

RESEARCH ARTICLE

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Awareness about Livestock Standards - the Case of Dairy Farmers Albania and Kosovo

YLLI BIÇOKU^{1*}, MEDIN ZEQRIRI², GRIGOR GJEÇI³¹Department of Animal Production, Agricultural University of Tirana, Tirana - Albania²Food Science and Biotechnology UBT, Lagja Kalabria, 10000 Prishtinë Kosovo³Ministry of Agriculture and Rural Development, Tirana - Albania.

Abstract

The aim of this exploratory study was to assess the farmers' awareness about food safety standards. We are focused on farmers' awareness about food safety institutional framework, animal disease, and national food safety standards. A total of 144 dairy farmers in two regions of Albania, and 150 ones in two regions of Kosovo, with more than four cows per farm, were interviewed according to a questionnaire assessing the farmers' general knowledge about animal diseases, as well as preventive farm practices with regard to food safety. In both countries about 87% of the respondents state that they have no cooling tank for storing the milk, which is a prerequisite for attaining milk safety and quality standards. A considerable number of farmers (52.7% in Albania and 44.6% in Kosovo) are not aware about the institutions in charge of food safety and animal health control. About 1/3 of the farmers in Albania and 11.3% in Kosovo stated that they never or rarely use ear tags to identify their livestock animals. In addition most farmers' state that they do not know symptoms of the Brucellosis (59.7% in Albania and 71.3% in Kosovo) and TBC (64.6% in Albania and 68.6% in Kosovo), indicating the low awareness level among farmers about animal diseases and food safety. Extension and Veterinary Services must plan awareness, teaching and training programs for dairy farmers to improve safety standards at farm level. In addition public and donors support schemes for farmers should be strongly linked to food safety standard implementation

Keywords: Dairy farms, veterinary service, advisory system, food safety, animal register, and animal diseases.

1. Introduction

1.1 Sector background

Agriculture sector is the one of the most important sectors of the Albanian and Kosovo economy. Both countries continue to be predominantly rural economies with 20 percent of the GDP generated by agriculture in Albania, and 12 percent in Kosovo. Agriculture is also the largest employing sector, accounting for it employs more than 40 percent of the active force in Albania and approximately 35 percent in Kosovo.

Generally, livestock production is seen as a backbone of Albania's agriculture. Livestock sector in general, and dairy sector specifically have been considered priority sector by the government [19]. The cattle sector is one of the most important sub-sectors in agriculture since it provides 86 percent of milk and 47 percent of meat production [18, 19]. Cattle breeding

include mostly the dairy cattle husbandry since there is not yet any specialized beef cattle production, so meat is obtained from the dairy farms. Farm level - dairy and beef production is characterized by small-scale farming system. Many small farms continue to produce in the traditional ways and market the products through informal channels. The number of cows is approximately 354 000, and one farm family as average is managing 2.32 cattle or 1.67 cows [4]. Cow milk production is 983 000 ton, but only 1/2 of the production reach the markets while the other half is used for consumption, consumption by animals or processed on the farm. Of all cow milk produced, only 11.2% (110 000 tons) is processed by the dairy industry [17]. The remaining 38.8% (381 000 ton) reaches consumers directly.

In Kosovo livestock production is the most profitable activity and is of economic importance, and cattle milk dominates raw milk production. According Kosovo Agency of Statistics, the cattle fund is approximately

*Corresponding author: Ylli Biçoku; E-mail: ybicoku@ubt.edu.al

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265 000 heads of which 137 000 are cows. Milk production (285 000 ton) accounts for more than 4/5 of the milk consumption and processing. [20]. Most dairy farms produce for self-consumption, thus small and middle-sized farms are the dominant farms. On average, the farm size is 3.2 ha agricultural land (including common land/pasture) and about 3.9 cattle (about 2 milking cows) [1]. The small farms (managing 1-4 cows), constitute 94.2 percent of farms that breed dairy cows. Only about 18 percent of milk produced is delivered to dairies for processing [24]. The rest is used for feeding calves and for on farm processing and consumption or sold as raw milk or white cheese on the various local informal (green) markets [7, 8, 21, 22]. For both countries the fragmentation and small size of agricultural farms and plots represent a major barrier for the agro-food sector growth and competitiveness in both countries. Feeding is one of the main causes behind the low production performance and high production cost. More specifically, typical local dairy farms face the following problems: a) low yield due to health problems and improper feeding, b) a high percent of culled cows due to mastitis and other pathological conditions, c) reproductive problems caused by varieties of factors among which the most important is poor farm management, hygiene conditions at the farm and thereby low revenues [4, 5, 16].

