RESEARCH REGARDING THE PERFORMANCES OF AN IMPORTED NUCLEUS OF MONTBÉLIARD CATTLE EXPLOITED IN THE EAST OF ROMANIA

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Abstract

The current paper aimed to study the performances of a nucleus of Montbeliard breed, imported from France in 2008, in the exploitation conditions from the East of Romania. In order to complete this study, we gathered milk samples, at each three months, from the whole herd. The obtained data regarding milk quality, duration of lactations and milk quantity were statistically processed. Study was carried out in 2011 on a number of 89 individuals from which were gathered a total of 333 milk samples. Samples were analysed to establish physical-chemical composition using a CombiFoss 6000 analyser. For the characters connected with milk quality, our research enlightened values between 2.12 ÷ 6.69% for fat, 2.30 ÷ 4.45% for protein and 1.71 ÷ 3.40% for casein. As for the milk quantitative production the studied nucleus recorded mean values of 6036.12 kg milk per total lactation and recorded a mean duration of lactation of 309.6 days. The results we have obtained are fitting between the limits described before for this breed.

Key words: Montbeliard breed, milk quantity, milk quality, Romania

INTRODUCTION

Montbéliard breed or French red spotted it is a mixt breed and represent 40% of it's breed structure. This breed was formed in Eastern France by cross-breeding of local breeds with Simmental, Fleckviech, Abondance [9].

Montbéliard breed it is considered to have a future in Romania because this breed has some important characteristics: low incidence of mastitis [5, 6, 10, 11]; high fertility; longevity; environmental adaptability; high milk content of beta-casein (β-CN).

The individuals from this breed have mean production of over 7400 kg milk per lactation [9, 12].

Our study was necessary to establish the productive performances of this breed exploited in the conditions from East of Romania. The results will be compared with the ones obtained and presented in specialty literature.

MATERIAL AND METHOD

Biological material was represented by cattle from Montbéliard breed, imported from France in 2008 by a farm located in Banca, Vaslui county. From the dairy cattle described were gathered seasonally milk samples. Our study took place in period January-November 2011, on a batch of 89 cows.

We gathered a total amount of 333 milk samples. Gathering was realised seasonally: spring, summer, autumn and winter. Milk samples for analyses were taken from the average sample in according with the standards. So, samples were gathered from each individual, in sterile flacons of 50 ml, for which were utilised as preservative potassium dichromate. Samples were stored and transported at a temperature of 4°C, in an interval of 24 hours.

We have paid attention that the milk quantity to be enough for being analysed.

For this nucleus we tracked the milk qualities characters (protein, fat and casein percent, number of somatic cells) and also the ones connected with milk quantity (duration of lactation, milk quantity per day respectively total milk quantity).

Data regarding the range and lactation duration respectively milk production were extracted from the milking area connected

programme (data base type) and also from the farmer's data base.

Physical-chemical analyse of the gathered milk samples were realised with the device MilkoScan 6000 (Foss Electric). This automatic system include a Lactoscope analyzer, a Somascope analyzer, a unit for automatic preparation of samples and a packet with programmes base-data type which record the obtained results of the analysed samples (up to 220 samples per hour). This whole complex system is called "Combi-system". Lactoscope use "Mid Infra-Red" (MIR) technique to determinate content in fat, protein, lactose and dry matter. This technique was described by Bijgaart in 2006 [1]. The device offers results for all those parameters, simultaneously, in less of a minute. It isn't needed any previous preparations so the risk of damaging the physical and chemical properties of the samples is eliminated.

MIR technique need an adequate calibration of the analyser and for this thing was used the following standard methods: Gerber for fat; Kjedhal for proteins; Microscope for somatic cells; polar-metric and gravimetric methods for lactose and dry matter, in according with SN ISO 57 0530 standard from 1972 [4].

Data processing was realised with the help of programmes S.A.V.C (Statistical Analyse of Variance and Covariance) and Microsoft Excel from Microsoft Office pack. Were establish the estimators (arithmetic mean $\overline{\mathbf{X}}$, standard deviation of the mean $s_{\overline{\mathbf{X}}}$, standard deviation $\mathbf{s}$, variation coefficient V% and minimum and maximum limits) for the studied characters: fat percent, protein percent, casein percent , number of somatic cells/ml, lactation duration, milk quantity.

RESULTS AND DISCUSSIONS

In the current research were studied the following quality characters: fat percent, protein percent, casein percent and number of somatic cells. The establish estimators for the presented characters are shown in table 1.

