From Beak to Tail, Group discussion summary

Theme 1: Mechanisms underlying the link between health and damaging behaviour

Summary by Anna Valros

1. *Was anything missing/unclear/not logical in the two plenary review talks? Did they raise any specific questions?*

Some researchers have looked at populations, and some at individuals when trying to identify behavioural differences. At the end it will be needed to have something in-between.

In studies using high and low feather pecking lines the group average, and not the individual is selected. Studies on individual animals would be the next step. There is also a need for studies on 'normal' lines.

There is a need to be clear about the interpretation of the behaviour that causes the damage - is it always the same behaviour or different behaviours?

The phenotypic profiles are not always clear, and might be overlapping (eg. biter/victim) – thus it is even more difficult to identify underlying mechanisms. It would further be important to identify the first individual that initiate the behaviour, and to better characterize neutral animals.

How close/clear is the suggested link between depression in humans and these behaviours? Maybe a link to OCD-type behaviour would be more logical. Are cytokines impacting these?

Nutritional aspects might also be important for the link.

There was no mention of the possible role of mycotoxins

2. *Which similarities/differences between species (pigs/poultry) did you identify?*

Both species are curious omnivores

Both in poultry and pigs it seems like (ill) health might be predisposing factor, and there seem to be links to cytokines and serotonin.

In pigs, animals can be performers, victims, both or neutral with possible change during life. In birds, not clear whether we have the 4 categories of animals, and if there is the same "flexibility" between categories in birds?

In both species the days just before an outbreak seem most interesting – what triggers the behaviour? In both species the damage caused by the behaviour trigger further individuals to bite/peck.

Both behaviours develop at an early stage of the animals´ lives, although adult pigs seldom bite tails, while adult hens do feather peck.

There appear to be some level of heritability of the damaging behaviours in both species, as well as links to productivity (back fat and tail biting, and egg production and feather pecking).

In both the species the problems are multifactorial, both might have a link to nutrition, and both can be handled by management factors, such as avoiding overcrowding

3. *Which are the main gaps of knowledge in pigs/poultry?*

We know already a lot about the risk factors for the behaviours, but there is a lack of knowledge on the causality – which starts first, the disease or the biting/pecking? We also still lack knowledge on the actual motivation behind the behaviour.

In both species it is a problem to identify the performer of the behaviour. This leads to eg. genetic work being based mainly on damage, not on the behaviour as such.

Are the relationships between disease and damaging behavior similar for victims and biters/peckers?

Both behaviours occur also in organic farms – why is this (when these farms should have higher welfare status)? There are differences between countries in the level of the problem. How can this be explained?

4. What research approach could help fill in these gaps?

Intervention studies of animals in groups are required to become more aware of specific pathways and of cause and effect. The interventions studies could include causing an experimental immune challenge or to study effects of inhibiting certain components of the possible link (such as cytokines, if possible).

We need to develop a robust, and ethically acceptable model to study tail biting in pigs, and feather pecking on in poultry.

Also a whole-farm approach is needed, to produce practical scores for risk assessment, and management programmes for producers, including precision livestock farming measures

In addition more studies are needed on

- the individual animal from birth to slaughter
- developing tracking devices which might help identify phenotypes
- intact tails as a potential measure in breeding programs
- the role of coping strategies
- neuroscience
- the role of the gut microbiota, especially in pigs.

More networking and communication between researchers!