RESEARCH REGARDING PRODUCTION AND REPRODUCTIVE TRAITS ON THE FIRST FOUR LACTATION, IN ROMANIAN BLACK AND WHITE DAIRY COWS

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Abstract

Through this study, we proposed evaluation the productive and reproductive traits in a number of the 1196 Romanian Black and White cows, raised in four farms in semiintensive and intensive system. Thus, based on data on milk production and centralized, we obtained the largest quantity of milk in lactation second 7151.38 ± 106.27 kg, with 4.70 ± 0.2% fat, respectively, 300.61 ± 4.70 kg fat, 3.36 ± 0.01% protein, 240.61 ± 3.62 kg respective proteins. Regarding productive precocity, first lactation represents 97.76% of maximum lactation. In terms of breeding characters, age at first calving was 876.79 ± 3.16 days, showing a good reproductive precocity. Calving interval and service period have closes values for optimal values. Study parameters are strongly influenced by technology which makes the effect of genetic improvement to be diminished.

Key words: cows, milk production, lactation

INTRODUCTION

There are a variety of factors affecting milk production, such as environmental factors, breed, calving season, lactation number, management practices [1, 2, 3]. Today is not enough to get a high milk production, but milk production is competitive in terms of both quality and cost of production is obtained [4]. Milk production is the most important character for cow milk production in 305 days and is often used in genetic evaluation of livestock. The average cow Romanian Black and White are exploited from 3.5 to 4 lactations. On average, Romanian Black and White dairy cows are exploiting 3.5 to 4 lactations [5]. However, reproductive cycles relates to a calving interval of 365 days and a service period of 85 days.

MATERIAL AND METHODS

Thus, based on recorder data and centralized on milk production, from 1196 Romanian Black and White dairy cows, raised semintensiv and intensively system in four farms. Production indicators were studied over a period of four lactations, from 2006 to 2009. Lactations shorter than 260 days were excluded from the research. Data refer to the milk production were taken from the Official Control of Milk Production from the OARZ. The data were statistically processed and interpreted using conventional methods (arithmetic mean, standard deviation of the mean, variance analysis, etc.).

RESULTS AND DISCUSSION

In Table 1 are presented data on the mean and variability of production indices successive lactations on Black and White dairy cows. The total population we find that the total lenght of lactation is high in all lactations. It is noted that during lactation decreases as rank increases lactation, if on first lactation reach the highest average value of 391.52 days, the fourth lactation to decrease to 330.47 days. Length to first lactations total is very large and is contraindicated because of the mammary gland physiological wear occurs with negative consequences for the organism and subsequent lactations. It also shows that the highest amount of total lactation milk per lactation is recorded on first

lactation(8625.44 kg) and lowest in the fourth lactation (7171.78 kg). Decrease in average milk yield in subsequent lactations, show management errors and significant loss of milk. Fat content on total lactation is very good, being higher in first lactation (4.24%) and lowest at third lactation (4.14%). The fat content on total lactation had a higher coefficient of variation, over 25% of all lactations. Average values ranged from 365.24 kg (lac. I) and 296 kg (lact. IV). The protein content was close to average values, ranging from 3.38% (lact. I) and 3.32% (lact. IV). The coefficient of variability was low as 5%.

The amount of total protein per lactation had averages ranging from 291.59 kg (lact. I) and 244.18 kg (lact. IV). This character has high variability with a minimum of 64 kg (lact.IV) and a maximum of 570.20 kg (lact.I).

If normal lactation per total population (Table 2) to Romanian Black and White breed observed that, during normal lactation is close to average values and tends to decrease with increasing rank of lactation. Lactation length ranged from 299.71 days (lact. IV) and 301.93 days (lact. I). In the case of milk, on normal lactation, the highest average value was 7154.38 kg (the second lactation) and the smallest amount of 6526.77 kg of milk (the fourth lactation). The maximum amount of milk was recorded in the second lactation (100%) and first lactation was 97.76% of maximum lactation, with an average of 23.15 kg of milk, which highlights the productive precocity this breed.

Fat content was very good values ranging from 4.14% (lact. III) and 4.25% (lact. I). The amount of fat ranged from 275.37 kg (lact. III) at 300.61 kg (lact. II). The protein content is good averages between 3.33% (lact. II) and 3.35% (lact. III). Also, if the total amount of protein per lactation have been good values ranging from 216.94 kg (lact. IV) and 240.61 kg (lact. II).

High variability of the milk from cows is evident. Also, we can see the animal with a very high level of milk production over 8000 kg which indicates the existence of a superior genetic resources. This variability is attributed to the conditions imposed by the management of the farms studied.

