SOY BEST®
RESEARCH NEWS
8/04

New-Process Soy Best® Supplies More Bypass Protein in Total Mixed Rations

Background: Soy Best has always been manufactured by a unique, all-natural, mechanical-extraction process. The controlled heat treatment renders the protein more resistant to degradation in the rumen, allowing for more bypass amino acids. But now the new manufacturing process includes addition of gums, with naturally occurring soy nutrients – called lecithin, phosphatidyl-choline and phospholipids – derived from whole soybeans. These natural soy nutrients behave like rumen-protected fat.[1,2,3,4,5] Phosphatidyl-choline has a methionine-sparing effect.[6] Phosphatidyl-choline[7,8,9] and phosphatidyl-ethanolamine[7,8] play critical roles in mobilization of fat out of the liver for synthesis of milk fat.

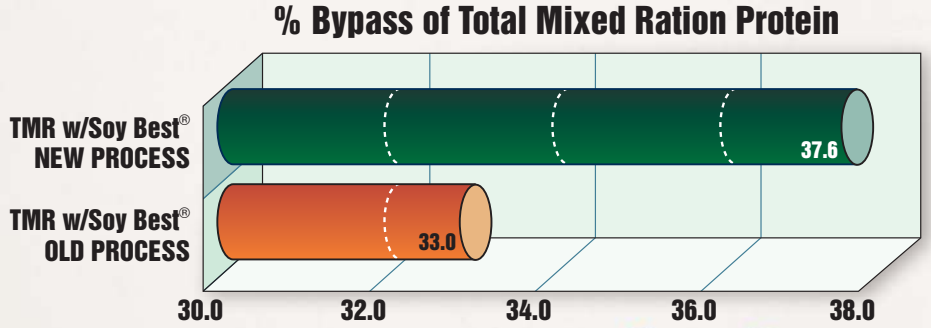
Venue: Rumen Fermentation Profiling Laboratory, West Virginia University.

Summary: Eight protein supplements were evaluated in mixed dairy rations (see table 1). The rations contained seventeen percent crude protein on a dry matter basis, with twenty eight percent of the total protein supplied by the supplement. Each ration was evaluated in triplicate, nine-day continuous culture fermentation periods. Conditions simulated rumen parameters of lactating cows.

Liquid dilution rate:	13%/hour	**Solids dilution rate:**	4.55%/hour
Solids retention time:	22 hours	**Feeding frequency:**	4X daily

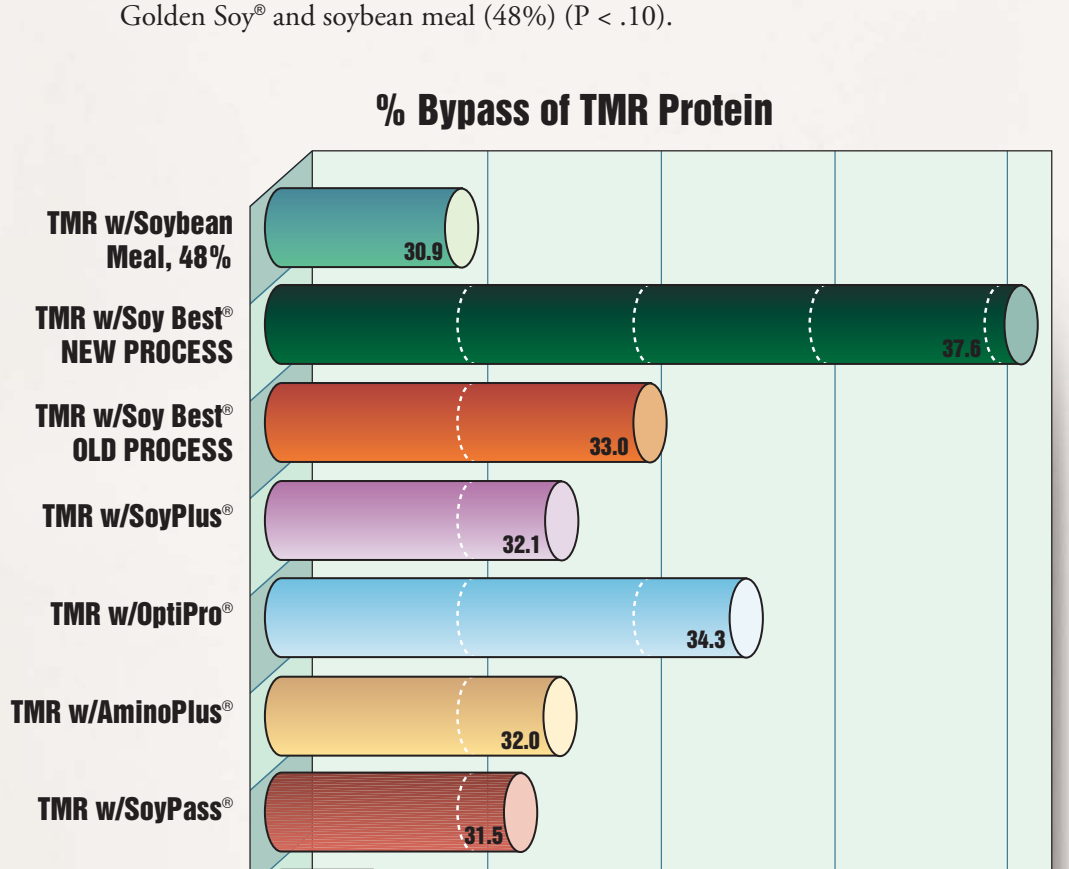
Results: ***Soy Best® protein bypass is improved by the addition of lecithin.***

