

MILK QUALITY IN COMMUNITY FARMS AND FARMERS' PERFORMANCE TOWARDS TOURISM RELATED ACTIVITIES

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Abstract

Tourism as a potential path for further development in the agricultural field has increased the attentiveness of farmers who designate further extension of their services. A lucid awareness of the possible increase in their income from tourism-related services in their daily activities has changed their perspective of the future of their business operation. We evaluated the quality of the milk produced from local farmers by performing DELVOTEST to assess the presence of antibiotic residues in cows. Moreover, we performed a questionnaire with topics corresponding to tourism-related activities implemented in their farm now or planned for the foreseeable future. In conclusion, elevated levels of antibiotic residues in the milk of the cows proved a decrease in the quality of their product. Some of the farmers have already started to engage in tourism-related services but a decline quality of their milk is considered to represent a barrier for attraction of customers in agro-tourism owing to the fact that quality improves image. Since this study was conducted in a low-income country, challenges of successful implementation of agro-tourism need to be further evaluated.

Key words: *antibiotic residues, farm activities, tourism services.*

JEL Classification: *Z32; P32; L15*

I. INTRODUCTION

The past few decades have been genuinely innovative in the sense of making an effort to introduce two fields of interest together with the intention of inviting customers from two separated sectors of the industry, at once. Following this era, agro-tourism is progressing to become a convenient field of research for a sustainable economic development of rural areas. A sustainable economic growth is defined as “continuous economic growth” with the purpose of fulfilling the rural community needs for an economic stability (Ammirato.S, Felicetti.A, 2014, pp. 17-29). However, knowing that the majority of rural community members are farmers by occupation, agriculture is their mean field of economic income. Still, since tourism is a relatively pristine area of farm activity, it is difficult for farmers to perform efficient tourism activities (Ohe.Y, 2017). Farmers manage to take care of their livestock, which provide them with food in the form of meat, milk and eggs. Milk, as one of the most consumed beverages

among population has to go through various routes of processing in order to be safe for consumption. A substantial part of this job is to assure that this food is controlled and safe to be used by their customers. One well-known barrier in the development of the milk industry is the presence of antibiotic residues in milk. Antibiotics residues can be found in the milk of a cow treated with antibiotics for several reasons. These reasons are labeled as therapeutic application, prophylactic application or as growing promoters (Jank L, Martins MM et al., 2015, pp. 686–95). In this sense, controlled measures must be implemented to preserve public health and to promote a compelling image in the market for the milk provider. A good image of the farmer improves his incomes in the market. A renowned market chain provides a new path for farmers to start promoting tourism activities in that respective farm.

According to Eurostat, *Cows' milk collection and products obtained - annual data* for 2019, in 28 countries of European Union were collected over 158 million tonnes of milk for consumption. Altogether,

European Parliamentary Research Service states that most of the milk produced is delivered to dairies for further processing, the rest being used in other ways on the farms (either consumed, processed, directly marketed or used as feed). Farmers use these other ways as an attempt to engage new strategies to extend their profit. Focusing in the arena of tourism economics has been observed to be an intriguing way for them to raise their income. By using all available facilities, natural resources, traditional and cultural heritages and new technology, farmers can offer a lot of services. In this way, they achieve farm diversification. Apart from offering tourism-related services, farmers can sell their products in their own farms such as milk, eggs, cheese and others. So, we have evidence of “farming” and “non-farming” activities occurring at the same time (Brandth.B, Haugen.M, 2011, pp. 35-44). These activities are important tools to address poverty, enhance agricultural development and create employment opportunities beyond an immediate household or smallholder dairy operation (Achchuthan.S, Kajanathan.R, 2012, pp. 1-13).

Farmers who aim to have qualitative products and qualitative services have started to keep track of their livestock. They achieve this by labeling their livestock. In this way they are able to track their location and be sure that they are being properly fed and are not exposed to a contaminated environment. Exposure of these animals to possible dangerous factors that might cause infection or any other disease will require putting them in separated stables and treat them separately from others. Several tests are used in these cases that are applied in such animals to determine the quality of their products. One of them is DELVOTEST, as a screening test of milk samples before they are declared safe to be consumed.

