WQNews n.9

Content

From the WQNetwork Coordinator

Antoni Dalmau, IRTA, Spain.

First of all, I would like to thank the trust of our colleagues in the management team of the WQN for accepting my candidacy to coordinate the network and secondly, to all the colleagues in the network for supporting it. I also want to thank on my own behalf but also on behalf of those who are or were at some point linked to this scientific network for the time, dedication and enthusiasm with which bot Harry, as coordinator, and Bryan, as a member of the management team, they have shown in these years since the end of the WQ project, in keeping us connected through this network.

I would also like to take this opportunity to welcome to the management team to Dr. Daiana de Oliveira from SLU and Dr. Ingrid de Jong from WU. In recent years, despite the obvious limitations associated with the fact that the network is self-managed and does not receive external funds, we have made important progresses. All the protocols were reviewed a few years ago in order to eliminate errors in the documents and provide improved protocols in relation to those published on paper for their PDF format, training regulations in the WQ protocols were updated, the incorporation of associate partners approved, and in recent years a new protocol for laying hens has been finished. Very shortly we will present a new protocol for veal calves, and an improved version, with significant changes in the evaluation system will also be presented soon.

In the near future, a new protocol will also arrive, with calculations included, for the protocol on sows and piglets and we hope that in the future we will have much more to tell you about. Of particular importance is the decision taken at the last general assembly in 2022 to open the network not only to the protocols that were developed during the course of WQ, but to others that have a similar approach, focusing on animal based measures. One of my main objectives as coordinator of the network will therefore be to comply with this last point of the last general assembly to accommodate not only the protocols that are being developed in the field of animal welfare and that start from a traceable and rigorous scientific methodology and animal based, but also to their authors. Projects such as Awin, in which protocols were developed for species not addressed in WQ, did not end with the formation of a network as such, so I consider that they should be the first to be invited to be part of our network. Although the Science of animal welfare has Advanced a lot in recent years, and although the approach and structure of welfare quality have great prestige inside

and outside EU, it is also true that for a big percentage of stakeholders animal welfare is mainly considered and assessed in terms of management and facilities, with a residual weight for the consequences of these risk factors on the animals themselves. This is why I think it is important to have a strong, broad, clearly recognizable network that helps us debate, explain the Science we do and help in transmitting all the knowledge we generate to the society and stakeholders. We should follow the path that Harry and Bryan marked out for us and widen it, because we need to be more in this boat and try to make our work visible more and better

Harry Blokhuis, former Coordinator of the Welfare Quality Network

The Welfare Quality Network was established on 1st July 2010 by former partners of the Welfare Quality project. The main aim of the Network was, and still is, to maintain a scientific collaborative platform to support the further development and implementation of the WQ results. The latter include practical strategies to improve animal welfare and

insights into animal welfare related concerns, attitudes and strategies of consumers, retailers and farmers, but the most well-known deliverables of WQ are the animal welfare assessment protocols with a main focus on the use of animal based measures.

The WQ 'brand' has become well known not only in Europe but also worldwide. At a wide variety of conferences and meetings reference is made to WQ and the results have an impact on legislation as well as company policies. What was originally a project acronym has developed into a catch phrase that is even used in normal everyday language like: 'we need to improve the welfare quality of our product'. This illustrates the widespread recognition of the aims of WQ and the impact of our work.

The science underpinning the WQ protocols is constantly progressing, deepening our understanding of animals' cognitive capacities and emotions, and increasing the technological possibilities to measure welfare indicators. I believe the partnership and collaboration in the WQ Network are important to stimulate and support these developments.

I feel proud and privileged to have been the coordinator of the WQ project and for almost 13 years the coordinator of the WQ Network. I am sure the WQ Network will further contribute to the scientific assessment of animal welfare as well as to practical welfare improvement strategies in support of a sustainable animal production sector.

Daiana de Oliveira

My name is Daiana de Oliveira, I am an Associate Professor in Ethology and Animal Welfare at the Swedish University of Agricultural Sciences, where I have been working for the past 11 years. Being an animal scientist in my background, I bring a general overview of livestock production and welfare interrelations. I have developed research with different species (ruminants and monogastric), both in intensive (European context) and extensive systems (in Brazil, where I am originally from). Over my career, I have been intrigued and motivated to understand the individual animal, and this led me to develop research in topics related to positive welfare, working on the development of positive animal welfare indicators. But also intrigued to understand more of the emotional world of animals and how their environment can be a modulator/predictor of their life quality (including health, behavioural traits and emotions) and overall well-being. Some of my research topics involve human-animal relationships, assessment of positive welfare indicators, positive emotions, early life programming, animal personality, cow-calf-contact and sustainable production systems and the relationships between sustainability, climate change and animal welfare.

I am super excited, grateful and honoured to be part of the management team of Welfare Quality Network. The Welfare Quality project has set a blueprint for Animal welfare assessment using animal-based measures and has had a big impact on my work as a scientist. I believe that it is ultimately important to keep this brilliant network alive and further progress the work by bridging with other initiatives and facilitating the implementation of all this knowledge within society. I want to support the network to my best ability to articulate the conversations with stakeholders, and scientists and bring my diverse/plural expertise from different contexts and contribute to this important work, envisioning a future in which animal welfare becomes part of the global agenda for sustainable food systems.

Ingrid de Jong (ingrid.dejong@wur.nl), Wageningen Livestock Research.

I am Ingrid de Jong and working as senior researcher and project manager at the department of Animal Welfare and Health of Wageningen Livestock Research, Wageningen University & Research. My main task is to coordinate research projects in the

field of animal welfare, with a focus on poultry and pig welfare. One of the research areas I have been working on already for several years is the development of animal welfare monitoring protocols, either or not with the application of novel sensor technologies. I am therefore happy to be a member of the Welfare Quality network management team and hope to contribute to the network activities by bringing my expertise on welfare assessment protocol development and application. The network is an excellent opportunity to continue the work on and application of the Welfare Quality protocols. My future work will certainly be related to network activities, as it comprises the development of sensor technology for welfare assessment in commercial practice, the development of new or better indicators for behaviour and positive emotions in pigs and poultry, including development of indicators that can be applied in commercial practice.

WELFARE QUALITY NETWORK GENERAL ASSEMBLY

BARCELONA, 9TH NOVEMBER 2023

The 9th of November of 2023, the Welfare Quality Network had its annual assembly, the main action points agreed upon were:

The communication team of the Welfare Quality Network will be formed by Mara Miele, Radka Sarova and Daiana de Oliveira

A new website will be developed to merge the contents of the Awin website, the Welfare Quality website, the current Welfare Quality Network website, the Euwel-net website and the e-pig training website. This also includes a link with the welfare hub website managed by Adroaldo Zanella. To do it, a working group coordinated by Antoni Dalmau, with Elisabetta Canali and Adroaldo Zanella will be created.

A new WQ qualification outline, that will include new figures called qualified examiner, will be published in the website in 2024.

The cattle protocols will be spread into four different protocols and published separately, as some of them are already updated and others will be updated in the next future. In consequence, a new version of the protocols will be published in 2024, that will consist in: one file for veal calf protocol already updated, one file for dairy cow protocol already updated, one file for fattening cattle that will be updated in 2024 and one file for fattening cattle at the slaughterhouse.

A new working group coordinated by Ingrid de Jong will be created to finalise a new version of the broiler protocol.

