

ONE Planet

ADVANCING ANIMAL WELFARE TO MEET SUSTAINABILITY TARGETS

Summary

Sustainability is considered to be composed of three conceptual pillars: economic, social and environmental. Farming systems are under pressure to reduce their environmental impact, but must remain economically viable and be socially acceptable. There are growing societal demands for animal production systems to be more sustainable, safeguarding both the environment and the welfare of animals. We need to produce animal-sourced food with improved animal welfare and less environmental impact. The Farm to Fork initiative and the One Health ambition recognise that there is a need to improve farmed animal welfare, which in turn will lead to an improvement in animal health, reducing the need for medication, helping to preserve biodiversity and raising the quality of food. However, it is not yet known how to deliver sustainable food animal production systems, nor how to measure progress towards this goal and what compromises might have to be made along the way. In this session, we will examine the relationship between animal welfare and sustainability in the various animal husbandry systems, describing challenges and potential solutions. Also, we will consider sustainability assessment tools that have been developed to gain insight into the sustainability performance of animal husbandry systems, including animal welfare, with a view to assessing their potential future role in regulatory science.

Vision

Sustainability is considered to be composed of three conceptual pillars: economic, social and environmental. Therefore, for animal husbandry systems to qualify as sustainable, they should be profitable for producers, acceptable to society at large and not harmful to the environment. Both the Farm to Fork initiative and the One Health concept recognise the importance of improving the welfare of farmed animals for better animal health, higher food quality, reduced antimicrobial resistance and improved preservation of biodiversity. Improvements to the living conditions of livestock however do not necessarily result in positive environmental impacts or vice versa. Citizens are demanding changes, for example, with the “End the cage age” citizens’ initiative that seeks to end the current practice of keeping livestock in cages, crates and individual pens. Current policies and initiatives recognise this by underlining that in order to be socially acceptable, future livestock production systems will have to improve the welfare of animals. Various on farm welfare assessment tools have been developed with a view to ensuring the three pillars of sustainability are upheld, and which could be used in the future to regulate the production of animal-based foods.

Background – Challenges and opportunities

According to the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, a sustainable food system can be defined as "a food system that delivers food security and nutrition for all in such a way that the economic, social and environmental bases to generate food security and nutrition for future generations are not compromised". Farming systems are under pressure to reduce their environmental impact, but must remain economically viable, be socially acceptable and not harm the environment. We need to produce animal-sourced food in a way that ensures higher animal welfare and protects our environment. We must also become less dependent on pesticides, fertilizers and antimicrobials, and reverse biodiversity loss. Indeed, better animal welfare improves animal health and food quality, reduces the need for medication, and thereby the threat of antimicrobial resistance, and can help preserve biodiversity.

Citizens are demanding changes: the End the cage age citizens' initiative is calling for the end of cages, crates and individual pens in animal husbandry systems. Similarly, the European Council, in 2019, emphasised that good animal welfare is an integral part of sustainable animal production and stressed the need to improve the welfare of animals in the context of the transport of farm animals. Also in 2019, the European Parliament said animals should be slaughtered at the nearest possible slaughter facility, thus limiting the need for animal transport and reducing environmental impact. The European Commission, in turn, has started an evaluation of the legislation covering the welfare of animals kept for farming purposes to include laying hens, calves, pigs, chickens kept for meat production, animals during transport and at the time of killing.

In addition, the European Economic and Social Committee has called on the European Commission and Member States "to develop a clear EU policy and implementation plan for building a sustainable, resilient, healthy, fair and climate-friendly food system, which encourages cooperation and mutual understanding among all stakeholders along the food supply chain. Better coherence and integration of food-related policy objectives and instruments (e.g. on agriculture, environment, health, climate, employment, etc.) must be ensured taking into account the three pillars of sustainability".

Sustainability assessment tools have been developed to gain insight into the sustainability performance of animal husbandry systems including animal welfare. The assessment results could potentially be used by risk managers, risk assessors and farmers themselves to assess performance and progress. However, the validity and reliability of such sustainability assessment tools has been uncertain to date. On farm welfare assessment tools may be implemented in the future however as a

constituent component of regulatory science to regulate food animal production with a view to ensuring the three pillars of sustainability are upheld.

