

Meeting of the sub-group on the welfare of pigs

Ninth meeting, 16 January 2023
(Videoconference)

– MINUTES –

Attendance

Independent expert	Anna Valros Anne-Claire Berensten
Civil society organisations	CIWF
Business and professional organisations	COGECA FVE UECBV
Member States	Denmark Germany Italy Sweden
European Commission	DG SANTE G3
Guest	EFFAB (European Forum of Farm Animal Breeders) European Reference Centre for the Welfare of pigs External contractor for IA study on kept animals

Discussions on EU rules regarding genetic selection in pig production

1. Context by the Commission

The Commission explained the purpose of the meeting. The discussion started with the presentation of EFFAB and was followed by a Question-and-Answer session with the speakers and a discussion among the members of the subgroup, as shown below.

2. Presentation by EFFAB

Introduction

EFFAB is the European forum of animal breeders and works on the genetics of pigs, poultry, ruminants, aquatic animals and insects, bringing together about 50 member companies and cooperatives in Europe as well as Norway, Switzerland, UK and Canada.

The members of EFFAB are also members of FABRE (Farm Animal Breeding & Reproduction Technology Platform), which is a technology platform bringing together the industry and academia, research and technological institutes working in the area of animal genetics and reproduction.

Responsible and balanced pig breeding

EFFAB is engaged to promote the dialogue on sustainable animal breeding and farming through EFABAR, which is a code of good practice in the areas of genetics, use of antibiotics and other aspects of animal production.

For EFFAB, the principles of responsible and balanced breeding are not revolutionary, as they have been implementing them since the 1990s, when the breeding shifted from programs related to production and efficiency to programs that take into account different components such as improved animal health and

welfare (e.g. piglet survival and weight, maternal and milking abilities), better use of resources (e.g. better feed use, sow fertility and longevity), reduction of the environmental impact of livestock production (i.e. reduction of carbon and ammonia emissions), better production and quality of the products, food security, while maintaining genetic diversity.

The EFABAR code contains a list of health and welfare criteria that EFFAB members take into account in their work over the past 17 years, since the code was first established. The code also monitors genetic progress in welfare-related traits in paternal lines, as well as the evolution of welfare-related parameters such as the piglet survival in relation to litter size. The prevailing view in the past that it is not possible to improve certain traits at the same time as improving production, is no longer valid. Modern genetics offers the possibility of producing more animals while improving survival and other benefits, such as those related to the environment.

Pig breeding programs are more complex than those for other animals, such as dairy cows. They involve multiple individual pure lines which are under selection. The goals of the breeding program as a whole are not necessarily the same as those of the individual pure lines within the program. They may be different but ultimately complementary, so to improve the overall population. Maternal lines are responsible of coming together to create the best possible mother, combining traits such as sow longevity and robustness. Increasing litter size is one of the goals, but not if the piglets do not survive. Paternal lines are used to make better use of resources through increased feed efficiency.

Pig breeding contributions to animal welfare.

With regard to *piglet survival*, EFSA has reported that there is an unfavourable genetic association between litter size and piglet survival., i.e., the larger the litters, the lower the survival rate. EFFAB gave graphic examples of genetic selection can move a population in the desired direction. EFFAB explained that the unfavourable correlation between the two traits has not and cannot be changed, but breeding can be used to achieve the desired progress in several traits at the same time.

EFSA also recommended that litter size should be limited for reasons of *sow longevity*. EFFAB disagreed with this recommendation, considering it was based on a single, relatively old study which showed a negative relationship between larger litter sizes and sow retention in the herd. EFFAB considers there are 17 studies showing either no correlation or positive correlation between the two traits.

For *teat number and quality*, EFFAB showed an increasing trend in population teat number and graphs showing that the genetic trend combines litter size and teat number.

Finally, on average, the larger the litters, the smaller the piglets will be. However, EFFAB considers that *birth weight* is a trait already taken into account within the context of piglet survival. Balanced and responsible breeding programs take into account all the unfavourable associations between important traits.

Perspectives on the current proposals for Animal Welfare legislation.

EFFAB made the following points:

- Genetics is already today doing the best it can from a genetic point of view.
- Genetics will never be the magic bullet for animal welfare, as even the ultimate phenotype for a particular system is impacted by the exact environment, e.g., even genetically identical animals will have different welfare in different environments.
- Breeding programs receive constant feedback from the industry and can make changes based on additional information from the field. Therefore, if a favourable trend changes in the wrong direction for unknown reasons at one point in time, the geneticists are able to make changes in real time and adopt a new approach to influence the trend in a favourable direction, to ultimately rectify the situation.

