

RESEARCH CONCERNING THE EXPLOITATION TECHNOLOGIES AND PRODUCTION OF BOVINE MEAT IN ROMANIA'S EAST CROSS-BORDER AREA

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Abstract

Aim of the paper was to analyze the exploitation technologies and the results obtained in the production of bovine meat. The research was carried out during 2013-2015 in the cross-border area of Romania, Ukraine and the Republic of Moldova.

The meat production in Romania is at the level of 206 thousand tons of live weight at slaughter in 2016, 6 thousand tons more than in 2015 when meat production was 200 thousand tons live weight at slaughter. Compared to 2013, we see a decline in bovine meat production, which may be due to market fluctuations that occur both at national and on the Community market. In terms of cattle slaughter in specialized units, the number of slaughtered heads has decreased, but the average carcasses weight has increased (from 280 Kg to 327 Kg).

For the Odessa region, the production of meat in 2013 was 32203 kg and in 2012, 35233 kg with 3030 kg less or 8.6%. The average daily gain was 402 g per day in 2013, up with 23 grams more than in 2012.

Meat production (live weight) in the Republic of Moldova in all farms increased by 4.5% in 2009, and in 2010 it is decreasing, reaching in 2012 at 15.8 thousand tons, less by 14.2%, compared to 2009.

Having in view of the cross-border study, the following measures are necessary to make farms more profitable: increasing the cutting weight which will result in high meat yields in the carcass; integration of cattle breeding activity into U.E. standards and regulations; to promote the activity of genetic improving the cattle population in order to increase and improve meat production; financial support for the organization of farms in associations, in order to represent their interests in relation to the suppliers of inputs and beneficiary of the made products; securing own revenues by capitalizing on export goods; ensuring the necessary conditions for exteriorization of the animal's production potential; stimulating the growth of animals in hill and mountain areas with opportunities for exploiting beef cattle.

Key words: farms, cows, meat, area, cross-border

INTRODUCTION

On October 1, 2013, the cross-border project MIS ETC 1549 was signed with 90% European funding and involving three universities, namely the University of Agricultural Sciences and Veterinary Medicine from Iasi Romania, the Odessa State Agricultural University, Ukraine and Agrarian State University of Chisinau, Republic of Moldova.

The overall objective of the project was to improve the economic performance of the border area by facilitating and modernizing agriculture in a sustainable way. Thus, following the completion of the study, results have been obtained and conclusions have been drawn that have helped to make decisions on the sustainability of production and good practices in cattle breeding [4-7]. In this paper, we present some of the results obtained in the cross-border area of Romania, Ukraine and Republic of Moldova, which refers to the technologies for the exploitation and production of bovine meat in the Eastern cross-border area of Romania.

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MATERIAL AND METHOD

The research was carried out between 2013-2015 in the cross-border areas of Romania, Ukraine and the Republic of Moldova [5, 7]. During this time, cattle herds, the type and size of farms, the technical equipment of farms, and the yields obtained and the profitability of the exploitations, as well as the welfare standards of the animals were pursued. Primary data were extracted from the holding records but also from the administrative offices database. They have been systematized, statistically processed and interpreted by methods specific to such research [8-11]. Statistics and parameters, which characterize a normal distribution, are on the one hand mean or median and on the other hand dispersion indices represented by variance and the standard deviation of the persuaded character. Statistics are marked with Latin letters: the arithmetic mean ($\bar{X}$), variable (s^2), standard deviation (s) and parameters with the Greek letters: theoretical average (μ), the variance (σ^2) and standard deviation (σ). For this purpose the software S.A.V.C. (Statistics Analysis of Variance and Covariance 2003) was used to determine the average ($\bar{X}$), arithmetic mean error ($\pm S_{\bar{X}}$) standard deviation (s), coefficient of variability ($V\%$) and significance tests ANOVA respectively p [1].

It should be mentioned that the data analysis was carried out by combining and correlating with the many observations made directly on farms and reporting the results obtained to the requirements and standards of the European Union (UE) [2, 3].

