



aWISH

ANIMAL WELFARE INDICATORS AT
THE SLAUGHTERHOUSE

awish-project.eu

awish@ilvo.vlaanderen.be

From Monitoring to Management: aWISH Best Practice Guides

Maite Jachens

Institute for Animal Hygiene, Animal Welfare and Farm
Animal Behaviour,
University of Veterinary Medicine Hannover, Foundation



Funded by
the European Union

Recap: Precision Livestock Farming



Generated with DALL-E (OpenAI), 2026

Animal Welfare Indicators

Resource-based indicators

→ Measure environment features

e.g.: stocking density, number of drinkers



© The Dairyland Initiative

Management-based indicators

→ Management processes applied by a stockperson

e.g.: use of anesthesia, frequency of cleaning

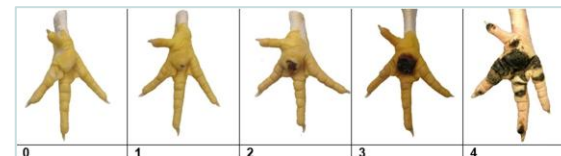


© Laboratory of Animal Behavior, Physiology and Welfare, Texas Tech University

Animal-based indicators

→ Assessed directly on the animals

e.g.: tail lesions in pigs, FPD in broilers



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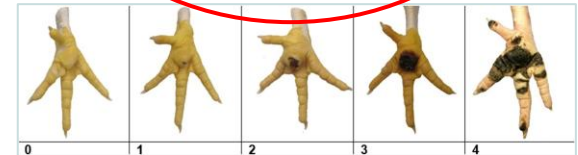


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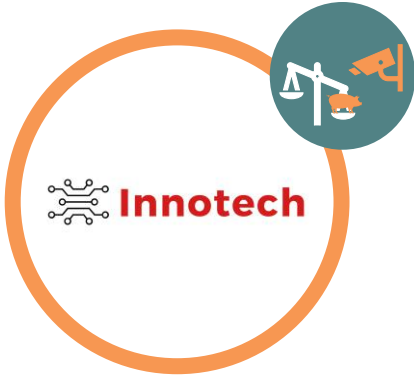
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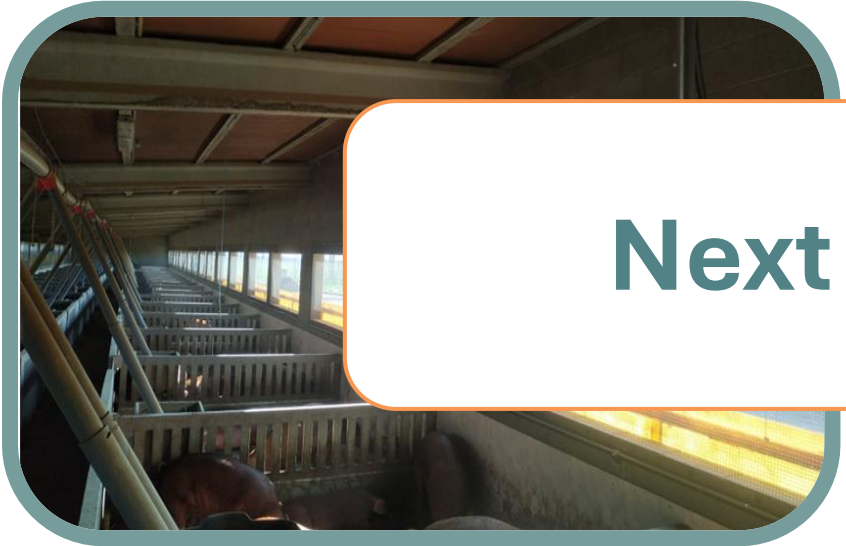
WEIGHT DETECT

Measures the average animal weight + total pen weight.

The sensor is placed above the pen.



WEIGHT DETECT



Next step??



From Monitoring to Management



Generated with DALL-E (OpenAI), 2026

Interpreting Data → Appropriate actions



Generated with DALL-E (OpenAI), 2026

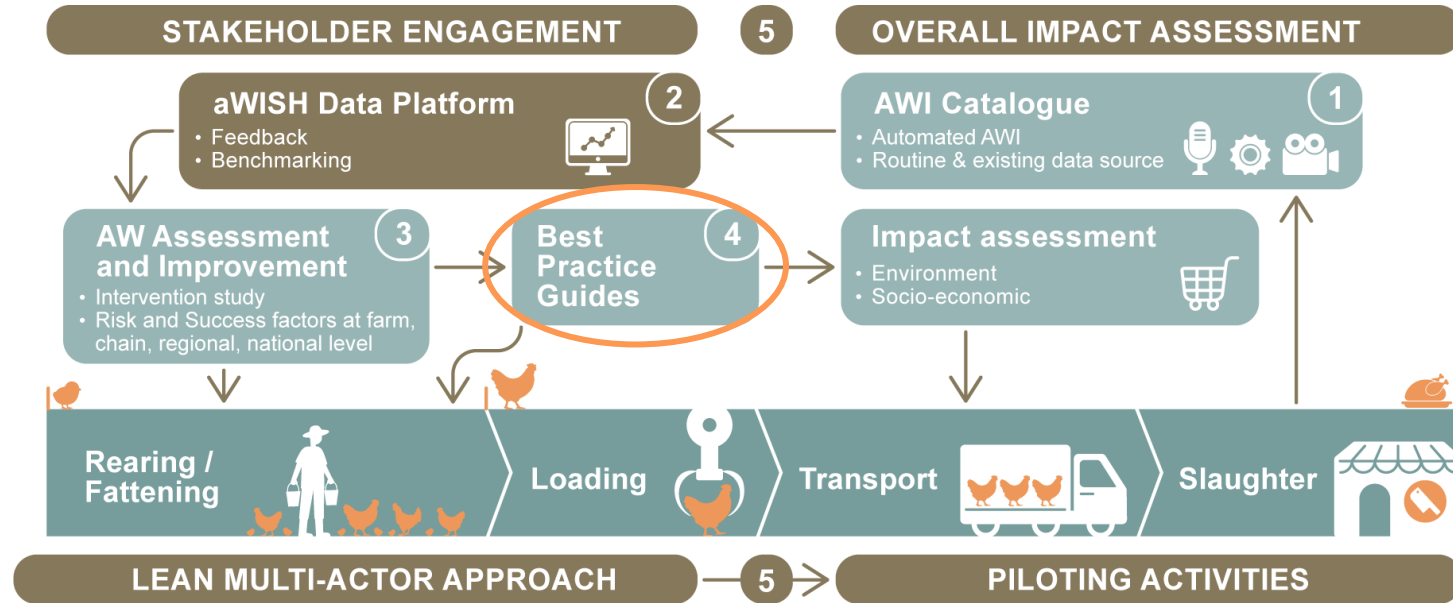
**Improving animal welfare by
implementing Best Practices**

