

RESEARCH REGARDING THE PERFORMANCES OF A NUCLEUS OF IMPORTED FRIESIAN BREED CATTLE EXPLOITED IN THE NORTH-EAST AREA OF ROMANIA

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Abstract

The current paper aimed to study the performances of a nucleus of specialized dairy cows belonging to Holstein-Friesian breed, imported from Germany in 2008, in the exploitation conditions from the North-East area of Romania. In order to achieve our goal were 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 170 individuals from which were gathered a total of 596 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 2.40 ÷ 4.62% for fat, 2.38 ÷ 4.65% for protein and 1.78 ÷ 4.79% for casein. As regarding the milk quantitative production the studied herd recorded mean values of 7817.52 kg milk per total lactation and 26.8 kg milk per day for a mean duration of lactation of 288.5 days.

Key words: Holstein Friesian, milk quantity, milk quality, Romania

INTRODUCTION

At world level it is a tendency to keep or even to decrease the total number of dairy cows, from economical reasons. This thing is possible by focusing the farmers to breeds with higher productive performances and through genetic breeding programmes. So, Holstein-Friesian breed is in the attention of cattle breeders since the beginning of XX century, due to its remarkable performances.

Holstein breed have an important share from the total of dairy cows and it is spread in over 128 countries in the world due to its high performances. Also presents perspectives of remarkable development because it has the greater productive capacity for milk, fact which makes the farmers to be interested in this breed.

In Europe, Black spotted cattle represent around 31.6 % from the total of cattle [9].

In Romania, these breed was strongly imported since period 1960-1964 from different countries such as Canada, Denmark,

England [4], now representing over 35% from the total number of cattle [8].

Holstein-Friesian breed could be consider a real gene "reservoir" for increasing the milk quantities, have productions of over 9,700 kg milk per lactation, with 3.8 – 3.9% fat and with individuals which frequently overpass 12,500 kg of milk per lactation [6].

Are individuals from these breed which could realise productions of over 34,000 kg of milk per lactation, fact which represent an absolute record on milk market.

In Romania, in 2008, mean milk production obtained from Holstein Friesian breed was of 4,756 kg of milk per lactation, with 3.86% fat and 3.32% protein [8], and the mean production obtained from this breed at Romania level starting with 2001 up to now was of 4,892 kg of milk [9].

Study was necessary to establish if the animals exploited in the conditions of North-East area of Romania could manifests their productive potential as well as in the origin countries. For this we will compare the performances obtained in our research with the data from Romanian and international literature.

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MATERIAL AND METHODS

Biological material was represented by cattle from Holstein Friesian breed, from which were gathered seasonally milk samples. Animals were imported from Germany in 2008 and are exploited in the conditions of North-East area of Romania, at Chilia Farm, Botoşani County.

Study took place in period January-November 2011, on a batch of e un lot 170 cows being at second lactation (68 heads), respectively at third lactation (102 heads).

From the milk provided from those animals, during research, were gathered 596 samples. Gathering was realised seasonally: spring, summer, autumn and winter. Milk samples for analyses were taken from the average sample in according with the samples. So 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.

Because that at the studied 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 from programme (data base type) BouMatic, which recorded the productions from the milking area.

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 [5].

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, standard deviation of the mean, standard deviation, variation coefficient and minimum and maximum limits) for the studied characters: fat, protein, casein, number of somatic cells, lactation duration, milk quantity per day and in total.

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. So for fat the mean value varied between 3.28% (recorded in spring) and 3.92% (recorded in winter). Variation coefficient from all the analysed months indicate a heterogeneous population for this character (high variability, $V\% > 15\%$). Mean values obtained at cows from the studied batch for fat percent are between the limits mentioned in the literature, 2.8-6.0% [2].

At the studied for protein percent were found mean values between 3.55% and 3.63%, in spring months, respectively autumn. Variation coefficient for this character shows a medium homogeneity. The obtained mean values for protein content are similar with the ones presented in the literature, protein content at Holstein Friesian breed could varied between 2.8 and 4.6% [7].

