

## PRELIMINARY DATA ON GROSS MARGIN COMPARISON OF DAIRY FARMS IN TWO REGIONS OF ALBANIA

Grigor GJEÇI<sup>1,2</sup>, Ylli BIÇOKU<sup>1</sup>

<sup>1</sup>Agricultural University of Tirana, Tirana, Albania

<sup>2</sup>Ministry of Agriculture, Rural Development and Water Administration of Albania,  
Tirana, Albania

Corresponding author e-mail: Grigor.Gjeci@bujqesia.gov.al

### Abstract

*The purpose of the study was to analyze and compare the economic efficiency of dairy farms in two regions of Albania. This was a descriptive and quantitative survey and the target population was the dairy farmers collaborating with Agriculture Regional Directories of Elbasan and Shkoder. The farmers and expert panel was used to calculate the gross margin. The annual farm income and the cost of milk production were studied. The milk cost ranged from 0,271 to 0,30 Euro/kg, while milk price ranged from 0,310 to 0,356 Euro/kg, while the meat price ranged from 2,2 Euro/Kg to 2,5 Euro/Kg. The farms in Shkodra have a negative result only from the milk production, but the Gross Margin is improved from the meat selling. In Elbasan region the results are better; and incomes from milk are higher than incomes from meat while in Shkoder is vice-versa. The market price of one kilogram of meat is equal to 6.75 kg of milk. In variable cost, feed took the highest share by 81.2 percent. Feeding keeps the highest share within variable cost: 78.1% for Elbasan region and 75.6 % for Shkodra region. The Gross Margin per Cow (GMpC), for all the farms monitored, have positive values. The GMpC milk+meat ranged from 145.1 to 480.2 Euro/Cow in Shkoder and from 380.9 to 1480.8 Euro/Cow in Elbasan, while the GMpC milk in Elbasan had positive value (160.1 to 886.8 Euro/cow) in Shkodra three farms had a negative value (-1.3 to 7.1 Euro/Cow) and the rest had positive value but lower than of Elbasan (47.8 to 136.8 Euro/Cow). This is one of the reasons, emphasized by MARDWA, that the analysis of the competitiveness of agriculture of Albania shows that currently only a small share of farms can compete in the regional market, EU and international level.*

**Key words:** dairy farm, gross margin, farm income, income per cow.

### INTRODUCTION

Albania continues to be a predominantly rural economy with about 20 percent of GDP generated by agriculture, and about 51% of it is provided by animal production (INSTAT, 2015). In addition, agriculture is the largest employing sector, accounting for approximately 52% of total employment of which 60 percent are involved in herding and rearing livestock (MAFCP, 2007). Only 6,5 % of the farm holders are women even though women are the main labor force in the farms (MARDWA, 2014).

Due to the favorable natural resources, animal husbandry in general and especially cattle (milk and meat) activities have a long tradition in the country, and the value of livestock production is almost 50 percent of the total value of agricultural production (MAFCP, 2012). The dairy sector plays a significant role in the economy of Albania. Milk is one of the most important agricultural products and

accounts 22 percent of gross agricultural output (42% by volume of the livestock sector output), and cow milk represents 85 percent of it (Foy Reed and Skreli, 2013; INSTAT, 2015; and author's calculations).

Most of the dairy farms are relatively small-scale producers and a small percentage of large producers, which handle a large share of the total dairy herd. The structure of the dairy farms is dominated by the category of holdings with 1-5 cows. This group includes farms with 1.9 heads of cattle on average (only regarding farms that keep cattle), of this the number of milking cows is 1.66 (Gjeçi and Biçoku, 2015). Such farms are producing exclusively for own consumption or limited direct sales. Only about 3372 farms have more than five dairy cows (MAFCP, 2008 and 2012).

According to the statistics provided by the Ministry of Agriculture Rural Development and Water Administration (MARDWA) and Albanian Institute of Statistics (INSTAT), milk produced by cows increased from 421 000 tons

in 1990 to 1 131 000 tons in 2015. In addition to home production, about 7-10 percent of milk and milk products consumed (calculated as raw milk equivalent) in recent years has been imported.

The average milk yield in 1990 was 1482 litres/cow/year and recorded 2712 litres in 2013 (INSTAT 1991 and 2015), which is considered very low compared to the average of the EU-27, which is slightly higher than 6500 litres per cow per year. The low capital intensity of production has resulted in low productivity, relatively high production costs and low profitability, which in turn prevent the accumulation of capital for financial investment, thus perpetuating the low production and productivity levels on many dairy farms.

