

Added Lysine Can Fortify Soybean Meal

Soy Best PEARL Rumen Undegraded Lysine Study, Intestinal Digestibility Study

Background

Soy Best High Bypass Soybean Meal is mechanical extracted soybean meal with fresh soy gums. Studies show that gums technology increases rumen undegraded protein (RUP), often called protein bypass (Figure 1)¹, RU-methionine² and RU-lysine².

RUP for any feedstuff varies with dry matter intake, rumen solids retention, liquid dilution rate and stage of lactation. In an *in vivo* Dacron bag study, Soy Best RUP was 73.3% in a cow at 50 days in milk and producing 79.4 lbs. of milk and was 62.1% in a cow at 200 DIM and producing 59.9 lbs. of milk¹. The native lysine and methionine in Soy Best have bypass rates similar to the protein².

Problem

Compared to milk protein, soy bypass protein is deficient in lysine.

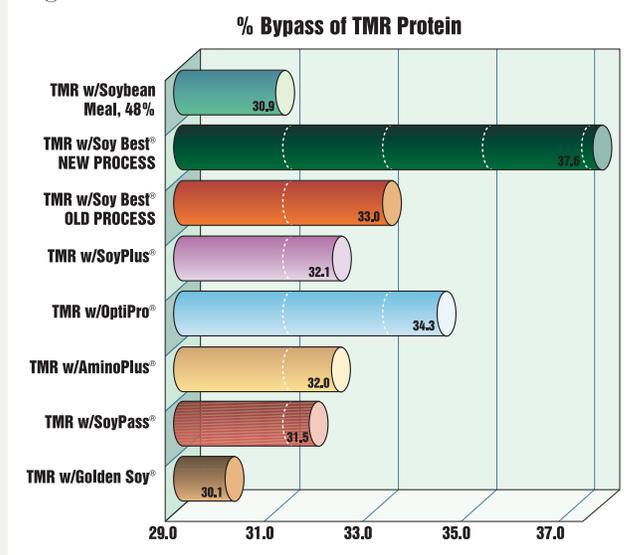
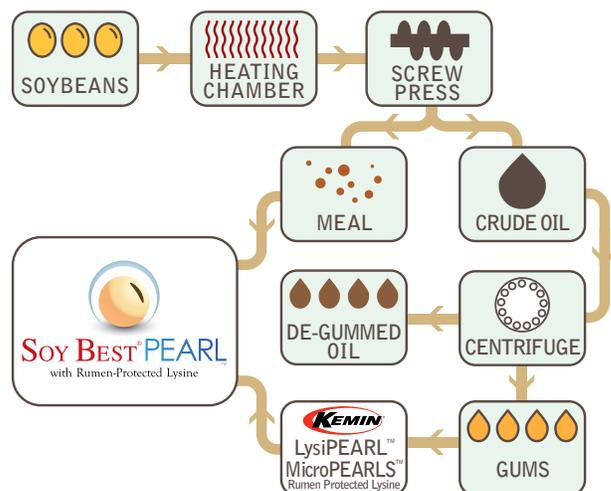
Solution**SCIENTIFIC BREAKTHROUGH!**

The lysine deficiency in soybean meal can be corrected by inserting rumen-protected lysine into gums and applying the gums onto the meal.

What are gums?

Soy gums are lecithin with small amounts of water, mineral and vitamin E. Lecithin is a mixture of phospholipids. Phosphatidyl-choline is the primary phospholipid, followed by lesser amounts of phosphatidyl-ethanolamine, phosphatidyl-inositol and others. Lecithin is mainly insoluble in the rumen.

Figure 1.

**How Soy Best PEARL is Made**

Methods

Soy Best and Soy Best PEARL were evaluated using the Ruminant IV Model at Sapienza Analytica LLC (Figure 2). This is an *in vitro* protocol, unlike the procedure mentioned previously (Background), which is an *in vivo* protocol. Results from the two protocols are not comparable. Results within each protocol are comparable.

