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DAIRY PROCESSORS' ASSOCIATION DEVELOPMENT

KOSOVO CLUSTER AND BUSINESS SUPPORT PROJECT

15 September 2005

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, Dr. Charles O'Connor.

DAIRY PROCESSORS' ASSOCIATION DEVELOPMENT

IDENTIFICATION OF RESOURCES AND TECHNOLOGIES THAT WILL MODERNIZE THE KOSOVO DAIRY PROCESSING SECTOR AND, THROUGH THE KOSOVO DAIRY PROCESSORS' ASSOCIATION, TRANSFER THIS INFORMATION TO THE DAIRY PROCESSOR.

Kosovo Cluster and Business Support project Dairy Processors' Association Development
Contract No. AFP-I-00-03-00030-00, TO #800

This report submitted by Chemonics International Inc. / 15 September 2005

CONTENTS

PURPOSE OF ASSIGNMENT

The purpose of the assignment is to assist the Kosovo dairy industry through the development of a Kosovo Dairy Processors Association. The livestock cluster will identify resources and technologies that will modernize the dairy processing sector in Kosovo and through the Kosovo Dairy Processors Association transfer this information to the dairy processor. This will be done by focusing on:

- Value added opportunities for processors in the form of improved quality products commanding higher market values; and
- Increased consumer demand for dairy products through educating and encouraging milk consumption at the consumer level.

BACKGROUND

KCBS has identified many Kosovo dairy farmers that have put labor and limited capital into the establishment of new dairy farms, milk collection centers and other dairy farm improvements. Farmers are now willing to buy some of the necessary equipment and technology they need to produce and market high quality milk. Further, improvements in the collection, distribution, and processing of milk in Kosovo will lead to added income throughout the rural sector.

EXECUTIVE SUMMARY

This final report is a compilation of interim reports, reports on the activities of meetings and visits to various organizations and the presentation made during my 26-day consultancy in Kosovo from July 31 to August 28 2005.

The report contains documentation on visits to

- three milk processing plants,
- six milk producers
- two milk collection centers
- an ice cream plant
- the University of Pristina
- the Institute of Public Health Laboratory
- the Veterinary laboratory
- Ministry of Agriculture Forestry and Rural Development
- Kosovo Veterinary and Food Agency
- information on EU legislation pertaining to milk production, processing and marketing
- typical specifications for cheese varieties and milk powders
- suggested tasks; action plans for improving and consolidating the dairy sub-sector project of KCBS.

This consultant believes that the Kosovo dairy processing industry can and must make several important changes in order to improve its position in the dairy marketplace of Kosovo. The dairy processing industry requires an improvement in the quality of raw milk that the processors purchase from the milk producers. A milk quality payment scheme is suggested and this should be discussed among the milk producers and dairy processors in order that producers of high quality milk will be rewarded for their improved raw material, while giving an incentive to other producers to improve their raw milk quality.

The dairy processing industry in Kosovo will also need to implement an integrated quality management system. The international food market now requires that dairy processing plants have a Good Manufacturing Practices (GMP) program along with a Hazard Analysis Critical Control Points (HACCP) programs in order to minimize the presence of a hazard (microbiological, chemical, or physical) in the food items processed. A GMP checklist is included in the Annexes.

Findings include poor to very bad conditions at farm level militating against the production of good quality milk. Processing facilities should be improved to cater for the existing products as well as new and/or modified products, which may result from consumer demands.

Opportunities should be provided at the University of Pristina to study Food Science and Technology at certificate, diploma and degree levels. The existing Institute of Public Health Laboratory has the potential to be the principal laboratory in Kosovo and to cater for the analytical requirements of the Food Industry.

It is strongly recommended that a milk quality payment scheme is introduced and implemented at the Dairy Plants and that formal training courses are conducted in clean milk production.

FIELD ACTIVITIES TO ACHIEVE PURPOSES

The activities involved discussions with the main players in the dairy sector and to see at first hand the conditions prevailing from farm level, through educational facilities to the production and marketing of dairy products. Discussions were held with Ministry of Agriculture personnel, The Dairy Working Group, Veterinary and Food Agency, the University of Pristina, the Institute of Public Health as well as visits to farms, milk collection centers and milk processors.

During our discussions with milk producers, processors and representatives of Association of Milk Producers and Dairy processors Association the need for an Independent milk testing laboratory to check on the results of analytical tests carried out by the individual milk processors was investigated.

Discussions were held with members of the Dairy Working Group and the (UNMIK) Department of Crime to discuss milk powder imports.

Specifications for both Whole Milk powder and Skim Milk Powder were discussed with members of the Dairy Working Group

TASK FINDINGS AND RECOMMENDATIONS

Conditions at farm level militate against the production of safe wholesome milk of good compositional quality. Generally the standard of management and animal husbandry is substandard resulting in cows in poor condition, a high incidence of mastitis in the herd (up to 90%) and reduced milk yields. Because of poor mastitis control the potential yields are reduced by at least 20%. Also, additional financial losses are incurred by the milk producers through penalties imposed by the milk processors for poor hygienic quality milk.

Because of the high incidence of mastitis there is a great danger of the risk of food borne disease. Such mastitic milk may contain species of Staphylococcus and Clostridium and Escherichia *coli*. Because of the frequent outages in electricity supply milk may not be cooled as quickly as it should and milk produced under less than hygienic conditions will contain large numbers of bacteria (including pathogens), which will multiply rapidly at elevated temperatures. Milk containing about 100,000 bacteria per ml when fresh will contain about 15 million bacteria per ml after 24 hours if the temperature of storage is about 15C.

The dangers and risk of food borne disease is highlighted almost on a daily basis. In the US, for example, around 76 million cases of food borne disease, resulting in 325,000 hospitalizations and 5,000 deaths, are estimated to occur each year. Sixty-one deaths and 73,000 illnesses are blamed on eating foods contaminated with E.*coli* each year, according to the US Center for Disease Control and Prevention.

If milk processors do not receive milk of good quality then it is very difficult if not impossible to produce a wide range of milk products on a consistent basis. While some milk supplies were of reasonable hygienic quality some milk supplies contained bacterial numbers in the millions. Milk with high bacterial numbers cannot be processed and may have to be fed to animals or dumped. This results in financial losses to the farmer and the industry in general. Milk of low-grade quality may result in an inferior finished product with a short shelf life. Consumers demand a top quality dairy product, e.g. cheese, yoghurt, and if they cannot rely on a consistently good Kosovo produced product they will inevitably turn to imported supplies. The damage done to the indigenous dairy industry may take some time to repair.

Products with a poor shelf life will be returned to the manufacturer with consequent financial losses to the milk producer, processor and the economy particularly of the rural areas.
Poor quality milk will not allow the product diversification required to stimulate the dairy industry through consumer demands for a greater range of quality products. For example, better quality milk is required for the manufacture of certain varieties of cheese than may be required for butter making.

There was evidence of poorly designed and maintained equipment, which would not be conducive to proper processing and cleaning. The risk and dangers of pathogens originating in the milk or arising from contaminated storage or processing equipment has been referred to above.

There are many requirements to the development and sustainability of a Food Industry. We already have adverted to the need for good quality raw materials and finished products. In addition a competent work force is required at all levels from workers at farm level through milk production, processing and marketing. Because of the nature and complexity of the raw material, milk, personnel must be available who understand the biological nature of milk and the processing of that milk into quality dairy products. Personnel at operative level, production management and general management level require technical training appropriate to their position.

While the University of Pristina offers qualifications in General Agriculture and Veterinary medicine it does not provide any courses leading to qualifications in Food Science and Technology. Progress is being made however through collaboration with the French Government who are assisting in the development of a curriculum and syllabus for a qualification, at degree level, in Food Science and Technology. It is suggested that in addition to courses leading to a primary degree, courses at certificate (1 year) and diploma level (2 years) should be provided for personnel on the factory floor to middle management. These will include technicians to carry out the broad range of chemical and microbiological tests that will be required as the dairy industry expands and develops

There should also be a pool of trained personnel to take up management *cum* technical positions in the various Government departments and other Regulatory Organizations.
A pilot food processing plant is also planned for the University of Pristina. Laboratory facilities at industry and regulatory level were investigated. Because of the comparatively young (operating) age of most of the milk processing plants analytical facilities, while basic but suitable under the present operational circumstances, are inadequate for the future development of the dairy industry. Beside the Devolli milk testing laboratory, there are no milk testing facilities at factory level, e.g. for the bacteriological analysis of milk and dairy products.

Methylene Blue reduction test is being used as an approximation of the bacterial plate counts. The reduction time can be equated with a range of bacterial numbers, e.g. a reduction time of between 2 and 5.5 hours equates to bacterial numbers of between 500,000 and 4.5 million bacteria. The Methylene Blue reduction test is a very useful screening test for milk but it is not sufficiently accurate or precise. Tests for Somatic Cell Counts are not carried out at the processing plants and there are no facilities at processing plant level for the detection and counting of E.coli and coliforms.

