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# Effects of pasture on carcass composition in Cinta Senese pig

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**ABSTRACT:** The trial was performed to investigate on the effects of different periods of grass pasture in fattening Cinta Senese pigs; growth performances, carcass characteristics and meat quality were studied. Control group was reared in paddock and fed concentrate, while experimental group grazed on grass pasture with an integration of 1.4 kg/pig/d of concentrate. Initial live weight was not different between the two groups and individual weights were periodically recorded. Animals were slaughtered from 36 to 160 days from the trial beginning. Carcass weight, body measures, backfat thickness, pH<sub>45</sub> and pH<sub>24</sub> were recorded. After 24 hours of refrigeration, each carcass was dissected into lean, fat and bone cuts. Results didn't show differences between the two groups, revealing that Cinta Senese pigs can profitably utilize pasture on grass even in fattening period.

**Key words:** Pig, Cinta Senese, Grass pasture, Carcass traits.

**INTRODUCTION** – Pig is a social animal and it usually explores large areas in search of feed (fruits, roots, coos and little invertebrates). Outdoor pig production permits animals' better life conditions by an increase in environmental diversity and behavioural freedom (Edwards, 2005). Besides, growth rates obtained in an outdoor system seems to be comparable to growth rates of indoor production (Strudsholm and Hermansen, 2005). Cinta Senese is an Italian local breed reared extensively; in recent years it has been recovered by numeric loss thanks to proper safeguard and developments programs. Cinta Senese peculiarities considerably encourage farmers to utilize pasture also in adverse climate; that could be extremely appreciate by consumers guaranteeing a tight bond with land and traditions. Muscle and fat contents are critical attributes of the quality of pig carcasses and cuts (Monziols *et al.*, 2006) especially in rustic pig. This research tried to investigate the effect of different periods of grass intake on growth performances and carcass characteristics in Cinta Senese pigs trough subsequent slaughtering during the trial.

**MATERIAL AND METHODS** – The study was carried out in an organic Cinta Senese pig farm near Pisa. Fattening happened in large areas where rest and feeding spaces were provided. 16 animals were divided in two groups (each with 3 castrates and 5 females) homogeneous for body weight: "concentrate group" - "C" - fed concentrate usually utilised in the farm (2.6 kg/pig/d) and "pasture group" - "P" - fed on grass pasture (6.2-7.3 q of live weight/ha respectively at the beginning and at the end of the trial) with an integration based on the same concentrate (1.4 kg/pig/d). Concentrate consisted in barley (40%), corn (20%), *Vicia faba minor* (15%), wheat bran (15%) and wheat bran shorts (10%). Pasture sampling (Numata, 1982) resulted in lucerne, oat, lolium and clover (Table 1).

Table1. Chemical composition of feeds (on as fed basis).

	Moisture	Crude protein	Ether extract	Crude fibre	N-free extract	Ash
Concentrate	11.5	12.7	2.7	4.5	64.7	3.9
Pasture	77.0	3.5	0.7	4.4	11.8	2.6

Body weight was periodically recorded and slaughter occurred between 36 and 160 days from the beginning of the trial: this wide range was planned to test the effect of the duration of grass pasture on meat and carcass quality. Each slaughtering regards the same number of animals belonging to the two diets. At slaughter, live and carcass weights were recorded. Carcass length and chest depth were measured. Backfat thickness at the first (FT) and last (LT) thoracic vertebra and at *Gluteus medius* muscle (GM) was measured using a gauge (ASPA, 1991). pH<sub>45</sub> and pH<sub>24</sub> were measured on *Longissimus dorsi* muscle at the 5<sup>th</sup> thoracic vertebra by a puncture pHmeter. After 24 hours of refrigeration each carcass was dissected (ASPA, 1991): weight of individual lean cuts (shoulder with foot, loin, ham with foot and lean residuals), fat cuts (belly, backfat, kidney fat) and head with jowl was recorded. Data were analysed by ANCOVA. Model concerning evolution of live weight on days of the trial included fixed effects as sex, diet and animal within diet\*sex. Average daily gains were calculated as the first derivative of the live weights - trial days function. Carcass traits data were analysed included diet, sex and trial days\*diet, by estimating the LS-means in three different steps during the trial (50, 100, 150 days).

**RESULTS AND CONCLUSIONS** – Initial live weights of animals of the two groups were similar (107.07±3.19 kg and 106.07±3.19 kg for “C” and “P” group, respectively). Live weight and average daily gain (Figures 1 and 2) showed no significant differences in the two groups during the whole trial, underlining satisfactory daily gain also in the group fed on grass pasture.