aWISH: Animal Welfare Indicators at the Slaughterhouse

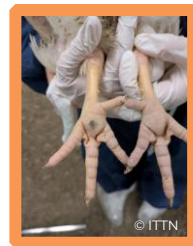
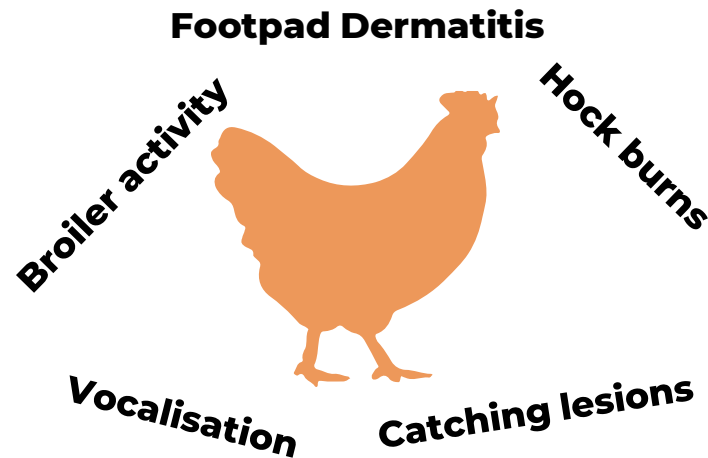
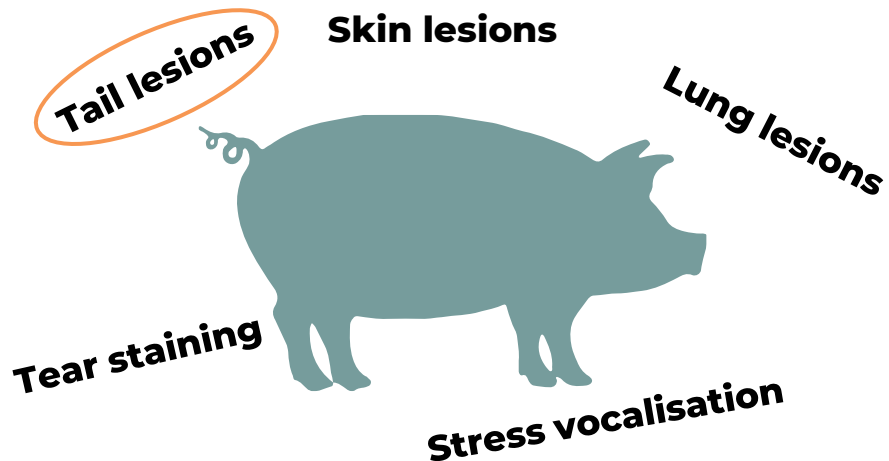
- **Horizon Europe** project
- **24 partners** from **11 countries**
- Aim: Large-scale **automated welfare monitoring** of **animal-based indicators** at the slaughterhouse
- **6 pilot slaughterhouses** in Austria, France, the Netherlands, Poland, Serbia and Spain



Overview aWISH project



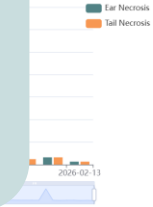
Animal-based indicators in aWISH



Indicators → Best Practice Guides



Access to Best Practice Guides



What are “Best Practices”?



“a **working method** or set of working methods that is **officially accepted as being the best** to use in a particular business or industry”

(www.dictionary.cambridge.org, accessed 02.04.2026)

Animal production: Practices that ensure the best possible conditions for the animals → health, welfare, behaviour

Often available as so-called “Best Practice Guides” for different animals

Available Best Practice Guides

Cow Welfare

Nutrition

Best practice farms optimise the performance of their cows by providing tailored nutrition, in a clean, safe and enriched environment which supports optimal health, welfare and human-animal interactions.

Why is this important?
Ensuring cows receive optimal nutrition to support both health and reproductive performance is a vital investment to optimise performance and minimise costs.

Good practice

Watering

- ✓ Clean water must be freely available at all times.
- ✓ Cows must have access to an adequate volume of clean, palatable water enabling them to maintain healthy hydration, irrespective of their diet and the temperature of their environment. Cows need approximately 40 L of drinking water per day at dry-off and 120 L per day during lactation, depending on their individual size, environmental temperature, the moisture content of the feed and their stage of lactation.
- ✓ Drinking water must meet the same potability criteria as for humans (constituent minerals and potential for pathogens). If the drinking water is not running water (e.g. rain, borehole, pond) it should be tested annually as a minimum, as well as whenever problems are observed. Attention should also be paid to open wells contaminated by surface water, where infectious agents often accumulate after periods of rain.
- ✓ Water troughs and drinkers should be easily accessible for both the cows (if possible from two sides) and humans (for maintenance), positioned in high traffic areas but on a stable, drained area (not close to gateways). They should be cleaned at least once a week and immediately if identified as dirty or contaminated. Stagnation of water should be avoided.
- ✓ Where water intake appears to have reduced (e.g. drop in production or feed intake, dry dung, animals hesitating or jostling at drinkers, bawling and sucking noises) check the drinker for problems (e.g. lack of flow, contamination or leakage).

