ISAH 2026 Proceedings Paper Template

„Best Practices“ for broiler welfare – comparison of scientific experts’ vs. poultry farmers’ views

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Abstract

Objective

The EU Horizon project “aWISH” (Animal Welfare Indicators at the Slaughterhouse) aims to improve animal welfare in poultry farming. For this purpose, “Best Practice Guides” were developed. To ensure the suitability as well as the scientific accuracy of the proposed “Best Practices” in the guides, scientific experts and poultry farmers were consulted to evaluate these measures in a survey.

Material and Methods

The study commenced with a literature review to identify Best Practices to reduce footpad dermatitis/hock burns (FPD/HB) and catching damage (CD) in broilers. Subsequently, identified Best Practices were integrated into two surveys: one was aimed at scientific experts (aWISH project partners, the project’s expert panel and external experts from different countries), the other at German poultry farmers. Participants were asked to evaluate the proposed Best Practices on a scale from 0% (unsuitable) to 100% (very suitable). Data analysis, including a mixed linear regression model, was performed with the software R.

Results

In total, 37 completed questionnaires from experts and 60 from farmers were analyzed. For FPD/HB, the measures “Good ventilation in stables” (experts: 91.0% vs. farmers: 94.0%, $p>0.05$) and “Height of waterline adjusted to animal size” (80.0% vs. 86.5%, $p>0.05$) received the highest scores in both groups. Farmers and experts showed significant differences in their opinions on “Slow growing breeds” (76.0% vs. 25.0%, $p<0.001$) and “Litter management” (77.5% vs. 46%, $p<0.001$). All proposed measures to reduce catching damage were scored ≥70% by experts, while farmers were critical towards practices relating to upright catching, such as “Carrying broilers upright” (73.5% vs. 20.0%; $p<0,001$).

Conclusion

Experts and farmers agreed on the effectiveness of most of the proposed measures. However, farmers rated measures that can be more challenging to implement on farm significantly lower than scientific experts. These results emphasize the importance of considering practical constraints such as costs, workload and feasibility when developing Best Practice Guides.

Keywords: Animal welfare, broiler, stakeholder comparison

1. Introduction

Recommendations to improve animal welfare for farmed animals are often based on the results of scientific research (e.g. EFSA AHAW Panel et al., 2023). However, implementation on farm and acceptance by farmers can be hindered when practical experiences and constraints are not considered in these recommendations. As part of the EU Horizon project aWISH (Animal Welfare Indicators at the Slaughterhouse), Best Practice Guides were developed that offer measures to improve animal welfare for broilers. In order to include scientific findings as well as practical knowledge into the guides, both animal welfare scientists (hereafter: scientific experts) as well as poultry farmers were consulted to evaluate candidate Best Practices to reduce the occurrence of footpad dermatitis (FPD)/hock burns (HB) and catching damage (CD) in broilers.

2. Materials and Methods

First, a literature review was conducted to identify Best Practices in broiler farming related to specific animal welfare indicators (AWI). The database PubMed (www.pubmed.ncbi.nlm.nih.gov) was used for literature research. The AWI "footpad dermatitis", "hock burns" as well as "catching damage" were used as keywords along side the animal species "broiler". Only scientific publications written in English that included measures to improve the relevant AWI were considered for this study.

All identified measures (Best Practices) as well as the corresponding references were collected in a Microsoft Excel sheet. A validation score from zero to three according to the frequency of occurrence of the different measures in the literature was introduced (Table 1). Only measures that received a score of 2 or more were considered important and subsequently used in the development of two online surveys.

Table 1: Validation score for measures identified in the literature review

Validation Score	Number of scientific publications recommending this measure
0	1
1	2 - <5
2	5 - <10
3	10 or more

Two online surveys were developed using the program LimeSurvey (V6.6.6 +2 41002 LimeSurvey GmbH, Hamburg, Germany):
The first survey was aimed at scientific experts. It was sent out to all partners of the aWISH project, the project's own expert panel, as well as to 128 animal welfare scientists from 21 countries all over the world. The external experts were chosen according to three criteria: a current position in research/academia, at least postdoctoral level in their current role as well as relevant publications regarding poultry welfare.
The second survey was aimed at German poultry farmers, specifically ones that worked with broilers. These were contacted via e-mail addresses on their business websites and through poultry organizations. The link to the survey was further published in the German agricultural magazine "DGS" as well as on the website of the German Animal Welfare Network ("Netzwerk Fokus Tierwohl").
Both surveys consisted of two parts: questions about the participant's background such as work country and professional experience, and the main part where participants could evaluate the suggested Best Practices on a scale from 0% (unsuitable) to 100% (very suitable) according to their suitability in reducing the occurrence of FPD/HB and CD. To ensure that participants only evaluated measures they were experienced with, it was not mandatory to answer each question. Furthermore, farmers were asked to indicate whether they were involved in the catching of their animals. Only participants that answered "Yes" could move on to the questions regarding CD.

