

PROCESSING CONDITION INDICATOR (PCI)

The methods and conditions in which soybean meal is processed can impact the nutritional quality of the protein to a major extent and carbohydrates and other components to a lesser extent in the processed meal. To evaluate the impact of processing on protein quality, certain processing indicators are measured to assess if the soybean meal has been over, under or properly processed.

The Processing Condition Indicator (PCI) was developed by Evonik (or Evonik Industries AG) and includes key parameters that measure processing conditions. The PCI includes factors such as Trypsin Inhibitor Activity (TIA), KOH Solubility, and Reactive Lysine to Total Lysine Ratio. Nutritionists should have thresholds for these individual metrics, which provide some indication of over or under processing the soybean meal or variability in the quality of the soybean. The PCI aggregates these parameters into one metric that can be directly estimated using NIR (Near-infrared Spectroscopy). The ideal range for the PCI is 12-14. As the indicator moves closer to zero, it suggests that the meal had severe heat damage (over processed). A value that approaches 30 indicates a raw soybean (under processed).

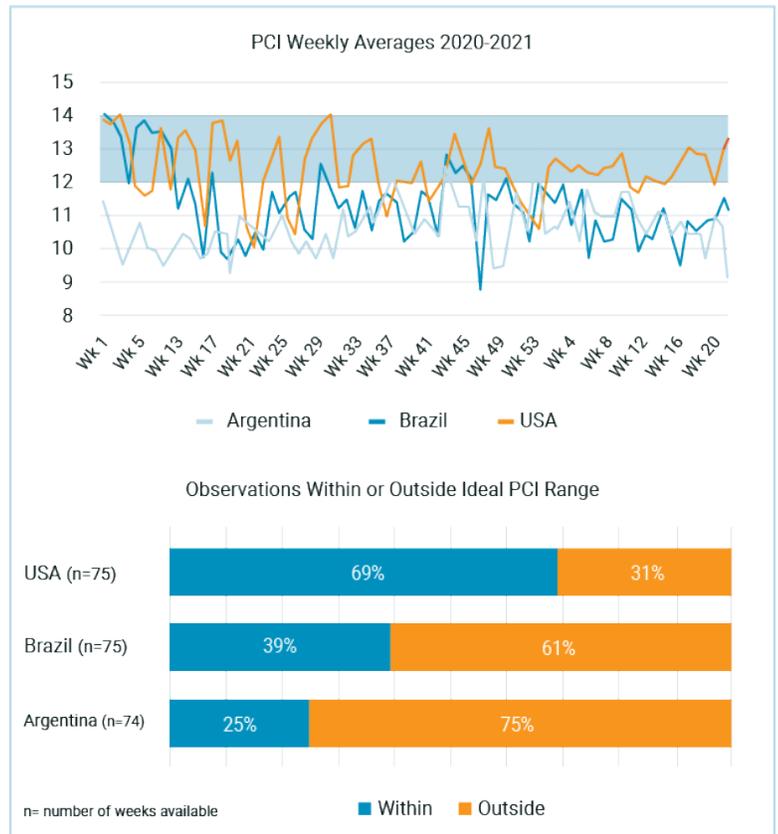


Using soybean meal data¹ collected from January 2020 through May 2021, the following charts summarize the PCI comparisons between the U.S., Brazil, and Argentina. Over this period,

THE U.S. HAS MORE CONSISTENT SOYBEAN MEAL CONSIDERING THE PROCESSING CONDITION INDICATOR (PCI) VALUES.

Most of the U.S. soybean meal observations (69%) fall within the 12-14 ideal range for PCI. The majority of the Brazilian and Argentine observations are outside the 12-14 range.

This can be an indicator that most of the Brazilian and Argentine soybeans are variable in quality or have been over or under processed.



While the methodology for determining PCI is proprietary, it can be used by industry as a resource since it uses multiple soybean meal quality indicators. Since the priority and importance of various soybean meal processing indicators vary among nutritionists, PCI offers a broad-spectrum assessment of soybean meal quality. PCI is important to monitor so that appropriate levels of soybean meal can be used in animal diets. With more variability in soybean meal, nutritionists would likely limit inclusion levels to the lowest quality level, as indicated by PCI.

U.S. SOYBEAN MEAL IS MORE CONSISTENT THAN BRAZILIAN OR ARGENTINE MEAL WHEN CONSIDERING THE PCI VALUES OF THE MEAL. THIS UNIFORMITY TRANSLATES INTO ADDITIONAL VALUE WHEN CONSIDERING THE OVERALL NUTRITIONAL BUNDLE OF THE MEAL.

¹Data 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%.

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/>.

ABOUT THE U.S. SOYBEAN EXPORT COUNCIL (USSEC)

Soybeans are the United States' number one food and agricultural export. The U.S. Soybean Export Council (USSEC) is devoted to building preference, improving the value, and enabling market access for the use of U.S. Soy for human consumption, aquaculture, and livestock feed in 82 countries across the world. USSEC is a dynamic partnership of U.S. soybean producers, processors, commodity shippers, merchandisers, allied agribusinesses, and agricultural organizations; and connects food and agriculture industry leaders through a robust membership program. USSEC is farmer-funded by checkoff funds invested by the United Soybean Board, various state soybean councils, the food and agriculture industry, and the American Soybean Association's investment of cost-share funding provided by U.S. Department of Agriculture's (USDA) Foreign Agricultural Service (FAS). To learn more, visit www.ussoy.org and www.ussec.org, and engage with us on [LinkedIn](#), [Twitter](#), [Facebook](#), [Instagram](#) and [YouTube](#).