Feeding

- ✓ Cows must have daily access to a palatable ration that meets their nutritional needs (energy, protein, vitamins and minerals), promotes safety and maintains skeletal growth, body condition, health, and vigour. Advice may be sought from a veterinary advisor or cow nutritionist.
- ✓ The composition of diets must be adjusted for production level, reproductive stage, body size, environmental temperatures and range of feedstuffs offered (e.g. pasture, hay, stage, concentrates). Consult your veterinarian or a nutrition specialist for advice. Use of regular body condition scoring enables adjustment of diets for over or underweight animals.
- ✓ Feed should be visibly clean, not contain obvious mould and be free of contamination from faeces, rubbish, sticks, tree leaves or toxic plants. For less visible sources of contamination, testing should be regularly completed to ensure there is no evidence of mycotoxin, poisonous plants or any other potential source of microbes, parasites or toxins.
- ✓ Cows should have the opportunity to graze outdoors, where weather conditions permit; however, cows not on pasture may require supplementation of roughage, concentrates or minerals, depending on the season and the cows' stage of production cycle, and the nutritional value of the grass.

1

©care4dairy

Guide on best management practice for the welfare of pullets (meant for production of eggs for human consumption)

Voluntary initiative group for the welfare of pullets
2021

© EU Platform on Animal Welfare

EAZA Best Practice Guidelines for Elephants

second edition
published 2020

© EAZA

aWISH Best Practice Guides

4 Guides for pigs:

- Animal Welfare
- Animal Health
- Transport
- Slaughter

4 Guides for broilers:

- Animal Welfare
- Animal Health
- Catching
- Transport





Lung lesions

Improve barn climate

1. Reduce ammonia concentration (<20 ppm) & dust
Immediate measures:
→ Check ammonia concentration in the compartments
→ Check and improve ventilation (0.1 – 0.6 m/s)^{1,4, 39}
→ Clean dirty pens^{1,5}
→ Use liquid or mushy feed
→ Add oil to feed to bind dust particles⁶
→ Increase humidity and reduce high temperatures (→ water spray cooling)
→ Use a small amount of litter or dust-free litter
→ Cover slurry tanks⁷
→ Clean corridors with water⁸

Long-term measures:
→ Regular drainage/slurry removal^{1,5,9}
→ No/little storage of manure in the stable (under the slatted floor)³⁹
→ Lower stocking density^{11, 39}
→ Provide fresh air (outdoor area)³⁹
→ Use of an automated ventilation system (based on continuous gas analysis)
→ Clean the compartment regularly with water (walls included) → all-in-all-out system³⁹
→ Install a water spray system
→ Add oil to the water spray system
→ Switch to a nitrogen-reduced diet⁷
→ Allow the pigs to use dunging areas (space allowance!)

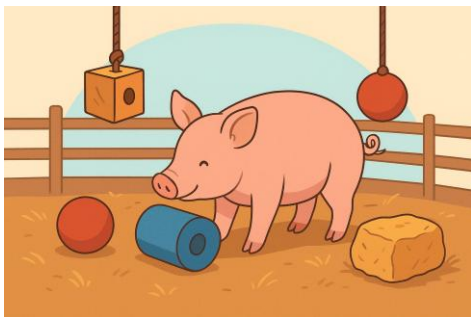
2. Improve ventilation & temperature
Immediate measures:
→ Check ventilation rate as well as for signs of draught³⁹
→ Check temperature and humidity^{3,13, 39}
→ Contact adviser for barn climate
→ Open windows and doors to improve ventilation rate in hot weather¹²
→ Clean fans¹²
→ Shade windows in summer to avoid high temperatures
→ Spray water onto barn roof in hot weather

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2

Examples of Best Practices recommended for tail lesions in pigs

Enrichment



AI-generated image with OpenAI ChatGPT (DALL-E), 2025

- Change enrichment material frequently
- Replace when broken and/or dirty
- Offer straw

Barn climate



AI-generated image with OpenAI ChatGPT (DALL-E), 2026

- Monitor: noxious gases, temperature, humidity & ventilation
- Install a waterspray system
- Provide fresh air (outdoor areas)

Feeding



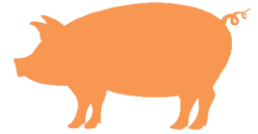
AI-generated image with OpenAI ChatGPT (DALL-E), 2026

- Provide roughage
- Check aminoacids
- Provide enough feeding and drinking space, preferably 1:1
- Clean water and feed lines regularly

Why Best Practice Guides?



- Step from data to practical guidance
- Compact collection of animal welfare improving recommendations
- Translate knowledge into usable advice
- Reduce gap between technical knowledge and farm practice



Often based on scientific recommendations →
practical feasibility?