- New ways of getting feedback from farmers are currently being opened up by new technologies such as precision farming or video tracking of animals. This would allow the monitoring of new traits related to animal welfare and the assessment of whether there is a genetic component to an underlying behaviour. In the future, the new technologies can feed commercial breeding programs with an additional set of traits that can impact welfare positively.
- Setting a limit on litter size will reduce the average litter size of the whole population, as litter size is a trait that has a significant distribution around the population mean. This would put in risk the economic sustainability of EU farmers, who would need financial support from the state. Carbon footprint will be also impacted.
- A regulation limiting litter size would not take into account the whole picture from a genetic and non-genetic perspective, nor the ongoing aspects of selection (increasing litter size, survivability and robustness of piglets and sows) aimed at making production more sustainable and producing more kilograms of final product for less underlying resource input.

Conclusions

EFFAB summarised the presentation and concluded that:

- The creation of legislation on specific genetic traits is not necessary, since code EFABAR can be considered as self-regulation.
- Animal welfare cannot be considered in isolation, as breeding programs are an exercise in balancing different traits.
- Legislating on genetics will have an impact on the farming and breeding sectors, but also on the knowledge activities in animal breeding and genetic research by scientists, universities, and research institutes.

3. Question-and-Answer session with EFFAB

Q: Limiting litter size would obviously impact farmers. Why would there be an impact on breeding companies, since breeding companies can design any pig with desirable traits? Why do breeding companies care if they develop trait X instead of trait Y?

A: Breeding companies are open to new trait development whether these are related to ways of measuring traits, for example through new technologies, or to new science for example in relation to gut microbiomes and pig health. However, if legislation restricts the design of a particular program in a particular region, but not in other regions, products will be very regionally based and will not be able to influence producers around the world. In addition, there are cases like Denmark, where the breeding system is not exclusively part of a commercial company, but basically owned by the farmers, who are then directly impacted by restrictions in breeding.

Q: Although a product having more regional and less international magnitude would have less economic value for breeding companies, wouldn't it also be profitable to develop a second breeding program or a second genetic product?

A: There are certainly examples in Europe where niche products have been developed and this makes sense from an individual trade perspective. However, if populations shrink down into a regional aspect, genetic improvement will slow down in other traits that are being improved. Using a small regional population for selection is less efficient compared to breeding companies being able to pick out animals from a multinational breeding system. Geneticists look at what is best in an overall population and the best animal not just for one trait but for all the traits that breeding is trying to push in the right direction.

Q: What is the cost of developing a genetic program on a regional basis? Are there concrete figures? Can EU be considered as regional basis?

A: Running an individual genetic improvement program for one breeding line costs millions of euros per year. If breeding programs are developed on a regional basis, the products will have a limited use outside the EU where no similar restrictions exist and therefore, the EU market will become smaller from an overall economic perspective. This will also limit the genetic diversity available for EU farmers. The number of genetic suppliers to the European pig market has already been dramatically reduced over the last 30 years, following the same path as poultry.

Q: Apart from litter size, the overall question is how to manage the piglets in the farm, especially in view of the divergent farm situations in the EU. What can genetics offer in terms of animal behaviour to facilitate the farm management regarding, e.g., mating, farrowing, lactation behaviour?

A: Different farms have different challenges so there need to be different genetic lines on the market for different types of production systems. At the same time, however, genetics look at multinational breeding programs measuring traits under different underlying environments, e.g., different temperatures in northern and southern Europe. If certain animals have a high degree of genotype-like environment interaction, i.e., they are specifically linked to one environment, they will not be favoured. Genetics aim at identifying those animals that perform well in multiple environments so that they have inherent robustness and can thrive in any part of Europe.

At farm level, it is essential to understand the genetics one is working with and get the best out of them. This is not a question for genetics, but for the experts working on the farms.

There is no real genetic program today that has behaviour within the selection. This is because up to this date, measuring the behavioural traits in an objective way and adequate volume has been challenging (e.g., would need to have people watching pigs in videos all day). New technologies combined with ethology and animal welfare science will help in this regard. Once there is an understanding of which traits are important, genetics will look at those particular traits and whether there is a genetic basis for them. If yes, the traits can be incorporated into a selective program.

