

# **IGN-Forschungspreis 2018 – PD Shana Bergmann**

## **Summary**

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*Animal- and environment-based welfare indicators in poultry (turkeys, broilers, laying hens) for assessing and optimizing husbandry systems*

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The origin of food products has become increasingly important for the purchase decision of consumers. These are mostly concerned about regional production, animal welfare and well-being. This is reflected in an adjusted legislation. Since the amendment of the German animal welfare act in 2013, § 11 (8) has required livestock owners to assess and report animal welfare indicators to improve evaluation and rating of animal welfare in livestock in terms of the § 2.

This habilitation thesis represents a summary of seven original scientific research articles on animal-based indicators for poultry. These publications addressed aspects of animal health and behavior and identified factors that possibly influence these parameters.

Aim of the study with turkey birds (publications 1–3) was to evaluate on altogether 24 German turkey farms, the prevalence, severity and possible factors that may lead to foot pad dermatitis (FPD) up to the age of 35 days. The study revealed that distinguishable and measurable foot pad alterations occurred already during the early rearing phase. This finding highlights that animal friendly husbandry must be considered in the early rearing period. Foot pad health is a suitable indicator in poult aged below six weeks and can be measured without great effort within the barn. This indicator is influenced by different factors, that have been screened out in this study, especially litter management.

In the field study concerning optimization of the husbandry system and enhancement of well-being for broilers (publication 4), we established and tested new arrangements based on an alternative rearing concept while using two different broiler strains (fast compared to slow growing). Results showed that slower growing Cobb Sasso broilers reared under alternative rearing conditions experienced more well-being than conventionally reared fast-growing Ross 308 broilers. Contact dermatitis of foot pads (FPD) and hocks (hock burn) were mainly found in conventionally reared broilers, whereas Cobb Sasso broilers reared under the alternative concept showed hardly any of these skin changes.

In the study concerning the welfare indicator behavior (publication 5), we demonstrated that the provision of appropriate resources, such as straw bales, perches, pecking stones and a roofed outdoor run, has positive impacts on the behavior of poultry. The broilers especially accepted straw bales during the first few days of life as retreat options or shelter for resting and lying. With ongoing fattening period and increasing age, they used straw bales as perching possibility for species-specific elevated sitting and lying and as occupation material. When straw bales were not provided, the birds showed no huddling behavior during the first few days in the new environment.

In the behavioral study on the usage of resources in colony cage systems for laying hens (publication 6), we identified preferences for perch locations in various systems from different manufacturers. The

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hens preferred higher installed perches to lower positioned ones. Perches installed underneath supply devices such as nipple drinkers were used to reach the devices but were avoided during the night and thus did not offer suitable resting areas. Although perches were offered at various heights, not all provided perches were occupied by the hens. Possibly, not all housed hens had sufficient room on the preferred perches and therefore chose to rest on the wire floor. Thus, enough elevated perches should be provided for all housed hens.

Another indicator of well-being in poultry may be dust bathing behavior. The seventh study examined dust bathing behavior of laying hens housed in colony cage systems with 925 cm<sup>2</sup> Astroturf mats and feed as litter material (publication 7). It revealed that the frequency of litter provision influenced the number and duration of dust bathing bouts and the number of interruptions. The number of dust bathing bouts increased with increasing daily frequency of litter provision. This increase may be a sign of high motivation or frustration. The number of dust bathing bouts also seemed to increase with the higher stocking density in the second compared with the first experiment. This relationship may indicate unsatisfied behavioral needs because the minimal mat size did not provide enough space for all hens and limited the opportunity for joint dust baths. The short dust bathing duration noted in this experiment might have had the same cause. Furthermore, feed as litter material or the available litter depth might have been inadequate, as described in the literature. Interruptions were mainly induced by the hens of one unit, also suggesting that the provided mats were too small to allow all hens to simultaneously perform dust bathing behavior. Thus, the main reason for limited dust bathing behavior in laying hens housed in cage systems can be a suboptimal, insufficiently sized mat for the number of housed hens.

The results of these seven original studies together with findings in the literature highlight where improvements in poultry farming are needed. They give valuable information about current husbandry conditions and indicate which conditions could be improved. The presented habilitation thesis thereby contributed to establishing and validating practicable animal welfare indicators for poultry. These indicators target animal health and behavior and can be used on-farm and at slaughter plants to measure animal welfare. They allow livestock owners and manufacturers of housing systems to identify problematic housing conditions and to optimize the provision, dimensions and placement of resources for the birds.