




EU CAP Network Workshop
Animal Welfare and Innovation



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1. Introduction

1.1 Background

The Farm to Fork Strategy (F2F) recognises that better animal welfare improves animal health and food quality and reduces the need for medication. Animal welfare is interconnected with human well-being and the environment, according to the 'One Welfare' concept, which in turn is an extension of the 'One Health' idea, linking human and animal health. Indeed, enhancing animal welfare can lead to many economic benefits beyond those associated with healthier livestock, particularly access to new commercial opportunities and the creation of added value on the market, especially when consumers give specific attention to the animal products they consume. The main animal welfare objectives of the F2F are the revision of the EU legislation and the contribution to a sustainable consumption through animal welfare labelling.

Animal welfare indicators and methods can help assess, monitor and ensure welfare. Studies on animal welfare show that focusing on the animals' state is more important than the quality of the facilities and equipment. Precision livestock farming has brought some progress in monitoring animal welfare. Still, implementation is incomplete, and there are technical and economic challenges with specific indicators.

Societal demands are increasing to avoid practices that are perceived as detrimental to welfare (or in conflict with ethics) and the welfare of animals. This has become a very important issue for European citizens. For example, the European Citizens' Initiative (ECI) entitled 'End the Cage Age', which was submitted to the European Commission on 2 October 2020, gathered 1,397,113 statements of support. In response to this, the European Commission committed to table a legislative proposal to phase out, and finally prohibit, the use of cage systems for all animals mentioned in the initiative by the end of 2023.

This has an important impact and Member States will need to invest significant resources to actively support the transition to cage-free management, and promote innovation and the exchange of good practices towards more animal-friendly production systems.

To address the animal welfare challenges that affect European livestock production, the Directorate-General for Agriculture and Rural Development of the European Commission (DG AGRI) organised, together with the Support Facility for Innovation and Knowledge exchange | EIP-AGRI (EIP-AGRI SF), the [EU CAP Network 'Animal Welfare and Innovation'](#) workshop in Hanover (Germany) from 9 to 11 May 2023. All available information such as the agenda, the programme and description of the field visits and an overview of speakers can be found on the event webpage.

1.2 Overall aim of the workshop

Exchanges between projects and initiatives, including EIP-AGRI Operational Groups and Horizon 2020 / Europe projects, and relevant actors, can help transition to more animal-friendly production systems. The workshop was aimed at creating conditions for exchanging knowledge and sharing innovative and inspirational practices that will support farmers in successfully adopting animal welfare standards. A further aim was to gather research needs from practice as perceived by farmers, their advisors and livestock stakeholders. The event also aimed to contribute to achieving the F2F goals by supporting farmers' knowledge, skills and motivation to cope with cage-free animal welfare standards and address related societal concerns and market demands for animal welfare-friendly food.

1.3 Specific objectives of the workshop

The specific objectives of the workshop were to:

- › Exchange knowledge on successful practices, opportunities and tools that are relevant to animal welfare procedures, and specifically on:
 - › Best cage-free practices, for example for laying hens and sows;
 - › Animal and non-animal-based measures as indicators to monitor and improve animal welfare;
 - › Successful innovative farming systems, precision livestock farming, and extensification of farming systems to improve animal welfare and sustainability of livestock farms;
 - › Best practices to respond to societal demands and take advantage of new commercial opportunities, and the creation of added value on the market, e.g. through labelling and marketing.
- › Identify challenges and explore potential solutions in animal welfare procedures;
- › Identify needs from practice and possible knowledge gaps that need research;
- › Promote networking among EIP-AGRI Operational Groups, Horizon Europe multi-actor projects and other relevant innovative projects that deal with topics covered by the workshop.



1.4 Participants

The workshop was designed as a multi-stakeholder event for exchanging knowledge and for sharing innovative practices that support farmers in successfully improving the welfare of farm animals. Participants included farmers, advisors, researchers, NGOs and policymakers involved in developing, disseminating and applying good practices for better animal welfare. Farmers were welcome to provide advice and inspiration on animal welfare practices and monitoring

indicators. Advisors play an essential role in transferring innovation and knowledge between and to farmers and other actors in the livestock supply chain. In total, 74 delegates from 21 European countries participated in the workshop. The biggest group of participants were researchers (32). This was followed by advisors from an association, network, group or enterprise (21), innovation brokers (9), IT experts (6), civil servants (5) and press (1). Out of all participants, 16 were farmers, farm managers or land owners, and rural entrepreneurs. Several participants belonged to more than one group.

