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# The Mallorca Black pig: Production system, conservation and breeding strategies

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**SUMMARY** – From 1997, the "Mallorca Black pig" is recognised as an autochthonous endangered extensive pig breed by the Spanish Ministry of Agriculture, Fisheries and Food. In the present situation, close to 80 extensive farms with more than 1300 reproducers are recovered by the "Mallorca Black Pig Association". These animals are managed in extensive conditions and the feeding regime is based on pasture, cereals, legumes, figs, almonds, acorns and Mediterranean shrubs. A continuous evaluation of new reproducers (electronic identification, DNA traceability, reproductive and productive traits recording and morphological standard appraisal) and across farms genetic exchanges (via auction sales) are basic elements of the conservation and improvement programme set up by IBABSA and IRTA. Apart from the production of piglets for consumption at a low weight ("*porcella*"), growing animals are slaughtered at heavy weight (120-180 kg) and are used to obtain spiced typical sausages ("*sobrasada*"). Production, reproduction and carcass characteristics are under investigation to improve efficiency without a reduction on meat and traditional product quality.

**Key words:** Mallorca Black pig, conservation, improvement, quality.

**RESUME** – "*Le porc Noir de Mallorca : Système de production, stratégies de conservation et d'amélioration*". Depuis 1997, le "*porc Noir de Mallorca*" est reconnu comme une race autochtone extensive menacée par le Ministère Espagnol de l'Agriculture, de la Pêche et de l'Alimentation. A l'heure actuelle, près de 80 fermes en extensif avec plus de 1300 reproducteurs adhèrent à l'Association du Porc Noir de Mallorca. Ces animaux sont exploités dans des conditions extensives et leur régime alimentaire est basé sur le pâturage, et les céréales, légumes, figues, amandes et glands. Une évaluation en continu des nouveaux reproducteurs (identification électronique, traçabilité par ADN, enregistrement des performances reproductives et productives, évaluation morphologique suivant le standard de la race) et les échanges entre fermes (par la voie de la vente aux enchères) sont les éléments de base d'un programme de conservation et d'amélioration établi par IBABSA et IRTA. Mis à part la production de porcelets consommés entiers à un faible poids ("*porcella*"), les animaux sont abattus à des poids élevés (120-180 kg) et utilisés pour la production d'un type spécial de saucisse très épicée ("*sobrasada*"). Les performances de production, reproduction et carcasse sont analysées dans l'objectif d'améliorer l'efficacité sans une diminution de la qualité de la carcasse et des produits traditionnels.

**Mots-clés :** Porc Noir de Mallorca, conservation, amélioration, qualité.

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## History and present situation

Several archaeological sites indicates the presence of pigs in the Balearic Islands before the roman and vandal dominations. It seems probable an Iberian peninsula origin but several other Mediterranean pig breeds introduced by different civilisations contributed to his establishment (Torrens, 1947; Sañudo, 1994). The Arabian domination, the effect of diseases (as African swine fever) and, recently, the introduction of leaner pig breeds and intensive production systems are the major factors of the decline of this autochthonous pig breed. Black skin and fatness are common traits of the Mallorca Black pig with some strains of Iberian pigs distributed along Spanish and Portuguese extensive areas (Payeras, 1988; Payeras and Falconer, 1998). Preliminary studies on the mitochondrial haplotypes of b citochrome reveals a close relationship with other European breeds and far from the Asiatic and Middle East pig breeds.

The Mallorca Black Pig Association was founded and the breed herd book established in 1997. This association receives the technical support of IBABSA, a service of the Balearic Government, to preserve, improve and promote the breed.

At present, 121 boars and 1329 females are recognised as Mallorca Black pig reproducers in the

herd book. The population is fragmented in small herds (79) with an average of 20 reproducers each (Table 1), sex ratio (males/females) in nucleus herds is close to 10% and only a reduced number of farms distributes male reproducers to other herds. Consequently the effective genetic population is lower than real figures.