A new working group coordinated by Daiana de Oliveira and Antoni Dalmau will be created to develop a harmonised protocol for cattle in extensive/semi-extensive/pasture systems.

New Members

University of Lisbon.

Contact person is George Stilwell.

The Centre for Interdisciplinary Research in Animal Health (CIISA) implements and coordinates the research activities at the Faculty of Veterinary

Medicine of the University of Lisbon (FMV-ULisboa). CIISA develops fundamental and applied research in animal, veterinary and biomedical sciences. CIISA promotes and integrates research in many Animal Science and Animal Health areas, through the work of different research labs.

The Animal Behaviour and Welfare Laboratory (ABW Lab) is one of these. ABW Lab has been involved in farm animal welfare assessment for the last decade namely through its participation in the AWIN project, in which it led the development of the dairy goat protocol. Since then ABW Lab has organised the training of animal welfare auditors in both AWIN and WQ® protocols, and continues to promote research for the development of new protocols (e.g. for suckler herds) or for the improvement of existing protocols for ruminants. ABW Lab is currently collaborating with the Regional Government of the Azores and with Turkey to promote the certification of animal welfare in dairy and beef farms in these regions.

Other current research topics are: the development of an innovative curriculum to train and accredit farm animal welfare auditors; pain assessment and management in farm animals (e.g disbudding, castration and lameness); the impact of bovine respiratory disease on welfare; establishing behaviour and temperament as traits for the selection of breeding bulls; validation of positive welfare indicators; control of canine epilepsy through managing canine anxiety; psychological and physiological benefits of human-animal bond in animal-assisted services; map and critically evaluate how evidence-based veterinary medicine is currently being taught to veterinary students and practitioners in Portugal.

ABW Lab is at the moment hosting a residency in animal behaviour and welfare for the European College of Animal Welfare and Behavioural Medicine (ECAWBM).

University of Sao Paulo.

Contact person is Adroaldo José Zanella

Adroaldo José Zanella is Professor of Animal Welfare, in the Department of Preventive Veterinary Medicine and Animal Health, at the School of Veterinary Medicine and Animal Science, at the University of São Paulo. Since 2013 he has coordinated the animal welfare research group at USP, the CECSBE, the Center for Comparative Studies and Health, Sustainability and Welfare. Veterinary Doctor, PUC-RS, completed his doctorate in Cambridge, United Kingdom. He was a post-doctor fellow at the Munich School of Veterinary Medicine in Germany, he was a professor in the area of animal welfare in the United States and Europe: at Michigan State University, USA, at the Norwegian Veterinary School, in Oslo and at Scotland's Rural College, Edinburgh, Scotland. He was the Coordinator of the FP7AWIN – Animal Welfare Indicators Project, sponsored by the European Union. His work on the impact of the early environment on the welfare of animals, particularly pigs, especially during the prenatal and neonatal period, is internationally recognized. Recently, with his team, he published influential articles on the consequences of the welfare of pregnant females and males on the productivity and welfare outcomes of piglets. Professor Zanella's work has already been presented in National Geographic, demonstrating the impact of early weaning on the aggression, memory and well-being of piglets, a subject that his group is a reference in the world. In the Welfare Quality Network Professor Zanella aims to bring the AWIN Animal Welfare Science Hub: https://www.animalwelfare-hub.com/ to help with the mission of the network. In addition, Zanella has the goal to help with the needed updates on the welfare assessment protocols

developed in the Welfare Quality and AWIN Projects to meet the demands of Brazilian animal production systems, with the goal to foster strong collaborative networks to improve sustainability on animal production systems.

Neiker.

Contact person is Prof. Inma Estevez

NEIKER is the Basque Institute for Agricultural Research and Development, in Spain, and is part of the Basque Research & Technology Alliance. NEIKER works according to the objectives established by the Ministry of Economic Development and Infrastructures of the Basque Government, aiming to contribute to the maintenance of the environment and the sustainability of the region while actively contributing to local economic and social development. Thanks to their capacities, research groups of Neiker generate knowledge and innovative, transferable solutions which contribute to add value and to improve the competitiveness of the agri-food and forestry sector. Sustainable livestock farming, animal breeding and animal health and welfare are key activities at NEIKER. Within the animal production area, research projects focus on the improvement of animal health and welfare, preventing disease transmission to other animals and humans, improve animal genetics and optimise livestock feeding and nutrition. Regarding animal welfare, the applied ethology and animal welfare team generates knowledge about animal behaviour, particularly for poultry and sheep. Besides generating new hypotheses and assessment methods for animal welfare, the team created the first digital tools for on-farm animal welfare assessment. These digital tools also permit improvements in livestock production systems to optimize animal welfare and performance. Neiker was one of the partners of the AWIN project and is very involved in the use of animal-based indicators to assess welfare in poultry and small ruminants.

Welfare Quality Network Seminar, 2023
8 November, Barcelona, Spain

AGENDA

09:00-09:15 Welcome, Introduction to the event and to the WQN. Antoni Dalmau. IRTA.
9:15-9:35 Use of the QBA using the WQ descriptors. Jen-Yun Chou. Vetmeduni Vienna/Teagasc

9:35-9:55 Using the Welfare Quality framework to assess the welfare of willd animals under human care. Xavier Manteca & Oriol Talló. UAB
9:55-10:15 Animal based protocol based on welfare quality approach for the assessment of animal welfare in sea-bream. Ana Roque. IRTA
10:15-10:35 Animal based indicators used for the assessment of gas stunning in broilers. Alejandra Contreras. EUCARW-poultry-SFA
10:35-10:50 Questions, discussion and short break.

10:50-11:05 Online. How to use transects to assess animal welfare. Experiences in protocols for turkeys and ducks. Xavier Averós & Inma Estévez. NEIKER
11:05-11:20 Online. Relevant indicators for the assessment of unconsciousness in electrical stunned rabbits. Virginie Michel. EURCAW-poultry-SFA
11:20-11:35 Online Use of a certification scheme based on Welfare Quality in Finland and new approaches in the field of protocols for horses. Essi Wallenius. Armenta Benessi®

11:35-11:55 Use of botanical extracts for stress reduction in fattening pigs. Josep Casadellà Xifra, Javier Álvarez Rodríguez, Isabel Blanco Penedo. UdL
11:55-12:15 Terra Bea software. Maité Louis & Marc Genest. Terrabea.

12:15-12:35 Welfair®. How to implement the welfare quality and awin protocols for certification purposes. Carles Rosell. Welfair®.
12:35-12:50 Questions, discussion.
12:50-14:00 Lunch

14:05-14:20 Online. Animal based measures in the inspection factsheets of EURCAW Ruminants & Equines. Josef Schenkenfelder. EURCAW Ruminants and equines.
14:20-14:35 Online. Improving welfare assessment with AI? Presentation of a pilot project. Radka Sarova & Barbora Valníčková. VUZV

14:35-14:50 Online. App to assess animal welfare using the Welfare Quality Protocols. Conor Barry & Camilla Kielland. Norwegian University of Life Sciences.
14:50-15:05 Online. Welfare assessment "from birth to slaughter" in dairy and beef farms within the project Cowlearning. Susanne Waiblinger. Vetmeduni Vienna.
15:05-15:25 Link between animal based post-mortem findings and on farm pig welfare. Marko Ruis. EURCAW-Pigs.
15:25-15:45 Questions
15:45-16:00 Online A new protocol to assess animal welfare in cattle reared extensively. George Stilwell. University of Lisboa.
16:00-16:15 Online Development of a welfare assessment protocol for grazing beef cattle in Ireland. Ana Strappini & Joop van der Werf. Wageningen Livestock Research.
16:15-16:35 Development of a protocol to assess dairy cow welfare at pasture. Lydiane Aube. INRAE.

