



**Welfare Quality Network Seminar  
12.12.2017  
University of Natural Resources and Life Sciences  
(BOKU), Vienna, Austria**

## **ABSTRACTS**

## Programme

- 09:00 *Welcome*
- 09:15 Practical issues associated with using the Welfare Quality broiler assessment to assess welfare in multi-tier cell production systems (Andy Butterworth, University of Bristol, UK)
- 09:45 Validation of the EBENE method's measures for standard broiler (Laura Warin, ITAVI/INRA Nouzilly, FR)
- 10:15 On-farm pig research: challenging the WQ pig protocol (Christine Leeb, BOKU, AT)
- 10:45 *Coffee break*
- 11:15 Reliability of the multi-criteria aggregation system of the Welfare Quality® welfare assessment for growing pigs (Irena Czycholl, Christian-Albrechts University Kiel, DE)
- 11:45 Sensitivity analysis of the Welfare Quality scoring model (Romain Lardy, INRA, Saint-Genès-Champanelle, FR)
- 12:15 *Lunch*
- 14:00 New consultation of experts to refine the Welfare Quality Scoring model (Isabelle Veissier, INRA, Saint-Genès-Champanelle, FR)
- 14:30 "AniFair" - a tool for assessing animal welfare using multi-criteria analysis (Jennifer Salau, Christian-Albrechts University Kiel, DE)
- 15:00 Development and evaluation of an online training tool for the assessment of animal-based welfare parameters in cattle (Josef Schenkenfelder, BOKU, AT)
- 15:30 *Coffee break*
- 16:00 Finnish dairy company obtains Welfare Quality certificate - the Juustoportti case (Essi Wallenius, Konsultointi, FI)
- 16:30 The Welfare Quality concept in certification: Strengths and weakness, incorporation of Awin protocols and development of new protocols for rabbits (Antoni Dalmau, IRTA, ES)
- 17:00 *End*

## **Practical issues associated with using the welfare quality broiler assessment to assess welfare in multi-tier cell production systems**

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Visits to multi-tier cell production systems took place in the summer between May 2017 and September 2017. The birds were assessed at the time of final loading. Each production row consisted of 6 identical tiers on top of each other, equipped with feed, water and litter, and houses contained approximately 4000 birds per cell. Environmental measures were collected (temperature, humidity and sound levels) for each cell, and temperature data loggers were placed at various locations throughout the shed during the observation period. Bird measures assessed, derived from the Welfare Quality® protocols, included; panting, vocalisations, wing flapping, discomfort/escape behaviours and incidences of trapped/injured birds. The practical limitations of applying the welfare quality protocol in this setting included; it was not always possible to collect birds from the 'layers' within the tier system, and many birds for assessment had to be taken from the belt at depopulation, head torches were necessary to observe the birds, and were used by researchers across all visits, but even with light sources, observation of the birds was 'not easy'. Issues associated with conditions encountered by researchers as the birds were assessed at the time of depopulation were; dark, noisy, dusty, and with a high speed of handling.

## **Validation of the EBENE method's measures for standard broiler**

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The objective of the welfare project EBENE (Evaluation du BIEN-Etre animal) is to provide the French poultry and rabbit industries with a shared and practical method to assess animal welfare. This study aimed to validate the practicability (simple and under 1 hour) and the scientific reliability of the method for the indoor broiler production system. Two assessors carried out the measures on seven broiler farms, initially together on the same population sample and then a second time. After collecting general information about the flock, behavioral measures (e.g. proportion of foraging birds) were conducted on two areas of the building (4m<sup>2</sup>/ area). Then sanitary measures (e.g. proportion of lame birds) were assessed on three transects, allowing observation of around 45% of the birds. The total duration of the assessment was calculated and correlation tests were run to evaluate the repeatability of the measured indicators. A lower total duration than required in the objectives (26±5 min for the collection of behavioral data and 24±5 min for the collection of sanitary data) confirmed the practicability of the method. Intra and inter assessor repeatability were validated for the sanitary measures, except for the “dead” indicator. However, improvements were still needed for the repeatability of the behavioral measures (e.g. more accurate definitions). Following validation, a smartphone application will be developed in 2018 to facilitate use of the methods.

