

VALUE CHAIN ANALYSIS: SHEEP MILK FOR PROCESSING IN THE GOSTIVAR REGION, REPUBLIC OF MACEDONIA

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Abstract

Primary goal of the study was to perform a detailed analysis of all chain stakeholders, irrespective of their direct or indirect participation, for the purpose of identifying and discussing possible problems, possibilities and methods of their reduction and elimination, and to identify actions how to increase the milk quantity and quality. Processed product is yellow cheese, intended for the domestic market, which is produced in a local dairy in the region. Apart from the economic analysis of the sheep milk value chain, the farmers were interviewed to identify their motivation to increase production, as well as to analyze identified weaknesses in the process.

The obtained results indicated a weak motivation of farmers to sell sheep's milk in dairies, due to the low purchase prices. At the same time there was substantial difference between selling prices at dairy markets and selling price in retails. The obtained results were compared with data determined for the Kumanovo region. Simple analysis show that in Gostivar region, sheep yellow cheese is produced with lower production cost, compared to the same region of Kumanovo.

The findings from the study show the following: farmers, due to the low purchase prices, did not sell the sheep milk to the dairy; the milk production was low due to genetic composition of sheep in the region and the low level of animal welfare measures implemented; the production price of milk was high due to the high price of animal feed and labour engaged on farms, as well as lack of herd booking, market research by producers, etc.

Key words: *Sheep, sheep milk, sheep cheese.*

1. Introduction

Primary goal of the study was to perform a detailed analysis of all chain stakeholders, irrespective of their direct or indirect participation, for the purpose of identifying and discussing possible problems, possibilities and methods of their reduction and elimination, as well as advisory services required at all value chain levels.

Sheep breeding in the Republic of Macedonia bears the sign of tradition and is a significant part of livestock production with a large economic impact. Due to the specific climate conditions and terrain features of our country, sheep have been one of the major sources of animal products in human diet.

On grounds of State Statistical Office data from 2008, the number of sheep heads is 800,000 (550.000 milking sheep). 96% of sheep are owned by individual farmers. In addition, the fact should be taken into account that sheep production in the Republic of Macedonia takes place mostly on small individual family farms and the flock size is usually 20 to 200 sheep, with rare cases over 300 sheep.

Breed structure of sheep population in the Republic of Macedonia mainly consists of domestic Pramenka with 60% of the Ovcepolian breed and 30% of the Sharplanian breed. The rest is cross-bred with many Merino and other imported breeds. Traditional sheep breeding implies production of milk-fed lambs as well as milk to be processed into several specialised primary products such as white brined cheese, yellow cheese, yoghurt and cottage cheese, and less significant secondary products such as mutton, salted dried meat (pastrma) and wool (of non-standardised quality).

2. Value Chain Actors

The Value Chain actors are presented in the table below:

Table 1.* Sheep Milk Value Chain participants

ROLE	ACTOR	ACTIVITY
Producers	Farmers	1
Buyers	EKOŠAR	2
Processors	EKOŠAR	3
Transporters and distributors	EKOŠAR	4
Users	Markets	5
Final users	Consumers	6

*Source: Authors research

2.1 Producers

were farmers that breed sheep in the region of the Municipality of Gostivar (*ACTIVITY 1*).

Number and farm size: Within the region of the Municipality of Gostivar, there are about 32,000 sheep. 80% of sheep farmers have sheep breeding as primary activity they deal with traditionally for many years, whereas in 20% of farmers it is an additional activity. In the region of the Municipality of Gostivar, of the total number of farms 35% own 70 heads or less, 50% own up to 180 heads and are considered medium, and 15% are large farms with over 180 heads.

Sheep breeds in the region of the Municipality of Gostivar are of the Pramenka breed (Šar Planina variety) and cross-breeds with Merinolandschaf (Württemberg).

Sheep breeding method in the region of the Municipality of Gostivar is defined as traditional, which implies sheep grazing in mountain pastures during summer months, and barn accommodation in winter.