16:35-16:50 Online. Use of the Welfare protocol for extensive cattle in the intertropical area of Brazil. Mateus José Rodrigues Paranhos da Costa . UNESP
16:50-17:05 Online. Animal welfare in Argentine dairy farms under the WQ approach. Belen Lazzarini. UNL
17:05-17:20 Online Use of the Welfare Quality protocols in Uruguay. Opportunities for improvement. Stella Maris Huertas. UDELAR
17:20-17:35 Online Shared image and data repositories in the Animal Welfare Science Hub! Adroaldo José Zanella. USP
17:35-17:55 Questions and discussion 18:00 Closing

Welfare Quality® Protocol for consistent assessor training

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Qualitative Behavior Assessment (QBA) is a valuable approach in understanding farm animal welfare as it uses a holistic approach to capture an animal's emotional state. Lists of QBA descriptors validated to assess pig welfare are available, but their definitions are not found in the published literature. We aim to use QBA to first assess post-weaned sow welfare in relation to different housing and subsequently investigate whether different cultural/professional backgrounds of and information acquired by the assessors may influence their QBA outcome. To ensure consistency across assessor trainings, we systematically created and verified clear definitions for a pre-existing fixed list of descriptors that was adapted from the Welfare Quality® protocol for pigs to fit the context of post-weaned sows. Ten pig experts were recruited to define these descriptors through an expert panel. Descriptor definitions were discussed and voted upon with revising and re-voting as needed until an 80% agreement was reached. Half of these experts participated in a verifying study by implementing QBA using these definitions on a subset of videos of post-weaned sows situated individually in a novel arena test to blind the housing treatment. After the definitions were verified, they were used to train 13 veterinary students to assess the full library of videos. For the verifying study, principal component analysis identified two main components interpreted to represent the valence (PC1) and arousal (PC2). Kendall's W was used to assess experts' agreement. Experts displayed almost perfect agreement in identifying valence (Kendall's W = 0.91) and substantial agreement in arousal (Kendall's W = 0.66). The students' scoring was then compared to the experts' by Pearson's Correlation. Strong correlation was found between the students and experts on both components (Valence: $r(10)$ = 0.93, $P < 0.001$; Arousal: $r(10)$ = 0.95, $P < 0.001$). These results highlight the benefits of a systematic approach to both the definition of QBA descriptors and their use in high-quality training sessions for assessors. This strategy promises to facilitate our future investigations by maintaining the consistency of training quality when we need to conduct multiple training sessions across different sites.

human care

Oriol Tallo-Parra & Xavier Manteca
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Ensuring the highest possible standards of animal welfare has become an absolute priority for modern zoological institutions (zoos and aquaria, rescue and recovery centres, conservation centres, sanctuaries, museums, etc.). This is mainly because of ethical concerns, but also because having the best possible welfare status for their wild animals is a necessary condition if zoological institutions are to successfully realize their functions of education, conservation, research, or rescue, among other. In any animal-related field, performing an adequate welfare assessment is a crucial step in order to improve and protect animal welfare. The creation of the Welfare Quality® protocols for animal welfare assessment had a major impact in the welfare assessment of farm animals. Interestingly, the influence of the Welfare Quality® protocols, especially the conceptual and working frameworks, went far beyond the field of animal production. An example of this is the use of the Welfare Quality® framework as the basis or inspiration for the design of welfare assessment tools for wild species under human care. For these wild species and conditions, a rigorous, science-based assessment of their welfare is a challenge due both to the sheer diversity of species kept and the lack of knowledge on the general biology and specific needs of many of them. Moreover, clear differences exist between farm animals and wild animals under human care (welfare expectancy, type and management, resources, facilities and contexts, human interests, etc.). Nevertheless, several welfare assessments for wild animals under human care have been successfully designed using the Welfare Quality® framework. The welfare assessment protocols inspired by the Welfare Quality® vary in target species (from species phylogenetically closer to farm animals such as wild ungulates to very different species such as marine mammals) and in contexts (modern zoos, conservation centres, etc.). This presentation will discuss the benefits, adaptations required, and limitations of the Welfare Quality® framework for its use in wild species. In conclusion, although the adaptation of the Welfare Quality® framework needs to be carefully addressed and is not exempt of challenges and limitations, the use of the Welfare Quality® framework is a valid and useful strategy to design welfare assessments for wild animals under human care.

animal welfare in sea-bream

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There is a trend towards increased concern for the welfare of animals under human care, and this concern has expanded to include the welfare of farmed fish. However, at present, the necessary operational welfare indicators (OWI) and implementation protocols required to monitor and safeguard the welfare of farmed fish are lacking. Operational Welfare Indicators (OWI) in aquaculture are measures that can be used to assess welfare status in individual animals or groups of animals, made practical and operational on commercial aquaculture facilities. The objective of this project was to develop a complete protocol inspired in the Welfare Quality approach to be used to certify the welfare of Gilthead seabream (Sparus aurata).

The approach taken is based on the four principles of animal welfare used in WQ in an attempt to follow a methodology already developed to certify farmed terrestrial animals including mammals and birds. This methodology was selected for two reasons; firstly, it has been developed over the years by experts in the field of animal welfare from all over Europe and it has been validated for different farmed animal species, secondly it can be easily applied in a farmed fish welfare certification scheme. To garantee animal welfare, different criteria need to be covered, and in the case of seabream, 11 of the 12 used in WQ were identified. These criteria are grouped under the four principles mentioned above, including good feeding, good housing, goos health and appropriate

behaviour. The welfare criteria must be applicable to all farmed species (in our case all farmed fish). Measures to assess these criteria corresponded to 21 potential OWIs. Each OWI was then plotted on a small chart and a final calculation method was proposed for each OWI. After this, a specific weight was given to each measure within a criterion to combine all of them in a unique score and finally the same was done to combine the score of each criterion within a principle. Finally, all four principles, that had the same weight (0.25 each) were combined to obtain a final score from 0 to 100. In addition, to avoid compensation between measures, criteria and principles a set of filters were developed that penalize when one score is vey low.