We have an opportunity to implement changes regarding both animal welfare and the sustainability of animal husbandry systems for all farmed animal species. The next step is to explore what changes are needed and how to measure progress towards sustainability.

Scope and objectives

The thematic session will investigate the relationship between animal welfare, in all food animal production systems, and the three pillars of sustainability (economic, social and environmental) with a view to identifying challenges and potential solutions for animal farming, thus helping us move towards a more sustainable production of food from animals.

More specifically, the thematic session aims to explore:

- The impact of animal welfare on the 3 pillars of sustainability (economic, social and environmental), and vice versa, as well as the challenges and potential solutions for each sector.
- Sustainability assessment tools, including their validity, that have been developed to gain insight into the sustainability performance of animal husbandry systems including animal welfare.

People behind the session

Session Coordinator: Sean Ashe (EFSA)

Chairpersons: Mette S. Herskin, Aarhus University

Moderators: Nikolaus Kriz, European Food Safety Authority (EFSA)

Rapporteurs Sean Ashe, European Food Safety Authority (EFSA); Mariana Geffroy, European Food Safety Authority (EFSA); Eliana Lima, European Food Safety Authority (EFSA); Yves Van der Stede, European Food Safety Authority (EFSA)

ONE Planet – Session affiliate profiles

ADVANCING ANIMAL WELFARE TO MEET SUSTAINABILITY TARGETS

Nikolaus Kriz, European Food Safety Authority (EFSA)

Chair/Co-chair

Nik Kriz is Head of EFSA's Risk Assessment Services Department. He is a veterinary surgeon with 28 years of professional experience having worked in general practice, veterinary clinics and academia in four continents before moving to risk assessment in One Health at the European Medicines Agency. He then took on managerial functions in the area of parallel distribution and certificates, as well as supporting the work of the seven EMA scientific committees. In these roles Nik was responsible, among other things, for the EU regulation on substances essential for the treatment of Equidae and the development of guidance for multi-strain dossiers plus the early development of the new veterinary medicines regulation. He also implemented the public register for parallel distributed products in the EU, a major step towards improved transparency in the sector. Nik joined EFSA on 1 January 2017 as Head of Unit for Animal Health and Welfare and Plant Health, where he was responsible for delivering risk assessments for topics as diverse as *Xylella fastidiosa*, African swine fever, avian influenza and the welfare of farmed rabbits. The main achievements of his tenure were the scientific support provided to the European Commission in implementing the Animal Health Law, the setting up of an animal disease data model, partnering on data collections to analyse risks from diseases shared between wildlife, livestock and humans, the introduction of commodity risk assessment of high risk plants.

Sean Ashe, European Food Safety Authority (EFSA)

Rapporteur

Sean is a vet and epidemiologist by training having graduated from University College Dublin in 1996. Following 5 years in mixed veterinary practice in the west of Ireland, where he worked with cattle, horses and small animals, he spent 15 months working on the 2001 Foot and Mouth outbreak in the United Kingdom. This turn was followed by a Master's in Veterinary Epidemiology at the Royal Veterinary College (RVC), and the London School of Hygiene and Tropical Medicine (LSHTM) at the University of London. He then worked on various epidemiological projects for another 15 months at the Centre for Veterinary Epidemiology and Risk assessment (CVERA) at UCD Dublin. Between 2006 and 2018, he worked as a risk manager for the competent authority in Ireland working on BSE surveillance, Animal Welfare and the Transport of Animals, as well as on an occasional epidemiological study. He is

currently on secondment from the Department of Agriculture, Food and the Marine, Ireland to EFSA, where he is the lead Scientific Officer working on the Protection of Animals during Transport opinions.

Mariana Geffroy, European Food Safety Authority (EFSA)

Rapporteur

Mariana Geffroy is a Mexican veterinarian. She holds a Joint Master's Degree within the Erasmus Mundus program in Infectious Diseases and One Health at the Université de Tours, Universitat Autònoma de Barcelona and the University of Edinburgh.

In Mexico, she worked as a teaching and research assistant at the National Autonomous University of Mexico, teaching students, creating learning materials, and also working with small farm-holders. She also did an internship at CIRAD in Guadeloupe, in a project where the One Health approach was used to create databases and technology for West Nile Virus surveillance in the region.

