

ASSESSMENT OF THE STATUS OF THE ALBANIAN MILK QUALITY TESTING SYSTEM

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Abstract

Milk production has a long tradition in Albania and still plays an important role in agriculture and rural development. According to MAFCP for the year 2010 the total domestic milk production in Albania is about 1 Mio tons from which cow milk production is about 86%, small ruminants 14% imported 10%. Milk production holdings and milk processing units are in average very small. In the majority of production holdings and processing units traditional technologies are applied. Farm gate price for milk is not based on parameters for quality. Regular testing of the quality of raw milk is important instrument for the development of dairy sector and consumer protection. Parameters to evaluate milk quality are fat, protein, lactose, for food safety Total Bacteria Count (TBC per ml), Somatic Cells Count (SCC per ml) and residues in the milk. This study was carried out by the Albanian Dairy and Meat Association, from November 2011 to February 2012 and we have asses the production and testing system. An integrated system of raw milk quality testing by collection of representative number of milk samples from production holdings to check the compliance of raw milk quality is currently not in place. Neither the National Food Authority nor the private dairy sector is performing continuously this task. Some activities on raw milk testing are going on at public institutions and the private sector but they are not linked. Results from non-representative investigations are usually not published or distributed to the stakeholders of the sector. A system of laboratory ring tests to monitor the reliability of the results of the different labs which are performing milk quality tests is currently not in place. Also the national reference lab of the Food Safety and Veterinary Institute of Albania (ISUV) is not accredited for those tests.

Keywords: *Albania, milk quality testing system, status assessment.*

Introduction

Milk production has a long tradition in Albania due to favorable natural resources for large and small ruminants and still plays an important role in agriculture and rural development. According to the official statistic of the Albanian Ministry of Agriculture Food and Consumer Protection [1] for the year 2010 the total domestic milk production in Albania is currently about 1 Mio tons from which cow milk production is about 86% whereas 14% come from small ruminants. In addition to the domestic milk production about 10% of milk consumed (in raw milk equivalent) had been imported during the last years. Milk production holdings as well as milk processing units are in average very small in Albania. [1] In the majority of production holdings and processing units

traditional technologies are applied. Farm gate price for milk is usually not based on parameters for quality.

Professional milk quality testing is an essential component of any dairy sector and should be performed for various reasons. First, it can serve dairy farmers, milk collectors, milk processors and further actors in the milk chain to identify the quality status and weak points in their ongoing activities. Secondly, it helps the staff involved in milk quality monitoring (e.g. in processing plants and competent public authorities) in assuring that final milk products on the shelf meet the consumer's expectations for a safe and nutritious high quality food product.

High quality of raw milk is required to produce high quality dairy products. Many factors can influence the quality of raw milk during the production on farm, storage, collection and transport to the milk processor. Once the raw milk is of weak quality, only simple milk products can be processed from that raw material (e.g. UHT milk products) which finally affects not only the farm gate price but also the competitiveness of the whole dairy sector. Therefore it is important that raw milk is produced and stored properly on farms and collected and transported from a dairy farm to a milk collection point and to processors under conditions that do not reduce its quality or, consequently, the potential quality of the final milk product for consumers [5, 7].



Figure 1: Factors of Milk Quality

Tests are designed to ensure that raw milk or milk products meet accepted standards for chemical composition and purity as well as levels of different micro-organisms [3,8,10]. Milk is a highly perishable food product and an excellent medium for transmitting a variety of diseases.

Professional milk quality testing according to international recognized standards is costly. However the application of a good and efficient milk quality testing system is an important tool to strengthen the competitiveness of a country's dairy sector as well as to serve consumers with safe milk products [5,6,11]. The implementation of a system with regular and representative milk analysis taken by random sampling from milk production holdings or at least milk collection centers is a precondition for Albania to export milk or milk products to other countries, in particular with regard to the future integration into the internal EU market [11]. Regular testing of the quality of raw milk is a very important instrument for the development of the Albanian dairy sector and to protect the consumer in buying a safe domestic milk product. [2,4,5] An internationally competitive dairy industry with open markets requires a milk production with excellent domestic

quality standards. Otherwise the import of milk and milk products could increase step by step. Internationally recognized parameters to evaluate milk composition are in particular fat, protein and lactose and for food safety aspects Total Bacteria Count (TBC per ml), Somatic Cells Count (SCC per ml) and the evidence of residues (antibiotics) in the milk. [9,10,11,12]

Aim of study

The aim of the study it was to identify strengths, weaknesses, potentials, strategies and specific needs for further development

Material and methods

This study for initial assessment of the current status of the Albanian milk testing system was carried out by the Albanian Dairy and Meat Association (ADAMA) from 16 November 2011 to 29 February 2012, through the support of the Netherland Development Organization (SVN)..

