experts in KVFA and a private laboratory. She has excellent experience in laboratory food analysis and is a practical person.

TASK FINDINGS AND RECOMMENDATIONS

In relation to the situation of the laboratory sector in Kosovo the following findings are relevant.

At the present time none of the laboratory facilities in Kosovo fulfill the necessary requirements to provide accurate, timely test results. Further it appears that only the NIPH and KIA laboratories are considered likely to achieve the required standards for some types of testing in the short to medium term.

Only two laboratories are capable to microbiological or physical chemistry analysis. NIPH can do microbiological tests and KIA can do Chemical tests. However, there is no laboratory within the country that can serve as a reference laboratory to prove that the reliability of the tests in these laboratories is adequate.

As an interim measure until suitable laboratory facilities have been established within Kosovo, the laboratory facilities in an EU Member State, or in a neighboring country (if laboratory facilities of the required standard exist there) can be used as a reference laboratory. If a private laboratory facility would exist the need for a reference laboratory will be rare and it would effect positively the general situation in quality control of the milk sector.

It is recommended, however, that any further investment in new laboratory equipment be researched very carefully from an economic viability standpoint before such investment would be made.

In particular, the roles and responsibilities of the laboratories must be clearly defined and the recommendations relating to the development of the laboratories must be followed. The laboratories and laboratory personnel must be physically and technically capable of using the new equipment. The current situation is very unclear with no clear division of responsibilities between laboratories.

It is very interesting as well that all the laboratories are presenting themselves as a perfect laboratory with excellent knowledge but it is clear that a number of tests can't be conducted properly or are done very poorly. Thus in fact they are not fulfilling the requirements and standards required of a quality laboratory.

The supply of any further new laboratory equipment should also be dependant upon a demand from the private sector for more analysis as we expect that laboratory in the future to become self sustainable.

Each employee in private laboratory should have a job description and a position in an organizational structure in order to be more specialized and thus produce quality results. These results will ultimately be recognized in the country, region and further in the EU.

The laboratories that have the potential to operate in the domain of food safety control in Kosovo should collaborate with data communicated and shared so there is no duplication of activity.

The methods used for the testing of milk and milk products are not adequate, very slow and expensive, especially for the conditions in Kosovo. If compared with the prices in the region the difference is huge and doesn't allow interested parties to conduct more testing.

Usually NIPH and KIA conduct complete analysis for microbiology or chemical analysis and not specific analysis thus increasing the cost of the analysis. At the same time all of them, if somebody asks them to conduct any given test, even if they don't know how to do the test, they take the responsibility to do it with results that are not acceptable or very poor.

Interviewed milk producers, dairy processors and other stakeholders have clearly indicated the current quality of services, price of services and consistency of the results in laboratories in Kosovo are not at a satisfactory level.

The needs for quality control and testing starts at the farm continues at the MCC's and dairy processor and through the distribution system until it reaches the final consumer. This creates demand for more independent testing in laboratories.

CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE ACTIVITY

Based on our visits in the field and laboratories and discussions we had with the main stakeholders it is believed that there is a need for a potential private laboratory that will serve producers, processors and all other interested parties regarding food quality.

The following recommendations should be taken in account before any further steps are developed:

- Proper economic analysis on the cost-benefit of a private laboratory with a proposed budget and timeframe for final start of the activities.
- The availability of two pieces of FOSS sophisticated microbiology lab testing equipment in KVFA for total bacteria count and total somatic cell count. The final price calculated could possibly be lower than the price for testing in the Land O Lakes laboratory in Macedonia.
- The recommendation is not to invest in sophisticated automatic equipment before the basic working experience (good practical knowledge) and the professionalism of the staff are in place.
- The staff selected should start their training from basics since most of the existing staff has general knowledge but not specialized in certain areas. The proposal is to hire Ms. Shyhreta Omeragiq as a senior practical expert to train new staff and monitor them closely during the training period and manage the laboratory effectively. Her experience and knowledge will be crucial for the success of the laboratory and the high expenses of hiring an international expert could be avoided. If necessary there are experts in the region that could be used for specific trainings.
- A sufficient number of adequately qualified, trained and experienced staff is required to be trained by official laboratory specialists to carry out the tests and analyses that are required and to operate the laboratory equipment effectively.
- The priorities in all cases should be similar, focusing on the need for training of the staff in laboratory management and safety measures, bio-security, Good Laboratory Practice (GLP), and Quality Management Systems (QMS) and microbiological and chemical analysis.
- The laboratory staff should be well motivated for upgrading their skills and working to international standards.
- Laboratories should be seen as service providers to the official food chain control services as well as industry participants
- Laboratory should test dairy and meat products.
- Service contracts between the laboratories and the official control services could be established and the official control services need to have the staff and financial resources to obtain the necessary samples and specimens for testing.
- The cost of the testing should decrease in order to allow interested parties to use the facilities more often and improve the general current situation of product quality in Kosovo.
- The laboratory should be able to serve the dairy industry and meet the standards of GMP, HACCP and ISO in order to monitor and control the quality of dairy products.

