

U.S. SOYBEAN MEAL'S AMINO ACID PROFILE BEST PROMOTES DIGESTIBILITY FOR SWINE

- To know the true value of soybean meal, its amino acid profile and the digestibility of those amino acids must be considered
- Soybean meal digestibility impacts costs and formulation of swine diets
- U.S. soybean meal has better digestibility characteristics for swine compared to other origins

The digestibility of amino acids in soybean meal is critical to match the animal's nutritional requirements. Crude protein alone is not a sufficient indicator of overall soybean meal value. **It is essential to consider the soybean meal's protein content by understanding the animal's digestibility capability to meet its requirements for tissue synthesis and other critical metabolic functions.** Standardized Ileal Digestibility (SID) for soybean meal provides a more accurate measurement of amino acid availability to the animal than crude protein.

Comparing U.S. and Brazil soybean meal data from October 2018 through June 2021¹, when applying the swine average Standardized Ileal Digestibility (SID) of amino acid coefficients², U.S. soybean meal has an advantage in most amino acids (all SID content means are statistically different at 1% level).

Considering the 10 essential amino acids SID content for pigs (Arginine, Cysteine, Histidine, Isoleucine, Lysine, Methionine, Phenylalanine, Threonine, Tryptophan and Valine), **the U.S. has a 0.57% advantage over Brazil.**

When considering the 5 EAA SID content (Cysteine, Lysine, Methionine, Threonine, Tryptophan) **the difference is 1.06%.** In addition, **the SID digestibility of all amino acids is greater in U.S. soybean meal when compared to Brazilian soybean meal.**



¹ Data obtained from Evonik and summarized based on international trading specifications and includes observations with crude protein values between 46.0-49.0% and fiber values between 3.5-3.9%.

² Lagos, L. V., & Stein, H. H. (n.d.). Chemical composition and amino acid digestibility of soybean meal produced in the United States, China, Argentina, Brazil, or India. *Journal of Animal Science*, 2017, 95(4), 1626-1636.

The table below summarizes the mean SID content (%) and the variation (standard deviation) in amino acid SID content (%) by amino acid.

Amino Acid	Mean AA SID content (%)			Variation in AA SID (standard deviation) (%)		
	USA	BRA	USA/BRA (%)	USA	BRA	USA/BRA (%)
Alanine	1.884	1.851	1.73%	0.026	0.035	-34.29%
Arginine	3.339	3.328	0.33%	0.057	0.062	-10.43%
Aspartic Acid	4.887	4.830	1.17%	0.077	0.090	-16.37%
Cysteine	0.585	0.565	3.41%	0.013	0.016	-19.94%
Glutamic Acid	7.773	7.695	1.00%	0.121	0.134	-10.77%
Glycine	1.909	1.824	4.42%	0.028	0.030	-7.97%
Histidine	1.152	1.154	-0.15%	0.020	0.023	-13.94%
Isoleucine	2.010	2.008	0.11%	0.033	0.042	-26.96%
Leucine	3.329	3.323	0.19%	0.051	0.056	-8.88%
Lysine	2.691	2.678	0.49%	0.052	0.060	-16.21%
Methionine	0.599	0.594	0.83%	0.013	0.014	-6.97%
Phenylalanine	2.231	2.237	-0.26%	0.037	0.052	-39.04%
Serine	2.220	2.185	1.59%	0.034	0.036	-8.05%
Threonine	1.667	1.644	1.39%	0.023	0.023	-0.45%
Tryptophan	0.604	0.600	0.61%	0.009	0.010	-8.64%
Valine	2.054	2.027	1.30%	0.029	0.031	-8.43%
10 EAA	16.932	16.834	0.57%	0.239	0.245	-2.58%
5 EAA	6.145	6.080	1.06%	0.094	0.096	-2.53%

This difference in digestibility is important because the inclusion of soybean meal with higher amino acid digestibility will lower the proportion of dietary amino acids excreted undigested, thus minimizing the nitrogen output to the environment, which is important from a sustainability standpoint.

