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Ethical Problems and Breeding Goals: Pigs

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Ethical problems in pig production systems arise when the rights of different stakeholders conflict. These rights can be summarised in the ethical principles of wellbeing, autonomy and justice. The stakeholders who should be considered are the animal itself, the farmer, the consumer (and wider society) and, more generally, the natural environment.

The most prominent ethical problems arise from the conflict between animal welfare and farmer income, associated with affordable food for consumers. These frequently arise from the breeding goals which have been adopted in order to increase system output relative to resource inputs. Selection for prolificacy has resulted in dramatic increases in litter size and annual sow production of weaned piglets, but at the cost of increased piglet mortality arising because of lower birthweight, reduced vitality and greater suckling competition. A further cost in sow longevity is also becoming apparent as sows are unable to meet the greater metabolic demands of sustaining high production levels. Both issues are exacerbated in low input systems, where environmental challenges to low vitality piglets and nutritional challenges to high production sows are greater. Since both piglet survival and sow longevity have significant heritability, these are important breeding goals for low input systems.

Similar challenges for animal welfare, especially in low input systems, result from selection for high lean tissue growth rate in order to improve rate and efficiency of meat production. Extreme selection for this trait results in reduction in robustness and ability to adapt to low input conditions. Metabolic demands cannot be met with low quality diets, natural ability to resist disease is compromised by reduced immunological function, and locomotory ability can be impaired by greater susceptibility to leg weakness. Breeding goals for low input systems demand a better balance in selection programmes between these genetically correlated functions. Furthermore, selection for this trait has also impacted on thermoregulatory function through loss of fat insulation, which is important in cold conditions, and high metabolic heat production, which is detrimental in hot conditions. Low input systems require animals with greater tolerance to climatic variation. This has been demonstrated to have a genetic component, and is therefore another important breeding goal.

Whilst breeding for efficiency can have many disadvantageous correlates for the animal, it is important to consider consequences of inefficiency for environmental impact. Traditional breeds, with slower growth and greater fatness, and more extensive environments, with greater climatic penalty, reduce the efficiency with which food is used. This can increase the carbon footprint of meat produced in this way, and give greater excretion of nutrients with the potential to increase environmental acidification and eutrophication. This represents another potential ethical conflict in low input systems.

In addition to animal genotype, ethical conflicts also arise between management decisions which improve production efficiency and animal welfare. Decisions relating to economically optimal group size, composition and stability can give rise to increased aggression and injurious behaviours. Since these traits have also been shown to have a genetic component, breeding for reduced social problems is a feasible option. However, this does raise other ethical considerations regarding the integrity of the animal. Other contentious management decisions such as weaning age and housing choices that restrict natural behaviour are equally important ethical issues, but are unlikely to be solved by breeding approaches.

Ethical conflicts also exist between the rights of consumers and animals. The most prominent of these relates to the issue of castration, where the demand of consumers for meat without boar taint conflicts with the integrity (and welfare) of the animal. Once again this conflict is greater in low input systems where use of early-maturing, slow-growing traditional breeds and provision of diets with lower quality, imbalanced proteins will exacerbate taint problems. Since the concentration of boar taint compounds in carcass fat has been shown to have a genetic component, breeding strategies will be an important part (but not total solution) in future resolution of this problem. Consumers also demand safe and healthy food. This is sometimes facilitated in low input systems, but sometimes conflicts with other goals. For example, fatter animals deposit more of the saturated fats which are harmful to human health, giving a conflict between promotion of traditional breeds and wellbeing of consumers. Since fatty acid composition of lipid deposits also has a genetic component, in addition to the much stronger dietary influence, breeding approaches to this issue might be considered.

Finally, the way in which breeding goals are achieved can, in itself, raise ethical issues. Technology has delivered powerful new tools to implement rapid genetic change in populations. For example, the use of genomic selection using genetic markers and SNP information can give faster progress than the use of only phenotypic information. The extent to which such approaches compromise the integrity of the species, and hold dangers for the welfare of the individual animal, can be debated. At the extreme, the use of genetic modification techniques to achieve specific targeted traits is now possible and, whilst being increasingly adopted in plants, still holds many issues for implementation in animals.