

## **From Beak to Tail, Group discussion summary**

### **Theme 2: Predisposing factors for damaging behaviour during early development**

*Summary by Sandra Edwards*

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

There is a need to clearly define damaging behaviour – differences between aggressive behaviors vs. exploratory behaviors that result in damage.

- If there is aggression in hens – it may trigger feather pecking. Typically hens don't have feather pecking due to aggression. Not much literature on this.
- The really aggressive biting is done by single pigs. When you have a lot of pigs biting, this tends to be more exploratory. Typically not based on gender.

Are the 4 categories of performer/receiver as discrete as we often show them to be, or are there also intermediate stages? When animals in the same group change their status (biter, victim, both, none) over life, why does one animal change in one direction and another in another? The link between early and later life is not always clear.

What is the role of the parent in intense aggression in neonates. Is there any impact of mothering style and how this impacts neonatal behavior? Some work in quail but not in chickens. Also a role of the mother in early life feeding in pigs. What is the maternal impact on tail biting on practical farms?

Is there much work in broiler breeders and feather pecking and how this translates to laying hens? There are other causal factors in broiler breeder settings that contribute to feather damage (e.g. males). May be different motivations/causations between broiler breeders and layers.

In poultry – rearing causes metabolic stress and birds must adapt to an entirely new system.

What are the effects of transport shortly after hatching (huge stressor) and does this affect development of damaging behaviour? Also, catching and transportation occur between the rearing and adult environment.

Arising from discussion in session 1 – are there prenatal influences on serotonergic pathways? There is some work looking at serotonergic pathways in rodents as models for humans.

What are the cognitive and social learning aspects of damaging behaviors? What are the social interactions of others beginning to join in?

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

Chicks cannot learn from parents because they do not know each other, whereas mothering ability can be important in pigs.

Pigs experience weaning, which has multifactorial influences – what is the important factor? Timing of weaning may be a factor.

Prenatal effects are more clear in chickens - is this due to differences in the ease with which an experiment is set up? We need more research on prenatal stress and the incubation period in chickens. Pigs may experience overcrowding in utero as a factor.

Both species change housing system at a young age. Chickens need to learn multi-level systems.

There is also a mismatch of type of environment pre- and post-natally in both species. Sows move from group housing to individual farrowing giving stress of confinement – is this important?

Victim animals occur in both systems but their predisposing factors are unknown.

Pigs fight more and for longer than chickens. Damage in pigs more often arises from aggressive behaviour as well as redirected foraging.

Damaging behaviour may develop early in both species but the injuries are difficult to see.

There is a species difference in the age at which most damaging behaviour occurs. No tail biting in adult sows but injurious pecking occurs in adult hens

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

Damaging behaviour is caused by interconnectedness of different factors, which makes it difficult to set up and control experiments.

Propensity to be a biter is not the same as propensity to be victim - there is often only information on victims (when lesions / plumage damage is scored). What predisposes victims to be victims?

More knowledge is needed on the motivation behind behaviours to be able to make a better distinction between redirected foraging vs aggression. What is the trigger at the level of underlying mechanism for damaging behaviour?

Are there prenatal effects on feather pecking - we know that it can have effects on later life behaviour in general but effect on feather pecking is not known. What are the mechanisms of prenatal factors that impact gene expression after hatch? What changes in the chick and how does it change – serotonin, cytokines and immune response? There is some work in frogs and invertebrates on the impacts of temperature and nutrition on whether they become more cannibalistic or not. Comparative studies across species and strains could be valuable to understand common mechanisms that contribute to damaging behaviours.

What is the impact of mothering style e.g. influence of parity on damaging behaviour in pigs? There is a shortage of information on early postnatal stress from procedures and non-aggressive biting, especially since there are differences in pain sensitivity.

Lots of data have been generated on the issue of damaging behaviour but there is not a lot of consistency in how this is collected. Big data could be very useful to identify key differences and therefore factors that contribute to damaging behaviours. This could be used to investigate the effect of change of environmental conditions, for example pigs all in all out by farm vs integrated systems. Tail biting occurs in conventional and organic systems – what are the similarities and differences between the systems that contribute to tail biting?

More knowledge is needed about the role of the microbiota from the sow/hen maternal environment.

There should be greater focus on sex effects – males are under-represented in pig genetic studies.

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

Literature review/meta-analysis on the causality of damaging behaviours – how many studies have found effects, and how much effect.

Use big data approaches to connect farm description data to occurrence of damaging behaviour and look for patterns

Interactions between different housing systems and effect of changing system. Give pigs a choice – preference tests – having more control over their environment could reduce stress.

Microbiota transmission from sow/egg to offspring – is this linked to damaging behaviour in later life?

Maternal care – quantify how this is beneficial to young animals

Does the difference in the age of animals on occurrence (pigs v chickens) relate to a decrease in motivation to investigate over time?

Does ear and tail necrosis occur as a result of biting or an unrelated event?

The genetic companies have a significant role as we evaluate the genetic lines for these traits. How do we ensure we have the “right type” of animals to reduce/eliminate damaging behaviours?

There is a need for better implementation of the scientific knowledge that we have!