A New Idea on How to Take Swine to Feed on Crop Residues in the Field

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Abstract

Inspired by the commercial success of the extensive farming of black pigs (cerdo iberico) in Spain, there is a revived interest in Italy for the old black pig breeds which were once common. In the year 2000 a community of towns on the hills of the province of Foggia (North Apulia) started a project with the purpose of recovering the local black breed (Suino Pugliese) and encourage farmers to raise it in the traditional way. Twelve farms collaborated with the project. The quality of the meat proved to be outstanding, but the extensive form of husbandry initially programmed was never realised because all the pigs were in fact raised in enclosures and fed artificially. This article suggests how to complete this last step by using motorised transport for taking the pigs out to feed on the crop residues in the fields.

Keywords

Pigs, Suino pugliese, Foggia province, Crop residues, On-site feeding, Motorised transport

1. The province of Foggia

The project was targeted for the territorial features of the province of Foggia. This province is the third largest in Italy with an area of ca. 7000 km^2. To the North and to the East, it borders on the Adriatic Sea. Its territory is divided geographically in three distinct parts. Along the western border there is a chain of partially wooded hills barely exceeding 1000 m a.s.l., the Monti Dauni, which cover an area of about 1000 km^2. The towns of the project are located in the southern part of these hills, with Bovino as their centre. The highly forested Gargano mountain, the 'spur' of Italy, forms the eastern portion of the province. It extends to ca. 2000 km^2, with its highest point scarcely exceeding 1000 m a.s.l. Separating the Monti Dauni from the Gargano lies the Tavoliere, a great plain of ca 4000 km^2 where a highly developed and diversified agriculture is conducted. It is relevant to the topic of this work to note that, up to the 1950s, the low-lying tracts of coastline of this province held 300 km^2 of marshland.

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2. The old swine economy

It was the custom for every household in the old days, a custom which still endures here and there, to raise and fatten two pigs: one for home consumption and one to be sold to repay for the expenses incurred in raising them. A pair was also recommended for the company they kept each other, because a solitary hog pines and does not develop properly. This domestic production cycle began by the purchase at a local fair of young pigs weighing 12-35 kg. Having been castrated or spayed, as the case would be, all the family pigs of the town were then collectively entrusted to a swineherd for taking them out to forage off the land during daytime. On returning to the village in the evening, each pig would trot back to its own home for the night, where a supplementary meal was waiting for it. At about 80-90 kg the pig was consigned to a sty for the last fattening stage and, on reaching 130-150 kg, was slaughtered. This operation took place during the cold months, in order that the content of fat would stay firm.

The offer of piglets for sale depended on a category of men who kept the breeding stock and raised swine on a big scale. The sounders kept by these men were fed by taking them to forage on what the countryside had to offer. The geographical situation of the towns within the province dedicated to such activity, such as S. Paolo Civitate, S. Nicandro, Apricena, Serracapriola, and others, made for convenient transhumance on foot between woodland and marsh. In winter the sounders frequented the woods of *the Daunian hills and the Gargano, when oaks (Quercus pubescens, Q. cerris, Q. ilex),* beech *(Fagus sylvatica*) and sweet chestnut (*Castanea sativa*) shed their fruit. However, mast is to be had only in winter, so that in other seasons food had to be sought elsewhere. During spring the sounders were taken to graze in the fields left fallow. After harvest they were allowed to glean the wheat grains left on the ground, in this way also doing the farmers a favour by grubbing out such vermin as voles and furthermore leaving beneficial dung behind. With the advance of summer, it was the time to go down to the marshes.

This environment provided a whole range of spontaneous animal and vegetal items to their diet. To avoid the heat of the season, the swineherds would lead the sounders out at night, while the daytime was spent resting in the cool mud of some shady hollow. When a sow was due to give birth, she would go off by herself into the brush. It was the job of the swineherd's dog to find where she was hiding her litter, whereupon the swineherd would go and retrieve the piglets while his dog kept the jealous sow at bay. The piglets were then taken to the farm and kept secluded in a pen with their mother, till they were weaned at about four months.

3. A recent initiative

In the year 2000 a community of hill towns in the province of Foggia (*Comunità Montana dei Monti Dauni Meridionali*) decided to revive the farming of the local breed of swine which had once been so common and had apparently become extinct in the last decades. The scope of the project was to create a type of husbandry entirely based on local resources combined with a high-quality end product.