The Albanian Government started in 2007 the subsidy/support scheme program, but livestock sector was not part of it. The 2008 program comprised some direct support measures (premium per cow) for dairy/livestock farming and subsidized interest rates of loans for agro-food processing companies. Since 2010 the program has changed from the support related to the number of cows to the milk delivered to the milk processors. In the last eight years livestock has received 1.02 billion ALL (7.5 million EURO), or about 16.3% of total budget expenditures. Within livestock support 45.6% of the expenditures were given to the cattle sector (Musabelliu et al., 2014).

The present study was undertaken to evaluate the gross margin of dairy farms, in two regions (Shkoder and Elbasan) as few studies are conducted in Albania on the milk production profitability. According to several authors (Delgado et al., 2003; Dhuyvetter, 2010) larger producers may survive with low unit profit because of the large volume of business; and returns in dairy farming are deeply determined by variable cost, production cost and the correlations existing between farm size, milk yield, variable cost, total cost and milk price are important to be studied and kept under control by farmers

The information about this survey may help dairy farmers and other stakeholders in the dairy industry to try and improve economic inefficiency.

## MATERIALS AND METHODS

This study was conducted to collect farm data pertaining to revenue and expenses on medium sized dairy farms (in Albania, the farms breeding 11-50 Livestock Unit are considered medium sized ones) and make an economic analysis based on gross margin. The gross margin is calculated as the difference between total income and the total expenses (variable cost). Variable cost includes the cost of: feed (from farm fodder production and feed bought in the market), labor (from a family member), veterinary service, water, electricity, transportation, and miscellaneous.

Data analyzed in this paper were collected through the questionnaire from the representative dairy producers. Twenty-six farms were monitored and interviewed in two regions of Albania (Shkoder and Elbasan). In addition, in each region was conducted a panel discussion with the participation of dairy farmers and livestock experts.

**Data collection:** A structured questionnaire was used and the following data were recorded:

**Income and expenses:** (i) Milk yield per cow; (ii) Milk production per farm; (iii) Quantity and price of milk sold; (iv) Quantity and price of meat sold (slaughterweight); (v) Expenses for the fodder production; (vi) Expenses for the animal feed bought in the market; (vii) Expenses for veterinary service and cow's insemination; (viii) Expenses for fuel, electricity, water, trips, lease on the land, and the land tax; (ix) Gross Margin per Cow from sales of milk and meat (GMpC<sub>milk+meat</sub>); (x) Gross Margin per Cow from sales of milk (GMpC<sub>milk</sub>).

**Data analysis:** A model in Microsoft Excel program was developed for data analysis, while the statistical data processing was done with Statgraphics Centurion XVII.

## RESULTS AND DISCUSSIONS

Data on number of cattle and cows per farm, milk yield, Gross Margin per Cow (GMpC<sub>milk + meat</sub> and GMpC<sub>milk</sub>), milk price, meat price, and milk cost, are summarized in Table 1, as shown below.

Table 1. Technical data

District	Number of cows	No of Farms	No. of Cows per farm (average)	Milk yield (litre)	GMpC (milk + meat) Euro	GMpC (milk) Euro	GMpC (meat) Euro	Milk cost (Euro/kg)	Milk price sold (Euro/kg)	Meat price (slaughter weight) sold (Euro/kg)
Elbasan	15-32 cows	14	21.5	5440	877.3	463.6	413.7	0.271	0.356	2.5
Shkoder	15-25 cows (medium size farms)	12	21.0	6000	247.1	60.0	187.1	0.30	0.31	2.2

Source: Data from the farm visits and interviews.

1 Euro = 136 Leka

The number of cows of dairy farms for both regions is equal (Elbasan ranged 11-32 cows and Shkodra 11-34 cows). The milk yield of dairy farms in Elbasan (ranged from 4400 to 7480 kg/cow) is 9.3 percent lower than the Shkodra farms (ranged from 5100 to 7100 kg/cow). However the milk cost of dairy farms of Elbasan region is 9.7 percent lower than the milk cost of dairy farms of Shkodra region. In addition the milk price in Elbasan region is 14.8% higher than in Shkodra, because in Elbasan several farms are breeding cows of NRF breed, which has a higher milk fat content.

Feeding keeps the highest share within variable cost: 78.1% for Elbasan region and 75.6 % for Shkodra region. This figure is much higher of 58.3 percent published by INSTAT (2012), however the data of INSTAT includes variable and fixed cost.

The returns of the dairy farms came from the sale of milk and meat, however, in Shkoder 2/3 of the incomes is from meat. In Elbasan the income ratio milk:meat is 52.8/47.2 percent.

The Gross Margin per Cow (GMpC), for all the farms monitored, have positive values. The GMpC(milk+meat) ranged from 145.1 to 480.2 Euro/Cow in Shkoder and from 380.9 to 1480.8 Euro/Cow in Elbasan, while the GMpC(milk) in Elbasan had positive value (160.1 to 886.8 Euro/cow) in Shkodra three farms had a negative value (-1.3 to 7.1 Euro/Cow) and the rest had positive value but lower than of Elbasan (47.8 to 136.8 Euro/Cow).