This paper aims to understand how applicable agro-tourism as a new field of study is amongst farmers in Kosovo. We intend to test the quality of the milk they produce by using DELVOTEST as the most straightforward and most reliable methods for detecting antibiotic residues in animal milk. After the evaluation of the quality of milk that they offer as an operation to bring customers to their farm, we will assess tourism related services they offer in their farms.

II. MATERIALS AND METHODS

We conducted a cross section study, performed from September to October 2019 in local farms of the two major cities of Kosovo. Prishtina as a capital city is surrounded by 41 villages, while Mitrovica incorporates 46 villages.

A total of 100 cow's milk samples were taken and analyzed, 50 samples were from Prishtina farmers and 50 samples were from Mitrovica farmers. These samples were taken from a total of 17 farmers, 7 of whom were from Prishtina and 10 were from Mitrovica. Analyzes were performed with the DELVO test, on the Delvo Incubator Model MCI-212.

Delvo-test offers a convenient and effective result for early identification of antibiotic residues in milk and milk-products. Delvo-test is primarily practiced by farmers, milk buyers, milk processors and helps provide high-quality milk.

Qualitative and safe milk is estimated when the values of antibiotic residues do not exceed 0.05 UI/ml of milk. To additionally collect data, we conducted a questionnaire about farm activity and its purchase. The questionnaire was anonymous and contained seven questions related to the milk production in the farm and whether the respective farm offered any tourism related activities. All of the farmers agreed to answer the questionnaire and expressed an interest in the tourism related possible profits that farm could bring. Every confusion in the questions was carefully explained.

After data collection, we utilized an inductive approach to identify patterns and trends within that data set to evaluate the correlations and contrasts between answers from farmers in the region of Prishtina compared to farmers in the region of Mitrovica.

III. RESULTS

Results show that antibiotic residues in 50 milk samples taken in Prishtina were 10 %, while in 50 milk samples taken in Mitrovica were 56%. From 50 milk samples analyzed with Delvo test, in Prishtina were 5 samples of milk positive for antibiotic residues. From 50 milk samples analyzed with Delvotest, in Mitrovica were 28 samples positive for antibiotic residues. (Table 1)

Table 1. Frequency of antibiotic residues in tested milk samples in the region of Prishtina and Mitrovica.

	Prishtina		Mitrovica	
Antibiotics residues	No	%	Nr	%
Positive	5	10	28	56
Negative	45	90	22	44
Total	50	100	50	100
p < 0.005				

The percentage of negative results on antibiotic residues was significantly higher in Prishtina milk samples. 90% of the milk samples in Prishtina were negative for antibiotic residues, while 44% of the milk samples in Mitrovica were negative. (Figure 1)

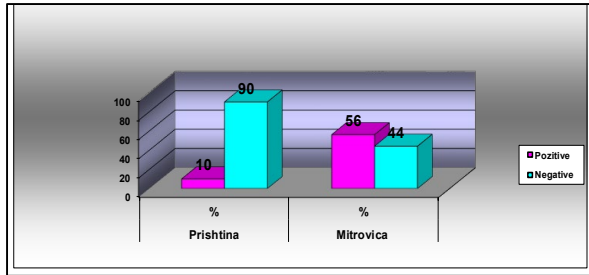


Figure 1. The frequency of antibiotic residues in milk tested samples in region of Prishtina and Mitrovica.

All farmers who responded to the questionnaire declared they performed active participation in the life of the farm daily. (Question 1)

Question 1. Active participation in the life of the farm (participation in farm tasks)

Total No. of samples	Place	Yes		No	
		No	%	No	%
50	Prishtina	7	14	0	0
50	Mitrovica	10	20	0	0
100	Total	17	17	0	0

8% of all farmers were open to offer educational activities (i.e. feeding or petting animals and milking cows) to their customers who also come as tourists to visit. This commitment was higher in Mitrovica (12%) than in Prishtina (4%). (Question 2)

Question 2. Educational farm (e.g. feeding or petting animals, milking cows)

