

# STUDY OF PRODUCTIVE AND REPRODUCTIVE FEATURES IN COWS OF ROMANIAN BLACK SPOTTED BREED GROWN IN PARTICULAR HOLDINGS OF THE ROMANIAN NORTH-EAST TERRITORY

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## Abstract

The research was performed on a group of 175 cows, Romanian Black Spotted breed, grown in multiple private holdings in the North East territory of Romania, and investigate the most important productive and reproductive indices. Therefore, was tracked quantitative and qualitative production of milk in the first lactation, body growth in second lactation, the age at first calving (VP), respectively the dry period (RM), calving interval (CI), service period (SP) and their evolution in the successive lactations (from I to VI).

In the first lactation the results reached an average production of 4250 kg milk with 3.85% fat and 3.26% protein, with a higher variability. In the succession of six lactations analysed, the dry period ranged between 76.2 days in lactation III, and 85.4 days in lactation IV, with a very high variation's coefficient (52.6%), indicating a poor homogeneity of this character. Analysing the calving interval (CI), it highlights range from 409.5 days in lactation III to IV, and 435.6 days between first and second lactation, with an average variability.

The values of the principal reproduction indices - age at first calving (VP), dry period (RM), calving interval (CI), service period (SP) - shows a poor state of reproductive activity being closely correlated with exploitation technology and reproduction management applied.

**Key words:** Romanian Black Spotted, cattle, productive, reproductive indices

## INTRODUCTION

The Romanian Black Spotted (BNR) breed cattle population exploited in private farms in the North East of the country is quite varied (Gîlcă, 2001), with productive and reproductive capacities incompletely studied. Performance of milk production varies significantly by the exploiting technology enforced (Gîlcă, 2003; Stefanache et al. 2000). Further, body development and breeding activity depending on conditions provided in each farm (Al-Salman, 1989). Based on these considerations, we propose in this paper an analysis of NBR breed cows exploited in the North-East region of the country, in terms of morphological, productive and reproduction features.

## MATERIAL AND METHODS

The research was performed on a group of 175 cows, Romanian Black Spotted breed, grown in multiple private holdings in the North East territory of Romania, and investigate the most important productive and reproductive indices. Therefore, was tracked quantitative and qualitative production of milk in the first lactation, body growth in second lactation, the age at first calving (VP), respectively the dry period (RM), calving interval (CI), service period (SP) and their evolution in the successive lactations (from I to VI).

Raw data were extracted from records offices of Romanian Animal Breeding Agency from the counties of the North-East region, which were processed and statistically interpreted.

## RESULTS AND DISCUSSION

In the first lactation (table 1) the results of study population reached an average production of 4250 kg milk with 3.85% fat

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and 3.26% protein, with a higher variability (between 2730 kg and 5300 kg milk). The body development was studied on a number

of 175 cattle in the second lactation period and data collected are presented bellow in table 2.

Table 1 Mean values and the variability of milk production, fat and protein (1-st normal lactation)

Specification	<sup>1</sup> n	$\bar{X} \pm s_{\bar{X}_2}$	<sup>3</sup> V%	Min.	Max.
Quantity of milk (kg)	175	4250±48.83	15.20	2730	5300
Fat content (%)	175	3.85±0.02	5.60	3.19	4.28
Quantity of fat (kg)	175	163.62±1.86	15.02	87.08	226.84
Content in protein (%)	175	3.26±0.01	4.89	3.01	3.54
Quantity of protein (kg)	175	138.55±1.65	15.73	82.17	187.62

Notes: 1-number of animals analysed, 2-average values of different quantifiable indice and coefficient of correction, 3-percentage of variation

Table 2 Mean values and the variability of body development at the second lactation

Specification	<sup>1</sup> n	$\bar{X} \pm s_{\bar{X}_2}$	<sup>3</sup> V%
Live weight	175	588.30±2.80	6.30
Withers height	175	132.36±0.27	2.70
Height at croup	175	134.62±0.30	2.91
Thorax perimeter	175	209.16±0.73	4.63
Whistle perimeter	175	24.75±0.20	10.67
Croup width at ischial	175	36.21±0.22	8.05
Croup width at hips	175	55.67±0.24	5.75
Croup length	175	59.27±0.19	4.33
Height at the tail	175	137.69±0.39	3.76
Depth of chest	175	74.05±0.32	5.64
Oblique length of the trunk	175	148.26±0.39	3.48

Notes: 1-number of animals analysed, 2-average values of different quantifiable indice and coefficient of correction, 3-percentage of variation

Analyzing the body weight and the principal body size values observed in the herd studied, the values was satisfactory, with an average size of 132.26 cm for waist, 209.16 cm perimeter of chest, oblique length of the trunk of 148.26 cm and a weight of

588.30 kg, appropriate with specialized international literature (Al-Salman, 1989)

Mean values and the estimate variability for age at first calving, as an indicator of precocity of a population are presented in table 3.

