Corn Particle Size Impact on Growth, Performance and Digestibility in Broilers, Pullets and Layers

Particle size (PS) for poultry diets has been debated for years, as particle size is related to pellet durability, amount of fines, bird growth, feed conversion, and carcass characteristics for broiler chickens. In laying hens and pullets, less information is available regarding the impact of particle size, though research is equally important to maximize nutrient uptake, hen performance, and production. Additionally, there are potential feed fabrication aspects to consider as mills could save machine energy, wear, and money by modification of PS.

Cooperator feed mill Wenger Feeds, LLC (Rheems, PA) delivered two batches of corn ground to 600, 900, 1200, or 1500 microns by hammer mill. Energy and machine efficiency showed larger PS (1200 and 1500 microns) lent themselves to greater efficiency, tonnes per hour (TPH) throughput, and lower cost/tonne than the 600 or 900 micron grinds. Four live birds studies followed: First, a broiler digestibility study was conducted on each of the four corn treatments to measure apparent ileal digestibility (AID) and true ileal digestibility (TID) to determine the level of nutrient absorption through the small intestine of 35d old male broilers. Second, a floor pen broiler study at commercial bird density was performed with crumbled and pelleted diets. In a third study, commercial egg laying pullet chicks were fed one of three corn treatments (600, 900, or 1500 microns) in complete mash feed in a phase feeding program. Last, pullets were carried on to a hen house setting and from 19-43 weeks of age evaluated for one of the four corn treatments (600, 900, 1200, or 1500 microns) for egg production, BW, FI, FC, interior egg quality, and specific gravity.

Lisa Kitto is a native of Michigan and grew up in the Metro Detroit area. She received her Bachelor's in Animal Science from Michigan State University, where she spent her time outside of the classroom doing research with Dr. Darrin Karcher looking at laying hen health and environment microbiology in alternative hen housing systems. After graduation she worked for a time at Penn State as a Research Tech in Dr. Paul Patterson and Dr. Mike Hulet’s lab working on a wide range of studies on broiler, turkey, pullet, and layer nutrition and physiology. During this time she also completed her Master's in Animal Science, which focused on poultry nutrition. Since completing her graduate degree, Lisa has been working as Poultry Nutrition Associate with Heritage Poultry Management Services, Inc. where her work centers on pullet and laying hen diet formulation for Pennsylvanian flocks as well as feed quality assurance, specifically particle size distribution, for those flocks.