WHEN NUTRITIONISTS AND PRODUCERS KNOW THE CRITICAL AMINO ACID VALUE IN FEED INGREDIENTS, THEY KNOW THE TRUE VALUE IN THE FEED.

NORTHERN SOY QUALITY
UNLOCKING KNOWLEDGE OF SOY QUALITY

ABOUT NORTHERN SOY MARKETING

NSM is comprised of the soybean checkoff organizations from Minnesota, South Dakota, North Dakota, Nebraska and Wisconsin. The board invests soybean checkoff funds to conduct research on soybean quality in U.S. soybeans and soybean meal destined for export, especially those from the Pacific Northwest (PNW) ports. NSM funds educational outreach sessions for international soybean buyers to consider critical amino acid value as a complete assessment of soybean feed quality rather than only crude protein levels.

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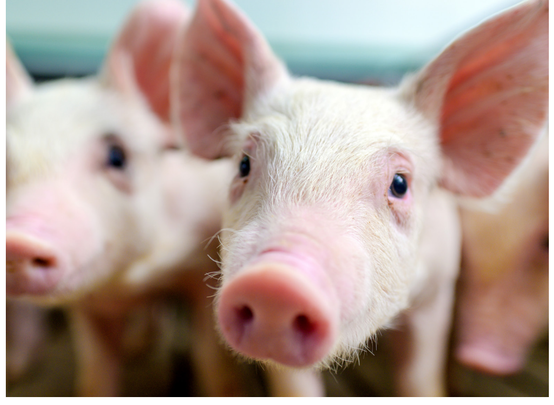
Unlocking knowledge of

SOY QUALITY

Essential Amino Acids and CAAV



UNLOCKING A NEW DEFINITION OF SOY QUALITY

U.S. soybean farmers have re-defined the measure of feed quality and value based on content of **essential amino acids (EAAs)**. Calculating the sum of the five most critical amino acids (lysine, cysteine, methionine, threonine and tryptophan) provides a numerical **Critical Amino Acid Value (CAAV)**.

When these 5 EAAs are not present in sufficient quantities in feed ingredients, nutritionists must either increase the level of protein or supplement the diets with synthetic amino acids. This may increase production costs and lead to potential imbalances of intact digestible amino acids.

This usually results in excess nitrogen excretion, a higher requirement for energy and negative environmental consequences.

Whole soybeans and meal have historically been valued largely on crude protein quantity; a higher crude protein content does not equate to higher protein quality or better nutritional value in feeding monogastric animals. True protein quality is based on the presence and balance of essential amino acids. Current purchasing decisions based largely on higher crude protein will not necessarily provide the best value feed ingredient.

WHY CAAV MATTERS

- CAAV provides a simple numeric descriptor for assessing comparative value of soybean meals
- CAAV provides an indication of critical amino acid concentration
- Modifications may enhance CAAV as a tool to assess soybean meal value
- Using CAAV as a selection tool can identify soybean meals of higher value in swine and broiler starter rations more consistently than crude protein
- CAAV promotes the selection of soybean meals with higher concentrations of economically important amino acids

WHY IS A BETTER MEASUREMENT NEEDED?

Crude protein percentage alone is only an estimate of the total amino acids based on the level of nitrogen detected; it tells you nothing about the quantity of each amino acid or the balance of the essential to non-essential amino acids.

When nutritionists and producers know the CAAV in feed ingredients, they know the true value in the feed. There are quantifiable economic benefits to using high CAAV meals in feed formulations, and there are significant environmental benefits to utilizing high CAAV soybeans. A diet using meal from a lower crude protein soybean with a naturally higher CAAV can contribute to a healthier animal and cleaner environment.

BETTER VALUE FOR LIVESTOCK, POULTRY AND FISH PRODUCERS

Purchasing and feeding protein sources based on EAAs is more efficient, cost-effective, and potentially less polluting than buying based on crude protein alone. That's because crude protein is only an approximate estimate of protein, and does not provide information about EAA content or balance.

The CAAV measurement delivers greater value to producers by providing a more complete and accurate profile of soybean protein quality, especially for northern-grown soybeans that often have lower total crude protein but higher CAAV.

A BREAKDOWN OF CAAV

THE EQUATION

% Lysine + % Threonine + % Tryptophan + (% Methionine + % Cysteine) divided by (/) Total Amino Acids =
Critical Amino Acid Value (CAAV)

AMINO ACID	% OF 18 AMINO ACIDS MEASURED
Lysine	6.71
Cysteine	1.44
Methionine	1.36
Threonine	3.94
Tryptophan	1.06
Total CAAV	14.5

NIRS SHOWCASES TRUE VALUE IN SOYBEAN MEAL

The use of analytical instruments that utilize near-infrared reflectance spectroscopy (NIRS) to determine the levels of amino acids within whole soybeans and soybean meal has changed our ability to look at feed ingredient quality. This technology swiftly and inexpensively empowers:

- Animal nutritionists to more precisely formulate feed rations to maximize animal growth rates during each phase of their lives, while minimizing feed costs and nitrogen excretions
- Soybean crushers to more precisely meet the needs of their animal feed customers
- Commercial traders/brokers of soybeans and soy products to more accurately value soybeans or soybean meal sourced from different geographic origins

Knowing the CAAV, in combination with crude protein percentage, provides a more complete basis on which to evaluate the quality and value of soybeans and soybean meal. Lower crude protein soybeans are more concentrated in essential amino acids than are soybeans with higher crude protein levels (that are usually from warmer regions in the south).