DRY-CURED HAM PRODUCTION: CORRELATION BETWEEN BREED AND QUALITY OF RAW MEAT

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INTRODUCTION

The quality of raw ham is a decisive factor in dry-cured ham production because productions methods are not able to modify possible unfavourable characteristics of raw materials.

Several studies have demonstrated the effect of the genetic origin of the ham on its technological properties. In fact, differences between raw hams coming from different breeds in ham conformation, content of intra-muscular fat, thickness of subcutaneous fat, presence of PSE meat and others traits are obvious. Currently in Italy the main genetic types of pigs delivered for slaughter are Large White or offspring of LW boars (16,5%), Landrace or offspring of LA boars (1,9%), hybrid offspring of other breeds of boar, mainly Duroc (31,4%), offspring of hybrid boars (50,1%).

This situation leads to strong differences in technological properties among the raw hams and results in difficulties in finding hams suitable for the transformation process undertaken to obtain a finished product with the sensory attributes desired.

The aim of this work was to investigate the effect of breed on raw meat quality.

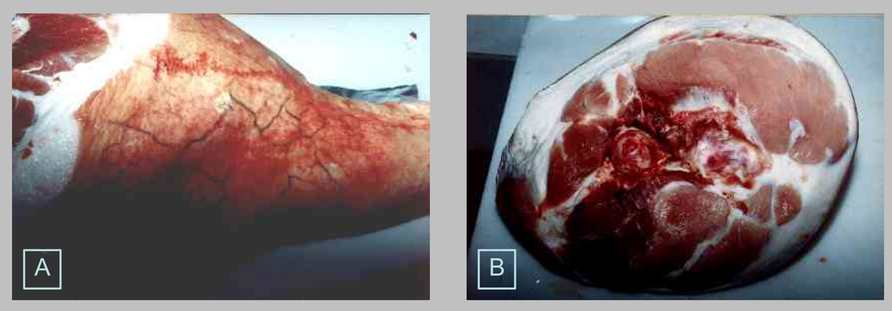

Fig 1 Example of non-conformity relative to the PDOs "Parma" and "San Daniele" :
A = abnormal colour; B = PSE meat

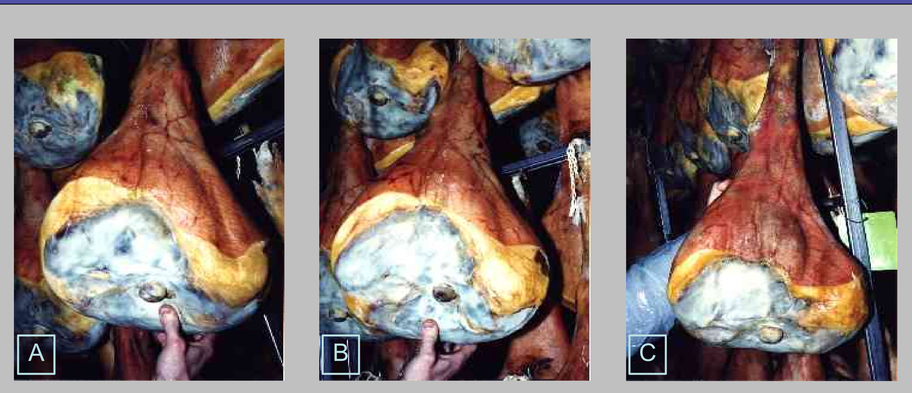

Fig 2 Quality of Dry-Cured Ham:
A= excellent; B = Good; C = sufficient

MATERIALS AND METHODS

A total of 240 pigs (n=60 per breed) of four different breeds, Duroc × (Landrace × Large White), Duroc × Large White, Duroc × Landrace and Landrace × Large White were slaughtered at a commercial abattoir at a liveweight of 150–160 kg. Measurements of carcass weight were recorded for each carcass on the slaughter floor. After slaughter we recorded the weight of all left raw hams. The pH was measured at 45 min and 24h post mortem in *M. Semimembranosus.*

After trimming we collected the weight of the ham. Trimmed hams were evaluated for fatness, meat colour, meat tenderness and absence of defects.

