

Research sheds light on fat digestibility in pigs

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Producers and feed companies add fat to swine diets to increase energy, but recent research from the University of Illinois suggests that measurements currently used for fat digestibility need to be updated.

"It's critical that we gain a better understanding of the energy value of fat," said Hans H. Stein, U of I professor in the Department of Animal Sciences. "If we don't know the true energy value of fat, we can't determine if it's economical to add to the diet."

In a recent experiment, Stein and his team of researchers studied how different types of diets affect endogenous losses of fat (fat excreted from pigs that did not originate from the diet). They measured endogenous losses of fat to determine the true digestibility of both intact and extracted corn oil. The intact corn oil was provided in the form of corn germ, and the extracted fat was provided as liquid corn oil.

Endogenous losses differed depending on the type of fat in the diet, he said. The intact fat was less digestible than extracted fat.

"We believe that the main reason intact fat is less digestible than extracted fat is that it is easy for the enzymes to gain access to the fat in corn oil. In contrast, the corn [germ](#) is encased in the feed ingredient among the fiber complexes, which makes it difficult for enzymes to access and digest it," Stein said.

His team also discovered that measuring fat digestibility at the end of the

ileum results in a more accurate value than measuring the total tract digestibility of fat.

"The [microbes](#) in the hindgut can synthesize fat," Stein explained. "This fat is not absorbed in the hindgut; it's just excreted in the feces. Because of this, it's easy to underestimate the amount of fat that was absorbed in the small intestine by the pig."

Stein said this research has opened new doors for swine nutrition.

"We knew that the concentration of fat in the diet affects the value that is determined for apparent digestibility," Stein said. "However, by correcting these values for the endogenous losses, we can calculate the true digestibility of fat fed to pigs."

Results of the research indicate that more information on fat digestibility is needed to ensure that diets are formulated economically.

"We now know that fat digestibility should be determined as ileal digestibility rather than total tract digestibility to avoid the influence of the microbes in the hindgut of [pigs](#)," he said. "We also know that for practical feed formulation, it is more accurate to use values for true ileal digestibility than for apparent ileal digestibility because these values are not influenced by the level of fat in the diet."

However, Stein said we still don't know many of the factors that influence fat digestibility in different feed ingredients and we do not have good data for the true ileal digestibility of fat in most of our feed ingredients. A better understanding of how fat is utilized by the pig after absorption is also needed. Stein believes follow-up research should focus on addressing these questions and determining the energy value of the different sources of fat used in swine diets.

More information: "Effect of the form of dietary fat and the concentration of dietary neutral detergent fiber on ileal and total tract endogenous losses and apparent and true digestibility of fat by growing pigs," was recently published in the *Journal of Animal Science*. Researchers include D.Y. Kil, T.E. Sauber, D.B. Jones, and H.H. Stein.

Provided by University of Illinois at Urbana-Champaign

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