Bacteriological facilities are not available to examine the final dairy product, which may also require testing for Yeasts and Moulds. It has long been debated that testing for pathogens e.g. Salmonella, Listeria, Staphylococci, should not be carried out at processing plant level and such tests are usually outsourced to independent laboratories. Processing Plants may get samples tested by an outside laboratory. The Institute of Public health laboratory will carry out a microbiological examination of a food at a cost of about €40 per sample. The

tests carried out include, Salmonella, Staphylococcus *aureus*, Sulphite reducing Clostridia, Proteus spp., Streptococcus *faecalis*, Escherichia *coli*, Coliforms and Total Bacterial Count. Chemical tests, e.g. Fat, Moisture, Protein, Lactose, Peroxidase cost from €2 to €8 per parameter.

Discussions were held with personnel in the Institute of Public Health Laboratory and their analytical equipment and general facilities were observed. While actual testing and competency in analysis of food products was not observed it appears that this laboratory has the space and equipment to carry out a large range of chemical and microbiological tests on food including dairy products and water supplies. Facilities exist for the detection of pesticide residues and for heavy metals, e.g. Lead, Cadmium and Mercury. For the assessment of water quality a wide range of chemical tests include pH, Residual Chlorine, Ammonium, Chlorides, Nitrites, Nitrates, Iron, Manganese, Lead, Sulphates, Hardness.

CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE ACTIVITY

A. General

Unless milk of good quality is produced at the farm, stored at a low temperature (4C) in a clean tank and transported to the Dairy Plant in a clean insulated tanker the milk processor will not have the required raw material to produce top quality dairy products. Poor quality milk will limit the opportunities for processors to improve the quality of existing dairy products as well as limiting the possibility of producing new products as required by the market place. Consumers will continue to make greater demands for better quality products and a wider range and choice of dairy products. The production of poor quality products will result in reduced consumer demand, poor shelf-life products and economic losses to the milk producer and the rural community. The worst-case scenario is that imported dairy products will be the preferred choice of the consumer and local milk processors may become non profitable and go out of business.

Some farmers appear to have little appreciation of the need for good animal husbandry and hygienic milk production practices. They do not appear to realize that cows need proper care and attention including proper nutrition and clean healthy housing.

It is strongly recommended that a comprehensive milk quality payment scheme is introduced and implemented. This must be done by discussions and cooperation between the Milk Producers Association and the Dairy Processors Association. It is accepted that good quality milk is required to produce a good quality wholesome dairy product. As it was found that milking techniques and conditions were substandard it is recommended that formal training courses be held to assist the farmer to produce milk of the required hygienic and compositional standard. Clear milking guidelines and procedures must be provided. The economic benefits of producing good quality milk must be explained to the farmer.

Conditions at Milk Processing Plants need improvement and it is recommended that Good Manufacturing (GMP) techniques be introduced to all Dairy Plants followed by the introduction of Hazard Analysis and Critical Control Points (HACCP) and ISO quality standards. Considerable improvements in Good Manufacturing Practices can be brought about at minimum cost. For example the removal of grass and weeds adjacent to the milk reception and processing area is neither time consuming or costly. Staff at the dairy plant should be advised to dispose of cigarette ends and spent matches in a proper container and

the removal of broken pallets, paper wrapping and cardboard boxes to an appropriate area would greatly improve the appearance of the plant. Discarded papers, cardboard boxes and other materials attract flies and vermin who may gain access to the processing area. Windows of the plant should be adequately screened to prevent the ingress of flies and rodent control measures should be put in place. Within the Plant the careful use of water hoses is important from a safety and water conservation point of view. A rack should be provided where a water hose is placed when not in use. Each water hose should have an automatic cut off tap, which will safe water and water costs. The above are a few examples of where improvements can be made at minimum or no additional cost to the Dairy Plant.
Laboratory facilities at plant level should be upgraded to carry out a greater range of tests and this presupposes the availability of trained laboratory technicians.

An examination of the formal training of technical personnel for the Food Industry showed a lack of appropriate courses. It is recommended that training courses, at certificate, diploma and degree levels should be established at the University of Pristina. Assistance and guidance with regard to detailed curricula, syllabus and pilot plant facilities should be provided as well as providing opportunities for graduates to pursue postgraduate courses overseas.

B. Establishment of an Independent Milk Testing Laboratory

Milk that is delivered to Dairy Plants in Kosovo is mainly paid for on the basis of fat content. In some cases the microbiological content of the milk is used as an additional basis for payment, i.e., where the bacterial content of the milk is deemed excessive by the Dairy Plant then a penalty is imposed on the milk producer. One can understand that if a farmer is receiving a low price for his milk supplies then he may feel that poor sampling and inaccurate testing may be a contributory factor in this low price. The farmer may also feel that any errors that may be made will always disadvantage the milk producer and some farmers may feel strongly that they may be cheated by the chemical and microbiological analysis. From work in several countries this consultant's experience has been that a significant number of farmers are not happy with the test results of Dairy Plants in so far as they impinge upon and affect the final payment made to the milk producer.

Some farmers spoken to during this assignment were happy with the test results of the Dairy Plant while others wished they had an opportunity to have an independent check on the results of the Dairy Plant. There are two approaches to this situation. One is that an independent laboratory is set up and run by the Association of Milk Producers (KAMP) and the second approach is to utilize the facilities of an existing laboratory, e.g. the Institute of Public Health Laboratory, to carry out spot checks on split samples that are taken by the Dairy Plant.

It is this writers opinion that the establishment of an Independent Laboratory by milk producers, at this stage in the development of the dairy industry in Kosovo, would be excessive and that the use of an existing laboratory on a fee per sample or test basis would be the most cost effective.

C. EU Rules and Regulations pertaining to the Dairy Industry

As Kosovo aspires to membership of the EU then it is essential that Kosovo adopts the laws of the EU relating to Food Production, Processing and Standards.

The following are examples of EU Regulations that are relevant to the Food, including Dairying, Industries.

852/2004 Hygiene of Foodstuffs

853/2004	Specific hygiene rules for food of animal origin
92/46	Milk and Milk based products
89/362	Hygiene in Milk Production Holdings
213/2001	Methods of analysis and quality evaluation of milk and milk products
2160/2003	Control of Salmonella

D. Constraints to the Further Development of the Dairy industry.

These may be summarized as follows and are already referred to above.

- Substandard on-farm facilities
- Poor quality milk supplies from farmers
- Bad management at farm level
- Substandard processing facilities
- Product modification and product diversification limitations due to poor quality raw milk and moderate processing facilities
- Insufficient advisory inputs particularly at farm level
- Lack of technically trained personnel at all levels of the dairy industry
- The threat of cheap dairy product imports

Frequent electricity breakdowns in the national grid supply and the high cost of borrowing money for expansion or improvement in equipment at either Farm or Plant level were often cited as problems faced by the Dairy industry. Unless and until these constraints are seriously and systematically addressed then the Dairy Industry will not reach it full potential with knock on adverse affects for the economy of Kosovo.

ANNEXES

Annex 01 ABI Dairy Plant
Annex 02 Devolli Dairy Plant
Annex 03 RONA Dairy Plant
Annex 04 Farm visits
Annex 05 Milk Collection Centers
Annex 06 Veterinary and Food Agency
Annex 07 Ministry of Agriculture, Food and Rural Development
Annex 08 Institute of Public Health Laboratory
Annex 09 Kosovo Association of Milk Producers and Kosovo Dairy Processors Association
Annex 10 Veterinary Laboratory
Annex 11 University of Pristina
Annex 12 Ice Cream Plant
Annex 13 Food Safety Control System for Kosovo
Annex 14 Department of Crime, UNMIK
Annex 15 Skim Milk Powder Specification
Annex 16 Whole Milk Powder Specification
Annex 17 Mozzarella Cheese Specification
Annex 18 Emmental Cheese Specification
Annex 19 Check List for Good Manufacturing Practice (GMP)

Annex 1

ABI Dairy Plant

We (Arben Musliu, O'Connor) were met by Mr. Ifram Fusha, Manager and Mr. Fari Rizanaj. ABI is located about 78km SW of Pristina in the city of Prizren.

It was established in 1985 as an SOE. Mr. Fusha took over as owner in 1996.

They have 33 employees including 20 involved in processing.

They manufacture 20 different products, which include different cheese varieties, yoghurt, Kos, and pasteurized milk. Yoghurt and cheese (white and Sharri) are the largest volume products.

Processing capacity is 15 tons of milk per shift. They work 1 shift per day.

They processed 2.5 million tons of milk in 2004 and expect to process 3.5 million tons in 2005. Daily supplies vary from 30,000 to 13,000 and individual supplies vary from 300 liters to 70 liters per day. There are 600 milk suppliers. Farmers supply milk to 20 milk collection centers (MCC). The milk is collected by ABI from 8 MCCs and the other MCCs deliver the milk to the milk plant. ABI pay 6.5 cent per 1% fat if milk is collected by ABI and 7.5 cent if milk is delivered to ABI.

Fat content is the sole basis for payment.

Milk is sampled and tested for acidity (Soxhlet Henkel), fat content and specific gravity. Samples for the enumeration of total bacteria are taken twice per month. Mr. Rizanaj stated that the total bacterial count of raw milk supplies was less than 300,000 per ml. ABI work closely with farmers and Milk Collection Centers to improve hygiene on the farm.

Water supplies are provided by the Municipality and wastewater is discharged into the Municipal system.

