

Early lactation response to AjiPro[®]-L



Not all rumen protected lysine (RP-Lysine) products perform equally in early lactation cows, according to recent research. Consequently, a best practice among nutritionists is to increase the lysine/metabolizable protein ratio rather than focusing on the grams of lysine present in the ration.

RESEARCH TRIAL: EFFECT OF LYSINE SOURCE ON TRANSITION COWS

A research trial was conducted to examine the effects of three metabolizable protein-lysine sources: blood meal, a commercial RP-Lysine product “A” and the first-generation AjiPro-L. (Third generation product now available)

Trial methodology

- 72 multiparous Holstein cows
- Treatment period from week 4-7 of lactation with a withdrawal period on a common diet from week 8-11
- Production in the third week postpartum served as a covariate.
- Daily measurement of individual dry matter intake (DMI) and milk weight; weekly measurement of milk components.
- Body condition score (BCS) and bodyweight (BW) measured on 21, 49, and 77 days in milk (DIM)
- Use of manufacturer’s suggested specs for two RP-Lysine products
- The blood meal numbers used in the model were for medium quality, 80% bypass with 70% digestibility.

Diets

Ingredients	Control		Blood Meal		Product “A”		AjiPro-L	
	DM (lb/d)	%Ration DM	DM (lb/d)	%Ration DM	DM (lb/d)	%Ration DM	DM (lb/d)	%Ration DM
SHF Corn Silage Analyzed 07-12-2011	18.000	37.97	18.000	37.97	18.000	37.97	18.000	37.97
SHF Haylage 3rd Cut Analyzed 07-12-2011	4.000	8.44	4.000	8.44	4.000	8.44	4.000	8.44
AlfHay 20%CP CPM Book Values	3.000	6.33	3.000	6.33	3.000	6.33	3.000	6.33
SHF Corn Meal	8.000	16.88	8.000	16.88	8.000	16.88	8.000	16.88
Citrus Pulp	2.750	5.80	2.750	5.80	2.750	5.80	2.750	5.80
SHF Roasted Soybean	3.000	6.33	3.000	6.33	3.000	6.33	3.000	6.33
SHF Lact Mix	5.000	10.55	5.000	10.55	5.000	10.55	5.000	10.55
SHF Fresh Pak	0.900	1.90	0.900	1.90	0.900	1.90	0.900	1.90
SHF Canola Meal	0.500	1.05	1.500	3.16	1.500	3.16	1.500	3.16
DDGS	2.000	4.22	–	–	–	–	–	–
Blood Meal 80%Bypass 70%Dig	–	–	0.500	1.05	–	–	–	–
Soy Best	–	–	–	–	0.410	0.86	0.410	0.86
AjiPro-L	–	–	–	–	–	–	0.090	0.19
RP-Lys product	–	–	–	–	0.045	0.09	–	–
Carrier Corn Meal	0.250	0.53	0.750	1.58	0.795	1.68	0.750	1.58
TOTAL	47.4	100	47.4	100	47.4	100	47.4	100

CP (%)	17.7	18.3	17.8	17.8
RUP (%CP)	45.2	45.9	44.9	44.9
peNDF (%)	21.8	21.7	21.8	21.8
NFC (%)	43.7	44.0	44.3	44.2
Sugar (%)	5.3	5.4	5.4	5.4
Starch (%)	28.2	28.7	28.8	28.8
Sol Fiber (%)	6.4	6.0	6.2	6.2
EE (%)	6.5	6.0	6.1	6.2
ME Balance (mcal)	-2.1	-2.3	-2.1	-2.1
MP Balance (g)	-23.9	62.7	23.8	22.3
Lys (%MP) / Lys Supply (g/d)	5.95 / 153.1	6.27 / 166.1	6.37 / 166.8	6.38 / 166.8
Met (%MP) / Met Supply (g/d)	2.07 / 53.3	2.04 / 54.3	2.07 / 54.2	2.07 / 54.2

RESULTS

Summary of production responses

	Treatment			
	Control	Blood	Product "A"	AjiPro-L
Number of cows	18	18	18	18
DMI, lb/d	45.1	44.6	45.3	45.2
Yield, lb/d				
Milk	94.2 ^b	93.9 ^b	92.8 ^b	97.7 ^a
3.5% FCM	102.8 ^b	108.5 ^{ab}	103.2 ^b	111.4 ^a
Fat	3.79 ^c	4.18 ^{ab}	3.89 ^{bc}	4.26 ^a
Protein	2.49 ^b	2.45 ^b	2.41 ^b	2.59 ^a
FCM/DMI efficiency	2.29 ^b	2.45 ^a	2.29 ^b	2.49 ^a
Composition, %				
Fat	4.06 ^b	4.43 ^a	4.15 ^{ab}	4.32 ^{ab}
Protein	2.65	2.62	2.61	2.66
Lactose	4.85	4.82	4.84	4.81
MUN, mg/dl	10.8	11.8	11.6	11.4

a, b, c significant difference $p < 0.05$.

Effects of lysine source on plasma AA

	Control	BM	Product "A"	AjiPro-L	SEM	P=
Cow/trt	17	17	17	17		
AA (μmol/dL)						
Tyr	4.9 ^{ab}	5.1^a	4.2 ^b	4.7 ^{ab}	0.22	0.05
Thr	7.2	8.2	7.1	7.6	0.39	0.23
Trp	3.5	3.6	3.4	3.3	0.16	0.67
His	7.2 ^{ab}	8.1^a	7.3 ^{ab}	7.0 ^b	0.29	0.03
Asp	0.6	0.7	0.5	0.6	0.05	0.17
Lys	7.4 ^b	9.7^a	7.0^b	8.3^{ab}	0.45	0.002
Leu	16.3 ^b	21.4^a	15.5 ^b	15.9 ^b	0.86	0.001
Ile	9.5	11.1	9.7	10.2	0.58	0.21
Met	1.78	2.04	1.76	1.90	1	0.14
Val	27.8 ^b	38.3^a	29.5 ^b	29.5 ^b	1.5	0.001
Phe	4.8 ^b	5.5^a	4.9 ^b	4.8 ^b	0.15	0.003
Orn	3.4 ^b	4.3^a	3.4 ^b	3.7 ^{ab}	0.22	0.03
Urea	424.1	456.4	442.0	448.4	22.7	0.78

(Nocek & Shinzato, 2012 JDS Vol. 95, E. suppl. 2: 483)

1. All RP-Lysine products do not perform equally in early lactation cows.
2. Blood meal delivered a significant amount of lysine, but milk production was compromised presumably due to an oversupply of other amino acids that were not limiting.
3. With early lactation cows, a best practice is to increase the lysine/metabolizable protein ratio rather than focusing on the grams of lysine present in the ration.

AjiPro-L third generation product is now available. Third gen continues the trend of lowering cost per metabolizable Lysine while maintaining the same high level of protection and consistency Ajinomoto puts behind all of its products.



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