The total mixed ration (TMR) based on old-process Soy Best had a protein bypass rate of 33%. The TMR based on new-process Soy Best had a protein bypass rate of 37.6%. This is a substantial improvement in protein bypass due to the new process.



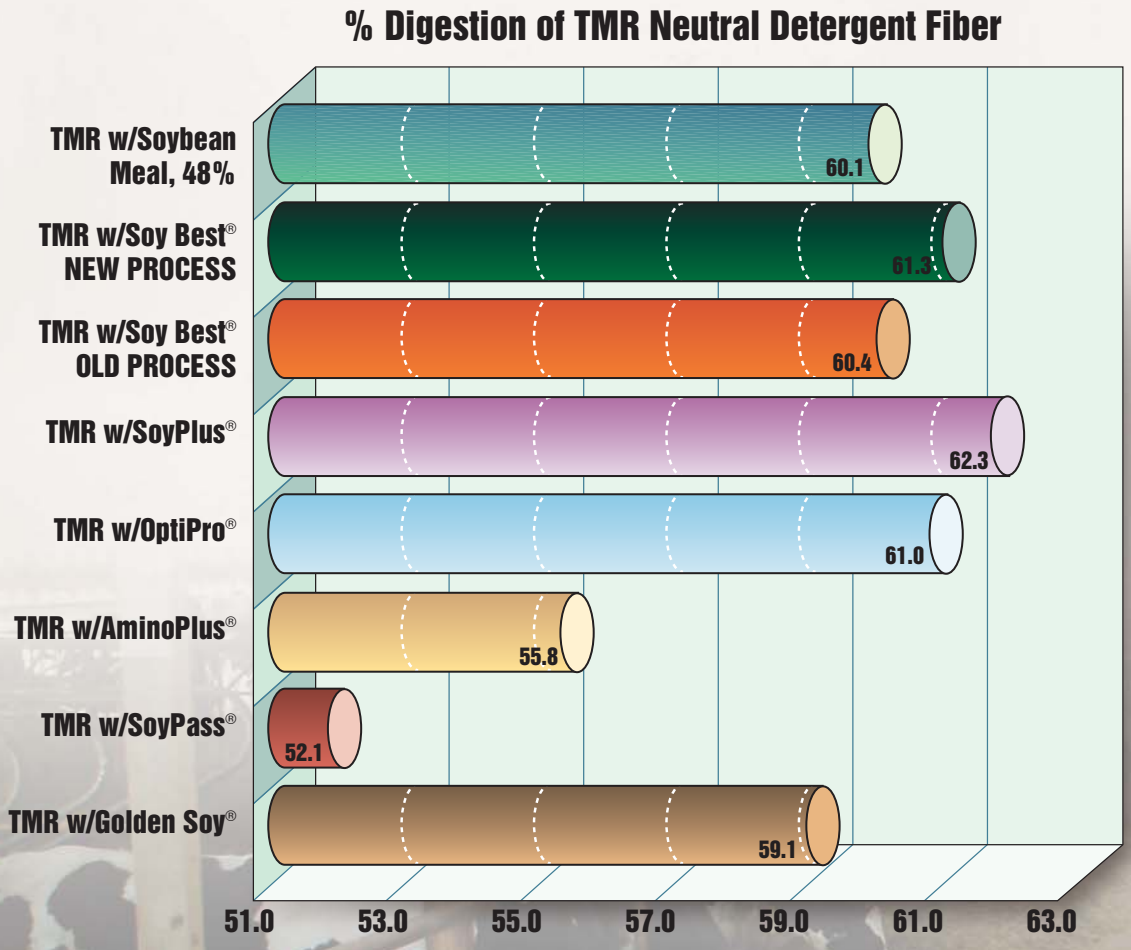
Results: ***Soy Best® protein bypass rate is greater than other bypass protein supplements.***