They distribute their products throughout Kosovo and particularly the main cities of Pristina and Prizren.

Included under their "main problems" are imports of powder. ABI continue to improve the hygienic quality (bacterial counts) and they plan to increase their processing capacity. There is an over supply of milk during the summer months.

A GMP checklist was sent to ABI.

Annex 2

Devolli Dairy Plant

Devolli Company is located in Peja about 85 km West of Pristina.

It is privately owned. It has about 62 employees.

It began production of Vita UHT milk in November 2003. According to Devolli Vita milk is a result of successful cooperation between Devolli and Tetra Pak multinational company. We met with Mr. Ismet Bojku, General manager and Mr. Ernest Jusufi, Production manager.

In addition to producing UHT milk of 3 different fat contents (3.2%, 1.6%, 0.5%) Devolli also package coffee and 8 different juices in a standard and premium grade.

Processing capacity for UHT milk is 12,000 liters per hour. All UHT milk is produced from fresh cows milk. Seventy farmers supply about 17,000 to 24,000 liters of milk per day. Supplies range from 100 liters to 2,000 liters per farmer per day. About 55% of farmers deliver their milk to the Factory and Devolli collects the milk from the remaining farmers.

Payment for milk is based on fat content and hygienic condition. Payment is 7 cent per unit of fat and there is a bonus for milk of superior hygienic quality based on the Methylene Blue test.

At reception the milk is tested for acidity, pH and alcohol (75%) test. An additional sample, which is taken 3-4 times per month, is tested for antibiotics, total bacterial count and somatic cell counts. Details of the quality payment scheme were not available.

The main problems for Devolli are the unreliability of electricity supplies, the high price paid to the farmer for his milk, the high cost of milk assembly, the high price of fuel oil, high taxes on imports of consumables such as detergents and cleaning materials. The quality of milk from farmers can cause problems but this situation is improving. Imports of dairy products are disrupting the market especially as it is alleged that goods are invoiced at prices below the cost the importer is actually paying for the milk. Mr. Ismet stated that the total cost of milk, milk assembly, processing and distribution is 50 cent per liter of UHT milk. The invoiced value of imports is 30 cent per liter.

The cost of 3.2% fat Vita in a supermarket in Pristina was 60 cent per liter.

There is no discernable difference between the quality of imported and locally produced UHT milk according to Mr. Ismet.

Devolli are aware of the need for integrated quality management systems and are working towards achieving HACCP and ISO standards. We suggested that a good starting point would be an audit of Good Manufacturing Practice (GMP) and a checklist was provided. Processors should be mindful that GMP includes activities within the plant and conditions of buildings and the surrounding compound.

Farmers are given advice on clean milk production and financial assistance is provided to enable farmers to improve milking conditions, milk cooling and storage.

Devolli have recently started exporting semi-skimmed UHT milk to Albania and Macedonia. Before they could export to Macedonia the Devolli plant was subjected to a sanitary inspection by Macedonian authorities.

Annex 03

RONA

Rona milk processing plant, which was established in September 2004, is located in Ferizaj, about 37 km south of Pristina.

The owner is Mr. Skifter Ajvazi.

He has 14 employees including 6 people involved in processing.

All milk received is processed into 5 different kinds of cheese, e.g. Kachaval, Double cream soft, Hard white, Imperial. Approximately 25 tons of cheese are made per month. Milk intake is about 6 to 7 tons per day.

Two hundred farmers supply milk to RONA and are paid about 25 cent per liter.

Milk is paid on the basis of fat content, 7 cent per 1% fat.

Management is proposing to introduce the Methylene Blue Reduction test to check the hygienic quality of the milk and a bonus or penalty imposed depending on the results of the test. Milk supplies per individual farmer range from 500kg to 15,000kg per month. About 75% of the farmers have a 2-year contract with RONA.

The majority of farmers deliver their milk to a Milk Collection Centre and a RONA bulk milk tanker delivers it to the factory.

The owner stated that the quality of his cheese was as good as the equivalent imported variety. We were shown chemical and microbiological test results from an independent laboratory in Skopje, which supported the quality claims. Mr. Arben Musliu and myself visited a nearby supermarket and we were informed that sales of RONA cheese were increasing as consumers became aware of its good quality.

Imported Kackaval was retailing at €4.76 per kg and Kackaval produced by RONA was retailing at €4.5 per kg.

RONA provides technical advice to the farmers. Mr. Skifter is a veterinarian and advises on animal health issues as well as clean milk production.

Financial assistance is also provided to farmers to improve milk production, milking facilities including cooling and storage of the milk.

There appears to be a lack of formal technical advice from Government sources.

Rona's main problems stem from the import of dairy products at prices, which are lower than production costs in Kosovo.

Electricity supplies are unreliable and constant breakdowns not only damage machinery but can also cause quality problems with the dairy products.

Annex 04

FARM VISITS

Visit to Milk producer supplying milk to Devolli Company

We visited **Istog farm** located about 10km from the Devolli milk processing plant.

Mr. Qerim Halilaj and Mr. Fadil Sadikaj rent the farm from the Government.

Mr. Qerim is an agricultural engineer and Mr. Sadikaj is a veterinarian.

The size of the farm is 450 hectares of which 150ha is used for corn silage, 75ha for rye and peas, 60ha for alfalfa and the remainder for pasture.

Their initial activity was in trading, buying and selling animals but they now concentrate entirely on milk production. They have 150 cows, mainly Holstein with a few Brown Swiss and Simmental. Natural mating is practiced (2 bulls) with the emphasis on fat content and quantity. At present protein content is not important as all milk is processed into UHT milk. The high yielding cows are milked 3 times per day. The highest yielder is 55 liters per day and the average for the herd is about 25 liters per day. Cows producing less than 22 liters per day are culled and sold on to local farmers. Milk recording is not practiced and this activity was suggested as a useful exercise in identifying low yielding cows not only in terms of total quantity of milk but also the total solids content, e.g. Fat, Protein, Lactose. The protein content of milk is important in cheese making. They have a 1-year supply contract with Devolli with no restriction on the quantity supplied.

Bucket milking is practiced and milk is taken manually to the bulk milk cooling tanks. There are 3 tanks each with a capacity of 1,250 liters. A new milking parlour and storage area is being built and milk will be directly pumped to the bulk milk tanks.

The new milking parlour will minimize contamination of the milk and maintain its original hygienic quality.

When the milk is collected by the bulk milk tanker from Devolli it is tested for temperature, acidity, alcohol (75%) and pH. A sample is also taken 4 times per month and tested for fat content, total bacterial count, Antibiotics and Somatic Cell Counts.

The average fat content of the milk sold to Devolli is 4.17% for which they receive almost 30 cent per liter.

Agro Albini Farm of Mr.Isufi. Supplying milk to Devolli.

Mr. Isufi started farming 3 years ago. He owns 2 ha and rents 145ha.

He is located about 108km from Devolli and about 40km from Pristina.

He receives between 29.2 and 30 cent per liter based on 7 cent per 1% fat and a bonus for total bacterial count (TBCs). He did not know his actual TBCs but he says he is “among the best”. He has 38 milking cows and 18 heifers. The breeds include Montbeliard, 11 cows and 6 heifers, and Brown Swiss, 27 cows and 13 heifers. Montbeliard (French) are reputed to be good producers both in terms of quantity and compositional (fat and protein).

Note; The milk processing factories visited so far are paying for milk on the basis of fat content but where cheese making is carried out then the protein content of the milk becomes important as the yield of cheese depends on the fat AND the protein (casein) contents.

His best yielding cow produces 35 liters and the lowest is 10 liters due to “health problems”.

Mr. Isufi previously supplied milk to RONA but due to non-payment (thus far) by RONA for 4 months supply he switched deliveries to Devolli.

While I was at the farm the bulk milk tanker arrived from Devolli to pick up the milk.

The driver of the tanker was accompanied by a technician who checked the milk for temperature, acidity (Soxhlet Henkel) and alcohol (75%) test. When the above checks were made it was pumped from the bulk (lacto freezer) tank to the milk tanker. The temperature of the milk was 10C, which is above the recommended 4C at collection. The reason for the "high" temperature was that milking was completed a short time before arrival of the truck.

An important point to note is that where milk at high temperature is collected by the large capacity tanker it will increase the temperature of the milk in the tanker. This may lead to microbial deterioration and possible problems with the processability of the milk. The farmer is satisfied with the fat test results. This question was asked in the context of the possible establishment of an independent milk-testing laboratory.

Mr. Isufi, like farmers in general, is dissatisfied with lack of sources of advice of a technical nature, i.e. animal health problems, problems with hygienic milk production.

Mr.Isufi stated that he was concerned about imports of dairy products in that they could impact negatively on the viability of Devolli and therefore on the success of the Dairy industry in Kosovo. The farmer was very critical of the Government in that they promised a subsidy of 5 cent per liter of milk, which was not paid.

The cows at the farm have some problems with their hoofs and joints, possibly due to lack of exercise.

Legendas farm owned by Bayram Mujota.

The farm is 25 ha-including 10 rented ha. He started milk production 1 year ago. In the past he supplied milk to RONA but because of late payments from RONA he now supplies all his milk to Devolli.

The farm is situated about 106km from Devolli and 30 km from Pristina.