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Stunning during the slaughter process is mandatory in the European Union and many other countries. It consists of inducing unconsciousness in animals to prevent them any avoidable pain, distress, or suffering during bleeding and related operations. When an animal is unconscious, it is unable to perceive and respond to any external stimuli, including pain. Gas stunning is widely recommended over electrical waterbath stunning in broiler chickens on welfare grounds. Nevertheless, the induction of unconsciousness in gas stunning is not instantaneous and aversion to the gas or gas mixtures might occur. The present study is aimed at determining the behavioural indicators of onset of unconsciousness and death and the aversive behaviours that might occur during the induction to unconsciousness when using different gas mixtures in broiler chickens. For this, 39-day-old mixed-sex broiler chickens were submitted to a gas stunning system. First, broilers were submitted to atmospheric air serving as control. Then, birds were exposed to one of the three experimental treatments. Treatments were CO_2 in two phases (<40% CO_2, 2 min followed by >90% CO_2, 2 min) and CO_2 associated with inert gases (40% CO_2, 60% N_2, ≤2% O_2, 4 min or 20% CO_2, 80% N_2, ≤2% O_2, 4 min). Since altered electrophysiological brain states are associated with certain behavioural patterns, the correlation between EEG evidence of loss of consciousness (LOC) and death and behavioural indicators allows the use of those indicators as proxies for unconsciousness and death in commercial conditions. For this reason, neurological (through EEG) and behavioural responses to the gas treatments were assessed. LOC seems to be well correlated with loss of posture (LOP) and brain death with motionless. Regardless of the gas mixture tested, all broiler chickens experienced several behaviours of aversion and breathlessness during the induction of? unconsciousness such as head shaking, deep inhalation, high pitch vocalisations, gasping and escape attempts expressed as wing flapping. Sometimes broiler chickens can perform also high pitch vocalisations and wing flapping while being unconscious due to convulsions and gasping but it does not represent a welfare issue for the bird itself. Therefore, LOP is the key behaviour to differentiate behaviours of aversion in conscious birds or convulsion in unconscious birds. All birds must be motionless before the stunning process is completed to prevent them from regaining consciousness once shackled or bled.

Use of the transect method in animal welfare assessment; Experiences with turkeys and ducks
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The transect walk method developed within the EU AWIN project is currently acknowledged to be a simple, but effective, method for on-farm poultry welfare assessment, and has so far been used in studies carried out on chickens, laying hens, turkeys and ducks. The method, originally adapted from population ecology studies, was used to overcome the impossibility and intrinsic risk of injuries for animals and humans when handling large turkeys for welfare assessment. The numerous available studies in turkeys, chickens and laying hens have reported consistency of results in regard to inter-observer reliability, sensitivity and efficiency of the method, the possibility to sample larger number of animals with respect to methods based on individual animal capture, the reduction in the time taken to assess birds, and avoiding animal handling. The method consists in the division of poultry houses into sampling regions (transects) delimited by resource lines such as feeders and drinkers, and on the assessment of different animal-based indicators in a standardized manner, according to the number of animals present in the house and on the relative size of each assessed transect. The method was first developed and validated for turkeys housed under intensive conditions and proved a high correlation between the indicators assessed on-farm with flock performance results at slaughter. Specific Android apps were developed to assist transect data collection for broilers and turkeys, and both the method and the app are widely used for turkey

welfare certification within the Welfair® scheme. The method has been recently adapted to assess the welfare of ducks raised for meat and derivates in extensive outdoor systems without the use of forced feeding. Method adaptations covered ethological particularities and main welfare problems for the Pekin duck, as well as housing specificities of the production system. Results of on-farm tests of the developed assessment protocol proved the adequacy of the method and protocol to capture a reliable picture of the welfare status of duck flocks raised under these conditions.

stunned rabbits
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In 2020, the EFSA recommended list of animal-based indicators (ABIs) to assess the state of consciousness in electrical stunned rabbits based on their validity and feasibility. Nevertheless, the repeatability of the indicators as well as their frequency in commercial slaughter has not been evaluated yet. A survey sent to official veterinarians of rabbit slaughterhouses reflected that there is heterogeneity on the ABIs they use. Therefore, the main goal of the study was to refine the list of ABIs proposed by EFSA and provide a list of relevant indicators to ensure consistency of controls. For this, we assessed in commercial slaughterhouses the inter-observer repeatability (IOR), the frequency and the co-occurrence of the different indicators of consciousness of electrical stunned rabbits in two stages: 1) immediately after stunning (tonic/clonic seizure, breathing, spontaneous blinking and vocalisation) and 2) during

bleeding (tonic/clonic seizure, breathing, spontaneous blinking, vocalisation and righting reflex). This study compared the assessment of four observers in 3219 rabbits from 12 batches of five different slaughterhouses. Data were analysed at individual rabbit level and the combination of crude percentage of agreement (PoA) and Fleiss' kappa (k) was used to assess the IOR of the indicators of consciousness. Immediately after stunning, the most repeatable ABI was vocalisation (PoA = 100%) followed by spontaneous blinking (PoA = 99.8%; k = poor), breathing (PoA = 98.9%; k = fair to good) and tonic seizure (PoA = 91.7%; k = fair to good). Although absence of tonic seizure was the least repeatable, it was an indicator of risk of failure at inducing unconsciousness in rabbits. Thus, we recommend focusing on absence of tonic seizure as well as on the presence of breathing and spontaneous blinking as indicators of consciousness. However, presence of vocalisations, although not observed in our sample, should not be neglected. During bleeding, the most repeatable ABI was vocalisation (PoA = 100%; k = poor) followed by spontaneous blinking (PoA = 95.6; k = fair to good), righting reflex (PoA = 89.7%; k = fair to good), tonic/clonic seizures (PoA = 72.3%; k = fair to good), and breathing (PoA = 71.1%; k = fair to good). The most frequent ABIs were absence of tonic/clonic seizures and presence of breathing, spontaneous blinking and righting reflex. Sometimes two or more ABIs were showed simultaneously like breathing and spontaneous blinking and breathing and righting reflex. Since all the ABIs assessed after bleeding were repeatable and observed, we recommend focusing on all of them at the same time when evaluating rabbits at this stage. The presence of one ABI is a sign of consciousness or consciousness recovery.

approaches in the field of protocols for horses
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Three Finnish dairies are using WelfareQuality (WQ) certification commercially, two of them for six years now. The presentation will describe how farms have developed in different aspects of animal welfare between the first and the last WQ-auditing of the first five-year-certification period. Finland's first animal welfare label, ELVI was developed partly from these experiences. ELVI was launched in March 2023. The presentation will shortly describe the process behind and demands of ELVI label.

Additionally, the presentation will discuss the need for further development of horse welfare protocols. Finland is currently running a 3-year long project aiming to develop a WelfareQuality inspired horse protocol and the need for adaptations is evident due to the companion animal status of horses.

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The stress response causes noteworthy alterations in behaviour, biochemistry and immunology. These changes adversely affect animal welfare and farm productivity. Interest in phytotherapy in veterinary medicine has escalated in recent times. This is a result of the requirement to discover substitute therapies to decrease the use of antimicrobials. The study aimed to evaluate the potential of a botanical extract as a tranquilliser (Quiet-farm® at 3 kg/t feed) to reduce stress in a commercial fattening pig farm. Danbred x Pietrain pigs (n=135) were used in the study (mean age: 11-12 weeks; mean weight: 49.5±

1.5 kg), which were randomly assigned to two groups: control (diet not supplemented with tranquilliser) and phytotherapy (diet supplemented with tranquilliser). Both groups were housed in the same fattening unit, with 4 pens containing 16-17 animals each (2 pens with whole males and 2 pens with whole females) (~0.74 m2/pig). The stress biomarkers evaluated were salivary and hair cortisol (n=24 pigs, half per treatment and sex) at baseline (day 0) and at the end of the experiment (day 72, when the pigs reached slaughter weight of 110 kg). Furthermore, activity patterns (lying and feeding), agonistic behaviour (aggressive and redirected interactions), sexual behaviour (mounts) and skin lesions on the trunk (forequarter, mid-quarter and hindquarter) and appendages (tail, ears and legs) were assessed on days 40, 54 and 68. Various data on production parameters (body weight, ADG and mortality) were also recorded. The phytotherapy group exhibited significantly lower levels of hair cortisol than the control group on day 72 (p = 0.02). However, there were no observable statistical differences in salivary cortisol levels between the two groups (p > 0.05). No significant variations in activity patterns were found in any of the three days of assessment. The frequency of agonistic and sexual behaviours was significantly lower in the phytotherapy group throughout the three days of observation (p < 0.05). Correspondingly, the incidence of skin lesions on the trunk (days 40, 54) and body appendages (days 40, 54, 68) was also significantly lower in the phytotherapy group (p < 0.05). Finally, while there were no differences in mortality between groups (p > 0.05), ADG tended to be higher in the phytotherapy group (p < 0.10). Initial findings indicate that the usage of phytogenic tranquilizers may have a positive impact on animal well- being, potentially leading to enhanced productive performance in pig rearing. Nevertheless, additional research is imperative to verify these outcomes.

