RESEARCHES REGARDING THE PERFORMANCE OF MILK PRODUCTION REGISTRED IN DAIRY BREEDS PINZGAU AND TRANSILVANIA'S PINZGAU, EXPLOITED IN THE NORTH-EAST OF ROMANIA

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Abstract

The main aim of this study was to compare the milk performance realized by cattle of Pinzgau breed (PZ) imported from Austria and the indigenous breed Pinzgau of Transylvania (PZT). The analysis was performed in two herds at the first and second lactations. Both breeds were kept in the same conditions and with the same feeding. The first lactation records were analyzed according to the following linear model: $Y_{ij} = \mu + H_i + C_j + e_{ij}$. The second lactation records were analyzed according to the following linear model: $Y_{ijk} = \mu + H_i + C_j + J_k + e_{ijk}$. The analyses of covariances were processed and calculated the production of fat-protein corrected milk (FPCM) and energy content in milk (ECM) according to the following formulae: $FPCM = 0.22M + 7.5F + 15P$, respectively $ECM = 37.68F + 16.75P + 16.54L$. The difference in milk production between Pinzgau and Pinzgau of Transilvania breeds, at first and second lactations, were not statistically significant. The Pinzgau breed cattle achieved higher fat, protein and lactose percentage at the first lactation and second lactations. These differences were statistically highly significant (P<0.01).

Key words: North-East Region, milk yield, cattle, Pinzgau breed

INTRODUCTION

After 1990 in Romania has developed the import of pregnant heifers of Pinzgau breed, especially from Austria. The subject of this research was to compare the milk yield traits of the cattle of Pinzgau breed imported from Austria (PZ) with the Romanian breed Pinzgau of Transilvania (PZT).

MATERIAL AND METHODS

The analysis was performed in two herds. At the first lactation the imported dairy cows of Pinzgau breed imported from Austria were compared with contemporaries of Romanian breed Pinzgau of Transilvania, calved in the same period. Both breeds were kept in the same stall with the same feeding and grazed during the summer period.

Linear models with fixed and random were used for the statistical analysis of milk yield traits data records. First lactation records were analysed according to the following model:

$$Y_{ij} = \mu + H_i + C_j + e_{ij}$$

where,

Y_{ij}: a milk yield observation

μ: an overall mean

H_i: a herd effect

C_j: a cow effect

e_{ij}: a residual error effect, which contains effects of factors that we have not considered in the model

At the second lactation the imported dairy cows of Pinzgau breed were compared with contemporaries of the Romanian Pinzgau breed. The breeds were kept separately in two stalls with the same technology. The basic feed ration was the same for both breeds. The animals of both breeds grazed together during the summer period.

Second lactations were evaluated according to the following model:

$$Y_{ijk} = \mu + H_i + C_j + J_k + e_{ijk}$$

Where,

Y_{ijk}: a milk yield observation

μ: an overall mean

H_i: a herd effect

C_j: a cow effect

J_k: a year of calving effect (the environment is always different each year)

e_{ijk}: a residual error effect

The analyses of covariances were processed and calculated the production of fat-protein corrected milk (FPCM) and energy content in milk (ECM) out of the estimated values of the studied parameters according to the following formulae.

FPCM= 0.22M + 7.5F + 15P

ECM = 37.68F + 16.75P + 16.54L

where: M - quantity of milk in kg

F - quantity of fat in kg

P – quantity of protein in kg

L - quantity of lactose in kg

RESULTS

Least square mean values of the studied traits in cattle of Pinzgau and Pinzgau of Transilvania breeds are given in *tables 1 and 2*. Statistically significant differences (P<0,01) were found only with the content and production of fat, lactose content and weight

of dairy cows which were better in the imported breed. Higher content of proteins in milk was noticed in the Pinzgau of Transilvania breed, however, the difference was not statistically significant. We noticed a marked increase in yield in the second lactation compared with the first lactation in both breeds. The Pinzgau dairy cows produced more milk compared with the Pinzgau of Transilvania, however the difference was not statistically significant. Only the differences in lactose percentage in milk and weight after the second calving were statistically significant (P < 0,01), which were better in the Pinzgau. The highest milk production was achieved in the Pinzgau breed in both lactations. The production of fat-protein corrected milk (FPCM) and the energy in milk (ECM) in cattle according to breeds are given in the *figures 1 and 2*. The highest production of fat-protein was achieved in the Pinzgau breed. This breed achieved also the highest production of energy in milk.

