

THE DYNAMIC OF MILK PRODUCTION FOR GREY STEPPE BREED

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Abstract

The purpose of this paper was to establish the variation of milk production for Sura de Stepa breed based on the fact that this breed was the focus of many researchers lately. The biological material was represented by a number of 48 cows of Sura de Stepa breed from three locations (SC Boviselect SRL, Neamț, SC Modern Farm SRL, Cluj-Napoca and SCDCB – Dancu, Iași).

The indices of milk production were calculated based on the production records of the above mentioned units and were statistically interpreted with the help of the program Microsoft Excel from the Microsoft Office package and finally the variation estimators (arithmetic average, the average standard deviation and the variation coefficient) for the analyzed parameters were established.

The milk production indices that were taken into account, were: the duration of the normal and total lactation, the fat and protein content in milk, procentually expressed also in kg. The duration of normal lactation has varied between 214,1 days for the cows from SC Boviselect SRL and 288,4 days for the cows from SC Modern Farm SRL and the total one was between 321 days for the cows from SC Modern Farm and 361 days from the specimens from SCDCB Dancu.

The minimum milk production was of 1878 litres and the maximum was of 3726,8 litres, both values being registered at SCDCB Dancu.

The fat content was of about 4% and the protein content was over 3% for all the cows from the three locations.

Key words: milk production, Grey Steppe, milk fat, milk protein

INTRODUCTION

Grey Steppe breed belongs to the group for traction production, steppe subgroup [8], an autochthon, primitive subgroup (non-improved) [6].

One of the most important factors we must take into account is the establishing of energetic and nutrient requirements of milk cows is their production (milk quantity). In norming the milk production, we must take into account also the fact that the cows' productivity is influenced, from a physiological point of view, by the lactation state [6].

It is necessary to establish the milk production in any cattle farm, in order to find out the rentability in breeding that kind of cattle breed. The fat and protein quantity in milk determines the milk's quantity and establishes the final sale price from the producer.

MATERIAL AND METHOD

The biological material, that was studied, was represented by a number of 48 cows from Sura de stepa breed from three locations (SC Boviselect SRL, Neamț, SC Modern Farm SRL, Cluj-Napoca and SCDCB – Dancu, Iași).

The reference period for the quantification of milk production was: normal lactation (the total milk quantity obtained beginning with the second day since calving until day 305), total lactation (total milk quantity btained beginning with the second day since calving until the cow's ablactation) [7].

In order to determine the qualitative milk production, one has collected milk samples from all cows in their lactation period, in special vessels of 50 ml and has determined the fat and proteine quantity.

The collected milk samples for the purpose of physical-chemical tests, were transported in the shortest time to the lab, at a temperature of

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4°C. One has used as a conservant, the bichrome, a substance that does not affect or modify the composition of milk.

The determination of the fat content in milk was performed by means of Soxhlet method [10] and that of the protein by means of the Kjeldahl method [11].

The calculation of the mean fat percent for the total and normal lactation was performed the following way:

- the pure fat quantity from each control period (multiplying the milk quantity with the determined fat percent and divided by 100);
- the fat quantities from the control periods were added up and resulted the pure fat content (K in kg) for the total lactation, respectively normal lactation (the first 305 days);
- the milk quantities from the control periods were added up and resulted the milk production for total lactation, that is normal lactation;
- the mean fat content was determined based on the formula[6]:

$$P = K / Cl \times 100$$

where:

P = mean fat percent (%)

Cl = total milk quantity (litres)

K = total fat quantity (kg).

The mean protein content in milk for total and normal lactation was calculated similar to the above mentioned examples [4, 6].

RESULTS AND DISCUSSIONS

The values of the determined indices lead to the quantitative and qualitative determination of the milk production and to the rentability of breeding the respective cattle breed.

The duration of normal lactation in the case of the first lactation for the cows from SC Boviselect SRL was an average of 214.1 days, being reduced with 38 days as to the mean determined value for the cows from SCDCB Dancu and with 52.23 comparative to the mean value for the cows from SC Modern Farm. The value was within the limits given in the literature [5].

