



Pig genetics for sustainable and quality pork production

APPLICABILITY

Theme/Keywords

Pig production, genetics, autochthonous breeds, commercial breeds, meat quality

Context

Intensive, extensive, and organic pig farming

Geographical coverage

Worldwide

Required time

The immediate replacement of the finishing boar is done through artificial insemination, although the first fattened pigs from the new genetics will not be slaughtered until about 10 months later. The complete replacement of all genetics through gradual replacement of all breeding sows will take 3 to 4 years for all slaughtered pigs to be of the new genetics.

Period of impact

All life cycle

Equipment

Only for artificial insemination: disposable catheters to inseminate, a refrigeration chamber to conserve semen doses, and a microscope to check their viability

Best in

Farms with artificial insemination

Problem

There are many pig breeds and crosses available in the market, but each production system requires its own type of animal, especially if pigs are raised outdoors, grazing natural resources, or using by-products or waste from the human food industry.

Solution

Pig genetics plays a key role in shaping pork production's sustainability and quality, addressing challenges such as disease resistance and environmental impact.

Benefits

Genetic selection aims to improve pork quality and enhance feed efficiency (feed conversion ratio (FCR) and growth rate) and pigs' natural disease resistance, boosting productivity with fewer inputs. This boosts economic profitability and reduces the environmental footprint of pork production.

Practical recommendations

Assess the current genetic traits of the pig herd, including health and disease resistance, feed efficiency (for the farm feed resources), growth and pork quality.

Identify the most important traits for your production goals (clear objectives). Selection criteria vary across different pig production systems.

Select breeding stock: choose breeding animals with superior genetics for the desired traits, based on genetic evaluations and performance records (if possible, within your own herd).

Utilize advanced technologies and collaborate with experts (geneticists and veterinarians) to implement your selective mating and genetic selection.

Prevent inbreeding by periodically introducing new genetic material to maintain genetic diversity and resilience. In small farms with indigenous breeds, collaborate with other farmers to exchange genetic material and use information on related animals by BLUP technology.

- 1st decision:** Identify the most important traits for the pork production goals
- 2nd decision:** to choose pure breed or hybrid pigs

1st step boars' selection and replacement

- ♂ ≥ 10 months for first pork results
- 1st artificial insemination for trials
- 2nd buy selected boars



2nd step sows' progressive replacement

- ♀ ≥ 10 months for first pork results
- 1st buy sows
- 2nd select the best sows as grandmothers to produce mothers



Figure 1: Steps of a genetic selection program

(Source: UCO).

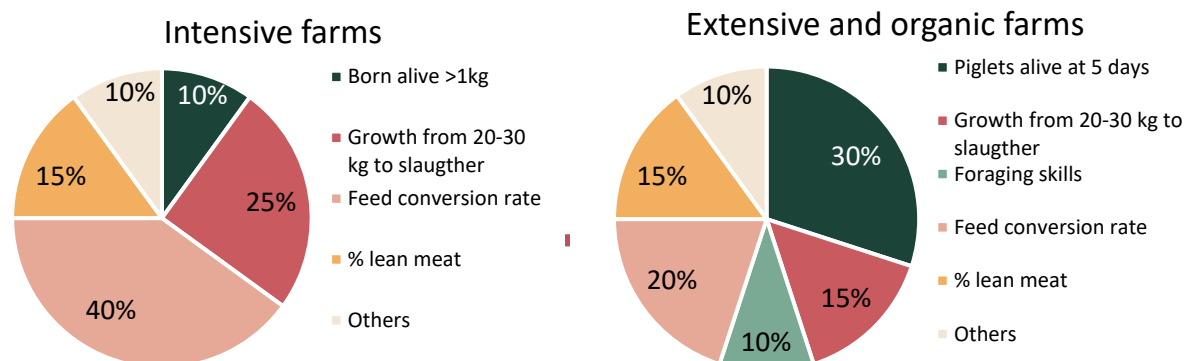


Figure 2: Examples of different focuses of Maternal Line Indexes (M.L.I.) for intensive and extensive pig farms (Source: UCO)

On-farm application

System approach

Consider that while the size of the sow herd is important, it's not the most limiting factor. The most limiting factor is collecting reliable information from the replacement gilt's entry into production to the sensory evaluation of the meat.



Figure 3: In native breeds, it is important to select for grazing skills (pregnant Iberian sows foraging in the *dehesa* agroforestry system) (Source: Vicente Rodríguez-Estévez, UCO)

Evaluation

It is essential to implement continuous progress monitoring to ensure desired traits are being improved and to evaluate economic and environmental impacts. Each farming system should have its own resource efficiency targets.

About this practice abstract and *mEATquality*

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***mEATquality*:** The *mEATquality* project aims to provide consumers with better-quality pork and broiler meat and animals with a high level of welfare by developing scientific knowledge and practical solutions together with farmers and chain partners.

The *mEATquality* project, an H2020 project, is coordinated by Wageningen Research (The Netherlands) and is a multidisciplinary team of 17 partner organisations representing 7 EU countries. The project is running from October 2021 to September 2025

Project website: www.meatquality.eu/

FURTHER INFORMATION

Videos

Check the following video with a general overview for small farms (in English):
<https://www.youtube.com/watch?v=oVLwITCidx0>

Weblinks

Selecting breeding stock
<https://www.thepigsite.com/genetics-and-reproduction/selecting-your-source-of-breeding-stock>

Performance testing to select replacement pig breeding stocks
<https://www.business.qld.gov.au/industries/farms-fishing-forestry/agriculture/animal/industries/pigs/breed/genetics/test>

Pork information gateway:
<https://porkgateway.org/resource/evaluating-genetic-sources/>

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