She has experience on livestock health and production in the tropics, mainly sheep and cattle, animal welfare, data analysis and epidemiology.

She is currently a trainee at EFSA in the Animal Welfare team, where she assists with the welfare of animals during transport mandates for both free-moving animals and the animals transported in containers. Within the ONE Conference, she is one of the rapporteurs in the thematic session: Advancing Animal Welfare to meet Sustainability Goals.

I believe in the transition to more sustainable production systems to attain both healthy humans and animals with high animal welfare standards. In addition, I am a One Health advocate and I believe in the need for a multidisciplinary approach to tackle infectious disease and climate change.

Harry Blokhuis, Swedish University of Agricultural Sciences (SLU)

Speaker

Prof Blokhuis worked for almost 30 years in The Netherlands where he carried out research projects and was managing research groups in the area of animal behaviour and welfare. Since 2007 he is professor of Ethology at the Swedish University of Agricultural Sciences in Uppsala. He is also director of the European Union Reference Centre for Animal Welfare for Ruminants and Equines.

Prof Blokhuis coordinated nine EU funded international research programmes. This includes the Welfare Quality project which was the largest coordinated research effort in this area to date. Currently he coordinates an EU project on sustainability 'PATHWAYS' and is involved in several European funded projects (re-Livestock, BroilerNet, Care4Dairy).

For many years Prof Blokhuis was a member of the Scientific Veterinary Committee and later the Scientific Committee on Animal Health and Welfare, advisory bodies to the European Commission. Between 2002 and 2009 Prof Blokhuis was a member of the Scientific Panel on Animal Health and Animal Welfare of the European Food Safety Authority (EFSA). He is a fellow of the Royal Swedish Academy of Agriculture and Forestry.

Prof Blokhuis' field of specialization is behaviour and animal welfare. His studies involved abnormal behaviours such as feather pecking and stereotypies and the development of alternative housing systems for poultry. Prof Blokhuis published about 275 publications as first author or co-author, of which about 120 in refereed journals.

Title of talk: Key stages in the implementation of the PATHWAYS project

Abstract of talk

Worldwide demand for animal products is predicted to double over the coming decades due to population growth and increasing economic prosperity. This may lead to further intensification of production, which in turn may put pressure on available resources like land or water, and lead to higher greenhouse gas emissions and other environmental impacts. Furthermore, there is increasing concern about the negative impact of intensive production on animal welfare in livestock farming. At the same time, livestock farming plays a vital role in food and nutrition security by providing nutrient-rich food, whilst contributing to efficient agriculture and the vitality of rural territories. Livestock systems can also recycle biomass and help to close nutrient cycles on farms and in particular territories. The lack of a holistic sustainability assessment approach makes it difficult to measure the contribution livestock makes to society, hampering evidence-based debates about trade-offs and leading policymakers to focus on highly tangible, but essentially weak, leverage points. PATHWAYS is about identifying and increasing sustainable practices along the supply and production chains of the European livestock sector. It aims to reduce environmental impact while addressing societal demands for safe, nutritious and affordable meat and dairy products. Coordinated by the Swedish University of Agricultural Sciences (SLU) and comprising 28 partners from 12 countries, this 5-year (2021-2026) EUR 9 million Horizon 2020 project contributes to the EU Farm-to-Fork Strategy, which is at the heart of the EU Green Deal. PATHWAYS will be implemented through four key stages. First, we will define visions for the development of the livestock sector, and current drivers and barriers for sustainability and human nutrition within Europe. In the second stage, we will translate these visions into scenarios and develop a holistic evaluation of current/future systems. In the third stage, scenarios and innovations will be assessed, and in the fourth and final stage, we will identify solutions and development pathways for a holistic re-design across agri-food chains.

Linda Keeling, Swedish University of Agricultural Sciences (SLU)

Speaker

Linda Keeling is Professor of Animal Welfare at the Swedish University of Agricultural Sciences where she manages an active research group. She has over 140 original peer-reviewed publications and is Editor for the newly formed Section of Animal Welfare and Policy in the journal Frontiers in Animal Science.

