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Methionine, lysine, and histidine supplementation at low and high net-energy supply in dairy cows

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Table 1 (Abstr. T169).

	Treatment				SEM	P-value		
	LEAA-	LEAA+	HEAA-	HEAA+		AA	E	AA × E
DMI, kg/d	21.1	21.1	21.4	21.0	0.4	0.12	0.71	0.18
MPY, kg/d	828	916	927	962	39	0.02	0.01	0.22
MY, g/d	28.2	29.6	30.1	31.2	1.3	0.07	0.02	0.82
MPC, g/kg	29.3	31.1	30.9	30.9	0.9	0.08	0.13	0.08
MFY, g/d	1,289	1,317	1,363	1,410	55	0.07	<0.01	0.59
Lactose, g/kg	52.6	49.2	50.1	50.8	1.4	0.21	0.66	0.08
MPef, %	75.0	80.6	72.6	76.3	2.0	<0.01	0.03	0.43

with higher levels of plasma Met, greater 305-d mature equivalent milk yield, WK4M, and combined fat and protein yield at the herd level.

Key Words: methionine, transition cow, herd-level management

T169 Methionine, lysine, and histidine supplementation at low and high net-energy supply in dairy cows. C. Omphalius^{1,3}, H. Lapi-erre², L. Bahloul^{*3}, and S. Lemosquet¹, ¹PEGASE, INRA, Agrocampus Ouest, Saint Gilles, France, ²Agriculture and Agri-Food Canada, Sherbrooke, QC, Canada, ³Adisseo France S.A.S., Antony, France.

The responses in milk yield (MY) and composition to a supplementation in Met, Lys and His at 2 levels of NE_L were investigated. Four Holstein cows received 2 dietary levels of NE_L (LE: 30.9 vs. HE: 36.0 Mcal/d) and duodenal infusion of 2 AA mixtures, arranged in factorial and distributed according to a 4 × 4 Latin square, with 3-wk periods. Diets were composed of corn silage and concentrates (60:40). The 2 AA mixtures, both providing 92 ± 2 g/d of PDI (MP in INRA 2018), contained (g/d) Lys (28), Met (9), His (9) and NEAA in AA+ or only NEAA in AA-. Diets plus infusions provided 2.4 vs. 2.0, 7.2 vs. 5.8, 2.4 vs. 2.0% of PDI of Met, Lys and His respectively in AA+ vs. AA- compared with INRA (2018) requirements at 2.4, 7.0 and 2.4% PDI, for Met, Lys and His, respectively. Data were analyzed using the MIXED procedure of SAS with treatment and period as fixed effects and cow as random. Treatments did not affect DMI. The CP content of LE and HE diets were 147 vs. 145 g/kg DM, but current estimated MP supply increased by 101 g/d between LE and HE diets. Analyses of rumen N degradability will confirm the MP supply from LE and HE diets and associated MP efficiency (MPef) variations in response to NE_L. Increasing NE_L supply increased milk protein yield (MPY: 73 g/d) through an increased MY (1.8 kg/d) and increased milk fat yield (MFY: 84 g/d). Better balancing AA increased MPY (61 g/d) through a tendency to increased MY at the 2 NE_L levels and increased true milk protein content (MPC) at LE only (AA × E interaction), leading to an overall increase in MPef from 73.8 to 78.5%. Milk fat yield (38 g/d) tended to increase in response to AA+ vs. AA-. Milk lactose content tended to be lower in LEAA- than in the other treatments (AA × E). In conclusion, better balancing Met, Lys and His improved MPef at both levels of NE_L and has other effects on MY and composition.

Key Words: amino acid, efficiency, dairy cow

T170 Rumen-protected methionine supplementation on blood metabolites of transition dairy cows. G. F. M. Leão^{*1}, S. K. Santos², E. J. Askel¹, T. C. Michelotti¹, G. Negro¹, F. Lopes³, and R. Almeida¹,

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Recent data have shown several benefits of methionine supplementation during the transition period to health parameters of dairy cattle. The objective of this study was to investigate the effects of rumen-protected methionine (RPMet) during the transition on blood metabolites of dairy cows in a commercial herd. One hundred and 66 Holsteins, 58 nulliparous and 108 multiparous cows, were blocked by parity and expected calving date and randomly allocated in 2 treatments groups: Control and RPMet. Cows were individually fed and the RPMet group received a top-dressed methionine supplementation (Smartamine; Adisseo Inc.) during 21 d prepartum (8 g/cow/d) and 16 d postpartum (15 g/cow/d), maintaining a lysine/methionine ratio of 2.81/1. After 16 d postpartum all animals received methionine (15 g/cow/d). Blood samples were collected from the coccygeal vein before morning feeding on -14, -7, +1, +7 and +14 d relative to calving date. Data were analyzed using the MIXED procedure of SAS with a model containing the effects of block, treatment, time, and treatment × time interaction as fixed effects and cow within treatment as a random effect. Metabolites did not differ ($P > 0.10$) between groups. Nevertheless, there was a trend of RPMet animals to present lower values of AST ($P = 0.08$) and higher values of total calcium ($P = 0.05$) on +1 d, and albumin ($P = 0.06$) on +14 d. In summary, results suggest that RPMet supplementation had small effects on blood metabolites of dairy cows in a commercial herd.