- Sustainability and professionalism are two key issues that laboratories need to fulfill in order to be credibly recognized by the dairy industry in Kosovo, the region and the EU.
- KCBS should start discussions with KDPA and KVFA about the possibility of starting the laboratory very soon. First training potential staff and after that purchasing the most necessary equipment.
- Laboratory should be independent in order to avoid pressures from different sides and conduct really good analysis with some supervision from KVFA from the legal side.
- The Supervisory Board should be created for the private laboratory from all main stakeholders: KDPA, KVFA, KAMP, KSDP Swiss project Head of laboratory and one independent person with good knowledge on laboratories.
- A co- financing contribution should come from KDPA and KAMP members.
- The laboratory should be not very big, but effective and self sustainable with good management and not overstaffed. Other models of private labs in the region should be visited to have better picture how the laboratory should look.
- The cost per analysis in year one should be calculated.

The types of tests required to be performed on dairy products are included in Annex I. The suggested prices are based on the USAID Land O Lakes price list in Macedonia.

A description of the operations of a potential private laboratory is included in Annex II.

ANNEXES

- Annex I Types of tests required to be performed on dairy products
- Annex II Description of operations of a potential private laboratory

ANNEX I: TYPES OF TESTS REQUIRED TO BE PERFORMED ON DAIRY PRODUCTS

Dairy products test type	actual costs					
	US \$	Past. Milk	UHT milk	cheese	ice cream	yogurt sour milk
TC + CC in pasteurized milk	3.3	3.3				
TC+CC in UHT milk	3.3		3.3			
TC + CC in ice-cream	3.7				3.7	
Coli form count in milk products	2.8			2.8		
Coli form count in yogurt, sour milk	2.2					2.2
Antibiotic test - milk	2.1	2.1	2.1			
Phosphates test - pasteurized milk	3.2	3.2	3.2			
Fats in raw milk, past milk, UHT milk	0.2	0.2	0.2			
Fats in cheese, kashkaval	0.5			0.5		
Fats yogurt, sour milk	0.3					0.3
Fats-ice cream, sour cream, fruit yogurt.	0.1				0.1	
Moisture and solids	0.4	0.4	0.4	0.4	0.4	0.4
Acid degree - milk, yogurt, sour milk	0.1	0.1	0.1			0.1
Acid degree - cheese, kashkaval	0.4			0.4		
Fats, moisture & solids - dairy products	0.5					
	US \$	9.3	9.3	4.1	4.2	3

Raw milk testing test type	actual costs US \$
TC +CC in raw milk (to 10-4)	3.3
Antibiotic test - milk	2.1
Somatic cell count (DMSCC)	0.3
Added water	0.6
Fats in raw milk, past milk, UHT milk	0.2
Moisture and solids	0.4
Acid degree - milk, yogurt, sour milk	0.0
Proteins in milk	1.1
	8.2

Meat products testing test type	actual costs US \$
Fats, moisture & solids - meat products	0.4
Water activity	0.2
TC, CC, E.coli meat products	3.7
	4.3