She carries out research related to the welfare of farm, companion and sport animals. Her emphasis is on ethology, asking fundamental questions related to social behaviour, motivation and cognition in animals, but also applied questions related to the effects of housing and management on animals, and the development of animal welfare assessment methodologies.

Her current research involves investigating emotional states in animals, the effects of early experience on later behaviour and the role of animal welfare in sustainable development. Her broad experience within animal welfare science means that she is active in multidisciplinary projects and also in science-based animal welfare policy development.

She is a member of the EU Platform on Animal Welfare, member of the Royal Swedish Academy of Forestry and Agriculture and former chairperson of the Biology Committee at the Swedish Academy of Sciences.

Title of talk: Animal welfare: Moving forward to help score sustainable development goals

Abstract of talk

Sustainable development refers to the many processes and pathways to achieve sustainability, now gathered into the 17 UN sustainable development goals (SDGs). Animals are hardly mentioned in the SDGs and their welfare (their sustainability) is not mentioned at all. However, animal welfare is an important 'implicit' part of a sustainable future and the question is how we should best move towards that future. I will present a method we are developing to evaluate the extent to which achieving the different SDGs is compatible with improving animal welfare. The overall aim with the method is to help find a structure within which to govern trade-offs and build coherence in policymaking so that we can move strategically towards improving animal welfare and towards a sustainable future, as envisaged in the Farm to Fork initiative and Agenda 2030.

The method was inspired by earlier work mapping the interactions between SDGs by rating relationships between targets. Since there are no animal welfare targets, we rated the relationship between the broad goal of improving animal welfare and each of the 17 SDGs. We used the same 7-point scoring system as in the original method. What was noticeable was the similarity of ratings when we repeated our studies and

the similarities between participants from different regions around the world. The strongest co-benefits were found with SDG 3 (Good health and well-being), SDG 12 (Responsible consumption and production) and SDG 14 (Life below water). Importantly though, there were co-benefits between improving animal welfare and achieving all of the SDGs. The ratings nevertheless varied according to the direction of the association. On average, the impact of achieving the SDG on improving animal welfare was considered greater than the impact in the reverse direct. However, there were several associations for which the strength of impact was rated as similar, irrespective of the direction of the association e.g. with SDG 2 (Zero hunger) and SDG 13 (Climate action). Although this method is still under development, insight into the relative strengths of the associations between animal welfare and the different SDGs may help organisations identify appropriate policy tools and potential new allies for strategic partnerships.

Mette S. Herskin, Aarhus University

Chair/Co-chair

Mr Mette Herskin's research links ethology and veterinary science, and seeks to increase biological understanding of farm animals and how they are managed. Doing this, he was inspired by the OneWelfare concept, recognizing the interconnections between animal welfare, human well-being and the environment. What drives him the most are the need for transparency in animal farming, as well as the privilege of being involved in the creation of new knowledge to facilitate evidence-based decisions in industry, society and policy-making. His works focus on science communication in different ways: from giving public lectures, teaching at the university, writing textbooks and publishing scientifically in veterinary, ethological and animal science journals. Mett's research has been carried out in Denmark and other countries, as part of research projects involving Danish universities, industry, international universities and authorities (including the European Reference Centre for Pig Welfare). A large part of his research is focused on improvement of the understanding of the welfare effects of production diseases and other pathological conditions (such as mastitis, shoulder ulcers, hernia, footpad dermatitis) as well as management procedures (such as animal transport, pick-up facilities, dry-off, castration and the use of sickness pens). He also chairs the Animal Welfare Body within the department of his university, and he is a member of the EFSA Animal Health and Welfare Panel.

Pol Llonch, Autonomous University of Barcelona (UAB)

Speaker

Dr Pol Llonch obtained his veterinary degree from the Autonomous University of Barcelona (UAB) in 2007, where he also completed his master's degree in Veterinary

Sciences. In 2012, he obtained a PhD in Veterinary Science from the Institute of Agrifood Research and Technology (IRTA). He worked for several years as a postdoctoral researcher at the University of Warwick first and at Scotland's Rural College (SRUC) thereafter. He is a Diplomate of the European College of Animal Welfare and Behavioral Medicine (ECAWBM) and a member of the EU Platform on Animal Welfare as an independent expert. In addition, he serves as president of the recently created Scientific Spanish Network for Animal Welfare (Red CIBA). He currently works as a Ramón y Cajal researcher at the Department of Animal and Food Science of the UAB.

