

## RESEARCH CONCERNING THE INFLUENCE OF AGE AT FIRST CALVING ON MILK PRODUCTION, IN ROMANIAN BLACK AND WHITE BREED

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### Abstract

*This paper is part of a larger project, which aims to study the influence of growth technology, on breeding at Romanian Black and White. Thus, based on data and centralized on the age of first calving, that milk production, from a total of 155 dairy cows, was to investigate the influence of age at first calving on the length of first lactation and that the quantity and quality production (% fat, % protein) of milk. Results show, that herd studied is quite heterogeneous; age at first calving (AFC) being between 23 and 39 months, with an average of 29.95 months. On the length of first lactation in cows, it had no significant differences depending on age at first calving, instead of milk production quantitative differences were highly significant even in some cases. In terms of quality, age at first calving influenced, less milk fat content and more on the protein.*

**Key words:** cows, milk, calving, production, lactation

### INTRODUCTION

A breeding program well founded is very important to maintain a higher milk production from one year to another. Morphological, NBR breed cows have a good productive precocity [6].

Somatic maturity is reached by four years, but heifers are inseminated for the first time on 16-17 months when they carried two-thirds of adult cow weight (360-380kg); in this case, the entry in production have a minimum of 450kg body weight and age at first birth (VPF) is 25-26 months [8].

AFC reduction in a system to reduce milk price, could be an effective strategy for farmers in reducing costs [13].

In the U.S., age at first calving of dairy cows is on average 25.4 months.

Overcoming age of 24 months is uneconomic, a monthly maintenance after 24 months of age it costs a farmer between 50 and \$ 75 per month, per heifer [1].

### MATERIAL AND METHOD

Biological material was represented by 155 cows, taken in the C.O.P., belonging to the farm Târzii.

Heifers were divided into 3 groups (I, II and III), depending on age at first calving, respectively: early as 26 months, medium, 27-30 months and late, over 30 months.

Each group was analyzed in terms of age at first calving, lactation length normal and total milk production and milk quality (% fat and % protein).

The data obtained were statistically processed and interpreted using conventional methods (arithmetic mean, standard deviation of the mean, variance analysis, etc.).

### RESULTS AND DISCUSSION

Data on age at first calving, lactation length and milk production were processed and centralized in Tables 1 and 2.

AFC average was 29.95 months.

Of the 155 cows taken in study, 28 (18.06%) were considered early age at first calving (23-26luni), 60 (38.71%) were considered average age at first calving (27-30 months), and the remaining 67 (43.23%), having at first calving age 30 months (31-39 months), were the group of cows late in this regard (Fig. 1).

Table 1. Mean duration of lactation, milk production and fat content and protein

Groups		I (23-26 month)	II (27-30 month)	III (31-39 month)
Number of individuals		28 (18,06%)	60 (38,71%)	67 (43,23%)
Lactation length (days)	N*	299.04±1.86 V% 3.29	297.55±2.85 V% 7.42	301.90±1.66 V% 4.51
	T**	362.68±18.08 V% 26.37	369.63±11.88 V% 24.90	404.78±11.85 V% 23.96
Milk production (kg)	N	7558.36±116.69 V% 8.17	7763.28±110.25 V% 11.00	7073.28±117.15 V% 13.56
	T	8862.11±390.17 V% 23.30	8989.45±219.00 V% 18.87	8994.78±240.01 V% 21.84
% milk fat	N	4.41±0.04 V% 5.22	4.46±0.03 V% 4.64	4.47±0.04 V% 6.94
	T	4.39±0.04 V% 4.42	4.43±0.03 V% 4.49	4.41±0.04 V% 6.85
% milk protein	N	3.42±0.03 V% 4.88	3.45±0.01 V% 1.89	3.48±0.01 V% 1.89
	T	3.40±0.03 V% 4.70	3.45±0.01 V% 1.87	3.46±0.01 V% 2.09

