



As presented at Petfood Forum 2024

Characterization of antinutritional factors across samples of US soybean meals

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Abstract details:

Only 0.5% of global soy is used in pet food. This is predominately due to a negative perception by pet owners and understanding by pet food industry professionals that use is limited by antinutritional factors (ANFs) and indigestible oligosaccharides (OS). These ANFs may have a detrimental effect on nutrient digestibility, and the highly fermentable OS may result in flatulence and soft stools when fed at high levels. Interestingly, soy OS may serve as a prebiotic to promote gut health though the optimal dose for gut health that does not compromise nutrient digestibility or stool quality in dogs and cats remains unknown.

The first objective of this study was to characterize SBM's from across the United States supply chain regarding their nutritional, ANFs and OS composition. The second goal was to evaluate the viscosity properties and OS/fiber fermentation using an *in vitro* canine and feline inoculum model.

Ten SBM samples from cooperating suppliers were sourced in the Fall of 2023. The SBM samples were analyzed for proximate analysis, amino acid and oligosaccharide analyses, and trypsin inhibitor activity. Soybean meal varied in CP from 51.02 to 54.35% (average 52.21%, SD=0.97), acid-hydrolyzed fat 1.95 to 3.15% (average 2.54%, SD=0.46), total dietary fiber with 21.01 to 25.42% (average 23.16, SD=0.63) and trypsin inhibitor activity (TIU/mg of seed powder) 2.05 to 5.47% (average 3.98%, SD=1.18). Additionally, the total amino acid concentrations ranged from 50.92 to 54.30% (average 52.02%, SD=0.92). The viscosity properties and the fiber *in vitro* fermentation outcomes are underway.

Results from this project will provide information regarding SBM composition and variability across the U.S. and provide an understanding regarding the beneficial impact on markers of gut health from *in vitro* fermentation.

Biography:

Kallee Dunn is a master's student under Dr. Greg Aldrich in the Pet Food Program at Kansas State University. She earned a Bachelor of Science in Animal Science and a Bachelor of Science in Food Science from Oklahoma State University. Her research focuses on the characterization and evaluation of different U.S. soybean meals'



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antinutritional factors and determine an optimal soybean meal nutritional composition and prebiotic for companion animal diets.