Factors Effecting of Milk Productions in Select Herds of Slovak Spotted Breed

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Abstract
The aim this work was analyse factors effecting on the milk production in select breeding herds of the Slovak spotted breed. Data were analysed using the Statistical Analysis System version 9.3.1 and linear model with fixed effects of herd-year-season of calving, genetic group, father, number of lactation and cod of milk production. Average of traits of milk production was 5266.4 kg of milk, 222.19 kg of fat, 177.79 kg of proteins and 251.37 kg of lactose. The linear model to represent coefficient determination R^2 = 0.598099 for milk production with all fixed effects. The analysis by the effect was the highest effect of herd-years-season of calving (0.3724) than effect of father (0.3017). Correlation coefficients between milk, fat, protein, lactose in kgs (r=0.90826, r= 0.98260, r= 0.98830), were statistically high significant.

Key words: Slovak spotted breed, dairy cows, traits of milk production, correlation, coefficient of determination.

1. Introduction

The breeding work is directing programme which cover system of necessary steps to improve productive abilities of farm animals which decide to fulfil the aims of breeding [1].
The aim of each breeding program is to cover all steps of breeding work into one system to provide in real condition with adequate economical effect of breeding type and standard. In the process of high productive stock creation are proved animals very important and they play decisive role in intensity of breeding work in relation to breed and to productive orientation.
The breeding programme in population of Slovak spotted breed come out from principles opening population for ever report breeding process [2].

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Identification and evaluation of factors that affect genetic evaluation, selection, and mating strategies in a population are essential to evaluate genetic improvement programs and determine areas in need of improvement [3]. The analyse factors effecting on productive and reproductive traits was evaluated many authors [5, 6, 7].
The aim this work was analyse factors effecting on the milk production in select breeding herds of the Slovak spotted breed.

2. Materials and methods

The aim this work was point the interesting effects on traits of milk production dairy cows in selected herds Slovak spotted breed for period years 1990-2010 with all genotypes of Slovak spotted breed. Analysed were production traits - milk production, fat production, protein production and lactose production on the all lactation.

Data were analysed using the Statistical Analysis System version 9.3.1 [4] and linear model with fixed effects herd-year-season of calving, genetic group, father, number of lactation and cod of age of first calving.

3. Results and discussion

The average of traits milk production in selected herds together were 5266.4 kg of milk, 222.19 kg of fat, 177.79 kg of proteins, 251.37 kg of lactose. The results of statistical characteristic of traits milk production by selected herds was presented in Table1. The highest average milk production after all observed lactations was reached in the herd (3) 5266.4 kg of milk, 222.19 kg of fat, 177.79 kg of proteins, 251.37 kg of lactose and the lowest in the herd (1) 4391.62 kg of milk, 167.33 kg of fat, 144.92 kg of proteins, 209.25 of lactose. In Table 2 showed the linear model to represent coefficients of determination for traits of milk production with all fixed effects. The coefficients of determination were between 0.5886 - 0.6308. The highest coefficient of determination was reached 0.6308 for fat production and the lowest 0.5886 for lactose production. These results were similar us showed [1, 2].

Table 1 Statistical characteristic traits of milk production in select herds of Slovak spotted breed

Herds	traits	n [1]	$\bar{x}$ [2]	s [3]	v [4]
1	milk	8 279	4391.62	1714.18	39.03
	fat		167.33	61.50	36.76
	proteins		144.92	56.97	39.32
	lactose		209.25	85.10	40.67
2	milk	4 102	4613.75	1291.36	27.99
	fat		214.43	70.59	32.92
	proteins		150.81	41.74	27.68
	lactose		216.98	60.41	27.84
3	milk	4 262	5266.40	2124.65	40.34
	fat		222.19	104.43	47.00
	proteins		177.79	70.26	39.52
	lactose		251.37	100.80	40.10
4	milk	5 057	4713.47	1574.91	33.41
	fat		195.53	67.24	34.39
	proteins		156.35	52.57	33.62
	lactose		225.02	76.42	33.96

[1] number of observation, [2] average, [3] standard deviation, [4] coefficient of variation

Table 2 Summary coefficients of determination for traits of milk production

Traits	R-Square	Coefficient of Variance	Root MSE	Mean
Milk	0.598099	25.91554	1098.461	4238.621
Fat	0.630800	27.69990	48.85649	176.3779
Protein	0.619161	25.55903	35.91291	140.5097
Lactose	0.588658	26.89919	55.38241	205.8888

Table 3 Factors effecting on the traits of milk production.

Sources of variability	DF (grades of freedom)	Mean Square	F Value	Pr > F	R-Square (coefficient of determination - R^2)			
					Milk	Fat	Protein	Lactose
Herd-years-season	471	51478833	30.67	<.0001	0.3724	0.4070	0.3881	0.3650
Breeding type	19	2954641	2.45	0.0004	0.0361	0.0315	0.0320	0.0335
Father	571	8187921	4.88	<.0001	0.3017	0.3169	0.3109	0.3024
Number of lactation	16	87586581	52.18	<.0001	0.0295	0.0221	0.0294	0.0335
Cod of age	2	12526471	10.38	<.0001	0.0305	0.0386	0.0386	0.0300

The analyses by the effect was the highest effect of herd-years-season R^2 = 0.3724 than effect of father R^2 = 0.3017 (Table 3). The comparable tendency was in yield evaluation of milk, fat, proteins and lactose. These the effects were statistical high significant.

Table 4 Correlation between traits of milk production

Traits	Fat	Fat %	Protein	Protein %	Lactose	Lactose %
Milk	0.90826 <.0001	0.02488 0.0002	0.98260 <.0001	-0.02982 <.0001	0.98830 <.0001	0.04683 <.0001
Fat	-	0.41428 <.0001	0.90456 <.0001	0.02900 <.0001	0.89317 <.0001	0.02585 0.0001
Fat %	-	-	0.05287 <.0001	0.14825 <.0001	0.01725 0.0110	-0.02294 0.0007
Protein	-	-	-	0.14227 <.0001	0.97417 <.0001	0.06269 <.0001
Protein %	-	-	-	-	-0.01658 0.0146	0.07338 <.0001
Lactose	-	-	-	-	-	0.18791 <.0001

Correlation coefficients between evaluated traits were statistically high significant, scilicet between kgs of milk and fat r= 0.90826, between kgs milk and proteins r= 0.98260 and kgs milk and lactose r= 0.98830 (Table 4). These results are similar with results [1, 2, 8].

4. Conclusions

The finding we can to observe, that average of traits of milk production was 5266.4 kg of milk, 222.19 kg of fat, 177.79 kg of proteins and 251.37 kg of lactose. The linear model to represent coefficient determination R^2 = 0.598099 for milk production with all fixed effects. The analysis by the effect was the highest effect of herd-years-season of calving (0.3724) than effect of father (0.3017). Correlation coefficients between milk fat, protein and lactose in kgs (r=0.90826, r= 0.98260, r= 0.98830), were statistically high significant.

Acknowledgements

This work was supported by projects of Ministry of Education Slovak Republic of the VEGA No. 1/0769/09 and No. 1/0046/10.

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