PRICE LIST

1\$US=52
den

1EUR=62 den

Laboratory services

Detailed price per each test

test type

	SUGGESTED PRICES					
	Association members		Non Association members			
	den	VAT	den	VAT	EUR	US \$
Total bacterial count in raw milk - 99 ml	100.0	118.0	130.0	154.7	2.5	3.0
Coliform count in raw milk	120.0	141.6	200.0	238.0	3.8	4.6
TC +CC in raw milk (to 10-5)	250.0	295.0	350.0	416.5	6.7	8.0
TC +CC in raw milk (to 10-4)	200.0	236.0	250.0	297.5	4.8	5.7
TC + CC in pasteurized milk	200.0	236.0	250.0	297.5	4.8	5.7
TC+CC in UHT milk	200.0	236.0	250.0	297.5	4.8	5.7
TC + CC in ice-cream	200.0	236.0	250.0	297.5	4.8	5.7
Total bacterial count in raw meat	150.0	177.0	200.0	238.0	3.8	4.6
Coliform count in milk products	150.0	177.0	200.0	238.0	3.8	4.6
Coliform count in yougurt, sour milk	150.0	177.0	200.0	238.0	3.8	4.6
Coliform count in meat products	150.0	177.0	200.0	238.0	3.8	4.6
TC CC water	200.0	236.0	250.0	297.5	4.8	5.7
Swabs hands , working surface	200.0	236.0	250.0	297.5	4.8	5.7
Swabs CHARM	200.0	236.0	550.0	654.5	10.6	12.6
Antibiotic test - milk	150.0	177.0	200.0	238.0	3.8	4.6
Phosphatase test - pasteurized milk	200.0	236.0	250.0	297.5	4.8	5.7
Phosphatase - milk products	200.0	236.0	250.0	297.5	4.8	5.7
Phosphatase - meat products CHEF	250.0	295.0	300.0	357.0	5.8	6.9
Somatic cell count (CHARM)	120.0	141.6	150.0	178.5	2.9	3.4
Somatic cell count (DMSCC)	50.0	59.0	100.0	119.0	1.9	2.3
Added water	40.0	47.2	50.0	59.5	1.0	1.1
ph & temperature	20.0	23.6	100.0	119.0	1.9	2.3
Fats in raw milk, past milk, UHT milk	40.0	47.2	50.0	59.5	1.0	1.1
Fats in cheese, kashkaval	60.0	70.8	100.0	119.0	1.9	2.3
Fats yogurt,sour milk	60.0	70.8	100.0	119.0	1.9	2.3
Fats-ice cream, sour cream, fruit yog.	60.0	70.8	100.0	119.0	1.9	2.3
Fats-meat products	60.0	70.8	100.0	119.0	1.9	2.3
Moisture and solids	40.0	47.2	100.0	119.0	1.9	2.3
Acid degree - milk, yogurt, sour milk	50.0	59.0	100.0	119.0	1.9	2.3
Acid degree - cheese, kashkaval	50.0	59.0	100.0	119.0	1.9	2.3
Water activity	70.0	82.6	150.0	178.5	2.9	3.4
Proteins in milk	80.0	94.4	100.0	119.0	1.9	2.3
Proteins in products	150.0	177.0	200.0	238.0	3.8	4.6
Yeast count	250.0	295.0	300.0	357.0	5.8	6.9
Mould count	250.0	295.0	300.0	357.0	5.8	6.9
Lactic bacteria count	250.0	295.0	300.0	357.0	5.8	6.9

ANNEX: II DESCRIPTION OF OPERATIONS OF A POTENTIAL PRIVATE LABORATORY

EU and WHO standards require diagnostic food control laboratories to meet certain standards relating to the construction of buildings and the provision of equipment. These standards can be summarized as requiring:

- Adequate space, safety and security,
- Control of temperature,
- Control of humidity,
- Ventilation for negative or positive pressure,
- Hepa-filters for dust and microorganisms,
- Vibration and sound control,
- Control of electromagnetic interference, Stable electric power supply of 220 V and 360 V
- Adequate lighting at working places.
- Safe storage facilities.
- Access to reference materials and literature.
- Provision of necessary equipment, instruments and materials.
- Equipment professionally installed and maintained.
- Equipment calibrated at appropriate intervals.

In view of these required standards, we believe that further research should be conducted and field visits be organized in neighboring countries in order to have a model acceptable for a private laboratory. Two USAID projects are available to gather the detailed descriptions of laboratory needs. They are Land O Lakes laboratories in Albania and Macedonia.

Potential organizations for lab testing and analyses:

- KDPA Kosovo dairy processor association members 11 dairy plants to test raw milk and final products at least twice per month in average 161 tests per month
- In process of licensing 5 more dairy plants 40 more samples to test per month
- KAMP members near 200 farmers to test twice per month raw milk 400 samples per month
- KVFA as a part of seal of quality lab test four samples per each dairy processor twice per month 88 samples per month
- KVFA border quality control of imported dairy products 100 samples per month for dairy products and 50 samples for milk powder.
- Ice cream producer 10 samples per month

- 11 slaughterhouses licensed by KVFA to test microbiology on meat 30 samples per month
- Dairy training schools in Peja, Lypjan and Mitrovica 30 samples per month
- Sheep dairy farmers 100 farmers to test one sample per month, 100 tests
- USAID/KCBS Dairy Herd Improvement Pilot Program on 25 dairy farms for each cow with average of 20 cows equals 500 samples per month
- In average to start with 1300 samples per month.