Table 3 Mean values and the variability of first calving (days)

Estimate	<sup>2</sup> $\bar{x} \pm s_x$	<sup>3</sup> V%	Min.	Max.
<sup>1</sup> n = 175	947 ± 12.6	17.6	520	1497

Notes: 1-number of animals analysed, 2-average values of different quantifiable indice and coefficient of correction, 3-percentage of variation

Average age at first calving was 947 days (over 31 months) on the entire population studied, a value that falls within the limits of literature for BNR race (Gîlcă, 2016), analyzed on the national level. This character has a medium homogeneity, allowing improvement

by inbreeding and the application of suitable technologies of holding and reproduction. Dry period is a very important indicator for product quality design and estimated production levels for next lactation (table 4).

Table 4 Mean values and the variability of dry period (days) on the successive lactations

Previous lactation:	<sup>1</sup> n.	<sup>2</sup> $\bar{x} \pm s_x$	<sup>3</sup> V%	Min.	Max.
II	175	80.0 ± 2.94	48.6	21	325
III	162	76.2 ± 3.11	51.9	30	301
IV	145	85.4 ± 3.58	50.5	25	318
V	123	83.9 ± 3.98	52.6	28	325
VI	101	79.2 ± 3.53	44.8	32	270

Notes: 1-number of animals analysed, 2-average values of different quantifiable indice and coefficient of correction, 3-percentage of variation

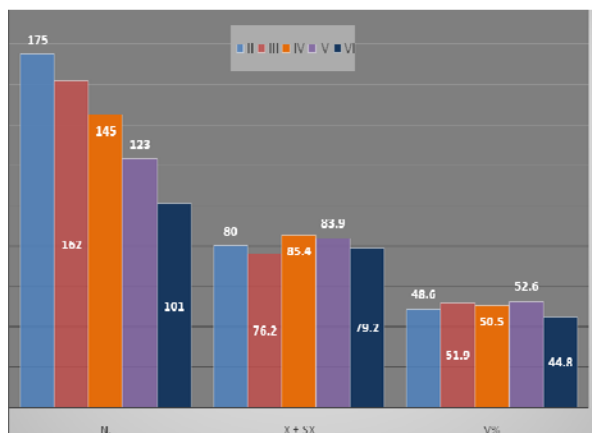


Fig. 1 Mean values and the variability of dry period (days)

In the succession of six lactations analyzed the dry period ranged between 76.2 days in lactation III, and 85.4 days in lactation IV, correlated data with literature (Gilcă, 2003; Stefanache et al. 2000), but exceeding the optimum limit of 60 days. The values of variation's coefficient is very high, reaching 52.6%, indicating poor homogeneity of this character.

Analyzing the calving interval (CI), it highlights range from 400 days in lactation V to VI representing the optimal

value for this race, and 435.6 days in first to second lactation (table 5) in accordance with national literature (Georgescu, 1995; Ujica, 2005), with a regular variability. The range recorded suggests significant losses on the number of calves and milk quantity with a strong economic impact and profitability of farms. Mean values and variability of service period (SP) are presented in table 6. This data was collected from a different number of animals in each lactation interval.

