50th ANNUAL MEETING OF E.A.A.P.
ZÜRICH, 22.-26. AUGUST 1999

ÁTK
HUNGARY

Commercial crossing using Belgian White Blue and Charolais semen in Hungarian Grey herds

K. Bölcskey,[1] I. Bárány,[1] I. Bodó,[2] S. Bozó,[1] I. Györkös,[1] Ms. A. Lugasi,[3] J. Sárdi.[1]

[1]Research Institute for Animal Breeding and Nutrition, Herceghalom, Hungary
[2]University of Veterinary Sciences, Budapest, Hungary
[3]National Institute of Food Hygiene and Nutrition, Budapest, Hungary

SUMMARY

Hungarian Grey (HG) cows were inseminated with the semen of three Belgian White Blue (BWB), and three Charolais (Ch) bulls. HG bulls were serving in the same herd. Seven BWB x HG, 10 Ch x HG, and 9 HG bull calves were taken into the same tied fattening system at 288.0, 265.6 and 251.9 days of age and 255.1, 242.9 i.e. 187.3 kg weight. After 344 days fattening average live weight corrected to the same age of the BWB x HG group was 633.7 kg, by 98 kg (18.3%, P<1%) higher, than that of the HG, and by 14.3 kg (2.3%, P>5%) higher, than that of the Ch x HG group. Average corrected weight of the Ch x HG group was higher by 83.5 kg (15.6%, P<1%) than that of the HG group. Dressing percentage of the groups was 61.6, 60.3, and 55.7%, respectively, the differences are all significant. Proportion of abdominal fat was less by 23% (P<.1%) in BWB x HG as compared to HG, and by 14.3% (P<5%) as compared to the Ch x HG group. Boning data show 84.1 kg (46.4%, P<.1%) more pure meat for the BWB x HG as compared to HG, and 35.8 kg (15.6%, P<1%) more as compared to the Ch x HG group. Proportion of intermuscular and subcutan fat was by about 25% less in the BWB x HG (P<.1%) as compared to both the control, and Ch x HG groups. The proportion of bone was also the lowest, 16.1% in the BWB x HG group, 16.8% in the Ch x HG, and 17.8% in the HG groups. This way HG cows may produce offspring of excellent slaughter quality.

INTRODUCTION

The ancient breed of Hungarian Grey (HG) cattle belonging to the Podolian group is re-evaluated by beef cattle breeders. This breed demonstrates some outstanding qualities missing in so called modern breeds. The cows of excellent constitution are long living under the extreme conditions of the dry hot summer periods and cold winters of badlands, have reliable seasonal reproduction, easy calving, excellent nursing abilities and strong herd instinct. Typical economically negative characteristics of natural breeds are the slow growth, late maturation, and the quantitatively not sufficient fattening and slaughter results of pure-bred young cattle.

The extraordinarily long effective (up to 20 years) lifespan of the breed makes possible the extended application of simple utility crossing with terminal breeds providing an economical use of the steppes of Eastern-Hungary.

The most up-to-date terminal breeds are also bred in Hungary today. This time we investigated the crosses of ”viande” type of Belgian White-Blue (BWB) and the Charolais (Ch) bulls with HG cows as compared to pure-bred HG-s.

MATERIAL and METODHS

HG cows were inseminated with the semen of three BWB and three Ch bulls in a herd of 600 in the Kiskunság National Park between the Danube and Tisza rivers, and HG bulls were serving in the same time. There were no stalls and no fences were allowed by the rules of the National Park. The calves were born in the February-March season without any help on the pasture, they got no fodder, and were weaned by the end of November.

Weaned bull calves (7 BWB x HG, 10 Ch x HG and 9 HG) of similar age were taken into tight fattening with the same feeding (*Table I.*). They were fed with a wheat-maize based fodder supplemented with premix in a daily dose of 1% of the actual liveweight, meadow hay ad libitum, and wet sugarbeet chips of 16% dry material in the first 5 months of fattening, and later a 1:1 mixture of meadow- and lucerne hay.

After the not too intensive fattening following local traditions, the groups were evaluated based on the results of experimental slaughter and boning. Significance of differences was controlled by Student’s test.

RESULTS and DISCUSSION

There were significant differences in the liveweight corrected to the same age (*Table I.*). The BWB x HG group reached significantly much (+ 98 kg) higher terminal weight, than the HG control, and by 14.3 kg (non-significant) more, than the Ch x HG group.

This above tendency was confirmed by the data of weight gain (*Table II.*), while the weeker daily weight gain of the BWB x HG group during the extensive calf-rearing periode, was greatly increased until the end of fattening.

Besides the absolute data, differences of dressing percentages are especially convincing (*Table III.*) demonstrating significant superiority of the BWB x HG group in all of the comparisons. Proportion of abdominal fat shows the fat-reducing effect of BWB, as the results of Ch x HG and HG are both about the same, while that of the BWB x HG group is significantly less.