His main lines of research include the evaluation of animal welfare and more recently using precision livestock tools, as well as the search for new housing and management strategies to improve livestock welfare.

He has participated in multiple research projects with public and private funding. At the moment, he is working as the Technical Coordinator of the ClearFarm project, funded by the Horizon 2020 programme.

He authored more than 50 articles in scientific and technology transfer journals and teaches animal behavior and welfare at the UAB and the University of Edinburgh.

Title of talk: Benefits (and challenges) of digital transformation of livestock agriculture for animal welfare and environmental sustainability

Abstract of talk

Environmental impact and animal welfare are two important societal concerns related to livestock production. Precision livestock farming (PLF) technology enables monitoring of the status and performance of livestock using animal-based measures. PLF technologies are capable of monitoring a growing range of phenotypical variables, such as animal behaviour (e.g. feeding), physiological response (e.g. body temperature), health status (e.g. somatic cell count) and productivity (e.g. growth), generating large volumes of on-farm data that can be used to monitor animal welfare and environmental impact. PLF technology has several advantages compared to ordinary on-site assessments: 1) it not only identifies existing welfare issues but also anticipates them (with early warning signals), so that preventative measures can be implemented; 2) it provides continuous information, thus expanding the available information on the severity and extent of existing welfare problems; 3) it monitors welfare status at an individual level, facilitating individualised strategies to improve animal welfare; 4) data is objective and quantifiable, which facilitates transparent and unbiased analysis.

The integration of PLF data has attracted much attention, and current research and innovation activities are developing new tools to pursue this aim. One of these initiatives is the EU H2020-funded project, ClearFarm. This project proposes to use PLF technology and integration of (animal-based) data, based on blockchain, to improve animal welfare and reduce the carbon and water footprint across the entire

production chain, thus contributing to improved sustainable livestock production. ClearFarm is working on the integration of data from multiple PLF sensors, seeking the most efficient data usage to assist producers in optimising the production process and informing consumers about the sustainability of food products, thereby facilitating a transparent and informed purchase. ClearFarm will develop a user-friendly platform that can provide information about the sustainability of pig and dairy cattle production systems, adapted for different target audiences including producers and consumers.

Francisco Galindo, National Autonomous University of Mexico (UNAM)

Speaker

Francisco Galindo is a Professor in the Faculty of Veterinary Medicine of the National Autonomous University of Mexico (UNAM). He obtained a degree in Veterinary Medicine from the same University (1990) and later a PhD in Animal Behaviour and Welfare (Cambridge, UK, 1996). In 1995 he was appointed as Head of the Department of Ethology at UNAM and since then he started teaching Animal Behaviour and Welfare to undergraduate veterinary students and Applied Ethology to graduate students. He has supervised several graduate thesis on areas related to Applied Ethology and Welfare of Farm Animals, as well as Wildlife and Zoo animals. He has been Coordinator of the Animal Welfare Committee of the National Animal Health Council in Mexico, as well as Programme Coordinator for the Latin American office of the International Fund for Animal Welfare. Through this work he contributed to the elaboration of Animal Welfare Legislation in Mexico and in other Latin American countries. He is Coordinator in Mexico of the OIE Collaborating Centre on Animal Welfare and Sustainable Livestock Systems. He has a strong interest in the integration of animal welfare and sustainability, and has been supervising graduate students and publishing scientific papers on the relationships between animal welfare, conservation and the provision of ecosystem services in livestock production systems. He is co-editor of *Etologia Aplicada*, one of the first publications of the topic in Spanish, and of *Animal Welfare* 3rd ed.