As regarding the mean percent of casein from the milk analysed on seasons, could say that the limits were between 2.72% and 2.81%, values establish in summer and

winter months. The obtained mean values for casein are between the limits mentioned in the literature (2.5-4.5%), even were founded extreme values 1.78% (summer) and 5.06 (autumn) [3].

Number of somatic cells from milk is the character at which was found the greatest variability, recorded values between 4,000

somatic cells/ml milk (spring) and 2,577,000 somatic cells/ml milk (autumn), obtaining very high variation coefficients of over 100%.

Even the means are between the limits from the legislation (under 400,000 somatic cells/ml milk), exist many values which overpass these limit.

Table 1 Estimators establish for the quality milk characters

Studied character	Months	n	$\bar{X} \pm s\bar{x}$	s	V%	Limits
Fat (%)	Winter	160	3.92±0.062	0.782	15.71	3.25÷4.62
	Spring	153	3.28±0.065	0.806	16.07	2.66÷3.86
	Summer	147	3.30±0.052	0.629	14.34	2.82÷3.37
	Autumn	136	3.57±0.090	1.044	22.94	2.40÷2.94
Protein (%)	Winter	160	3.62±0.034	0.432	11.93	2.59÷4.23
	Spring	153	3.57±0.027	0.338	7.44	2.69÷4.65
	Summer	147	3.58±0.026	0.312	8.74	2.38÷4.30
	Autumn	136	3.63±0.046	0.535	14.75	2.77÷3.89
Casein (%)	Winter	160	2.81±0.028	0.349	12.42	1.96÷4.79
	Spring	153	2.74±0.021	0.263	9.61	2.02÷3.90
	Summer	147	2.72±0.020	0.247	9.05	1.78÷3.39
	Autumn	136	2.80±0.033	0.385	13.74	2.14÷5.06
Number of somatic cells (x 1000)	Winter	160	138.53±24.79	313.656	226.41	7.00÷2387.00
	Spring	153	141.93±21.89	270.825	190.81	4.00÷2049.00
	Summer	147	213.05±34.80	422.021	198.08	15.00÷3341.00
	Autumn	136	245.59±34.06	397.279	161.76	8.00÷2577.00

Table 2 Estimators of the studied characters for quantitative milk production

Studied character	n	$\bar{X} \pm s\bar{x}$	s	V%	Limits
Lactation duration (days)	170	288.56±4.42	57.56	19.95	185÷581
Milk quantity per day (kg)	170	26.88±0.60	7.82	29.07	6.1÷50.2
Total milk quantity (kg)	170	7817.52±185.06	2405.90	30.78	3400÷14302

After the study we observe that the cows from the studied batch had a mean duration for lactation of 288.56 days with variations between 185 and 581 days, with a variation coefficient of 19.95% which show a great variability (table 2).

At the level of nucleus of Holstein-Friesian cows for the daily milk quantity was

obtained a mean of 26.88 kg with limits between 6.1 and 50.2 kg and a variation coefficient of 29.07%, which indicate a great variability (table 2).

Total quantity of milk recorded a mean value of 7,817.52 kg/lactation with limits between 3,400 and 14,302 kg of milk and with a variation coefficient of 30.78% (table 2).

For all the three studied characters we could say that the population is heterogeneous (V% >15%).

Mean value is placed between the productive limits of the breed in the exploitation conditions from Romania 2,430 – 9,279 kg per lactation (table 2) [9].

CONCLUSIONS

After the current study realised on 170 cows from Holstein-Friesian breed imported and exploited in the environment conditions of North-East area of Romania can be drawn the following conclusions:

- mean recorded 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 between the limits from literature;
- cows population is heterogeneous for the characters connected with milk quality (exceptions could be explained through some errors which could be deleted by repeating the experiment);
- the studied Holstein-Friesian cows could show their productive potential in the

environmental conditions from the North-East area of Romania.

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