\* normal lactation; \*\* total lactation

Table 2. The significance of differences obtained between groups

Character	groups	Normal lactation		Total lactation	
		I	III	I	III
Lactation length	I	-	ns	-	ns
	II	ns	ns	ns	ns
Milk production	I	-	*	-	ns
	II	ns	***	ns	ns
% milk fat	I	-	ns	-	ns
	II	ns	ns	ns	ns
% milk protein	I	-	*	-	*
	II	ns	*	*	ns

ns - not significant, \*- significant, very significant \*\*\*

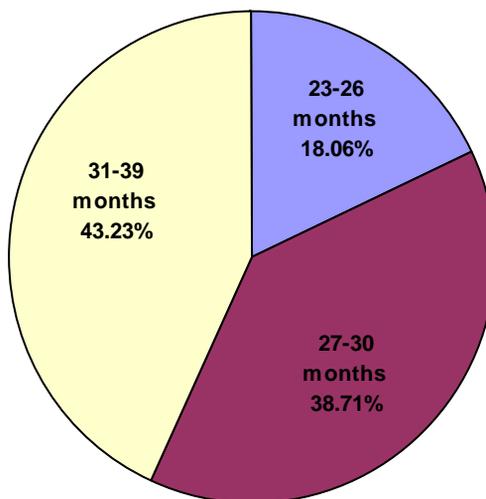


Fig. 1. The structure of the herd studied, depending on age at first birth

It was demonstrated that the heifers kept and fed under the same conditions, the same weight, there is a variability of the AFC, which is influenced by the efficiency of breeding [11].

It was found that, cows that have calved at the age of over 30 months, are the most numerous, this is undesirable because it shortens the lifespan, which involves an inefficient economically [2, 3, 7, 9, 12].

Since this breed is a good precocity should be given a greater control of the introduction to breeding age. In our case the age at first calving should be reduced to 24-26 months for an efficient operation [4, 5].

Normal lactation length had a low variability, ranging, on average between

297.55 days, the group 27-30 months and 301.90 days in group 31-39 months, the differences recorded between groups are statistically insignificant (Fig. 2).

Total lactation length, not recorded significant differences between groups, ranging on average between 362.68 days, the group 23-26 months and 404.78 days in group 31-39 months, the variability of this character is great.

Milk production of normal lactation, had generally, an average variability, quantities of milk produced ranging from 7073.28 kg in group III, and 7763.28 kg group II, between groups, registering even very significant differences (Fig. 3).

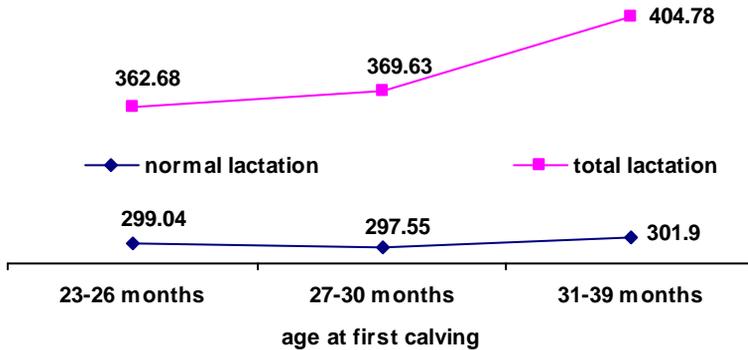


Fig. 2. Lactation length, depending on age at first calving (days)

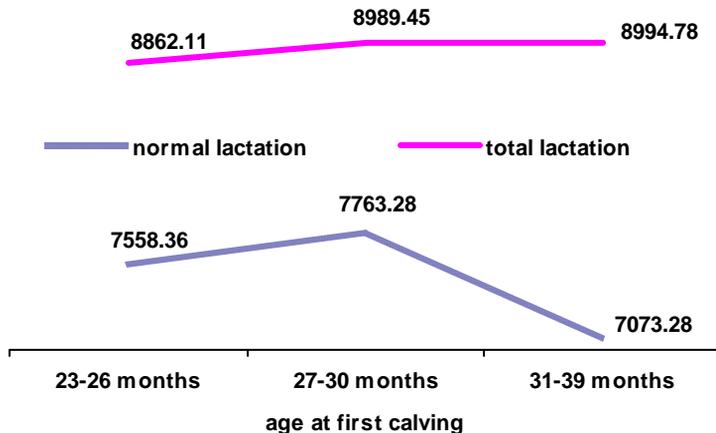


Fig. 3. Milk production, depending on age at first calving (kg)