Maité Louis and Marc Genest

The development of a webapp begun last february with the objetive to promote and democratize the use of the Welfare protocols. In fact, there is a strong demand from veterinarians auditors wanting to see respect for animal welfare evolve.
The app should simplify the completion of the audit, make accessible and encourage the use of protocols to trained welfare quality auditors, optimize the unfolding, límit rating errors, simplify, harmonize and automate teh writting of reports, digitize and facilitate adata acquisition, intèrpret the data collected, gather statistics for the purpose of improving protocols and access standardized protocols from anywhere

purposes.

Carles Rosell and Laura Freixa
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The label Welfair® and the Welfare Quality Network has always been very linked. For instance, in the first newsletter of the WQN, published in June 2011 and under the title "What happens in Spain with Welfare Quality results?" it was explained the interest of a Catalan Federation of Meat Industries in the development of a Welfare certification System for pig and beef slaughterhouses, based on the Welfare Quality® protocols. In the second newsletter, from January 2013, it was explained how IRTA created a scoring system (not available at the end of Welfare Quality) for the slaughterhouse protocols used in cattle and pigs to be used for benchmarking for specific slaughterhouses in Spain. In June 2015, in newsletter 4, a potential commercial application of WQ protocols in Spain for dairy cattle at farm is mentioned. Then, in newsletter number 5, published in January 2017, it is explained how in 2014 a certifying company called AENOR requested IRTA to develop a pilot project for the certification of animal welfare in dairy cows and how IRTA proposed to test

the Welfare Quality protocols, including their scoring system. The result was the first company in the world, with only 7 dairy farms, certified in animal welfare with the WQ protocols. Newsletter 6 arrived in March 2018, where the history of the certification scheme is summarized and some new challenges that should be faced are explained, such as how to audit and certify a pig company with more than 1400 farms using the WQ approach and how it was resolved through internal audits and the evaluation of a sample of farms. Finally, it is explained how the Awin protocols were incorporated to the scheme and how three new protocols, based in the welfare quality approach, were developed for rabbits. In newsletter 7, published in september 2019 is is explained how IRTA technicians abandoned the audits and were only in charge of supervision and training tasks. The next newsletter arrived in 2020 and there the arrival of the Welfair® label at the end of 2019 was announced. Welfair is the combination of the words welfare + fair, since these are two critical statements of the schema. Now, in 2023, we can announce major changes to the way this scheme works. Firstly, four new protocols developed by IRTA were included (one for meat quails, another for quails that produce eggs, another for quails at the slaughterhouse and another for Gilhead seabream), all of them, of course, based on a welfare quality approach. However, the most important change is a new structure of the label. This means that a manager was hired for the label, and different people, independent of the Animal Welfare Program, also hired. The manager of Welfair is Laura Freixa, an agronomist engineer with more than 15 years of experience in certification, and according to her, the current numbers of the label are nowadays around 30.000 farms certified per year, in Spain and Portugal, and their future plans are to start certification in Europe (Denmark, France, The Netherlands, Italy) and Latin America (Beginning in Chile and Brazil). The main constraint of the label nowadays is the high demand for auditor training. Actually, due to the great acceptance and growth of Welfair®, there is a constant demand for trained auditors, who are the ones who apply the protocols on a daily basis. In addition, due to the expected expansion of the label to other European countries different to Spain and Portugal and Latin American countries, in the short term there will be an increase in the demand for courses in countries other than Spain.

Equines

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The European Union Reference Centres for Animal Welfare (EURCAW) support the correct application of European Union legislation on animal welfare by providing Competent Authorities, policy workers and support bodies with access to updated, reliable and consistent technical data, to research findings, new techniques and expertise. Consequently, EURCAW Ruminants & Equines addresses specific EU legislation to safeguard animal welfare regarding husbandry of calves (Council Directive 2008/119/EC), transport (1/2005) and slaughter (1099/2009) of farmed animals. For the husbandry of other species and animal categories covered in EURCAW Ruminants & Equines such as dairy cows, beef cattle or horses, the general rules laid down in Council Directive 98/58/EC concerning the protection of animals kept for farming purposes apply.

For example, the first work programme of EURCAW Ruminants & Equines comprised welfare indicators and assessment methods addressing the open norms of 1) provision of adequate feed and feeding frequency and 2) direct visual and tactile contact for calves. For each topic a so called thematic fact sheet and an indicator fact sheet was developed (see e.g. https://www.eurcaw-ruminants-equines.eu/welfare_topics/calf-feeding-2/). While

the compliance with legislation can be checked using resource-based or management-based indicators directly referring to the minimum requirements provided in the specific regulations, also animal-based measures may provide a valid tool to identify welfare problems.

Such an animal-based approach was used for the calf feeding topic mentioned above. To evaluate whether calves are provided with an appropriate diet adapted to their age, weight and behavioural and physiological needs information regarding calf feeding routines (frequency, quantity) shall be obtained from the farmer. In addition, body condition of calves can therefore be considered a proxy to identify feeding routines that compromise animal welfare. Underfeeding can also be visible as a dull and dirty coat and a hunched posture. Behaviours of calves that indicate hunger (cross-sucking, sucking on pen structures, standing/displacing other calves) may be observed at a higher incidence, whereas more satiated calves may be observed to either lie down and rest or exploring and playing. Detailed suggestions of animal-based indicators to assess feeding routines have been provided by EURCAW Ruminants & Equines.

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Welfare standard requirements in farms have increased singificantly over the last decades. These requirements very often combine a practical view of the breeder, scientific knowledge and the requirements of consumers. Based on these, we have already several protocols and methodologies suitable for welfare assessment, including Welfare Quality protocols. The modern protocols are animal based and are constantly being improved and systematically tested in practice. However, the welfare assessment can be time consuming, requires a trained specialist and it may not detect certain types of problems. Additionaly, the selected sample of animals for welfare assessment is dependable on farm size (e.g. in the Czech Republic, average farm size is 288 cows).

Many farmers have already access to precision farming tools which use biotelemetry as automated, mechanized technologies toward refinement of farm management processes, procedures, or information collection. These technologies are able to monitor behavioural, physiological, or production indicators of each animal, and also to detect individual animal disease, oestrus, potentially welfare problems or impending calving. Many precision farming monitoring technologies are commercially available and are widely used. Sensors used within progressive farming technologies can be placed on/inside the animals or be part of the technological equipment of the farm (i.e. parlour, in feeding or milking robots, and in an exit or feed alley). Recently, the increasing availability of accurate and small-sized real-time location systems, or automated picture analysis unlocked the potential of using location data for livestock behaviour monitoring and management.