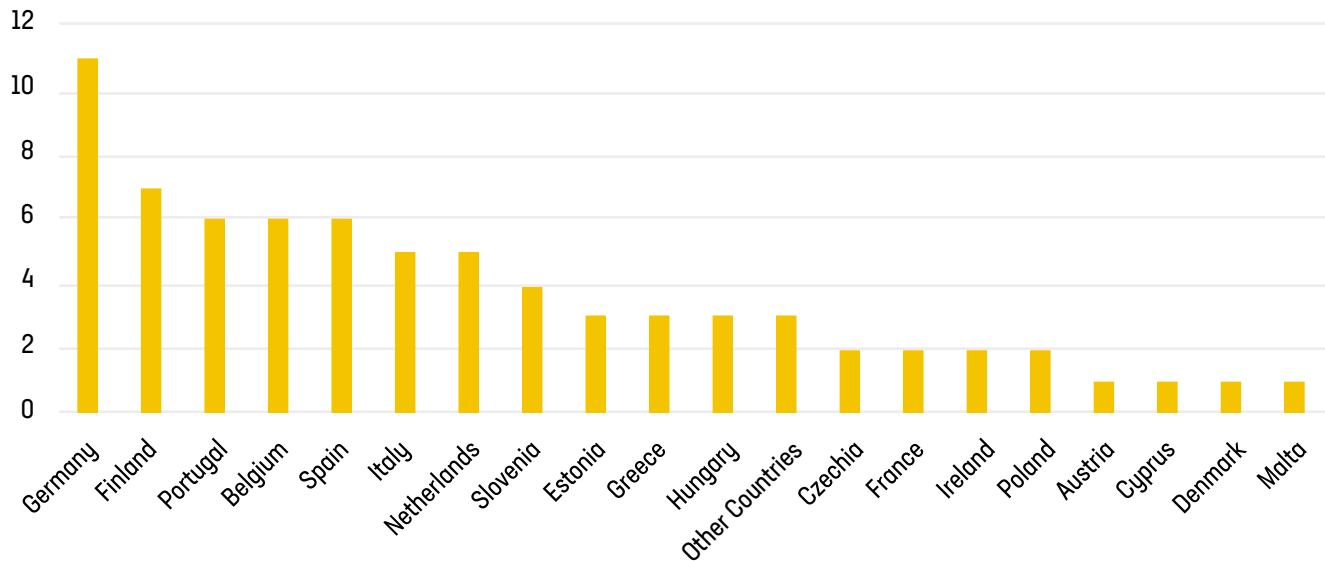


Figure 1. Participants by country of origin

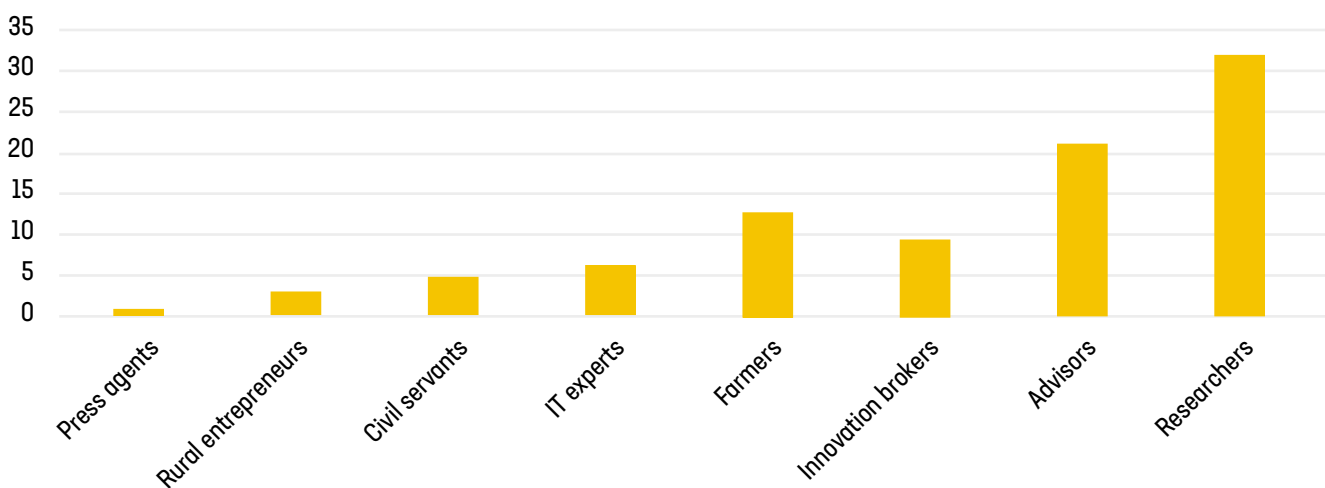


Figure 2. Participants by professional background



1.5 Interactive workshop methods and programme

The workshop was designed to facilitate communication and knowledge exchange between participants and to encourage active involvement and engagement. The reason for using interactive workshop methodologies, including collaborative work in breakout sessions, was to encourage creative thinking and to quickly gather ideas and solutions. A structured set of facilitated activities was therefore developed to facilitate answering the questions that the participants were asked to reflect on.

Field visits to three innovative farms were organised in the afternoon of the day before the workshop, on 9 May. The participants were encouraged to write the ideas that inspired them during the field visit (and during the whole workshop) on post-it notes and put them up on the 'inspirational wall'.

The workshop started with a plenary session to **introduce the event and the EU CAP Network**. Then, the participants were invited to get to know each other through a facilitated ice-breaking session. Afterwards, the scene was set by the presentation of **European support policies** and funding opportunities on animal welfare. This was followed by **three inspiring speeches** that provided examples of animal welfare best practices, related to the three topics that were the focus of the workshop. Following that, there was a feedback session to summarise the **participants' impressions of the field visits** in plenary. The 'popcorn' methodology was adopted in reviewing the post-it notes on the inspirational wall and asking participants for comments, summarising lessons learnt from the field visits.

Voices from participants' was the first breakout session, designed to build upon the inspiration from the presentations. The participants were invited to share their own projects and/or experiences and to discuss them with interested participants, related to these three topics:

- > Cage-free production systems;
- > Animal welfare indicators and monitoring methods;
- > Welfare labelling and certification.

The afternoon was reserved for two interactive sessions. The first one was dedicated to exploring and identifying the main **'Challenges and solutions'** in the three topics. The 'fishbowl' methodology was applied for this purpose and the discussion was summarised by means of post-it notes that were hung on three flipcharts, one for each topic. The second interactive session was run in small groups, including a gallery moment to explore and identify the main **'Research Needs from Practice'** in terms of knowledge gaps and the most important and urgent innovation and research needs.



The second workshop day started with a review of the previous day followed by an inspirational presentation about 'Fokus Tierwohl', the German network that disseminates knowledge about animal welfare. A breakout session entitled **'Idea and project exchange market'** followed, with the aim of discussing and sharing ideas for future collaborations and networking possibilities between participants. The **'Open Space Technology'** method was used for this purpose. Two discussion rounds of 45 minutes each were held in seven different rooms or locations in the plenary room.

Back in the plenary, participants shared key insights from the whole workshop, gave feedback and evaluated the workshop organisation and content and, at the end of the workshop, the organisers delivered closing remarks.

2. Proceedings

2.1 Field visits

Three field visits were organised in the vicinity of the workshop venue. The idea was for participants to see practical examples of innovative practices designed to improve the welfare of cattle, pigs and laying hens:

- > 'Biohof Kinkelbur' cattle farm;
- > 'Hohls Becklingen GbR' pig farm;
- > 'Biohof Schieren Eichen' laying hen farm.

More details about each of the sites can be found in the document with the [field visit information](#). Furthermore, in the following sections some of the participants' lessons and highlights are summarised.



2.2 Welcome, introduction to the workshop and EU CAP Network

- › **Klavdija Ramsak-Noemi**, Policy Officer, DG AGRI, Unit D.1 Rural areas and networks, European Commission – [Presentation](#)

Klavdija Ramsak-Noemi introduced the governance structure of the new EU CAP Network, which is composed of 3 'strands' and is now integrating the ENRD, EIP-AGRI and European Evaluation Helpdesk under the same umbrella. These strands are innovation (EIP-AGRI), evaluation (Evaluation Helpdesk) and support for CAP implementation (ENRD). The overall aim of the EIP-AGRI is to connect policies in order to better link research and practice and speed up innovation. The EIP-AGRI keeps promoting the implementation of Operational Groups (OG) within the CAP. They will keep the focus on fulfilling farmers' or foresters' needs through a bottom-up approach and co-creation and will be able to cover any of the 9 CAP specific objectives. Furthermore, EU Member States will need to provide specific support for innovation helping to capture grassroots innovative ideas. 25 Member States plan to implement OGs in the 2023-2027 period, expecting over 6 600 Operational Group projects in total across the EU. An important new feature of this period is transnational, including cross-border OGs. From the research side, several projects will arise at EU level in the following years; many of these will keep the multi-actor approach within this concept, helping to speed up innovation towards practice. Finally, another important mission for this new period is to ensure that knowledge from the OGs and other projects is added to the AKIS (Agricultural Knowledge and Innovation) system, to facilitate its dissemination to farmers and its practical application.



2.3 Setting the scene

- › **Valerio Abbadessa**, Research Programme Officer, DG AGRI, Unit F.2 Research and Innovation, European Commission – [Presentation](#)

Valerio Abbadessa presented relevant EU policies and initiatives that have a direct or indirect impact on animal welfare and its legislation.