Overview of study

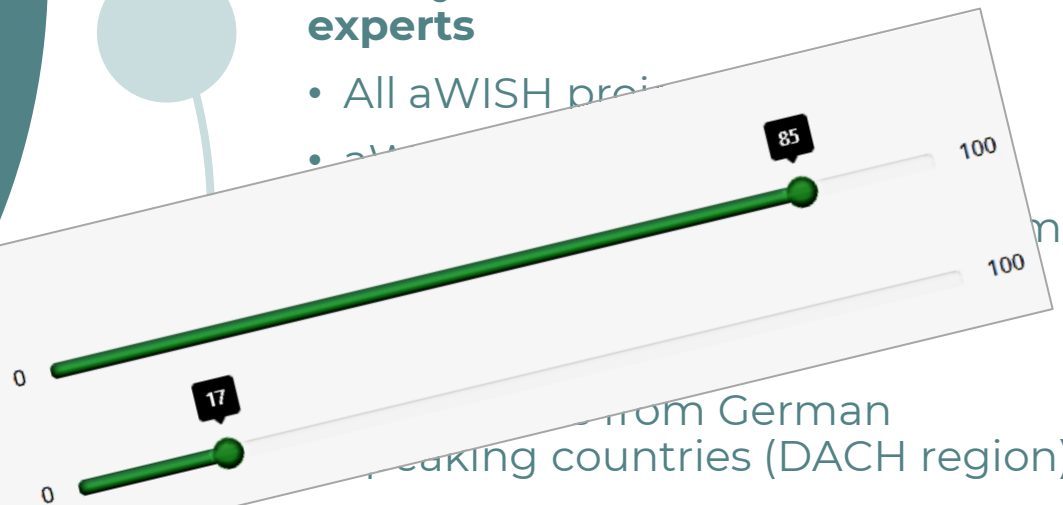
Survey with animal welfare experts

- All aWISH projects
- aWISH projects

Tail lesions / Ear lesions

Organic manipulable material on farm except straw
(wood, sisal ropes, pressed molasses, etc.)

Non-organic manipulable material on farm (metal
chains, chewable plastic material, etc.)



from German speaking countries (DACH region)

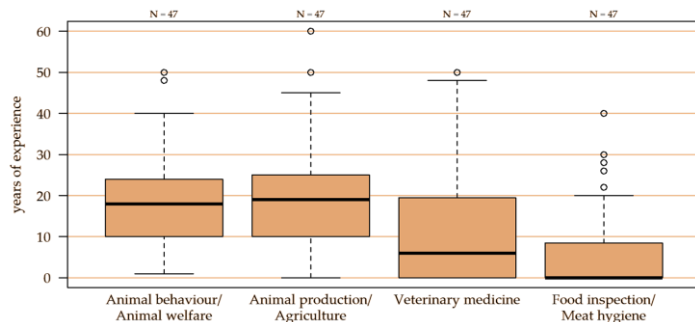
- Contacted via business websites, chambers of agriculture, pig organisations and an appeal in the agricultural magazine top agrar



Participants

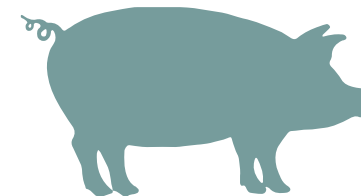
Animal welfare experts:

- 47 participants
- Background:
 - 64% Research/Academia
 - 15% Consulting
 - 13% Slaughterhouse
 - 9% Other (e.g. NGO)



Farmers:

- 80 participants
- Background:
 - 78% self-employed
 - 9% employed
 - 8% Agricultural service providers
 - 6% Other (e.g. agricultural student)
- Gender: 82% male
- Nationality: 90% German, 10% Austrian
- Age: 20 – 67 years ($\bar{x}$ 48,3 years)
- Experience: $\bar{x}$ 26 years (max. 50 years)



Tail and ear lesions



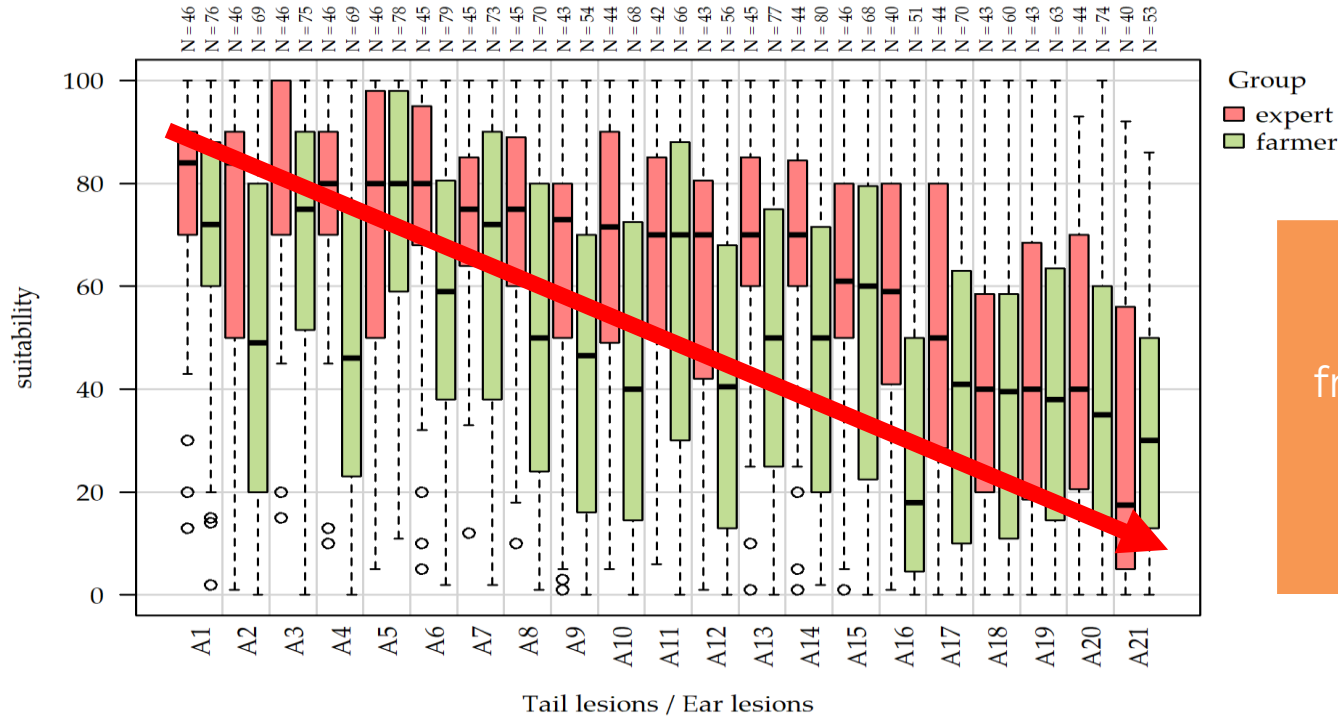
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Code	Best Practice
A1	Good barn climate/air quality (e.g. little ammonia, optimal air flow, etc.)
A2	Provision of straw as bedding on farm
A3	Good health status
A4	Enough feeding space per pig (preferably 1:1)
A5	Good feed quality (e.g. no mycotoxins, balanced)
A6	Regular refilling of manipulable or bedding material on farm (so it doesn't run out)
A7	Good feeding management (e.g. ad libitum, short feeding intervals)
A8	Structuring of the pen (lying, feeding, dunging area)
A9	Keeping litter mates together from birth to the fattening/finishing period (no mixing)
A10	Lowering stocking density below EU legislation/more space allowance per pig
A11	Genetic aspects (genetics that are preferred in countries without tail docking)