In both countries are gaps in food safety standards throughout the value chain going downstream. The system for the control of milk quality is still weak and not functioning very well. A big share of the milk is still sold on the road or directly to the home door or in green markets what makes difficult the control. By the other side the laboratories are not efficient and the farmers have to pay for the analysis, therefore they neglect to analyze samples, which might be dangerous in regard to public health. Only a few larger mechanized dairies have implemented an internal system of quality control including raw milk. Closed cooling chains from producer to consumer are still rare. EU quality and food safety standards are not yet fully implemented [3].

According to Demirbas et al [11], as long as milk and dairy products have the easily perishable nature, food safety is the most important quality criterion in the dairy sector, and the consumer preference towards safe and quality products imposes the production of safe food.

The milk safety process for fresh milk and its products

begins on dairy farms and continues in dairy processing units, and in the market. Farmers, extensionist and veterinarians should effectively manage animal health, cattle rearing, public health and daily environmental health procedures [9, 10].

In both countries, the Food Law imposes a certain rules in the milk sector in the framework of food safety. However, the farmers' knowledge level and their attitudes towards food safety practices play a crucial role.

Despite recent improvements in food safety, the agro-food sector in Albania and Kosovo, particularly the meat and dairy subsectors still face serious challenges. The uncontrolled non-application of sanitary and quarantine rules, as well as the low level of cultural and technical education of farmers, and other actors of the value chain, are some of the main reasons behind this situation. Unreliable food safety and quality also undermine competitiveness in domestic markets-a weakness that will be magnified as average incomes rise and consumer preferences continue to evolve [13, 14].

1.2. Food Safety Institutional Framework and Standards

Albania. The Albanian Government considers food safety and consumer's health protection as a priority in its policy agenda. Food Law (No 9863, dated 28.01.2008) is the main one on food safety and is partially compliant with the EU provisions (European Regulation No.178/2002 on food law) but still improvements are necessary. The law provides the principles for assuring the high level of protection of human life and health and consumers' interest. According to the law (article 26) food production companies are obliged to implement Hazard Analysis and Critical Control Point (HACCP), as self control requirement, which is considered one of the tools to ensure food safety in Albania.

The National Food Authority (NFA) was established in compliance with the Law on Food, and is part of the MARD. NFA was supported from IPA 2009 Project ("Consolidation of the food safety system in Albania"), with the purpose to strengthening and consolidation of the administrative structures responsible for ensuring the enforcement of EU compliant food safety measures. The Food Safety System institutions in Albania are represented through the following three institutions:

1.The MARD- responsible for official controls of animal health, plants protection, and ensuring human health from diseases coming from animals and food.

These tasks are implemented from veterinary and plant protection services.

2.The National Food Authority (NFA) –responsible for the necessary controls and inspections, risk assessment and communication, for the whole area of food safety, animal health and plant protection in Albania.

3.Local Government Units, - responsible for veterinary-sanitary control of animals before, during and after the slaughter and veterinary certification in accordance with the requirements set forth in law.

The limited coordination between municipal units and NFA has led to duplications of functions on regards to control and certification [12].

In Albania the legislation on animal health and welfare aspects as well as diseases control is in place but often not enforced; for example animal movements and slaughtering are not yet fully controlled.

The safety along the food chain is indirectly affected by the welfare of animals, particularly those farmed for food production, due to the close links between animal welfare, animal health and food-borne diseases [15]. Therefore MARD has introduced National Minimum Standards (NMS) in accordance with EU practice.

During the last years, the food safety, animal welfare and NMS has been reformed through amendments and new laws as well through Minister's Orders covering the issues such as animal and farm registering, business licesing, transport and slaughtering of animals, milk collection and transport, animal health etc.

