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Effect of crossbreeding on market value of calves from dairy cows

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Introduction

- Calves obtained by dairy breeds provide a large quota of meat market in Italy
- Crossbreeding is an interesting mating system in dairy cattle to obtain a greater economic income from selling the crossbred instead of purebred calves
- About 30% of insemination on dairy cow is realized using beef semen

Aim

To estimate the commercial value of calves of different genotypes

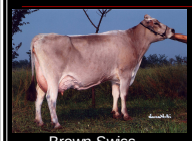
With emphasis on :

- Sire breed effect
- Dam breed effect
- Sire x Dam effect

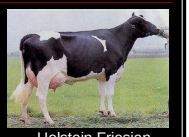
Material and Methods-1

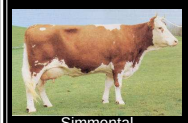
- 78,490 calves sold
- 191 weekly auctions
- From January 2003 to December 2006
- 23 ± 8 d age at auction
- Only calves with registered breed sire and dam have been considered

Material and Methods-2


Brown Swiss


Belgian Blue


Holstein Friesian


Simmental


Limousin


Alpine Grey

Material and Methods-3

Descriptive statistics for number of calves sold (n) and weight (kg) at auction of different genotypes.

Sire breed	Dam breed: BS		HF		SI		AG	
	calves	weight	calves	weight	calves	weight	calves	weight
BS	20,967	63.1						
HF			8,058	58.9				
SI					11,763	68.3		
AG							8,007	65.0
LI	1,330	67.2	424	65.3	228	68.0	226	68.3
BB	13,332	68.8	4,673	66.7	6,638	70.4	2,844	71.3

Material and Methods-4

Trait considering in the ANOVA model:
COMMERCIAL VALUE defined as Euro/calf

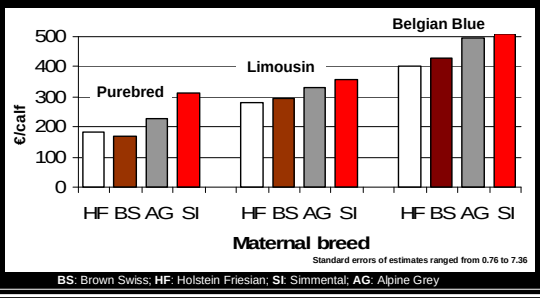
Effects considered in the ANOVA model:

- CROSS (sire breed x dam breed)
- SEX of CALF (female and male)
- YEAR of the AUCTION (4 years)
- MONTH of the AUCTION (12 months)
- AGE of CALF (young, intermediate, old)
- All interactions of first order among effects

Euro/calf → R^2=0.79 Mean=310 RMSE=70.3

Results-1

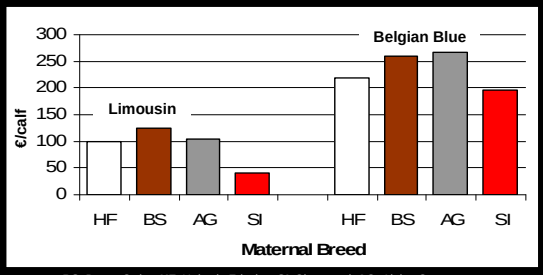
Least square estimates of the genotype effect on calves commercial value (Euro/calf)



BS: Brown Swiss; **HF**: Holstein Friesian; **SI**: Simmental; **AG**: Alpine Grey

Results-2

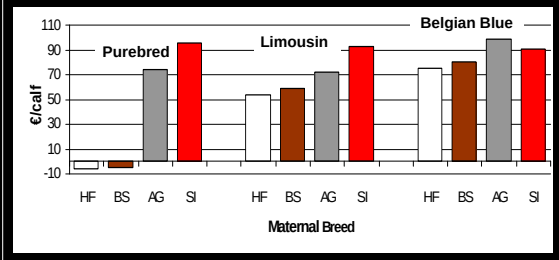
Differences between purebred and crossbred on calves commercial value (Euro/calf)



BS: Brown Swiss; **HF**: Holstein Friesian; **SI**: Simmental; **AG**: Alpine Grey

Results-3

Least square estimates of the sex effect (male vs. female) on calves commercial value (Euro/Calf)



BS: Brown Swiss; **HF**: Holstein Friesian; **SI**: Simmental; **AG**: Alpine Grey

Male vs. Female → **366 vs. 301** Euro/calf

Conclusions

- For Sire breed effect: BB showed the best commercial value on all maternal breeds
- For Dam breed effect: greatest commercial values was obtained with SI
- For Sire x Dam effect: better improvement of calf value obtained using BB and LI as sire on BS and AG dam breed
- The mating of dairy and dual purpose cows with BB bulls can increase significantly the profit of the farm

Perspectives

- To estimate the differences among BB sires when used on different dairy breeds
- To estimate the genetic parameters for commercial value traits
- To study the crossbreeding effect using Italian beef breeds
- To estimate the herd profit increment resulting from the use of sexed semen aimed to increase the ratio of dairy dams available for crossbreeding