Is it possible to use all these measurments to assess welfare of animals at the farm? And how to proceed these measurements? Is it possible to use artificial intelligence (AI) to evaluate these data and to help to indetify an individual welfare index for each animal and then calculate the average welfare index per farm? Artificial intelligence, and in particular machine learning and complex algorithms, combined with the frequent collection of indirect measures with sensors, that give us informations about animals behavior, physiology and potentionally animals affective state, can provide us with an objective, efficient and automated means of monitoring animal welfare and therefore have a huge potential in welfare assessment.

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In 2021, the WelCow project set out to attain a status of animal welfare in Norwegian dairy herds using the Welfare Quality® (WQ®) protocol. From the beginning of the planning process, it was clear that a system to electronically register the data during the farm visits and then automatically calculate the WQ® scores would be invaluable. Welfare assessment is time- consuming enough without spending additional time manually processing the data. At the time no such systems were available to us so we aimed to develop our own, and thus the WelCow App 1.0 was created.

The Eik Lab (NMBU Centre for Student Driven Innovation) paired the WelCow project with talented, ambitious computer science students and together we developed an online application to our specifications. The app includes the full WQ® protocol for dairy cattle and has been used on farm to register data in over 60 dairy herds and to perform the WQ® score calculations for more than 160 dairy herds. WQ® criteria and principle scores are automatically calculated, and a WQ® category assigned, immediately following data registration during the farm visit.

The collaboration was beneficial both for us, as animal welfare scientists, and the students, as budding developers. Our cooperation continues, and an improved WelCow App 2.0 is under development. The second version will include user-specific access to the database (a must for data security), improved visualisation of the assessment results (both WQ® scoring and intermediate data such as prevalences), and the addition of the WQ® protocol for welfare assessment in fattening cattle.

At today's Welfare Quality Network seminar, we will present the original WelCow App 1.0 and the improved functionality expected with the WelCow App 2.0. We hope to make our app available to fellow animal welfare researchers around the world, in exchange for a nominal fee, so that they and the animals under their care can avail of the benefits of easy registration and instanteaous feedback within the roboust WQ® framework.

project COwLEARNING
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The transdisciplinary project COwLEARNING aims to identify different transition paths to a more sustainable beef and dairy supply by initializing a co-learning process that combines expertise from social, environmental, agricultural, and veterinary sciences with the knowledge of practitioners in farming, processing, retail and gastronomy, and of citizen-consumers. As one important part of the project we will analyse innovations at different levels of the supply chain (e.g. cow-calf contact [CCC] systems in dairy production, cow-sharing as marketing strategy, nose-to-tail gastronomy) in a farm-to-fork assessment, considering sustainability and potential for up-scaling.

The project aims to assess animal welfare throughout the chain from birth to slaughter (though not following the individual animal) as far as feasible and combining it with a comprehensive sustainability assessment comprising the three pillars environment, economy and social aspects. We will compare innovative dairy and beef production systems (cow-calf contact, pasture based fattening, integrated fattening, i.e. on farm of birth, or an associated farm) with reference systems (early separation of dairy calves, transport of male calves to

specialized fattening farms, fattening bulls on fully slatted floors) and the according slaughter processes (on farm, alternative or conventional slaughterhouse). Besides animal welfare we focus on the human-animal relationship and its potential association with animal and human welfare.

For this we aim to visit 80 farms in Austria: 50 dairy farms, half of them CCC, half of them early separation, aiming to include integrated fattening farms in both systems, as well as 30 beef production farms (fattening bulls on fully slatted floors, pasture-based fattening, beef suckler herds). On the farms we assess all animal categories with the Welfare Quality® protocols for dairy cows, fattening bulls, calves and young stock. Further we will assess the slaughter process at the respective location with the indicators of the Welfare Quality® protocol. Both on farms and slaughterhouses we will assess aspects of the human-animal relationship - human attitudes and behaviours - towards animals and human well-being with questionnaires.

We aim to have a final animal welfare assessment not only per farm but for the whole production chain and also including the slaughter process to feed into the final farm-to-fork sustainability assessment. It needs to be decided if the welfare of different animal categories (cows, calves,...) and of different life stages should be aggregated, to what level and how. This will be discussed with experts as well as with the farm-to-fork stakeholders in our project's transition arena.

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The activities of EURCAW-Pigs focus on the welfare of pigs, and cover the entire life cycle from birth to the end of life. EURCAW-Pigs' main objective is a harmonised compliance with EU welfare legislation regarding pigs. In order to harmonise the interpretation of animal welfare requirements and to verify compliance with the European pig welfare legislation, the Competent Authorities (CAs) require standardized and relevant welfare indicators.

EURCAW-Pigs therefore provides relevant indicators suitable to verify compliance with Directives 98/58/EC and 2008/120/EC (on farm), Regulation (EC) No 1/2005 (transport), and Regulation (EC) No 1099/2009 (slaughter). Animal welfare indicators include animal based, management based and resource based indicators. To be relevant, an indicator needs to be valid, feasible, reliable. For this purpose, EURCAW-Pigs explores the different quality assurance schemes that consider animal welfare as a valid quality attribute, and the animal based indicators provided by the Welfare Quality project.

Todays presentation is on the link between animal based post mortem findings at slaughter and on farm welfare. This is based on several questions that EURCAW-Pigs received from welfare policy workers in the EU. Studies indicate that slaughter findings may play an important role for a retrospective assessment of certain aspects of animal welfare on farm. Slaughter findings can be used as (1) feedback to farmers and CAs in order to monitor and benchmark aspects of the welfare status of a herd, (2) to derive measures to improve the welfare status, and (3) to identify farms with a poorer performance, and thus support a risk based inspection strategy by the CA.

Tail damage at the abattoir is presented as an iceberg indicator. Tail damage potentially provides a general overview of animal welfare problems on farms. However, assessing tail damage at the abattoir should be standardized first to provide a functioning feedback system. EURCAW-Pigs experts also reviewed the scientific information on a link between animal welfare status on farm and, respectively, bursitis, pleuritis and skin lesions at post-mortem inspection. The occurrence of bursitis at post-mortem inspection seems to reflect the occurrence of bursitis on farm, unless pigs have spent the night in lairage. As skin lesions often arise during transport and in lairage they seem not useful for evaluating the

occurrence of skin lesions on farm. Finally, for chronic pleuritis no direct link was found between post mortem at slaughter and air quality in weaner/finisher herds: there is mainly an association with infection pressure.

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The welfare of farm animals has become an increasingly important issue for society. The European Green Deal aims to set the EU on the path towards a more sustainable agriculture, that includes ensuring farm animal welfare from Farm to Fork. This has resulted in the development of welfare assessment protocols and certification schemes for different stages of production and different production systems. However, current programmes tend to concentrate on intensive systems, transport and slaughter, forgetting the first stage of beef production – suckler cow herds in extensive systems. With the aim of solving this gap, we tested an adaptation of the WQ® protocol for cattle in suckler herds in extensive systems in Portugal and Mozambique. The feasibility of the protocol was tested in herds in very different settings and composed of different breeds.

Lack of validity, impracticability or unfeasibility, were the main reasons for removing some of the original WQ indicators (e.g. avoidance distance and QBA). These were replaced by measures suggested by studies carried out in pasture-based cattle in New Zealand and a few new ones proposed by us. To the WQ indicators, such as body condition, integument alterations, disease signs and management indicators, we added behaviour when in the chute, positioning of ear tags, and signs of thermal comfort. To answer to the main hindrance of current protocols, we included indicators that could be collected from animals when being handled in a race/chute for reasons other than welfare assessment. We also included new resource and management - based indicators (shelter and water distance; handling quality) more appropriate to these extensive conditions. In general feasibility and repeatability of these indicators were considered good.