He has 50 cows, 34 are red Holstein and the remainder are Brown Swiss and Simmental. Eighty per cent of the cows are in their 1st lactation. The average yield is 18 liters but some cows produce about 30 liters. The average fat content is 4.2%, 3.9% and 3.7% for the Simmental, Brown Swiss and Red Holstein respectively. They have a 1-year contract with Devolli with no limit on the amount of milk supplied. Devolli pay 7 cent per 1% Fat.

The milk has never been rejected based on tests (Alcohol stability and acidity) carried out by the Devolli technician at time of milk pickup.

The alcohol (75%) test and acidity are carried out at every pickup of milk at the farm and, in addition, a sample is taken for analysis at the factory for fat content and total bacterial count. The fat content is determined everyday and the total bacterial count is carried out 3 or 4 times per month.

The farmer is paid 25 cent per liter but this is dependent on the results of the total bacterial count. Mr. Mujota stated that he lost about 800 Euro for last month's supply due to a high bacterial count of more than 600,000. A standard price is paid for milk where bacterial counts range from 100,000 to 300,000; a bonus of 10 % is paid for less than 100,000; a penalty of 5% is applied with counts ranging from 300,000 to 600,000 and a penalty of 10% is applied for counts in excess of 600,000.

Mr. Mujota is convinced that he is carrying out proper cleaning procedures and that the problem lies with the slow cooling rate of the bulk milk tank.

We observed that the cows were not clean with the hindquarters and tail caked with feces. We explained that the main sources of contamination of milk were the cow, the milking environment, milking and milk storage equipment. As bacterial numbers double approximately every half an hour the need for keeping initial numbers to a minimum is clear.

Mr. Vladimir Kokarev, Land O'Lakes, Skopje had already visited the farm of Mr Mujota and provided him with written guidelines on the proper cleaning procedures for cows and milking equipment. It appears that up until recently Mr. Mujota was only using hot water for all

cleaning purposes so therefore a count of more than 600,000 was not entirely unexpected. Mr. Mujota is now using detergent for cleaning and we await the most recent bacterial count results from Devolli with more than a little interest.

It was suggested to Mr Mujota that if high counts persist there should be a thorough objective assessment of the milking equipment and milk storage tanks. Dr. Skender Muji, University of Pristina was suggested as a person who might undertake this assessment on a fee-paying basis.

Visit to farm of Mr. Mustaf Dajci

The size of the farm is 10ha and is located 10km from ABI. He supplies about 250 liters per day and is paid about 30 cent per l depending on the fat content. Mr. Dajci has 15 cows, mainly Holstein, and 10 heifers. The yield per cow varies from 30 l to 15 l per day. ABI personnel have provided him with advice on clean milk production.

His milk cooling facilities are basic, e.g. milk is put in 40 l cans and the cans are placed in a trough of cold water. The temperature of the water was about 10C. His milk supply was rejected by ABI once in the past few months due to high acidity. The farmer would like to increase his number of cows and purchase a milk-cooling tank but the cost of borrowing money is prohibitive for him.

Observation – cows were housed in a simple byre; they were not very clean which would lead to high bacterial counts in the milk.

Visit to farm of Mr.Tefi Mazrek

Mr. Mazrek has 8 cows, mainly Holstein, and 7 calves. The size of the farm is 6 ha

He supplies milk to the MCC described above. Total milk produced ranges from 90 liters to 60 liters per day.

Acidity and fat tests are carried out by the MCC on each days supply. He receives 6.5 cent per 1% fat.

His cow byre was reasonably clean but could and should be improved.

Visit to Guci farm-milk producer.

The owner of the farm is Mr. Gursel Nebiu

He has 48 cows, 45 of which are now milking. They are mainly Holstein with 4 Simmental. The average milk production per day is 450 liters. This poor milk production is due to a high incidence of mastitis. Mastitis can reduce milk yields by up to 20%.

The cows are milked in the byre, which was not clean, and, in addition, the cows (udder and hindquarters) were very dirty and would certainly militate against the production of milk of high hygienic quality.

He delivers milk to RONA, which is nearby and is paid on the basis of fat content.

Mr.Nebiu was very critical of the veterinary personnel for the poor quality of advice. He cited one instance where a veterinarian said a cow was healthy but the following morning it was dead.

Borrowing money to improve his facilities is expensive and irregular and interrupted electricity causes damage to his lacto freezer and milking equipment.

Annex 05

VISITS TO MILK COLLECTION CENTERS

Two milk collection centers were visited

The owner of the first MCC visited is Mr. Amdi Mazreku.

It is located in the village of Mamusha about 25km from ABI Dairy Plant. The MCC receives milk from 30 farmers. Total milk received is between 1,500 and 2,00 liters per day. Acidity and butterfat tests are carried out daily on each farmer's milk supply. If the acidity is greater than 7 SH the milk is rejected. The owner pays each individual farmer 6.5 cent per 1% fat and Mr. Mazreku delivers the milk directly to ABI. He is paid 7.5 cent per 1% fat.

The MCC has a bulk milk tank with a capacity of 1,100 liters, equipment for carrying out the Gerber fat test and milk acidity. The area of the MCC is about 12 sq metres and was clean and tidy. Fat content of individual farmer milk supplies varies from 2.8% to 4.7%.

While there are problems with power supplies the temperature of the milk in the tank was 2.8C.

The second MCC visited was established in 2004 and is located 20km from RONA Dairy Plant.

The owner/manager of the Centre is Farie Recica. The centre receives an average of 950 liters/day from 35 farmers. Milk supply from individual farmers ranges from 10 liters to 150 liters. All milk suppliers are within a radius of 5km of the MCC.

RONA collects the milk from the MCC every second day. Before collection of the milk the alcohol (75%) test is carried out. Milk is paid for by RONA on the basis of Fat content, 6.2 cent per 1% fat. The owner of the MCC is paid 1 cent per liter of milk collected. Mrs Recica is not happy with the payment of 1 cent/liter particularly as the costs of detergents and electricity are high.

The size of the MCC is 25 sq.m. and the walls are tiled to a height of 1.5m. The building is clean and tidy. It has 2 bulk tanks (lacto freezers) with a total capacity of 1,750 liters. The milk is received from the farmers in an area covered by an asbestos canopy. Asbestos should not be used as a covering or building material because of health implications.

The owner of the MCC (who is also supplying milk to the Centre) is not happy with RONA primarily because of irregular and late payment for milk.

Mrs. Farie is also not happy with the Government who reneged on the promised payment of a subsidy of 5 cent per liter for milk. The cost of borrowing money was cited as being prohibitive and imports of milk powders is damaging the potential of the Milk Processing industry.

Annex 06

Veterinary and Food Agency

Meeting with Dr. Kujtim UKA, Chief of Veterinary Drugs and Residue Section, Kosovo veterinary and Food agency.

Kujtim described the work of his agency. For example when a product arrives at the border the inspector at the border post will decide if the product should be sampled.

Samples may be submitted to Institute of Public Health in Pristina and, for the more sophisticated analysis (heavy metals, pesticides) samples may be sent to a laboratory in Skopje. I think this lab in Skopje is run by Land O'Lakes. Kujtim appears not to be

enamored with the laboratory in Pristina. Kujtim said that they are in the process of establishing a laboratory, under their control and supervision, in Pristina. I offered to assist them in identifying appropriate analytical equipment (automatic, manual, large/small throughput etc) for testing for the various parameters.

Kujtim said that his staff has already licensed 11 dairy processors and today his staff are visiting 3 other dairies for inspection with the objective of granting them a license.

They are drafting food laws including standards for labeling.

Meeting with Ardian Purrini, Chief of Food Hygiene, Veterinary and Food Agency, MAFRD. The purpose of the meeting was to discuss the checklist and criteria used to license milk processing plants.

There are 23 milk processing Plants, 11 are licensed and 5 are under "observation" until the end of August when they will be re-assessed.

The checklist for the granting of a license to a milk processing plant was drawn up by the Veterinary and Food Agency in association with the Swiss Dairy Project.

At present if a milk Plant achieves conformity with 75% of the checklist then it is granted a license. From next year these minimum requirements will be strengthened and plants will have to conform to the entire checklist criteria.

The veterinary and food agency plan to improve their analytical facility, e.g. the purchase of a Bactoscan for the rapid enumeration of bacteria and equipment (Fossomatic) to check on Somatic cells. At present the veterinary laboratory does not test food samples, these are tested by the Institute of Public Health.

Other points discussed included,

- The poor quality of milk ex-farm.
- Farms producing milk are not licensed at present but in the future the Ministry of Livestock will license them.
- The final draft of the Food Law (based largely on EU law) is going before Parliament and should be in place in about 2 months. A maximum of 2 years will be allowed to implement the Food Law.
- Dairy product imports and exports.

Devolli and SHARRI export milk to Macedonia and Albania respectively. The veterinary inspection agency certify the product for export and, in the case of Devolli, inspectors from Macedonia check on the processing conditions at the Devolli plant.

Imports to Kosovo are inspected at the border. Imports from non-EU countries (e.g. Turkey) are checked more thoroughly than imports from EU countries, where processors have a EU export number (license).

Meeting with Ardian Purrini, Veterinary and Food Agency.

