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Modifying soluble carbohydrates in soybean seed for enhanced nutritional energy meal

Katy Rainey*, Department of Agronomy, Purdue University, Indiana, USA

Rima Thapa, Syngenta Seeds, North Rhine-Westphalia, Germany

Alencar Xavier, Dow AgroSciences, Indiana, USA

William Muir, Department of Animal Science, Purdue University, Indiana, USA

The conversion of U.S. soybeans to high oleic in the next several years will create opportunities for commercialization of other value-added traits. Modified carbohydrate composition is considered the most promising meal trait due to the potential value to the animal industry and the lack of negative agronomic impacts. Modified carbohydrate composition improves metabolizable energy for monogastric animals, besides helping in the wider acceptance of soy-derived food products. Incompletely removed during standard processing of soybean meal, raffinose family oligosaccharides (RFOs) reduce ME due to fermentation in the gut of monogastric animals, while sucrose increases ME. Thus, RFOs are likely anti-nutritional factors that reduce the value of soybean meal. Such output traits offer highly attractive new opportunities for nutritionists and international markets, although the successful adoption of output traits relies on combining enhanced meal value with elite agronomic performance. We present progress and results of a multidisciplinary project that aims to develop the market for valuable modified soluble carbohydrate meal by developing germplasm lines and germplasm for farmers and the seed industry. The project also supports quantification of metabolizable energy and component pricing through research activities including transdisciplinary research on animal feeding, and integrating diverse sources of information to establish realistic and valuable breeding thresholds and targets.