Table 1 Least square means estimation and standard errors for milk yield traits according to breeds – 1-st lactation (comparison Pinzgau and Pinzgau of Transilvania breeds)

Breed		Pinzgau n = 57	Pinzgau of Transilvania n = 16	F value
Trait		$\overline{X} \pm s_{\overline{X}}$	$\overline{X} \pm s_{\overline{X}}$	
Milk	(kg)	3219.61±87.00	3046.09±82.94	1.14-
Fat	(g/100g)	4.32±0.06	3.99±0.10	21.36++
Fat	(kg)	139.06±3.98	121.53±6.99	10.13++
Protein	(g/100g)	3,25±0,02	3,20±0,04	2.70-
Protein	(kg)	104.61±2.63	97.47±4.62	0.36-
Lactose	(g/100g)	4,64±0,02	4,42±0,04	7.26++
Lactose	(kg)	149.36±4.40	134.63±7.73	2.16-
Live weight	(kg)	538.89±1.63	517.87±2.87	43.20++

+P<0,05; ++P<0,01

Table 2 Least square means estimation and standard errors for milk yield traits according to breeds – 2-nd lactation (comparison Pinzgau and Pinzgau of Transilvania breeds)

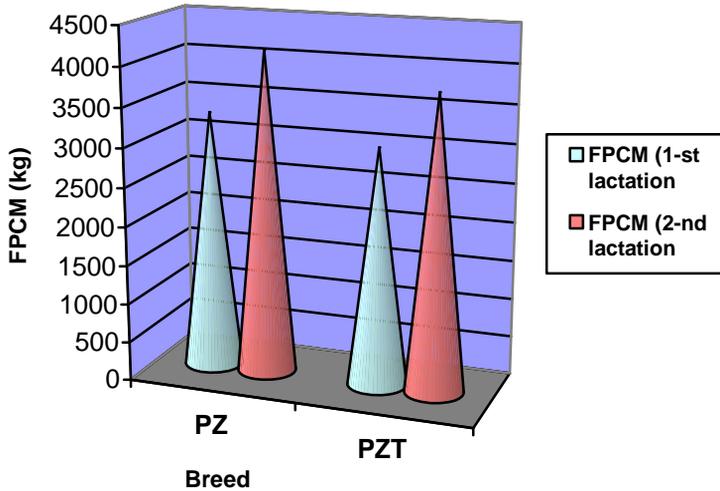| Breed		Pinzgau n = 11	Pinzgau of Transilvania n = 40	F value
Trait		$\overline{X} \pm s_{\overline{X}}$	$\overline{X} \pm s_{\overline{X}}$	
Milk	(kg)	3980.36±89.16	3679.85±77.2	2.74-
Fat	(g/100g)	4.16±0.15	4.00±0,00	0.71-
Fat	(kg)	165.57±11.81	147.16±6.31	0.89-
Protein	(g/100g)	3,40±0,06	3.36±0.00	0.37-
Protein	(kg)	135.32±7,85	123.61±4.19	3.49-
Lactose	(g/100g)	4,72±0,04	4.59±0.00	13.45++
Lactose	(kg)	187.85±12.12	168.86±6.48	1.14-
Live weight	(kg)	590.22±3.29	565.58±1.70	17.35++

+P<0,05; ++P<0,01

Figure 1 FPCM at the Pinzgau (PZ) and Pinzgau of Transilvania (PZT)
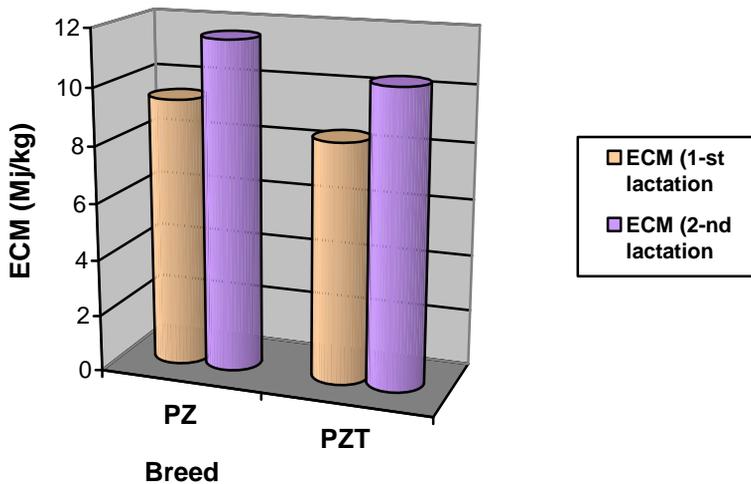at the 1-st and 2-nd lactations

Figure 2 ECM at the Pinzgau (PZ) and Pinzgau of Transilvania (PZT)
at the 1-st and 2-nd lactations

DISCUSSION

The imported animals of Pinzgau breed achieved lower milk production in the production conditions in Romania than in Austria. The content of proteins, fat and lactose in milk was also lower. On the contrary, the milk production and the content of proteins, fat and lactose in milk was higher at Pinzgau breed than Romanian breed. The high content of lactose in milk of Pinzgau and Pinzgau of Transilvania breed cows can be evaluated positively, and it can be related to the better shape of udder.

It is necessary to take into account the high value of energy in 1 kg milk of the Pinzgau breed. The milk yield achieved in the generation born and raised in the production conditions of Romania could be important for further spread of the Pinzgau breed in Romania.

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