

**P456 Rumen-protected methionine and its relationship with milk fatty acid profile in high-producing dairy cows under different planes of dietary energy.**

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The aim of this trial was to determine the effect of methionine supplementation at 2 levels of dietary metabolizable energy (ME) on milk fatty acid (FA) profile of mid-lactation cows. A total of 112 multiparous Holstein cows ( $49.4 \pm 5.3$  kg/d of milk;  $146.6 \pm 68.2$  DIM) from a commercial herd were blocked by lactation number, milk yield, and DIM. Cows were divided into 4 isoprotein (16.6% CP) diets: control (CON; 1.62 NEL Mcal/kg DM); high energy [HE; CON +1.2% of DM of hydrogenated fat (Prius F 100 Nat Dry, Auster)]; methionine (MET; CON + 24g of Smartamine M, Adisseo SA); and HE+MET. The experimental period was 38 d, and the first 3 d were used as a covariate with all cows fed the CON diet. TMR was provided once a day, with or without the addition of HE treatment, while MET treatments were top-dressed twice a day. Milk samples for FA profile were individually collected on d 36 of the trial and stored  $-20^{\circ}\text{C}$  until further analysis. Milk samples were analyzed by gas chromatography to determine 52 FA profile (Finnigan Focus CG, Thermo Fisher Scientific<sup>TM</sup>). Data were analyzed using the MIXED procedure of SAS. The greater supply of MET improved milk fat concentration (4.13 vs. 3.87%;  $P < 0.01$ ). Both HE ( $P = 0.015$ ) and MET ( $P < 0.01$ ) increased daily fat yield over CON (1.99 and 2.00 kg/d, respectively). There was no difference between treatments in proportion of De novo mixed FA, but there was a trend ( $P = 0.10$ ) for MET treatment to increase preformed FA (34.56 vs. 33.58 g/100g fat) and monounsaturated FA (25.13 vs. 24.25g/100g fat;  $P = 0.05$ ) while decreasing PUFA (3.05 vs 3.44g/100d fat;  $P < 0.01$ ). C10:0, C16:0, and C18:2cis9cis12 were reduced ( $P < 0.01$ ) with MET, while C17:0iso, C18:1cis11, and C18:1cis13 were increased ( $P < 0.05$ ). Higher intake of MET showed a trend ( $P = 0.07$ ) to increase the C14:1/C14:0 ratio. No interactions were observed between HE and MET on FA profile. Changes observed in mono and polyunsaturated FA, as well as in the C14:1/C14:0 ratio, give us indications that MET may have some effect during the synthesis and modification of FA in the mammary gland.

Key Words: methionine, fatty acids, milk fat