It is noted that cows that calved between 27 and 30 months had the highest production of milk per normal lactation; it was  $7763.28 \pm 110.25$  kg milk.

In the total milk production per lactation, character was generally a high variability [10], differences between groups registering significant quantities of milk being contained, on average, between 8994.78 kilograms, group III 8862.11kg, group I.

Fat content of milk, both in normal and lactation and in total lactation, saw a low variability, ranging between 4.41% and 4.47%, not significant differences between groups (Fig. 4).

The protein content of milk, variability was low, ranging on average between 3.40% and 3.48% between groups registering significant differences (Fig. 5). Cows that had lower AFC were lower in protein content [13].

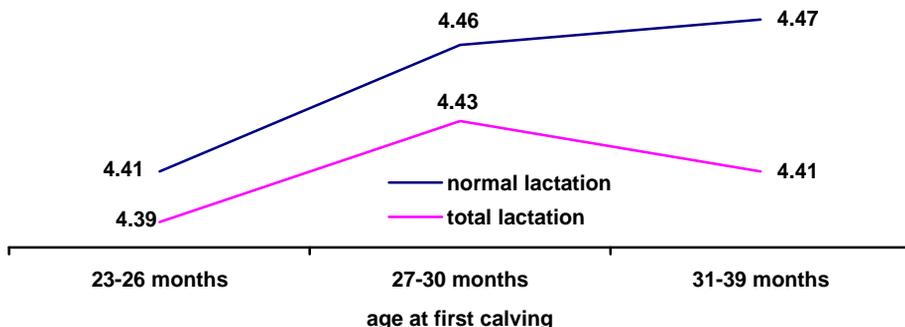


Fig. 4. Milk fat content, depending on age at first calving (%)

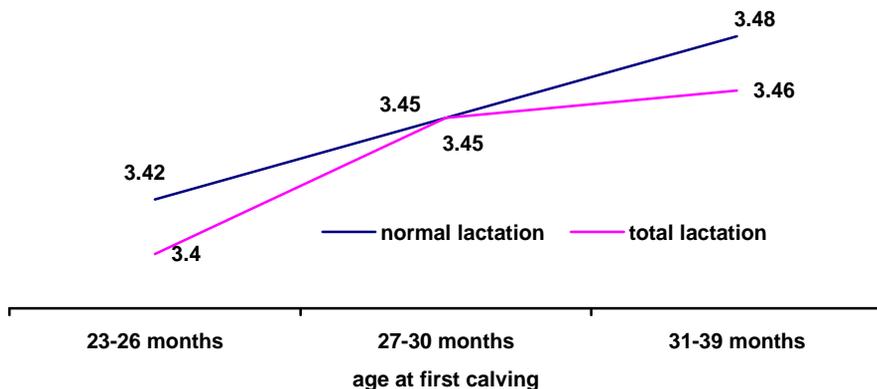


Fig. 5. Protein content of milk, depending on age at first calving (%)

**CONCLUSIONS**

Based on research conducted on cows bred BNR results the following conclusions:

Only 18.06% of cows had AFC early (23-26 months), representing a small percentage, for an efficient breeding technology.

Cows that calved between 27 and 30 months, had the highest production of milk

per lactation normal, and that is  $7763.28 \pm 110.25$  kg milk.

Fat and protein content of milk, has very good values for B.N.R. breed, over the 4.41% fat, and 3.40% protein.

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