The first step in the project was to find out whether the local breed of swine (Suino Pugliese) still existed. Therefore, texts on animal husbandry were consulted in order to get an idea what to look for. F. Alberti (1893), the earliest author found on the subject, gives the following description (my translation) of the Apulian hog:

> The breed is very common in South Italy being a type of swine that is raised extensively. It is rather small, has a large head and compressed sides. It is covered with stiff bristles like on a brush. The colour is nearly always black, but sometimes shows white markings. Only rarely it is all-white. It gives the general impression of being rather feral, much like a wild boar. Final live weight reaches only about 70 kg, since no supplementary feed for fattening is provided, and the energy taken in with the acorns and chestnuts is consumed in foraging for them. This pig is also very common in the regions of Basilicata and Calabria and, though local owners may claim their own special variety, they all belong to the same breed.

A later description by C. Manetti (1924) contradicts the former author by presenting a white pig instead of a black one:

> The swine industry flourishes in all the region [of Apulia] especially at the household level because every family in the countryside grows their own hog. All these pigs have a long snout and belong to the Iberian or Roman or Mediterranean type. Ten thousand head are raised in the oak forests and rich pasturage of the Gargano promontory. They are rosy white with sparse bristles; the head is fine and slightly tapering; the legs are short; the flesh is tasty and pink with a good disposition for acquiring fat. The final live weight reaches 200 kg. Towards October they are taken to the woods of Umbra, Ginestra, Quarto, Vieste, S. Tecla and Campi. If, by November, the pannage becomes scarce, they are returned to their sty. In summer they are taken to the stubble of broad beans, barley and wheat; from spring to June they are fed on slops of broad beans, barley, etc.

E. Mascheroni, a slightly later authority (1927), describes both black and white pigs:

> The pigs of Apulia are remarkable for their stature, robustness, frugality and hardiness. Their hide is covered by thick black bristles showing at times reddish tips, particularly along the back and neck where they form a long upright crest. In some cases, they have white markings and may also entirely be of a dirty white colour, in which case they present a black patch on their rump. These pigs have a long angular body with a long small cone-shaped head with a slightly concave profile.
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> The ears are long and thin, and either hang down or are upright with bent tips; the legs are long; the broad back may be either humped or swaybacked; the chest is tight and shallow; the belly hangs and has flat sides; the hams are not very developed; the tail is corkscrewed. They live by grazing and rooting on the land and, like the swine of Basilicata and Calabria, are taken to glean the fields after harvest. Sows give birth twice a year with litters of five or six, rarely eight piglets. To fatten them for the slaughter, they are taken to the woods for the acorns; if these are not available, they are given broad beans or maize. They fatten readily and the meat is red, firm, and has an excellent taste. When ready after one year, they rarely exceed 100 kg. The Gargano district claims to have its own variety of Apulian pig, distinguished by extreme hardiness acquired from living at 900 m a.s.l. and the special flavour of its meats, deriving from feeding on beech-mast.

It seems from the foregoing texts that we are dealing with local pigs that could be either black or white. These two versions are summarised by Tortorelli (1983), the most recent author consulted who lists the swine breeds of Italy. The Apulian pig 'does not show definite features, being either white with a black patch on the rump, as in the swine of the Gargano and the Daunian hills, or black, as to be found on the Murge upland of middle Apulia. They are all range animals of small size and late developers, but provide excellent lean meat for sausages and salami.'

Keeping in mind the somewhat controversial guidelines offered by these authors, a search began among the farmers and livestock dealers of the province of Foggia. The Daunian hills, home of the project, held no animals that corresponded to what was wanted. All the pigs encountered were derived from Large White and Landrace. The large plain of the province was hardly investigated because, by all accounts, it held little promise. The search in the Gargano, on the other hand, brought success. Pig husbandry here was still conducted as described by the authors cited above, the countrymen leaving their swine free to forage for themselves in the extensive forests of the promontory. Interestingly enough, both the white and the black types described were found, so that the question lay on which type should the project concentrate. The choice eventually fell on the black variety, because this colour is a sure sign that it belongs to the southern or Mediterranean type (Sanson, 1880). Although the white pigs with a black patch are also considered by the quoted authors to be a native variety, yet there is always the suspicion that their white colour might betray the influence of the northern or Celtic type. The Large White or Yorkshire breed was introduced to Italy in the late 19th century and has had all the time to spread its influence. But then, of course, even the black pigs of the Gargano might supposedly carry the influence of black foreign breeds like the Large Black, Berkshire, and others. This possibility, however, did not necessarily invalidate the idea that the local black pigs we had discovered were indigenous, because all the black British pigs just mentioned are derived, at least in part, from south Italian pigs, so that, even in a hypothetical case of hybridisation, it would be simply a matter of a return of native genes.