Kosovo. Food safety is considered strategic priority in Kosovo, aiming to ensure quality and safe food based on international standards, further development of production and processing capacities, and improvement of the food chain. Through the sector it is also aimed the fulfillment of the local food demand, providing employment, reducing agriculture product imports and increasing the export capacities, integration to international organizations, improving rural livelihood, sustainable development and achieving economic growth in Kosovo [23].

The veterinary policies are regulated on the base of three laws: (i) On Livestock is the base for the general functioning of livestock sector; (ii) On Animal Welfare, and (iii) On Veterinary.

The circulation of live animals, products of animal origin, veterinary inspection for import/export and the transitional transport of live animals; as well the rights and duties of the central government, municipalities and private enterprises operating in this field are

regulated on the base of Law on Veterinary and Law on Food.

The institutions in charge of food safety are (i) the Ministry of Agriculture, Forestry and Rural Development (MAFRD); (ii) the Food and Veterinary Agency (FVA) which is the main authority to ensure food safety and veterinary in the Republic of Kosovo, and linked directly to the Office of the Prime Minister; (iii) and the Ministry of Health. Currently the role of MAFRD on food safety is still undefined. Within the Ministry of Health, the National Institute of Public Health is also responsible with food testing.

Significant investments are done both by the donors and Kosovo government in building and equipping the Food and Veterinary Laboratory. Currently the infrastructure is in place and most of the equipment installed and operational. ISO system 17025 is implemented and national accreditation is obtained. However, there are still gapes in the range and the quality of services provided by the food laboratory related to the tests and methods.

2. Material and Methods

This is an exploratory study, aiming at assessing farmers' awareness about food safety standards in Albania and Kosovo. We expect that most farmers have limited awareness about national food safety standards, animal diseases and given constraints in institutional framework, and thereby such standards are not met in most cases – this survey provides insight into gaps in awareness and information at farm level looking into different aspects.

Questionnaire was developed to assess farmers' general knowledge about animal diseases, as well as preventive farm practices with regard to food safety. In both countries the questionnaire was subject to review by a panel of 4-5 livestock specialist. The questionnaire was pre-tested with a pilot group of 8-10 farmers before starting the interviews in the field; and in the case of inconsistent questions, it was modified accordingly. The questionnaire was used to collect data pertaining to the objective formulated for the survey including questions about farm profile and size, and questions related to food safety and animal health standards awareness.

There were carried out 144 interviews in Albania with randomly selected larger farms in different villages in the region of Shkodra and Lushnje – in principle interviewers were instructed to interview farmers with

more than 4 cows - thus farms that are market oriented (avoiding self-subsistence farms). While in Kosovo the sample consisted of 150 dairy farmers that were randomly selected from the farmers' list prepared by the municipalities (with the condition of having more than 4 cows) in the regions of Gjilan and Ferizaj.

The survey in both countries was administered during 2015, using direct interviews with the farmers.

The surveyed farms in Albania were breeding 8.7 cows while in Kosovo 10.8 cows, which means that these farms are market oriented (Table 1). The reason why we targeted market oriented farms, is that naturally they are more likely to have more awareness for

standards, invest more in the future toward improving standards, and are also more likely to "survive" the growing competition in the future, as compared to small subsistence farms (with 1-2 cows). The average age of farmers in Albania and Kosovo was 50.85 and 46.22 years, respectively. Their experience in milk farming was 18.08 and 19.95 years and their household size 5.2 and 9.56 members, respectively.

The responsive rate was 100 percent, which was far above typical surveys.

Data has been entered into CPRo based database. The database has been transformed into SPSS file and has been analyzed based on descriptive statistics.

Table 1: Main sample socio-demographic and farm indicators.

Sample farm household indicators	Albania		Kosovo	
	Mean	Std. Deviation	Mean	Std. Deviation
Household size	5.20	2.200	9.56	6.876
Age	50.85	11.321	46.11	10.519
Owners experience with livestock (years)	18.08	8.449	19.95	13.386
No. of cows	8.72	9.174	10.78	6.853

3. Results and Discussions

Milk storage

In Albania, according to the Albanian law on "Production, Collection, Processing and Marketing of Milk and Milk-based Products" (appendix A) – "the milking process must respect all hygienic conditions and if the milk is not collected within two hours of milking, it is cooled to the temperature of 8°C when milk is collected daily, or to 6 °C in the case when collection is every second day.

