

Establishing nutritional value in copra and palm products fed to pigs

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Products derived from coconuts and oil palm trees are the primary protein sources in swine diets in parts of Africa, southeast Asia, South America, and Europe. New research from the University of Illinois is helping to establish the nutritional value of these products.

"In many countries in the world, and particularly in the tropics, copra and palm kernel products are the main protein sources for livestock. You also see palm kernel products and copra products fed throughout Latin America and in some countries in Europe," said Hans H. Stein, a U of I professor in [animal sciences](#). "However, there are no recent values on energy and amino acid digestibility so we wanted to get those established."

Copra meal is produced when [coconut oil](#) is removed by solvent extraction from the meat of the coconut. Similarly, palm kernel meal is produced by solvent extraction of oil from [oil palm](#) seeds. When [palm oil](#) is instead removed by mechanical expelling, the resulting product is called palm kernel expellers.

Stein's research team conducted two studies. In the first, they determined that copra meal contains 22 percent crude protein whereas palm kernel meal and palm kernel expellers contain about 14 percent crude protein. The standard used for comparison was soybean meal, which contains about 47 percent crude protein. The difference is largely the result of the high [fiber content](#) of copra and palm kernel products.

The standardized ileal digestibility (SID) of crude protein and amino acids was also determined and compared with values obtained for soybean meal.

"The SID was between 10 and 20 percentage units less for many of the [amino acids](#), in particular for lysine and [threonine](#)," Stein said. However, the SID of methionine in copra and palm kernel products was only 5 to 10 percent less than that of soybean meal.

In the second experiment, the concentrations of digestible and metabolizable energy in copra meal, palm kernel meal, and two sources of palm kernel expellers were determined. Copra meal contained 3,692 kcal/kg digestible energy, palm kernel meal 2,905 kcal/kg, Asian palm kernel expellers 3,304 kcal/kg, and African palm kernel expellers 2,994 kcal/kg. Metabolizable energy concentrations in copra meal, palm kernel meal, Asian palm kernel expellers, and African palm kernel expellers were 3,496, 2,766, 3,184, and 2,883 kcal/kg, respectively.

These values were 15 to 30 percent less than the concentrations of digestible and metabolizable energy in soybean meal. Stein said that the reduced energy concentration in copra and palm kernel products, like the reduced protein concentration, is due to the high fiber concentration in these ingredients.

"We have high concentrations of NDF, in particular, in the palm kernel products," Stein said. "That limits the inclusion rate in diets for pigs. And that is the biggest drawback to these ingredients."

Stein added that establishing inclusion rates in diets for weanling pigs and for growing-finishing pigs and sows is a possible direction for future research.

More information: The study, "Amino acid digestibility and

concentration of digestible and metabolizable energy in copra meal, palm kernel expellers, and palm kernel meal fed to growing pigs," was published in the *Journal of Animal Science*

[www.journalofanimalscience.org ... ntent/91/3/1391.full](http://www.journalofanimalscience.org/content/91/3/1391.full)

Provided by University of Illinois at Urbana-Champaign

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