On population, the average total duration of lactation is 363.19 days, a quantity of milk is 7995.95 kg. Normal lactation observed an average of 6826.77 kg milk, with variations between 7151 and 6526.77 kg, 38 kg. The average fat content is 4.20% and the average protein content is 3.35%.

The degree of precocity productive is highlighted by comparing the first lactations with full lactation, as for example in the first lactation Frisian breed is done 75-80% of maximum. Following, the evolution of milk production on the four lactations, we find that the second is the maximum lactation lactation, and the first lactation is 97.76% of maximum lactation (Table 3).

It may be noted that generally the cows bred for milk production achieved lower production than potential. If we consider the average yield obtained by the BNR in 1993 breed, the elite farms, which was 5,000 kg milk [6], currently there is a considerable improvement of milk production exceeding 6000 kg milk, as a result of genetic improvement, the genetic breeding of high quality. The average milk yield on the entire population is increasing BNR, compared with research conducted in previous years by other authors who have conducted extensive research [7,8].

In table 4 are presented data on the mean and variability indices of breeding. successive lactations on dairy cows from farms.

The entire population of the Romanian Black and White breed from four farms shows that age at first calving is 876.79 days (29 months and 22 days) a precocious age, which indicates good reproductive health, with limits ranging from 676.00 days (22.53 months) and 1241 days (41.36 months).

Calving-interval between the averages is 432.69 days (lact. IV) and 450.35 days (lact. II), The coefficient of variation confirm the variability of nature which is 22.64% for CI I-II. Maximum levels are very high: 893 days to second lactation and 848 days to third lactation.

Dry period is close to the average optimal averages; 60.69 days to second lactation, increasing slightly to third dairy lactation, (61.54 days) and four lactation achieve the maximum (65.25 days) recorded on these four lactations.

Service period for heifers has an average value of 589.90 days (19.66 months) with a range of 375 days (12.50 months) and 957.00 days (31.9 months).

Service period (SP) in cows are elevated in all lactations, ranging from 128.72 days (lact. IV) and 149.86 days (lact. III). Variability is very pronounced for SP, beyond what is observed in the standard deviation values (s = 94.41) and coefficient of variation V% = 64.49% (lact. II).

As shown, during the service period has a value of 141.66 days. Not recommended postpatum first insemination in cows after the fifth cycle of heat. since they will rest more than 105 days of gestation and the interval between births over 13 months. Exceeding the optimum period, usually is the result of gynecological problems that lead to recovery of the animal in a long time [9,10].

Table 1 Mean and variability indices for milk yield on total lactations to Romanian Black and White breed

Specification	Statistics	Total lactation					
		Lactation lenght days	Milk kg	% fat	Kg fat	% proteins	Kg proteins
Lactation I	n	1196	1196	1196	1196	1196	1196
	$\bar{X}$	391,52	8625,44	4,24	365,24	3,38	291,59
	$\pm s_{\bar{x}}$	2,67	72,02	0,01	3,05	0,00	2,47
	s	92,50	2492,57	0,29	105,52	0,10	85,43
	V%	23,63	28,90	6,82	28,89	2,90	29,30
	Min	260,00	2925,00	3,50	124,00	2,87	97,80
	Max	764,00	21899,00	4,98	936,40	3,85	759,80
Lactation II	n	530	530	530	530	530	530
	$\bar{X}$	370,81	8519,10	4,20	358,42	3,36	285,50
	$\pm s_{\bar{x}}$	7,35	188,75	0,01	8,12	0,01	6,62
	s	81,12	2130,20	0,17	92,15	0,08	74,18
	V%	21,84	25,00	4,01	25,62	2,36	26,07
	Min	207,00	2974,00	3,61	124,30	2,92	92,60
	Max	668,00	16793,00	5,12	726,20	3,72	570,20
Lactation III	n	202	202	202	202	202	202
	$\bar{X}$	359,96	7667,49	4,14	317,92	3,34	255,35
	$\pm s_{\bar{x}}$	10,52	240,24	0,02	10,26	0,01	8,14
	s	82,94	1931,80	0,14	82,66	0,08	65,37
	V%	22,96	25,24	3,33	26,02	2,35	25,63
	Min	260,00	4241,00	3,62	174,10	3,11	140,50
	Max	783,00	13127,00	5,03	586,70	4,12	449,00
Lactation IV	n	72	72	72	72	72	72
	$\bar{X}$	330,47	7171,78	4,20	296,98	3,32	244,18
	$\pm s_{\bar{x}}$	11,13	421,13	0,04	19,81	0,01	15,73
	s	53,00	2023,45	0,17	92,49	0,06	73,61
	V%	15,92	28,29	3,97	31,10	1,73	30,13
	Min	260,00	1903,00	3,63	78,70	3,16	64,00
	Max	560,00	14052,00	5,12	578,40	3,43	475,50