Production is three fold and it implies breeding sheep for milk, meat and perhaps wool. Sheep diet in the Gostivar region comprises of grazing at summer mountain pastures owned by farmers, as well as at pastures under concession. During winter months, sheep diet is carried out according to usual norms and in this case farmers provide feed by their own production, but they also purchase the parts that are missing.

Farmers in the Gostivar region only apply the basic veterinary and sanitary measures (vaccination and parasite treatment, with an annual cost of 2 EUR/sheep head).

Flock booking and farm accounting with farmers in the Gostivar region may be defined as an 'unknown business', although those interviewed showed interest.

Monthly hired labour costs for farmers are about 300 EUR for shepherd and 150 EUR for assistant shepherd (hired for average of 10 months).

Of the total number of farmers in the Gostivar region, 70% should be certain subsidy users for 2008 (15 EUR/lamb left for breeding).

About 80% of the farmers in the Gostivar region, process the milk to produce white brined cheese, which they sell by themselves to individual buyers. The rest of the farmers (about 20%) sell their milk to one of the three dairies (EKOŠAR, Laktoza and Fejzi). Farmers are interested in selling their milk to dairies provided that the purchase price is satisfactory and should not be lower than 0,80 EUR/litre. Production price per litre milk is 1.1 EUR/litre.

This production price was estimated on grounds of milk production calculations in a model farm with 300 sheep of all categories (200 milk sheep). The farm employs two shepherds (12 months) and one assistant shepherd (10 months), as well as the farm owner. Average quantity of milk produced is 60 litres/sheep head and the purchase price is 0.6 EUR/litre. 150 lambs were sold of 17 kg average weight for a price of 2 EUR/kg of flesh and 30 sheep of 40 kg average weight for a price of 0,8 EUR/kg of flesh. The farmer retained 70 lambs for his farm production.

Table 2.* Revenue in 300 sheep farm

TYPE OF REVENUE	SHARE (%)
Milk	46.3
Lambs	36.6
Sold sheep	6.6
Additional revenue*	7.7
Wool and manure	2.8
TOTAL	100

*Revenues estimated are those gained by the farmer pursuant to the measure "Financial support for earmarked female lamb for the purpose of sustaining and enlarging the primary sheep herd" within the Programme on Stimulation and Development of Agriculture for 2008. (Source: Authors' research).

Table 3. Costs in 300 sheep farm

TYPE OF COST	SHARE (%)
Sheep diet	50.4
Drinking and other water requirements	0.2
Veterinary measures	2.2
Salary and food for employees	42.0
Variable costs	4.4
Pasture fee	0.8
TOTAL	100

Source: Authors' research

2.2 Purchasers

EKOŠAR Dairy was subject of analysis as sheep milk purchaser (ACTIVITY 2). EKOŠAR Dairy buys sheep milk from 22-23 farmers in the Gostivar region. In 2007, the dairy bought 375.000 litres of milk.

Purchase price for sheep milk is 0,6 EUR/litre for 2008 for all farmers irrespective of quantity and quality of milk purchased.

2.3 Processors

EKOŠAR Dairy was a processor of sheep milk (ACTIVITY 3). EKOŠAR Dairy is located in the Village of Poroj, Municipality of Tetovo. It has been producing variety of solid dairy products for a long time. They include white brined cheese made of sheep or cow milk or mixed, yellow cheese of sheep and cow milk or mixed, yellow hard cheese of cow milk and cottage cheese. Sheep milk yellow cheese, as an analysed product, has an input of 12.13% in the total production, whereas 71.86% is white brined cheese of sheep milk and 16.01% mixed white cheese and mixed yellow cheese.

Yellow cheese of sheep milk was subject of analysis.

The daily capacity of the dairy is 14.5 t cow milk and 2.5 t sheep milk. There were 32 individuals employed at the dairy, 2 of whom have a university degree as technology specialists and the others are secondary education graduates.

The following were facilities within the dairy:

- Dairy with cooling and fermenting room;
- Yellow cheese fermenting room;
- Storage and
- Business facility with parking.