This initial assessment shall contribute to strengthen the quality control of the raw milk through the establishment of a quality control system in Albania, and to a consolidation of the responsible administrative structure and implementation of the food safety standards in accordance with the EU standards.

The study it was based on the analyses of the two main elements:

- Analyses of the existing raw milk quality monitoring system in Albania;
- Elaborate major elements of a future system complying with EU requirements;

Results and discussion

Legal framework in Albania for the dairy industry

The national legal framework for food safety and animal health is defined particularly by the following national laws and regulations:

- National Food Law
- Veterinary Law
- Milk Law
- National Hygiene Package for Milk (approved in 2011)
- Several amendments and secondary regulations related to the Laws mentioned above (which are relevant for dairy sector)

In the year 2007 the Milk Expert Committee of Albania approved by the Consul of Ministries decided for the transition of the microbiological norms in the raw milk in order to improve the quality.

Key organizations involved and available lab infrastructure

This part describes briefly the key stakeholders which are directly or indirectly involved in food *safety and animal health issues with relevance to milk quality aspects and milk testing in Albania.*

Public organizations:

National Food Authority (NFA) The NFA was established in 2010 as part of a program to improve food safety and is the competent authority for food safety issues in Albania. NFA is an institution that is subordinated to the MAFCP. NFA had about 55 persons working in its headquarter in Tirana and about 500 persons working in the 12 Regional Food Authorities of NFA. NFA is composed of 3 directories:

1. Management of the risks and coordination of food inspections
2. Risk assessment and communication of food products
3. Internal services

A regional veterinary & food lab usually consists currently of 4-5 technical staff. A regional lab of NFA is usually performing basic analyses related to animal health, plant material, plant protection and food safety control. In 2011 a total of about 1,163 samples of milk or milk products had been tested by all labs of NFA.

Milk samples are usually taken by food inspectors only if something occurs to be critical or on specific request. Regular and representative collection of samples of raw milk from milk production holdings taken by random sampling to check the compliance of raw milk quality with national legislation and targets is not performed by NFA.

NFA also works closely with the Ministry of Health and Ministry of Interior in terms of guaranteeing the health of the consumer.

Food Safety and Veterinary Institute (ISUV) The ISUV located in Tirana was established in 2007 and was the former National Research Institute for Veterinary and Food. The ISUV has currently about 100 staff members in Tirana and is organized in 5 departments. The Institute has no regional structure or staff. The Department for Food Safety within ISUV is responsible for issues dealing with milk quality testing. This department is operating the national reference lab for food control and is performing milk testing particularly on request of NFA, public or private veterinarians and private operators of the dairy sectors. ISUV has two lab sections:

1. Microbiological section for microbiological tests, e.g. Total Bacteria Count, presence of *E. coli*, Coliform count, Somatic Cells Count, residues, pathogens as *Listeria monocytogenes*, *Salmonella spp.* and potential enterotoxin producers as *Staphylococcus aureus* and *Bacillus cereus* etc.
2. Analytical test for milk contents, e.g. fat, protein, lactose, added water etc.

Both lab sections are covering all kinds of food. Ring tests for the supervision and support of the 12 regional public labs of NFA and relevant private labs are currently not in place for milk testing. The national reference lab is accredited for some tests for fish and meat products which Albania wants to export, but not for milk products. Currently about 1,200 samples of food are analyzed per year at the lab of ISUV. Of them about 500 samples are related to raw milk or milk products. Only about 100 samples per year are related to raw milk testing and about further 400 samples are

dealing with milk products. With regard to milk the capacity of the lab is about 20 milk samples per day according to the information received by the head of the lab.

