

CONTRIBUTIONS REGARDING THE STUDY OF PRODUCTIVE LONGEVITY OF A BNR POPULATION FROM DOAGA FARM, VRANCEA COUNTY

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Abstract

From the analysis of literature regarding the cattle's longevity resulted that the research, with implications of genetic and economic aspects in dairy cows exploitation, is still a poor chapter, so the theme it is well motivated and very actual. Regarding the productive longevity study at BNR breed from Doaga Farm, Vrancea County, resulted that the duration of productive life (productive longevity) at those 167 cows which finished their productive career was of 997.12 days. The cows from this farm were exploited, in average, only 3.26 normal lactations and did not give the maximum potential of production in exploitation period. At the studied population the production usage index of the cows had a mean value of 83.83% close to the one for a dairy cow farm. Average production was of 22,927.96 kg of milk, with limits of 28,175.58 kg at cows from at indigenous bulls and 21,485.86 kg at the ones from imported bulls. Having in view the productive lifetime at the studied population we obtain a quantity of 22.93 kg milk per day of productive life, respectively 22.09 kg/day at the daughters of indigenous bulls and 23.26 kg milk/day at the daughters of imported bulls. From the analysis of survival percentage through „Survival Analysis” resulted that after first lactation remain only 76.1% from initial herd, and after first four lactations 14.4%. Survived till lactation sixth only 6 cows (3.6%) from the initial herd and a descendant cow from an imported bull survived seven lactations. A detailed analysis of the out of herd exists enlightened on the first place the alteration of reproductive function followed by the alteration of udder and members, as imperious consequence of the influence of technological exploitation factors, poor management and in a low measure by the genetic factors.

Key words: productive longevity, BNR, milk production

INTRODUCTION

From the analysis of literature regarding the cattle's longevity [1, 7, 8, 9, 11, 16, 19, 20] resulted that the research, with implications of genetic and economic aspects in dairy cows exploitation, is still a poor chapter, so the theme it is well motivated and very actual.

MATERIAL AND METHODS

Research were carried out on a nucleus of 350 cows from Romanian Black Pied (BNR)

breed exploited in the pedo-climatic conditions of Doaga Farm, Vrancea County, the most representative farm in the area.

The studied herd was structured in two genetic batches function of origin: animals having origin in indigenous bulls and animals having origin in imported bulls.

For the whole herd, were analysed the milk production indexes on successive lactations, reproduction indexes, corporal development, bulls used for reproduction and breeding value. On a sample of 167 cows, divided, in the above mentioned genetic batches, was studied the productive longevity, using the data from the farm and

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the ones provided from the official production control OARZ Vrancea.

Complexity of the aimed aspects, with the established objectives, implies the usage of a diverse working methodology, specific to the research in husbandry which was recommended by the literature [12, 13, 18].

RESULTS AND DISCUSSIONS

Fitness features are more and more important in selection and breeding programmes of dairy cows. Having in view these aspects were made research on the main

fitness features at the elite farm Doaga – Vrancea, which owns one of the most valuable nucleuses of BNR breed from Moldova.

Were analysed the productive performances for 167 cows which finished their productive career, herd belonging to some indigenous bulls (36 daughters) and imported bulls (131 daughters), and the obtained results are presented below.

In table 1 are presented the results of the analysis for productive longevity at BNR cows from Doaga Farm.

Table 1 Productive longevity of BNR cows from Doaga Farm

Specification	U.M.	n	$\bar{X} \pm s_{\bar{x}}$	s	V%	MIN	MAX	
Number of lactations	nr.	167	2.77±0.11	1.45	52.62	1	7	
Mean duration of lactations	days	167	997.12±36.74	474.89	47.62	254	2142	
Milk quantity on productive life	kg	167	23328.90±899.68	11626.52	49.83	5339	55914	
Fat quantity on productive life	kg	167	961.56±36.34	469.70	48.84	205.5	2287.7	
Protein quantity on productive life	kg	167	789.71±34.44	445.10	56.36	123.5	3691	
Fat content on productive life	%	167	4.16±0.01	0.22	5.33	3.56	4.66	
Protein content on productive life	%	167	3.35±0.01	0.12	3.82	2.93	3.81	
Usage index	%	167	76.00					

Exploitation duration was in average of 2.77 normal lactations, with limits between 1 and 7 lactations. Could be observed that the cows from this farm were exploited for a small number of years, and the exit from herd was after an average number of 997.12 days of lactation.

Milk quantity on productive life was of 23,328.9 kg, with limits between 5,339 kg and 55,914 kg. From the analysis of the variability of this index could be observed that the studied flock was very heterogeneous, standard deviation ($s = 11,626.52$ kg) and variation coefficient ($V\% = 49.83$) having maximal.

The variation row shows that 41.4% from the cows which ended their productive career produced between din 30,000 kg and 40,000 kg of milk, and 6.5% produced over 40,000 kg of milk. The champion of productive longevity was the cow with the number 000050,

descendant from the imported bull 51023, which in seven lactations realised 52,958 kg of milk and 3,967.1 kg G + P, respectively 24.72 kg of milk and 1.902 kg G + P per day of productive life. The greatest productive performance was realised by cow number 000101, daughter of bull 51030, with a production of 55,914 kg of milk and 4,058.5 kg G + P, obtaining 25.85 kg of milk and 1.946 kg G + P per day of productive life.