Title of talk: Sustainable livestock systems: integrating the provision of environmental services and animal welfare measurements

Abstract of talk

Cattle production is one the main causes of land use change in the tropics. The demand for meat and milk are increasing globally and as a result, it is urgent to work on sustainable livestock production systems that satisfy food security and protect the environment. Silvopastoral systems (Ssp) are an alternative for more sustainable forms of production. Hence, their sustainability performance compared to conventional systems need to be evaluated. The SAFA framework is a tool to assess

sustainability performance in agricultural systems that has not been used in livestock production. The objective of this study was to use this framework to compare silvopastoral, native (NSsp) and intensive (SSPi) and monoculture (Mc) cattle farms in the state of Yucatan, Mexico. Animal welfare was assessed using the Welfare Quality tool. Species Diversity and Richness was also obtained, as well as soil variables. Questionnaires were created using the SAFA Guidelines version 3.0 and applied in 9 farms of the local communities in 3 municipalities. Responses were fed to the application SAFA tool version 2.1.50 and sustainability polygons were produced. Native farms had positive ratings for Participation, Land, Biodiversity and Cultural Diversity, and SSPi for Holistic Management. Native farms had limited ratings for Decent Livelihood, due to poor training and underpay. NSsp farms and one Sspi farm had the highest percentages of themes positively valued (NSsp1- 67%, Sspi- 62%, NSsp2- 57%) compared to monocultures and with one SSPi farm ranged as the lowest in positive valuations (Mc3- 33%, SSPi3- 33%, Mc2- 24%). Positive evaluations identified native systems as an option for sustainable production, however, it was also recognised that group participation, environmental knowledge and awareness, identification of potential business risks, technical support and training were key factors to improve sustainability in all farms. This study is a novel approach to the SAFA protocol, as it validates its efficiency in the conditions present in the Mexican tropics and compares the sustainability performance of Ssp systems, which have never been evaluated using this tool. Transdisciplinary research is needed to integrate measurements on sustainability criteria in different livestock production systems to design more efficient policies and incentives for producers.

Laura Higham, University of Edinburgh
Panellist

Laura is a PhD student at the Global Academy of Agriculture and Food Security at The University of Edinburgh (R(D)SVS), studying antimicrobial use and animal welfare in agricultural supply chains. With a particular interest in actionable sustainability solutions in food supply chains, she is using farm data from a commercial broiler integration and applying a linear programming multi-criteria decision tool to determine the supply chain standards and policies associated with sustainable antimicrobial use and animal welfare outcomes.

Laura is a 2008 veterinary graduate from the R(D)SVS and holds an MSc with distinction in international animal health. Her dissertation characterised and compared animal health outlets and their drug dispensing practices in the Rift Valley of Kenya. She is currently a veterinary consultant in sustainable livestock production at the Food Animal Initiative (FAI), advising food businesses on antimicrobial stewardship and animal welfare, and is also the founder and director of the social enterprise, Vet Sustain, championing sustainability in the veterinary professions.

Gesa Busch, University of Göttingen

Speaker

Gesa studied agricultural economics in Göttingen and successfully completed her doctorate on the topic of "Farm animal husbandry and society - communication management between agriculture and the public" in 2016. During her doctoral studies, she spent 6 months at the University of British Columbia in Canada as a visiting researcher in the Animal Welfare Program. After completing her PhD, she researched and taught at the Free University of Bolzano (Italy) from 2016 to 2019 on issues related to sustainable mountain agriculture in the Alpine region. Since September 2019, Gesa is a research associate at the Chair of Marketing for Food and Agricultural Products in Göttingen, Germany. Her research currently focuses on societal expectations for sustainable agriculture and the transformation of food systems. She investigates attitudes of different stakeholders towards controversial topics such as animal welfare and genetic modifications of plants and animals and focuses on ethical components in consumption decisions.

Title of talk: Public perceptions of animal husbandry and welfare: how to respond properly?

Abstract of talk

There has been increasing public concern about animal welfare in animal farming systems in several European countries. This applies to several aspects of animal farming, such as the lack of 'naturalness' and chance for animals to have species-appropriate behaviour, animal health and the abusive use of antimicrobials, and painful interventions such as dehorning in cattle or tail docking in piglets – to name but a few. Around 80% of the German population consider farm animal husbandry conditions to be inadequate in terms of welfare. This leads to a problematic situation for the agricultural industry and related businesses, and puts social pressure on those involved in animal farming. In this presentation, I will first present some research on the public's attitude to farm animal welfare so as to better understand perceptions. Secondly, I will discuss the prospects for success of the different strategies designed to respond to the concerns the public has. Most people with no connection to agriculture have very little knowledge about agriculture in general or about husbandry systems and management practices in animal farming in particular. Within the industry, this is often considered as the main reason for criticism. Information strategies are therefore put in place to respond to this criticism, known as 'information deficit hypotheses'. However, research and experience from the real world show that merely informing the public about agricultural practices does not remove their concerns, and might even have the

