STUDY OF MILK PRODUCTION INDICES OF BĂLȚATĂ ROMÂNEASCĂ EXPLOITED IN FARMS IN NEAMȚ COUNTY

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Abstract

In this paper we analyzed the milk production indices, for normal lactation (305 days), on the first two lactations of Spotted Romanian cattle breed in two farms in Neamț County. To aim this, we used data from the Association of Cattle Breeders from Mureș County accredited for performing our own performance control (CPP) as well as data from the Genealogical Register. For the analysis of the productive performances, statistical processing of the primary data regarding the average value and the variability of the milk production indices for 4 characters was carried out, as follows: length of normal lactation (days), quantity of milk per normal lactation (kg), percentage of fat, and percentage of milk protein. The studied farms were coded with Arabic numerals: darm 1- I.I Ciucalău Aurelia Vasilica, and farm 2 - P.F.A. Pintea Ionela. The best productive performances were registered in farm 1, where the average milk production for the first lactation was 5967.80 kg, the average value of the fat percent was 4.08%, and the average value of the protein percent was 3.26%. At the second lactation, the average milk production was 5012.89 kg, the average value of the fat percent was 4.05%, and the average value of the protein percent was 3.31%. In the first lactation the average milk production per normal lactation was 5967.80 kg, but it decreased in the second lactation to 5012.89 kg.

Key words: cows, milk production, farms, CPP

According to the data provided for the control year 01.10.2019-30.09.2020, by the 3 Associations of Animal Breeders, which performs in Neamț County the control of the production performances of dairy cattle, regarding the structure by breeds of Bălțată Românească breed of 7147 cows, the breed participates with a herd of 3027 cows, which represents 42.35%.This indicates that the breed that belongs to the mixed morphological type of milk-meat, is bred in an increasing number of farms, because it is addapted to the specific conditions of this area.

On average, milk production per lactation is 5000-5500 kg of normal lactation, and the fat content of milk is 3.8-3.9%, and 3.5% protein.

Genetic progress in a cattle population is more difficult than in other species, due to the large inter-generational gap, it can be said that if 10-15 years ago this cattle breed recorded an average milk production per normal lactation of 3000 kg, currently achieves productions of 5967.80 kg, the milk fat content being - 4.08% and protein - 3.26% It is important that in medium-sized private farms (30-100 cattle) use all the principles of scientific improvement which includes that they use frozen semen from the best breeding bulls, as well as selective reform. In the studied farms, the system resumes to: closed production circuit, with simple reproduction, staggered calving, the cows are tied in the shelter, with two-row placement, and end-to-end arrangement, the feeding system involves using season fodder (in winter canned fodder and in summer mixed feeding, with technological trailer or animal traction), manure is evacuated in some farms manually and in others mechanically, automatic watering, and milking is done mechanically, in cans.

MATERIAL AND METHOD

In this paper, we analyzed the milk production indices, on normal lactation (305 days) for the first two lactations, in Bălțată Românească registered in the performances control, exploited in two farms in Neamț County. The studied farms were coded as follows: farm 1- I.I. Ciucalău Aurelia Vasilica, and farm 2 - P.F.A. Pintea Ionela. The studied herd was represented by 55 cows from the Bălțată Românească breed. The primary data were extracted from the Association of Cattle Breeders from Mureș County, from the Genealogical Register of the breed but also from the farm records. Statistical processing was performed following the average value and variability for 4 characters: length of normal lactation (days), milk

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quantity per normal lactation (kg), fat percent in normal lactation (%), protein in normal lactation (%). The data was was analyzed for successive lactations: for the first lactation and the second lactation