There is a veterinary laboratory located about 3 km from Pristina. They do not test Milk or Dairy Products. At present samples, e.g. of milk powders, are taken at the border by the veterinary inspection team and these samples are passed to the Institute of Public Health Laboratory for analysis. The Veterinary and Inspection Agency are in the "process" of procuring equipment, e.g. Bactoscan, for testing of Milk and Dairy Products. The approximate cost of this new equipment for testing milk and milk products is €300,000.

It appears that the Veterinary Inspection Agency do not have any specifications for Dairy Products and they are interested in the sample specifications for skimmed milk and 26%fat milk powders which were given to Mr. Imeri. Results of the analysis from the Institute of Public Health indicate that they test for microbiological criteria (e.g. Salmonella, E. *coli*, S. *aureus*).

Meeting with Mr. Ardian Purrini, Chief of Food Hygiene Sector

The objective of the meeting was to obtain detailed information on the sampling, testing, reporting of analytical results and action to be taken in the event that the powder does not meet the declared standard.

When an importer wishes to import milk powder he informs the Veterinary and Food Agency to whom he supplies the relevant details of the product being imported, i.e. details of the manufacturer of the product, a certificate that the exporter has a EU license to manufacture the product and certification as to the quality of the product. The Veterinary and Food Agency has a database of all manufacturing Plants with a EU license export number.

When the product arrives at the Border in Kosovo the border inspector takes 3 samples of the product 2 of which are retained at the border. Having obtained the samples the container is sealed and cannot be opened until the results of the chemical and microbiological tests are known. The samples are sent to the Institute of Public Health Laboratory and, occasionally, for verification, to the Veterinary Institute in Skopje or Land O'Lakes laboratory in Skopje.

The parameters to be tested are decided by the Veterinary Border Inspector based on the certification and specification provided by the exporter. The truck driver provides this certification to the Border Inspector. The chemical tests include fat%, acidity and moisture content. The border inspector may decide to check for the presence of heavy metals such as lead, mercury and cadmium. The microbiological tests include tests for pathogens, e.g. Salmonella, S. *aureus*, Clostridia, S. *faecalis*, Escherichia *coli*, and total bacterial count. The analytical results are reported to Dr. Purrini who takes the appropriate action. If the importer does not hear any adverse report within 3 days of sampling then he is free to use the product. If the product fails on any of the parameters the importer is notified and an additional sample is sent to an independent laboratory (SQTS – Swiss Quality Testing Services) for re-assessment. They check the sample for chemical and microbiological status and also for radioactivity, insecticides and Aflatoxins. If the sample conforms to the declared standards then the consignment is cleared and released to the importer.

If however the product fails to meet the standards as tested for by the independent laboratory then the following action is taken. If the product fails any test, which makes the product unsafe from the consumer health point of view then the product, is destroyed by burying the product with the addition of acid and a dye. If, on the other hand, the product fails to meet the declared standard, e.g. for fat content, then the product will be returned to the exporter.

All samplers are trained in proper sampling procedures and the Veterinary and Food Agency continue to improve inspection and sampling facilities at the border.

We were assured by Mr. Purrini that all importers of milk powders are licensed by his Department and, most importantly, all importers are known to the Kosovo Veterinary and Food Agency.

Annex 07

MAFRD, Dairying Working Group

Meeting with Peter Oldham, Policy Advisor, Ministry of Agriculture, Forestry and Rural Development. Present Peter Dickrell, Arben Musliu and O'Connor.

Discussed imports of dairy products into Kosovo and levels of customs tax (10%) and VAT (15%) levied. Peter said that a custom official at the border receives documentation with regard to the type of product, quantity and price. He gave an example of price per kg of cheese as Euro 1.50, which is much lower than the price from the factories in Pristina. Peter described his meetings with other players in the Dairy industry mainly the dairy processors who complain about the unfair competition from imports. I suggested to Peter that the manufacturer of the product should submit to the customs, in addition to the relevant invoices, a copy of a report from an independent agency (better still from a Regulatory agency) in the exporting country stating that the product conforms to the product description and is safe for human consumption. Results of some important chemical and microbiological criteria would be advantageous.

Rules and regulations are useful only if they are implemented and the infrastructure must be put in place to monitor, examine and validate the

Documents requested include a map of Kosovo indicating location of dairy processors and the main milk producing areas.

Meeting with Peter Oldham, Policy Advisor, MAFRD and Mr. Bajram Imeri, Director of Animal Production Department, MAFRD.

The purpose of the meeting was to discuss the activities and objectives of the Dairy Working Group (DWG).

Members of the Dairy Working Group include personnel from MAFRD, Swiss project and KCBS. Additional specialists from MAFRD and other agencies are called on when required.

DWG was set up in May 2005 with the objective of developing a seven-year plan for the Agricultural Sector, e.g. improve breeding of cattle and dairy cows, increase cow yields, improve animal reproduction and feeding and increase the market share for locally produced product.

At present there is no direct/formal contact with the Milk Producers Association and the Dairy Processors Association

The imports of dairy products was discussed and specifically the under valuing of product prices on the invoice. Milk powder is imported with an invoice price of 50 cent per kg. Milk powder is imported by companies that "do not exist".

Devolli and Sharri are the main processors using milk powder.

Mr. Oldham has suggested the use of indicative prices for dairy product imports. While this will counteract the undervaluing on invoices the use of indicative prices should be supported with a description of the product and a technical specification.

I will provide Bajram Imeri with a technical specification for whole milk and skim milk powder.

A total of 630 tons of milk powder were imported in the first 6 months of 2005. Mr. Bajram did not know the type/kind of powder imported.

Evaporated /concentrated milk is imported by Sharri (Frutti-Prizren-Kosovo) and is reconstituted and sold as UHT milk with different fat contents.

Meeting with Mr. Bajram Imeri, Director of Animal Production Department, MAFRD. Specifications for skimmed milk powder and whole milk powder (26%fat) were given to Mr. Imeri. It was pointed out to Mr. Imeri that these were examples of specifications, which can and should be added to or strengthened, by either the importer and/or the Regulatory Agency. The importer may be interested only in a basic specification regarding chemical and hygienic status. The Regulatory Agency will be particularly interested in the wholesomeness and safety of the Food and, depending on the source of the food, tests for pesticide residues, toxic trace elements and radioactivity may be required.

Meeting with Walter De Oliveira, (MAFRD) Team leader, Project on Strengthening Advisory and Support Services.

Mr. De Oliveira gave a brief account of his project and progress to date. At present they have 50 advisors located in Pristina and in the Municipalities. They recognize that this number is insufficient for the number of farmers (up to 83,000 with cows) and they are in the process of securing an association with a private organization to support and complement the activities of the 50 advisors. The 50 advisors are graduates in Agriculture from the University of Pristina. Mr. De Oliveira is optimistic that the demand for the service will be initiated by the farmer who will also pay for the advice. Mr. De Oliveira stated that his advisors have provided advice, albeit to a limited degree, to farmers on clean milk production.

Annex 08

Institute of Public Health Laboratory

We had discussions with Mr. Vehbi Tahiri, technician and Ms Aferdita Zuka.

There are 3 technicians in the Microbiology laboratory carrying out tests on food products. The tests include Total bacterial Count, Coliforms, Anaerobic bacteria, Streptococcus *faecalis*, Staphylococcus *aureus* and Salmonella.

Samples are collected from commercial outlets and from manufacturers.

Every month they carry out tests on about 30 samples of milk and dairy products.

Institute staff visit Vita and Sharri twice per month and collect finished product UHT milk samples.

Imported milk powders are sampled at the border and submitted to the laboratory for chemical and microbiological analysis.

They also test about 40 water samples per day. These water samples include samples from different municipal supply outlets and commercial bottled water from supermarkets. The assessment of drinking water quality is done by a comprehensive range of tests, e.g. turbidity, color, pH, chlorides, nitrites, nitrates, iron.

The laboratory has the capability to test for heavy metals, e.g. lead (Pb), Mercury (Hg), Cadmium (Cd). Bacteriological tests as listed above are also carried out. Samples are taken from swimming pools and are microbiologically assessed and chlorine content.

Chemical tests carried out on milk are, Organoleptic, water content, specific gravity, total solids, solids non-fat, lactose and peroxidase.

AOAC methods of analysis are used.

We met Dr. Tahire Maloku-Gjergji, Director of the Department of human ecology.

The objective of the visit was to obtain the cost of carrying out chemical and microbiological tests on milk. For 6-8 microbiological parameters the cost is €36. The cost of chemical analysis is,

Acidity	Fat	S. gravity	Taste	Tot solids	Lactose	Protein
€2	€5	€2	€3	€5	€3	€5

Samples are either taken by their own staff or sanitary inspectors from the Department of Health.

With regard to sampling of milk powders at the border the Director is critical of the quality/correctness of sampling.

Annex 09

KAMP, KDPA

Attended Board meeting of the Kosovo Association of Milk Producers

Topics for discussion at the meeting included a presentation by Kasim Bytyqi from the Kosovo Trust Agency on Agricultural land and assets privatization program.