Table 2 Mean and variability indices for milk yield, on normal lactations to Romanian Black and White breed

Specification	Statistics	Lactation (305 days)					
		Lactation lenght days	Milk kg	% fat	Kg fat	% proteins	Kg proteins
Lactation I	n	1196	1196	1196	1196	1196	1196
	$\bar{X}$	301,93	6991,86	4,25	297,69	3,38	236,85
	$\pm s_{\bar{x}}$	0,25	39,84	0,01	1,84	0,00	1,40
	s	8,81	1377,66	0,30	63,60	0,11	48,49
	V%	2,92	19,70	7,11	21,36	3,33	20,47
	Min	260,00	2925,00	3,13	124,00	2,23	97,80
	Max	305,00	13857,00	5,11	600,30	3,98	482,30
Lactația II	n	530	530	530	530	530	530
	$\bar{X}$	300,50	7151,38	4,19	300,61	3,36	240,61
	$\pm s_{\bar{x}}$	0,96	106,27	0,02	4,70	0,01	3,62
	s	10,94	1203,55	0,21	53,90	0,10	41,17
	V%	3,65	16,72	4,88	17,63	2,86	16,96
	Min	217,00	2974,00	3,44	124,30	2,70	92,60
	Max	305,00	12115,00	5,08	578,10	4,21	401,90
Lactation III	n	202	202	202	202	202	202
	$\bar{X}$	300,09	6652,68	4,14	275,37	3,35	221,81
	$\pm s_{\bar{x}}$	1,26	128,62	0,02	5,67	0,01	4,36
	s	10,43	1047,71	0,16	46,30	0,11	35,44
	V%	3,48	15,79	3,89	16,76	3,15	15,97
	Min	260,00	3930,00	3,61	161,40	3,11	131,30
	Max	305,00	10792,00	5,06	464,10	4,80	359,50
Lactation IV	n	72	72	72	72	72	72
	$\bar{X}$	299,71	6526,77	4,24	278,97	3,34	216,94
	$\pm s_{\bar{x}}$	4,96	327,93	0,05	62,65	0,03	10,10
	s	20,70	1570,08	0,24	13,38	0,14	48,05
	V%	6,88	24,56	5,71	22,95	4,08	22,51
	Min	260,00	1903,00	3,01	78,70	2,43	64,00
	Max	305,00	11774,34	5,06	431,60	4,06	340,00

Table3 Evolution of successive lactation on Romanian Black and White breed

Lactation number	Lactation (305 days)		
	Average milk yield (kg)	% from maximum lactation	Quantity of milk per day (kg)
I	6991,86	97,76	23,15
II	7151,38	100	23,79
III	6652,68	93,02	22,16
IV	6526,77	91,26	21,77

Table 4 Mean and variability indices for reproductive traits on four lactations to Romanian Black and White breed

Statistics		n	$\bar{X}$	$\pm s_{\bar{x}}$	s	V%	Min	Max
Age at first calving (days)		1196	876.79	3.16	109.24	12.44	676.00	1241.00
Calving interval (days)	I-II	530	450.35	4.43	101.96	22.64	290.00	893.00
	II-III	294	431.39	10.59	90.57	20.83	296.00	848.00
	III-IV	73	432.69	17.12	81.45	18.77	323.00	741.00
Dry period (days)	II	530	60.69	0.93	21.46	35.37	10.00	148.00
	III	294	61.54	2.49	21.27	35.37	12.00	149.00
	IV	73	65.25	3.34	16.00	24.31	23.00	127.00
Service Period (days)	I	1196	589.90	4.55	97.19	16.48	375.00	957.00
	II	530	146.39	4.10	94.41	64.49	34.00	643.00
	III	294	149.86	9.29	80.28	52.28	25.00	561.00
	IV	73	128.72	14.09	71.04	53.32	34.00	465.00

CONCLUSIONS

The Romanian Black and White dairy cows were characterized by a good production of milk, due to the biological material of high genetic value, operating performance and technologies used. It requires a careful selection of cows to eliminate alternatives and create a less effective as homogeneous in terms of productive potential. In terms of breeding cows have a good reproductive precocity and the indicators are close to optimal breeding.

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