Directorate for Animal Health Services at MAFCP. The Directorate for Animal Health Services at MAFCP in Tirana is the competent authority for animal health and consists of two sections:

1. Animal health and welfare
2. Animal identification & registration

MAFCP Directorate for Animal Health Services is responsible for safeguarding the health (and productivity) of domestic livestock populations and protecting the human population by controlling zoonotic diseases in national livestock and wildlife populations and preventing the contamination of foods of animal origin. With regard to food quality aspects the Directorate is only engaged in the milk chain at farm level (supervision, control and support of operators with animals).

The Directorate for Animal Health Services of MAFCP is carrying out the national plan for residues and is reporting to DG Sanco. Activities related to the national plan for residues are currently focused on food products relevant for export, e.g. meat products of small ruminants, eggs and fish products.

In the year 2010 about 2,000 samples have been analyzed on residues (group A). Out of them about 300 raw milk samples of small ruminants have been analyzed. The lab analyses were performed at ISUV.

Directorate of Extension Service, Science and Agricultural Information (DESSI). The public agricultural extension service in Albania is supporting farmers with information and advice. DESSI consists of three levels: central level, regional level and field level. At central level, the extension service is under the Directorate of Extension Service, Science and Agricultural Information (DESSI) in the MAFCP. The Extension service sector is responsible for strategy formulation as well as for the management and organization of this service at national scale.

Agricultural Technology Transfer Centers (ATTC) are also part of the central structure. Main tasks of the Agricultural Technology Transfer Centers (ATTC) are as follows: introducing new methods, inputs and technological packages; conducting of farm research and testing based on problems raised by farmers in respective regions; training of technical expertise to extension service staff and farmers; demonstration of new technologies of animal breeding; and preparing and publishing extension materials intended to specialists and farmers.

Universities and relevant Faculties. Further public institutions dealing with food quality or animal health issues are the Faculty of Biotechnology and Food and the Faculty of Veterinary Medicine of the Agriculture University of Tirana as well as the Faculty of Natural Science of the University of Tirana.

The Agriculture University of Tirana and its Faculty for Biotechnology and Food is dealing with the education of agro-food engineers, bio technologists and specialists for food and food safety issues. Beside the education and research activities no specific activities related to milk testing are going on.

Ministry of Health and Institute for Health. The health system in Albania is mainly public. The state provides the majority of services offered to the population in the field of promotion, prevention, diagnosis and treatment. The public sector plays the leading role of the Ministry of Health which is responsible for drafting policies and strategies of the health system and for its regulation and coordination of all stakeholders inside and outside the system.

Higher technical institution in the field of public health is the Institute of Public Health who is a national institution directly subordinated to the Ministry of Health. Its duties include the research and monitoring of risk factors, surveillance of infectious diseases, as well as reference lab management of immunization programs. The Institute of Public Health has no official tasks on regular food inspection related to milk quality and is only sometimes involved in

Private organizations

Albanian Dairy and Meat Association (ADAMA). ADAMA was established in 1997 as a non-profit organization representing the interests of dairy & meat processing business. The office is located in Tirana. ADAMA has currently 60 members (48 dairy and 12 meat processors) and most of the members are the bigger sized units of the sector, especially in the dairy sector. Services are also provided to non-members if they are able to pay fees for services. ADAMA has a lab for chemical, physical and microbiological analysis which is used for raw milk, milk products as well as for meat and meat products. In 2010 about 130 samples of raw milk or milk products had been tested at ADAMA's lab. In 2011 the number of milk tests increased to more than 800 which in particular due to the support of this SNV project.

Milk processors & milk collectors. Only very few milk processors currently dispose of a milk lab. Most of the dairy plants that are equipped with complete milk processing lines and that are close of the required standards dispose of a lab for milk testing. The existing labs are typically equipped for testing of raw milk on physical and chemical indicators, quick tests (fat content, protein, lactose, density, added water and pH). Specific milk analyzers' (from Bulgarian lab equipment producers) are also existent but usually don't use reference methods. Processors with complete milk processing lines usually have also basic equipment for the measurement of other indicators such as titration acidity, CMT (California Mastitis Test) and antibiotic residues. There are only two dairy plants which are (regularly) testing the microbiological indicators (TBC). 10 dairies are equipped with Cryoscope measuring the milk freezing point on deduction of the added water in the raw milk. Also more than one hundred of the small milk processing units dispose of simple milk analysers. Very few milk processing units (approx. 4-5) are using the simple test Resazurin or metil blu test that indicates the shelf life of raw milk.