RESULTS AND DISCUSSIONS

Taking into consideration the conditions of Romania, the current state of structural reforms in agriculture and the estimation of their evolution can be structured by organizational structures of agricultural holdings in accordance with the Romanian family tradition and the requirements of agricultural performance that will show profound structural mutations in the sense of preponderance of commercial family farms, large agricultural commercial farms, and holding type companies.

Estimates highlight that family subsistence farms will be numerically reduced by 2020, reaching 13.5% of the country's agricultural area. Family associations will double compare to 1999, reaching 20.2% of the agricultural area with an average size of 200 ha and the private sector will hold 1475 thousand farms with 74.5% of the agricultural area.

Family farms represent the organizational structure to which most of the individual agricultural households will target. These agricultural production structures will be asserted as the concentration and modernization of production, becoming agricultural units producing mainly for marketing.

The analysis of the current situation as well as the forecast regarding the production and consumption of beef meat in Romania should start from highlighting the factors influencing this important sector of agricultural production. Among the main factors determining the level of beef meat production, the following can be mentioned: intensification of the specific production of feed and feed additives, density and productivity of cattle per 100 ha, productive potential of the breeds used, fattening systems and methods, size and degree of farms modernization, financial possibilities of the farmers, national agricultural policies and specific Community policies [4-7].

It is worth pointing out that, compared to the geo-climatic possibilities of Romania and in comparison with the other European countries, both the total number of cattle per 100 ha of agricultural land and the average weight at slaughter, as well as the human consumption of beef meat are lower compared to the values considered to be optimal.

A brief calculation shows that in a population of approximately 1,700,000 cows there are 1,360,000 calves (80% birthrate) annually, or 680,000 male calves that can be capitalized for meat production.

If the capitalization were made at 321 kg, as currently is, would result 218,280 tones, and by capitalizing at 450 kg would result 306,000 tones, which is, a plus of 94,172 tones, a quantity that is lost annually through a non-economic exploitation of the youth destined for meat production.

In the structure of meat consumption at national level, traditionally, but also due to the (family) own production possibilities, pork meat accounted for approx. 50%, followed by poultry meat with approx. 23% and beef with approx. 20%, the difference being represented by sheep meat and other animal species.

The results of the bovine livestock and meat production survey for the analyzed period are presented in Table 1. We see a

decrease in the total number of cattle to 2197 thousand heads in 2013, but also the total live beef production from 333 thousand tons in 2007 to 232.6 thousand tons in 2013. Instead, the average weight at slaughter increased from 280 Kg in 2007 to 327 Kg in 2013. The explanation lies in the fact that Romania as a member of the European Union had to comply with the Community standards for quality assessment of bovine carcasses.

Table 1 Dynamics of livestock and meat production during 2007-2013

Specification	UM	2007	2008	2009	2010	2011	2012	2013
Total cattle livestock	thousands heads	2819	2684	2512	1.985	2.130	2164	2197
The total production of beef, live weight	thousands, tons	333	306	264	205	289.3	198.5	232.6
Average weight at slaughter	kg/head	280	285	287	264	333	332	327

Also, updated data of I.N.S. (National Institute of Statistics) points out that meat production is at 206 thousand tones live weight at slaughter in 2016, 6 thousand tons more than in 2015 when meat production was 200 thousand tones live weight at slaughter. Compared to 2013, we see a decline in bovine meat production, which may be due to market fluctuations that occur both at national and on the Community market.

Concerning the slaughtering of cattle in specialized units, the number of slaughtered heads has decreased, but the average weight in the carcass has increased.

After Romania's integration into the EU, the beef production sector had to comply with specific European regulations aimed at producing, processing and selling of this important food product. This sector of activity also faces fierce competition from both European and continental manufacturers (especially from South America, North America and Australia).

The Odessa region is located in the southern part of Ukraine and stretches on 250 km from the sea to the north. The coastline stretches over 300 km. It borders with Moldova and Romania to the west, the regions of Vynitsya and Kirovograd to the north, the Mykolaiv region to the east,

and part of the Ukrainian frontier of the southwest is bordering Romania. There are, in total, 1362 km of state border in the region. The south and south-east of the region is bordered by the Black Sea coast [4-7].

Agriculture is the main area of activity in terms of product volume and higher numbers of employees, with 35% of the population employed in the sector, more than half of the production units are concentrated there, producing 42% of gross domestic product (GDP) and 80% of consumer goods.