Code	Best Practice
A12	Pens with outdoor area
A13	Provision of straw or hay as enrichment (in racks, feeders, etc.)
A14	Organic manipulable material on farm except straw (wood, sisal ropes, pressed molasses, etc.)
A15	As little regrouping/mixing of animals on farm as possible
A16	No storage of manure in the stable (under the slatted floor)
A17	Stocking density on farm according to EU legislation
A18	Small group size on farm (<40 pigs per group)
A19	Very small group size on farm (similar to litter size: 10 - 16 pigs)
A20	Non-organic manipulable material on farm (metal chains, chewable plastic material, etc.)
A21	Bigger group size on farm (>40 pigs per group)



Results: Tail and ear lesions



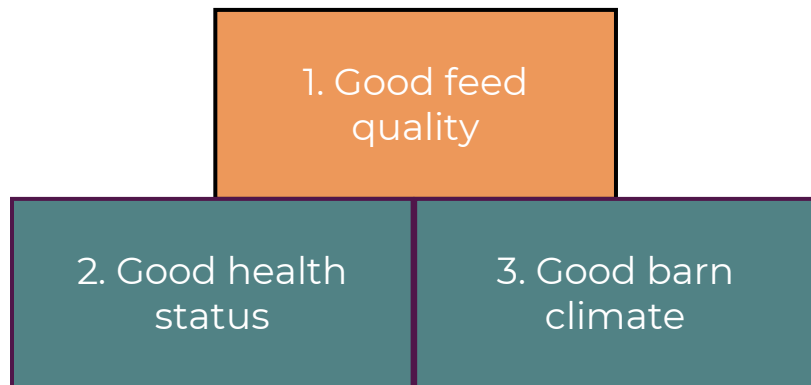
Higher score
from experts for
almost every
Best Practice

Tail and ear lesions

→ Top 3 Best Practices

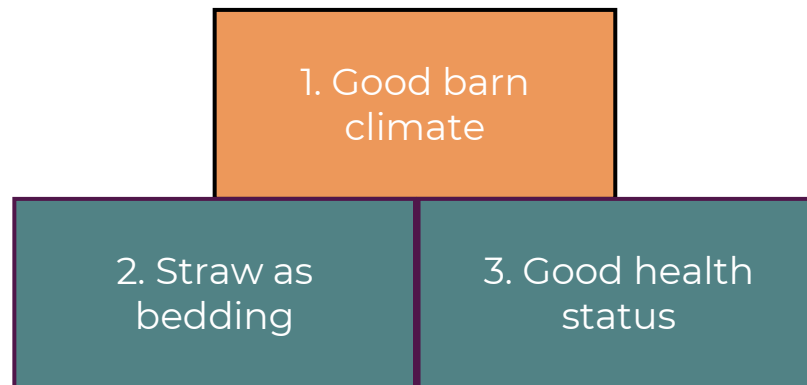


Farmers:



Straw as bedding: rank 11

Experts:



Good feed quality: rank 6



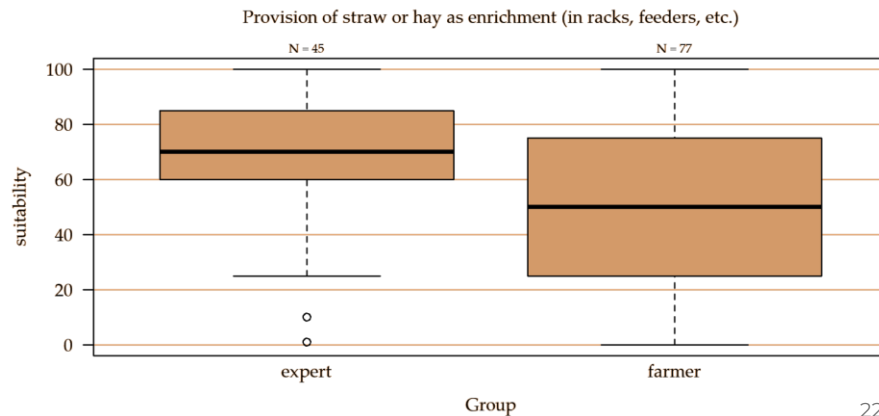
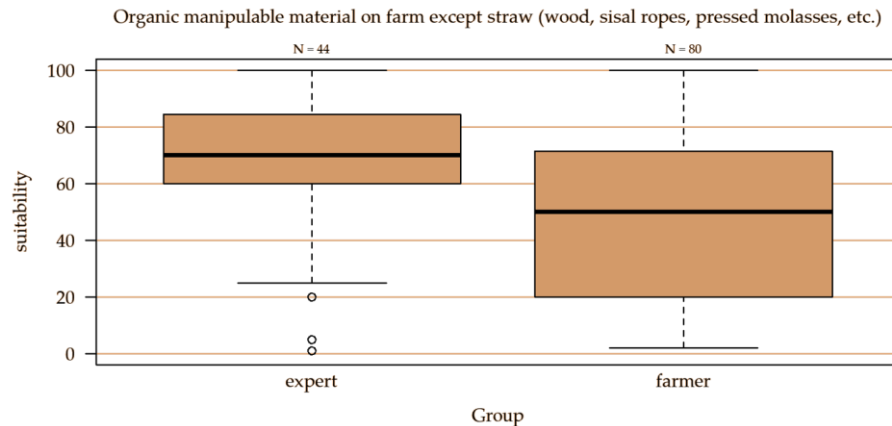
Tail and ear lesions