Table 1 Mean values of milk production of Sura de stepa cows at SCDCB Dancu, Iași

Lactation	Statistic calculation	Normal lactation						Total lactation					
		Duration days	Milk kg	Fat		Protein		Duration days	Milk kg	Fat		Protein	
				%	kg	%	kg			%	kg		
I	n	27	27	27	27	27	27	5	5	5	5	5	5
	\bar{X}	252	1471.5	4.58	70	3.62	52.7	361.4	2570.8	4.12	121.6	3.37	88.8
	$\pm s \bar{X}$	7.79	91.8	0.07	4.18	0.02	3.10	40.5	260.5	0.07	110.5	0.10	12.58
	s	43.5	467.56	0.33	23.1	0.20	16.1	93.1	579.3	0.20	20.8	0.30	23.9
	V%	18.5	42.0	9.68	31.5	5.55	32.9	33.3	21.7	4.91	20.3	7.80	29.13
	Min	140	680	3.60	23.3	3.18	21.4	301	1983	4.1	81	3.20	63.27
	Max	300	2300	5.30	102	3.89	80.1	520	3560	4.47	147	3.90	132.1
II	n	20	20	20	20	20	20	2	2	2	2	2	2
	\bar{X}	256.15	1639.9	4.14	70.7	3.50	60.1	355.4	1878	4.36	83.35	3.63	67.51
	$\pm s \bar{X}$	7.24	113.05	0.08	4.64	0.02	4.30	15.8	267	0.07	12.8	0.02	11.09
	s	40.35	511.63	0.23	21.6	0.25	19.7	24.33	380.73	0.10	18.52	0.03	13.67
	V%	16.20	30.35	7.36	25.7	6.04	30.7	6.70	20.30	2.95	23.10	1.20	22.36
	Min	130	479	3.87	22	3.3	16	326	1609	4.27	70.60	3.50	56.40
	Max	300	2800	5.10	110	4.1	95	360	2150	4.45	98.10	3.58	76.60
III	n	14	14	14	14	14	14	2	2	2	2	2	2
	\bar{X}	249.75	1772.8	4.70	83.4	3.69	64.1	326.2	2290	4.16	99	3.60	84.24
	$\pm s \bar{X}$	15.11	175.18	0.10	8.50	0.07	6.30	19.48	143	0.06	8	0.40	14.75
	s	55.80	652.60	0.40	33.1	0.34	23.3	27.62	201.54	0.13	11.21	0.60	20.75
	V%	22.13	35.78	8.58	38.9	8.41	35.7	8.87	8.77	2.50	11.76	16.28	24.88
	Min	115	424	3.87	22	3.06	20	305	2152	4.10	89	3.20	68.75
	Max	315	2811	5.40	140	4.27	103	341	2427	4.35	103	4.05	98.10

IV	n	11	11	11	11	11	11	2	2	2	2	2	2
	\bar{X}	261.37	1880.01	4.70	238.54	3.38	64.06	309.1	2282	4.80	110.7	3.60	81.73
	$\pm s \bar{X}$	13.447	246.94	0.12	159.14	0.12	9.73	0.45	570	0.01	26.50	0.06	21.40
	s	43.54	820.33	0.35	527.38	0.43	32.13	0.67	810.64	0.01	37.90	0.10	31.57
	V%	18.11	41.10	9.40	220.40	12.50	51.60	0.20	35.70	0.80	36.20	3.07	37.55
	Min	189	850	4.10	45	2.30	20	309	1705	4.80	81	3.49	59.33
V	Max	307	3550	5.50	1820	3.78	128	310	2870	4.87	136	3.54	104.55
	n	8	8	8	8	8	8	2	2	2	2	2	2
	\bar{X}	250.08	1928.28	4.74	95.40	3.70	71.30	333	3726.8	5.20	190	3.65	136.70
	$\pm s \bar{X}$	18.75	403.10	0.10	22.29	0.02	15.10	26	360.5	0.03	18	0.04	12.89
	s	53.08	1139.92	0.22	63.30	0.07	42.50	36.80	508.31	0.05	24.03	0.06	18.40
	V%	21.20	59.10	6.80	66.35	2.30	59.12	10.62	14.53	1.11	12.30	0.19	13.42
Min	170	674	4.30	31	3.50	23	315	3365	5.19	175	3.60	123.90	

The duration of the total lactation for the cows from SCDCB Dancu varied from 361.4 days at the first lactation to 355.4, in the second lactation, mean values above the ones determined by SC Modern Farm (321 days for the first lactation and 288.4 days for the second lactation).

The mean milk production has exceeded the interval given by the literature for the first and the fifth lactation (800 – 2500 kg) [8].

