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Effects of different nutritional levels on Nero Siciliano pig performance

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RIASSUNTO – Influenza del livello nutritivo della dieta sulle performance del suino Nero Siciliano. In due recinti collettivi da 1400 m² ciascuno sono stati allevati in *plein air* 20 suini Neri Siciliani, suddivisi in due gruppi di 10 soggetti ciascuno, omogenei per sesso (6 maschi castrati e 4 femmine), età (8 mesi) e peso vivo (42±2 kg). Un gruppo riceveva mangime *ad libitum* (*Libitum*), l'altro razionato in base al 3% del peso vivo (*Restricted*). Dopo 95 giorni di allevamento gli animali sono stati macellati. Il peso vivo alla macellazione (93,26 vs. 82,97 kg; $P<0,01$) come gli IPMG (539,6 vs. 430,6 g/d; $P<0,05$) sono risultati più elevati nel gruppo "*Libitum*", ma ciò ha comportato un peggioramento degli ICA (5,4 vs. 3,9; $P<0,001$). Il gruppo "*Restricted*" ha fornito una percentuale maggiore di carne magra (42,25 vs. 39,66%; $P<0,05$), di tagli carnosì (52,21 vs. 46,55%; $P<0,001$) e minore di quelli adiposi (37,42 vs. 42,38%; $P<0,001$).

Key words: Nero Siciliano pig, nutritional level, performance.

INTRODUCTION – It is well-known that the productive performance and the carcass and meat characteristics are influenced by genetic factors so as by different environmental conditionings. Among these, the feeding should be considered particularly for the quantitative (nutritional level) and qualitative aspects (different components of the ration) so as for the modality of administration, because of the important correlation between genotype and nutritive requirements. The correct growth of the animal and its productive performance are also influenced by the energetic level of the diet in relation to the genetic aptitude. For this reason, the feeding surplus could be transformed into high production costs, metabolic diseases, and lowering of the quality of the meat (Ferrarini *et al.*, 1992).

The aim of this study was to evaluate the influence of the nutritional level of the diet on the productive performance of the Nero Siciliano pig.

MATERIAL AND METHODS – The study was carried out on 20 "Nero Siciliano" pigs, 12 castrated males and 8 females, divided into two homogeneous groups for number (10 subjects), sex (6 males and 4 females), age (8 months) and live weight (42±2 kg), denominated "Restricted" and "Libitum", selected in a larger group of the animals living in extensive condition in the Nebrodi mountain areas (Messina – Sicily). All the experimental subjects were reared, in the same woody Nebrodi areas, in *plein air* system, and housed in two collective loose pens of 1400m² each with wooden shelters, mangers, drinking troughs. The animals of the "Restricted" group were fed with pelleted complete feed rationed on the basis of 3% of the live weight, those of the "Libitum" group received pelleted complete feed *ad libitum*. The composition and the chemical characteristics of the pelleted complete feed (A.O.A.C., 2000) are reported in Table 1. The trial lasted 80 days, preceded by 15-day adaptation period to the new breeding system. The animals, clinically healthy, were subjected to anti-parasite treatment and controlled periodically. At the beginning of the trial, all the subjects were identified through the

application of individual microchips (Portorider[®]) subcutaneously at the base of the ear. Monthly, the individual weight of the pigs (electronic scale - Laumas Elettronica[®]) were recorded, the average daily weight gain calculated (ADG) and the thickness of the back-fat determined, in correspondence with the last rib at 6 cm from the median line of the back, using ultrasound instrument (Pie-Medical Scanner – 100), equipped with a linear probe of 6/8 MHZ. The average feed intake of the “Libitum” group was determined monthly in order to calculate the feed conversion index (FCI). Pigs were slaughtered after a 18 hours fast (A.S.P.A., 1991). Yield and lean percentages of the carcasses were determined, the latter by Fat-o-Meter (FOM); the thickness of the back-fat at the first (1T), at the last (UT) thoracic vertebra and at the top of the medium gluteus muscle (GM) was measured using a calibre. After 24 hours of refrigeration at 4°C, the right half carcass of each animal for group was dissected (A.S.P.A., 1991) into the lean cuts (loin, ham, shoulder and neck), fat cuts (belly, backfat, jowl and flare fat) and bone cuts (head, feet and tail).

Data were subjected to the statistical analysis of variance (proc. GLM, SAS 2001) considering two variables: nutritional level and sex.

Table 1. Ingredients and chemical composition of the pelleted complete feed.

Components	%	Chemical composition	%
Corn	44	Dry matter (%)	92.5
Barley	19		
Soybean meal (44% CP)	13	As DM (%)	
Broadbean	10	Crude Protein	17.2
Wheat shorts	10	Ether Extract	2.36
Calcium carbonate	1	Crude Fibre	3.99
Dicalcium phosphate	1	Ash	5.78
Sugar cane molasses	1	Digestible Energy (kcal/kg)	3501
Vitamins and minerals	0.5		
Sodium bicarbonate	0.5		

RESULTS AND CONCLUSIONS – The performance *in vitam* were significantly influenced by the nutritional level, while no significant difference was observed for the sex variable, in accordance with Della Casa *et al.* (1991). The final live weight, the ADG and the back-fat were significantly higher in the “Libitum” group, but this has determined an increase of the FCI (Table 2). This increase is due to the higher energetic availability of the subjects of the “Libitum” group, in accordance with the results obtained by Della Casa *et al.* (1991) and by Ferrarini *et al.* (1992).