→ Enrichment

- Significant differences between experts and farmers ($p < 0.05$)
- Experts: enrichment related Best Practices $\geq 70\%$ agreement
- Farmers: less inclined, 50 – 60% agreement
- Non-organic enrichment (e.g. toys) less favoured (40 vs. 35% agreement)



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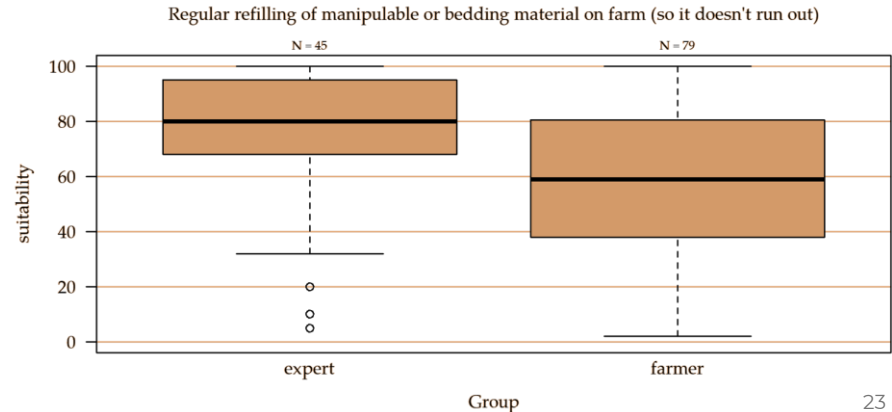
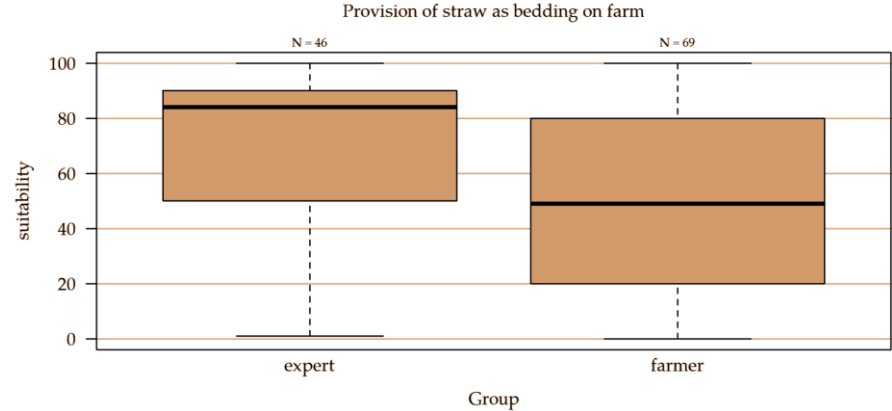


Tail and ear lesions

→ Enrichment

- Significant differences between experts and farmers ($p < 0.05$)
- Experts: straw as bedding and regular refilling of manipulable material = top Best Practices
- Farmers: ranks 7 (straw as bedding) and 11 (refilling) out of 21

→ Enrichment = AW improving



Tail and ear lesions

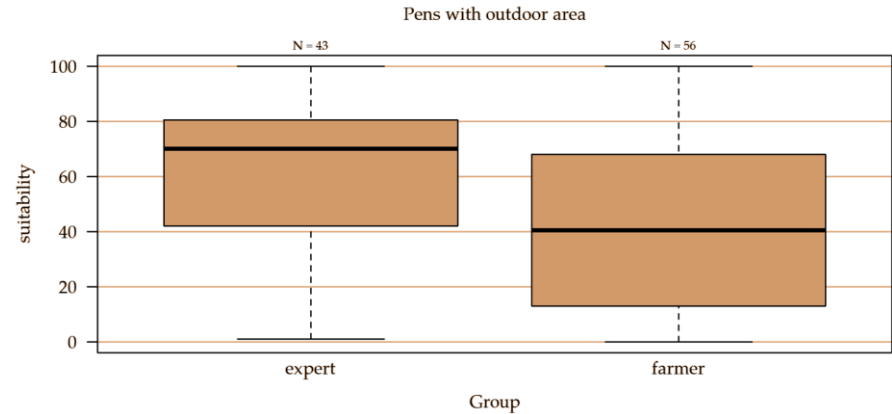
→ Outdoor access

- Different levels of agreement: 70% (experts) vs. 40.5% (farmers) ($p > 0.05$)

- Outdoor access favoured by AW experts
- Farmers less inclined: biosecurity & feasibility
- Outdoor access rare in conventional pig farms in Germany



