

AMINOPLUS

AMINOPLUS[®] Performance Proven in Independent Research

University of Wisconsin Study:

Objective: To compare the milk production and component response of AminoPlus[®], a soybean meal control (SBM), and two competitive bypass soybean products, non-enzymatically browned soybean meal (NESBM) and expeller soybean meal (EXPSBM). Forages fed were corn silage and alfalfa haylage. Ground corn, whole cottonseed and soy hulls plus mineral and vitamins made up the basal ration. Whole soybeans were utilized to maintain similar fatty acid profiles across the iso-nitrogenous/ iso-caloric rations. Rations were balanced to be positive for rumen degraded and un-degraded protein intake except for the SBM control which was negative for un-degraded protein intake. Design was a 4 X 4 Latin square, replicated 4 times with 21 day periods, with the last 5 days designated as the test period.

Ration Composition

<u>Ingredients</u>	<u>SBM</u>	<u>AminoPlus[®]</u>	<u>NESBM</u>	<u>EXPSBM</u>
	-----(% of ration on dry matter basis)-----			
Alfalfa silage	22.5	22.5	22.5	22.5
Corn silage	38.3	38.3	38.3	38.3
Corn grain, ground	14.2	15.0	15.0	15.1
Cottonseed, whole	4.7	4.7	4.7	4.7
Soybean hulls	7.3	6.4	6.4	6.3
Soybean meal	8.7	2.8	3.1	3.3
Soybean whole	2.4	2.4	2.5	-
EXPSBM	-	-	-	7.9
NESBM	-	-	5.6	-
AminoPlus	-	6.0	-	-
Mineral-vitamin premix	1.9	1.9	1.9	1.9

Analyzed chemical composition of diets

<u>Diet component</u>	<u>SBM</u>	<u>AminoPlus[®]</u>	<u>NESBM</u>	<u>EXPSBM</u>
	------(dry matter basis)-----			
Dry Matter, %	50.1	50.1	50.2	50.1
NE-L, Mcal/lb	0.72	0.72	0.72	0.72
Crude Protein, %	17.6	17.5	17.3	17.1
Neutral detergent fiber, %	29.9	29.2	29.4	30.0
Non-fiber carbohydrate, %	40.9	41.9	41.9	41.5
Fatty acids, %	4.7	4.6	4.7	4.5
Ash, %	6.9	6.8	6.7	6.9

Production Data

	<u>SBM</u>	<u>AminoPlus[®]</u>	<u>NESBM</u>	<u>EXPSBM</u>
Dry Matter Intake, lbs/day	50.7	51.6	50.0	52.2
Milk Yield, lbs/day	81.3	84.9	82.2	81.8

Response vs. SBM

+3.6 +0.9 +0.5

Milk Composition, %

Protein	2.93	2.89	2.89	2.91
Fat	3.74	3.72	3.72	3.74
Lactose	4.91	4.96	4.92	4.90

Component Yield, lb/day

Protein	2.38	2.44	2.37	2.38
Fat	3.03	3.15	3.06	3.06
Lactose	4.00	4.20	4.06	4.02

Cows fed the AminoPlus ration produced more milk than cows fed either of the competitive bypass soy products or soybean meal rations. Value of milk produced (\$/cow/day) was 7.92, 8.17, 7.94, and 7.95 for the SBM, AminoPlus, NESBM, and EXPSBM rations, respectively assuming \$1.18 per pound of fat and \$1.81 per pound of protein produced.

Leonardi, et al., JDS 86: In press

F.A.R.M.E. Institute Study

Objective: To compare milk production of high producing cows fed commercially available bypass soy products. The bypass soy products compared were AminoPlus, bypass expeller soybean meal (EXPSBM), and non-enzymatically browned soybean meal (NESBM). Cows, grouped to equalize parity, milk production and days in milk, were housed in a cold freestall and provided a TMR fed ad libitum (adjusted for approximately 2-5% daily refusal) for the 8 week study. Rations, equalized for crude protein (CP), undegraded intake protein (UIP), energy and forage content, were balanced to meet current NRC standards. Rations were formulated to contain 18% CP, 37% UIP, 39% non-fiber carbohydrate (NFC), 5% fat, and 0.79 Mcal/ lb NE_L.