The most important ones are the EU F2F Strategy, to align the EU's animal welfare legislation with the latest scientific evidence, to ensure a higher level of welfare and to consider options to better transmit the value through the food chain (e.g. through labelling) and the 'End of cage age' initiative to phase out and finally prohibit the use of cages by the end of 2023. The rationale for revising the EU's animal welfare legislation was explained together with the timeline of the process up to the legislative proposal. When considering a change towards systems for better animal welfare, several findings related to costs and benefits emerged from the Inception Impact Assessment, the Fitness Check, as well as from recent research projects. Among the initiatives launched by the EC, attention was devoted to the [EU platform on animal welfare](#), which aims to support EC priorities in the field of animal welfare, and its subgroup on 'animal welfare labelling' (i.e. one of the three topics of the workshop). Several projects on animal health and welfare in different types of livestock farming systems were funded by the ERA-NET SUSAN, CORE Organic, H2020 and Horizon Europe programmes. The candidate European co-funded Partnership on Animal Health & Welfare (PAHW) is designed to generate key knowledge, innovative methodologies, tools and products that help strengthen animal health and welfare in livestock and aquaculture. International activities are ongoing within the framework of the F2F Strategy, including bilateral activities with third countries, multilateral activities with WOA (World Organisation for Animal Health) and FAO (Food and Agriculture Organization of the United Nations), training and technical assistance.



2.4 Introduction to the workshop topics

- › **Paolo Ferrari**, Coordinating Expert, Support Facility 'Innovation & Knowledge exchange | EIP-AGRI' – [Presentation](#)

Paolo Ferrari introduced the three main topics of the workshop and their implications in terms of challenges and opportunities for farmers, taking into account farmers' perspectives and concerns, as expressed in a series of studies and consultations.



For instance, farmers are concerned about the investments needed, the length of the transition period to cage-free housing systems, the planning restrictions when wider livestock buildings are needed to reduce animal density, the higher mortality in the first years of change and the lack of staff experience and capacity to manage cage-free systems. As regards the use of animal-based indicators to consistently monitor animal welfare in combination with input factors to control the farming system, concerns were raised about cost and timing of animal-based measurements, training for assessors to get valid and comparable results in a reliable way and the usefulness of the real-time monitoring information for farmers. Farmers are more in favour of voluntary rather than compulsory schemes for animal welfare certification and labelling and they ask for both social and economic incentives to join them, a fair share of the value of animal-friendly products and educating citizens and consumers about animal welfare standards.



2.5 Inspirational examples

- › **Cage-free systems for laying hens Mariana Yuan Ribeiro Couto, ECOVALIA - [Presentation](#)**

'Best Practice Hens' is a DG SANTE pilot project funded by the EU to support the transition to cage-free systems for laying hens in the EU. The aim is to help make the transition to cage-free systems. When switching to cage-free, several things change for the birds. They will have more space, more contact with the other birds, indoor and outdoor climate changes, and new problems and challenges may appear (e.g. cannibalism), so management is different and farmers need to learn. 'Best Practice Hens' has created several best practices' sheets and practice abstracts with recommendations and specific advice for farmers. These are translated into several languages. In conclusion, several key aspects need to be considered in this transition: firstly, the farmers' training (i.e. focused on prevention and monitoring), societal demands for animal-friendly products, the

diversity of farms (i.e. big farmers are different from small farmers), ecosystems and traditional cultures across the EU.



- › **The use of the Welfare Quality protocol as implemented by the WellFair certification: Indicators and monitoring methods for practical use on the farm Antoni Dalmau Bueno, IRTA - [Presentation](#)**

The WellFair® animal welfare certification is an independent certificate approved by the Institute of Agrifood Research and Technology (IRTA) in collaboration with the Basque Institute for Agricultural Research and Development (NEIKER). It is based on European benchmarks - Welfare Quality® and AWIN - and it comprehensively evaluates and monitors animal welfare quality on farms, in rearing areas and in slaughterhouses for bovine, porcine and ovine species as well as for hens, chickens, rabbits and turkeys. One of the innovations of the Welfare Quality® and AWIN animal welfare assessment systems is that they focus more on animal-based measures (e.g. directly related to animal body condition, health aspects, injuries, behaviour, etc.), rather than on resource-based indicators of farm housing and management. Animal-based indicators can assess not only the absence of pain and fear but also the "positive emotional state" including, for example, variables related to appropriate behaviour (i.e. social behaviour, human-animal relationship).



➤ **Beter Leven animal welfare certification scheme Janneke Aelen,** Beter Leven keurmerk, De Dierenbescherming – [Presentation](#)

Beter Leven ('Better life') is a very old NGO, a pioneer in animal welfare. Beter Leven was funded in 2007, aiming to bridge the gap between conventional and organic livestock farming to improve animal welfare. It counts on schemes for various livestock types (pigs, broilers, laying hens, calves, etc). Some farmers do not accept the high standards of Beter Leven very well, so this is one of the challenges they have (keep the highest standards and reach far fewer farmers or lower the standards somewhat and have more farmers progress towards better systems). It is a 3-level system (1 to 3 stars); the more stars a farmer is given, the more animal-friendly his/her activities are. The 3 stars are normally for organic systems, except in the case of dairy cows, to which Beter Leven applies more restrictive standards because it is believed that the standards for organic are not high enough to ensure the welfare of these animals (e.g. competition for resources is quite frequent, as observed on these organic farms). The development of this label is based on scientific knowledge, looking at recognised standards, and is applicable and feasible for farmers, retailers and others in the value chain. It should be ambitious but achievable, with a good balance between resource-based and animal-based criteria.



➤ **Fokus Tierwohl – a nationwide network to impart knowledge on animal welfare Katja Brase,** Network of animal welfare 'Netzwerk Fokus Tierwohl', Chamber of Agriculture – [Presentation](#)

Katja Brase presented the German initiative called Fokus Tierwohl, which was funded by the Federal Ministry of Food and Agriculture (BMEL) in 2019 and has a budget of EUR 15 million over a 3 year period. This network supports Animal Welfare competence centres to promote the transfer of knowledge nationwide and improve the transfer of knowledge into practice. The network is structured as a national Agricultural Knowledge Innovation System (AKIS), comprising an expert advisory board, cattle, pig and poultry-specific working groups, and 120 'impulse farms' distributed throughout Germany with a forward-looking concept of animal welfare, which

network with each other and participate in knowledge transfer to the target groups. Regular network meetings of the participating farmers are organised with farm visits and workshops on topics that are interesting and important for the target groups of farms. Participation in events and trade fairs is planned to present the farms and their animal welfare concepts with the support of contracted multipliers. A number of institutions are involved across the country. The Forschungsinstitut für biologischen Landbau (FiBL) and Deutsche Landwirtschafts-Gesellschaft (DLG) are engaged in the editorial preparation of dissemination materials and in developing target group-specific communication concepts for the entire sector and the general public. The project ends in 2023 but a follow-up application is pending until the end of 2026.



2.6 Lessons learnt from field visits

'Biohof Kinkelbur' cattle farm: organic dairy farm

The participants were impressed by the cleanliness, calmness, curiosity and friendliness of the farm's cows and calves, which are allowed to go outdoors and which perform natural behaviour. Most participants liked the calf grouping system developed by the farmer, in which calves are grouped at a young age. They are monitored and have access to an outside area from a young age, allowing them to freely express natural behaviour. The calves are monitored frequently to detect any emerging health issue early on, as well as to monitor the quality of colostrum, feed and forage. Participants were also impressed by the farmer's calmness, enthusiasm and pride, by his consistency in what he is doing, and by his positive attitude and willingness to adapt his farm to improve animal welfare. However, some attendees argued that the farmer actually spends a lot of time taking care of the calves; others suggested that there could still be room for further welfare improvement. Participants were also surprised by the relatively high milk yield per cow in this organic farm, which is achieved thanks to the high health status of the whole herd.