The main purpose of our (Arturo Inda, Charles O'Connor) participation in the meeting was to give a brief outline of our qualifications and experience and the role we will play as consultants to the KCBS project. As we are in Kosovo to further assist the development of milk production and processing the assistance of KAMP members would be greatly appreciated

The General Manager of Devolli Dairy Plant, Mr. Ismet, is vice president of the **Kosovo Dairy Processors Association** (**KDPA**) and he gave a brief outline of the KDPA.

The main aim of the KDPA is to influence the Government on policy issues. There are 26 members of the KDPA and so far the Government has licensed 11.

The funding of the activities of the KDPA will be through membership subscriptions.

In the light of problems posed by imports it was suggested that funding should be provided to vigorously promote the nutritional and wholesomeness of dairy products produced in Kosovo

Meeting with the Chairman of Kosovo Milk Producers Association (KAMP)

The Chairman is Dr. Behlul Behluli.

KAMP was established in 2005 with the twin objectives of,

- Improving milk quality
- Improving milk quantity

Their main activities to date include

- Lobbying the Government
- Proper feeding, clean milk production and management of cows.

The Government promised a subsidy on milk but this has not materialized.

KAMP has 80 registered members with a potential for 150 members.

KAMP has a Board of 9 and they meet every second week. The members supply their milk to 14 different processors. The Association have good cooperation with the Milk Processors and have regular contact regarding milk quality and price. Where milk payment includes a bonus or penalty for Total Bacterial Counts milk producers sometimes question the accuracy and reliability of milk sampling and testing.

The main problems affecting the development of the Kosovo Dairy Industry are the imports of dairy products with low invoice prices, milk quality and the lack of mechanization in farming in general. The high rate of interest on borrowings is prohibitive.

It was suggested to Dr. Behluli that, in association with the milk processors, they should have a sustained campaign advertising the nutritional attributes of milk and dairy products.

Annex 10

Veterinary laboratory

Visit to the Veterinary laboratory, Pristina.
We had a discussion with Prof. Ragip Kastrati on the activities of his laboratory.
They have 1 technician and 2 assistants. They carry out tests for fibre, protein, fat, ash, water, calcium and phosphorus on animal feed concentrates and forage. They also carry out chemical analysis on milk samples from their experimental farm.
Concentrates are tested for protein by the classical Kjeldahl procedure.

Annex 11

University of Pristina

Met Dr. Skender Muji, vice dean of the Faculty of Agriculture.

The University of Pristina was established in 1970. It has 20 Faculties and 30,000 students. The Faculty of Agriculture was set up in 1974 with 1 Department in General Agricultural Engineering.

In 1984 three Departments were established, Plant Production, Fruit and Grain and Animal Production.

In 1994 two more Departments were added, Agro economics and Plant protection.

The above Departments provide a BSc degree after 3 years of study.

In 1995/1996 a Veterinary Department was set up and awards a Dr in Veterinary medicine after 5 years study.

At present there are more than 600 students within the Faculty and this year they will provide a Masters program. There are 50 academic staff within the Faculty and these are supplemented by about 70 staff from other Faculties who provide courses in subjects, which are common to a number of Faculties.

At present they are planning to set up a Department of Forestry and a Department of Food Technology and it is anticipated that the first intake of students to study in the Department of Food Technology will take place in 2006. After 3 years study a BSc degree will be awarded in Dairy Technology, Fruit and vegetable processing and Brewing. Considerable assistance is being provided by the French Government, e.g. a curriculum and detailed syllabus has already been compiled for the provision of courses in the Food Technology program. The Faculty of Agriculture is planning to have pilot processing facilities for milk processing, brewing, fruit and vegetable processing and a cattle-slaughtering line.

It is envisaged that by the year 2010 they will have the first graduates in Dairy technology, Fruit and vegetable processing and Brewing.

The University has a 10-hectare farm with sheep, cows, goats and poultry. These facilities are used for student training by the various Departments especially the students of Veterinary medicine.

Dr. Skender provides an advisory service to farmers especially in the area of clean milk production and the slides and training materials he uses are commended.

Annex 12

Ice cream Plant

Visit to Magic Ice – ice cream factory.

Met with the owner/manager Mr. Lulzim Aliu.

The factory was established 3 months ago. A Bulgarian company owns 30% and Mr Aliu owns 70%. The size of the building is 3,000sq.m.

The capacity of the plant is 10 tons per day and at present he is producing about 1.5 tons. Mr. Aliu plans to produce about 10 different flavored ice creams in consumer packs and for the retail trade.

Coconut fat is imported from Bulgaria and skim milk powder is imported from Hungary through the Pristina based Koral company.

Kosovo has about 25% self sufficiency in ice cream. Italy, Turkey, Serbia, Greece and Macedonia are the main exporters of ice cream to Kosovo.

Mr. Aliu is not aware of any standards for ice cream in Kosovo.

Sanitary inspectors take samples of the finished product primarily for bacteriological analysis. Mr. Aliu pays €37 for each sample tested.

Inspectors from the Veterinary and Food Agency visit his factory to check the sanitary conditions.

The ice cream manufacturing area is spacious, clean and relatively tidy.

We had a discussion on GMP and a copy of a checklist for GMP was sent to Mr. Aliu.

Mr. Aliu would like to use milk from local farmers but is not confident of receiving milk of the compositional and hygienic quality required.

Note: During the Summer time there is an excess supply of milk due to lack of processing capacity. There may be an opportunity for a small milk powder drying plant and this powder could substitute for some of the imports of skim milk powder.

Annex 13

Food Safety Control System for Kosovo (FSCK)

Meeting with Mr. Tony Wheale, Team Leader, Food Safety Control System Project.

The overall objective of the project is to support the Provisional Institutions of Self Governance in improving food safety in Kosovo by restoring public services related to public health, establishing a food standards and a food safety control system in order to protect consumer health and, to strengthen the institutions involved in all aspects of food control activities.

The project scope covers 6 key areas, Institutional, Legislative, Inspection, Communication/Information, Surveillance program, International links.

Included among the project objectives is the strengthening of the administrative and technical competences of the staff of the Kosovo Food Safety System (the Kosovo Food Agency-KFSA-and the Kosovo Food Safety Directorate-KFSD-through training and through reorganization to enhance effectiveness; Establishment of the legal basis for food safety policy and control in Kosovo in line with EU legislation; strengthening the expertise and technical capabilities of food control laboratories in conducting physical, microbiological and chemical analysis of food.

There will also be surveillance programs of food borne pathogens and residues and contaminants.

Annex 14

UNMIK

Meeting with Thierry Leprivey, Head of Department of Crime, UNMIK

Attended with Arben Musliu and Ms Laurence Grand-Clement. Laurence made a presentation on problems associated with the import of Dairy Products. She gave an overview of the dairy market including market size, milk producers and licensed importers. Hungary, Slovenia and Bulgaria are the main exporters of dairy products to Kosovo. The main immediate problem is that prices for UHT milk and cheese are significantly undervalued as per invoices presented at the border, e.g. UHT milk is invoiced at €0.34 and cheese is invoiced at €1.27 while the average retail price for these products is €0.65 and €4.50 respectively. Production costs for these products are calculated at 0.449 and €4.514 respectively.

Mr. Leprivey indicated that he understood the problem and that a similar situation pertained with the import of some alcoholic beverages, e.g. Red Bull.

The importing of dairy products at undervalued prices has an adverse effect on the economy of Kosovo and on the Dairy Industry in particular. There is a loss of revenue to the Government by undervaluing import prices and the profitability of milk processors is severely challenged with the knock on effect of lower prices for milk paid to farmers. With more than 50% of the working population of Kosovo directly and indirectly involved in agriculture any illegal trading activities would deal a severe blow to the viability of the agricultural sector.

The resolution of the above problems (undervaluing products at the border) can be approached in a number of ways, e.g. ensuring that the imported product is correctly described and classified and priced according to costings provided by the relevant agricultural organizations (processors, farmers) or based on their actual cost to the buyer.

With regard to the description and classification of milk and dairy products this presupposes the existence in Kosovo of the appropriate infrastructure to inspect, sample and test the imported products. In addition to establishing the conformance of the products to the classification an analytical facility will also ensure that the imported products are free of pathogenic bacteria and harmful chemical and chemical residues.