All data received through the surveys was downloaded from LimeSurvey and exported to a Microsoft Excel sheet. Statistical analysis was performed with the use of the software R 4.3.1.
Frequency distributions were determined for multiple choice questions (e.g. background of participants). Means, medians and standard deviations were calculated for the evaluation of measures, and a mixed linear regression model was applied. The level of significance was set at $p < 0.05$. Pairwise comparisons were conducted to compare scientific experts and farmers, with p values adjusted for multiple testing with the Bonferroni method.

3. Results

In total, 37 scientific experts and 60 farmers participated in the surveys. Most scientific experts (64.9%) were currently employed in research and academia. With 10.8% each, the backgrounds "consulting" and "slaughterhouse" were chosen equally, while 13.5% of the scientific participants chose the option "other". Farmers were mainly self-employed (81.7%), while some also worked as employed farmers (8.3%), agricultural service providers (6.7%) or in other fields (3.3%), e.g. as quality management officers.

Scientific experts evaluated most Best Practices to reduce FPD/HB as suitable. Only four out of 15 proposed measures received a median level of agreement below 50%. The top three Best Practices according to scientific experts were "Good ventilation" (median: 91.0%), "Adjusting the height of the waterline" (80.0%) as well as "Adjusting the water pressure" (80.0%). Farmers evaluated the Best Practices similarly, with five out of 15 measures

scoring below 50%. Top three Best Practices in this group were “Good ventilation” (94.0%), “Adjusting the height of the waterline” (86.5%) as well as “Preheating the stable/floor” (76.0%). Pairwise comparison identified three Best Practices that showed a significant difference between the two groups: “Litter management (e.g. windrowing, tilling)” (median experts: 77.5% vs. median farmers: 46.0%, $p < 0.001$), “Slow growing breeds” (76.0% vs. 25.0%, $p < 0.001$) and “Lowering stocking density below EU legislation” (70.0% vs. 36.5%, $p = 0.021$). Both groups also showed large variations in their agreement with individual measures (Figure 1).