In the upcoming period the dairy will be moved to a different location and will be adjusted in compliance with EU regulation.

The dairy has the following equipment available: lacto freezer, duplicator, pasteurizer, homogenizer, cheese pools, 3 pickup transport vehicles as well as other equipment. Production price set for a kilogram of yellow sheep cheese is 5 EUR. The production margin for the dairy owner is 29%. The producer/processor sells 1 kilogram of yellow sheep cheese for 6,4 EUR both to retailers as well as to large markets.

Table 5. Production price of 1 litre sheep milk

MUNICIPALITY	NUMBER OF MILKING HEADS	BREED	AVERAGE MILK QUANTITY/HEAD	PRODUCTION PRICE/ LITER SHEEP MILK
Kumanovo	63	Awasi	336 litre	0,4 EUR
Skopje	109	Awasi x Domestic	111 litre	0,9 EUR
Skopje	57	Domestic	76 litre	0,9 EUR

Source: Authors research and Master paper.

Table 4. Costs share in the production price of 1 kg yellow sheep cheese

TYPE OF COST (1KG YELLOW SHEEP CHEESE)	SHARE %
Milk	72.2
Production	3.9
Packing	0.6
Transport	0.5
Variable costs	2.6
Product analysis	0.2
TOTAL	100

Source: Authors' research

2.4 Transporters and distributors

Transporter and distributor of the yellow sheep cheese is EKOŠAR dairy (ACTIVITY 4).

Transport and distribution is carried out by individuals employed at the dairy, by vehicles owned by the dairy.

2.5 Users

Users of sheep yellow cheese produced in this dairy are big markets. This product is also sold in small quantities on spot from the dairy storage facility to individual buyers (ACTIVITY 5).

The trade margin in markets the dairy cooperates with is about 15-18% of the original purchase yellow cheese price, therefore 1 kg of yellow sheep cheese sells for 7,3 EUR.

2.6 Final product users are consumers (ACTIVITY 6) and comparative analysis of different value chain indicators

On grounds of research of production and profitability of three sheep farms in the region of the Municipality of Kumanovo and Skopje area, the table below depicts the production price of 1 litre of sheep milk for 2005.

This supports the analysis in Gostivar region where the production price was calculated at 1,1 EUR/litre.

Table 6. Production price of 1 kilogram yellow sheep cheese

PARAMETERS	GOSTIVAR REGION	KUMANOVO REGION
Percent of share of yellow sheep cheese in the total dairy production (%)	12.13	20
Conversion of liquid milk in cheese (litres)	7	8
Purchase price of 1 litre sheep milk (EUR)	0,6	0.6
Share of kilogram sheep yellow cheese produced in total production (%)	27.8	30
Production price kg/yellow sheep cheese (EUR)	5	5.8
Sale price of kg/yellow sheep cheese to markets (EUR)	6.4	6.9
Trade margin in markets (%)	15	18
Sale price of kg/yellow sheep cheese in markets (EUR)	7.3	8.1

Source: Authors research

If the two value chains of different regions are compared, it may be concluded that production costs and revenue of the production plant (dairy) do not differ significantly, although it is a case of different dairies in two different locations. Generally the problem with sheep milk and dairy products is inaccurate valuation. Sheep milk price has been fixed and unchanged for years, despite continuous increase of production costs.

3. Conclusions

1. Farmers are not motivated to sell sheep milk to dairies due to the low purchase price.
2. Lack of trusts between milk producers and processors.
3. High production price per 1 litre of sheep milk, as a result of multiple factors, the most significant being low sheep productivity, lack of implementation of zoo technical measures, high sheep diet costs and insufficient funding of sheep production by the government and other entities.
4. Insufficient market research by producers and their lack of interest for branded product marketing in restaurants.
5. Lack of education of milk producers and processors in production management, which would enable them to see weaknesses in production phases.

6. Lack of interest of the government for protection of standard indigenous traditional dairy products of sheep milk that may be marketed abroad.
7. Change of taste and demand of consumers for products of sheep milk.

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