Q: What requirements can be included in animal welfare legislation in relation to breeding?

A: Requirements should not necessarily be related to one trait or one limit, because that does not take into account the full spectrum of animal breeding and genetics. Instead, genetic companies can be requested to demonstrate the welfare components of their breeding program, as part of their animal breeding registration and audit. The relevant traits under selection must make reasonable progress over time. This would also allow for companies to approach welfare in different ways in their breeding programs.

Q: If the number of sow teats is not sufficient to support the piglets born, the farmer has to find other solutions to maintain the welfare of the piglets. All of these solutions have some negative impact to animal welfare. What would a responsible breeding program say about the number of teats in relation to the litter size?

A: Defining the production system where animals are kept is the first breeding goal. The number of sow teats is associated with this production system. For example, outdoor pig production in the UK needs a genetic line where the average number of teats per sow within the line corresponds to the average total born alive. Each sow must raise her own piglets. In Denmark, the breeding goal relates to the number of teats per group of sows or even sows that farrowed earlier. The negative welfare consequences related to the cross-fostering aspects of this production system can be offset with the positive impacts on environment, i.e., by having more efficient sows and producing more piglets.

Q: If the EU were to impose zero confinement around farrowing and lactation, would this not automatically create a European market for pig genetics? (Considering that this should be taken into account in the breeding programs).

A: Modern genetics can already function well in that regard, as they already work in a number of situations where genetics are adapted in zero confinement, for example outdoor production in the UK. There is no need to create a separate population for zero confinement.

Q: Isn't it important that the sow is able to sustain her litter on her own, i.e., to have sufficient functional teats so that she can actually provide piglets with milk in a non-competitive situation? The consequences for piglets of the use of nurse sows are largely unknown.

A: There is a lot of research that needs to be done to understand the welfare implications of current production practices, and this needs to be done before any legislative changes are made, so that the EU follows a truly science-led process. From a genetic perspective, legislation should be concerned with traits rather than ultimate values, which can change fundamentally as the genetic architecture changes. If an average litter size of 12-14 is set, farmers will still need to move piglets between sows because there will be sows that will give birth to 18-20 piglets. To avoid moving piglets between sows, the average litter size needs to be 6-7 piglets as this trait (litter size) is highly variable.

Q: Do farmers today have access to the full range of different genetics?

A: In principle, there is nothing to stop a genetic line from being used in any Member State. Of course, whether that population is multiplied in that country, is not necessarily a question of genetics but rather a logistical and commercial one.

Q: Can litter size be reduced?

A: Yes, genetics can increase or decrease litter size (breeding backwards). The purpose of doing so is a different question.

4. Legislative options:

Members of the sub-group identified the following options for reducing either large litter sizes or their negative welfare consequences:

- a. Set a specific **figure on the litter size** in line with the relevant EFSA recommendation.

Most members were not in favour of this approach, partly because of the economic consequences of farmers reducing their production, but mainly because it could put very good farmers at risk.

Members see a risk of penalising the best farms, i.e., those that manage their farms so well that they have large litters and low piglet mortality rates. This can happen in the same genetic line, where some farmers can have e.g., 14 live born piglets per sow and others 16, because they are very good farmers. It can even happen with breeding lines that have a relatively lower litter size, e.g., they normally produce an average of 14 piglets born alive, but some farmers are very good and can produce 14,5 or 15, which could lead to a sanction.

- b. Legislate a **correspondence between the number of teats and the number of piglets** born alive.

This option is based on the principle that there should not be on average more piglets born alive than sow teats. Sows should be able to sustain their own piglets. Several members considered that this is a preferable option to setting a fixed number for the litter size (option a).

From an inspector's point of view, this option could be controlled by checking the average number of teats or functional teats and the presence on the farm of equipment designed to support the sow's lactation capacity, such as artificial rearing systems and supplementary milk. As an inspector, one can get an indication of whether the sow is sufficient on her own or whether other aids are needed to feed the piglets. Several members pointed out that artificial rearing systems are already not compliant with current legislation.

- c. Legislate a correspondence between the **nursing capacity of the sow** (milking capacity) and the number of piglets born alive.

A member argued that it is not necessary to have a 1:1 correspondence between the number of teats and the number of piglets in the litter, like in option (b). There is research in Denmark that gave promising results about the sow's capacity to raise more piglets than initially thought. This approach must be coupled with appropriate management e.g., by increasing weaning age.