Boning results indicate absolute superiority of the BWB x HG group in lean meat proportion, which is significantly better as compared to both of the other groups. Changes of intermuscular and subcutan fat proportion are also of interest in the crossings. The proportions do not differ in the Ch x HG and HG groups, while that of the BWB x HG group is

significantly better as compared to both, the tendency is identical to the findings regarding abdominal fat. The absolute bone content of larger bodies is higher, but in proportion the result of the BWB x HG group is significantly better, than that of the other two groups.

CONCLUSIONS

The final product of utility crossing with BWB and Ch semen in a population of HG cows meets the exigencies of the time, while the phase of calf-rearing is very economical.

The BWB x HG group was better, than the Ch x HG in all of the important characters, although this was confirmed only by the same tendency, as due to the low numbers, some of the milder differences were not significant:

- beneficial effect of BWB was proven by the best weight gain during fattening, compensating the weaker weaning result as compared to the Ch x HG group, and finally by the best daily liveweight production,
- considering dressing percentage, the BWB x HG was the best, also less abdominal fat as well; suggesting that terminal weight could be increased in this construction,
- beneficial effect of BWB onto body composition was proven by the more meat produced by the BWB x HG group: 46.4% more, than by the HG control, and 15.6% more, than by the Ch x HG group. This great difference is significantly expressed in boning results as well : 75.6 % in the BWB x HG, 72.0 % in the Ch x HG and 71.1% in the HG group.
- bone percentage demonstrated also the superiority of the BWB x HG group, being less by 9.5 % as compared to the HG control and by 4.1%, than in the Ch x HG group; both of the differences are significant.
- the economical importance of the ”primitive” HG breed is increased by these results.

Table I. **Fattening results of Belgian White Blue x Hungarian Grey (F1) and Charolais x Hungarian Grey (F1) young bulls**

		HG control	Ch x HG (F1)	BWB x HG (F1)	difference I.	difference II.	difference III.
Group ✡		(**1**)	(**2**)	(**3**)	(**1**)⇔ (**2**)	(**1**)⇔ (**3**)	(**2**)⇔ (**3**)
n		9	10	7			
Age at the start of fattening, days	$\bar{x}$	**251.9**	**265.6**	**288.0**	**13.7*** ***(5.4%)***	**36.1***** ***(14.3%)***	**22.4***** ***(8.4%)***
	CV%	*8.1*	*6.1*	*3.5*			
live weight, kg	$\bar{x}$	**187.3**	**242.9**	**255.1**	**55.6**** ***(29.7%)***	**67.8**** ***(36.2%)***	**12.2** ***(3.1%)***
	CV%	*23.1*	*14.8*	*16.4*			
Age at the end of fattening, days	$\bar{x}$	**594.9**	**609.6**	**632.0**	**14.7** ***(2.5%)***	**37.1***** ***(6.2%)***	**22.4**** ***(3.7%)***
	CV%	*3.4*	*2.5*	*1.6*			
live weight, kg	$\bar{x}$	**501.8**	**596.4**	**633.7**	**94.6***** ***(18.9%)***	**131.9***** ***(26.3%)***	**37.3** ***(6.3%)***
	CV%	*9.6*	*10.5*	*10.1*			
Corrected weight to the age of group 3., kg	$\bar{x}$	**535.7**	**619.4**	**633.7**	**83.7**** ***(15.6%)***	**98.0**** ***(18.3%)***	**14.3** ***(2.3%)***
	CV%	*9.2*	*10.4*	*10.1*			

***= P<5%, **=P<1%, ***=P<0.1%** HG = Hungarian Grey, BWB = Belgian White-Blue, Ch=Charolais

Table II. **Weight gain results of Belgian White Blue x Hungarian Grey (F1) and**

Charolais x Hungarian Grey (F1) young bulls

		HG control	Ch x HG (F1)	BWB x HG (F1)	difference I.	difference II.	difference III.
Group ✡		(1)	(2)	(3)	(1)⇔(2)	(1)⇔(3)	(2)⇔(3)
n		9	10	7			
Duration of fattening, days		343	344	344			
Weight gain in fattening period, g/day	$\bar{x}$	**914**	**1028**	**1101**	**114**** ***(12.4%)***	**186**** ***(20.4%)***	**73** ***(7.1%)***
	CV%	*8.0*	*10.4*	*11.4*			
Weight gain / day lifetime							
until the start of fattening, g/day	$\bar{x}$	**754**	**918**	**868**	**164*** ***(21.6%)***	**114** ***(15.1%)***	**-49.3** ***(-5.4%)***
	CV%	*19.0*	*16.6*	*16.4*			
until the and of fattening, g/day	$\bar{x}$	**843**	**980**	**1003**	**136**** ***(16.2%)***	**160**** ***(18.9%)***	**23** ***(2.4%)***
	CV%	*8.5*	*11.7*	*10.2*			