Of the total Ukrainian gross agricultural product, the share of the region exceeds by 5.3%, grain - 7.5%, sunflower - 8.1%, grapes - 45.5%, meat - 4.5%, milk - 4.8 %, eggs - by 6.3%.

The climatic and environmental conditions of the region imply the specificity of agricultural businesses according to the profile and specialization of the area: cattle breeding area with a developed sunflower and sugar beet production; area of dairy, vegetable and chicken breeding; the area of cereals and cattle breeding with a good development of viticulture and of the pig breeding sector.

In 2013 from the total quantity of agricultural products as weight, the cultivation of vegetable products was 70.7% and the cattle breeding was 29.3%.

The cross-border study in the Odessa region highlighted that the cattle breeding activity has an important role to play in the area. On January 1,

2014 there was a total of 31667 thousand animals, of which 12364 thousand cows [5].

The beef cattle's in the Odessa region are mainly represented by the Aberdeen Angus breed. In January 2014, the number of beef cattle was 2993 thousand, of which 1,115 thousand cows. The number of beef cattle in the Odessa region is shown in Table 2.

The table shows that in 2014 the total number of beef cattle was 2,993 thousand heads, decreasing by 403 heads or 11.9% compared to 2013, of which 1,115 thousand cows, decreasing by 224 heads or 16.7%.

Table 3 shows the production of live bovine meat and the average daily gain in the Odessa region.

Table 2 Total beef cattle livestock in Odessa region

Odessa region	Cattle livestock – total			From which, cows		
	2014	2013	2014 % in comparison to 2013	2014	2013	2014 % in comparison to 2013
Total heads	2993	3396	88.1	1115	1339	83.3

Table 3 Live cattle meat production and average daily gain

Odessa region	2013	2012	2013 % in comparison to 2012
Cattle meat production, Kg	32203	35233	91.4
Average daily gain, g per day	402	379	

Meat production in 2013 was 32203 kg and in 2012 was 35233 kg with 3030 kg less or 8.6%.

The average daily gain in 2013 in the districts of the Odessa region was 402 g per day, with 23 grams more than in 2012.

The meat and milk sector in the region is represented by a total of 67 companies that process most of the production.

There is a breeding network in the region that provides the farmers and the farms with biological material and specialist assistance. There are 491 animal health centres' and a network of veterinary pharmacies serving the needs of farmers and private breeders to maintain animal health. There are also 89 places in veterinary education at the State Faculty of Veterinary Medicine.

The main branch of the zoo technical sector in the Republic of Moldova is represented by the cattle breeding, having as main purpose the production of milk and meat, valuable food for human nutrition as well as raw material for the industry.

The cattle breeding in the Republic of Moldova had the highest degree of development during the period 1989-1990, when were recorded the higher indices of the cattle population, their productivity and the global production of milk and meat [4-7].

Meat production declined in 2012 compared to 2008 by 10.3%. During this time, milk production per cow increased from 3011 to 3380 kg or by 12.2% (tab. 4).

Table 4 Total cattle livestock, milk and meat production in the Republic of Moldova

Years	Total livestock at January 1 st		Milk, thousands t	Meat, thousands t	Annual average milk production per cow, kg
	Total	Including cows			
2008	232.0	168.8	510.5	10.58	3011
2009	218.0	160.3	538.9	12.0	3316
2010	216.0	154.4	554.1	10.15	3435
2011	216.0	154.2	525.77	9.67	3224
2012	204.0	144.0	525.0	9.5	3380
2013	191.0	134.0			

In the last years, since 2005, global meat production has been gradually reduced, if in 2005 there were 15.6 thousand tons, then in

2012 only 9.5 thousand tons or by 39.2% less.

Meat production by category of farms is presented in Table 6.

Table 5 Global meat production, thousands of tons

Meat (weight after slaughter)	2005	2006	2007	2008	2009	2010	2011	2012
Beef and veal meat	15.6	15.0	15.2	10.6	11.1	10.2	9.7	9.5

Table 6 Bovine meat production per farms, live weight, thousand tons

Meat production at slaughter (live weight)	2008	2009	2010	2011	2012
All types of farms	17.6	18.4	16.9	16.1	15.8
Agricultural enterprises and peasant farms	1.8	1.6	1.7	1.8	2.2
Households	15.8	16.8	15.2	14.3	13.6

Meat production (live weight) in all farms increased by 4.5% in 2009, and from 2010 it is decreasing, in 2012 reaching 15.8 thousand tons or 14.2% less than 2009.