Eventually a few individuals were obtained from the Gargano forest. They showed signs of some hybridisation, but in a few generations of selection the original type re-emerged, being all-black, bristly, with a long snout and ears held horizontally forward (see table 1, fig. 1). When the project was in full swing, there were 100 head of breeding swine shared among twelve farms (see table 2).

Table 1. The main characteristics of the Apulian pig as bred in the project.

coat	black
skin pigment	black
bristles (density)	abundant
bristles (colour)	black
head (profile)	straight
ears (carriage)	horizontally forward
ears (size)	medium

wattles	absent
limbs	long
limbs (appearance)	muscular
toes	black
trunk	well-proportioned
teats	6 right, 6 left
sexual organs	vulva inconspicous; testicles prominent
tail	hanging straight
tail (attachment)	normal
body	well-proportioned
back	straight
belly	straight
live weight	200 - 250 kg at complete growth

Fig. 1. An Apulian sow from the project with her litter.

Table 2. The number of Apulian pigs present in the project during 2004.

Farms	♂♂	♀♀
A. Ciurlia, Posta Nuova, Troia.	-	2
Salecchia, Bovino.	3	10
Coop. Pegaso, Deliceto.	1	4
Posta Torrebianca, Troia.	1	3
P. Cocciardi, Panni.	3	2
C. Moreno, Faeto.	3	20
F. Lalla, Monteleone.	2	5
R. Zenga, S. Agata di Puglia.	1	6
Coop. On Line, Deliceto.	2	8
F. Cammisa, Bovino.	1	2
Black Pig Farm, S. Marco La Catola.	4	50
C. Schiavone, Accadia.	1	2

However, the other aspect of the project, which was to raise the animals by taking them out to feed in the fields and woods, never took place. Nourishment was originally planned in two phases.

1. Structural growth.
   From weanling to about 80 kg, the hog was to be taken to forage on anything available in the land. The province of Foggia has 400,000 ha under cultivation with wheat, tomatoes, fennel, cabbages, spinach, beet, melons, etc., all providing great quantities of crop residues throughout the year. An 80 kg pig needs 1.5 fodder units per day, and, considering, for instance, that a harvest of 400 q/ha of cabbages leaves roughly 40 q/ha of residues on the ground (Fig. 2), one hectare could furnish the daily ration for at least 300 hogs. For the FU value of other crop residues see Table 3. The physical exercise involved in walking, grazing and rooting across the fields would serve to develop the muscular system, i.e. the lean meat. In this phase of growth, proteins are important, and grass, pulse and whey should find their way into the diet.

Fig. 2. Residues left on a field of cabbages.

Table 3. Crop residues in the province of Foggia in 2004. The value of the residues in Fodder Units estimated following Borgioli (1978).

Crop residue	Value in FU/q	Residues q/ha	FU/ha	hectares cultivated	Total FU available from crop residues in the province of Foggia (2004)	Residues available in the year
Beet	12	18	216	15,000	3,240,000	June-July
Tomato	18	10	180	26,000	4,680,000	Aug – Oct
Cabbage	12.4	40	496	750	372,000	Dec – Mar
Broccoletti	11.4	20	228	4,500	1,026,000	Dec – Feb
Melons	10.5	10	105	700	73,500	Aug – Sept
Fennel	14	4	56	2,500	140,000	Dec– Apr
Wheat	105	2	210	280,000	5,880,000	June - Sept

