

Researchers look at lower-cost alternative protein source for pig diets

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Threonine is an indispensable amino acid, which is often provided in supplement form in swine diets. With U.S. production of crystalline amino acids increasing, more co-products from amino acid production are becoming available, and these co-products can also be fed to pigs. Researchers at the University of Illinois are investigating a co-product of synthetic threonine as a lower-cost alternative protein source to fish meal.

"To create synthetic threonine, you ferment a carbohydrate substrate using selected strains of bacteria, then extract the crystalline L-threonine from the fermentation product," said Hans H. Stein, a professor of animal sciences at U of I. "The [biomass](#) that's left over, even though most of the threonine has been extracted, is still rich in amino acids. If those amino acids are well digested by pigs, this could be a good source of protein."

Stein and his fellow researchers conducted two experiments comparing threonine biomass with fish meal. In the first experiment, they determined the concentration and digestibility of protein and amino acids in both ingredients. Threonine biomass contained 81.8 percent crude protein on an as-fed basis, compared with 65.6 percent crude protein in fish meal. The standardized ileal digestibility was greater in threonine biomass than in fish meal for crude protein, as well as for all indispensable amino acids except tryptophan. Overall, the average digestibility of [amino acids](#) in threonine biomass was 83.5 percent, compared with 72.3 percent for fish meal.

In the second experiment, Stein's team determined that threonine biomass contained about 25 percent more digestible and metabolizable energy than fish meal. On a dry matter basis, threonine biomass contained 4,935 kcal/kg of digestible energy and 4,335 kcal/kg of metabolizable energy, versus 3,957 and 3,508 kcal/kg respectively in fish meal.

"The results from these studies indicate that

threonine biomass can be used as an alternative to fish meal, and possibly other animal proteins, in diets for weanling pigs," said Stein.

More information: The study, "Amino acid digestibility and concentration of digestible and metabolizable energy in a threonine biomass product fed to weanling pigs," was co-authored by Ferdinando Almeida and Rommel Sulabo. The study was funded by Archer Daniel Midland Company, Decatur, Ill., and was published in a recent volume of the *Journal of Animal Science*. It is available online at www.animalsciencepublications.../articles/92/10/4540.

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