'Hohls Becklingen GbR' pig farm: breeding and fattening

This farm impressed most participants because of the combination of a high level of animal welfare with a low environmental impact and good financial outcomes. Participants expressed their interest in the large pens for farrowing sows with temporary cage confinement and the large straw-bedded pens for fattening pigs with outdoor access, providing pigs with a lot of room to move, explore and express their natural behaviour. Productive performances were found very good in terms of low piglet mortality, low aggression, high average daily gain (i.e. around 1 kg/d). Participants were also impressed by the circular bioeconomy driven by the farmer, as the farm is energy self-sufficient due to the solar energy and biogas production on the farm. They also enjoyed the positive attitude of the proactive, competent, engaged and motivated pig producer and his willingness to develop and change and awareness of the need to do so. Participants liked the way the farmer keeps pigs with undocked tails and is rewarded economically for that, although they are sceptical about the possibility of keeping pigs with intact tails without such a reward. In this regard, regional differences were highlighted in governmental rewards to farmers for higher welfare.



'Biohof Schieren Eichen' laying hen farm

This farm was found interesting by most participants because of its considerable efforts to improve animal welfare. The first good impression from participants was the beautiful landscape of the well-managed outdoor runs where many nut trees are spread to offer shelter to birds and protect them from predators (i.e. hawks, foxes). Most attendees were impressed by the way the farmer managed to change genetics from a brown to the 'Isabella' white strain, which is likely to reduce mortality, due to predation, and increase productivity and reduce environmental impact (i.e. lower CO₂ emissions). However, some participants observed frequent feather pecking injuries, which may be due to the fact that the hens have not undergone beak

trimming treatment (i.e. prohibited in organic production) and which could be influenced by high stocking density in certain areas within the stables. Others were struck by the large investments for new stables, which can be risky in current times of market instability and high inflation. Most participants were impressed by the innovative marketing approaches, such as sales at local markets, the direct sale and the production of pasta (i.e. egg noodles) as an alternative farm production.

2.7 Interactive session: Voices from participants

Participants were asked what innovative idea or best practice they would like to share, based on their experiences in previous or current projects. They were invited to discuss these with interested attendees. The breakout session led to the formation of 8 groups of participants, whose main topics of discussion can be summarised as follows:

- > Group 1: **Genetics of some species can help in the transition to cage-free production systems and in improving sustainability and resilience of animal production.** Five different dimensions are considered: Sensing, analysis, genetics, labelling, bioclimatic design. How can one use sensors to monitor animal behaviour and emotions, e.g. Artificial Intelligence (AI)? How can one ensure that monitoring is truthful and not tricked? How does one integrate data from different sources? **How does one align different production systems and data with a labelling system? Are there possible systems leading to automatic labelling?** Should we pursue a standard similar to that of organic farming?
- > Group 2: Despite the tools offered by digitisation today, it is still difficult to **use animal welfare indicators and translate them into practical information for farmers' real lives.** Farmers need to be heard by their stakeholders (i.e. citizens, consumers, advisors, other actors in the livestock supply chain, retailers, NGOs, policymakers) and it is important that their knowledge is shared. **Mutual understanding between farmers and consumers should be enhanced so that farmers can better meet consumer expectations and market demand for more animal-friendly food and become more keen to improve animal welfare on the farm.** Farmers claim that they are constantly challenged by the European Union; some laws are necessary but, in some cases, they can lead to farmers giving up their business. It is not only the quality of life of the animals that should be improved but also that of the farmers, according to the 'One Welfare' concept.



- > Group 3: There is a **need to look for new indicators to measure automatically**, to get a whole picture of an animal's welfare. Furthermore, linking data to each other and to existing databases is of the utmost importance. **Efficient schemes to monitor the production chain and measure animal welfare are needed as it is not possible to control and eliminate something that is not monitored.** AI has the potential to provide solutions with regard to animal welfare monitoring.
- > Group 4: There is a **lack of harmonised systems between EU Member States for monitoring animal welfare.** 24-hour cameras in combination with AI can provide solutions. There are already devices and solutions on the market for this. The future of such kinds of technologies is promising. A number of start-ups already exist but attention should still be paid to the accuracy of the data obtained with these systems.
- > Group 5: How can one measure, analyse and process animal welfare data, also using AI and taking into account the farmers' welfare, according to the 'One Welfare' concept? Different species need different indicators. The main challenges for a good transition are money and time. **The market is important as a driver for improving farm animal welfare.** Both harmonised labelling and the consumers' willingness to pay for animal-friendly food can be helpful. However, **attention should be paid to differences between regions, citizens, who may have wishes, and consumers, who are the actual buyers.** Harmonisation of welfare standards is necessary for producers, investors, citizens and consumers, taking into account that the **market is global, not just European.** **Financial incentives for better animal welfare** can be effective to support farmers in switching to cage-free and animal-friendly housing systems. **Trade-offs and synergies between animal welfare and environmental impact** should be considered too.
- > Group 6: An open strategy is welcome to achieve welfare goals, accepting bottom-up standards, the measurements of which should be based both on the analysis and measurement of the environment in which the animals are kept (i.e. resource-based indicators) and on the observation of the animals themselves (animal-based indicators), taking into account their needs. **Animal-friendly food production should be more decentralised, to more small and medium-sized farms instead of fewer, larger intensive farms, and distribution should be more at the local/regional level.** Innovation efforts to improve animal welfare should also focus on animal genetics and sustainability of production rather than merely on high levels of production.
- > Group 7: How do we use the knowledge, how do we promote it and **how do the results reach the farmers or remain in the research community?** What is the best method to measure animal

welfare and happiness? New sensors? How can one evaluate the human-animal relationship? Are there other good practices? Which tools should be used?

- > Group 8: The **exchange of knowledge between farmers makes them more experienced, stronger, more innovative and it helps them learn from others.** To this end the importance of cross-border experiences is emphasised.

The following innovative ideas and best practices were collected on the 'Inspirational wall' in relation to the three main topics.

Cage-free production systems

The participants stressed the importance of initiatives like the '[Best Practice Hens](#)' and the '[EU PiG](#)' European projects to share best practices of cage-free systems for laying hens and for farrowing sows across the EU. The practice of monitoring calves kept in groups from an early age (e.g. calves not responding to feeding stimuli indicates health/welfare issues) was also highlighted as effective to avoid or limit the individual housing of new-born calves and improve social contacts calf-to-calf.

The use of different genetics for different keeping methods was recommended to improve animal welfare, productivity and environmental sustainability (e.g. white genetics for laying hens in free-range and organic farming). Shelters, trees and bushes spread on free-range for laying hen farms can also be exploited to effectively improve birds' protection outdoors and to reduce mortality from predators. The innovative practice of virtual fencing (i.e. electric collars) for cattle was mentioned as being useful to improve grazing management and animal welfare, compared to stationary electric fencing.

Soft bedding materials and automatic brushes for loose-housed dairy cows were recommended for lower udder infection and better laying comfort, cow cleanliness and better animal health.