Quality grades were assigned by using a linear score where 1= Excellent; 2= Good; 3= Quite Good; 4= Insufficient.

Each ham was labelled with a numbered punch and manufactured following the procedures for Parma ham production. Weight losses (per cent difference from the weight of the trimmed ham) were recorded at the end of the salting and at the end of resting phases. Statistical analysis of the data was performed using the GLM and PRINCOMP procedures from the Statistical Analysis System.

RESULTS AND CONCLUSION

As reported in Table 1, the multivariate analysis shows a positive relationship (r=0.58) between carcass weight and trimmed weight of green hams. Raw ham weight was negatively correlated with both the weight loss at the end of salting (r= -0.18) and resting (r= -0.27). Ham weight was negatively associated only with weight loss at resting (r= -0.15). The weight losses at different stages of processing are strongly related (r= 0.93).

The principal component analysis showed clear distinctions between genetic types (Fig. 3). Green hams coming from Duroc × Landrace cross had lower weight losses during ham processing, Duroc × (Landrace × Large White) and Duroc × Large White crosses are quite similar for weight losses.

Duroc × Landrace crosses showed the best score for quality traits, and Landrace × Large White crosses had the lowest scores for quality traits (Fig. 4). Duroc × (Landrace × Large White) and Duroc × Large White crosses were also quite similar for quality traits.

The high correlation between the weight losses at different stages of production confirms the importance of the use of salting loss during the first 7 days of salting as selection traits for the Italian pigs breeding program.

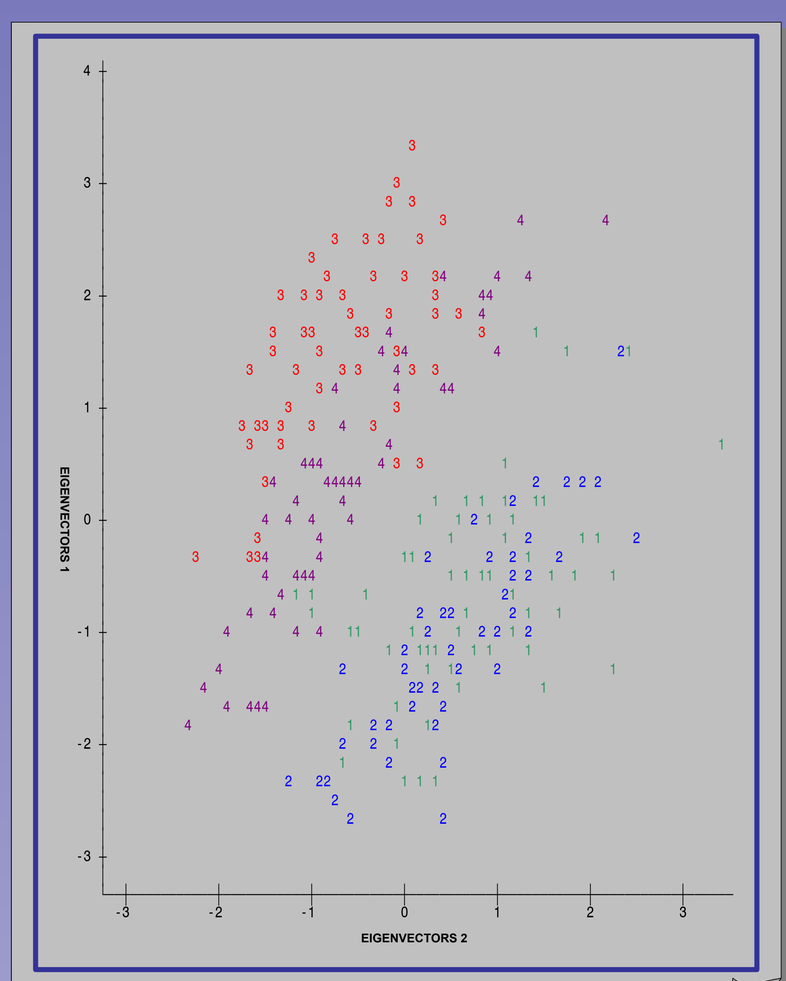

Fig 3 Plot of eigenvectors – Symbol are the values of the breeds:
1= DU × (LA × LW) ; 2 = DU × LW; 3 = DU × LA; 4 = LA × LW