***= P<5%, **=P<1%, ***=P<0.1%** HG = Hungarian Grey, BWB = Belgian White-Blue, Ch=Charolais

Table III. **Slaughtering results of Belgian White Blue x Hungarian Grey (F1) and Charolais x Hungarian Grey (F1) young bulls**

		HG control	Ch x HG (F1)	BWB x HG (F1)	difference I.	difference II.	difference III.
Group ✡		(1)	(2)	(3)	(1)⇔(2)	(1)⇔(3)	(2)⇔(3)
n		9	10	7			
Weight just before slaughtering, kg	$\bar{x}$	**470.6**	**542.8**	**584.9**	**72.2**** ***(15.4%)***	**114.3***** ***(24.3%)***	**42.1*** ***(7.7%)***
	CV%	*9.2*	*9.7*	*6.9*			
Carcass weight, kg	$\bar{x}$	**262.4**	**327.3**	**360.1**	**64.9***** ***(24.7%)***	**97.7***** ***(37.2%)***	**32.8** ***(10.0%)***
	CV%	*11.2*	*10.3*	*6.7*			
Yield at slauthering% (without fasting)	$\bar{x}$	**55.7**	**60.3**	**61.6**	**4.6***** ***(8.2%)***	**5.9***** ***(10.6%)***	**1.3**** ***(2.2%)***
	CV%	*3.5*	*2.7*	*2.5*			
Fat from body cavities, kg	$\bar{x}$	**13.6**	**14.1**	**13.0**	**0.5** ***(3.4%)***	**0.6** ***(-4.3%)***	**-1.1** ***(7.4%)***
	CV%	*13.2*	*20.5*	*9.1*			
%	$\bar{x}$	**2.9**	**2.6**	**2.2**	**-0.3** ***(-10.2%)***	**-0.7***** ***(-23.0%)***	**-0.4*** ***(-14.3%)***
	CV%	*12.1*	*20.5*	*9.0*			

***= P<5%, **=P<1%, ***=P<0.1%** HG = Hungarian Grey, BWB = Belgian White-Blue, Ch=Charolais

Table IV. **Boning out results of Belgian White Blue x Hungarian Grey (F1) and Charolais x Hungarian Grey (F1) young bulls**

		HG control	Ch x HG (F1)	BWB x HG (F1)	difference I.	difference II.	difference III.
Group ✡		(**1**)	(**2**)	(**3**)	(**1**)⇔(**2**)	(**1**)⇔(**3**)	(**2**)⇔(**3**)
n		9	10	7			
Carcass weight (cooled), kg	$\bar{x}$	**254.9**	**318.8**	**351.0**	**63.9*** *(25.1%)*	**96.1*** *(37.7%)*	**32.2*** *(10.1%)*
	CV%	*11.2*	*10.4*	*6.7*			
Meat, kg	$\bar{x}$	**181.3**	**229.6**	**265.4**	**48.3*** *(26.6%)*	**84.1*** *(46.4%)*	**35.8**** *(15.6%)*
	CV%	*11.3*	*10.5*	*6.8*			
% of carcasses	$\bar{x}$	**71.1**	**72.0**	**75.6**	**0.9** *(1.2%)*	**4.5*** *(6.3%)*	**3.6*** *(5.0%)*
	CV%	*3.4*	*2.5*	*6.7*			
Intermuscular and subcutan fat, kg	$\bar{x}$	**27.4**	**34.4**	**28.4**	**7.0**** *(25.4%)*	**0.9** *(3.4%)*	**-6.0**** *(-17.5%)*
	CV%	*18.2*	*13.6*	*11.0*			
% of carcasses	$\bar{x}$	**10.7**	**10.8**	**8.1**	**0.1** *(0.6%)*	**-2.6*** *(-24.6%)*	**-2.7*** *(-25.1%)*
	CV%	*10.8*	***7.2***	***7.3***			
Bone, kg	$\bar{x}$	**45.2**	**53.4**	**56.5**	**8.2*** *(18.2%)*	**11.3*** *(24.9%)*	**3.0** *(5.7%)*
	CV%	*10.0*	*9.5*	*7.0*			
% of carcasses	$\bar{x}$	**17.8**	**16.8**	**16.1**	**-1.0** *(-5.6%)*	**-1.7*** *(-9.5%)*	**-0.7*** *(-4.1%)*
	CV%	*5.6*	*4.1*	*3.2*			

***= P<5%, **=P<1%, ***=P<0.1%** HG = Hungarian Grey, BWB = Belgian White-Blue, Ch=Charolais

Acknowledgement:
This work was supported by the National Committee for Technological Development.

INFORMATION:
K. BÖLCSKEY, Research Institute for Animal Breeding and Nutrition,
Herceghalom H-2053
FAX: (0036-23) 319-133, E-mail: kbolcskey@atk.iif.hu