Table 1 Estimators establish for the quality milk characters

Studied character	Season	n	$\overline{X} \pm s_{\overline{X}}$	s	V%	Limits
Fat (%)	Winter	89	3.86±0.082	0.775	20.08	2.46÷6.69
	Spring	80	3.99±0.085	0.805	20.15	2.13÷5.85
	Summer	85	3.98±0.077	0.730	18.35	2.12÷6.19
	Autumn	79	3.82±0.082	0.766	20.34	2.14÷6.25
Protein (%)	Winter	89	3.32±0.034	0.325	9.79	2.52÷4.01
	Spring	80	3.57±0.034	0.321	8.98	2.79÷4.39
	Summer	85	3.48±0.033	0.313	9.00	2.30÷4.16
	Autumn	79	3.51±0.035	0.331	9.43	2.85÷4.45
Casein (%)	Winter	89	2.52±0.024	0.231	9.18	1.90÷3.06
	Spring	80	2.69±0.027	0.253	9.43	2.00÷3.40
	Summer	85	2.64±0.026	0.247	9.34	1.71÷3.16
	Autumn	79	2.73±0.030	0.281	10.30	2.21÷3.55
SCN (x 1000)	Winter	89	383.48±91.37	861.924	224.76	2.00÷5383.00
	Spring	80	413.66±85.51	806.640	195.00	5.00÷5333.00
	Summer	85	366.18±62.80	592.415	161.78	21.00÷3659.00
	Autumn	79	291.42±26.61	251.062	86.15	23.00÷1384.00

So for the fat percent the mean value varied between 3.82% (recorded in autumn) and 3.99% (recorded in spring). Variation coefficient from all the analysed months indicate a heterogeneous population for this character (V% > 15%). Mean values obtained at cows from the studied batch for fat percent are similar with the ones mentioned in the

specialty literature for this breed: 3.66-3.84% [7, 8, 9].

In the studied nucleus, for the protein percent we calculate mean values between 3.32% and 3.57%, in winter, respectively spring moths. Variation coefficient for this character was < 10%, showing a very homogeneous population. The calculated mean values for protein content are similar with the ones found in the literature for this breed: 3.32 and 3.31% [7, 8, 9].

As regarding the ceasein percent character from the analysed milk samples, we obtained mean values between 2.52 and 2.74%. These values were calculated for winter, respectively autumn months.

The mean values for casein from the milk analysed on seasons, are within the limits mentioned in the literature: 2.5-4.5% [2]. Variation coefficient for the casein character recorded values lower than 10% (very homogeneous population) for spring, winter and summer months, and slightly higher than

10% for the autumn months, indicating a medium homogeneous population.

Number of somatic cells from milk (SCN/ml) is the character at which was found the highest variability, with recorded values between 2.000 somatic cells/ml milk (in winter) and 5.383.000 somatic cells/ml milk (also in winter), obtaining very high variation coefficients (> 100%), although the maximum limit admitted for SCN, according to European Union legislation, is 100.000/ml. Although most of studied articles [5, 6, 10, 11,] indicate a reduced SCN and a lessened incidence of mastitis for Montbéliard breed, the results obtained in this study are showing the opposite.

Our research revealed that the cows from the studied batch had a mean duration for lactation of 309.66 days with variations between 205 and 570 days, with a variation coefficient of 19.73% which indicates a medium homogenity (table 2).

Table 2 Estimators of the studied characters for quantitative milk production

Studied character	n	$\overline{X} \pm s_{\overline{X}}$	s	V%	Limits
Lactation duration (days)	89	309.66±6.48	61.09	19.73	205÷570
Total milk quantity (kg)	89	6036.12±303.42	2862.23	47.42	1250÷12952

Total quantity of milk recorded a mean value of 6036.12 kg/lactation with limits between 1.250 and 12,952 kg of milk and with a variation coefficient of 47.42% indicating a very heterogeneous population (table 2).

The values we have calculated are within the limits mentioned in literature for our country ratings [7, 8, 9]. In France, the mean of milk production specific to Monbéliard breed is 7486 kg [12].

CONCLUSIONS

The current study took on 89 cows from Montbéliard breed, imported and exploited in the environmental conditions from East of Romania can be drawn the following conclusions:
- mean performances recorded for qualitative characters of milk (fat percent,

protein percent, lactose percent and number of somatic cells) are in the limits from the literature;
- mean performances for quantitative production of milk are similar to those from literature;
- cows population is heterogeneous for the characters connected with mill quality (exceptions could be explained through some errors which could be deleted by repeating the experiment);

Montbéliard breed can develop their productive potential in the environmental conditions from the East of Romania.

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