We will also present and discuss the difficulties in using the WQ protocol in outdoor feedlots for fattening cattle, which are very common in Portugal. In these feedlots, growing beef cattle are kept in large groups in large paddocks (> 5000 m2) with a soil surface. We suggest that for these systems, some indicators should be collected in the race/chute in the same way as it is proposed for suckler herds.

The correct identification and interpretation of indicators collected from Farm to Fork, will contribute to the implementation of more integrated beef cattle production and to the improvement of management and conditions under which animals are produced. Certification should be transparent and trustworthy across all production systems and stages.

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The welfare state of farm animals, including beef cattle, is best reflected in animal-based measures (ABMs). The aim of this study was to develop a valid and practical protocol for the monitoring of fattening-beef cattle welfare in Ireland using animal-based measures (ABMs). The first step was to conduct a comprehensive literature search on relevant indicators for beef cattle. Based on the research, a thorough inventory of existing parameters and information, both on-farm and in the

entire Irish beef production chain was compiled resulting in 90 ABMs (long list). The second step, was to submit the "long list of ABMs" to key stakeholders from the Irish beef sector through an interactive process (adapted Delphi consultation method). The stakeholders selected- based on their knowledge and experience - the ten most relevant indicators, judged for their relevance for welfare, feasibility (low, medium, high) considering their cost, time of evaluation and labour required. Next, a "short list of ABMs" was compiled. Based on this short list, a through detailed process of adjustment of modifiable ABMs was conducted, and a protocol with 17 potential indicators cluster into 5 domains was created of which 9 corresponds to Welfare Quality®. The practical feasibility of the draft protocol was tested during summer on a limited number of farms. During evaluation animals were outside at pasture. Only fattening cattle with a live weight
> 250 kg were assessed. The application of the draft protocol on the farms showed that for some indicators a more detailed scoring system was necessary to indicate more than acceptable and non-acceptable welfare threshold. For example, the indicator "animal hygiene" was adjusted to a categorical measure based on the degree of soiling by faeces and/or mud on the parts considered (i.e. 0: very clean; 1: clean; 2: acceptable; 3: dirty; 4: and very dirty). In other cases it was necessary to adjust the definition of the indicator and the terms of measurement. Examples are those indicators related with the outdoor environmental conditions such as queuing at the watering point, disconfort due to flies, and signs of thermal stress. The next phase will be to perform further testing on more farms with different characteristics (number of animals, breeds, infrastrucutre) and under different climatic conditions to validate the protocol and to test the inter-observer reliability.

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Pasture is perceived as positive for dairy cow because it allows expressing natural behaviours and gives freedom of movement. However, the welfare of cow can also be at risk at pasture. To date, there is no standardised protocol for animals at pasture. We intended to design a protocol for assessing dairy cow welfare at pasture.

Based on a review of the literature, we identified benefits and risks for cow welfare at pasture for each Welfare Quality® principle (feeding, housing, health and behaviour). We then identified six potential measures that need to be developped or adapted to pasture conditions. These measures relate to fly dislodging behaviours, queuing at waterers, reactivity to handling, social behaviours (affiliative and agonistic), avoidance distance at pasture, and Qualitative Behavioral Assessment (QBA). Five trained observers rated photos and video twice to assess inter- and intra- observer reliability of these measures. These measures, along with Welfare Quality measures (ex. injuries), were then performed by two observers on 48 grazing cows (24 cows /observer) and repeated two days apart to assess short-term repeatability and 7 times with a 5 week interval to assess repeatability over the grazing season. Intra-class correlation (ICC), Kappa (K) and prevalence-adjusted and bias-adjusted kappa (PABAK) coefficients were calculated.

For all measures, inter- and intra-observer reliabilities were mostly good to very good (ICC>0.75

and K>0.60) except for one observer and for QBA. Repeatability at short term was low for affiliative, agonistic, and fly dislodging behaviors (ICC<0.5 and K<0.2), moderate for lower legs cleanliness and ocular discharge and good for flank / upper legs cleanliness, lameness, swellings and injury score (K>0.6). Repeatability over the grazing season was low for almost all measures (K<0.4) except for swellings and injury score (moderate repeatability). In conclusion, all measures were validated in terms of inter- and intra-observer reliabilities. Poor repeatability over time for measures of fly dislodging and social behaviours is probably due to variations in environmental conditions. For instance, during the grazing season, weather conditions and availability of grass vary, animals are moved on different pasture plots, etc. This raises the issue of how many repetitions along the grazing season should be performed to obtain an overall picture representative of the whole season.

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In 2009, we contributed with a publication in the Welfare Quality Reports No. 12 (Huertas et al., 2009. http://www.welfarequality.net/media/1120/wqr12.pdf), describing the difficulties that we faced when applying the Welfare Quality® protocol for the assessment of beef and dairy cattle (to a lesser extent). Most of the difficulties reported at that time are still relevant today. Among them, we highlight the difficulties in defining the appropriate sample size (i.e., the number of animals assessed per farm) due to the large number of animals on farms (some with more than 30 thousand heads) and the protocol limitations when assessing heat stress, mainly when considering the differences between breeds. This topic is of vital importance in countries located in the intertropical zone, mainly because since 2009, the problems with heat stress have worsened due to global warming, even when taking into account Zebu breeds, which are more adapted to the tropical conditions, with high solar radiation and air temperature. We received farmers' reports last and this year, informing the occurrence of death of neonate Nellore (a Zebu breed) calves due to heat stress, which was never reported before, and I had never heard about such an occurrence in more than 40 years working with beef cattle. Another situation that deserves updating the methodology of beef cattle assessment is related to the significant increase in the number of cattle finished in open feedlots (mainly in Brazil, where the number of cattle finished in feedlots increased from 2,757 (ANUALPEC, 2009, Anuário da Pecuária Brasileira, Agra FNP Pesquisas Ltda, São Paulo. 360p.) to 6,09 million herd (ABIEC, 2020, http://abiec.com.br/publicacoes/beef-report-2020) from 2009 to 2019. Such a growing tendency is also happening in Paraguay and Bolivia. It is frequent to find feedlot units housing more than 50 thousand cattle at the same time, where they usually face extreme heat stress (most of the feedlot units have no shade available) and high dust concentration in the air during the dry season. Such conditions often result in respiratory health problems that can lead to cattle death. To reduce such risk, many feedlot keepers are adopting metaphylaxis (treatment of a group of animals without evidence of disease), which is condemned due to the risk of increasing the number of microorganisms resistant to the antibiotics. Thus, it would be relevant to develop strategies to assess the welfare of cattle kept under such conditions, which, according to my understanding, is not well addressed in the Welfare Quality® protocol.