However, it might also necessitate the provision of supplementary milk to the piglets, as there is a definite correlation between the number of teats of the sow and the number of piglets she can feed.

Although more science is needed in this area, the provision of supplementary milk is disputable. There is some research on the use of milk cups¹ in the farrowing pen when there are more piglets than sow teats, showing that there is higher mortality and more fighting because the last piglets without a teat continue to fight for one, a situation causing stress. If there is no defined teat order, the piglets will be stressed permanently. In addition, if the litter is bigger than the number of the sow teats, the provision of supplementary milk is not enough to avoid the weaning of some piglets that will not have access to a teat to suckle.

- d. Establish an **indicator** that shows the level of welfare as a function of litter size (outcome-based measure, e.g., mortality).

Several members consider such an option would be difficult to implement, because there is no science to suggest practical indicators to measure welfare in this context. Mortality is only part of the whole issue.

A member suggested scars or lesions on the snout as a suitable outcome measure, as it can be associated with teat fighting. In addition, farms would not be able to disguise this indicator because injuries occur many days before the audit arrives.

- e. Set **restrictions on the management of litters** e.g., minimum weaning age, restriction of use of nurse sows/moving piglets between sows etc.

Some members believe this option has potential to steer to more feasible litter sizes. Others think this option is difficult from a control point of view.

With regard to the use of *nurse sows*, it is challenging to check against a certain threshold. Although one can verify in which extent nurse sows are being used by looking at the number of piglets born, weaned or sold in relation to the number of sows in the herd records, the disadvantage remains the same as under option (a), i.e., the risk of penalising a good farm that manages to have a higher average of piglets weaned per sow compared to the set threshold set for an acceptable number of nurse sows.

In addition, a total prohibition of using nurse sows would not be feasible, as this possibility must be maintained in exceptional cases where the sow is sick, or she has given birth to a surplus of piglets.

As regards the *moving of piglets* (which should be avoided also for health reasons) it is difficult to check how many have been moved between sows. It is common in practice that animal handlers manage litters differently according to their perception of what is best for each situation and even the farm manager is not able to give precise information on the handling of litters. It is generally difficult to demonstrate the quality of management of the farrowing unit.

- f. Ban the farrowing crate and impose **zero confinement**.

Breeds intended for free farrowing produce less piglets than prolific breeds because zero confinement is compatible with a more limited number of piglets. Therefore, legislating for zero confinement would lead to a moderation of the litter size to fit this production system.

On the contrary, allowing crating even on a temporary basis, would allow farms to use nurse sows, as it is necessary when a sow must accept piglets other than her own. Despite the associated measures that can work

¹ There is also ongoing research into the design of milk cups/systems for supplementing milk that use the piglets' instincts.

well (e.g., maintain the smell of the original piglets), this procedure of acceptance takes usually from several hours to some days, which results in stress both for the sow and the piglets.

Under these circumstances, a nurse sow can be crated for quite a lot of time, not only for the 3-4 weeks that takes to wean her own piglets, but additional time to nurse the new piglets attributed to her. Also, confining a sow during the first 4 days post farrowing, when she has a lower-level activity, is different from confining nurse sows which have a higher activity level. The competent authority has no possibility to check and control the use of temporary confinement for the nurse sows. Therefore, nurse sows should not be confined and if temporary crating is to be allowed in the future, legislation must prohibit its use for nurse sows.

In Norway, farms do not have crates, but they allow the use of nurse sows without crating. These are sows selected for their good motherly behaviour and are used only in emergency cases.

- g. Set up a **procedure for the approval or authorisation of a breeding program**.

The welfare components of such an approval procedure may vary.

A member suggested to push genetics for behavioural traits such as sow calmness and less protectiveness to piglets, by setting such a requirement for the approval of breeding programs.

Others disagree with selecting for calm animals with characteristics that are easy to keep in production facilities. They believe that behavioural breeding is a dangerous way to go, even though it could lead, for example, to pigs that stop biting their tails. This is because there is a risk to breed away a behaviour that is normal for a pig and might end up creating a pig that cannot express its fear, frustration, or natural behaviour. Therefore, behavioural breeding is something the legislation should not favour.

- h. Establish **animal welfare labelling** that uses a criterion on decreased litter size.