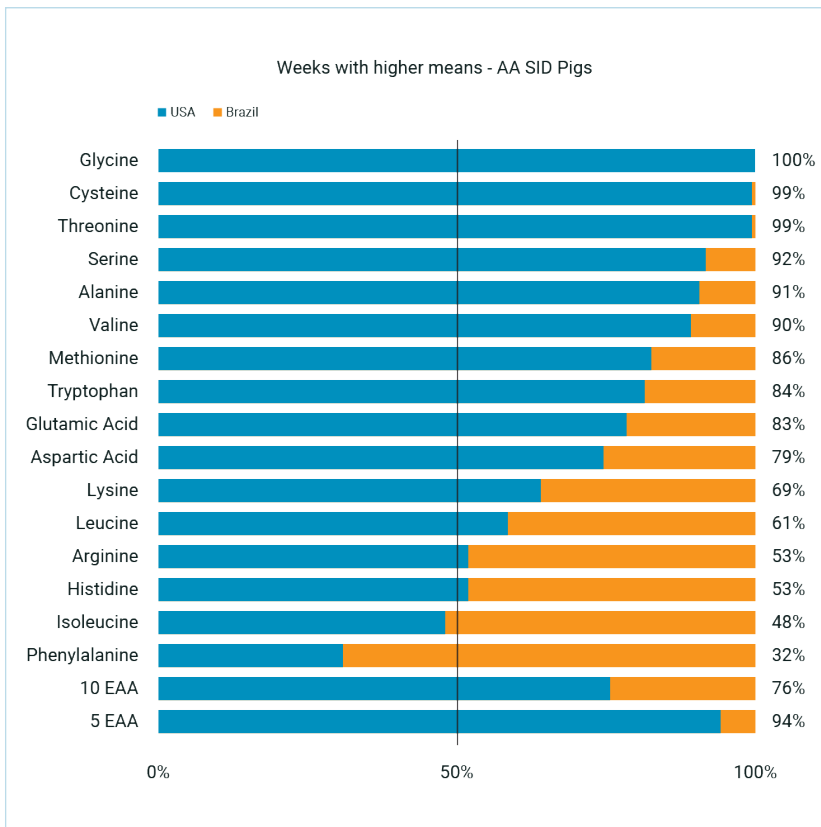
Moreover, **higher amino acid SID will reduce the need for synthetic amino acid supplementation in swine diets, which reduces formulation costs.**

These cost savings become more critical during a time when the price of amino acids have increased due to fluctuating market demands, high ocean freight costs, long lead times, and supply chain disruptions.

Likewise, **feed formulation based on digestible amino acids enables nutritionists to meet animals' requirements in a more precise manner, thus maximizing performance and profitability.**

As antibiotic-free production systems become more common, an adequate supply of digestible amino acids which contribute to supporting or restoring gut health is necessary to allow the animal to respond to different challenges that affect their performance, health, and welfare.

Soybean meal consistency is another a key value driver when evaluating which, and how much, ingredients to include in diets. When looking at this same data, **the variability of all amino acids (including the 10 EAA for swine and 5 EAA) is lower in U.S. soybean meal in comparison to Brazil which is an indication that U.S. soybean meal is more consistent.**



Lastly, **U.S. soybean meal has a higher SID content compared to Brazil** in most weeks analyzed, as illustrated in this chart, thus **demonstrating the repeated and sustainable advantage of more digestible U.S. soybean meal for swine relative to Brazil's soybean meal.**

CONSISTENT SOYBEAN MEAL IMPROVES DIET FORMULATION APPLICATIONS FOR NUTRITIONISTS, REDUCES NUTRIENT WASTE, LOWERS COST, AND DELIVERS SIGNIFICANT VALUE FOR END USERS OF SOYBEAN MEAL.



WHEN CHOOSING BETWEEN U.S. AND BRAZILIAN SOYBEAN MEAL FOR SWINE DIETS, TAKING ALL FACTORS INTO CONSIDERATION, U.S. SOYBEAN MEAL DEMONSTRATES ADVANTAGES.

To learn more about how U.S. Soy can enable your business, please contact your U.S. Soybean Export Council (USSEC) region or country representative; or submit your contact details via <https://ussec.org/contact/>.

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