Lighting management was also mentioned as an important practice, because it affects animal welfare in intensive farms (i.e. natural/artificial, light intensity, photoperiod, light spectrum). Further research is welcome to better understand the effect it has on different species and the best way to improve it in practice.

Finally, the participants underlined the importance of farmers' networks and communities to support farmers and to share innovative experiences and best practices for cage-free systems. They recommended the use, among the communication channels, of social networks and storytelling on the web to exchange knowledge and to support farmers in switching to innovative animal-friendly husbandry systems.

Indicators and monitoring methods

Innovative ideas about animal-based indicators were proposed and discussed by most participants in this session. All agreed that indicators are useful to observe animals and gain a better insight and understanding as to how to improve animal welfare management. A French tool to measure and communicate animal welfare on beef farms was developed by the [Boviwell national project](#), in agreement with farmers who were involved in the choice of the animal-based indicators.



Keeping pigs with long/undocked tails is considered as a good way to ensure good animal welfare, if the housing system and farm management are suitable to avoid/limit the risk of tail biting. For this reason the pig's undocked tail without bites is considered at slaughter as an 'iceberg indicator' for good pig welfare. Some indicators already exist to focus the welfare assessment on the animal behaviour (e.g. Qualitative Behaviour Assessment) and new animal-based indicators to assess "positive animal welfare" are being studied (i.e. [LIFT cost action European project](#)). The use of data-driven monitoring solutions and integration of data from different production phases were considered as useful to get a good picture of animal welfare management and of how to provide stakeholders with suitable analytics.

AI-validated tools can be developed to measure, detect, predict and manage animal welfare issues and diseases; thermal cameras and autonomous sensors can be used for animal monitoring. A number of start-ups already exist to analyse animal behaviour and sound through visual image and sensor analysis (e.g. [Vetvise](#), [Futuro Farming](#), [Wolution](#), [Pondus](#), [SoundTalks®](#)). Some participants also proposed to correlate animal-based indicators and analytic parameters (e.g. stress hormones in hair/fur/wool or saliva to ensure objective assessment). The dairy livestock sector is the one in which Precision Livestock Farming is used the most (e.g. to prevent mastitis and other diseases).

However, some attendees pointed out that conventional intensive farms can provide animals with good or even better welfare results, compared to organic farms, when using animal-based indicators. Furthermore, some participants recommended a holistic approach in integrating animal welfare data with farm management data to improve farm control and sustainability.

Welfare labelling and certification

The participants highlighted and discussed some existing animal welfare certification and labelling schemes, including welfare standards, above the minimum requirements of EU legislation and below the organic standards (e.g. [WelFair](#), [RSPCA Assured](#), [Beter Leven](#)). One participant also mentioned a pilot pig welfare scheme for the Consortium of Parma ham developed by the [PARSUUT OG \(IT\)](#).

Some participants mentioned in the discussion that animal welfare certification and labelling schemes can include the use of sensing and Internet of Things for their own operation. In this case, data space and data sovereignty assume great importance for farmers and the food chain. Farm subsidies/tax for enhanced animal welfare could also be linked to labelling systems to ensure farm viability. Marketing strategies looking for customers of products with additional value of high welfare (i.e. in the local market) were considered very important to ensure a fair income for farmers.

The participants stressed the importance of improving citizens' education and consumers' information on all steps of animal production systems for a better understanding of animal welfare labels.

Two initiatives were introduced in the discussion, as examples of effective communication and promotion of animal-friendly products:

- > [Kalverliefde](#) ('love for calves') is a brand of milk from farmers with calf-cow contact;
- > ['Milk of happy cows'](#) is a project to improve communication of animal welfare in dairy products.



2.8 Interactive session: Challenges and solutions

The 'fish bowl' methodology was used to explore and identify the main challenges and potential solutions in the three main workshop topics.

Cage-free production systems

Challenges

Livestock farmers are pressed by society and are increasingly challenged with new restrictive regulations, including animal welfare rules that affect their business and income. Social media are full of information about how livestock farming is bad. Additional demands from society for more animal-friendly production can make the lives of farmers more difficult but can also lead to more market space for cruelty-free food and animal products. Farmers need security and a stable income to be able to decide to make investment decisions. For instance, farmers need to know what is going to happen in ten years and they also need economic resources to invest in new cage-free and animal-friendly systems. Some participants also argued that now is not the best/right time for farmers to make new investments due to the current economic and environmental crisis.

It was pointed out that there is a lack of knowledge about the right space allowance and design that cage-free pens for farrowing sows should comply with. Pig farmers also need to learn how to design new farms and/or how to renovate their farms to enlarge farrowing pens and maintain the same (or improved) farm production levels. Participants also stressed the need for more knowledge on the environmental impact of new cage-free and animal-friendly farming systems to ensure that animal welfare improvements do not affect the environmental sustainability of livestock systems in a negative way.

Another important challenge for European farmers is the competitiveness of the EU livestock sector in the international market. Farmers are concerned about the unfair competition of cheaper animal food and products that are imported from third countries with lower animal welfare standards. Participants were of the opinion that consumers should be informed and aware of this issue so that they can make an informed purchasing choice. Furthermore, there is no certainty that consumers are ready and willing to pay for the extra price that society demands for enhanced animal welfare. Higher production costs, due to mandatory improved animal welfare and due to price volatility, should be covered by consumers or the government (e.g. for keeping pigs with undocked tails).

Finally, some attendees pointed out that the advisory system in most EU countries is not prepared enough for the transition of livestock

farms to cage-free farming systems. In addition, most farmers are ageing and reluctant to take advantage of advisory services. Whereas they are poorly motivated to invest time and money in the transition, young farmers have the energy to tackle new problems.

Solutions

Participants discussed and agreed that the EU's move to cage-free farming systems would benefit from the creation, at the right time, of a social and economic environment that is conducive to change without pushing farmers out of business. Effective solutions of cage-free housing systems, including innovative solutions that are already being implemented by farmers, should be scientifically tested and then scaled up. Demo pilot farms can be a good way to disseminate best practices for cage-free farming systems.

Assessing the technical and economic feasibility (e.g. farm income, cost and return of investments) and the environmental impact of new welfare requirements will help farmers and policymakers to make good choices. New solutions could be designed by including the Internet of Things. Farmers could be convinced that better welfare is beneficial to them, according to the 'One Welfare' concept, and that it can improve their incomes through farm subsidies or via the market. Farm subsidies could come from tax payers, be paid directly through the first CAP pillar for animal welfare and support the return on investment for switching to cage-free housing systems. It was also mentioned in the discussion that smaller livestock farms, adopting more welfare-conscious farming systems, could meet the demand for meat from more sustainably reared animals. Participants agreed that consumers and policymakers should be better informed about the good that EU farmers who are aware of welfare are doing and how they are improving animal welfare.

Some participants also suggested creating stronger links between farmers in different situations and regions and establishing an advisory network at European level, aimed at promoting networking and the multi-actor approach, training advisors and creating.

Indicators and monitoring methods

Challenges

The participants' discussion revealed a lack of harmonised and compatible indicators and data systems to measure, monitor and report animal welfare improvement across the EU Member States, and to relate with other systems outside the EU. Indicators are needed, particularly to monitor animal health and welfare in new or improved animal-friendly housing systems.