RESULTS AND DISCUSSIONS

From the data presented in table 1 regarding the average values and the variability of milk production indices in Ist lactation in farm 1, it revealed that the length of normal lactation is normal (305 days); from the standard deviation value s = 0.000 and the coefficient of variation which is V% = 0.000 the same conclusion can be drawn (Dinesc S. *et al*, 2002). The amount of milk per normal lactation recorded an average value of = 5967.80 ± 195,070 kg. Analyzing the degree of

dispersion of genotypes in the reproduction herd, an average value of variability was found, the standard deviation having the maximum value of s = 616,866 kg milk, and the maximum variation coefficient of V% = 10,337 with the minimum limit of 4864.00 kg milk and the maximum limit of 6801.00 kg of milk, a good situation for selection in order to improve productive performance (Georgescu G. *et al*, 1998). The fat percent registered an average value of $\overline{X}$ = 4.08%, the coefficient of variation is V% = 4.578 with the minimum limit of 3.74% and the maximum of 4.32%. The protein percent registered an average value of 3.26%, the coefficient of variation is V% = 3.385, with the minimum limit of 3.10% and the maximum of 3.42%.

Table 1

Average values and variability of milk production indices in Ist lactation (farm 1)

Characters	$\overline{X}$	±S$_{\overline{x}}$	s	V%	Minimum	Maximum
Duration of normal lactation (days)	305.00	0.000	0.000	0.000	305.00	305.00
Milk (kg)	5967.80	195.070	616.866	10.337	4864.00	6801.00
Fat (%)	4.08	0.059	0.187	4.578	3.74	4.32
Protein (%)	3.26	0.035	0.110	3.385	3.10	3.42

From the data presented in *table 2* regarding the average values and variability of milk production indices at lactation II in farm 1, it is revealed that the length of normal lactation is that indicated by the literature (305 days), observed also from standard deviation value s = 0.000 and the coefficient of variation which is V% = 0.000. The milk quantity per normal lactation recorded an average value of = 5012.89 ± 138,309 kg. Analyzing the degree of dispersion of genotypes in the reproduction herd, a lower variability was found compared to the one recorded in the first

lactation, the standard deviation had the maximum value of s = 414,926 kg milk, and the maximum coefficient of variation of V% = 8,277 with the minimum limit of 4348.00 kg milk and the maximum limit of 5469.00 milk. The fat percentage registered an average of 4.085%, the coefficient of variation was V% = 4.081 with the minimum limit of 3.78% and the maximum of 4.29%. The protein percent registered an average of 3.31%, the coefficient of variation was V% = 1.608, with the minimum limit of 3.23% and the maximum of 3.38%.

Table 2

Average values and variability of milk production indices in IInd lactation (farm 1)

Characters	$\overline{X}$	±S$_{\overline{x}}$	s	V%	Minimum	Maximum
Duration of normal lactation (days)	305.00	0.000	0.000	0.000	305.00	305.00
Milk (kg)	5012.89	138.309	414.926	8.277	4348.00	5469.00
Fat (%)	4.05	0.055	0.165	4.081	3.78	4.29
Protein (%)	3.31	0.018	0.053	1.608	3.23	3.38

The analysis of the milk production and variability indices on successive lactations, at the first two lactations, showed that in farm 1 at the second lactation there was a decrease of the

average milk production per normal lactation, which is determined by the poor management of technological factors which influences the milk production from this farm (*figure 1*).
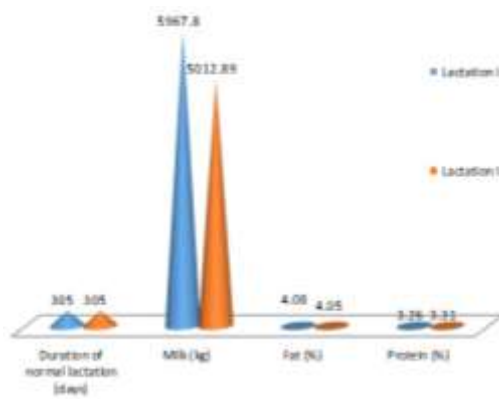
Figure 1 **Productive performances on successive lactations for the first two lactations (farm 1)**

