

**ESSENTIAL AMINO ACIDS:
CHANGING ^{THE} LANGUAGE
OF CRUDE PROTEIN**





INTRODUCING A NEW MEASURE OF THE FEED VALUE OF SOY

U.S. soybean farmers have introduced a new measure of feed quality and value based on content of essential amino acids (EAA). Adding the sum of the five most critical amino acids as a percentage of crude protein provides a numeric Critical Amino Acids Value (CAAV). It is much more reliable than the crude protein (CP) measure

Amino acids are the foundational organic compounds of protein.

Livestock, poultry and farm-raised fish require certain EAA to synthesize protein

for overall health, fetal development, muscle growth and production of meat, milk and eggs. These are cysteine, methionine, threonine, tryptophan and lysine.

Swine, poultry and farm-raised fish cannot manufacture these in their own bodies. For that reason, they are referred to as “limiting” essential amino acids, and must be supplied in the diet. When these EAA are not present in sufficient quantities in a feed ingredient, nutritionists and producers must supplement them with expensive synthetic amino acids.

These EAA occur naturally in soybeans, which makes soybean meal such a good feed ingredient.

AMINO ACID	PERCENTAGE OF TOTAL CRUDE PROTEIN
Cysteine.....	1.41
Methionine	1.42
Threonine.....	3.79
Tryptophan	1.60
Lysine.....	6.55
TOTAL CAAV	14.77

WHY IS A **NEW** MEASURE OF SOY PROTEIN VALUE NEEDED?

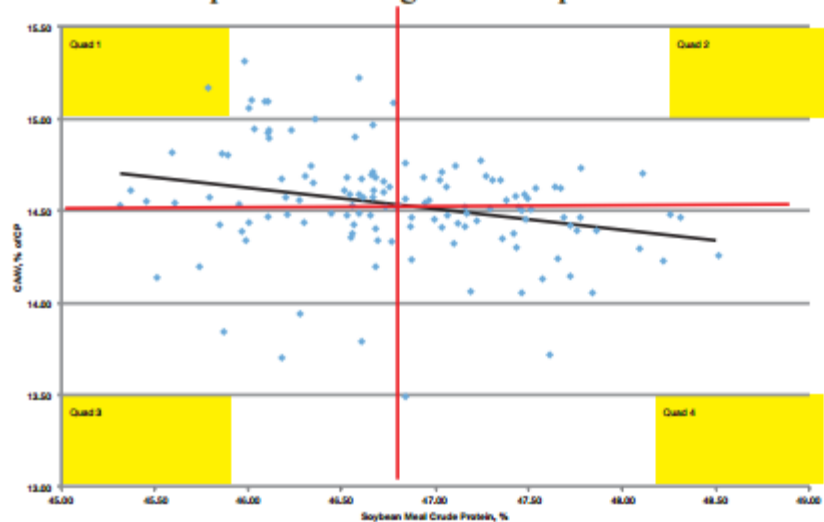
Discerning nutritionists and producers want to know the content of limiting amino acids in feed ingredients. This indicates the true value of the feed.

Traditionally, CP has been the primary method of measuring the value of a feed ingredient. CP percentages are only an estimate of the total amino acids based on the level of nitrogen detected. Soybeans grown in northern regions where colder temperatures and shorter growing seasons limit nitrogen fixing in the soybean plant often receive lower CP scores.

Near-infrared spectroscopy (NIRS) analysis and other modern scientific measurement tools now make it possible to buy feed ingredients based on their CAAV rating.

Research from several sources – University of Minnesota, Iowa State University, United Soybean Board, American Soybean Association, U.S. Soybean Export Council, Eastern Cereal and Oilseed Research Centre in Canada and Australian Oilseeds Federation – shows northern-grown soybeans that have lower CP actually have higher CAAV than soybeans with higher CP scores.

CAAV is not dependent on higher crude protein



A United Soybean Board (USB) 2013 study shows that soybean EAA content is higher when CP levels are lower. This graph sorts the data into four quadrants based on median crude protein (46.74 percent) and CAAV (14.53 percent). The samples in quadrants 2 and 4 have the highest crude protein content, but the samples in quadrant 1 have higher quality protein based on amino acid content. That's because a higher proportion of the protein is comprised of EAA. (Source: David R. Gast, PhD.)

BETTER VALUE FOR LIVESTOCK, POULTRY AND FISH PRODUCERS

Buying and feeding protein based on EAA is more efficient and cost-effective than CP. That's because CP is only an estimate of protein based on an approximate measure of nitrogen. ($CP = \text{percent N} \times 6.25$). CP does not provide any information about EAA content, and the level of nitrogen can be influenced by other factors besides protein.

CAAV measurement delivers greater value to producers by providing a more accurate profile of soybean protein quality, especially for northern-grown soybeans that often have lower CP but higher CAAV based on percentage of CP.



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