Table 5 Mean values and the variability of calving interval (days)

Lactation	<sup>1</sup> n.	<sup>2</sup> $\bar{x} \pm s_x$	<sup>3</sup> V%	Min.	Max.
I-II	175	435.6 ± 7.18	21.8	265	620
II-III	162	422.1 ± 7.36	22.2	273	574
III-IV	145	409.5 ± 7.01	20.6	315	538
IV-V	123	417.65 ± 7.46	19.8	286	508
V-VI	101	400.0 ± 6.45	16.2	273	578

Notes: 1-number of animals analysed, 2-average values of different quantifiable indice and coefficient of correction, 3-percentage of variation

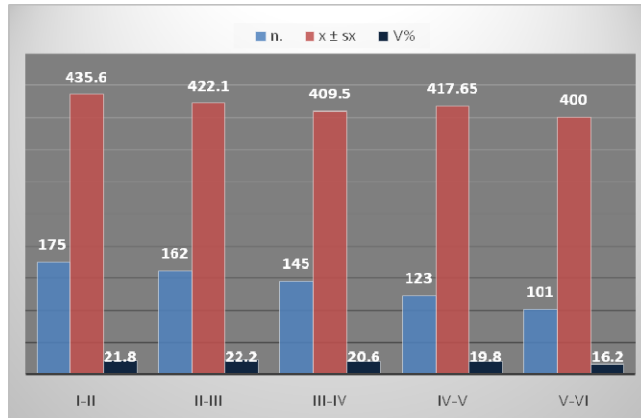


Fig. 2 Mean values and the variability of calving interval (days)

Table 6 Mean values and the variability of service period (days)

Lactation	<sup>1</sup> n.	<sup>2</sup> $\bar{x} \pm s_x$	<sup>3</sup> V%	Min.	Max.
I-II	175	143.5 ± 6.79	62.6	20	800
II-III	162	135.3 ± 6.86	64.5	21	630
III-IV	145	128.6 ± 6.74	63.1	23	460
IV-V	123	138.0 ± 7.62	61.2	27	625
V-VI	101	121.6 ± 5.94	49.1	36	290

Notes: 1-number of animals analysed, 2-average values of different quantifiable indice and coefficient of correction, 3-percentage of variation

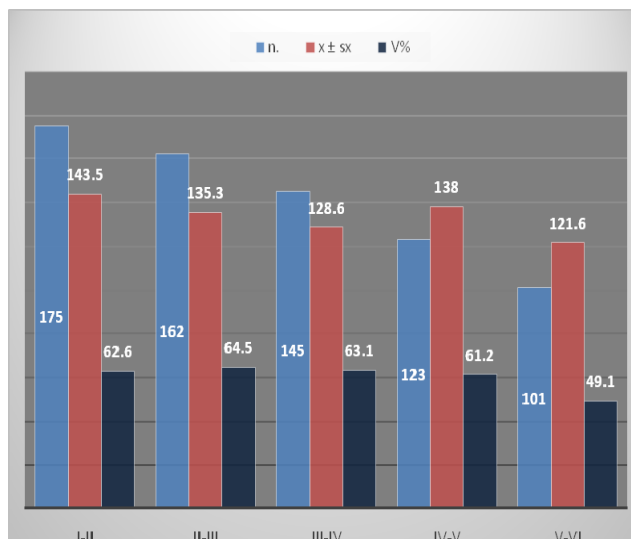


Fig. 3 Mean values and the variability of service period (days)

The lowest value was recorded in the sixth lactation (121.6 days) and the highest value was in first lactation (143.5 days). The present data highlighted from the research are in a row with those provided by the literature

(Maciuc et al. 2003), much higher than the optimum limit of the 80-days. It is noted however low homogeneity of the data, the values of the coefficient of variation exceeds in 60% of cases.

## CONCLUSIONS

1. The BNR cows breed exploited in the farms from the North-East part of the country have achieved an average production of 4250 kg milk with 3.85% fat and 3.26% protein.

2. Body weight and values of the principal dimensions are satisfactory, falling the limits of literature for this race, but influenced by nutrition and health status.

3. The values of the Mean of reproduction indices - age at first calving (VP), dry period (RM), calving interval (CI), service period (SP) - shows a poor state of reproductive activity with numerous deviation of values from literature due to a series of inappropriate managerial measures applied. The evidence of this quantifiable measurements decrease the number of calves and milk quantity with a strong economical repercussion and profitability of farms.

4. The analysis of homogeneity characters suggests an important differences between farms, standing by a large individual variability.

5. The parameters studied are strongly influenced by the growth of young technology, heifer management, reproduction and exploitation technologies, making the genetic improvement effect to be reduced.

6. Improving these indicators with influence on efficiency and production levels will reduce the large differences from one farm to another and even individual values from the same holding. This performance can be achieved by using the modern staff training for human resource, advance technologies for dairy cows and the suitable management of reproduction in each farm taken in this study.

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