Important challenges for the development and utilisation of animal-based indicators are related to the need for human and economic resources to validate them and the need to train assessors/auditors. AI can also be used for this purpose although it needs specific training because, in most cases, advisory support for farmers is weak on digitalisation. Furthermore, old farmers may be reluctant to changes and only a few young farmers are replacing them, creating problems of succession and continuity in farm management.

Solutions

One of the most well-known animal monitoring systems, including animal-based indicators, is the Welfare Quality® protocol. It is available and can be used to assess animal welfare and provide advice to farmers. Animal welfare issues are complex and include animal health, so a combination of feasible and scientifically valid and reliable indicators is needed to monitor and control them.

For instance, it was pointed out that the analysis of the gut microbiome is a good indicator of animal health, welfare and mental state. Feed supplementation can change the microbiome in a beneficial direction. Biomarkers in saliva can also be analysed to assess animal welfare. They can be used as additional proof for welfare labelling. However, agreement is needed on a combination of measures and on constant welfare improvement within the system. Someone suggested also using the existing indicators. On the farm, we routinely already collect data on animal health status, diagnoses, antibiotic use and productivity. Farm benchmarking can also improve farmers' awareness on welfare levels at his/her farm by comparing it with other farms. A systemic approach is recommended to study new animal-friendly farm systems globally, also considering other aspects of farm sustainability, from different perspectives, including climate mitigation and adaptation. The attendees recommended only using measurable and transparent indicators to collect data from existing data systems and integrate them into animal performance systems. AI, the Internet of Things, digitalised registers and smartphone apps can be used to provide tangible results for farmers' use. For instance, the Internet of Food Alliance has created synergies between its participants and civil society in order to develop new digital products and services.

Labelling & certification

Challenges

The participants recognised the concomitant existence of too many different animal welfare certification and labelling schemes in the EU market, leading to misunderstandings and confusion for consumers. In principle, welfare labelling should be reliable, as many labelling

systems are statement-based and not documented. However, some participants believe that market power relies more on retailers than on consumers themselves, and that consumers cannot know all the information behind all labels. This is the reason why retailers are likely to have the power to steer the system. At the same time, the holders of labelling and certification schemes must also avoid so-called 'welfare washing', or false, misleading or untrue actions or sets of claims made by an organisation about the positive impact that a farm, company product or service has on animal welfare.



The participants discussed and highlighted the considerable importance of consumer confidence in the certification system. For instance, organic certification was claimed as not always being able to guarantee better animal welfare compared to intensive farming. Labelling and certification could be linked to public economic incentives to cover the extra cost of welfare improvement, at least during the transition period. In this case, the coordination of such subsidies across EU Member States would avoid unfair competition between EU farmers. Finally, the participants underlined the lack of knowledge and skills of most EU farmers in marketing and communicating the value of animal-friendly products.

Solutions

Labelling and certification can be the economic push for changing to more animal-friendly livestock systems, in synergy with new legislation that includes scientifically verified requirements. However, not all retailers are open to new steps towards animal welfare certification and labelling. One of the most effective solutions that emerged from the discussion is to establish credible, scalable, comparable and interoperable certification systems amongst countries through a multi-actor approach. To this end, it was suggested that different levels of animal welfare quality should be introduced into the new labelling system (e.g. Beter Leven). Retailers should pay farmers a fair share of the value of animal-friendly products for fulfilling their requirements.



An animal production recording system that is connected to an EU-wide harmonised animal welfare benchmarking and labelling system was discussed and considered as a good solution for continuous improvement. An integrated approach was also suggested to certify and label animal welfare, while taking into account environmental issues, profitability for farmers and considering low input/extensive farming systems. Data related to animal health (e.g. antimicrobial use, vaccination programmes) and feed quality control, as accepted by farmers, can be linked and included in labelling and certification schemes. Furthermore, animal welfare and environmental protection requirements could even be combined in a single label, based on a sustainability index.

The processing industry should also be involved in the certification process to support changes towards better animal welfare, especially when linking animal welfare with product quality. CAP eco-schemes are a good example of subsidies for farmers who join voluntary, audited certification schemes for animal welfare. Another policy that can support changes in consumer attitudes towards informed purchasing is the education of consumers, from childhood onwards, about the legislation baseline of animal welfare and about upgraded certified and labelled standards. The 'Milk from happy cows' project (Azores) is a good example of effective communication for consumers and stakeholders of the animal welfare value in animal products, including food origin. Selling animal-friendly products at more profitable prices in local and regional markets, rather than in national or international ones, was considered as a good solution to ensure better income for farmers.

Posting and sharing videos and evidence-based positive content on social networks and channels about the good things that farmers do to ensure and improve animal welfare was considered as a good strategy to open farms up to consumers, to avoid false claims and to ensure that they are not being secretive about what is going on. Knowledge about best practices for certification and labelling could be shared between farmers (e.g. through practice abstracts) within farmers' and advisory networks. Participants also stressed the importance of training assessors and auditors to ensure a reliable control of welfare labelling and certification.

2.9 Interactive session: Research needs from practice

The participants were split into small groups of three (i.e. one farmer, one researcher, one from another profile) to explore and identify the main 'research needs from practice'. 27 'research needs from practice' were collected and voted on by participants, resulting in a ranking

of ideas, sorted by importance and by how urgently they needed to be addressed.

Most of these (56%) address the topic 'Indicators and monitoring methods', followed by 'Cage-free production systems' (33%) and 'Welfare labelling and certification' (22%), and some of them tackle more than one topic.

However, the first seven ranked research needs received more than half (52%) of all votes.



Two of them are focused on the need to better investigate the *differences of product quality and environmental impact between conventional/intensive and organic/less intensive farming* (e.g. in terms of food nutritional properties, greenhouse gas emissions, water pollution). These two research needs, affecting all livestock sectors throughout Europe, together received 17% of all votes. The need for a more holistic approach, including synergies and trade-offs between animal welfare and environmental impacts, is addressed by two other top 7 research needs, which are: *to measure emissions and all environmental impacts of innovative farming systems and to transfer the knowledge and apply science to everyday practice considering all affected factors, such as society, human health and environment*.

The other three top 7 research needs, accounting for 22% of the votes, are focused on 'Indicators and monitoring methods' and are about *monitoring welfare and productivity, investigating their links with farm profitability and the development of new indicators of 'positive welfare'* (i.e. not only indicators of negative welfare due to mistreatment) and *the use of IT technology and AI*.



In addition to the above research needs:

For **'Cage-free production systems'**, the participants stressed the importance of finding more adaptive and resilient genotypes under different systems, providing farmers with decision support tools and evidence of a cost/benefit analysis of renovating existing facilities and of building new facilities for cage-free systems. More knowledge on feasible cage-free systems for minor species (e.g. rabbits) is also needed, taking into account their socio-economic impact and effective solutions to control parasites and predation in cage-free/outdoor systems.