Milk cooling tank must be used to reach such temperatures. However the quality of raw milk is not satisfactory as result of low hygienic conditions during milking and transporting. Only the large farms (over 50 dairy cows) applied the good hygienic practices therefore the somatic cell count for $\leq 200,000/\text{ml}$. In such conditions should be improved the level of knowledge of dairy farmers regarding hygienic conditions and milk quality standards

In Kosovo, dairy processors collect the milk from the large farms every day (the farms that are located near the processors) or every second day. The small farms are processing the milk at home, or sell it directly to their neighbors, or sell to the milk collection centers, usually 1-2 hours after finishing the milking process. Then milk is transported to the dairy plant, by milk

collectors. Processors are trying to improve the quality of milk delivered by the system of higher prices paid for good-quality milk.

In both countries the control system for the milk quality is still weak and not functioning very well. A large part of the milk is still sold at directly to the home door or in the open/green markets. Closed cooling chains from producer to consumer are still rare. EU quality and food safety standards are not yet implemented. The quality and hygiene level of collected milk is generally low since and Good Milk Handling (GMH) standards are not applied; the same results are reported for Albania by Beli et al [2] and for Kosovo by Bytyqi et al. [6].

Our survey confirms the gap in milk storage capacity - about 87 percent of the respondents, in both countries (Table 2), do not possess cooling tanks, which is a prerequisite for attaining milk safety and quality standards.

Table 2: Answer to the question: “Do you have cooling tank?”

Answer	Albania		Kosovo	
	Frequency	Percent	Frequency	Percent
No Answer	1	.7	0	0
Yes	18	12.5	20	13.3
No	125	86.8	130	86.7
Total	144	100.0	150	100.0

Awareness about the institution responsible for food safety

According to the article 39 of Albanian Food Law and article 24 of Kosovo Food Law the official control of food shall be carried out from the inspectorate of food and feed control and the laboratories of food safety and veterinary under the NFA in Albania and under FVA in Kosovo.

Delivery of information, education and advice to stakeholders across the farm-to-table principle is very important for the food control system.

Farmers were asked to choose the institution in charge of food safety in Albania providing them several

options from which to choose – most farmers (52.7 percent) stated that they do not know (table 3) – also among those that answered that they know, some chose the wrong answer. In Kosovo – 44.7 percent of farmers stated that they do not know. Also among those that answered that they know, few of them chose the wrong answer. These answers in both countries are indicating the low awareness level among farmers about food safety.

Table 3: Answer to the question: “Which is the institution in charge of food safety?”

Answer	Albania		Kosovo		
	Frequency	%	Frequency	%	
National Food Authority (NFA)	41	28.5	Food and Veterinary Agency	73	48.7
Regional Agricultural Directory (RAD)	18	12.5	Commune Agricultural Service	0	0
Ministry of Environment	2	1.4	Ministry of environment	2	1.3
Food safety sector, Ministry of Agriculture	5	3.5	Food safety sector, MAFRD	5	3.4
Other	2	1.4	No Answer	3	2.0
I don't know	76	52.7	I don't know	67	44.6
Total	144	100.0	Total	150	100.0

Awareness about the institution responsible for animal health certificate

The articles 55 and 59 of the law “On Veterinary Service in Republic of Albania” and articles 6, 14,16 and 19 of the law “On Veterinary” in Kosovo, emphasis that veterinary service is responsible for issuing veterinary certificate for: (i) the movement of the animals and/or the products of animal origin out of

the holding of origin, (ii) trade of animals, (iii) slaughtering of animals.

When farmers were asked to choose the institution in charge of issuing animal health certificate providing them several options from which to choose – almost half of the farmers in Albania and about 40 percent in Kosovo stated that they do not know (table 4) – also among those that answered that they know, some chose the wrong answer, indicating the lack of information about this important aspect.