The income per farm (IpF) in Elbasan is 18862 Euro (ranged from 7332 to 50350) while in Shkoder about three times lower, 5189 Euro (ranged from 2002 to 12485). These significant differences are coming as the result of the price of milk and meat sold, which is higher in

Elbasan region (Table 1) and higher daily gain of calves in Elbasan as farmers are inseminating the old cows with beef breed. In addition, several farms in Shkodra are losing money from milk production, as the cost of production is very high. Several studies have found a negative relationship between expenditures for purchase feed per cow and measures of financial profitability (Gloy et al., 2001). A higher milk yield requires a higher production cost, an aspect that farmers should take into consideration and handle in the most efficient way (Popescu, 2014).

This is one of the reasons, emphasized by MARDWA, that the analysis of the competitiveness of agriculture of Albania shows that currently only a small share of farms can compete in the regional market, EU and international level.

Comparing Shkodra and Elbasan dairy farms for IpF(milk+meat) vs. Number of cows/year; and MilkCost (cent/Euro) vs. Milk Yield was used Statgraphics Centurion XVII (Figure 1 and Figure 2).

Shkodra dairy farms:  $IpF (milk+meat) = -802.259 + 292.52 * \text{Number of Cows}$ . The correlation coefficient equals 0.716304, indicating a moderately strong relationship between the variables.

Elbasan dairy farms:  $IpF \text{ milk +meat} = -3195.69 + 921.818 * \text{Number of Cows}$ . The correlation coefficient equals 0.925841, indicating a relatively strong relationship between the variables.

Since the P-value in the ANOVA table is less than 0.05, for both groups of farms, there is a statistically significant relationship between IpFmilk+meat and Number of cows at the 95.0% confidence level.

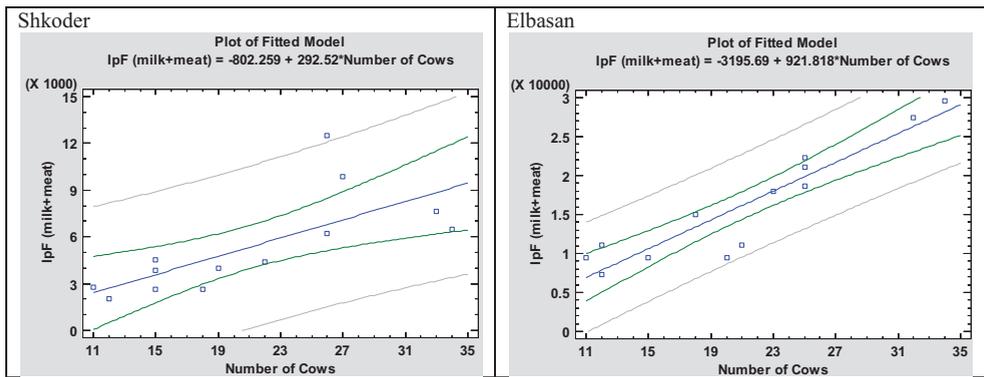


Figure 1. IpF (milk+meat) vs. Number of cows/year

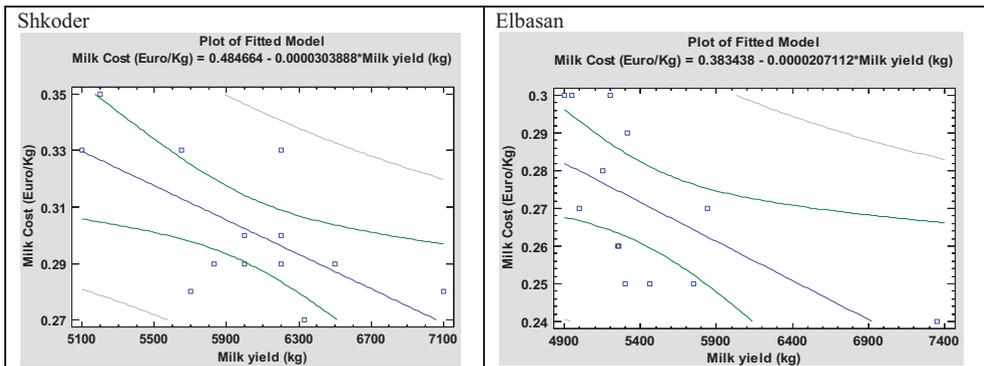


Figure 2. Milk Cost (euro cents/kg) vs. Milk Yield (kg)

Shkodra dairy farms: Milk Cost (Euro/Kg) =  $0.484664 - 0.0000303888 \cdot \text{Milk yield (kg)}$ . The correlation coefficient equals  $-0.65705$ , indicating a moderately strong relationship between the variables.