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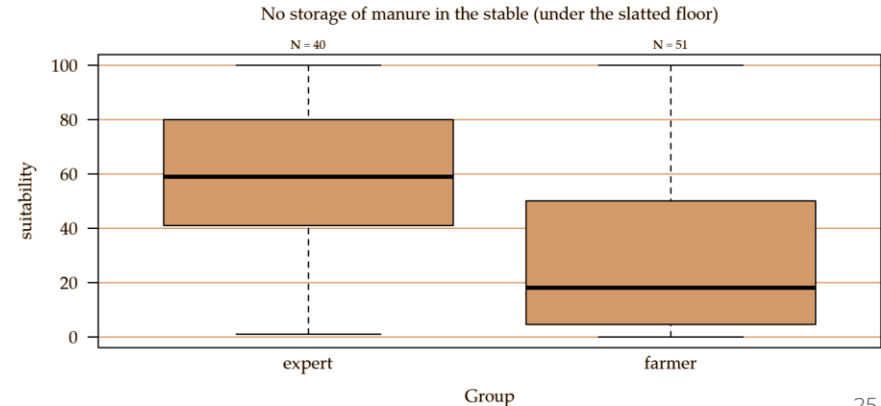
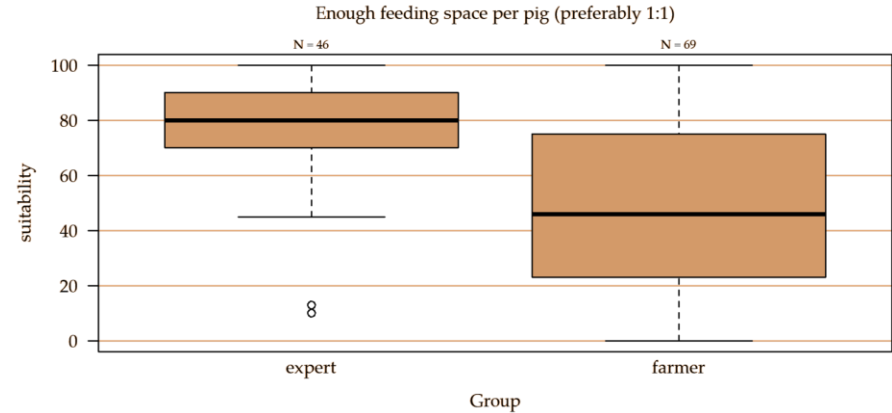


Tail and ear lesions

→ Big differences

- Enough feeding space per pig = rank 4 (experts) vs. rank 14 (farmers)
- No storage of manure in the stable → low scores in both groups, farmers considerably more negative (18% farmers vs. 59% experts)

→ Constraints regarding feasibility and costs



Skin lesions

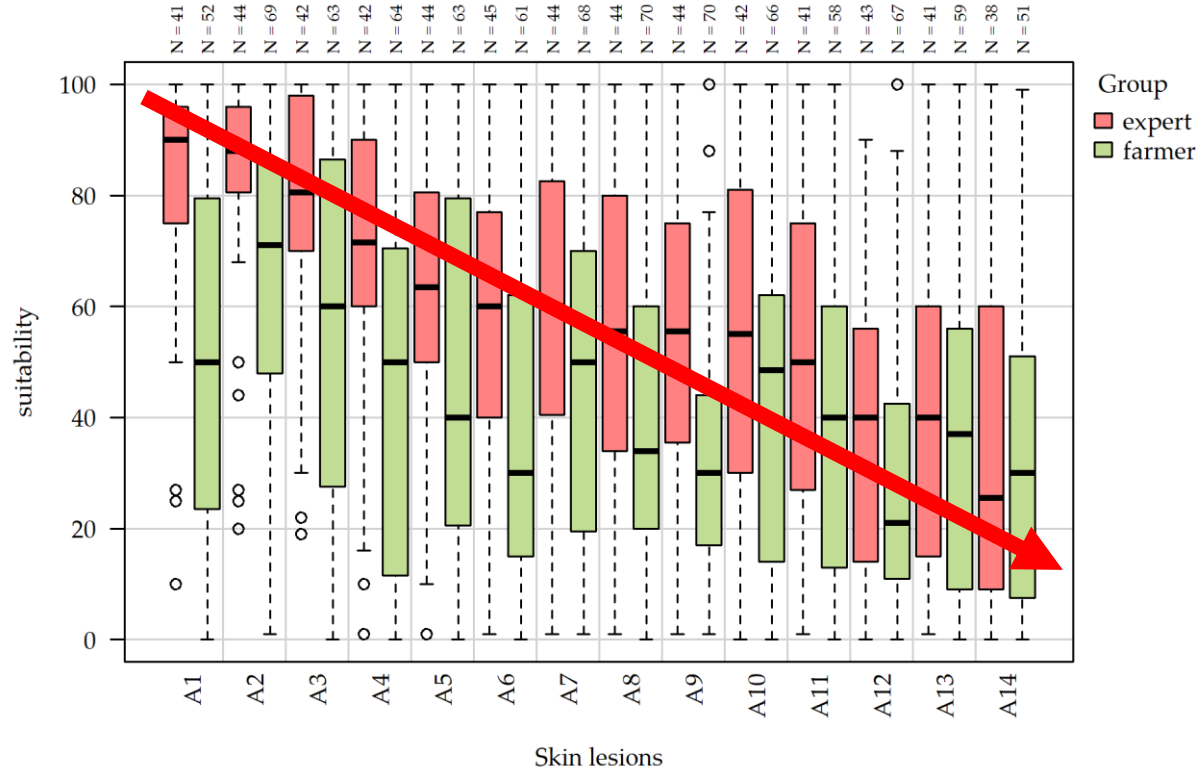


Code	Best Practice
A1	Keeping littermates together from birth to fattening/finishing period (no mixing)
A2	As little regrouping/mixing of animals on farm as possible
A3	Gentle animal handling on farm
A4	Lowering stocking density on farm below EU legislation/more space allowance per pig
A5	Structuring of pens (lying, feeding, dunging area)
A6	Provision of straw as bedding on farm
A7	Regular refilling of manipulable or bedding material on farm (no running out)

Code	Best Practice
A8	Provision of straw or hay on farm as enrichment (in racks, feeders, etc.)
A9	Organic manipulable material on farm except straw (wood, sisal ropes, pressed molasses, etc.)
A10	Stocking density on farm according to EU legislation
A11	Very small group size on farm (similar to litter size: 10 - 16 pigs)
A12	Non-organic manipulable material on farm (metal chains, chewable plastic material, etc.)
A13	Small group size on farm (< 40 pigs per group)
A14	Bigger group size on farm (> 40 pigs per group)