Ration Composition

<u>Ingredients</u>	<u>AminoPlus</u>	<u>NESBM</u>	<u>EXPSBM</u>
	-----(% of ration on dry matter basis)-----		
Corn Silage	31.06	30.99	30.85
Alfalfa Silage	7.42	7.41	7.05
Grass Silage	13.36	13.33	13.39
Hay	2.06	2.06	2.06
Whole Cottonseed	6.07	6.13	5.63
Corn meal	24.78	24.83	25.55
Soybean meal, 48%	4.93	5.11	3.49
Corn gluten meal	0.79	0.69	0.80
Optigen	0.53	0.49	0.58
Blood meal	0.33	0.33	0.36
Urea	0.21	0.25	0.21
Tallow	0.52	0.61	0.47
Megalac	0.37	0.43	0.38
Vitamin/mineral premix	3.37	3.41	3.40
AminoPlus	4.19	--	--
NESBM	--	3.92	--
EXPSBM	--	--	5.79

Milk Production Data

	<u>AminoPlus</u>	<u>NESBM</u>	<u>EXPSBM</u>
<u>All cows</u>			
Actual Milk, lb/day	72.1	68.5	70.0
LS Milk, lb/day ¹	73.8 ^a	71.7 ^b	74.7 ^a
<u>Less than 60 DIM at start of trial</u>			
Actual Milk, lb/day	76.5	68.9	72.4
LS Milk, lb/day ¹	72.2 ^c	68.7 ^d	69.7 ^{cd}
<u>Less than 90 DIM at start of trial</u>			
Actual Milk, lb/day	75.5	69.4	73.0
LS Milk, lb/day ¹	72.9 ^a	70.2 ^b	71.9 ^{ab}
<u>Less than 120 DIM at start of trial</u>			
Actual Milk, lb/day	75.1	69.8	74.0
LS Milk, lb/day ¹	74.7 ^a	71.9 ^b	73.6 ^a

¹ covariate terms used for testing effect of treatment were lactation number, week of lactation trail start and ME305

^{a,b} values within a row without a common superscript differ (P<.05).

^{c,d} values within a row without a common superscript differ (P<.10).

Milk Component Data (LS Means)¹

	<u>AminoPlus</u>	<u>NESBM</u>	<u>EXPSBM</u>
<u>All cows</u>			
Protein, %	3.09 ^b	3.14 ^a	3.07 ^b
Fat, %	3.46 ^c	3.26 ^d	3.36 ^{cd}
Protein, lb/day	2.21	2.14	2.14
Fat, lb/day	2.44 ^a	2.20 ^b	2.41 ^a
<u>Less than 120 DIM at start of trial</u>			
Protein, %	2.87	2.93	2.87
Fat, %	3.61 ^a	3.05 ^b	3.17 ^b
Protein, lb/day	2.18	2.13	2.16
Fat, lb/day	2.66 ^a	2.17 ^b	2.48 ^a
<u>Less than 150 DIM at start of trial</u>			
Protein, %	2.96 ^{ab}	3.01 ^a	2.91 ^b
Fat, %	3.53 ^a	3.15 ^b	3.21 ^{ab}
Protein, lb/day	2.24	2.21	2.16
Fat, lb/day	2.59 ^a	2.27 ^b	2.50 ^{ab}

¹ covariate terms used for testing effect of treatment were lactation number, week of lactation at trail start and component test at trail start

^{a,b} values within a row without a common superscript differ (P<.05).

^{c,d} values within a row without a common superscript differ (P<.10).

AminoPlus fed cows produced more actual milk of higher fat content than cows fed either of the competitive bypass soy products. Least square mean milk production for AminoPlus was greater than those cows fed the NESBM and similar to those fed the EXPSBM treatments. Using the least square means for milk and percent milk fat to estimate 3.5% FCM would result in values of 73.3, 68.9, and 73.0 lbs per day for the AminoPlus, NESBM, and EXPSBM treatments, respectively. The enhanced milk production occurred even though the rations were formulated to similar nutrient densities. The quantity of milk protein produced daily, while numerically higher for the AminoPlus treatment, was similar across treatments.