RESEARCHES CONCERNING THE COMPARISON OF MILK PRODUCTION BETWEEN CATTLE OF AUSTRIAN BROWN CATTLE *(ÖSTERREICHISCHES BRAUNVIEH)* AND BRUNA OF MARAMURES BREEDS

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Abstract

The main aim of this study was to compare the milk performance realized by cattle of Österreichisches Braunvieh breed imported from Austria and the indigenous breed Bruna of Maramures. The analysis was performed into a farm at the first and second lactations. The imported dairy cattle (Österreichisches Braunvieh breed) were compared with contemporaries indigenous breed (Bruna of Maramures) calved in the same period. 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 difference in milk production between Österreichisches Braunvieh and Bruna of Maramures breeds, at first and second lactations, were not statistically significant. The cattle Österreichisches Braunvieh compared Bruna of Maramures breeds achieved higher fat, protein and lactose percentage at the first lactation (4.25% and 3.99%, 3.32% and 3.26%, respectively 4.74% and 4.62%) and at the second lactation (4.16% and 4.03%, 3.40% and 3.26%, respectively 4.99% and 4.82%). These differences were statistically highly significant (P<0.01).

Key words: milk yield, cattle breed, *Österreichisches braunvieh*, Bruna of Maramures

INTRODUCTION

The import of *Österreichisches Braunvieh* breed in Romania has developed after 1990, the pregnant heifers being imported from Austria. The subject of this work was to compare the milk yield traits of imported animals of *Österreichisches Braunvieh* breed with the Romanian breed – Bruna of Maramures.

MATERIAL AND METHODS

The analysis was performed into a private farm in which the imported dairy cows of *Österreichisches Braunvieh* breed were compared with contemporaries of Bruna of Maramures breed calved in the same period. Both breeds were kept in the same condition with the same feeding. Linear models with fixed effects and the least square means method 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

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

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RESULTS

The comparison with first-calf cows of the *Österreichisches Braunvieh* and Bruna of Maramures breeds is given in *table 1*. 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 *Österreichisches Braunvieh* breed, however the difference was not statistically significant.

Table 1 Least square means estimation and standard errors for milk yield traits according to breeds – 1 st lactation (comparison *Österreichisches Braunvieh* and Bruna of Maramures)

Breed		*Österreichisches Braunvieh* (n=16)	Bruna of Maramures (n=16)	F value
Trait		$\overline{X} \pm s_{\overline{X}}$	$\overline{X} \pm s_{\overline{X}}$	
Milk	(kg)	3419,61±87,00	3246,09±152,94	1,14-
Fat	(g/100g)	4,52±0,06	3,99±0,10	21,36++
Fat	(kg)	154,09±3,98	130,47±6,99	10,13++
Protein	(g/100g)	3,33±0,04	3,26±0,02	2,70-
Protein	(kg)	110,75±2,63	107,81±4,62	0,36-
Lactose	(g/100g)	4,74±0,02	4,62±0,04	7,26++
Lactose	(kg)	162,33±4,40	150,26±7,73	2,16-
Live weight	(kg)	538,89±1,63	517,87±2,87	43,2++

+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 *Österreichisches Braunvieh* and Bruna of Maramures)

Breed		*Österreichisches Braunvieh* (n=14)	Bruna of Maramures (n=14)	F value
Trait		$\overline{X} \pm s_{\overline{X}}$	$\overline{X} \pm s_{\overline{X}}$	
Milk	(kg)	5094,36±239,16	4679,85±127,7	2,74-
Fat	(g/100g)	4,16±0,15	4,03±0,0	0,71-
Fat	(kg)	205,33±11,81	193,70±6,31	0,89-
Protein	(g/100g)	3,40±0,06	3,26±0,0	0,37-
Protein	(kg)	172,33±7,85	156,96±4,19	3,49-
Lactose	(g/100g)	4,99±0,04	4,82±0,0	13,45++
Lactose	(kg)	246,77±12,12	233,21±6,48	1,14-
Live weight	(kg)	564,58±1,7	532,22±3,29	17,35++

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

We noticed a marked increase in yield in the second lactation *(table 2)* compared with the first lactation in both breeds. The *Österreichisches Braunvieh* dairy cows produced more milk compared with the Bruna of Maramurs, however the difference was not statistically significant. Compared the first lactation, where the differences in fat and lactose percentages were statistically significant, at the second lactation only lactose percentage was statistically significant (P<0.01), which were better in the *Österreichisches Braunvieh* breed. The highest milk production was achieved in the *Österreichisches Braunvieh* breed in both lactations.

DISCUSSION

The imported animals of *Österreichisches Braunvieh* breed achieved lower milk quantity in the production conditions in Romania than in Austria. The content of proteins in milk was also lower. On the contrary, the content of fat in milk of imported animals was higher than in the Austrian population.

The cattle of *Österreichisches Braunvieh* breed achieved higher milk production then cattle of Bruna of Maramures breed, but these differences, at first and second lactations, were not statistically significant. The cattle of *Österreichisches Braunvieh*

breed achieved higher fat and lactose percentage at the first lactation, respectively only lactose percentage at the second lactation. These differences were statistically highly significant ($P<0.01$). Also, the live weight at both lactations indicates differences highly significant for the *Österreichisches Braunvieh* breed.

The high content of lactose in milk of *Österreichisches Braunvieh* breed cows can be evaluated positively, and it can be related to the better shape of udder compared with the Romanian 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 *Österreichisches Braunvieh* breed in Romania.

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