Effects of feed particle size, heat treatment and milling method on performance, nutrient digestibility, and pH of chyme in laying hens

*I. Ruhnke¹, I. Röhe¹, C. Krämer¹, F. Goodarzi Boroojeni¹, F. Knorr¹, A. Mader¹, J. Zentek¹

¹Institute of Animal Nutrition, Department of Veterinary Science, Berlin, Germany

Feed processing is commonly used in laying hen nutrition. Energy-saving milling methods are of increasing impact. However, the knowledge of the effects of various production methods on performance, nutrient digestibility and pH of chyme of laying hens is limited. The aim of this study was to evaluate the impact of feed particle size (coarse vs. fine), heat treatment (mash vs. expandate) and milling method (hammer mill, roller mill, multi cracker, disc mill) on performance and different aspects of digestive physiological processes in laying hens. Laying hens (19 weeks of age) were fed one of 12 diets for the duration of 3 weeks. Eight repetitions were performed with 6 hens per treatment. Three hens per cage were pooled to evaluate ileal digestibility determined by the use of titanium dioxide as marker. Laying performance, feed intake, and body weight was not affected by the feed treatments. Mash feed and coarse particles increased apparent ileal digestibility of starch significantly. Additionally, pH of chyme (ileum, rectum) and feces was affected by the various feed treatments. In conclusion, mash feed and coarse particles promoted apparent ileal starch digestibility and alkalizes pH of chyme in laying hens. Milling methods were of minor impact on the parameters investigated in this study.