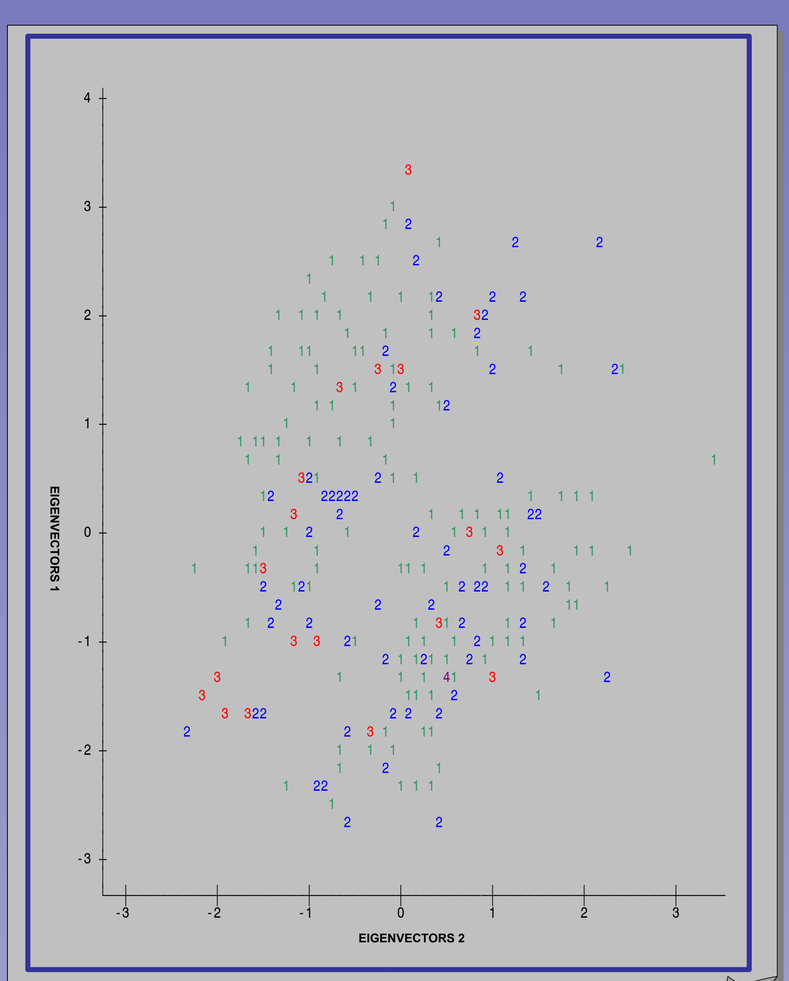

Fig 4 Plot of eigenvectors – Symbols are the values of raw ham quality score:
1= Excellent; 2 = Good; 3 = Quite Good; 4 = Insufficient

	CARCASS WEIGHT	RAW HAM WEIGHT	$pH_{45'}$	HAM WEIGHT	pH_{24h}	HAM SCORE	SALTING LOSS	RESTING LOSS
CARCASS WEIGHT	1	0,587503 <,0001	-0,033436 0,607	0,583461 <,0001	0,113108 0,081	-0,081013 0,2121	0,019894 0,7596	-0,100915 0,1197
RAW HAM WEIGHT		1	0,087461 0,1778	0,964303 <,0001	0,161681 0,0123	-0,024856 0,7022	-0,185102 0,0041	-0,271588 <,0001
$pH_{45'}$			1	0,085437 0,1881	0,142848 0,0272	-0,071295 0,2723	0,022961 0,724	-0,018815 0,7723
HAM WEIGHT				1	0,184897 0,0041	-0,048406 0,4564	-0,072395 0,2649	-0,15168 0,019
pH_{24h}					1	-0,060302 0,3533	-0,081921 0,207	-0,109339 0,0917
HAM SCORE						1	-0,020183 0,7562	0,01998 0,7586
SALTING LOSS							1	0,927012 <,0001
RESTING LOSS								1

Table 1 Partial Correlation Coefficients from the Error SSCP Matrix / Prob > |r|

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