

P464 Measurement of the difference in bioavailability of 2 sources of rumen-protected lysine using the plasma free AA dose-response technique.

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Precise estimates of the metabolizable lysine (mLys) contributions of rumen-protected AA technologies are needed for the industry to costeffectively formulate rations to meet the mLys and metabolizable Met (mMet) requirements of dairy cows. Our objective was to estimate the mLys of 2 RP-Lys products hypothesized to be very different in Lys bioavailability. Six multiparous Holstein cows were used in a replicated 3 × 3 Latin square with 7-d experimental periods. The 3 treatments were: 1) Control (CON), 2) CON plus 60 g/d Lys from Smartamine ML (SMML; Adisseo; 55.0% Lys-HCl), and 3) CON plus 60 g/d Lys from LysiGEM (LGEM; Kemin Industries, Inc.; 68% Lys-HCl). All treatments were reformulated to be adequate in mMet. The 2 RP-Lys products were fed in 3 daily aliquots at 0500, 1300, and 2100 h after hand mixing the product in 1.5 kg of TMR and stored at 4°C for 7–8 h before feeding. Intake, milk yield and milk components were collected the last 3 d of each period. Blood was collected from the tail vein the last 3 d of each period at 2, 4, 6 and 8 h after the morning feeding (0500 h). Data were analyzed using the PROC MIXED to generate means and REG procedures of SAS to generate the linear regression variables. Significance was declared at $P \leq 0.05$. Average milk yield was 43.5 kg/d and DMI was 28.0 kg/d. Plasma Lys concentrations (μM) were higher for cows fed SMML compared with CON or LGEM, which did not differ from each other. Slopes for RP-Lys supplements expressed as %TAA–Lys was greater for SMML compared with LGEM. Relative to SMML, the Lys bioavailability of LGEM was 8.6% (0.00224/0.02595). The Lys in SMML has been previously documented to be 80% bioavailable. This would indicate the mLys concentration of SMML would be $35.2\% \pm 1.7$ ($44\% \text{ Lys} \times 0.80$) vs $3.8\% \pm 1.5$ ($54.4\% \text{ Lys} \times 8.6 \times 0.80$) for LGEM.

Table 1. Plasma AA concentrations (μM) for cows fed RP-Lys supplements

Item	Control	LGEM	SMML	SEM	<i>P</i> -value
Lys	73.1 ^b	76.1 ^b	109.1 ^a	2.79	<0.001
Met	40.6	41.1	37.8	1.52	0.11
Total sulfur AA	120	120	118	3.47	0.84
Total AA	2,107	2,132	2,219	37.1	0.13
Slope for Lys, % TAA – Lys	—	0.00224	0.02595	0.002	<0.001

^{a,b}Means within rows differ at $P < 0.05$.

Key Words: bioavailability, lysine