## **On-farm pig research: challenging the WQ pig protocol**

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## **Reliability of the multi-criteria aggregation system of the Welfare Quality® welfare assessment for growing pigs**

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As animal welfare is a multidimensional concept, multiple indicators are needed for a welfare assessment. Thus, for an overall evaluation of a farm an aggregation system is needed to convert these multiple indicators into one comprehensible result. Such an aggregation system was included in the Welfare Quality® protocol welfare assessment protocol for growing pigs. This study analysed interobserver and test-retest reliability of the multi-criteria evaluation model based on 144 protocol assessments on 24 growing pig farms. Hence, the results of two trained observers, assessing the same animals at the same time (interobserver) and repeated visits of the same observers on the same farms to different points of time (test-retest reliability) were compared. Moreover, the influence of indicators in the aggregation steps was analysed by partial least squares (PLS) modeling. While interobserver reliability was in general acceptable, this was not the case for test-retest reliability. This shows that the aggregation was not capable of diminishing effects due to unreliable assessment at indicator level on-farm. PLS modeling revealed unexpected influences of variables that were not theoretically dedicated in the calculation. Thus, double counting of variables is present. However, the results of the PLS modeling revealed that some indicators have the potential as iceberg indicators as they have multiple influences on different welfare aspects. In the future, an adaptation of the aggregation system will be needed based on these insights. The tool “AniFair” can help with the improvement.

## **Sensitivity analysis of the Welfare Quality scoring model**

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A revision of the Welfare Quality scoring model for dairy cattle seems necessary because some criteria affect the results more than expected by experts (De Graaf et al 2017). Before changing any parameters in the calculation, we need to perform a sensitivity analysis to understand which are the most influent measures. A previous study (De Graaf et al (subm)) looked at the sensitivity of the model to extreme changes (i.e. shifts to the worst or best possible value from a set of observed farms). We performed a more comprehensive study, looking at “local” changes using the Morris method (Morris 1991). This method gives information of sensitivity through two indices: the overall influence of a variable and the non-linearity and interactions with other variables. We applied the method on all measures used in the scoring model for cows. At first, for each variable, we simply used a Uniform distribution based on theoretical values, which gives us information on sensitivity for the whole range of possible input values. We plan to run the same analysis on an observed distribution of input variables (i.e. data collected on a population of farms). This will tell us what is more likely to affect the scoring in practice. Next, we will consult experts to refine the scoring so that it matches better their opinion. Last, we will perform again the sensitivity analysis on the amended Welfare Quality scoring model to check that the new behaviour of the model is compliant with what is expected.

## **New consultation of experts to refine the Welfare Quality Scoring model**

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It is now nearly 10 years that the Welfare Quality® scoring model was designed, based on extensive experts' consultations. The authors of the model argued that the model should be revised after some years of use and – hopefully – improvements of the animal welfare situation in Europe. On a set of 491 farms, De Graaf et al. (2017) observed that some measures do not have an impact on the scoring of these farms although they are highly valued by experts (e.g., lameness, injuries). In addition, the experts consulted by De Graaf et al. (2017) were more severe than Welfare Quality® for some criteria (absence of injuries, absence of pain induced by management, procedures, expression of social behavior, and good human–animal relationship) but less severe for absence of thirst. We suspect that the discrepancy between the importance given to some criteria by Welfare Quality® and that attributed by experts comes from the severity by which measures are computed into criterion-scores rather than an intrinsic value of the criteria attributed by Welfare quality® when they are aggregated. To correct this, we propose a new set of questions to experts.



## **“AniFair” – a tool for assessing animal welfare using multi-criteria analysis**

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In assessing animal welfare, observers gather multiple indicators which are measured in different units and need to be converted into an objective overall welfare score to provide comparable classification of farms. Studies have proved, that with the current aggregation system, some indicators affect more than one category and are, thus weighted stronger in the calculation of the welfare score. Furthermore, effects of unreliable on-farm assessments are not diminished by the aggregation. As adaptations of the aggregation system have been discussed, the multi-criteria decision analysis (MCDA) software “AniFair” is developed.