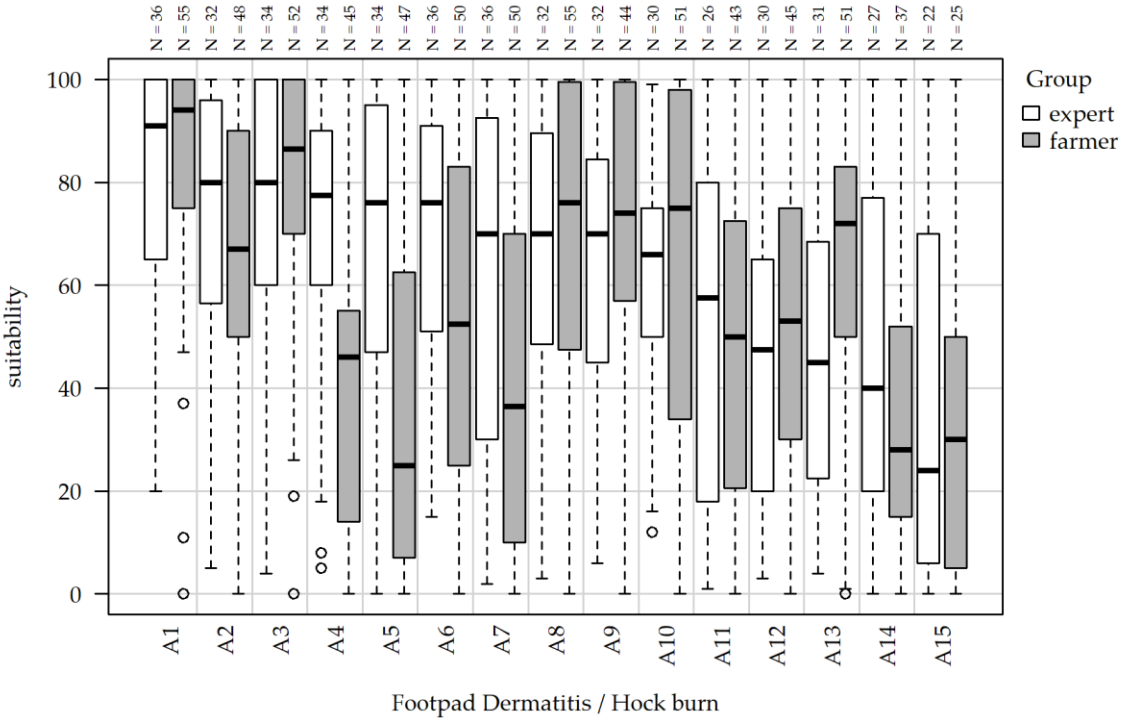


Figure 1: Level of agreement (0% - 100%) for measures to reduce footpad dermatitis/hock burns (experts vs. farmers) (A1 - A15: see Table 2)

Table 2: Explanation of answer codes (Best Practices) used in Figure 1

Footpad dermatitis/Hock burns	
A1	Good ventilation in stables (e.g. ventilation rate)
A2	Height of waterline adjusted to animal size
A3	Age appropriate adjustment of water pressure
A4	Litter management (e.g. raking, windrowing, etc.)
A5	Regular replenishment/replacement of litter
A6	Slow growing breeds
A7	Small cups or water nipples instead of bell drinkers
A8	Preheating stable/floor prior to arrival of animals

A9	Lowering stocking density on farm below EU legislation
A10	Litter other than straw (e.g. pine shavings)
A11	Avoiding high salt content in feed
A12	Feed additives (e.g. biotin, zinc, vitamin D3)
A13	Feed additives to stabilise gut microbiota
A14	Litter amendments (e.g. acidifiers)
A15	Black soldier fly larvae in feed

For catching damage, most measures received high levels of agreement. Scientific experts gave scores ≥ 70% to all proposed Best Practices. In the farmer group, the two measures "Not picking broilers up by their wings or legs" (25.0%) and "Carrying broilers upright" (20.0%) were the only two scored below 50%. Both of these measures also showed a significant difference between scientific experts and farmers in the pairwise comparison ($p < 0.001$). The top three Best Practices for scientific experts included "Careful handling" (99.0%), "Good condition of the crates" (97.0%) and "Training of the handling personnel" (92.0%). In the farmer group, "Low light intensity" (100.0%) received the highest median level of agreement, followed by "Handler experience" (91.0%) and "Good condition of the crates" (88.0%). Again, individual agreement levels of the participants in both groups showed a large variance.

4. Discussion

Overall, scientific experts and poultry farmers agreed with most proposed Best Practices. For FPD/HB, both groups emphasized ventilation and water management. Significant differences between experts and farmers were detected for practices that may increase costs and workload on farm (e.g. lowering stocking densities or windrowing/tilling as litter management). Since farmers need to consider economic outcomes and their income is tied to the performance of their animals (Mason, 2023), they may have been more inclined to consider practical constraints as part of their evaluation than scientific experts. This may have led farmers to rate certain measures more negatively than scientific experts did. The assessment of measures to prevent catching damage may also have been influenced by practical considerations. Farmers evaluated Best Practices related to upright catching < 50%. Delanglez et al. (2025) showed that while catching broilers upright is more animal welfare friendly, workload, costs and the duration of catching increase. Again, farmers may have taken economic feasibility into account in their evaluation.

This study is subject to several limitations. While scientific experts from different countries were consulted, only German farmers participated in the survey. Cultural differences and national laws may have influenced how participants view and evaluate Best Practices in regards to animal welfare. Self-selection bias might have also occurred, as both surveys were voluntary. Nevertheless, the results reveal important insights into academic opinions and farmers' practical perspectives. Further studies can build on these findings and explore the motivations underlying these respective opinions.

5. Conclusions

Scientific experts and farmers agreed on the effectiveness of most of the proposed measures. However, significant differences were detected regarding practices that can be more challenging to implement on farm. These results emphasize the importance of considering practical constraints such as costs, workload and feasibility when developing Best Practice Guides to improve animal welfare. The Best Practices Guides developed in the aWISH project will be made available to farmers, advisors and veterinarians in easy-to-read infographics and comprehensive documents (www.awish-project.eu/best-practice-guides).

Acknowledgements

The authors would like to thank all participating animal welfare scientists and poultry farmers as well as all aWISH project partners and aWISH expert panel members involved in this study.

This research has received funding as part of the aWISH project from the European Union's Horizon Europe Research and Innovation Program under Grant Agreement No. 101060818.

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