For the second, the third and the fourth lactations, the mean value of the milk

production was of 1878 kg, 2290 kg and 2282 kg, which are within the above interval.

The fat content from the milk from the first lactation was of 4.12%, a value above the one determined at SC Boviselect SRL (3.88%) and 0.23% lower than the mean calculated value for the cows at SC Modern Farm SRL, a value within the limits from the literature [3, 5].

The milk protein had mean values above 3.3% for all lactations, within the interval of 3.2 - 6% given in the literature [1, 2, 9].

Table 2 Mean values of milk production in Sură de Stepă breed from SC Boviselect SRL, Zănești, Neamț

Statistic calculation	Normal lactation					
	Duration days	Milk kg	Fat		Protein	
			%	kg	%	kg
n	6	6	6	6	6	6
\bar{X}	214.10	2340.30	3.88	95.11	3.2	76.81
$\pm s \bar{x}$	27.30	325.77	0.02	13.50	0.02	11.05
s	65	798.33	0.06	32.60	0.06	27.10
V%	31.18	33.11	1.90	34.80	2.40	35.10
Min	111	1392	3.80	53.58	3.13	46.10
Max	305	3726	4.03	151.17	3.40	125.01

The milk production from normal lactation was of 2340 kg, a value above the one determined for the cows from SC Modern Farm (2165 kg), but under the calculated one for the cows from SCDCB Dancu (2570.8 kg). The value is found within the variation interval recommended by the literature (800 – 2500 kg) [8, 9].

The fat and protein quantity in milk is within the limits given by the literature, the mean values both percentual and quantitative recommending the milk for sale [1, 5].

The duration of normal lactation for the cows from SC Modern Farm SRL was of 288.4 days for the second lactation and of 266.33 days for the first lactation, values above the ones determined at both farms.

The milk production was lower as to the one at SC Boviselect SRL and SCDCB Dancu, a mean value over 2000kg within the interval given by the literature [5, 8].

The fat quantity in milk was over 4% for both lactations, and the protein content was over 3%, values according to the data in the literature [2, 5, 9].

Table 3 Mean values of milk production of Sura de stepa breed at Modern Farm SRL, Jucu, Cluj – Napoca

Lactation	Statistic calculation	Normal lactation						Total lactation					
		Duration days	Milk kg	Fat		Protein		Duration days	Milk kg	Fat		Protein	
				%	kg	%	kg			%	kg	%	kg
I	n	3	3	3	3	3	3	2	2	2	2	2	2
	\bar{X}	266.33	1674.3	4.53	75.33	3.35	57.76	321	2165	4.35	95	3.25	70.90
	$\pm s \bar{X}$	39.60	418.86	0.13	17.25	0.06	12.34	13	180	0.20	13	0.03	6.50
	s	67.7	725.60	0.4	30.20	0.19	21.70	21.20	257.30	0.30	18.30	0.04	9.60
	V%	25.90	42.08	8.60	39.60	8.90	38.30	6.55	11.73	6.72	18.75	1.78	13.57
	Min	185	855	4.23	42	3.25	33	305	1990	4.20	85	3.20	64.10
	Max	304	2207	5.01	101	3.80	72	334	2353	4.61	109	3.2	77.80
II	n	2	2	2	2	2	2	2	2	2	2	2	2
	\bar{X}	288.4	1654.3	4.70	74	3.53	53.1	328.4	2054.3	4.60	94	3.33	73.1
	$\pm s \bar{X}$	10.4	176.5	0.02	8	0.02	5.4	11.4	175.5	0.03	9	0.03	5.7
	s	14.74	250.42	0.03	11.30	0.03	7.70	13.74	260.42	0.02	12.30	0.02	7.40
	V%	5.09	12.10	1.01	11.70	1.30	10.38	5.21	12.20	1.06	12.70	1.40	10.18
	Min	275	1870	4.54	87	3.50	35	305	1900	4.34	87	3.40	65
	Max	298	2230	4.70	103	3.60	73	344	2330	4.60	103	3.50	78

CONCLUSION

- Grey Steppe breed is specialized in traction production but it has also good qualities regarding milk production.

- Although it is a primitive breed, non-improved, the collected milk from Sura de stepa cows is a qualitative one, indicating a 4% fat content and over 3% protein content.

- The mean values of the milk production have repeatedly exceeded the maximum limit given by the literature; this breed has the possibility to yield good milk productions.

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