Economic Justification

The proposed new raw milk quality decree will require dairy processors to pay a premium for high quality milk and a discount for poor quality milk. This type of pay program will provide an incentive to farmers and handlers to provide high quality raw milk. This will in turn provide higher quality finished products to consumers which will improve the economic situation of the domestic dairy industry.

The new structure of the lab testing equipment with existing FOSS equipment from KVFA and the increased number of samples tested should make the cost of testing competitive with the Land O Lakes laboratory in Macedonia.

Attached Information

1. List of Price Comparison
2. Complete list of contacts, meetings and sources of information
3. List of specification and prices NIPH
4. Specification list - KIA
5. Analytical Reports - KIA

PRICES AVAILABLE FROM THREE DIFFERENT LABORATORIES.

Laboratory analyses	Method of analysis	NIPH	Institute of Agricultural Peja (Price)	Land O'Lakes Macedonia
Microbiological		38 euro	40	
Antibiotic test		5	5	3.8
Phisico cemistry		30 euro	25 euro	0.5
Organoleptik test		3	5	0.5
Coinsistency				
Smell and flavour, collor		3	1	0.5
Additives residues				
% of watter added		5	2.5	1.0
Acidity		2.0	2.5	1.9
% of fat content		5	5	1.0
Total solid		5	5	
Lactoze		3	5	1
Proteins		5	5	1.9
Dilution				
<p>The prices of testing are more aproprate for dairy industry from Macedonia land O Lakes Laboratory</p>				

NATIONAL PUBLIC HEALTH INSTITUTE – PRICES LIST

MILK

Nr.	Parameters	Price in euro
1	Organoleptik test and sample preparation	3
2	Acidity	2
3	Fat content %	5
4	Specific wait	2
5	Dry materia	5
6	Proteins	5
7	Laktoza	5
8	Reduktaza test	3
	Total	30

MILK POWDER

Nr.	Parameters	Price in euro
1	Organoleptic test and preparation the sample	6
2	Acidity	2
3	Fat content %	10
4	% of water added	5
5	Ach	5
6	Dolution	5
7	Proteins	5
	Total	38

CHEESE

Nr.	Parameters	Price in euro
1	Organoleptic test and preparation the sample	Price in euro
2	Acidity	2
3	Fat content %	10
4	% of water added	5
5	Ach	5
6	Solt	5
7	Proteins	5
	Total	38

SET YOGHURT

Nr.	Parameters	Price in euro
1	Organoleptic and preparation the sample	3
2	Acidity	2
3	Fat content %	10
4	% of added watter	5
5	Dry materia	2
6	Dry material without fat	3
7	Proteins	5
	Total	30

KIA PARAMETERS & PRICES

	Parameters	Price €
1	Organoleptik test	1.00
2	Specific wait	2.50
3	Ph acidity	2.50
4	Fat content %	5.00
5	Proteins	2.50
6	Laktoza	2.50
7	Acidity level	2.50
8	Dry materia	2.50
9	Added water	2.50
10	Alkool test of resistance on (72-75 %)	1.50
	Total	25.0

Physic chemistry and microbiology test

	Parameters	Price
1	Total bacteria count	5.0
2	Mycobacterium spp (Agrar method)	5.0
3	Brucella spp(agrar method)	5.0
4	Salmonellaspp (Agrar method)	5.0
5	L. monocytogenes (Agrar method)	5.0
6	E.coli(agrar method)	5.0
6	Bacillus spp(agrar method)	5.0
7	Clostridium perfringes(Agrar method)	5.0
	Total	40