approach
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Animal welfare is a multidimensional concept that comprises animal health, mental state and natural living conditions that plays an essential role in dairy production. Over the last two decades, there has been an increased concern among citizens about how animals are reared on farms. In dairy farms, animal welfare can be assessed with different available protocols. The goal of this study was to describe animal welfare on dairy farms in Argentina, based on available scientific literature, using the Welfare Quality®, protocol as a guide to structure the analysis. Argentina is characterised by its large agricultural sector and cattle population. We conducted a literature search using the Scopus database to find articles related to the measures included in the protocol for Argentine farms. Furthermore, we included data from national statistics. Data were grouped according to the four principles of the Welfare Quality® protocol: good feeding, good housing, good health, and appropriate behaviour. The results suggest that cows are well nourished; however, water provision is limited as cows need to walk long distances, between 244 m and 460 m, to access a water point. Heat stress is the main constraint affecting the welfare of cows, as the temperature-humidity index is higher than 72 for at least 100 days in the year in the main dairy region area. Lameness and milk fever prevalence were estimated to be 2.2% and 0.7%, respectively, which are below the limits for ensuring good welfare. The annual average of somatic cell count was close to 400,000 /ml in the last five years, exceeding the threshold recommended for good health, and mortality rate of cows was higher than recommended. The main strength of Argentine dairy farms in relation to animal welfare is the year-round pasture access in 90% of the farms. On the other hand, the risks rely on access to water provision, heat stress, somatic cell count, and outdated dairy facilities. These results may be useful for discussing the most relevant policies to assist farmers and advisors in improving animal welfare on Argentine dairy farms.

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Since the Welfare Quality® (2004 – 2009) was an integrated project, 4 Latin-American countries (Brazil, Chile, Mexico and Uruguay) were incorporated in 2007 as INCO-Welfare Quality® in Latin America (LA). The main objectives were: - to study consumers' attitudes and beliefs towards Animal Welfare (AW); - to test and implement AW monitoring system in the conditions encountered in LA, including extensive forms of production; - to develop practical strategies to improve the welfare of farm animals and - to increase existing knowledge of some of the major welfare problems of extensive systems of animal production. Two activities related to INCO- Welfare Quality® project took place in Uruguay during 2007. The International Seminar in AW: New challenges in Animal Production, to explain the scope of the integrated INCO-WQ® project for LA and EU and the First Workshop on Welfare Assessment in Cattle, to train LA people on the welfare protocols developed in WQ® and studied how to adapt that protocols to conditions commonly encountered in LA production systems. With this purpose, three workshops on cattle, pigs and poultry were held in Uruguay, Brazil and Chile respectively. Knowing that WQ protocols were not easy to apply in extensive systems of animal production, the experience gained by LA scientists in their own countries has revealed a number of areas that deserve further attention, especially in cattle (Huertas et al., 2009). WQ protocols in Uruguay were

largely apply mostly in cattle (Dairy and Beef) at farm level, but due to some particular characteristics of the production systems taking into consideration the extensive and semi-extensive conditions in the country, has been adapted and/or changed. Protocols were translated into Spanish and Portuguese. In relation to protocols applied to slaughterhouses, the level of difficulty was few, the only problem could be the speed of the line to assess all the items. With poultry and pigs, even though there not the most species in the country, we do not find big problems in the protocols application. In extensive beef cattle systems, animals are not feeding at any time, so behaviour observations are difficult to do at the field. Items added to beef cattle protocols: number of animals per group, overall conditions of pasture; mineral supplement, fences conditions, vaccination plan, cattle movements, corral pens, conditions of floor, broken fences, water provision for the animals inside the pen, etc. In Dairy cattle systems, some items were added like Heat stress, Teat score, Somatic Cell Counts, etc.

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The Animal Welfare Science Hub was originally developed with resources of the EU VII Framework Program, by the Animal Welfare Indicators Project. The educational platform is aimed at hosting science-based information on animal welfare which are relevant to all stakeholders and interested parties. With the end of the AWIN Project in 2015, the Animal Welfare Science Hub experienced limited updates, which created a significant gap between the developments in animal welfare science and the mission set by the AWIN Consortium. In 2021, the International Society for Applied Ethology helped to launch a new version of the HUB, with resources given by the Open Philanthropy. The new version of the Animal Welfare Science Hub aims to become a global repository of animal welfare resources. Our goal is to have an updated repository of teaching, extension, and research activities, in animal welfare science worldwide. Teaching and educational resources are present in the current animal welfare science hub. The main focus at present has been on activities developed in veterinary schools, in the world. The HUB team is discussing with the International Veterinary Students Association, ways to foster a close collaboration to update the educational repository promptly. The HUB also hosts welfare assessment protocols developed in many parts of the world. Standards and protocols on animal welfare certification programs are also part of the animal welfare science hub. A novel repository is available on the hub to host images and videos which are relevant to animal welfare. The image and video resources can be used to develop computational systems to assess relevant topics to animal welfare. Currently, the hub hosts a repository of videos of sows with different locomotion scores a repository of images of horses used to validate a protocol to assess pain and capybaras and equids dataset labelled images, that were used to develop a roadway animal detection system using computational vision technology. The Animal Welfare Quality Network represents a team of scientists working in animal welfare, globally. Our goal is to identify potential collaborative opportunities, to bring the AWIN Animal Welfare Science Hub closer to the Animal

Welfare Quality Network, particularly to attract new image and video datasets.

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Conclusions

After 22 communications related to the use of animal-based indicators in different species and scenarios, the main conclusions of the seminar could be summarised:

-Although when QBA was defined as a measure for the different Welfare Quality Protocols it was stated that the descriptors used should be assessed by the different assessors according to their interpretation seen on this on the animals, after some years of using them, it has been detected that some fundamental differences between assessors in using this tool were due not to a different perception of the emotional state of the animals, but a different interpretation of what it means each descriptor as such. In consequence, during the training sessions, it was decided to include a session to harmonise first to their application, the meaning of each one of the descriptors. This is especially important when the native language of the assessors is not English. The work presented by Jen-Yun Chou in the seminar provides a further step in this process, trying to define, by using different experts, the meaning of each one of the descriptors, which is something that the WQ network could consider in the future.

-The use of the Welfare Quality approach is still now useful for the development of new protocols, such as the one presented in wild animals under human care or the one for sea bream.

-The animal-based indicators results are fundamental in the assessment of a correct stunning in the slaughterhouses for different species.

-New approaches developed during the Awin project and implemented later in the market, such as the use of transects as a methodology for sampling in a poultry farm are interesting methodologies to consider in future protocols.

-Different private partners, such as Essi Wallenius in Finland, Welfair in different European countries and TerraBea in France works or will work with the welfare quality protocols to arrive to the consumer and other stakeholders, such as veterinary practitioners.

-New app's, AI and systems to consider all the chain are being created in different countries and will help the WQ protocols and any animal-based protocol beyond the current state.

-There is a close link between the mission of the WQ network and the work performed by the different EURCAWS that should be reinforced.

-Different groups in Europe and South America presented alternative protocols to the existing ones for cattle in extensive/semi-extensive conditions, highlighting the need to develop a new protocol for this purpose.

Henry Buller

We have been deeply saddened to hear that our dear friend and colleague, Professor Henry Buller, from Exeter University, UK, passed away in his home with his family on May 2, 2023. His intellectual curiosity, warmth, and love of transdisciplinary and international connection will be missed by many in the Welfare Quality Network. Henry joined the Welfare Quality Project in 2004-2009 and looked at retail activities to promote farm animal welfare. Later on, he worked extensively on projects around biosecurity, looking specifically at the use of antimicrobials in animal care, and agricultural. He edited the Routledge Human-Animal Studies Series and Sociologia Ruralis supporting scholars to shape more-than human studies. Henrys exceptional generosity, compassion, and sense of fun will make many feel his loss very deeply.