RESULTS REGARDING THE STUDY OF REPRODUCTION INDEXES AT BROWN BREED COW POPULATION FROM VRANCEA COUNTY

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Abstract

On a population of 1520 Brown cows, from 15 farms located in Vrancea County were evaluated the main reproductive indicators on the basis of data from official control in farms.

Were evaluated the following indicators: rank of lactation, age at first calving (AFC), service-period (SP), dry period (DP), calving interval (CI)and number of artificial inseminations for one gestation (IA).

From analysis of mean values could be observed that average age at first calving was of approximately 33 month ranking between 29 and 35 month, the analysed population having precocity under the standard of Brown breed. Number of inseminations for one gestation was 2.09, at the farms level being recorded a poor management of frozen seminal material.

Reproduction indicators had means values which prove that reproduction function was poor technically managed.

Key words: reproduction indexes, cows, management, technologic factors

INTRODUCTION

Cattle's breeding was and will be an economic activity of great importance in Romania and all over the world [40].

The lifetime productivity of the cows commences from the onset of puberty and will be influenced by subsequent critical events including age at first calving, duration of the postpartum interval for each successive calving, conception rates and number of lactations [7].

Higher milk productions occur due to relationship between genotype and environment, hence the need for knowledge of individuals and populations, to which they belong, exploitation and properly management of the farm activities [39].

Age at first calving (AFC) is extremely important economic feature determining the profit of cow milk production [38] and is more important in earlier lactations [18]. Pirlo et al. [25] showed that decreasing age at first calving has positive effect on genetic progress, but can be harmful to milk yield and longevity. In other research, Niloforooshan and Edriss [19] who studied on Iranian Holsteins found that the optimum age at first calving to maximize first lactation ME milk yield, was of 24 months. Moreover, reducing age at first calving can reduce feed costs and increase the number of calves per cow, but it has negative effects on first lactation milk yield and fat percentage as well [25]. In the USA, Hare et al. [15] reported decreased trends for age at first calving from 1980 to 2004, while Dobos et al. [9] showed that heifers calving at younger AFC produce similar amounts to their older herd-mates by the end of the third lactation. So, delaying the age at first calving, only increases the cost of rearing and causes the decrees of lifetime milk production [41,42].

Service period (SP) for cows, normally ranges between 60 to 90 days, but should not exceed 100 days [39]. If this time period is extended, the next calving will be temporally shifted [11]. The length of the SP is multifactorial [11], being dependent on several

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factors such as level of milk production [36], hormonal status [30], involution disorders [37], body condition [26], metabolic status [6] and other reproductive features [17].

Dry period (DP) is a important indicator of a good farm management [31]. A dry period is absolutely necessary not only for the repose of the mammary gland but also to maximize milk yield in the subsequent lactation [5, 27, 43]. Several research reported that to maximize milk yield in the next lactation [5, 27], for dairy cows, is necessary a 50 to 60 day dry period [32, 33], and as a general conclusion, a dry periods less than 60 day can reduce milk production in the subsequent lactation and can affect fertility efficiency [8, 12, 13, 14, 22, 29, 31,44]. However, on the other hand, some studies suggests that the reduction of dry period can improve cow performance regarding milk production composition, metabolic status and fertility [3; 8, 13, 14; 2444].

Regarding the calving interval (CI) as a general management practice in dairy herds is to breed cows with the aim of establishing a 12 months interval between one calving to another [20]. Management of the calving interval and its optimal length are important aspects of the economic performance of dairy farms [10].

The current dominant breeding system, with 12-13 months CI is based on the idea that the production economy benefits from an early conception[16, 35] and higher milk productions [21].

Even though numerous research strongly suggest that an optimal CI is in the range of 12 months, there are studies that have shown some advantage for a longer period of days open and, consequently, an extended calving interval till 18 months with positive influence on reproduction, in terms of a reduced need for the treatment of ovarian disorders and higher conception rates and economic advantages in extending lactations by 60 days in high yielding cows [2, 4, 28, 45].

The insemination index is another important indicator, facilitating the assessment of fertility in a dairy cattle herd[34]and the management of frozen semen material. Adamski, 2010[1] stated that proper value of this index should be around 1.6. Calving and calving hygiene affect puerperium in conjunction with food, accommodation and cow breeding and often leads to extended service periods and increased insemination index [23].