Table 1. Statistics of Mallorca Black Pig Herd book

Year	Total reproducers	Sows	Boars	Farms
1998	447	409	38	30
2000	730	656	74	50
2002	908	817	91	85
2004	1102	989	113	91
2005	1440	1329	121	79

## Production system

The Mallorca Black pig is managed in extensive conditions (25 pigs/hectare) as a complementary agricultural activity in family farms (Fig. 1). Because of the extensive production system, males and females remains together and matings are difficult to be controlled. In some cases the paternity of young piglets is uncertain and free piglet adoptions is not uncommon between sows (Jaume, 2000).



Fig. 1. Extensive production conditions.

Feeding regime is based on pasture, cereals (barley and rye), legume seeds, figs, almonds, acorns, and several Mediterranean shrubs. Aside of natural feeding resources sows are feed with commercial diets during lactation and pregnancy. Additionally growing pigs to slaughter are supplemented with barley and green peas.

Reproduction figures are similar to other extensive breeds (Dobao *et al.*, 1988). The litters per sows per year is close to 2 and the average number of piglets weaned per sow and year is nearly 12 (Table 2). A large variability is observed in reproductive traits and the management conditions have a large influence in this parameters. Lactation period is usually over 4 weeks and in some cases young piglets (close to 8 kg live weight) are removed and consumed as "*porcelles*".

Table 2. Reproduction traits in Majorcan Black pigs

Piglets/litter	Average	SD
Total born	7.9	2.62
Born alive	7.5	2.45
Alive at 1 week	6.1	2.35
Piglets weaned	6.0	2.35

Traditional growing period is longer than 12 months and the minimum live weight accepted to produce "sobrasada" is 120 kg. Males to be slaughtered are castrated at a young age. Average daily gain, despite of the extensive conditions of production, is close to 600 g/day from 25 to 65 kg live weight (Table 3).

Table 3. Average daily gain (g/day) in different test periods for females and males retained in the Mallorca Black Pig Association (November 2005 Auction Sale)

Sex		Period 1	Period 2
Female	Weights (kg)	14-24	24-59
	ADG (g/d)	392(40) <sup>†</sup>	598(80) <sup>†</sup>
Males	Weights (kg)	17-28	28-64
	ADG (g/d)	417(49) <sup>†</sup>	627(70) <sup>†</sup>

<sup>†</sup>Standard deviations in brackets.

## Morphological traits

Main characteristics of this breed are in accordance with other western Mediterranean pig breeds: black colour (or slate-grey) and high percentage of fat tissue (as most strains of Iberian pigs). The traditional morphological characteristics established in the herd book of the Mallorca Black Pig are: (i) slate-grey skin colour; (ii) concave nose profile; (iii) tassels in the neck base; and (iv) large and pendulous ears.

Size of adult animals is moderate (150 kg) and the average number of functional teats is 10.61. Animals with white spots, leg weakness, non horizontal back profile, less than 10 functional teats or conformed hams are not inscribed in the herd book in order to maintain basic morpho-functional standards (Figs 2 and 3).



Fig. 2. Mallorca Black pig boar.





Fig. 3. Mallorca Black pig female.

### Conservation program and breeding strategies

In the present situation all animals are identified with tattoo and electronic ear tags and an specific information system, including full reproduction data of the nucleus herds, are managed by IBABSA to provide advice to the Mallorca Black Pig Association. Biological samples are obtained from new reproducers, included in the herd book and tested, in order to estimate the genetic variability using DNA analysis. Twelve microsatellites located in 11 different chromosomes, previously described in literature, are currently analyzed to verify the parentage and identification of individual animals in these porcine populations.

Conservation programme is based on a limitation of the number of young females retained per sow and boar and with a continuous exchange of genetic material across herds in order to avoid an increase of inbreeding rates.