As regards the other research needs related to **'Indicators and monitoring methods'**, the participants underlined that animal welfare indicators should be correct, reliable, harmonised and validated in practice, in pilot farms, in collaboration with farmers and advisors to evaluate and monitor animal welfare. Indicators should be selected in agreement with the majority of stakeholders, considering the value of the results, their impact on the animal welfare assessment outcome, compared to other indicators, and considering the cost to use them. However, someone suggested that research should focus on a few effective 'iceberg indicators', to be collected in a continuous and harmonised way, in order to monitor all herds and efficiently identify those with poor welfare. This approach would save the limited resources of competent authorities, allowing them to focus their control activities more on bad farms with the most animal welfare problems.



ICT, AI and big data can be used to develop monitoring systems to improve farm welfare conditions and productivity over time, to compare them with other farms nationally or internationally (e.g. benchmarking) and to provide farmers and their employees with training and information tools to teach them about new animal

welfare skills and work routines. Data from various sources could be combined and their use could be optimised for new information and the development of decision support tools for farm management.

New innovative research is also needed to improve **'Welfare labelling and certification'**. Effective tools and communication channels should be developed and used to inform citizens and consumers about livestock production methods and animal welfare standards and to educate stakeholders at every step of the chain, including: replacement of workers, information/dialogue with society/citizens, renewable/generation shifts in agriculture.

For developing labelling and certification schemes, the participants stressed the importance of understanding how much retailers and consumers are willing and able to pay for specific measures to improve animal welfare. Another need for further research and innovation is about standardisation of key figure calculations to compare animal welfare across different countries and certification schemes. Discussion, via round tables, of what changes are necessary in the livestock industry could help to take into account the needs and expectations of consumers/farmers/researchers.

Finally, another research need was pointed out about investigating the extent to which small farms, operating within [Community Supported Agriculture](#) (CSA model), could secure better animal welfare compared to large farm operators.

2.10 Interactive brokerage session: Idea and project exchange market

Ideas for future collaborations and networking possibilities from breakout groups were captured on ten flipchart sheets. New ideas were proposed and discussed by eleven groups of participants, for instance to face the challenges of cage-free and loose housing systems for pigs and calves, and to support pig farmers in raising pigs with long/undocked tails; to assess positive welfare by means of existing and new animal-based indicators. Collaboration and networking to use digital technologies (i.e. sensing, AI) and the [Hazard Analysis and Critical Control Points \(HACCP\)](#) approach for monitoring animal welfare were also proposed and discussed. Another promising idea was about using animal welfare data in connection with environmental and productivity farm data to optimise the use of resources and pursue the whole sustainability of livestock farms.

- › **'Free farrowing systems for lactating sow and piglets'** were discussed in relation to space allowance, sow productivity, slatted flooring and slurry management. The next step would be to study solutions for low-cost systems for producers and learning from other experiences/challenges and opportunities of producers.



- › **'New housing for calves'** was proposed to network and exchange common projects and best practices across EU countries, taking into account the incoming EU regulation about cattle welfare. The idea is to identify the related welfare issues such as the fibre and iron content in feed, the group size, sex and age and cross-suckling management and building up a network of reference farms in different EU Member States.
- › **'Indicators of positive welfare'** were proposed to develop new indicators for a number of livestock species to determine when they are happy. For instance: social play, playing with straw and self/social grooming for pigs; curiosity, play behaviour for grazing cattle; jumping, running, kicking hind legs for dairy cows when releasing from indoor housing to pasture. 'Qualitative Behaviour Assessment' (QBA) is a welfare indicator of the Welfare Quality® protocol to assess the 'positive emotional state' in cattle, pigs and poultry. The idea is to test and validate QBA for other species.
- › **'Sensors and AI for monitoring animal welfare'** and the 'Use of deep learning for video analysis of behaviour' were two similar ideas for further research and collaboration to identify the welfare problems that need to be tackled and the related research needs in terms of types of data, the way the data should be collected on the farm and the type of technology available for this purpose.
- › **'Long pig tails'** was proposed to investigate best practices for rearing pigs with long/intact/undocked tails without risk of tail biting outbreaks. Participants discussed management practices, such as the use of jokers/novelty and straw for environmental enrichment, feed integration with fish meal, changing pens, sanitary status, housing conditions and ideal group size. Currently, these practices are addressed by a Dutch project. The next step is to develop a technology to control tail biting through the early identification of biters and victims.
- › A **'Proactive welfare programme'** was proposed to monitor animal welfare according to the HACCP risk assessment methodology, to provide alerts "before something happens" and to recommend effective and affordable interventions to avoid or reduce specific animal welfare risks. Such an animal welfare and health programme could be part of a quality scheme to provide chain actors with transparent quality data.
- › **'Transnational Operational Groups (OG) for sharing animal welfare best practices'** was the idea to investigate differences between farming systems across EU countries and look for collaboration from countries with specific experience facing specific animal welfare issues. Proposals for new applied research projects could start from existing OGs and projects showing animal-friendly farming systems. An example is a pilot project run by the Estonian government to integrate productive data with daily recorded animal welfare data to improve both welfare and farm efficiency. The first step is the farmers' engagement, followed by sharing challenges and innovation needs, looking for sources of knowledge and good practices, farm visits, farmer workshops and follow-up as an ongoing process. The next steps for future collaboration are: finding partners, facilitators and economic resources; setting goals related to the welfare issues under consideration; exploring affordable practical solutions; identification and dissemination of best practices.
- › **'Slaughtering at the farm'** was another idea that, even if not likely to be permitted by European rules for all animals, is allowed in some countries for certain species (i.e. Germany, Switzerland). Slaughtering on the farm is considered as an animal welfare best practice because it avoids the stressful conditions of animal transport and pre-slaughtering. However, the slaughter facility must comply with EU rules on food safety and on the protection of animals at the time of killing. In France, it is considered a big issue for which 30 farmers' groups are working on a solution. The next step for the future would be a European project to learn from each other in a number of EU countries, find solutions to the difficulties, promote this practice and develop a local market for the meat of animals slaughtered on-farm.
- › **'Egg and people'** was about involving people with disabilities in working with laying hens and egg production. This idea is applied in the Netherlands. There was a question and discussion as to whether something similar exists anywhere else or if there is an interest in replicating it in other countries.
- › **'The future of the EU's food production'** was focused on the need to balance animal welfare with production and environmental sustainability. As food safety is an EU and national issue, livestock systems should use plants and products that humans cannot use, to avoid competition between feed and food production. More vegetal proteins will be used in the future to feed humans, so intensive farming can provide good animal welfare but the use of resources should be optimised.



3. Wrapping up

At the end of the workshop all attendees were asked in plenary what they were taking home. The responses were all very positive. The participants liked the opportunities they had received to get in touch with new people and learn new ideas, helping them in their work. The quality of the farms visited and the workshop presentations was also very much appreciated by most of them.

Some of them replied that they had learnt more about creating new models with farmers and identifying and reducing gaps between scientific knowledge and farm practice. They stressed the need to take into account farmers' concerns and perspectives and to also look for the social sustainability of livestock farming.

The importance of exchanging experiences was found very important, but it was also suggested that more farmers should be involved in these kinds of events. The outcomes of this workshop were considered very important insofar as the EC may refer to them in future policies to improve animal welfare.

One participant expressed gratitude for the workshop and pointed out that a large number of issues discussed in this workshop could be discussed further at national and regional level, to learn more about how to handle the animal welfare issue and create awareness about it.

Finally, all participants enjoyed the good atmosphere and the type of platform that was created during the whole workshop to facilitate the discussion and collaboration between participants.