The milk collectors mostly depend on the milk processing units. Independent private milk collectors are collecting the milk and are selling it to the milk processing units. They are collecting the milk on the street, in the centre of the village or from door to door. There are few MCC (less than 50) permanently equipped with a milk room with cooling equipment (cooling tanks or plate heat exchanger) and mostly owned by the private milk collectors who sell the milk to the dairy plants and some of them directly to the markets in the cities. They are typically equipped with simple milk analysers as described above.

Suppliers of milking and cooling equipment Due to the specific size of farms only few companies are active in selling milking and cooling equipment for dairy farms in Albania. Specific focus is on the equipment for small farms (small milking machines and cooling tanks). Noticeable is the significant presence of plastic milk storage tanks in the country which is not a good solution for good milk quality at all. Commercial livestock farms especially those with a number of cows of over 100 dispose of a milking parlour system with automatic milking and a milking room with cooling tanks.

Discussion about raw milk quality testing in Albania in practices

According to the national food legislation, food processors should take care that raw milk has to be tested twice per month as self-control (“auto-control”). As most processors don’t have labs or only very simple analysis equipment, the private sector is currently not in the position to fulfill this requirement. As a system of milk testing is not developed and supported by the state, pro-active monitoring of raw milk quality on a regular basis with systematic evaluation, reporting and communication of results is currently not applied in Albania. Currently milk testing in practice in Albania can be described more or less as reacting on existing problems with milk quality at farms, milk collection centers or processors.

A national sampling plan is currently not in place. Statistics and evaluation reports from previous milk tests done by public or private organizations are only very fragmented available, usually not published and organizations involved are not fully aware of activities done in other organizations. Ring tests are not going on. The reference lab at ISUV is not accredited for the obligatory milk test. Regional labs of NFA are suffering from a lack of financial resources (lab kit etc.) (personal communications).

Food inspectors are also suffering from a lack of financial resources (transport, fuel etc.) and clear instruction or guidelines for the practical food inspection activities (personal communications).

Until now only a small number of milk samples per year are collected and analyzed. The lab analysis of TBC, SCC, residues and other parameters is currently very costly due to traditional manual analysis methods that are still applied in the labs.

The existing lab infrastructure and resources are currently not suitable to perform twice per month raw milk tests of commercial-oriented milk producers according to the national legislation. For example if the raw milk of 10,000 commercial-oriented milk production holdings in Albania needs to be tested twice per months, already minimum of 240,000 raw milk samples have to be tested per year for food safety requirements.

A Dairy Herd Improvement (DHI) system in accordance with the standards of the International Committee of Animal Recording (ICAR - www.icar.org) is currently not existing in Albania.

Only simple method for detecting high SCC (e.g. California Mastitis Test) is usually applied.

During the years from 2008 till now the legislation was harmonized which defines the standard to verify if raw milk delivered to milk processing plants is of acceptable quality.

A number of representative milk samples of raw milk collected from farms in random way should be checked in accordance with points of 28 and 29 of this directive. [2,4,]

The control can be carried out by, or for account of:

- a. Food operator business that produce the milk;
- b. Food operator business that collect and process the milk;
- c. A group of the business food operators or in the context of the official control scheme, regional or national.

In practice, the current situation of the official sampling and control of raw milk varies from establishment to establishment according to the individual food inspector concerned. It is more or less no control on raw milk going on in most of the small dairies. With regard to raw milk quality, Albania obtained derogation for strict implementation of the requirements until 1st January 2014 [2] Therefore until now non-compliant milk can be processed without any sanctions.

Conclusions

- Integrated system of raw milk quality testing with representative number of samples of raw milk collected from (commercial) milk production holdings taken by random sampling to check compliance with national requirements is currently not in place in Albania.
- With regard to the EU alignment process, there is no fixed „EU standard” with regard to the institutional and organizational arrangements of the milk quality monitoring systems in a strict sense. The relevant EU regulations are just laying down the criteria for raw milk to conform to EU standard, the minimum number of samples to be analyzed per month and further aspects to achieve representative results. There are different „solutions” in the 27 EU Member States to organize milk quality testing with different grades of compliance to the rules.
- It is one of the tasks of the Government and the dairy sector of the country to establish a system which is in compliance with the rules and that the system is appropriate to the specific natural, structural and financial conditions and infrastructure of the country.

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