In agricultural enterprises and peasant farms in 2012, meat production increased by 22.2% compared to 2011. In main households, the production of meat decreased from 16.8 thousand tons in 2009 to 13.6 thousand tons in 2012 or by 19.1%.

On January 1, 2014, there were only 21 farms in the Republic of Moldova, for the production of beef meat, from which 18 farms with 5-60 heads and three farms with 90 to 500 heads. In family-type households, the average daily gain does not exceed about 400 g per day. The veal's are slaughtered at low weight, which makes cattle meat production unprofitable.

Following the analysis in the cross-border region of the three countries, we can say that the meat-breeding technologies differ from one area to another and sometimes even within the same area.

Regarding the cattle welfare, which ultimately determines the level and quality of production, five fundamental freedoms must be ensured: freedom from discomfort - animals must have an adequate living environment, including a shelter and a comfortable resting area; freedom to express their natural behavior - animals must be given sufficient space and the company of animals of the same species; freedom from hunger and thirst - animals must have unlimited access to fresh water and adequate food to maintain their health; freedom from

fear and stress - animals must be treated in a way that does not cause them psychological suffering; freedom from pain and disease - animals should be provided with a rapid diagnosis and appropriate treatment.

CONCLUSIONS

1. After Romania's integration into the EU, the beef production sector had to comply with specific European regulations aimed at producing, processing and selling of this important food product. This sector of activity also faces fierce competition from both European and continental manufacturers (especially from South America, North America and Australia);

2. The meat production from Romania is at 206 thousand tones live weight at slaughter in 2016, 6 thousand tons more than in 2015 when meat production was 200 thousand tones live weight at slaughter. Compared to 2013, we see a decline in bovine meat production, which may be due to market fluctuations that occur both at national and on the Community market. Concerning the slaughtering of cattle in specialized units, the number of slaughtered heads has decreased, but the average weight in the carcass has increased (from 280 Kg in 2007 to 327 Kg);

3. The beef cattle's in the Odessa region are mainly represented by the Aberdeen Angus breed. In January 2014, the number of beef cattle was 2993 thousand, of which 1,115 thousand cows;

4. For the same region meat production in 2013 was 32203 kg and in 2012 was 35233 kg with 3030 kg less or 8.6%.

Concerning the average daily gain in 2013 in the districts of the Odessa region was 402 g per day, with 23 grams more than in 2012

5. On January 1, 2014, there were only 21 farms in the Republic of Moldova, for the production of beef meat, from which 18 farms with 5-60 heads and three farms with 90 to 500 heads. In family-type households, the average daily gain does not exceed about 400 g per day. The veal's are slaughtered at low weight, which makes cattle meat production unprofitable;

6. Meat production (live weight) in all farms increased by 4.5% in 2009, and from 2010 it is decreasing, in 2012 reaching 15.8 thousand tons or 14.2% less than 2009;

7. It was found that both in the cross-border area of Romania and in the cross-border area of Ukraine and the Republic of Moldova the allocation of production factors are beneath necessary, the current conditions, especially of financial nature, allowing only the use of some factors of production race, feed). If in Romania the Europe European funding has contributed to performance improving, farmers in Ukraine and the Republic of Moldova are facing large deficiencies.

8. Regarding the cross-border study, the following measures are necessary to make farms more profitable: increasing the slaughter weight which will result in high meat yields in the carcass; integration of cattle breeding activity into U.E. standards and regulations; to promote the activity of genetic improving of the cattle population in order to increase and improve meat production; financial support for the organization of farms in associations, in order to represent the interests in relation to the suppliers of inputs and beneficiary products; securing own revenues by capitalizing on export goods; ensuring the necessary conditions for exteriorization of the animal's production potential; stimulating the growth of cattle's in hill and mountain areas with opportunities for exploiting beef cattle.

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