

Section 3. General aspects of pig welfare

Chapter 10. Selective breeding

From an early age, breeding programmes were directed at improving reproductive performance, reducing aggressiveness and lowering the pig's fearfulness of man. Modern breeding has increased growth rates, food conversion efficiency and increased the leanness of



Large White/ Landrace cross

meat. Unfortunately, selective breeding for these factors has often come at a cost to welfare.

Modern breeds in the west are now largely based on the genetics of two breeds, the Landrace and Large White. Compared with their wild ancestors, these have been selected for the following traits:

1. High reproductive performance. Modern sows produce litters with over 10 piglets which is twice that of wild and feral swine. Unfortunately, this can increase the number of smaller and weaker piglets that find it difficult to survive.
2. Producing large litters can put a strain on the sow to produce enough milk to feed them. With early weaning, this is less of a problem. However, later weaning would be much better for the health and welfare of the piglets and this creates a problem of balance. Late weaning of a large litter could cause the sow to lose condition and this may compromise the productivity of future litters.
3. Faster growth rates and increased efficiency with which pigs convert food to muscle. This involves them having large appetites which leads to hunger when adult breeding stock have to be placed on restrictive diets.
4. Increased growth rates also put pressure on the pig's metabolism. High levels of oxygen are required, putting pressure on the heart and lungs. The combination of higher metabolism and larger muscle blocks results in greater heat generation and can make it harder for the pig to keep cool (AHAW, 2005).
5. Leaner carcasses with less back fat. Extra muscling in the back legs brought with it the undesirable trait of greater stress susceptibility.

Reduced back fat has also led to fertility problems. Having fewer reserves of fat can make it harder for a sow to produce enough milk for a large litter without losing condition, further compounding the problem raised in no 2.

6. Longer bodies to increase the amount of meat. This can also put pressure on legs and backs.
7. It is apparent that the modern breeds have lost much of their resistance to disease through years of application of veterinary treatment (Hartung, 1994). This is likely to have reduced selection pressure for good immune systems.
8. The lighter skin of modern pig breeds can increase susceptibility to sunburn in extensive systems.
9. Reduced snout length to lower the amount of rooting and digging.

Although pigs have been selected for certain valued characteristics, domestication has had little effect on the biology and most importantly the behaviour of the pig. The similarities between wild and domestic pigs remain more striking than the differences. Many welfare problems which arise in modern farming are due to a failure to address behavioural and biological needs which pigs have inherited from their wild ancestors.

Good Agricultural Practice – selective breeding for better welfare

Selective breeding could be used to improve the welfare of pigs. The following traits could be selected for:



Saddleback

- Smaller litters of stronger and healthier piglets which can be weaned later without compromising the condition and health of the mother
- Breeds which make good mothers and are less likely to crush their young
- Resistance to stress and disease
- Reduced aggression

- Animals adapted to outdoor rearing in different climates

Improvements to welfare which might follow from this would have benefits for productivity.

Selection for free-range and organic systems

The Landrace x Large White crosses used in intensive systems are not always appropriate for free-range and organic systems. Generally, they are less well able to cope with outdoor conditions where there can be more extremes of weather and less control over disease.

It may be more appropriate to use traditional and more local breeds that are better adapted. In the UK for example, traditional breeds such as Gloucester Old Spot, Berkshire, Saddleback and Tamworth are hardier pigs, more suited to outdoor conditions and more resistant to disease. They have smaller litters and generally make better mothers. The Duroc breed also has some of these qualities and is widely used in crosses for extensive systems.

Local breeds may be more adapted to the prevailing climatic conditions. In cold climates, the Mangalica

pigs from Hungary have thick fur coats making them more suited to the outdoor winter conditions. Many traditional breeds retain the darker pigmentation of their ancestors, helping to protect against sunburn in hotter climates. This includes the Spanish Iberian pig, the Sicilian Black and a range of traditional African breeds. These breeds are also suited to a semi-feral existence, foraging for food in pasture and woodland. The meat of slow-growing traditional breeds can also often be sold at a premium price based on its flavour, quality and fatty-acid composition (see Pig Case Studies from Hungary, Spain & Ivory Coast).

Many traditional and local breeds are at risk of becoming extinct. According to the International Livestock Research Institute (ILRI), 30% of the world's livestock breeds are endangered. These breeds may contain genes valuable for the future development of sustainable pig production as they may be adapted to different environments. For example, the curly-haired, lop-eared Turopolje pigs from Croatia are well adapted to harsh climates and can survive cold winters in marshy lands on a minimal diet. Unfortunately, only 50 of these animals remain in existence.

Four traditional breeds adapted to different climates

Spanish Iberian pig grows slowly on acorns to produce premium hams



Tamworth, traditional British pig



Mangalica, Hungarian woolly pig, adapted to cold Eastern European winters



Traditional African pig, Ivory Coast



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Summary

Selective breeding for performance and meat quality can have a range of unintended welfare consequences including:

- Increased metabolic pressure on both sows and growing pigs
- Increased stress susceptibility
- Increased hunger
- Reduced disease resistance
- Weaker legs and backs

Larger litter sizes are likely to result in higher piglet mortality.

The increasing predominance of a few breeds worldwide reduces biodiversity. Rare and traditional breeds are at risk of extinction. Genetics which adapt pigs to particular environments may be lost for ever. Breeding can select for traits which are beneficial for welfare including:

- Resistance to stress and disease
- Reduced aggression
- Better maternal qualities
- More sustainable levels of productivity

Rare and traditional breeds should be preserved.