Results: Skin lesions



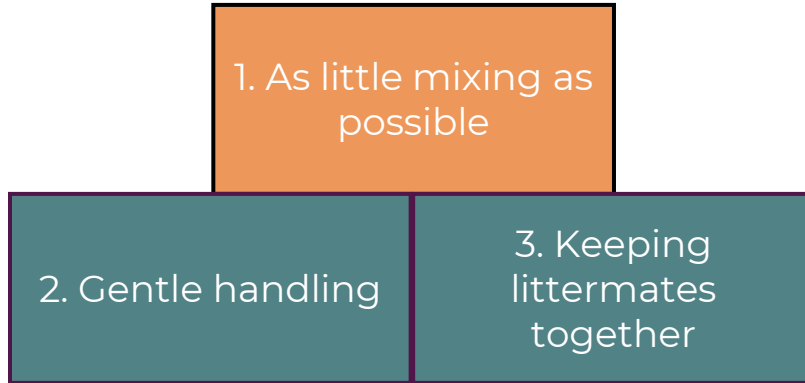
Higher score
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Skin lesions

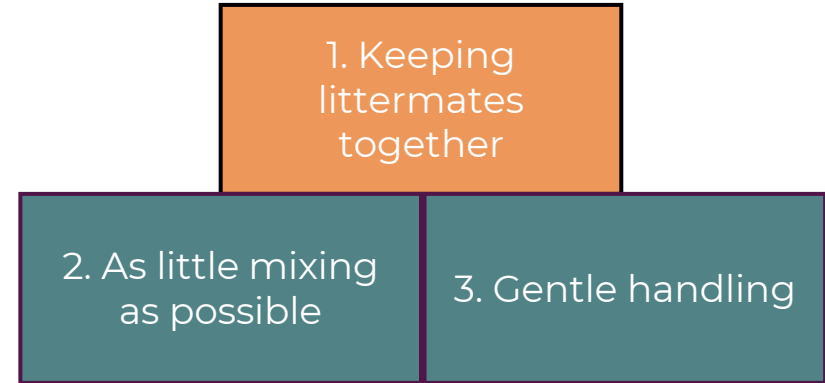
→ Top 3 Best Practices



Farmers:



Experts:

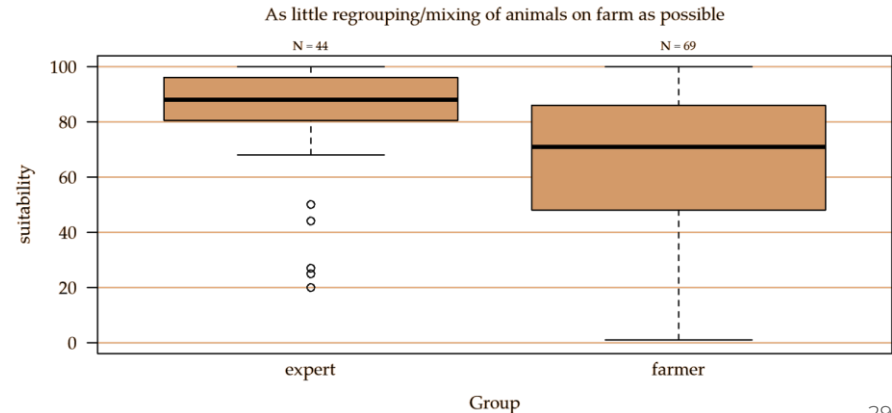
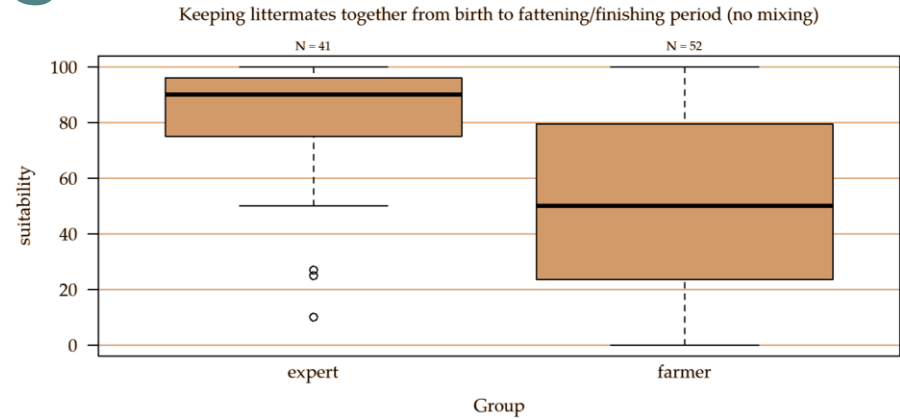


Skin lesions

→ Little mixing/regrouping

- Among top 3 Best Practices in both groups
- BUT: significant differences between experts and farmers

→ Not always feasible on farm



Conclusion

- Clear **discrepancy** between AW experts and farmers
- **Top Best Practices** the same or **similar** in both groups
- Experts overall more inclined towards the Best Practices
- Farmers take feasibility, costs and workload into account
- **Practical constraints** should be considered when developing Best Practice Guides



Consequences for the aWISH Best Practice Guides



Survey res

Project results

Intervention studies



Project results



Take home messages



- Data do not improve animal welfare — actions do
- Animal-based indicators reflect the animal's real welfare state
- Best Practices only work if they are feasible on farms

Good PLF does not stop at measurement — it supports better decisions, better practices, and better animal welfare.





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Thank you for your attention!
Any questions?



Maite Jachens
Maite.marie.jachens@tiho-hannover.de

www.awish-project.eu

awish@ilvo.vlaanderen.be

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