It was proposed by Mr.Leprivey that a meeting with Mr. Paul Acda, Director General, UNMIK customs would be useful

Annex 15

Skimmed Milk Powder specification

Product description	Produced from fresh, high quality skimmed milk by a spray-drying process. Available in low heat to high heat, calcium enriched, and high viscosity forms with or without added vitamins			
Compositional information			Specification	Typical value
	Moisture	% max	4.0	3.5
	Butterfat	% max	1.25	<1.0
	Protein	% min	34.0	35.0
	Lactose	% min	50.0	52.5
	Ash	% max	8.2	7.9
	Scorched particles	Disc	A/B	A
	Solubility index			
	-Low/medium heat	ml max	0.5	0.1
	-high heat	ml max	1.0	0.5
	Titratable acidity	% max	0.15	0.14
	Whey protein nitrogen (WPN)			
	-low heat	mg/g	>6.0	6.5
	-medium heat	mg/g	1.51-5.99	3.5
	-high heat	mg/g	<1.5	1.0
	-high heat, heat stable	mg/g	<1.5	1.0
	Color		cream/white	cream/white
	Flavor		No off flavors	
Microbiological data			Specification	Typical value
	Total Plate Count			
	-low heat	/g max	50,000	40,000
	-medium heat	/g max	40,000	5,000
	-high heat	/g max	10,000	1,000
	Coliforms	/g	negative	negative
	Staphylococcus -coagulase +	/0.1g	negative	negative
	Salmonella	/25g	negative	negative
Packaging	Multi-paper sacks with polyethylene liner, net weight 25kg			
Applications	• Yoghurt • Ice cream • Bakery and Confectionery • Chocolate • Processed cheese and spreads • Infant formulae • UHT milk • Recombined sweetened condensed milk • Evaporated milk			

Annex 16

Whole Milk Powder Specification

Spray Dried Full Cream Powder – 26%Fat

Product Description	Produced from fresh, high quality, full fat milk by a spray-drying process, with or without added vitamins			
Compositional information			Specification	Typical value
	Moisture	%max	3.5	3.2
	Butterfat	%min	26.0	26.2
	Protein	%min	26.0	26.5
	Lactose	%min	38.0	39.0
	Ash	%max	6.0	5.8
	Scorched particles,		Disc A/B	A
	Solubility index,	ml max	0.5	0.1
	Acidity	%max	0.15	0.11
	Color		cream white	cream/white
	Flavor		No off flavors	
Microbiological Data			Specification	Typical value
	Total plate count	/gmax	5,000	100
	Coliforms	/gmax	negative	negative
	Staphylococcus (coagulase +)	/0.1g	negative	negative
	Salmonella	/25g	negative	negative
Packaging	Multiply paper sacks with Polyethylene liner, net weight 25kg			
Applications	Confectionery Recombined milk			

The above is a basic specification and a more detailed specification can be agreed with the customer.

Annex 17

Mozzarella cheese specification

Description	Mozzarella cheese is part of the Pasta Filata family of Italian cheeses with functional characteristics tailored to meet specific requirements.			
Compositional information			Specification	Typical value
	Moisture	% max	52.0	48.0
	Fat in dry matter	% min	36.0	40.0
	Fat	%	18.0-22.0	21.0
	Salt	%	1.1-1.9	1.5
	pH		5.0-5.4	5.2
Microbiological data			Specification	Typical value
	Coliforms	/g	<100	<10
	E.coli	/g	<10	negative
	Yeast	/g	<50	<10
	Mould	/g	<50	<10
	Staphylococcus (coagulase +)	/g	<10	negative
	Listeria monocytogenes	/25g	negative	negative
	Salmonella	/25g	negative	negative
Nutritional information			Typical value /100g	
	Energy	kcal	292	
	Protein	g	28	
	Carbohydrate	g	0.2	
	Cholesterol	mg	27.4	
	Saturated fat	g	14	
	Unsaturated fat	g	7	
Taste	Free from objectionable odors and taints			
Appearance	Uniform creamy yellow color. No whiteners or coloring agents added.			
Texture	Close well knit texture, with a firm body that is easily shredded			
Packaging	2.5kg & 10kg blocks Grated (100g-5kg packs) and diced format			
Applications	Mozzarella is suitable for a wide variety of food ingredient applications including bakery, confectionery and other convenience food products			

Annex 18

Emmental cheese specification

Description	Emmental cheese is a hard distinctive Swiss type cheese with characteristic eye formation			
Compositional information			Specification	Typical value
	Moisture	% max	40.0	38.0
	Fat in dry matter	% min	45.0	46.5
	Fat	%	28.0-31.0	29.0
	Salt	%	0.5-1.0	0.75
	pH		5.4-5.8	5.6
Microbiological data			Specification	Typical value
	Coliforms	/g	<100	<10
	E.*coli*	/g	<10	negative
	Yeast	/g	<50	<10
	Mould	/g	<50	<10
	Staphylococcus (coagulase +)	/g	<10	negative
	Listeria *monocytogenes*	/25g	negative	negative
	Salmonella	/25g	negative	negative
Nutritional information				Typical value/100g
	Energy	kcal		382
	Protein	g		29
	Carbohydrate	g		Trace
	Cholesterol	mg		83
	Saturated fat	g		20.3
	Unsaturated fat	g		8.7
Taste	Characteristic sweet and nutty flavor with a fragrant aroma			
Appearance	Yellow straw color, with no free fat, mottling or other surface blemishes present.			
Texture	Firm and pliable, elastic with numerous eyeholes throughout the cheese.			
Packaging	2.5kg, 5kg, &60kg blocks Grated (100g-5kg packs), sliced and diced format			
Applications	Suitable for table use and for a wide variety of food ingredient applications including bakery, confectionery and other convenience food products. Good for cutting, slicing and grating.			

Annex 19

Checklist for Good Manufacturing Practices (GMP)

Page____of _____

1.3 PLANT & GROUNDS

	YES	*NO*
1. Are grounds litter-free and is grass properly cut?	□	□
2. Is drainage adequate?	□	□
3. Are areas sufficiently dust free?	□	□
4. Is there sufficient space to allow adequate sanitary practices?	□	□
5. Are floors, walls, and ceilings constructed to allow adequate cleaning and repair?	□	□
6. Are fixtures, ducts, and overhead pipes installed to prevent drippage into product and materials?	□	□
7. Are aisles between equipment and walls unobstructed?	□	□
8. Are processing areas so arranged as to prevent contamination?	□	□
9. Is adequate lighting throughout and are safety fixtures used in critical areas?	□	□
10. Is there adequate protection (screening) against birds, animals and vermin?	□	□
11. Is there adequate ventilation?	□	□

1.4 EQUIPMENT & UTENSILS

12. Are equipment and utensils made of proper materials and of sanitary design to facilitate cleaning and sanitary maintenance?	□	□
13. Are equipment and utensils mechanically maintained?	□	□

1.5 SANITARY FACILITIES & CONTROLS

14. Is water supply adequate in quality, quantity and temperature in areas where needed?	□	□
15. Is the sewage disposal system adequate?	□	□

	YES	*NO*
16. Is plumbing of adequate size to carry sufficient water to all required locations?	□	□
17. Is plumbing of adequate size and design to convey sewage from plant?	□	□
18. Is plumbing of adequate size and design not to create an unsanitary condition?	□	□
19. Is there adequate drainage where needed?	□	□
20. Are toilets properly located, designed, sanitary and adequately equipped?	□	□
21. Are the toilet room doors self-closing and do not open to crucial areas?	□	□
22. Are hand-washing signs posted in toilet facilities?	□	□
23. Are adequate and convenient hand-washing facilities in appropriate locations and properly furnished?	□	□
24. Is rubbish disposed of properly?	□	□

1.6 SANITARY OPERATIONS

25. General maintenance: Are physical facilities maintained in good repair and sanitary condition?	□	□
26. Are cleaning operations and chemicals used safely and effectively?	□	□
27. Are effective measures taken for control of animals, birds and vermin?	□	□
28. Are insecticides and rodenticides safe for food operations and properly used?	□	□
29. Are insecticides and rodenticides stored away from syrups, concentrates, and water treating chemicals?	□	□
30. Are product contact surfaces of equipment and utensils cleaned and sanitized on schedule using adequate methods?	□	□
31. Where necessary, is product contact equipment cleaned and sanitized prior to use following an interruption?	□	□

32. Are non-product-contact surfaces cleaned on schedule using adequate methods? □ □

33. Is cleaned and sanitized equipment properly stored? □ □

1.7 PROCESSES AND CONTROLS

34. Is overall sanitation responsibility assigned to an individual? □ □

35. Are warehouse and stockroom storage conditions satisfactory? □ □

36. Are raw materials and ingredients inspected and stored to minimize deterioration and protected against contamination? □ □

37. Is ice used in food products from potable water and manufactured and handled in a sanitary manner? □□ □

38. Is processing equipment maintained in sanitary condition? □ □

39. Is sanitation testing and inspecting performed where necessary? □ □

40. Is rejected or contaminated product disposed of properly? □ □

41. Do packaging processes and materials avoid transmission of contaminants to product? □ □

42. Is adequate coding of products used? □ □

43. Are production records kept? □ □

1.8 PERSONNEL

44. Are all production personnel certified as to health? □ □

45. Is proper action taken when undesirable health conditions occur? □ □

46. Does management promote hand washing by production personnel? □ □

47. Is clean and proper attire worn by plant personnel? □ □

YES *NO*

48. Are insecure jewelry and loose items removed from workers manipulating ingredients? □ □

49. Is the use of tobacco and food and storage of personal belongings prohibited in processing areas? □ □

50. Is effective hair restraint or head covering worn? □ □

51. Do production personnel take all necessary precautions to prevent product contamination? □ □

52. Are personnel trained in sanitizing techniques and food protection principles? □ □

53. Are competent supervisory personnel assigned responsibility for assuring compliance with GMP`s by all personnel? □ □

Notes: _____
_____
_____
_____
_____

(Use supplemental sheets for additional notes if necessary)

Surveyed by: _____

GMP SANITATION GUIDELINES

INSTRUCTIONS FOR USE OF GMP SANITATION CHECK-LIST

1.3 Plant and Grounds

1. Refers to all areas outside of plant. Check for old, worn out, or discarded equipment and materials which may be stacked up behind plant, etc. Also check for uncut grass, weeds and rubbish that could harbor rodents and insects.
2. Look for low spots or pot holes that catch run off water. Drainage should be away from plant. There should be no seepage into plant.
3. Is there enough dust to be a potential source of contamination?
4. Look for crowded plant conditions and equipment so close to walls and other equipment as to make it unwieldy to clean/repair. The subject here is whether or not there is a sufficient space to operate and how the space is used.
5. The construction should be such that floors and walls etc. are cleanable. This question does not refer to whether they are, in fact, clean.