The aim of this paper is the study and knowledge of reproduction indexes and management in cow farms from Vrancea County.

MATERIAL AND METHOD

Were taken in study 15 farms with Brown cow population belonging to Association for the Official Control of Zootechnical Production from Vrancea County being in the COP (Official Production Register) for 2018-2019, at which were analysed: lactation rank, age at first calving (AFC), service-period (SP), dry period (DP) or mammary repose, calving interval (CI) and number of artificial insemination (IA) for one gestation.

Cows' number was of 1520 in 1-7 lactation from 15farms located in Vrancea County, where Brown population has a significant share and farmers acceded to the Association for the Official Control of Zootechnical Production.

The data necessary to carry out this research came from the observations during the official production control, from the databases of ANZ Bucharest (National Agency for Animal Husbandry)and Association for the Official Control of Zootechnical Production, Vrancea County, as well as from the unique register of mating and calving from the farms taken in study.

Primary data from monitoring each farm were statistically processed (average, standard deviation, the coefficient of variation) and summarized for each analysed parameter.

RESULTS AND DISCUSSIONS

In tab. 1 is presented the average and variability of the main reproduction indexes at Brown cows' population registered in the COP for 2017-2018.

The studied population included the cows from each farm, which were in 1-7 lactation, with an average of 3.44 lactations for the entire population and with differences from one farm to another. As we can observe from the data presented in table 1 this parameter is very inhomogeneous (40.46-59.90).

Table 1 The average medium and variability of reproduction indexes at Brown cow population from Vrancea County registered in the COP (official production register) for 2018-2019

Specification	Samples statistics	Lactation rank	AFC (months)	SP (days)	DP (days)	CI (days)	Nr. IA / gestation
Farm 1 (51 cows)	$\bar{X}\pm s_{\bar{x}}$	2.82±0.40	34.37±1.41	89.78±1.48	76.91±4.01	387.92±6.31	2.22±0.40
	V%	41.65	13.43	34.63	41.17	29.32	17.32
Farm 2 (56 cows)	$\bar{X}\pm s_{\bar{x}}$	3.88±0.11	33.54±2.52	84.18±1.38	79.46±4.64	384.54±6.22	2.22±0.10
	v%	40.46	11.57	38.90	24.71	30.65	13.43
Farm 3 (57cows)	$\bar{X}\pm s_{\bar{x}}$	2.38±0.80	33.81±4.73	88.43±3.06	76.49±3.82	382.34±6.55	2.66±0.02
	v%	47.99	21.55	47.69	34.15	29.74	19.94
Farm 4 (69 cows)	$\bar{X}\pm s_{\bar{x}}$	3.75±0.70	31.96±1.80	81.11±2.16	73.37±7.25	381.68±6.43	2.38±0.03
	v%	35.55	20.26	34.48	34.23	29.42	17.28
Farm 5 (174 cows)	$\bar{X}\pm s_{\bar{x}}$	2.53±0.30	29.82±6.12	83.16±1.81	69.32±6.31	384.23±4.22	1.56±0.47
	v%	49.70	8.66	47.43	35.27	27.32	24.48
Farm 6 (64cows)	$\bar{X}\pm s_{\bar{x}}$	3.81±0.50	32.72±0.21	84.10±1.58	79.72±5.11	384.73±7.39	2.20±0.10
	v%	46.88	10.91	34.14	37.39	29.74	22.77
Farm 7 (182 cows)	$\bar{X}\pm s_{\bar{x}}$	3.40±0.89	30.55±0.66	74.96±1.66	65.51±7.33	377.80±6.33	1.74±0.78
	v%	46.9	16.15	44.15	33.46	27.50	28.81
Farm 8 (161 cows)	$\bar{X}\pm s_{\bar{x}}$	3.28±1.85	30.20±4.12	73.11±1.62	68.24±2.57	379.58±5.93	1.81±0.35
	v%	46.61	13.96	43.12	27.37	31.24	31.88
Farm 9 (185 cows)	$\bar{X}\pm s_{\bar{x}}$	4.04±0.40	31.33±2.17	72.44±4.15	66.21±7.92	378.85±6.81	1.54±0.88
	v%	59.90	7.57	39.11	29.42	35.11	26.41
Farm 10 (126 cows)	$\bar{X}\pm s_{\bar{x}}$	2.98±0.07	32.20±3.16	75.35±1.08	69.24±1.81	376.70±9.22	2.1±0.03
	v%	41.50	9.01	38.94	34.23	27.21	36.78
Farm 11 (26 cows)	$\bar{X}\pm s_{\bar{x}}$	3.84±0.48	34.58±7.41	91.48±1.28	85.31±2.14	401.98±8.33	2.51±0.64
	v%	45.54	11.56	44.55	38.80	47.63	29.45
Farm 12 (13 cows)	$\bar{X}\pm s_{\bar{x}}$	4.12±0.69	35.58±3.45	96.12±1.37	84.51±0.45	406.01±9.44	2.73±1.41
	v%	64.23	9.48	47.96	40.68	38.48	24.55
Farm 13 (89 cows)	$\bar{X}\pm s_{\bar{x}}$	3.94±0.77	34.99±4.48	86.24±2.44	74.56±1.56	386.45±7.61	2.03±0.49
	v%	39.57	6.58	41.12	33.71	36.36	31.48
Farm 14 (111 cows)	$\bar{X}\pm s_{\bar{x}}$	3.14±0.49	34.96±1.44	83.14±1.47	65.16±8.17	388.64±8.85	1.82±0.36
	v%	41.12	17.54	44.48	28.71	35.81	21.24
Farm 15 (156 cows)	$\bar{X}\pm s_{\bar{x}}$	3.74±0.89	33.69±1.73	79.66±1.97	70.15±2.54	383.88±7.49	1.97±1.14
	v%	51.34	11.21	49.16	39.64	46.09	32.54
Total population 1520 cows	$\bar{X}\pm s_{\bar{x}}$	3.44±2.02	32.95±11.06	82.88±7.54	73.61±8.64	385.68±11.73	2.09±1.14
	v%	49.7	17.92	54.14	22.46	24.48	65.61