The Danish experience with the growth rate of broilers could be taken as an example. Denmark has a government label where one of the basic requirements is low weight gain, so that the broilers can get older before they are slaughtered. Farmers who want to produce under this label have to get broilers with a lower weight gain. Because of consumer demand, farmers asked for this type of broiler and breeder companies - although international and out of reach - responded by providing the appropriate genetics for lower weight gain.

- i. Set up a **control system** to check whether farms have the necessary capacity and competence to keep prolific sows.

It would be difficult to measure whether farms are capable of managing big litters, as management measures are difficult to check (already explained under option (e)). Also, if an official control had to be carried out on every sow farm, this would not be feasible due to the huge implications in terms of manpower and economics. In addition, it would be complicated to legislate on which breed a farmer is entitled to keep, and therefore, any farmer in the EU should be in principle qualified to keep prolific sows.

Nonetheless, the enforcement of welfare rules to all farms, including those keeping prolific sows, through audits, veterinary visits and sanctions should always apply.

5. Prolific sows:

Hyper prolific sows are bred in several places in the EU, such as in Denmark and in Germany, where about 50% of the sows in the north and east of the country are imported from Denmark. Other breeding lines also produce large litters but not to the same extent as the Danish. The breeding goal in Denmark is not solely based on litter size, but also on increased survivability.

With regard to the use of hyper prolific sows, several members believe most farms are not able to ensure their welfare and that of their piglets. Farms vary widely in their husbandry systems and only few of them meet the requirements for keeping animals in such a demanding situation.

Others believe that this is doable under the conditions of mandatory training or qualification schemes, similarly to what happens with the training requirements for castration.

Even when farms wish to reduce the litter size of a given genetic line there are practical solutions, e.g., by diluting the semen or adapting the insemination procedure.

There are also management practices to facilitate the use of prolific sows through helping them look after their piglets and reduce the number of piglets that are moved or mixed.

6. *Mixing litters:*

Concerning the practice of moving piglets between sows, it can be done for different purposes a) within the first 48 hours of farrowing, some piglets are moved from one sow to another to balance the litters (equalisation). This is not considered a major welfare problem as the bonding between the piglets and their mother is not yet well-developed b) the use of nurse sows, where different systems exist. In a typical system, a litter is moved from its sow (first nurse sow) to a sow that has farrowed earlier and whose piglets have just been weaned (second nurse sow). Typically, the movement of the piglets is done no later than four to eight days after birth. The “first” nurse sow can then receive surplus piglets from other sows. Taking the piglets away from the first nurse sow may affect the sow-piglets bonding. There is no research on the consequences of this system on the behaviour of the piglets. For example, it could lead to more tail biting. In addition, in this system the second nurse sow feeds a second litter that is not her own. In some farms in Germany and Denmark, almost 20-40%² of the sows present in the farrowing unit are nurse sows.

7. *Accessibility of EU farmers to genetics:*

In small countries, such as Finland, farmers cannot choose their genetic lines - whether intensive or organic production - it is the breeding companies that put their products on any particular market. As a result, farmers might have to cope with large litter sizes which are not necessarily suitable for their farming conditions.

8. *Impacts of reducing the litter size:*

Whether litter size is directly or indirectly limited, there will be a negative economic impact on farms, as analysed under option (a), especially on the best ones in a given system of production. In Denmark, which largely uses hyper prolific sows, the best 25% of farms achieve a piglet mortality rate from birth to weaning of 12.7% (figure from 2021). There will also be an impact on the trade of piglets, due to the reduced number of piglets.

However, there are also farm savings associated with reducing litter size, such as those related to farrowing places no longer used for nursing sows, savings in management and the provision of supplemental milk. It should also be noted that sow's feed consumption varies according to litter size.

A decline in the commercial activity of breeding companies that produce hyper prolific sows can also be expected. Some members pointed to the possibility of breeding companies moving out of the EU, similar to what has happened with broilers and layer breeders, but no background information was provided on the reasons for the migration of poultry breeding companies.

9. *Transitional period for reducing litter size:*

Changing a breeding goal as such could be done relatively quickly but depends on the size of the population. A measure that has to be monitored in the field would take a longer time to establish and implement³.

² Percentage indicated by a member.

³ According to a member's estimate (sent in writing after the meeting), at least five years and most likely longer (5-10 years) before the effect of a new breeding goal is implemented in commercial herds.