In the last year (2005) 439 new sows from 121 different boars and 230 sows contributed to replace the 1329 adult sows in all herds. Replacement rate is 33%. No more than 2 young sows from the same mother are accepted in the herd book per year and an average of 3.6 young sows per boar are used yearly to replace culled ones. In the present situation all boars contributed to the replacement with at least one young sow.

Table 4. Conservation program statistics in 2005 year

New sows culled per boar	Number of boars	Total number of culled new sows	Culling rate
1-2	31	46	10.5
3-5	64	134	30.5
6-10	17	119	27.0
11-23	9	140	32.0
Total	121	439	

### Carcass and meat characteristics

Aside of the consumption of roasted piglets with an average carcass weight of 8 kg "*porcella*" (mainly in winter time), most of the traditional high quality products in the Balearic Islands are based on Mallorca Black pig ("*sobrasada*", "*botifarrons*").

The most important product is "sobrasada" (Fig. 4) a type of highly seasoned sausage with paprika, pepper and salt with a texture similar to "batter". All cuts of the carcasses are used to produce "sobrasada" but flare fat ("saim") could be used in the confectionery of special sweet cakes ("ensaimada").



Fig. 4. "Sobrasada".

Main cuts as loin, tenderloin, shoulder and ham are less than 30% of the hot carcass weight (Fig. 5) and fat represents more than 46% of the carcass carried about with all the main cuts, additional ones (as double chin, abdominal and back, kidneys, liver, lung) and blood are used to produce "sobrasada". Preliminary results of intramuscular fat content in the loin ranges from 5 to 10%, like in Iberian pigs, and a specific use of this cut to produce dry cured loin will be investigated. Several meat characteristics (pH, water holding capacity, color and fatty acids composition) and sensory traits will be analyzed at the IRTA Meat Technology Center.

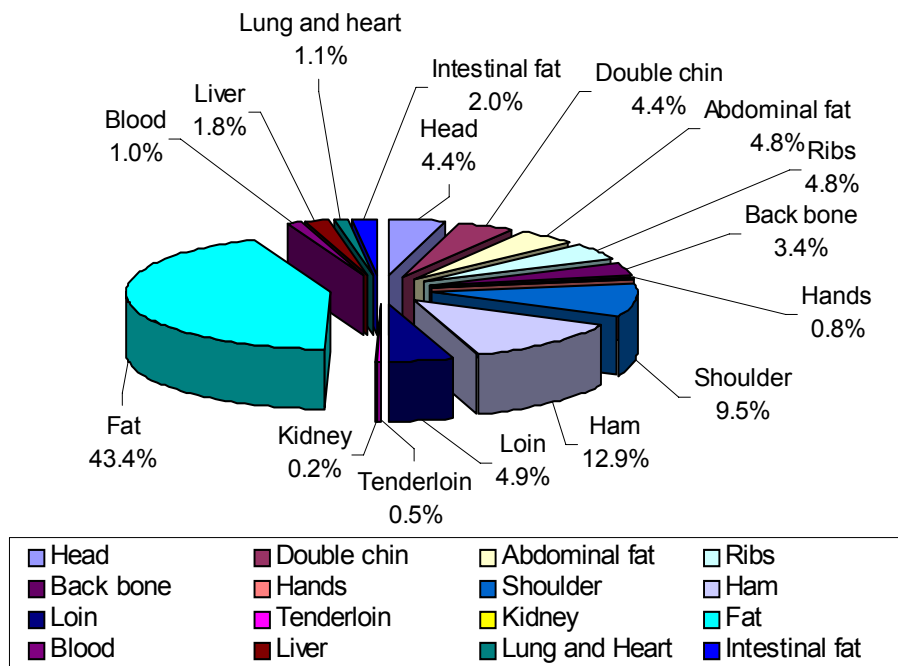


Fig. 5. Distribution of the carcass cuts in Mallorca Black pigs.

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