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Some aspects of meat production in pig autochthonous genetic types. I. Data at slaughtering, jointing of carcass and tissue separation[†]

P. Colatruglio*, D.F. Esposito*, D. Fornataro, A. Capone**, A. Zullo* and D. Matassino*,****
*Dipartimento di Scienze Zootecniche e Ispezione degli Alimenti,
Università di Napoli 'Federico II', 80055 Portici, Naples, Italy
**Consorzio per la Sperimentazione, Divulgazione e Applicazione di Biotecniche Innovative (ConSDABI) - Italian National Focal Point c/o FAO (NFPI)
for the safeguard of animal germplasm at risk of extinction, 82020 Circello, (BN), Italy

SUMMARY - The research was carried out on 51 pigs, 30 castrated males (CM) and 21 whole females (WF) belonging to Calabrese (n=10 CM and 6 WF), Cinta senese (n=6 CM and 2 WF) and Siciliano (n=14 CM and 13 WF) autochthonous genetic types (AGT). The major results indicated that: (i) no differences exist among AGTs for the refrigerated net dressing percentage, whose value is equal to 89.9% on average; (ii) among the considered cuts, ham from Cinta senese has a greater incidence (27.8%) on refrigerated carcass if compared to Calabrese (26.9%) and Siciliano (27.0%); the same behaviour is observed for neck cut (P<0.05); (iii) separable meat from all cuts, except for the ham for seasoning, ranges from 23.5% to 27.5% in Cinta senese and to 27.9% in Siciliano and Calabrese (P<0.01); nevertheless, the incidence of separable lean meat depends on "genetic type x sex" interaction, which, in Sicliano, is higher for whole females than castrated males (P<0.01); the contrary exists in Cinta senese (P<0.05); (iv) separable fat reaches the maximum mean value in Cinta senese followed in decreasing order by Siciliano (26.8%) and Calabrese (25.6%; P<0.05); and (v) in comparison with a castrated male, the whole female gives a carcass with higher percentage of neck (P<0.05) and ham (P<0.001) cuts but with a tendency to provide a higher proportion of separable fat (P<0.10).

Key words: Pig, autochthonous genetic type, meat, rheological and colour characteristics.

RESUME - *"Aspects de la production de viande de porcins autochtones. I. Résultats à l'abattage, au découpage de la carcasse et rendement des découpages". La recherche a été menée sur 51 porcins, dont 30 mâles castrés (MC) et 21 femelles entières (FE), appartenant à des types génétiques autochtones (TGA) de Calabrese (n=10 MC et 6 FE), Cinta senese (n=6 MC et 2 FE) et Siciliano (n=14 MC et 13 FE). Les résultats plus importants ont démontré que (i) le rendement net à froid n'est pas différent entre les TGA et atteint la valeur moyenne de 80,9% ; (ii) parmi les découpes prises en considération, le jambon de la race Cinta senese a une incidence majeure (P<0,10) sur la carcasse refroidie (27,8%) par rapport à la race Calabrese (26,9%) et Siciliano (27,0%) ; on retrouve la même tendance pour le pourcentage de petit salé (P<0,05) ; (iii) la viande que l'on peut séparer de toutes les découpes, sauf le jambon, varie de 23,5% chez la Cinta senese à 27,5% chez le Siciliano et 27,9% chez le Calabrese (P<0,01) ; cependant l'incidence de la viande que l'on peut séparer dépend de l'interaction 'type génétique x sexe': qui est plus élevée chez la femelle entière par rapport au mâle castré chez le Siciliano (P<0,01), vice versa chez la Cinta senese (P<0,05) ; (iv) le gras séparable atteint la valeur maximum chez la Cinta senese (29,9%), suivie du Siciliano (26,8%) et du Calabrese (25,6% ; P<0,05) ; et (v) la femelle entière par rapport au mâle castré fournit une carcasse avec un pourcentage plus élevé de découpe du type 'coppa' (P<0,05), 'petit salé' et jambon (P<0,001), mais avec une tendance à fournir aussi un pourcentage plus élevé de gras séparable (P<0,10).*

Mots-clés : *Porc, types génétiques autochtones, viande, caractéristiques rhéologiques et de couleur.*

Introduction

The conservation of animal biodiversity becomes increasingly important because of the high independent homeostatic capability exhibited by autochthonous genetic types (AGT) for the management and control of the land. Only AGTs may play a zootechnical role due not only to their capability to produce in disadvantaged areas, but also to provide products which

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may be defined "typical" (Boyazoglu, 1990; Matassino, 1992, 1996; Matassino *et al.,* 1993). On the basis of this consideration it is necessary to know the intrinsic characteristics of the animal in order to define the role of AGTs for achieving an eco-sustainable rural development (Matassino, 1997).

Material and methods

The research was carried out on 51 pigs, 30 castrated males (CM) and 21 whole females (WF) belonging to Calabrese (n=10 CM and 6 WF), Cinta senese (n=6 CM and 2 WF) and Siciliano (n=14 CM and 13 WF) autochthonous genetic types (AGT). For each subject, the following measurements were performed: (i) live-weight, weight of hot carcass, refrigerated half-carcass and fifth quarter; (ii) linear measurements of half-carcass and several intestinal tracts; and (iii) dorsal fat tickness including skin.

