#BreedersTalkGreen webinar report – 06 December 2021

What's next in Animal Breeding?

Welcome and opening – Ana Granados Chapatte (EFFAB & FABRE-TP)

The fifth session of the webinar series #BreedersTalkGreen, titled "***What's next in Animal Breeding?"*** was opened by Ana Granados Chapatte, EFFAB's Director and Secretary-General of FABRE-TP.

Ana proceeded with the presentation of EFFAB and FABRE TP and introduced the outline of the programme including the different speakers for the session. Ana also highlighted the EFFAB commitments to responsible and balanced breeding shown through Code EFABAR.

- How I bring Europe closer to the heart of agriculture - Asger Christensen - Member of the European Parliament & Farmer

Asger Christensen introduced himself, expressing that he uses his views as a farmer in politics by **bringing real-life into the political discussions.** Asger's ambition is to guarantee a high-quality food supply in the future, reduce emissions, and strengthen biodiversity. Asger underlined the need to use all the tools in circular bio-economy such as CRISPR, in breeding. He expressed his wish to have a good solution in the final Plenary vote in January on the Recommendations of the Committee for Animal Welfare during Transport, as transportation of breeding animals is necessary to improve sustainability.

- From FAANG to Fork: How more will knowledge of the genetic code of farmed animals benefit animal breeding? - Dr Emily Clark - Research Group Leader at the Roslin Institute

Emily Clark introduced the concept of animal breeding and how more knowledge of the genetic code of animals can benefit farmed animals. This knowledge is generated in the BovReg, GENE-SWitCH and AQUA-FAANG (FAANG initiative), in which Emily is highly involved. Outcomes and benefits of functional annotation for animal breeding involve enhanced genomic prediction accuracy, including for smaller breeds. **Farmers and breeders can make better decisions in managing herds and individual animals,** conservation of biodiversity at regional and global scales would be possible, and it will lead to improved farmed animals for health, welfare, and production efficiency traits.

For more information on FAANG and the FAANG to Fork strategy: From FAANG to fork: application of highly annotated genomes to improve farmed animal production | Genome Biology | Full Text (biomedcentral.com)

- Fish breeding and genetics for aquaculture's contribution to EU Sustainable Food Systems - Javier Ojeda - General Secretary, FEAP

Javier Ojeda introduced FEAP and set the aquaculture scene as diverse in species and types of production systems. While aquatic genetic resources constitute an invaluable biodiversity reserve, they remain largely unexplored. The aquaculture sector is closely linked to wild aquatic genetic resources and their habitats today.

A greater range of genetic technologies can be applied to aquatic species than what is generally possible for terrestrial livestock. New breeding techniques (NBTs) are not currently in commercial aquaculture. **Suppose all farmed aquatic species were in traditional selective breeding programmes. In that case, improvements in aquaculture production efficiency could produce a doubling in aquaculture production by 2050, thus meeting the projected increase in demand for fish and fish products with a low proportional requirement for additional land, water, feed or other inputs**. Aquaculture is a solution for the future.

By the end of the presentations, a general question was asked to the audience, which was: "What is the main challenge for the new genomic research and next level animal breeding to be used in the EU by the breeding companies and farmers?" The most chosen answer was "societal perception", followed by "affordability", "practicability", and "regulatory framework".

Panel Discussion

Following the presentations, a panel discussion and a Q&A session were held with speakers and guest panellists Mark Fife (Member of the EFFAB Steering Committee) and Peter Stevenson (Chief Policy Advisor at Compassion in World Farming).

The discussion was opened by Peter Stevenson from Compassion in World Farming. Peter argued that past breeding goals focusing on productivity have led to poor animal health and welfare.

Instead, modern animal breeding programmes focus on improving animal health and welfare. They also have been modernised through a more concentrated focus on improving sustainability. Better knowledge of the genetic code (genome) of animals will accelerate this trend. We can look at how heritable welfare and health traits perform, and this information can be used in breeding decisions. New Genomic Techniques, especially gene editing, are potential new tools to add these low heritable traits to the entire breeding population. For aquaculture, research is also essential to reach sustainable and competitive European aquaculture objectives. Animal Breeding can be beneficial in mitigating the challenges that are currently faced. Still, we need to rethink the role of breeding in modern farming, including welfare, to a further extent. FAANG and a better understanding of phenotypes can help provide us with the information for such breeding programmes.

Q&A Session

The Q&A session was dominated by delivering different solutions. The speakers and audience agreed on the fact that there are a number of solutions that can be applied depending on the situation.

FAANG can be valuable in identifying traits beneficial to disease resistance. Examples of such diseases are Porcine reproductive and respiratory syndrome (PRRS) in pigs, infectious pancreatic necrosis (IPN) in salmon and, mastitis in dairy cattle. In addition to focusing on specific disease resistance, focus can also be on robustness. However, aquaculture work is not only on the welfare of the animals, but from the environmental point of view and societal aspects such as the consequences when fish escape.

In the future, resilience to environmental challenges will become more critical, especially in animals reared outdoors. Current breeding goals are comprehensive, and the analyses done include environmental effects. More knowledge on farm animals' genetic code (genome) can also help select animals that are better adapted to specific environments. When thinking of the environmental aspects, it is also important to define which animal farming systems we want in the future.

In fish farming, escapees should and could be prevented by better training and engineering. The impact on natural stock should be minimized. Farming sterile animals is one solution and gene editing is the tool that could provide such a solution. We all need to rethink the farm sector of the future; sustainable food systems are very powerful. Generally, the public perception of gene editing is not that bad. Nevertheless, we need to get on board the public, explaining that things might cost more in the future for embracing the sustainable goals.

Wrap up

Mark Fife closed the webinar by thanking everyone. He summarised that the knowledge on different phenotypes will be beneficial in the future of animal breeding. Mark stated that it feels good to know that new genomic techniques are on the EU agenda. New genomic techniques have already provided us with a considerable advantage. **What's next in animal breeding will lead us to a more environmentally sustainable production system with more disease resistance.**

EFFAB and FABRE-TP would like to thank all participants and speakers for actively joining the session and for their input. Our webinar series will be back again in 2022.

If you have any questions, ideas or input, don't hesitate to contact us via email: effab@effab.info. For more information about our webinar series please visit www.effab.info.