The user inserts criteria and a list of objectives that need to be evaluated. Via graphical user interface (GUI) the user is then invited to provide referential information, i.e. to give qualitative judgement about differences of attractiveness between levels of the criteria. For all criteria pre-cardinal scales are calculated which are not based on fixed weights but on the user’s decisions. Also, comparability between criteria is ensured. “AniFair” visualizes the suggested scale, to allow adaptation of the scale before the aggregation step is initiated. For the aggregation the information on how the objects were scored regarding the criteria can either be uploaded from file or manually inserted via GUI. “AniFair” calculates overall scores based on the Choquet integral, whereby a GUI is provided to define additional constraints with regard to the relative importance of and interaction between criteria. Thus, “AniFair” is a flexible MCDA tool to aggregate the welfare indicators.

## **Development and evaluation of an online training-tool for the assessment of animal-based welfare parameters in cattle**

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Self-evaluation of animal welfare by farmers has recently been encouraged, e.g. by the Austrian organic farming association BIO AUSTRIA. However, rather little is known how a resource-efficient training of a large number of farmers could take place and which level of agreement might be achieved. For this purpose, in the present study, an online training-tool for the assessment of 10 animal-based parameters of dairy cattle welfare was established. This tool included online quizzes containing pictures or video clips of selected animal-based parameters which had to be assessed by the test persons. IOR as compared to a gold standard (calculated as Cohen's Kappa  $\kappa$ ) was investigated. Furthermore, it was of interest whether practice in terms of repeated trials leads to improvement.

In total, 938  $\kappa$  values from 111 users were obtained from the 10 different quizzes. The average agreement per quiz in round 1 reached values of  $\kappa \geq 0.40$  (n = 58–100 users). For the parameters cleanliness and diarrhoea,  $\kappa$  exceeded 0.40 for all test persons in round 1. Agreement was lowest for the parameters body condition, hairless patches and lameness. Retaking the quizzes (round 2, n = 14–24) led to significant improvement of agreement for all parameters, except for hairless patches and lameness.

In conclusion, the results of this study are promising as regards the intended use of the training-tool. However, its potential to improve reliability of live on-farm assessments needs to be further investigated, e.g. with regard to transferability to live observations.

## **Finnish dairy company obtains Welfare Quality certificate - the Juustoportti case**

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Juustoportti is a Finnish dairy company. They are the first company in the world to integrate Welfare Quality audits to all their contract farms. Juustoportti has introduced three tiers into which their producers can engage. The tiers have increasing demands with regards to animal keeping as well as to the level the farm must receive in the Welfare Quality assessment.

The presentation will describe the auditing and certification process in which Juustoportti has enrolled in as well as the pilot audit WQ-results. The presentation will also discuss their reasons for engaging in such process, their future aims and potential limitations to the implementation plan.

**The Welfare Quality concept in certification: Strengths and weakness, incorporation of Awin protocols and development of new protocols for rabbits**

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The use of the Welfare Quality protocols for certification purposes has received an important impulse the last year due to the interest of two of the most important retailers in Spain in this concept. The main strength of the system by part of the retailers is the European reputation it has and the support from NGO's and scientists. The time needed to have an assessment is not seen as a problem for small companies but need of a method based on samplings for the big ones in a model named multisite assessment. The main weakness for the companies are the difficulties in understanding how whole the system works and how to estimate the result or state of a farm before entering in a certification schema. Another problem for the certification companies is the limitation of the welfare quality to three species (chickens, cattle and pigs), when the demand is on most of the species used for consumption. One solution was to take the protocols developed in the Awin project and try to adapt the final output to a similar schema to those used for the Welfare Quality protocols. Finally, in some cases, such as rabbits, the development of new protocols were needed. It will be presented a summarized version of a protocol to assess welfare of does and bucks at farm based on more than 30 measures structured under the 12 criteria and 4 principles of the Welfare Quality.