Table 4: Answer to the question: “Which is the institution that issues animal health certificate?”

Albania			Kosovo		
Answer	Frequency	%	Answer	Frequency	%
National Food Authority (NFA)	3	2.1	Food and Veterinary Agency	84	56.0
Regional Agricultural Directory (RAD)	57	39.6	Commune Agricultural Service	0	0
Ministry of Environment	2	1.4	Ministry of environment	0	0
Commune	5	3.5	Municipality	2	1.3
Food safety sector, Ministry of Agriculture	6	4.2	Food safety sector, MAFRD	3	2.0
Other	4	2.8	Other	2	1.3
I don't know	67	46.4	I don't know	59	39.4
Total	144	100.0	Total	150	100.0

Awareness about the institution responsible for stable standards

Regional Agriculture Directories in Albania and Urban Planning Directory of Commune in Kosovo are responsible to approve the design of the stables for the livestock farms.

Almost 2/3 of the interviewed farmers in Albania and 53 percent in Kosovo stated that they do not know

which is the institution that controls stable standards (Table 5) – also among those that answered that they know, some chose the wrong answer, indicating the lack of information about this important aspect.

These answers give us the right to think that the construction of stable is done without the permission of the competent bodies.

Table 5: Answer to the question: “Which is the institution that controls stable standards?”

Albania			Kosovo		
Answer	Frequency	%	Answer	Frequency	%
National Food Authority (NFA)	2	1.4	Food and Veterinary Agency (FVA)	23	15.3
Regional Agricultural Directory (RAD)	29	20.1	Commune Agricultural Service	0	0
National Registration Center	1	0.7	Paying Agency	22	14.7
Ministry of Environment	5	3.5	Ministry of environment	1	0.7
Commune	9	6.3	Municipality	21	14.0
Food safety sector, MARD	1	0.7	Food safety sector, MAFRD	0	0
Other	2	1.4	Other	3	2.0
I don't know	95	65.9	I don't know	80	53.3
Total	144	100.0	Total	150	100.0

Awareness about farm register use and control

It is essential that farmers, veterinarians, and public health experts can identify which animals have recently been transported from one farm to another or from a

farm to a processing facility. If that animal is found to be sick, they can trace the animal's path back and find any other animals it may have come into contact with and potentially exposed to a disease. The

veterinarians can then determine if those animals need to be tested, treated, or even quarantined to prevent further spread of disease. While this is one more step the farmer must take, and one more round of paperwork that must be maintained, this is a very important step in securing the safety of our food supply. In Albania, Regional Veterinary Service (part of RAD) is in charge with the livestock identification (article 8, law “On Veterinary Service in Republic of Albania”) and in Kosovo the Veterinary and Food Service (part of

MAFRD) base on the article 27 of the law “On Veterinary”.

Although ½ of farmers in Albania stated that they have a farm livestock book/register (table 6), they are not aware of the institution that is in charge of controlling them (table 7). While in Kosovo the situation is quite different, only ¼ of the farmers have livestock book/register however most of them are aware of the institution that is in charge of controlling them (table 7).

Table 6: Answer to the question: “Do you have a farm book/register on livestock?”

Answer	Albania		Kosovo	
	Frequency	Percent	Frequency	Percent
No Answer	2	1.4	4	2.7
Yes	77	53.5	38	25.3
No	65	45.1	108	72.0
Total	144	100.0	150	100.0

Table 7: Answer to the question “Which is the institution in charge for controlling the animal book/register?”

Answer	Albania		Answer	Kosovo	
	Frequency	%		Frequency	%
National Food Authority (NFA)	2	1.4	Food and Veterinary Agency	81	54.0
Regional Agricultural Directory (RAD)	30	20.8	Commune Agricultural Service	1	0.7
Commune Food safety sector, Ministry of Agriculture	3	2.1	Municipality MAFRD	6	4.0
Other	7	4.9	Other	3	2.0
I don't know	102	70.8	I don't know	1	0.7
Total	144	100.0	Total	58	38.6
				150	100.0

Awareness about the animal identification

According to the law “On Veterinary Service in Albania” (article 6 and 134) and the law “On Identification and Registration of the Animals and the Livestock Farms” the owner is responsible for the animal’s identification and for keeping the identification register. The penalty of 200-350 Euro is applied to the farmer who doesn’t use the ear tag for his animals.