Figure 1. Trend of live weight during the trial.

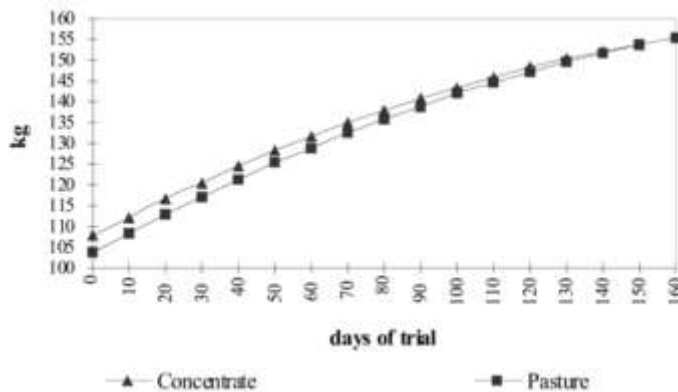
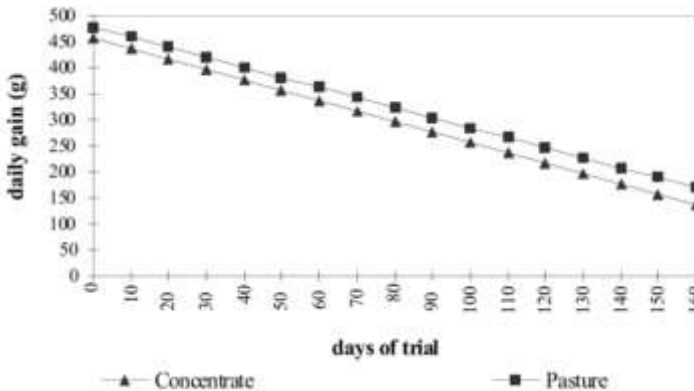


Figure 2. Average daily gain in the two groups.



Acceptable daily gain (Figure 2) were always recorded during the trial (323.4±23.63 g vs. 296.8±24.67 g respectively for “P” and “C”), pointing out the relevant role of grass in the fattening process and highlighting the good growing performances reached in this management condition, similar to those reported by Franci *et al.*, 2003 on pig reared in woodland.

Table 2. Evolution of carcass traits in the two groups at different periods (means estimated at 50, 100, 150 days of trial).

	50 d		100 d		150 d		Signif. of regression <i>p</i>	RSD
	C	P	C	P	C	P		
Final live weight (kg)	129.3	135.9	142.8	142.7	156.2	149.6	0.021	12.69
Carcass (kg)	111.1	116.3	123.4	120.6	135.7	125.0	0.012	9.85
Yield (%)	86.0	85.8	86.5	84.7	87.0	83.6	0.584	3.24
Head (%)	9.6	11.2	9.6	10.6	9.6	10.0	0.382	1.17
Lean cuts (%)	66.0	67.5	65.7	67.2	65.5	66.9	0.934	3.02
Fat cuts (%)	24.4	21.3	24.6	22.2	24.8	23.1	0.793	3.87
Backfat (%)	10.1	8.4	10.1	9.2	10.0	10.1	0.714	2.86
Ham (%)	28.2	26.9	28.2	27.5	28.2	28.0	0.271	0.94
Loin (%)	19.6	19.0	19.1	18.4	18.6	17.8	0.473	1.78
pH45	6.3	6.4	6.4	6.3	6.6	6.3	0.504	0.29
pH24	5.4	5.5	5.5	5.5	5.5	5.5	0.092	0.07
Backfat FT (cm)	5.7	4.4	5.2	5.0	4.8	5.6	0.179	1.09
Backfat LT (cm)	4.6	4.2	4.9	4.5	5.3	5.0	0.510	1.10
Backfat GM (cm)	4.5	4.4	4.4	4.4	4.2	4.4	0.898	0.90
Carcass length (cm)	98.2	101.0	104.0	101.3	109.8	101.6	0.147	7.52
Chest depth (cm)	40.4	43.4	41.8	43.0	43.3	42.7	0.275	2.42

Diet did not affect any carcass traits (Table 2) showing similar values in the three periods. The evolution of carcass traits over the trial never attained significance. The only statistical significance of the regression coefficients concerned live weight and carcass weight, as expected.

Sex significantly affected only pH<sub>24</sub> and ham percentage (5.37 and 5.50; 28.3% and 26.9%; respectively for female and male).

In conclusion, results suggested that Cinta Senese pigs can profitably utilize pasture even in fattening period, showing productive performances comparable with animals fed diet based exclusively on concentrate.

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