After chilling for 22 hours at 0-4°C, the two half-carcasses were dissected using the "Napoletano" method in order to obtain: (i) lean cuts (neck and loin prime ribs; ham and shoulder); (ii) fat cuts (throat, jowl, belly, kidney fat); and (iii) bone cuts (head, feet, tail). Subsequently, each cut was assessed for meat, fat and bone weights. Data were elaborated by the following model of variance analysis in which the genetic type (α_i) and sex (β_j) were considered as fixed factors and the effect of each was expressed as deviation from the overall average μ:

$$y_{ijkl} = \mu + \alpha_i + \beta_j + (\alpha\beta)_{ij} + e_{ijkl}$$

The significance of differences among estimated means was assessed by Student's t test.

Results and discussion

The results concerning the most significant assessments (Table 1) evidenced that:

(i) No differences among AGTs were found for the refrigerated net dressing percentage, which was equal to 80.9% on average.

(ii) Among tested cuts, ham from Cinta senese gives a higher percentage contribution to refrigerated carcass (27.8%) compared with that from Calabrese (26.9%) (P<0.05); the same behaviour was observed for jowl percentage (P<0.05) while the opposite holds for kidney fat (P<0.05) and all adipose cuts (P<0.001).

(iii) The incidence of separable lean of all cuts, except for the ham for seasoning, is higher in Calabrese (27.9%) and Siciliano (27.5), compared with Cinta senese (23.5%; P<0.001); furthermore, this latter AGT provides a higher percentage of separable fat if compared to Calabrese (29.9% *vs* 25.6%; P<0.05); hence the higher incidence of ham above evidenced might be due to a higher fat proportion.

(iv) In comparison with castrated males, females provide a carcass with a higher percentage of neck, belly and ham cuts (P<0.001), but with a tendency to give a higher separable fat percentage (P<0.10), in accordance to previous studies by Santoro *et al.* (1981) and Grandi (1992); Geri *et al.* (1982) evidenced there are no differences for growth rate between males and females until 140 kg of life weight; the growth rate becoming different from 140 to 160 kg.

(v) Interactions between genetic type and sex were observed for the separable lean percentage, which is higher in females than in castrated males in Siciliano (P<0.001), *vice versa* in Cinta senese (P<0.05).

Table 1. Estimated mean value (m) and variation coefficient (cv.,%) of some data at slaughter, at dissection of carcass and at tissue separation and significant[†] comparisons between genetic types and sexes

Parameters	Genetic type						Sex			
	Calabrese		Cinta senese		Siciliano		Castrated male		Whole female	
	m	cv. (%)	m	cv. (%)	m	cv. (%)	m	cv. (%)	m	cv. (%)
At slaughter										
Live weight (kg)	175.5^{a}	5	173.1^{ab}	10	166.1^{b}	6	171.3	8	171.8	5
Net live weight (kg)	170.1^{a}	5	169.2^{ab}	10	163.1^{b}	6	167.2	8	167.7	5
Hot carcass (kg)	143.8^{a}	8	140.5^{ab}	11	136.5^{b}	6	139.8	8	140.8	7
Cold carcass (kg)	138.8^{a}	8	137.1^{ab}	11	131.4^{b}	6	135.6	8	135.9	7
Cold net dressing (%)	81.5	4	81.0	2	80.6	3	81.1	3	81.0	4
At dissection										
Ham (%)	26.9^{a}	5	27.8^{b}	4	27.0^{ab}	4	26.4^{A}	4	28.0^{B}	4
Shoulder (%)	11.9	8	11.9	7	12.2	6	12.1	7	11.9	8
Neck prime ribs (%)	9.2	7	9.4	6	9.6	6	9.2^{a}	7	9.6^{b}	4
Loin prime ribs (%)	22.1	10	21.4	11	22.1	4	22.2	8	21.5	7
Total meat cut (%)	78.0^{a}	2	79.2^{ab}	2	79.0^{b}	2	78.0^{A}	1	79.4^{B}	2
Jowl (%)	2.3^{a}	19	2.8^{b}	22	2.7^{b}	16	2.5	19	2.7	18
Belly (%)	5.1^{a}	13	5.2^{a}	15	4.8^{b}	10	4.6^{A}	10	5.5^{B}	11
Throat (%)	2.7^{a}	19	2.2^{b}	20	2.5^{ab}	15	2.5	16	2.4	20
Kidney fat (%)	4.9^{Aa}	16	3.5^{bB}	35	4.2^{c}	31	5.1^{A}	14	3.3^{B}	31
Total fat cut (%)	15.0^{a}	6	13.7^{b}	6	14.2^{b}	10	14.6	7	14.0	10
At tissue separation[††]										
Total meat (%)	27.9^{A}	11	23.5^{B}	15	27.5^{A}	10	26.9	9	25.7	14
Total fat (%)	25.6^{a}	15	29.9^{b}	27	26.8^{ab}	13	26.2	15	28.7	18
Total skin (%)	6.4	17	7.0	26	6.9	8	6.7	18	6.8	11
Total bone (%)	6.9	10	7.0	25	6.7	7	7.0	15	6.8	8

[†]Different letters within genetic type and sex indicate significant level of $P<0.05$ if small and $P<0.01$ if capital

[††]Excluding ham for seasoning

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