005
AGSI

Understanding amino acid digestibility of locally (Tennessee) grown soybean cultivars for Broiler chickens, an *in vitro* study.

Feed nutritional labels mention the percentage of specific amino acids or crude protein; however, most do not specify the protein quality – based on the presence of the essential amino acids. Thus, it is essential to predict the nutritional values of soybean varieties locally grown in Tennessee (TN) and their digestibility profiles using an adapted *in vitro* multi-enzyme bioassay. This allows for an accurate bird diet formation and helps reduce feed costs and nitrogen output into the environment. Twelve soybean varieties were obtained from a Variety Testing facility at the University of Tennessee and performed in triplicates. The varieties were selected based on harvest year, yield, and maturity group. Tennessee's main soybean variety is categorized in the maturity group (MG) 4; however, others are noted to be grown in the state, such as MG 3 and MG 5. Soybeans were dehulled, solvent extracted, then dried and ground to make soybean meal, which was further passed through a 2mm sieve for final usage. In the revised two-step in vitro assay, the conditions of the bird's gastrointestinal tract were mimicked and simulated in three steps, representing the crop, the stomach, and the small intestine. *In vitro,* rate of disappearance (RD) values was calculated, and the data was measured and analyzed by one-way ANOVA using R-Studio. Tukey's HSD test was performed for differentiating significant means for *in vitro* factors. Means were considered significant with a P-value ≤ 0.05. The findings will assist crop geneticists and agronomists in soybean breeding programs to develop soybean varieties for poultry dietary formulation with the highest nutritional value and optimal digestibility values. Further research will be applied based on the statistical findings using *in vivo* bird trial.

Keywords: amino acid digestibility, broilers, soybean variety, in vitro study