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opposite effect. The reasons behind criticisms are therefore not based on information deficits but rather on a changing relationship between humans and animals. Demands for an ethically correct treatment of animals have increased, and anthropocentric attitudes are no longer widely supported. Furthermore, people's experiences with pets and new scientific knowledge about animals' capabilities back this up. Lastly, people's fear of being negatively impacted by animal farming (e.g. antibiotic resistance, zoonosis) leads to more questioning of practices. Strategies that actively acknowledge and value public concerns and incorporate them into the sector's transition strategies are much more promising. The role of science in this transition is grounded in answering the question of what a good life for animals means. Results are included from animal science, veterinary science, public opinion and ethics.

Peter Stevenson, Compassion in World Farming

Speaker

Peter Stevenson is Chief Policy Advisor of Compassion in World Farming and is a qualified solicitor. He received an OBE in October 2020 for services to farm animal welfare. He studied economics and law at Trinity College, University of Cambridge. He played a leading role in winning the EU bans on veal crates, battery cages and sow stalls as well as a new status for animals in EU law as sentient beings. Peter has written comprehensive legal analyses of EU legislation on farm animals and of the impact of the WTO rules on animal welfare. Peter is lead author of the FAO study reviewing animal welfare legislation in the beef, pork and poultry industries. He gave a paper in 2018 on the role of livestock in driving climate change at the Tenth International Conference on Climate Change. He also gave the keynote paper on pig welfare at the 2018 Congress in China of the International Pig Veterinary Society. He has written well-received reports on the economics of livestock production and on the detrimental impact of industrial farming on human health, biodiversity loss, deforestation, soils and water.

Title of talk: Improving animal welfare can deliver triple sustainability win

Abstract of talk

Improved animal welfare often produces benefits in terms of lower use of antimicrobials, reduced risk of zoonoses, and a better nutritional quality of meat. High welfare systems often have much lower economic externalities than industrial animal agriculture. Animals reared with good welfare also tend to be healthier, resulting in lower veterinary costs and reduced disease and mortality as well as, in some instances, better growth rates and feed conversion.

Industrial livestock production is a major source of air pollutants, including ammonia and particulate matter. These pollutants arise directly from manure production on farms and indirectly from nitrogen fertilisers used to grow animal feed crops. Soy is fed to industrial livestock, thus contributing to deforestation. 77% of the global soy production is used as animal feed, mainly in the industrial pork and poultry sectors. Almost two thirds of EU cereals – and 40% of cereals globally – are used as feed, primarily in industrial systems. This has fuelled the intensification of crop production which, with its use of monocultures and agro-chemicals, has led to soil degradation, biodiversity loss and overuse and pollution of water. Animals convert these cereals very inefficiently into meat and milk. If the grain used as animal feed were instead used for direct human consumption, an extra 3.5 billion people could be fed each year.

We need to redefine the role of livestock. Animals only make a positive contribution to food security when they convert materials we cannot consume – grass, by-products, crop residues and unavoidable food waste – into food we can eat. If we only raised animals that can be fed in this way, we would benefit from major reductions in GHG emissions, deforestation, soil erosion and nitrogen and phosphorus pollution. We would also see a reduced use of cropland, freshwater, energy and pesticides. We should move to extensive systems where animals are mainly fed on grass, by-products and unavoidable food waste. Well-managed pastures and integrated crop-livestock systems can restore soils and biodiversity. Moreover, keeping animals in more natural environments provides scope for high animal welfare. Moving away from industrial livestock production would necessitate reduced meat consumption, which is essential if we are to meet the Paris climate targets.

