

Heritability for traits obtained from slaughter data on Marchigiana, Chianina and Romagnola bulls

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INTRODUCTION

The Italian Marchigiana (M), Chianina (C) and Romagnola (R) beef-cattle breeds are now widespread throughout all of Italy and are found predominantly in the central and southern regions. The beef industry linked to these breeds is supervised by the Consortium of PGI "Vitellone Bianco dell'Appennino Centrale" that is the only brand of quality recognized by the EC for fresh beef produced in Italy.



OBJECTIVE

This study was aimed to estimate heritability (h^2) for slaughter age (SA) and carcass traits, i.e. cold weight (CW), carcass average daily gain (CADG) and fleshiness score (CFS), in Marchigiana, Chianina and Romagnola bulls slaughtered in commercial abattoirs between 2004 and 2007.

CONCLUSIONS

Using the data from commercial abattoirs, CW and CADG showed good heritability, while for CFS showed a low genetic component; the slaughter age showed an unexpected high heritability and could influence variance components of other traits when used as covariates.

MATERIALS AND METHODS

After editing, 8025 records for M, 14229 for C and 5871 for R were retained for further analysis.

Variance components were estimated by REML method using the following model^(*):

$$Y_{ijk} = \mu + AD_i + HY_j + FCK + a_{ijk} + e_{ijk}$$

Y_{ijk} = slaughter age (SA), carcass weight (CW), carcass ADG (CADG), carcass fleshiness score (CFS)

AD_i abattoir-day of slaughter;

HY_j : herd-year of slaughter;

FCK : farm fattening class (same or different farm of birth);

a_{ijk} : animal effect (25419 for M, 42143 for C and 20364 animals in the pedigree files)

^(*) An alternative model for CW, CADG and CFS was used accounting for SA as covariate

RESULTS

Tab. 1: Mean and standard deviation for analysed traits

Breed:	Slaughter Age (d)		Carcass Weight (kg)		Carcass ADG (g/d)		Fleshiness Score **	
	mean	sd	mean	sd	mean	sd	mean	sd
Marchigiana	631.8	72.3	433.5	57.8	693	108	4.06	0.60
Chianina	626.7	67.2	478.4	64.6	769	113	3.31	2.45
Romagnola	643.6	67.5	434.4	53.9	679	89	3.84	0.48

** Fleshiness score: E=5, U=4 and R=3 points.



Tab. 2: Heritability of carcass traits for each breed

Trait:	Breed:		
	Marchigiana	Chianina	Romagnola
Slaughter Age	6.9	27.7	24.7
Carcass Weight	17.4	15.7	20.2
Carcass ADG	35.2	39.9	29.7
Fleshiness Score	6.1	5.2	5.1

Tab. 3: Heritability of carcass traits (using slaughter age as covariate)

Trait:	Breed:		
	Marchigiana	Chianina	Romagnola
Carcass Weight	21.9	25.6	22.5
Carcass ADG	24.5	25.7	25.3
Fleshiness Score	4.2	5.9	5.1