The TMR based on new-process Soy Best® had a protein bypass rate of 37.6%. That rate was significantly greater than the rates for SoyPlus®, AminoPlus®, SoyPass®, Golden Soy® and soybean meal (48%) ($P < .10$).



Results: ***Applying lecithin (phosphatidyl-choline) does not reduce fiber digestion.***

Neutral detergent fiber digestion rates were not different among TMRs based on new-process Soy Best®, old-process Soy Best®, soybean meal, SoyPlus®, OptiPro® and Golden Soy®. The inclusion rate of lecithin in Soy Best® does not impair total ration NDF digestion.



Summary

- Soy Best's protein bypass rate has been improved with the new manufacturing process.
- Soy Best delivers more bypass protein in a total mixed ration than other protein supplements.
- Although lecithin has some degree of rumen protection, it is highly digestible in the small intestine and is associated with increased lower gut lipid digestibility of the total ration.[2, 4]
- Feeding bypass protein is important for achieving high milk production. Supplying adequate available nitrogen for the rumen microflora is also important and should not be overlooked.

Table 1. Composition and analysis of rations, % of dry matter

Alfalfa Hay	8.39	8.39	8.39	8.39	8.39	8.39	8.39	8.39
Alfalfa Silage	11.54	11.54	11.54	11.54	11.54	11.54	11.54	11.54
Corn Silage	24.91	24.91	24.91	24.91	24.91	24.91	24.91	24.91
Whole Cottonseed	7.97	7.97	7.97	7.97	7.97	7.97	7.97	7.97
Flaked Corn	28.66	27.68	27.23	27.93	27.56	28.61	28.79	27.56
Soybean Meal 48	13.17	4.19	4.19	4.19	4.19	3.86	3.86	4.19
Soy Best w/o Lecithin		9.95						
Soy Best w/ Lecithin			10.40					
Soy Plus				9.70				
OptiPro					10.07			
AminoPlus						9.36		
SoyPass							9.18	
Golden Soy								10.07
Urea	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22
Molasses	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49
Megalac	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
Dical Phos	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67
Limestone	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Sodium Bicarbonate	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Magnesium Oxide	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23
TM Salt	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Vitamin Premix	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14
Crude Protein	17.0	17.1	16.9	16.9	17.1	16.9	16.7	17.0
Sol Prot, (% of CP)	36.8	33.2	31.2	31.5	34.5	34.0	30.6	33.3
NDF*	31.4	31.0	31.8	31.1	30.6	32.3	30.6	30.5
ADF	19.3	19.7	18.4	19.2	19.6	18.3	19.0	19.8
NSC	32.9	31.1	31.7	32.2	34.0	34.0	33.7	31.5
Starch	28.3	26.1	26.7	27.2	29.0	29.2	28.9	26.5
Sugar	4.6	5.0	5.0	5.0	5.0	4.8	4.8	5.0
Ether Extract	3.3	3.8	3.9	3.6	4.1	3.4	3.4	3.7
Ash	7.4	7.5	7.6	7.6	7.5	7.4	7.5	7.4
NFC**	40.9	40.6	39.8	40.8	40.7	40.0	41.8	41.4

* NDF with sulfite

** Calculated (100 - NDF - CP - EE - Ash)

FOOTNOTES:

1. Abel-Caines, et al., 1998. J. Dairy Sci., 81:462
2. Shain et al., 1993. J. Anim. Sci., 71:1266
3. Jenkins and Fotouchi. 1990. J. Anim. Sci., 68:46
4. Grummer, 1991. J. Dairy Sci., 74:3244
5. Grummer, 1993. J. Dairy Sci., 76:3883
6. Emmanuel and Kennelly, 1984. J. Dairy Sci., 67:1912
7. Nishimaki-Mogami, Yao and Fujimori, 2002. J. Lipid Res., 43:1035
8. Pinotti, Baldi and Dell'Orto, 2002. Nutr. Res. Rev. 15:315.
9. Overton and Waldron, 2004. JDS., 87: (E. Suppl.) E105.