2. Fattening.
In order to obtain meat with a superior flavour, the fattening stage from 80-90 kg to the final 130-150 kg requires special attention to the type of feed. A diet of acorns is the ideal with its essential content of linoleic, oleic and palmitic acids, and also for its high content in carbohydrates convertible to fat. To attain this end, the plan was to send the hogs to forage from November to March in the mast-bearing woods of the Daunian hills or of the Gargano, or else fed previously-gathered acorns to animals kept in dry-lot. These old-time grazing swine have the ability of separating the outer husk of the acorn from the inner fruit, ability lacking in more modified breeds. The absence of proteins in the acorn is no liability, since the animals at this stage have completed their structural development. It must be taken into account that mast-bearing trees produce abundant fruit only every two of three years. The best woods are found at 2-300 m a.s.l. with a good exposition to the sun. Mast production (Laguna Sanz, 1998) ranges from 191 to 936 kg/ha/y, the yield differing from tree to tree. An 80 kg hog with a daily ration of 8 kg of acorns will attain 150 kg live weight in the course of 90 days.

Instead of following the latter method of husbandry, what the private operators in the project did was to keep the hogs in dry-lots and feed them artificially, mainly with maize. This may have partially satisfied phase 1 because the enclosures were large enough to let the animals have ample physical exercise and live amongst their kin, which is no negligible aspect since isolation depresses the pigs' reproductive instinct. But phase 2, which involved fattening them on acorns, was not achieved. The explanation lies in the fact that no one at the farms possessed the art of the swineherd, i.e. the ability of driving the swine on foot to the mast-bearing woods. An alternative solution could have been to deliver the acorns to the hogs in the dry-lots, but no commercial supply of this item was available.

4. A possible solution

What is proposed here to those farmers incapable of herding swine in the old way, is the use of animal transport trucks for conveying their animals to the feeding grounds, while at the same time using these same trucks as their normal resting place. Pigs are highly social and are quite happy to be packed close together for the night in a truck or for the short time needed for travelling between farm and field. A key factor here is that, contrary to all other domestic herbivores, pigs will not soil their bedding if allowed to relieve themselves in freedom during the day. In this way the trucks would not present the chore of being cleaned of dung.

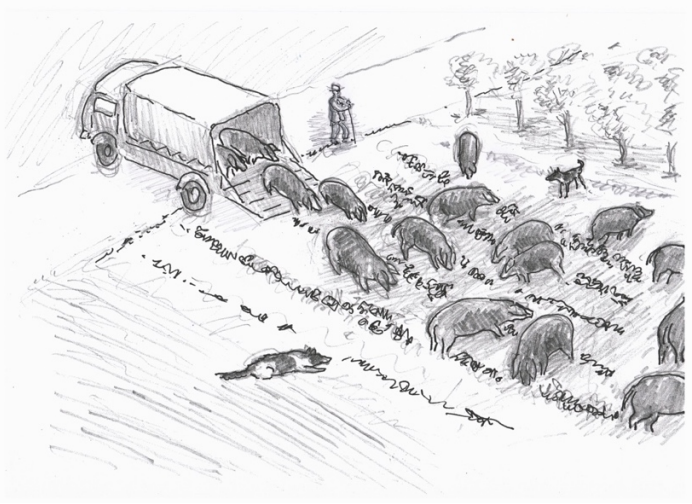

Fig. 3: Swine taken by truck to feed on crop residues.

The hypothetical daily routine in such a set-up may be so described. After having obtained permission from the owner of the fields, the operator drives there with his truckload of hogs and lets them loose on the crop residues. A pair of sheepdogs is indispensable here for keeping the animals within the bounds of the allotted area. When swine are raised in an enclosure, their rooting reduces the ground into a waste of tormented earth, but, when applied to ploughed fields or woods, it is beneficial. The farmer is grateful to the omnivorous pigs for rooting out vermin and for the dung they leave behind. With their overturning the ground in the woods, the pigs hasten the decomposition of the leaf and woody litter thus lessening the risk of fire. When it is time to leave, the hogs climb back willingly into the truck because they have been accustomed to consider it their sty. Back at the farm at the end of the day, they are let down to drink and maybe given some extra feed if necessary. This done, they are loaded on the truck again for the night, and so ready to be ‘driven’ out the next day.

At the end of a production cycle of 13-14 months, a triple decker animal transport truck will hold 92 hogs weighing ca 130-150 kg each. Considering the superior commercial quality of these hogs, the resulting final truckload of 12,000-14,000 kg live-weight should fetch the double of the price of industrial pork.

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