RU-Lysine

The lysine rumen bypass rate is the same for Soy Best and Soy Best PEARL (rumen undegraded lysine as a % of total lysine (Figure 3)).

That means the fortified lysine and the native lysine in Soy Best PEARL behave as one lysine pool and no differently from the native lysine in Soy Best.³ (As stated above, *in vitro* results are not comparable to *in vivo* results.)

Intestinal Digestibility

The rumen undegraded lysine in Soy Best PEARL (comprising RU-native lysine and RU-LysiPEARL lysine) has significantly ($P < 0.05$) greater intestinal digestibility than the native lysine in Soy Best (Figure 4).³ This improvement is due to the very high intestinal digestibility of the RU-lysine in LysiPEARL.

Conclusions

1. Soy Best PEARL is Soy Best fortified with Kemin LysiPEARL rumen-protected lysine (9.37% and 6.26% RU-Lysine for Soy Best PEARL and Soy Best respectively).
2. Because of the gums technology, the fortified lysine and native lysine in Soy Best PEARL behave as one lysine pool in regard to rumen kinetics. Due to the very high intestinal digestibility of LysiPEARL RU-lysine, Soy Best PEARL RU-lysine has higher intestinal digestibility than the native lysine in Soy Best.

Footnotes:

1. Stern, M.D., T. K. Miller-Webster, W. H. Hoover, M. R. Moreno and C. A. Macgregor. 2005. Effects of soy gum application to soybean meal on protein degradation by ruminal microbes and intestinal protein digestion. *J. Dairy Sci.* Vol. 88 (Suppl. 1): 90 (Abstr. #86).
2. Macgregor, C. A., L. O. Tedeschi and T. K. Miller-Webster. 2011. Evaluating the inclusion of Met and Lys to mechanically extracted soybean meal with soy gums on the ruminally-undegraded Met and Lys content. *J. Dairy Sci.* Vol. 94 (E-Suppl. 1): 393 (Abstr. #T373).
3. Macgregor, C. A., K. Kalsbeur and D. Sapienza. Added lysine can fortify soybean meal. *Feedstuffs.* Vol. 84, No. 29, July 16, 2012.

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Figure 2. Ruminant IV Model

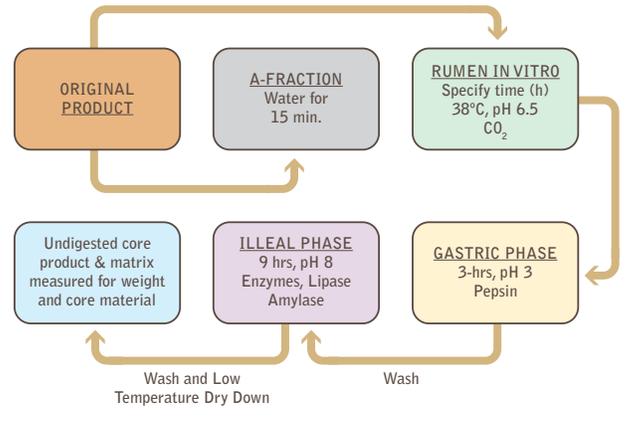
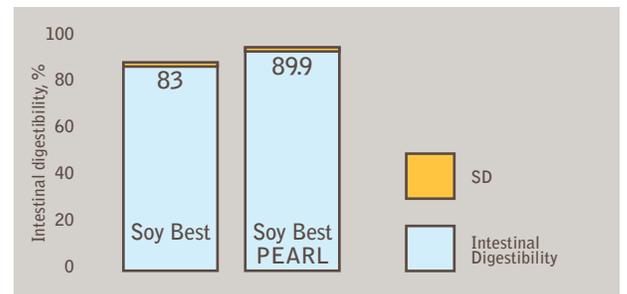


Figure 3. Rumen undegraded lysine in Soy Best and Soy Best PEARL



Figure 4. Intestinal digestibility of rumen undegraded lysine in Soy Best and Soy Best PEARL



SOY BEST[®]
High Bypass Soybean Meal
with Fresh Soy Gums

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