

# STUDY OF MILK PRODUCTION INDICES FOR CATTLE BREEDS EXPLOITED IN PRIVATE FARMS IN NEAMȚ COUNTY

Mariana Nistor-Anton<sup>1\*</sup>, V. Maciuc<sup>1</sup>

<sup>1</sup>Faculty of Animal Sciences, University of Agricultural Sciences and Veterinary Medicine of Iasi, Romania

## Abstract

In this paper, we have proceeded to analyze milk production indexes, on standard lactation (305 days) in maturity equivalent (MS), on successive lactations for two breeds of cattle, Black Spotted Romanian Cattle and Holstein, exploited in family farms in Neamț County. For this process, we utilized data from associations accredited to carry out the official control of milk production (COP), the Association of Animal Breeders "Operator I.A" Neamț and the Association of Cattle Breeders from Mureș County, as well as data from the Genealogical Register. In Holstein cows, an average quantity of milk of 6096.49 kg was registered on normal lactation, with 19.44% higher than that obtained in purebred Black Spotted Romanian Cattle but this performance is below the breed average.

Comparatively, in the population of Black Spotted Romanian Cattle, the average production was 5104.21 kg / lactation, the phenotypic production in this case being close in value to the real productive potential of the breed. Regarding the fat / protein ratio, it registered values of 1.17, both in the Holstein breed and in the Black Spotted Romanian Cattle, values that are close to the normal limits of the two breeds (1.20).

**Key words:** cows, milk production, family farms, COP

## INTRODUCTION

Without minimizing the importance of other animal species in providing the products needed for human consumption, cattle should be regarded as having a primary spot in the agricultural economy. By accepting this fact, the species deserves a different pursuit and support as far as size, performance and competition are concerned, both now and in future [23].

Cattle are the species with the highest proportion in livestock contingencies (36 - 43%), ensuring most of the milk needed (over 92%) for human consumption [8]. Therefore, the genetic improvement of cattle is required - an overarching activity in the development of a strategy for Romanian animal husbandry, carried out through selection works based on official performance control (COP) and by directed reproduction mainly by artificial

insemination (AI) [18]. The importance of knowing individual milk production as well as milk fat and protein content lies in the following important aspects for this sector:

- maximizing the economic efficiency of farms, due to increase in the specific competitiveness of dairy markets;
- increased consumer demand for products with high biological value [4];
- is the main criterion for assessing mixed and dairy cows along with productive capacity, which allows the ranking of animals [6];
- the composition of the selection nuclei, the nomination of bull mothers and bull mother candidates [10];
- importance for food organization [12];
- appreciation of lineage of breeders, as well as the establishment of the selling price for breeding cattle [20].

## MATERIAL AND METHOD

In this paper, we analyzed the performances of milk production in three family farms in Neamț County. In this respect, we carried out the research and

---

\*Corresponding author:  
marianaanton700@gmail.com  
The manuscript was received: 01.10.2020  
Accepted for publication: 05.11.2020

analysis of herds of cows included in the COP from the following breeds: Black Spotted Romanian Cattle and Holstein. The ensuing aspects were analyzed: the amount of milk on normal lactation, the fat content, the total amount of fat, the protein content, the total amount of protein. The data taken from the official production control, for the last three years, has been processed and interpreted statistically. The study included a total number of 161 cows from the previous active population as well as those from the current active population, on the first 5 lactations, of which: 121 heads from the Holstein breed and 40 heads from the Black Spotted Romanian Cattle. The official control of production is carried out permanently, based on the control schedule prepared by the two associations of cattle breeders, to determine the genetic quality of animal

breeds [5]. The control method applied is the AT4 method, (the control is performed by an official representative of the control association, the cows are subjected to individual control, to a control at evening milking and to the next control at the morning muzzle, the control interval being 4 weeks) [14]. The method used to calculate lactations is the control interval method (interpolation method) [11].

### RESULTS AND DISCUSSIONS

In order to assess the production characteristics of the cattle exploited in some private farms in Neamț County, 121 cows from the Black Spotted Romanian Cattle and 40 heads from the Holstein breed were studied. The results obtained are summarized in Table 1 and Figure 1.