Table 2. In vivo traits (mean±SD).

	Restricted	Libitum	P
Final live weight (kg)	82.97±5.65	93.26±9.18	0.005
Average Daily Gain (g/d)	430.6±0.06	539.6±0.09	0.05
Feed intake (kg/d)	1.72±0.54	2.93±0.79	<0.0001
Feed Conversion Index (kg/kg)	3.9±0.16	5.4±0.62	0.002
Final backfat (mm)	3.15±0.78	3.93±1.20	0.02

The slaughter characteristics were also influenced by the nutritional level (Table 3). The “Libitum” group showed, as expected, the best yields and the highest back-fat thickness (Table 3), while the percentage of lean meat (FOM), were higher in the subjects of the “Restricted” group (Table 3). The half carcass composition showed a greater incidence of the lean cuts in the subjects of the “Restricted” group and a greater incidence of

the fat cuts in those of the “Libitum” group; no significant difference was observed for the bone cuts between the groups (Table 4). These results are in accordance with those obtained by Leymaster and Mersmann (1991), Fabbri *et al.* (1991) and Ramaekers *et al.* (1996) on pigs of cosmopolitan races fed with different nutritional levels and by Freitas *et al.* (1996) on “Alentejano” pigs.

Table 3. Slaughter traits (mean±SD).

	Restricted	Libitum	P
Carcass weight (kg)	63.83±6.03	74.05±10.08	0.009
Yield (%)	76.84±3.50	79.14±3.08	0.07
Fat-o-Meter (%)	42.25±3.03	39.66±2.69	0.03
Backfat 1T (mm)	49.66±6.38	59.01±9.01	0.01
Backfat UT (mm)	32.22±5.14	39.11±7.83	0.02
Backfat GM (mm)	35.33±6.72	48.88±11.63	0.004

Table 4. Half carcass percentage composition (mean ± SD).

	Restricted	Libitum	P
Half carcass weight (kg)	31.14±2.9	36.15±5.1	0.009
Lean cuts (%)	52.21±2.2	46.55±4.86	0.002
Fat cuts (%)	37.42±1.3	42.38±2.9	0.0001
Bone cuts (%)	9.86±0.8	9.56±0.8	0.23

Therefore, in the productive reality of the “Nero Siciliano” pig, the administration of feeds in rationed quantity is the best one; however the level of the restricted feeding in order to obtain a product of high quality without penalising the profit of the farm, is to be defined.

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REFERENCES – **A.O.A.C.**, 2000. Official Methods of Analysis. 17th ed. Gaithersburg, Maryland, USA. **A.S.P.A.**, 1991. Metodologie relative alla macellazione degli animali di interesse zootecnico e alla valutazione e dissezione della loro carcassa. ISMEA, Agricoltura Ricerca, Roma, Italy. **Della Casa, G.**, Rosi, M.A., Bergonzini, E., Fabbri, R., 1991. Effetto di diversi livelli nutritivi e modalità di somministrazione sulle prestazioni produttive di suini all’ingrasso. I – rilievi in vita ed alla macellazione. Proc. 9th A.S.P.A. Congr., Roma, Italy, 811-822. **Fabbri, R.**, Bergonzini, E., Rosi, M.A., Gigli, S., Della Casa, G., 1991. Effetto di diversi livelli nutritivi e modalità di somministrazione sulle prestazioni produttive di suini all’ingrasso. II – spolpo delle mezzene e stagionatura dei prosciutti. Proc. 9th A.S.P.A. Congr., Roma, Italy, 797-810. **Ferrarini, F.**, Morlacchini, M., Varini, G., Grandini, A., Piva, G., 1992. Razioni a diverso livello nutritivo nella produzione del suino tipico italiano. Riv. Suinicoltura 11:61-64. **Freitas, A.B.**, Almeida, J.A., Nunes, J.L.T., Neves, J.A.F., 1996. Effet de la restriction alimentaire pendant la croissance sur l’engraissement du porc Alentejano. 2 – Carcasse et composition chimique corporelle. Proc. 3 Simposio Internazionale sul Suino Mediterraneo, Benevento, Italy, 85-88. **Leymaster, K.A.**, Mersmann, H.J., 1991. Effect of limited intake on growth of subcutaneous adipose tissue layers and on carcass composition in swine. J. Anim. Sci. 69:2837-2843. **Ramaekers, P.J.L.**, Swinkels, J.W.G.M., Huiskes, J.H., Verstegen, M.W.A., Den Hartog, L.A., Van der Peet-Schwering, C.M.C., 1996. Performance and carcass traits of individual pigs housed in groups as affected by ad libitum and restricted feeding. Liv. Prod. Sci. 47:43-50. **SAS**, 2001. User guide Version 8.2 Statistical Analysis System Inst., Cary, NC, USA.