Yves Van der Stede, European Food Safety Authority (EFSA)
Rapporteur

Team leader Animal Welfare Team of BIOHAW unit in EFSA. Yves Van der Stede (Doctor of Veterinary Medicine & Ph.D. Ghent University (BE) is a senior scientific officer and since 2022 leading the Animal Welfare team at the European Food Safety Authority (EFSA) in Parma (Italy). Between 2018 & 2021, he led the Animal Health and Welfare team with a focus on risk assessments on animal health (African Swine Fever, Avian Influenza, control measures for Category A diseases according to Animal Health Law Regulation (EU) 2016/429) & Animal Welfare (risk assessment in the context of Farm 2 Fork strategy to support revision of animal welfare legislation (transport, laying hens, broilers, calves, pigs, & welfare during stunning and killing of food-producing animals).

Between 2006 & 2015, head of Unit Veterinary Epidemiology, risk analysis, and surveillance at Sciensano (Brussels, BE). Responsible for the coordination of national veterinary diagnostics and its surveillance providing risk assessments,

scientific and epidemiological support to the Belgian Federal Agency for the Safety of the Food Chain.

Eliana Lima, European Food Safety Authority (EFSA)

Rapporteur

Eliana Lima is a veterinarian by training. She holds a Veterinary Degree from the University of Lisbon (2012) and a PhD in veterinary epidemiology from the University of Nottingham (2019). Following her PhD, Eliana worked at the OIE (World Organisation for Animal Health) on disease freedom assessment, and later joined EFSA in January 2021. At the moment, she is part of the Animal Welfare team and is involved in projects related with the welfare of calves, dairy cows and pigs.

In these projects, Eliana works closely with an international team of experts to assess the welfare implications of current farming practices and their impact on animal behaviour. Following the assessment of the relevant evidence, scientific recommendations on how to achieve better welfare are made publicly available and serve as a basis for reviewing current EU legislation on minimum standards for protection of calves, dairy cows and pigs.

Eliana is also involved in developing strategies for animal welfare data collection at EU level.

Eddie Bokkers, Wageningen University and Research (WUR)

Speaker

Eddie Bokkers is an associate professor at the Animal Production Systems group, Department of Animal Sciences, Wageningen University & Research, the Netherlands. He holds an MSc and PhD in Animal Sciences of Wageningen University. His research and teaching is focusing on animal welfare and sustainable development of animal production systems. His animal welfare research varies from developing novel indicators and protocols for assessing welfare, including sensor-based data, assessing animal welfare on farms and identifying risk factors for specific animal welfare issues, and evaluating trade-offs and synergies between animal welfare indicators and other sustainability indicators.

He is also interested in the evaluation of the role of animals in our food system. As a researcher or a work package leader he is and was involved in several EU projects, for example Welfare Quality, WhiteFish, GrazyDaisy, and ClearFarm. Several of his research projects are funded by the Dutch Research council and the Dutch Ministry of Agriculture, Nature and Food Quality, the latter often in collaboration with industrial partners.

Title of talk: Animal welfare in a circular food system

Abstract of talk

Current intensive livestock farming is criticised for its high dependency on external inputs (e.g. concentrates) and association with sustainability issues, such as environmental pollution and animal welfare. A circular food system is envisaged as an alternative for the future. This entails land being primarily used to produce plant biomass for human consumption and by-products not suitable for human consumption being used as animal feed. Feeding by-products to livestock contributes to a reduction in the use of natural resources such as land, water and fossil phosphorus, and to closing nutrient cycles. The consequences of this on animal welfare, however, are unclear. An evaluation of the risks and opportunities for animal welfare in a circular food system is presented. With respect to feeding by-products to livestock, the type of by-products and the method used to provide them to the animals are relevant for animal welfare. Types of by-products include, for example, plant products spilled during harvest and storage, co-products during (industrial) food processing, and plant and animal waste derived from restaurants, catering and households (a nutrient-rich flow if well treated and legalised). Either animals can be brought to the location where the by-products originate, or feeds can be first composed using by-products and then provided to the animals. Factors such as nutritional value, resource availability, physical characteristics, palatability, contamination risks, satiation and potential to stimulate species-specific behaviour determine the effect of feeding by-products to livestock on animal welfare. The welfare-related consequences of feeding by-products seem largely similar to current practices. Since animal welfare is a major public concern in current intensive livestock farming, it may not be ignored in the transition towards a circular food system. This envisaged transition is a unique opportunity to simultaneously and substantially improve animal welfare. This requires robust animals that can digest feed based on by-products, skilled farmers and farming systems designed in line with the animals' species-specific needs.