From the analysis of the main reproduction indexes resulted the following:

Age at first calving (AFC)was 32.95 months with variability between 29 and 35 months. From the 15 farms taken in study, in only one the age at first calving didn't exceed 30 months, in the other 14 the Brown cows had a poor reproductive precocity cu with an age at first calving situated above 30 months, the analysed population having precocity under the standard of Brown breed.

The average service period (SP) was in average of 82.88 days, pregnancy installation being achieved in general in the first 3-4 heat cycles.

The dry period or mammary repose was in average of 73.61 days, cows being weaning for more than two months before calving, without extending the period of lactation especially at cows with high daily production, which ultimately leads to obtaining a smaller quantity of milk, thus also significant economic losses, knowing that raw milk represents the main source of income of the Romanian farms.

Calving interval (CI) is synthetic index which highlights best the management of breeding activity from a farm. Mean value in the studied population was 385.68 days which means that reaching the desired one calf a year per cow has not been achieved. In 2 farms from the 15 analysed, calving interval exceed the value of 400 days, which proves that the management of the reproduction function was poorly conducted.

Dispersion indices highlights some particular situations on several farms with a maximum calving interval of over 700 days, so with a calving at two years.

Number of $IA_1$for one pregnancy was 2.09, with limits ranking between 1.54 and 2.73.The variability of this index was significantly high, standard deviation

being1.44and the coefficient of variation V % = 65.61.

The analysis of this indicator at farms and population level highlights some deficiencies regarding management of the reproduction function, and registration of some costs beyond normal limits for the seminal fluid used for insemination.

CONCLUSIONS

From analysis of mean values could be observed that average age at first calving was of 33 month ranking between 29 and 35 month, the analysed population having precocity under the standard of Brown breed. Number of inseminations for one gestation was 2.09, at the farms level being recorded a poor management of frozen seminal material.

The worst results were registered in the small farms, which show an inadequate knowledge of the factors that influence not only the reproduction function but also their economic management.

Reproduction indicators had means values which prove that reproduction function was poor technically managed in almost all of the farms taken in study.

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