Total No. of samples	Place	Yes		No	
		No	%	No	%
50	Prishtina	2	4	5	10
50	Mitrovica	6	12	4	8
100	Total	8	8	9	9

All farmers, personally tasted the milk after milking cows. Next they either consumed it themselves or sell it to customers. (Question 3)

Question 3. Tasting of self-produced milk

Total No. of samples	Place	Yes		No	
		No	%	No	%

50	Prishtina	7	14	0	0
50	Mitrovica	10	20	0	0
100	Total	17	17	0	0

15% of the farmers sold self-produced milk to customers, while 2% of them consumed it themselves. 16% of them were from Prishtina, while 14% of them were from Mitrovica. (Question 4)

Question 4. Selling of self-produced milk

Total No. of samples	Place	Yes		No	
		No	%	No	%
50	Prishtina	7	14	0	0
50	Mitrovica	8	16	2	4
100	Total	15	15	2	2

5% of the farmers sold milk to other local farms. This trend was applicable amongst farmers from Mitrovica (10%).

Question 5. Selling of the milk to other local farms

Total No. of samples	Place	Yes		No	
		No	%	No	%
50	Prishtina	0	0	7	14
50	Mitrovica	5	10	5	10
100	Total	5	5	12	12

14% of farmers from Prishtina sold the milk to markets, compared to 12% of farmers from Mitrovica. Overall, 13% of the farmers sold the milk to markets.

Question 6. Selling of the milk to markets

Total No. of samples	Place	Yes		No	
		No	%	No	%
50	Prishtina	7	14	0	0
50	Mitrovica	6	12	4	8
100	Total	13	13	4	4

Only 2% of the farmers sold the milk to restaurants and hotels, and all of them were from Prishtina (4%).

Question 7. Selling of the milk to restaurants and hotels

Total No. of samples	Place	Yes		No	
		No	%	No	%
50	Prishtina	2	4	5	10
50	Mitrovica	0	0	10	20
100	Total	2	2	15	15

IV. DISCUSSION

Data show that the percentage of antibiotic residues in milk samples taken from milking cows is high. Working conditions and low profit that comes from selling milk in a low-income country like Kosovo might explain the frequent use of antibiotics. The limited number of cows, a farmer has as the sole source of income to support an entire family, might oblige him to start milking a cow that has received antibiotics before they are out of its system. Meanwhile, only dairy herd sizes of 500 to 1 000 cows would be economically well grounded (Bailey.K, Hardin.D et al., 1997, pp. 205-214). Small herd size, low milk yield and high operating cost, remain barriers for small farmers to maintain strong position in market (Haq, Shamsheer et al., 2016). One strength of this study is that its results bring us to the conclusion that farmers need to raise measures and be more cautious about the quality of the milk they offer if they want to be more successful in their business and attract more customers. Farmers who are presented with the idea of agro-tourism as a source of increasing

their incomes, tend to be eager to try it. Some of them have already tried to make an effort. They welcome the idea of opening the door of their farm to tourists and offer activities that might attract their interest in trying this experience. Simultaneously, this idea would induce two experiences together: farm operation experiences and food/rural cultural experiences (Ohe.Y, 2017). This field of study is new and still unknown but with great potential and hope for small farmers in low-income countries. Many researchers have reported economic to be the most motivation for farmers to apply agro-tourism in their farms (Miller.B, 1993, pp. 8–11; Weaver and Fennell, 1997, pp. 357- 365; Nickerson et al., 2001, pp. 19- 26). Also, social and cultural experience meet because of the given opportunity for the farmers to meet new people and form new acquaintances. This raises the possibility of publicity and promotion. Offering a diversity of services by farms might be a possible strategy for raising total incomes. This has both its opportunities and challenges that need to be further evaluated.

V. CONCLUSION

While analyzing the data from milk samples, this study came to the conclusion that antibiotic residues are high in the milk provided by the farmers from a low-income country like Kosovo. The possibility of applying agro-tourism is intriguing for these farmers. Further studies need to explore the effect of motivational factors such as diversification strategies to increase income for small farms in low-income countries.

VI. REFERENCES

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