Having in view the duration of productive life and the productive performances could be observed that the studied flock realised 23.39 kg of milk per day of productive life, with 0.964 kg of fat and 0.791 kg of proteins, values which enlightened the genetic potential of BNR breed from this farm. Analysing the productive longevity, separate on those two batches of cows, from indigenous and imported bulls, results significant differences. So, cows from

indigenous bulls were exploited for 1-6 lactations, the majority of cows (61.1%) being exploited for 3-4 lactations. Average exploitation time was of 1,281 days (4.2 lactations) and a mean production of 27,369.61 kg of milk, returning an amount of 21.36 kg of milk per day of productive life.

The cows from imported bulls were exploited between 1-7 lactations, but the majority of them (78.6%) between 1 and 3 lactations. The average duration of exploitation was of 923.71 days (3.02 lactations) and a mean production of 21,831.16 kg of milk, returning an amount of 23.63 kg of milk per day of productive life.

Comparing the results of the two batches of cows, reared and exploited in the same environmental conditions, could be observed that cows from indigenous bulls had a greater exploitation period (4.2 normal lactations) and in consequence a mean production per

productive life greater than the one from the cows with origin in imported bulls. So, the cows with origins in indigenous bulls were better adapted to the environment conditions and had a longer period of superior exploitation than the one of the cows from imported bulls, but milk production per day of productive life was lower.

Tracking other fitness indicators, such as, organism resistance, frequency of genital diseases, abortion and calves mortality frequency, at the cows from imported bulls was observed a higher frequency of those diseases, so can be draw the conclusion of an inferior resistance of organism and a weak adaptability at the environmental conditions from Doaga Farm.

Analysis of the productive longevity of the cows from Doaga Farm was made using the „Survival Analysis” method and the results are presented in table 2.

Table 2 Analysis of longevity through „Survival Analysis” method

Lactation	Origin indigenous bulls		Origin imported bulls		Total population	
	n	%	n	%	n	%
I	2	5.5	37	28.2	40	23.9
II	3	8.3	36	27.5	38	22.8
III	12	33.4	30	22.9	43	25.7
IV	10	27.8	12	9.2	22	13.2
V	6	16.7	12	9.2	17	10.2
VI	3	8.3	3	2.3	6	3.6
VII			1	0.7	1	0.6
Total	36	100.00	131	100.00	167	100.00

From the analysis of those data we observe that after first lactation were out of herd a number of 40 (23.9%), and after third lactation exits 121 cows from the original number, 72.4%. From the total herd after the first three lactations were eliminated 47.2% cows with origin in indigenous bulls and 78.6% cows with origin in imported bulls. Could be very clear observed that the indigenous cows had a longer life, having a better organism resistance and a better adaptability to the environmental conditions from farm.

Considering the age of first calving and exploitation period was estimated the index of utilisation in production for the studied herd. The obtained results enlightened that on total population the utilisation index were

76%, below the optimal value of 83% cited in literature [5].

Cows with origin in indigenous bulls had an utilisation period of 79.41%, while at cows with origin in imported bulls was of 76.08%. Could also be notice, from the values of this parameter, that cows with origin in indigenous bulls had an utilisation period longer in comparison with the ones provided from imported bulls.

Analysing the age of first calving could be observed that cows with origin in indigenous bulls realised the first calving at 28 months and 20 days (860.03 days), with 24.59 days over the average of the population which was at 835.44 days. The variability of this reproduction indicator was between 757.83 days at the genetic batch Code 20097

and 993.67 days at genetic batch Code 19801.

Calving interval had a great variability, with limits between 394.33 days at genetic batch Code 19801 and 527.25 days at genetic batch Code 19201. Cows from this batch had the calving interval, in average, of 436.48 days, with 8.63 days over the population mean (435.23 days).

Mammary repose is the index which had close values to the optimal ones, with a mean of 65.05 days and means between 43.33 days for genetic batch Code 19801 and 77 days at genetic batch Code 19201.

Reproduction indexes for cows' batch with origin in imported bulls presented mean values which enlightened the favourable influence of those ones.

So, **the age of first calving** for the 28 genetic families was of 27 months and 11 days (821.69 days), with 13.75 days below the population mean. The precocious calving was recorded at half-sister family Code 51587, around at 23 months (686 days), while at family Code 51455 first calving took place at 1,066.75 days (35 months and 17 days).

Comparing with the mean of the batch provided from indigenous bulls for the batch with origin in imported bulls the first calving was precocious 38.34 days and with 13.75 days face to the mean of the whole population.

Calving interval was of 426.60 days, with limits between 331 days at genetic batch Code 51710 and 505.67 days at family Code 51453. For this batch of cows calving interval was with 8.63 days shorter than the farm average and with 9.88 days face to the mean of the batch of indigenous origin.

Mammary repose for the genetic families with origin in imported bulls had superior values face to the batch with origins in indigenous bulls, mean being of 72.22 days, with limits between 50.50 days at genetic batch Code 51710 and 105.71 days at batch Code 51030.

Comparing with the indigenous families batch this indicator was higher with 7.17 days but lower with 6.24 days that the farm average.

From the analysis of the reproduction indexes we can draw the conclusion that, on

genetic batches, imported bulls had a favourable influence, which is reflected on productive performances and also on corporal and shape development, ameliorated conformations face to the ones of indigenous origin.

CONCLUSIONS

Synthesizing the results of the study on productive longevity we can drawback the general conclusion that cows from Doaga Farm weren't exploited at their full genetic productive potential, exploitation period being shorter in comparison with the data from literature.

We observe that the maximum production on productive life didn't over pass 60,000 kg of milk and we couldn't talk about individuals which over pass production of 100,000 kg of milk. Such performances weren't realised by Romanian Black Pied breed in Romanian farms fact which show serious deficiencies in dairy cows exploitation management and important economical losses.

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