Table 1 Milk production in MS (maturity equivalent) on standard lactation (305 days)

Race	Lactation I Kg milk	Lactation II Kg milk	Lactation III Kg milk	Lactation IV Kg milk	Lactation V Kg milk
Holstein	5742.04	6153.90	6281.27	6242.54	6062.72
Dotted with Romanian black	4453.09	5002.54	5574.23	5291.57	5199.65

Source: Association of Animal Breeders "Operatorul I.A" Neamț, Association of Cattle Breeders from Mureș County

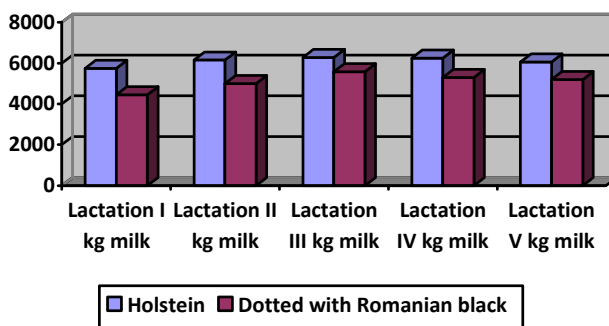


Fig. 1 Milk production in MS (maturity equivalent), on standard lactation (305 days)

Quantitative milk production, in the Black Spotted Romanian Cattle, on normal lactation, on successive lactations reveals a normal production curve, recording the maximum production at the third lactation - of 5574.23 kg of milk - but the minimum amount was obtained at lactation I - 4453.09 kg. In the Holstein breed, milk production on successive

lactations also registers an ascending curve, from 5742.04 kg of milk to the first lactation, to over 6200 kg to the III and IV lactations.

From the analysis of the evolution of milk production, on successive lactations, it is found that Holstein cows have a better productive precocity, in the first lactation, achieving 91.41% of the maximum lactation,

while the cows of the Black Spotted Romanian breed achieved 79.88%, which indicates an average productive precocity. It is also noted that the average lactation of cows in Holstein breeds is 6096 kg, which is 19.44% higher, compared to what is obtained in the cows of the Black Spotted Romanian Cattle. But the amount of milk, on normal lactation, obtained from Holstein cows on the farms studied is below the average of the breed, this being 9,700 kg / lactation [15].

This demonstrates that milk production is not only influenced by genetics, which requires improvements in the management of food, reproduction and exploitation technology in these family farms [1]. Given the fact that the quality of milk is mainly reflected both in the opinion of the consumer and of the milk processor, in the two components, namely: fat content and protein content [22], we analyzed their values in the two studied breeds, as shown in Table 2.

Table 2 Milk fat (%) and protein (%) content

Race	Lactation I Kg milk		Lactation II Kg milk		Lactation III Kg milk		Lactation IV Kg milk		Lactation V Kg milk	
	Fat	Protein	Fat	Protein	Fat	Protein	Fat	Protein	Fat	Protein
Holstein	3.70	3.40	3.78	3.45	3.91	3.31	4.02	3.24	4.12	3.25
Dotted with Romanian black	3.66	3.18	3.72	3.30	3.70	3.16	3.79	3.17	3.87	3.15

Source: Association of Animal Breeders "Operatorul I.A" Neamț, Association of Cattle Breeders from Mureș County

The milk fat content had average values, between 3.66% in the 1st lactation and 3.87% in the 5th lactation in the Black Spotted Romanian Cattle. In the Holstein breed, the fat content recorded at lactation I was 3.70% and 4.12% at lactation V.

The milk content in protein, on successive lactations, at normal lactation, registered in the Black Spotted breed had average values between 3.20% in the second lactation and 3.15% in the 5th lactation. In the Holstein breed, the protein content scores the lowest values at the fourth and fifth lactation: 3.24%, respectively 3.25%, the highest protein content in milk being at lactation II - 3.45% (Table 2).

Analyzing the quality of the milk in terms of fat and protein content, significantly higher values were recorded in Holstein cows, the average fat percentage being 3.90% and the protein percentage being 3.33%, compared to the results obtained in the cows of the breed Black Spotted Romanian Cattle, in which the average fat percentage was 3.74% and the protein percentage 3.17%.

## CONCLUSION

Given that the exploitation of cows for milk production in this area of the country is

practiced almost exclusively in the family system, we considered it necessary and appropriate to undertake this work.

The breeding of cattle in Neamț County "benefits" from a series of factors favorable to the development of this activity, among which we can name the natural, social and economic conditions and, last but not least, the tradition factor. The Black Spotted Romanian Cattle is a breed with good skills for milk production, it achieves an average production of 4500 - 5000 kg / lactation, with 3.8-3.9% fat. The average production registered in the population of the Black Spotted breed studied in this paper was 5104.21 kg / lactation, which demonstrates that by the correct management of the factors that influence the individual milk production (feeding, milking, maintenance, crossbreeding) the phenotypic production approaches, as a value, the real productive potential of the cow.