ANALYTICAL REPORTS AND COMMENTS FROM KIA



UNMIK
PROVISIONAL INSTITUTIONS OF SELF-GOVERNMENT
Institucionet e përkohshme të vetqeverisjes
Privremene institucije samoupravljanja
QEVERIA E KOSOVËS/ MINISTRIA BUJQËSISË, PYLLTARISË DHE ZHVILLIMIT RURAL
VLADA KOSOVA/ MINISTARSTVO POLJOPRIVREDE, SUMARSTVA I RURALNOG
RAZVOJA
GOVERNMENT OF KOSOVA/MINISTRY OF AGRICULTURE, FORESTRY AND RURAL
DEVELOPMENT
INSTITUTI BUJQËSOR I KOSOVËS – PEJË
KOSOVA INSTITUTE OF AGRICULTURE –PEJA
KOSOVSKI INSTITUT POLOPRIVREDE-PEC
Raport analize Nr.K- 1031 DATA:24.11.05

IPVK

I. Shënimet e përgjithshme I. General information

Materiali i analizuar: Matter of analyse: Qumësht UHT 1 l 3.5 % Y
Kërkuesi i analizës: Order of analyse :Inspektori veterinary 04/ED
Prejardhja e mostrave:Origin of sample :Import
Shenja e mostrave: Sample mark :2126/005562/BIP-04/ED
Sasia koresponduese:

II. Rezultatet e analizave kimike Results of chemical analyses

Parametrat e analizuar Analysed parameter	Njësia matëse Unit rate	Vlerat e fituara Obtain value	Vlerat e lejuara Aproval value	Metoda Methods
1. Yndyra	%	3.5	Min 3.4	
2. Proteina	%	3.2		
3. Shkalla e aciditetit	⁰ SH	6.6	Max 7.5	
4. Materia e thatë pa yndyrë	%	9.1	Min 8.0	
5. Peshë specifike	g/cm ³	1.028	Min 1.025	
6. Laktozë	%	4.6		
7. Ph-ja		6.8		
8. Uji i shtuar	%	0.0		

II. Mendimi profesional: Mostra e analizuar i plotëson kushtet e kualitetit për qumësht UHT 3.5 % sipas rregullores nr 51/82 dhe 58/94 të FZ.

Analizoi:
Dr. Nevzat Aliaga

Udhëheqësi përgjegjës:
Mr. Bardh Begolli



UNMIK
PROVISIONAL INSTITUTIONS OF SELF-GOVERNMENT

IPVK

Institucionet e përkohshme të vetqeverisjes

Privremene institucije samoupravljanja

QEVERIA E KOSOVËS/ MINISTRIA BUJQËSISË, PYLLTARISË DHE ZHVILLIMIT RURAL
VLADA KOSOVA/ MINISTARSTVO POLJOPRIVREDE, SUMARSTVA I RURALNOG
RAZVOJA

GOVERNMENT OF KOSOVA/MINISTRY OF AGRICULTURE, FORESTRY AND RURAL
DEVELOPMENT

INSTITUTI BUJQËSOR I KOSOVËS – PEJË
KOSOVA INSTITUTE OF AGRICULTURE –PEJA
KOSOVSKI INSTITUT POLOPRIVREDE-PEC

Raport analize Nr.K- 1081 DATA:04.12.05

I. Shënimet e përgjithshme I. General information

Materiali i analizuar: Matter of analyse: Qumësht i freskët

Kërkuksi i analizës: Order of analyse :Fermeri -Dukagjin Deda-Pejë

Prejardhja e mostrave:Origin of sample : Fermeri -Dukagjin Deda

Shenja e mostrave: Sample mark :

Sasia koresponduese:

II. Rezultatet e analizave kimike

Results of chemical analyses

Parametrat e analizuar Analysed parameter	Njësia matëse Unit rate	Vlerat e fituara Obtain value	Vlerat e lejuara Aproval value	Metoda Methods
1. Yndyra	%	4.0		
2. Proteina	%	3.3		
3. Shkalla e aciditetit	⁰ SH	6.7	Max 7.5	
4. Alkool testi(75 % Alkool)		negativ	negativ	
4. Materia e thatë pa yndyrë	%	9.3	Min 8.0	
5. Peshë specifike	g/cm ³	1.030	Min 1.025	
6. Laktozë	%	4.6		
7. Ph-ja		6.7		
8. Uji i shtuar	%	0.0		

II. Mendimi profesional: Mostra e analizuar i plotëson kushtet e kualitetit për qumësht të freskë sipas rregullores nr 51/82 dhe 58/94 të FZ.

Analizoi:

Dr. Nevzat Aliaga

Udhëheqësi përgjegjës:

Mr. Bardh Begolli