Elbasan dairy farms: Milk Cost (Euro/Kg) =  $0.383438 - 0.0000207112 \cdot \text{Milk yield (kg)}$ . The correlation coefficient equals  $-0.617142$ , indicating a moderately strong relationship between the variables. Since the P-value in the ANOVA table is less than 0.05, for both groups of farms, there is a statistically significant relationship between Milk Cost (euro cents/kg) and Milk Yield at the 95.0% confidence level.

These data of our study show that Farms of Elbasan had better results than those of Shkoder for production cost, incomes per farm, incomes per cow, gross margin per cow, milk and meat price.

## CONCLUSIONS

The production and economic results of our study are much better for the dairy farms of

Elbasan region than for those of Shkodra region. The milk cost of the dairy farms of Elbasan regions is 10 percent lower and the milk price 13 percent higher than those of dairy farms in Shkodra region.

The Gross Margin per Cow (GMpC), for all the farms monitored, have positive values, but the farms of Elbasan region had 3,5 times higher the GMpC (milk+meat) compare with Shkodra ones.

The returns of the dairy farms came from the sale of milk and meat, however, in Shkoder 2/3 of the incomes is from meat. In Elbasan the income ratio milk:meat is 52.8/47.2 percent.

These significant differences are coming as the result of the price of milk and meat sold, which is higher in Elbasan region. In addition, the cost of production of dairy farms is higher in Shkodra region and as result, several dairy farms are losing money from milk production. Maybe farmers of such category are careless as they are getting money from the grant schemes and other businesses.

The extension service of Shkodra should train farmers to keep the financial record separate for milk, meat, and other crops/businesses. In addition, the extensionists should assist farmers in improving the profitability and long-term viability of their operations.

## ACKNOWLEDGEMENTS

The authors of this paper are thankful to Mr. Kujtim Gjoni and Ms. Mynire Mandija for their contributions of farmers interviews and their comments.

## REFERENCES

- Foy Reed B., Skreli E., 2013. Agricultural Markets in a Transitioning Economy. An Albanian Case Study. ISBN-13: 978 1 78064 100 3.
- Delgado C., Narrod C., Tiongco M., 2003. Policy, technical and environmental determinants and implications of the scaling-up of livestock production in four fast-growing developing countries: A synthesis. Final Report of IFPRI-FAO Livestock Industrialization Project. Phase II. IFPRI (International Food Policy Research Institute), Washington, DC, USA.
- Dhuyvetter K., 2010. Factors Impacting Dairy Profitability: An Analysis of Kansas Farm Management Association Dairy Enterprise Data. Longman Scientific and Technical Publishers. UK.
- Gloy B.A., Hyde J., LaDue E.L., 2001. Dairy Farm Management and Long Term Farm Financial Performance. Agricultural and Resource Economics Review 31: 233-247.
- Gjeçi G., Biçoku Y., 2015. Challenges of the cattle sector-the case of Albania. The 11<sup>th</sup> International Conference of Agriculture, Food and Environment. Proceeding Book ICAFE, 25 September 2015, Korçë Albania, pp 200-210. ISBN: 978-9928-146-41-0.
- INSTAT, 1991. Statistical Yearbook of Albania.
- INSTAT, 2012. Agriculture Statistics, 2012.
- INSTAT, 2015. Gross Domestic Product, Preliminary estimates 2015. Tirana, December 13, 2016.
- MAFCP (Ministry of Agriculture, Food and Consumer Protection (MAFCP) until September 2013), 2007. Inter-Sectoral Rural Development Strategy of Albania, 2007-2013.
- MAFCP, 2008. Vjetari Statistikor 2007. Published by Ministry of Agriculture, Food and Consumer Protection.
- MAFCP, 2012. Vjetari Statistikor 2011. Published by Ministry of Agriculture, Food and Consumer Protection.
- MARDWA, 2014. Strategjia Ndërsektoriale për Zhvillimin Rural dhe Bujqësor, 2014-2020. (Inter-Sectoral Rural Development Strategy of Albania, 2014-2020).
- Musabelliu B., Sulçe S., Meço M., Maçi A., Kongoli R., Dobi P., Biçoku Y., Brahushi F., 2014. Analiza e Skemave Meshtetese- Politikat dhe Strategjite e Nderhyrjeve ne Bujqesi. Studim per MBZHRAU. (Report prepared for MARDWA).
- Popescu A., 2014. Research on Milk Cost, Return and Profitability in Dairy Farming. Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development, Vol. 14, Issue 2. Print ISSN 2284-7995, E-ISSN 2285-3952.