The Holstein breed is a breed of cattle with exceptional skills for milk production, the average production mounting at approx. 9000 - 10000 kg of milk / lactation with an average fat content of 3.6-3.8%. The phenotypic performances for milk production, recorded in the Holstein population under study, are below

the average of this breed, the average production being 6096 kg milk / lactation, which confirms that it is a breed with very good skills for milk production, but inadequate feeding and maintenance conditions lead to a significant reduction in milk production. Summarizing the results of the research carried out, it can be concluded that the bulls from the breeds Black Spotted Romanian Cattle and Holstein are well adapted to the environmental conditions specific to the area, but the productive performances are often modest, so it is necessary to reconsider and improve the management of all factors that influence the quantitative and qualitative production obtained from the two breeds studied.

### ACKNOWLEDGEMENTS

Association of Animal Breeders "Operatorul I.A" Neamț, Association of Cattle Breeders from Mureș County.

### REFERENCES

- [1] Acatincăi, St., 2010 - Cattle breeding technology. Agropint Publishing House, Timișoara
- [2] Alexoiu, A., Roșca, L., 1988 - Practical guide for selection and management of matings in cattle farms. Ceres Publishing House, Bucharest
- [3] Dinescu, St., Săbădeanu P., 1966 - Feeding animals in small and medium farms. Ceres Publishing House, Bucharest
- [4] Dinescu S., 2002, Milk production in Romania - Restrictions - Opportunities - Solutions, Ceres Publishing House Bucharest
- [5] Dronca D., 2003, Animal breeding, Mitron Publishing House, Timișoara
- [6] Georgescu, Gh., Ujică, V., et al., 1988 - Treaty for cattle breeding. Vol.I, Ceres Publishing House, Bucharest, pp. 53-55
- [7] Georgescu Gh., Stanciu G., Velea C., Ujică V., 1990, The technology of cattle breeding. Didactic and Pedagogical Publishing House, Bucharest
- [8] Georgescu Gh., 2000 - Milk and dairy products. Ceres Publishing House, Bucharest
- [9] Georgescu Gh. Et al., 2007 - The book of the milk producer and processor, vol. II, Ceres Publishing House, Bucharest
- [10] Grosu, H., et al., 1996 - Prediction of the improvement value in dairy cattle. Labor, I.C.P.C.B., Bucharest
- [11] Grosu, H., Pascal, A., 2005 - Genetic improvement programs in animal husbandry. Ceres Publishing House
- [12] Halga, P., et al., 2005 - Animal nutrition and nutrition, Alfa Publishing House, Iași
- [13] Ivancia, Mihaela, 2007 - Animal breeding. Alfa Publishing House, Iași
- [14] Maciuc V., Nacu G., Zaharia V., Zota D., 2003 - Animal breeding. Alfa Publishing House, Iași
- [15] Maciuc V., Ujică V., Nistor I., 2003 - Practical guide for genetic improvement of cattle for milk production. Alfa Publishing House, Iași
- [16] Maciuc V., 2006 - Cattle breeding management. Alfa Publishing House, Iași
- [17] Neață, Gh., 2005 - Genetic breeding of dairy cows - a national priority. In: Journal of Animal Husbandry and Veterinary Medicine (Bucharest), № 1
- [18] Onaciu, G., 1999, Aptitudes for milk production of a population of Romanian Bălțată cattle from central Transylvania. Symposium.USAMV Cluj-Napoca, 21-23 oct
- [19] Onaciu, G., Velea, C., 2000 - Assessment and control of cattle production. Science Book Publishing House. Cluj Napoca
- [20] Podar, C., Oroian, I., 2003 - Raising and exploitation of dairy cows in households. Editura Tipomar, Tg. Mures
- [21] Stanciu, G., Acatincăi, St., Czister, L.T., 2005 - Cattle breeding technology. Eurostampa Publishing House, Timișoara
- [22] Ujică V et al, 1998 - Characterization of a BNR cattle population from the eastern part of Romania according to some productive indices, Simp. Del. Nat. The rebirth of Romanian Animal Husbandry - a certainty of the second millennium, USA
- [23] Usturoi, M.G., 2007 - Milk and milk technology. Alfa Publishing House, Iași
- [24] Virginia Z., Maciuc V., Nacu Gh., Zota D., 2003 - Animal breeding, 255 pp. Alfa Publishing House
- [25] Zalan, K., 2005 - Feeding, a factor influencing milk quality. Symposium "Cattle farm in the perspective of integration into the European Union". Second edition, September 9-10