The EC representatives thanked all participants, the speakers, the organising committee, the German CAP Network and German Network Fokus Tierwohl for hosting and supporting the event on site, and the EU CAP Network team for organising the workshop. They also invited the participants to stay in touch and share innovations through the 'Support Facility for Innovation and Knowledge exchange | EIP-AGRI'.



4. Conclusions

Animal welfare today is one of the hottest issues in the public debate in most EU countries, whenever the quality and sustainability of food from livestock systems is being discussed. For this reason, the EC is committed to revising the EU's animal welfare legislation in the near future, including a ban on cage-farming systems for certain species, and to consider options for animal welfare labelling. This 'Animal Welfare and Innovation' workshop was organised by the EU CAP Network. Its aim was to focus on the main challenges for the EU livestock sectors and to exchange knowledge, best practices and innovation needs in relation to cage-free production systems, animal welfare indicators and monitoring methods, and welfare labelling and certification. The discussion was partly dominated by the expectations and concerns of participants about the incoming update of the new animal welfare legislation.



For **cage-free production systems**, participants identified the current lack of security and stability of farmers' incomes that is needed to let them make investment decisions. For instance, farmers need to know what is going to happen in 10 years and they also need economic resources to invest in new cage-free and animal-friendly systems. Some participants argued that now is not the best/right time for farmers to make new investments due to the concurrent economic and environmental crisis and that there is no certainty that consumers are ready and willing to pay for the extra price that society demands for enhanced animal welfare. Furthermore, most European farmers are relatively old and more reluctant to make changes than young farmers. However, European and national projects, networks and platforms for sharing innovative, effective and affordable best practices for cage-free and outdoor/extensive farming were discussed and proposed by participants as solutions to overcome these challenges.



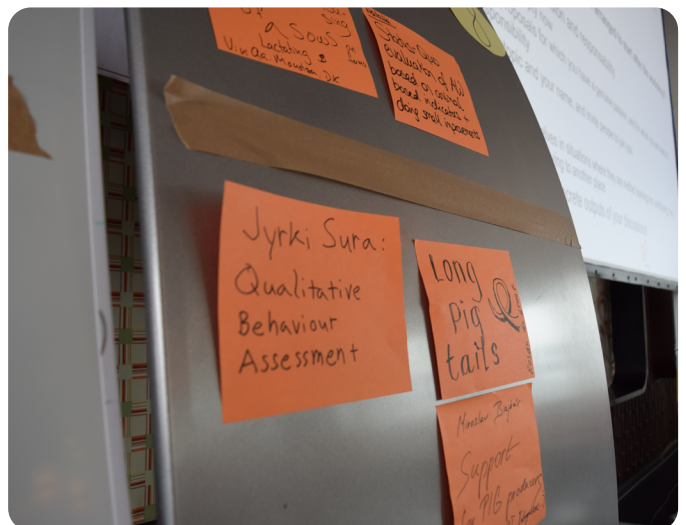
Best practices, including innovative solutions that are already implemented by farmers, should be scientifically tested and then scaled up; for this purpose, demo pilot farms can be effective to show and disseminate successful best practices and to train farmers and advisors. Genetic strains and breeds of some species could also help farmers in the transition to cage-free production systems to improve the sustainability and resilience of animal production.



For **animal welfare indicators and monitoring methods**, the lack of a harmonised system for monitoring animal welfare across the EU Member States and comparing different farming systems (e.g. conventional vs. organic) was pitched as a major challenge for all stakeholders. More animal-based indicators are also needed to directly and reliably assess the welfare conditions of animals on the farm, beyond assessing the resources available for them (e.g. space, flooring, feed, water). Considerable interest was expressed in existing and new indicators of positive welfare, reflecting the animal's emotional state through the evaluation of behavioural patterns. Important challenges for the development and utilisation of animal-based indicators were related to the need for human and economic resources to validate them and to train assessors/auditors. Most participants stressed the need for a combination of valid and reliable indicators to monitor and gradually improve animal welfare in different farming systems, although some of them also suggested focussing welfare assessment on a few effective 'iceberg indicators', to be collected in a continuous and harmonised way for monitoring all herds and efficiently identifying those with poor welfare. To overcome these challenges, attendees recommended only using measurable and transparent indicators and linking welfare data with animal health and performance data from existing data sources to provide farmers with outputs that are useful for improving farm management in practice. Farm benchmarking, for instance, can improve farmers' awareness about the welfare level on their farm by allowing them to compare their farm with other farms. Digitalisation also has the potential to

provide solutions for monitoring animal welfare along with monitoring farm performances, animal health, food quality, productivity and economics. However, this requires specific training for farmers and advisors.

Participants clearly pointed out the importance of animal welfare **labelling and certification** in the EU market as an economic drive for changing to more animal-friendly livestock systems in synergy with a new legislation that includes scientifically verified requirements. However, attention should be paid to the differences between regions, citizens (who express certain wishes) and consumers (who are the actual buyers). In principle, welfare labelling should be reliable, as many labelling systems are statement-based and not documented. Attendees also recognised the concomitant existence of too many different animal welfare certification and labelling schemes in the EU market. This can lead to misunderstandings and confusion in consumers. At the same time, they underlined the general lack of knowledge and skills of many farm operators in the livestock sector in marketing and communicating the value of animal welfare. Solutions were proposed, such as considering different levels of animal welfare quality in the new labelling system. Importantly, retailers should be ready to pay the farmers a fair share of the value of animal-friendly products for fulfilling additional welfare requirements. An integrated approach was suggested to certify and label animal welfare, also taking into account environmental issues and farmers' profitability, considering low input/extensive farming systems. Financial incentives for farmers (i.e. CAP subsidies) could cover the extra costs for welfare improvement, at least during the transition period. In this case, the coordination of subsidies across EU Member States should avoid market distortion due to unfair competition between EU farmers. Once again, digitalisation has the potential to provide evidence for animal welfare labelling and certification schemes and to provide farmers with training materials and stakeholders with suitable information and analytics.



Attendees emphasised the need to study the differences between intensive/conventional and less intensive/organic farming systems in terms of animal welfare, product quality and environmental impact as one of the most urgent research needs from practice, to better understand and improve animal welfare. They also mentioned 'monitoring of animal welfare together with farm productivity and profitability', 'new positive welfare indicators' and 'information technology and artificial intelligence' as other important areas of research to be further explored in the near future.



Finally, the participants acknowledged the need for mutual understanding between farmers and citizens so that farmers do not give up their activity and would become more keen to improve animal welfare, based on consumer expectations and market demand for more animal-friendly food. The huge importance of farmers' networks and communities was stressed, to support farmers and share innovative experiences and best practices for cage-free systems. The use of social networks and storytelling on the web was recommended to exchange knowledge and to support farmers in switching to innovative animal-friendly husbandry systems. At the same time, the participants agreed that another policy that can support changes in consumer attitudes towards informed purchasing is the education of consumers, from childhood onwards, about the baseline of animal welfare and upgraded certified and labelled standards. However, the capability of EU farmers to cope with the incoming changes of the EU's animal welfare legislation is likely to depend on how big this change will be, in terms of economic impact, and depending on how much the market will pay for more animal welfare-friendly products.



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