From the data presented in *table 3*, the average values and the variability of milk production indices at lactation I on farm 2, revealed that the length of normal lactation is indicated by the literature (305 days), which was observed from the value of the standard deviation s = 0.000 and of the coefficient of variation which was V% = 0.000. The milk quantity per normal lactation recorded an average value of 4420.67 ± 99,280 kg. Analyzing the degree of dispersion of genotypes within the reproduction herd, a small variability was found, the standard deviation had the maximum value of s = 171,957 kg of milk, and the maximum coefficient of variation of V% = 3,890, which indicates a homogeneous population with a minimum limit of 4270.00 kg milk and a maximum limit of 4608.00 milk. The fat percentage registered an arithmetic average of = 3.38%, the coefficient of variation is V% = 2.682 with the minimum limit of 3.28% and the maximum of 3.45%. The protein percentage registered an average value of = 3.23%, the coefficient of variation is V% = 4.208, with the minimum limit of 3.10% and the maximum of 3.37%.

Table 3

Average values and variability of milk production indices in Ist lactation (farm 2)

Characters	$\overline{X}$	±S $_{\overline{x}}$	s	V%	Minimum	Maximum
Duration of normal lactation (days)	305.00	0.000	0.000	0.000	305.00	305.00
Milk (kg)	4420.67	99.280	171.957	3.890	4270.00	4608.00
Fat (%)	3.38	0.052	0.091	2.682	3.28	3.45
Protein (%)	3.23	0.078	0.136	4.208	3.10	3.37

From the data presented in *table 4* on the average values and variability of milk production indices at lactation II in farm 2, it was revealed that the length of normal lactation is that indicated by the literature (305 days), which is observed from the value standard deviation s = 0.000 and coefficient of variation which is V% = 0.000. The quantity of milk per normal lactation registered an average value of = 5209.17 ± 318,934 kg. Analyzing the degree of dispersion of genotypes within the reproduction herd, a rather high variability is found, the standard deviation had the maximum value of s = 781,226 kg milk, and the maximum coefficient of variation of V% = 14,997, which indicates a population with average homogeneity with the minimum limit of 4407.00 kg milk and the maximum limit of 6190.00 milk. The fat percentage registered an average value of 2.96%, the coefficient of variation was V% = 24,440 with the minimum limit of 2.37% and the maximum of 4.20%. The protein percentage recorded an average value of 3.29%, the coefficient of variation was V% = 5.555 (the minimum limit was 3.12% and a maximum of 3.61%).

Table 4

Average values and variability of milk production indices in IInd lactation (farm 2)

Characters	$\overline{X}$	±S $_{\overline{x}}$	s	V%	Minimum	Maximum
Duration of normal lactation (days)	305.00	0.000	0.000	0.000	305.00	305.00
Milk (kg)	5209.17	318.934	781.226	14.997	4407.00	6190.00
Fat (%)	2.96	0.296	0.724	24.440	2.37	4.20
Protein (%)	3.29	0.075	0.183	5.555	3.12	3.61

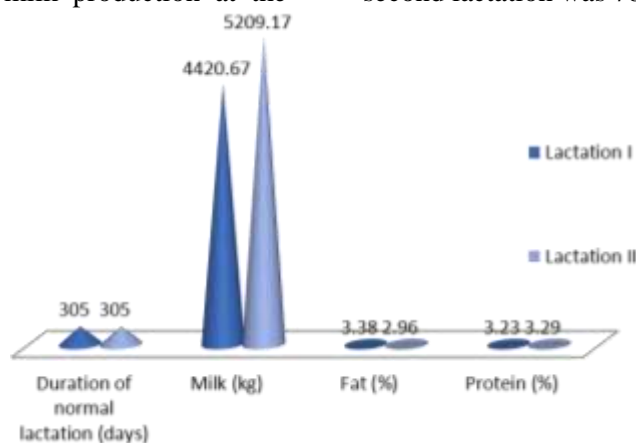From the data presented in *tables 3 and 4*, and from *figure 2* shows a normal, ascending evolution of the average milk production at the second lactation compared to the first lactation, the increase of the average milk production at the second lactation was 788.50 kg.