Example: the filter room ceiling should be impervious to moisture. There should be no support structure for catching dust, dirt, etc., they may contaminate the product. Floors should be concrete or tile; the walls of tile, smooth epoxy-painted block, or similar construction.

6. Check for hanging fixtures, ducts, and pipes over critical working areas that could cause drippage or condensate that may contaminate product, raw materials or food contact surfaces.
7. Determine that there is sufficient working space between pieces of equipment and between equipment and walls so that employees can perform their duties without contaminating product or product contact surfaces.
8. Check for separation by partition, location, or other means for those operations that may cause product contamination

a). Cleaning and lubricating materials should be stored so that they are isolated from product manufacturing areas and product ingredients storage.

b). Check location and storage conditions of product.

9. Critical areas are dairy, evaporator, drier and bagging-off. Safety features such as sheets over light bulbs or fluorescent tubes to catch broken glass are required. Gloves, shields, and other light coverings should be highly impact resistant.
10. Windows and doors that may be opened to allow ventilation to critical areas must be adequately and effectively screened. If air screens are used determine to your best judgment that they move enough air to be effective.
11. Determine that all areas in the plant are properly ventilated to minimize odors, fumes and noxious vapors (including steam) that may contaminate product with airborne particles.

1.4 Equipment and Utensils

12. Consider here the materials and sanitary design of the equipment and utensils. The equipment and utensils must be constructed, designed and installed to allow for ease in sanitary maintenance. The equipment and utensils should be suitable and appropriate for the job in which they are used. Examples of utensils are: scoops.
13. Deficiencies in the mechanical condition of the equipment and utensils should be determined here. An example would be leaking filler valve as a result of poor mechanical maintenance. Also, equipment that has rusted so badly that proper mechanical operation is impaired. Other examples are leaking caustic, water, and pumps and lines.

1.5 Sanitary Facilities and Controls

14. If city water is used, assume it to be adequate in quality unless there is evidence to the contrary. Unless there is apparent evidence that the supply is inadequate assume the quantity to be OK. Determine that sufficient hot water is available for cleaning equipment and utensils. (Hot water used for general clean up is usually considered to be at least 140°F). If a private well is a source of raw water, ask the manager if the water has been certified as potable. Ask to see recent Health Department analysis of water. If not available, encourage manager to have one available for next survey.
15. Assume sewage disposal is adequate unless there is definite evidence to the contrary.
16. Is plumbing of adequate size to provide sufficient quantities of water to required locations? Judge on basis of water pressure and volume at representative outlet.
17. Assume sewage plumbing to be adequate in size unless there is evidence to the contrary.
18. Drains, traps, and sumps should be maintained in a sanitary condition. Plumbing should be of adequate size to carry off water from drains. See that traps and sumps are free and open. Odour is usually a reliable indication for this item.
19. See that adequate and properly installed drains are located in areas of the plant where water is apt to gather. Adequacy is judged by evidence of water not standing in drain.
20. See that ``sufficient`` number of toilets are convenient for use, and that toilet rooms are adequately equipped with hand washing facilities (including disposable towels, soap, toilet tissue) and are in good repair. Sufficiency of number of toilets is a matter of judgement unless there is available knowledge of local or state guidelines, which usually specify ratio of toilets for employees.
21. See that doors are self-closing and not propped open.
22. See that signs are posted in a conspicuous place directing employees to wash hands using soap before returning to work.
23. Hand washing sinks are needed at locations in addition to those at toilet area.
24. Determine if plant properly disposes of refuse and rubbish, especially from the processing area, in a satisfactory and prompt manner. Preferably this would entail frequent removal to exterior of plant.

1.6 Sanitary Operations

25. The subjects of investigation here are facilities that are not directly related to manufacturing of the product. The building, fixtures and other physical facilities are, for example: roof, stairs, air-conditioning equipment, truck maintenance/repair area, steam generators, air compressors, light fixtures, electrical wires and conduits, cooler repair/painting equipment, heating facilities and the like. Here it should be determined if these items are in generally good repair and in sanitary condition.
26. Here determine if the cleaning operations are conducted in such a manner that contamination of food products and food contact surfaces is prevented. Also determine what chemicals are used in the cleaning operations for product contact surfaces and non-product contact surfaces including machinery, floors, walls etc. Determine if these chemicals are ones that are generally accepted in the food industry.
27. Ask the plant management to outline controls exercised to exclude pests, animals, birds, and vermin. Determine if the controls as outlined appear to be effective by making observations in critical areas for birds, insects, flies, mice droppings, roach eggs, roaches, etc.
28. Determine to the best of your knowledge that the insecticides and rodenticides are safe; and that they are effective when used with the precautions and restrictions that will prevent contamination of the product. The most common insecticides considered safe for use in food industry are pyrethrins and piperonyl butoxide. Accepted rodenticides are of the Di-Coumerol type (such as D-Con). Some unacceptable insecticides and rodenticides are DDT, Malathion, Sodium Fluoride, etc.
29. Make sure that insecticides or rodenticides are not stored in areas where concentrates, syrups, or water treating chemicals are stored.

30. Determine that the plant has a time schedule outlined to allow for frequent cleaning and sanitizing of equipment and utensils. The frequency must be such as to ensure all product contact surfaces are kept clean and sanitary at all times. The question here is whether there is a pre-determined, working, organized program for sanitary maintenance. Evidence of this type of program would be written programs, charts, and/or appropriate documentation giving dates and times of last cleaning and sanitizing.
31. Product processing equipment, which has been out of service for several days should be cleaned and sanitized before use. If during the manufacturing process, it becomes necessary to stop the equipment for repair or inspection, such equipment that is repaired or replaced should be cleaned and sanitized.
32. Instructions given for Item 30 apply here also. But in this case reference is to programs for exterior portions of processing equipment, which are non-product contact surfaces.
33. This means that all potable or removable cleaned and sanitized equipment and utensils that contact the product must be stored in a location and manner, which will prevent contamination.

1.7 Process and Controls

34. The regulation states that an individual shall be assigned the responsibility for overall plant sanitation. Determine through the plant management if in fact they have assigned responsibility to an individual. Best evidence is a memo, letter, or organization chart. Strongly recommend one of these options be accomplished.
35. The warehouse and stock room area should reflect good housekeeping and sanitary principles. Full goods and supplies should be stored 18`` to 2` away from walls. There should be no excessive heat and humidity should be reasonable and normal.
36. Examples of raw materials and ingredients are: Concentrates, sugar (liquid and granulated), finished syrup and treated water. Inspect the conditions under which these items are stored to see that they are protected against contamination and will be subject to minimal deterioration. Proper storage conditions would preclude excessive heat and humidity and provide orderly storage in a clean environment. Segregate items that may cause cross-contamination. Examples of adequate storage are:-

(a) Passed product should be labeled as such.
(B) Pending product should be labeled as such.
(C) Reject product should be labeled and segregated as such.

37. Any unsanitary condition found on or inside any and all pieces of equipment that are directly related to production and product manufacture would come under this question. When it is impossible to observe directly the interior portions of equipment, spot checks may be made by asking the superintendent to remove certain filler valves, disassemble syrup pumps, syrup lines and proportioners, etc., for inspection. In this instance, do whatever you consider reasonable and practical for the accomplishment of the task at hand.

1.8 Personnel

38. All persons employed in the manufacture or processing of food must be certified as to health. Assurances must be obtained from plant management that these certifications are valid and up-to-date as required by local or State regulations.
39. Assume that no undesirable health conditions exist unless there is evidence to the contrary. Make a quiet observance of employees for evidence of sickness or disease.
40. Ask plant management if employees are instructed to wash hands before starting to work and after each absence from workstation. Observe employees to determine compliance.
41. Observe the attire worn by personnel and determine if it is proper and clean. Complete uniforms are considered proper attire.

42. Observe employees and determine if they are in compliance by having insecure jewelry removed.
43. Check to see that food, drink, and tobacco are used only in those suitable areas designated for this purpose. Make observations around plant for evidence that smoking or eating is done in designated areas only. Cigarette butts, tobacco packages, candy wrappers or matches can be evidence of non-compliance.
44. All personnel, while in food processing area wear effective head covering. Observe all persons, (including yourself), for compliance. This includes workers from general office or other areas who may be in the processing area for any reason.
45. Determine as best you can if personnel take necessary precautions to prevent product contamination.
46. Determine if the personnel responsible for sanitation are qualified both on training and experience to provide a level of competency necessary for production of clean and safe food. Determine if there is a training program, either formal or informal, to instruct food handlers and supervisors in sanitation procedures. This is especially important for new employees.

Make sure that the management is aware of this stipulation in GMP and determine that management is satisfied with competence of the supervisory personnel who have been assigned the responsibility of compliance to GMP.