

RESEARCHES CONCERNING THE COMPARISON OF MILK YIELD BETWEEN CATTLE OF BRUNA OF MARAMURES AND BRAUNVIEH BREEDS IMPORTED FROM AUSTRIA

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Abstract

The main aim of this study was to compare the milk performance realized by cattle of 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 (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 Braunvieh and Bruna of Maramures breeds, at first and second lactations, were not statistically significant. The Braunvieh breed cattle achieved higher fat, protein and lactose percentage at the first lactation (4.25% and 3.94%, 3.42% and 3.20%, respectively 4.67% and 4.49%) and at the second lactation (4.29% and 4.02%, 3.42% and 3.21%, respectively 4.59% and 4.43%). These differences were statistically highly significant ($P < 0.01$).

Key words: milk yield, cattle breed, Bruna of Maramures, Braunvieh

INTRODUCTION

The import of 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 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 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:

$$Y_{ijk} = \mu + H_i + C_j + J_k + e_{ijk} \quad \text{where:}$$

Y_{ijk} : a milk yield observation

μ : an overall mean

H_i : a herd effect

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The manuscript was received: 17.09.2019

Accepted for publication: 30.10.2019

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

RESULTS

The comparison with first-calf cows of the 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 Braunvieh, however the

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

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

Breed	Braunvieh (n=20)	Bruna (n=20)	F value
Trait	$\bar{X} \pm s_{\bar{X}}$	$\bar{X} \pm s_{\bar{X}}$	
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 Braunvieh and Bruna of Maramures)

Breed	Braunvieh (n=20)	Bruna (n=20)	F value
Trait	$\bar{X} \pm s_{\bar{X}}$	$\bar{X} \pm s_{\bar{X}}$	
Milk (kg)	5094.36±239.16	4679.85±127.7	2.74-
Fat (g/100g)	4.03±0.15	4.16±0.0	0.71-
Fat (kg)	205.33±11.81	193.70±6.31	0.89-
Protein (g/100g)	3.40±0.06	3.36±0.0	0.37-
Protein (kg)	172.33±7.85	156.96±4.19	3.49-
Lactose (g/100g)	4.82±0.04	4.99±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++

+ $P < 0.05$; ++ $P < 0.01$

DISCUSSION

The imported animals of Braunvieh breed achieved lower milk production 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 Braunvieh breed achieved higher milk production than cattle of Bruna of Maramures breed, but these differences, at first and second lactations, were not statistically significant. The cattle of

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 Braunvieh breed.

The high content of lactose in milk of 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 Braunvieh breed in Romania.

REFERENCES

- [1] Gilca I., V. Ujica V., Creanga St., Groen A., Vos H.: Breeding value estimation of sires using the modern methods. Univ. Agr. Iași. Lucr. Științifice, Seria Zootehnie, vol.37,38, p. 90 (1993)
- [2] Gilca I., Ujica V., Vacaru-Opris I, Creanga St. Inheritance of somatic cell count and its genetic relationship with milk yield and lactose in different parities. Book of the 47th Annual Meeting of the European Association for Animal Production, Lillehammer, Norway, p. 61 (1996)
- [3] Gilcă I. - Zootehnie generală. Edit."Ion Ionescu de la Brad". Iași, 2016
- [4] Gilcă I. – Tehnologia creșterii animalelor. Edit."Ion Ionescu de la Brad". Iași, 2016
- [5] Hermas, A.S.; Young, C.W.; Rust, J.W.: Genetic relationship and additive genetic variation of production and reproductive traits in dairy cattle. J. Dairy Sci., Champaign, 111. 70 (1997)
- [6] Kreilinger, J.; Zierer, E.: Leistungs- und Qualitätsprüfung in der Rinderzucht in Bayeen 1994. Landeskuratorium de Erzeugerringe für tierische Veredelung in Bayern e.V., (1994)
- [7] Maciuc V., Ujică V., Nistor I. – Ghid practic de ameliorare genetică a bovinelor pentru producția de lapte. Edit. Alfa, Iași, 2003
- [8] Schaeffer L.R., Kennedy Bw. Linear models and computing strategies in Animal Breeding. University of Guelph, Ontario (1996)