Figure 2 **Productive performances on successive lactations for the first two lactations (farm 2)**

CONCLUSIONS

From the present paper, where we studied the production performances in the first and the second lactation registered in the studied farms, the following conclusions are revealed:

1. In farm 1, for the first lactation the average value of the quantity of milk per normal lactation was 5967.80 kg, and at the second lactation 5012.89 kg of milk were obtained, which indicates that the cattle have a good genetic value but due to poor management, especially as regards feeding, the cows are unable to externalize their genetic potential.

2. In farm 2, for the first lactation the average value of the quantity of milk per normal lactation was 4420.67 kg, and at the second lactation there is a normal evolution (5209.17 kg of milk). This fact reveals that the management is superior to farm 1, but a special attention is required for the selection of the most valuable individuals based on knowledge of the performance of the herd; there was a fairly high variability, the standard deviation had the maximum value of s = 781,226 kg milk, and the maximum coefficient of variation of V% = 14,997, with quite wide limits, the minimum limit being 4407.00 kg milk and the maximum of 6190.00 milk.

3. Regarding the fat percent obtained in normal lactation for the first and the second one, it appears that the highest percentage of fat was recorded on farm 1, of 4.08% at the first lactation and 4.05% at the second lactation.

4. Regarding the protein percent obtained for lactation I, a higher percentage of 3.29% was found on farm 2, and at the second lactation in farm 1 of 3.31%.

REFERENCES

Acatincăi St., 2004 - *Cattle production. Second Edition*, Eurobit Publishing House, Timişoara
Acatincăi St., 2010 - *Cattle breeding technology*. Agroprint Publishing House, Timişoara
Alexoiu A., Roşca L., 1987 - *Practical guide for selection and management of matings in cattle farms*. Ceres Publishing House, Bucharest
Arişanu I., 2000 - *To raise and exploit cows with high milk production*, Fermierul Magazine
Creangă Şt., Maciuc V., Pîntea M., 2008 - *Genetic polymorphism in cattle breeding in Moldova*. 218pp., "Ion Ionescu de la Brad" Publishing House, Iaşi, vol. ISBN 978-973-147-024-5
Crişan G, Onaciu G., Crişan D., 2012 - *Research on the morphoproductive properties of Romanian Frize-Bălţată bulls in Transylvania*, Scientific papers Zootechnics Series Vol. 50 (12)
Dinesc S., Tontsch, Anne-Marie, 2002 - *Raising dairy cows*. Ceres Publishing House, Bucharest
Dinescu St, Săbădeanu, P., 1996 - *Feeding animals in small and medium farms*. Ceres Publishing House, Bucharest
Drinceanu D., 1994 - *Animal nutrition*. Euroart Publishing House, Timişoara
Georgescu Gh., Ujică, V. et al., 1998 - *Treaty for cattle breeding*. vol. IV, Ceres Publishing House, **Bucharest**
Georgescu Gh., 2005 - *The state of health of the mammary gland and milk production,* Revista de Zootehnie, no. September 3, Iasi
Gîlcă I., Doliş M., 2006 - *Animal breeding technologies*. ALFA Publishing House, Iaşi
Halga P. et al., 2005 - *Animal nutrition and nutrition*. Alfa Publishing House, Iaşi
Maciuc Domnica, Maciuc V., Creangă Şt. 2009 - *User Manual C.O.P.* R.G.106 pp. Edit. "Ion Ionescu from Brad" Ias
Maciuc V., 2012 - *Cattle Breeding*. Technical Publishing House, Botoşani.
Maciuc V., Leonte C., Radu-Rusu R. 2015 - *Manual of good practices in cattle breeding*. 100 pp. Edit. Alfa, Iași, ISBN 978-606-540-148-8
Onaciu G., 2006 - *Design and technological engineering in cattle*. Casa Cărţii de scientie Publishing House, Cluj-Napoca8.