GENETIC PARAMETERS AND BREEDING VALUES OF WEANING RESULTS OF HUNGARIAN FLECKVIEH BEEF CALVES

Sz. Bene, I. Füller, Z. Lengyel, B. Nagy, F. Szabo

Materials and Methods 1

During the study data of 8929 Hungarian Fleckvieh calves (4539 male and 4390 female) sired by 232 breeding bulls, born between 1980 and 2003 were evaluated in Hungary (Table 1). Population genetic parameters and breeding value were estimated.

MTDFREML (Boldman et al., 1993) (Modet 1, and Model 2, with and without permanent maternal envirinmental effect), method were used for statistical analyses.

Materials and Methods 2

The model was as follows:

$$Y = Xb + Zu + Wm + Spe + e$$

Where:

Y = vector of perfomance trait
b = vector of fix effect
u = vector of random effect
m = vector of maternal genetic effect
pe = vector of permanent maternal environmental effect
e = vector of error
X = matrix of fox effects
Z = matrix of random effects
W = matrix of maternal genetic effect
S = matrix of permanent maternal environmental effect

Results 1

The overall results of weaning traits are summarized in Table 2.

The variance, and covariance components obtained by two animal models (Model 1, Model 2) and population genetic parameters are shown by Table 3.

Table 1 - COMPOSITION OF THE EXAMINED POULATION

Designation	Number of animals
Number of animals with records	8929
Sires	232
Dams	2057
Paternal grand sires	17
Maternal grand sires	114
Total grand sires	131
Paternal grand dams	24
Maternal grand dams	817
Total grand dams	841
Calves without perfomance	1897

Table 2 – OVERALL WEANING RESULTS

Designation	Weaning Weight (kg)	Preweaning daily gain (kg/day)	205-day weight (kg)	Age of calves at weaning (day)
Overall mean value	217	1,009	242	181
Standard devation (SD)	45,30	0,198	40,46	35,53
Coeficient of variation (CV%)	20,86	19,61	16,71	19,63

Table 3 – GENETIC PARAMETERS, VARIANCE AND COVARIANCE COMPONENTS IN 205-DAY WEIGHT

Parameters	Model 1	Model 2
Additive direct genetic variance	461	451
Maternal genetic variance	89	145
Direct maternal genetic covariance	-137	-134
Maternal permanent enviromental effect	69	-
Residual variance	768	791
Phenotypic variance	1250	1253
Direct heritability	037±006	036±006
Maternal heritability	007±003	012±003
Direct-maternal genetic correlation	068±010	-052±009
The ratio of the permanent enviromental variance to the phenotypic variance	006±002	-
The ratio of the residual variance to the phenotypic variance	061±004	063±004
$h^2_{mt}c^2$	0,125	-
Total heritability	0,24	027

As it is seen from the data the maternal genetic and residual variance in case of Model 2 is higher and the coefficient of direct-maternal genetic effect is lower than that of in Model 1.

Results 2

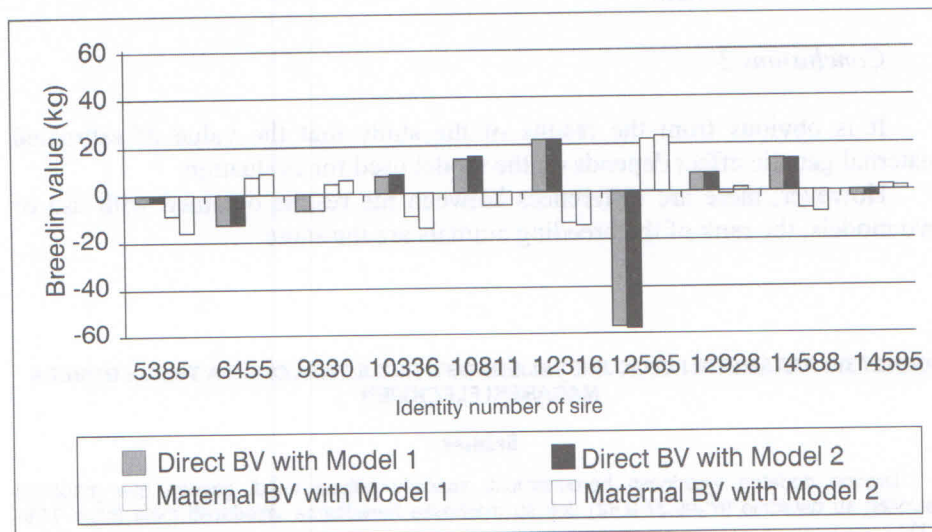Breeding values obtained by using two models are in Figure 1.

Figure 1 - ESTRMATED BREEDING VALUE OF THE TESTED SIRES BY ANIMAL MODEL IN 205-DAY WEIGHT

As the results show the breeding values depend on whether the permanent maternal environmental effect is considered (Model 1) or not (Model 2)

The rank of the sires by two models is similar to each other, that is proved by the strong positive correlation.

Table 4 – COMPARISON OF THE MODELS WITH RANK-CORRELATION

			Model 1	
**=P<0,01		Weaning weight (WW)	Preweaning daily gain (PDG)	205-day weight (CW)
Model 2	WW	0,95**	-	-
	PDG	-	0,94**	-
	CW	-	-	0,92**

Conclusions 1

Direct additive heritability values of weaning traits of beef type Hungarian Fleckvieh calves are medium (h^2_d=0.37-0.42), while maternal heritability values are low (h^2_m= 0.08-0.12).

The correlation between direct and maternal effect is negative (r_{dm}= -0.52 - -0.74) so consideration of both traits are suggested for breeding value estimation and selection.

Conclusions 2

It is obvious from the results of the study that the value of estimated maternal genetic effect depends on the model used for evaluation.

However, there are differences between the results obtained with use of two models, the rank of the breeding animals are the same.

GENETSKI PARAMETRI I UZGOJNE VRIJEDNOSTI REZULTATA ODBIĆA TELADI GOVEDA MAĐARSKI FLECKVIEH

Sažetak

Izravne dodatne vrijednosti hereditarnosti značajki odbića teladi goveda tipa mađarski fleckvieh su osrednje (h^2_d=0.37-0.42) dok su majčinske hereditarne vrijednosti male (h^2_m= 0.08-0.12).

Korelacija između izravnog i majčinskog djelovanja je negativna (r_{dm}= -0.52 – -0.74) pa se predlaže uzeti u obzir obje značajke za procjenu uzgojne vrijednosti i selekciju.

Očito je iz rezultata istraživanja da vrijednost procijenjenog majčinskog genetskog djelovanja ovisi o modelu upotrijebljenom za procjenu.

Postoje razlike, međutim, između rezultata dobivenih primjenom oba modela, dok je položaj životinja u uzgoju isti.