Only about 60 percent of the interviewed farmers state that they always use ear tags for the identification of their animals, while about 1/3 state that they never or rarely use the ear tags (table 8).

In Kosovo, according to the law on “Veterinary” the owner is responsible for the animal’s identification and for keeping the identification register. The penalty of 500-30,000 Euro is applied to the farmer who doesn’t use the ear tag for his animals. The majority of the farmers (81.3 percent) state that they always use ear tags for the identification of their animals, and only 11.3 percent state that they never or rarely use the ear tags (table 8).

Animal diseases

In both countries most farmers’ state that they do not know symptoms of the Brucellosis (59.7 and 71.3 percent) and TBC (64.6 and 68.6 percent) (table 9). Poor knowledge of brucellosis and in general for the

zoonosis might significantly impede people who are infected with brucellosis from seeking medical services.

Table 8: Answer to the question: “Do you use ear tags for livestock identification”

Answer	Albania		Kosovo	
	Frequency	Percent	Frequency	Percent
Always	86	59.7	122	81.3
Often	10	6.9	11	7.4
Rarely	21	14.6	3	2.0
Never	27	18.8	14	9.3
Total	144	100.0	150	100.0

Table 9: Answer to the question: “Do you know the symptoms of the following diseases?”

Answer	Albania				Kosovo			
	Brucellosis		TBC		Brucellosis		TBC	
	Freq.	Percent	Freq.	Percent	Freq.	Percent	Freq.	Percent
No answer					3	2.0	1	.7
Yes	58	40.3	51	35.4	40	26.7	46	30.7
No	86	59.7	93	64.6	107	71.3	103	68.6
Total	144	100.0	144	100.0	150	100.0	150	100.0

4. Conclusions

This is an exploratory study, aiming at assessing farmers' awareness about food safety standards and is the first attempt to obtain in-depth understanding about farmers' awareness related to food safety standards and animal health, according to the best author knowledge.

Despite recent attempts to raise awareness of livestock farmers for food safety, animal welfare and diseases, in both countries appears that still most farmers do lack information or awareness on these issues.

Albania. About 87 percent of the respondents state that they have no cooling tank for storing the milk, which is a prerequisite for attaining milk safety and quality standards.

Most farmers (52.7 percent) are not aware about the institutions in charge of food safety and animal health control. About 1/3 of the farmers stated that they never or rarely use ear tags to identify their livestock animals. In addition most farmers' state that they do not know symptoms of the Brucellosis (59.7 percent) and TBC (64.6 percent), indicating the low awareness level among farmers about animal diseases and food safety. Also, 46.4 percent and 65.9 percent of the farmers are not aware which is the institutions that issues animal health certificate and responsible for stable standards.

Moreover most farmers (53.5 percent) state that they have a farm livestock book/register, they are not aware (70.8 percent) of the institution that is in charge of controlling them.

Kosovo. According to the survey findings, about 87 percent of the respondents do not possess cooling tanks; 44.7 percent of farmers stated that they do not know which is the institution in charge of food safety; 11.3 percent state that they never or rarely use the ear tags; in addition most farmers' state that they do not know symptoms of the Brucellosis (71.3%) and TBC (68.6%), indicating the low awareness level among farmers about animal diseases and food safety. Also, 39.4 percent and 53.3 percent of the farmers are not aware which is the institutions that issues animal health certificate and responsible for stable standards. In addition the majority of the farmers (72 percent) do not have the farm livestock book/register.

For both countries its a need to integrate extension and veterinary service, and to develop the coordination and communication that are vital in providing information and effective support to farmers, especially for implementing the NMS and GAPs . There is a critical role for veterinary and extension services in explaining the requirements of the standards to the farmers and helping them meet those standards and requirements.

Otherwise the small scale farms could face difficulties to sell their dairy products if they don't meet the hygienic standards.

To overcome aforementioned problems the farmers first need to be trained on technical issues. In addition, to make use of the newly acquired technical knowledge farmers have to be trained to add value to their current business.

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