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Bioavalability of methionine from two different level of an hydroxyl-analog supplement

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INTRODUCTION

- Methionine (Met) is one of the first limiting aminoacids for lactating dairy cows fed corn-based diets.
- The NRC (2001) suggests that the required amounts of Lys and Met in metabolizable protein for optimal milk protein production are 7.2 and 2.4%, respectively.
- Supplemental sources of Met escaping rumen degradation have been developed in order to increase postruminal support of Met, such as, 2-hydroxyl-4-methylthio butanoic acid (HMB) and, more recently, the isopropyl ester of HMB (HMBi; MetaSmart™, Adisseo Inc., Antony, France)
- The HMBi is commercialized both in powder and liquid form. The liquid form of HMBi is easy to handle and it can be integrated into pellets.

AIM

Aim of this study is to assess Bioavailability of HMBi in lactating dairy cows by a blood plasma test according to Graulet et al.,2005.

RESULTS

The model seemed to indicate that the kinetic of Met concentration in plasma comprises two phases:
1- Plasma Met concentration did not increase following supplementation in group 2, whereas the increase lasted 6 h after supplementation in group 3, reaching approximately 4× the basal level,
2- then decreasing in group 3 and at 24h it has already returned at basal value

- Only 85 g/cow Met fed group treatment determined a significant difference in plasma Met concentration from two until twelve hours after administration.

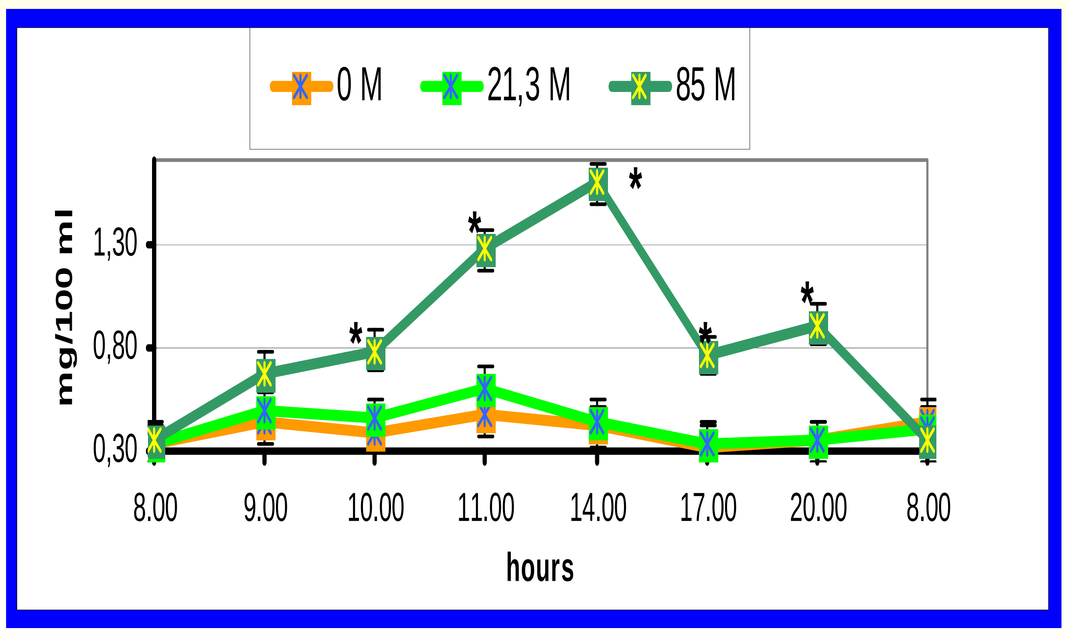

Figure 1- Kinetic of Metionine in blood
The asterisk indicates significant differences between 85M group and 0M group

REFERENCE

Graulet B., C. Richard, and J.C. Robert 2005. Methionine availability in plasma of dairy cows supplemented with methionine hydroxy analog isoprpyl ester. J.Dairy Sci. 88:3640-3649

MATERIALS AND METHODS

- The liquid form of HMBi (MetaSmart; Adisseo) supplement was orally administered by a single dose to 9 lactating dairy cows divided in three groups:
1. control group with placebo treatement,
2. 21,3 g/cow HMBi fed group,
3. 85 g/cow HMBi fed group .
- Blood samples were obtained by jugular venipunctures eight times a day at 8:00, before HMBi administration, and then at 1, 2, 3, 6, 9, 12, and 24 h after administration of placebo or HMBi treatments
- Plasma concentrations of Met and Lysine were determined.
- Statistical analysis was performed to consider repeated measurement over time for each cow, to evidence differences among treatments at each sampling.

GROUP	TREATEMENT	SUPPLEMENT
1	Control group	none
2	supplemented	21,3 g/cow of HMBi (MetaSmart)
3	supplemented	85 g/cow of HMBi (MetaSmart)

Table 1- Experimental design

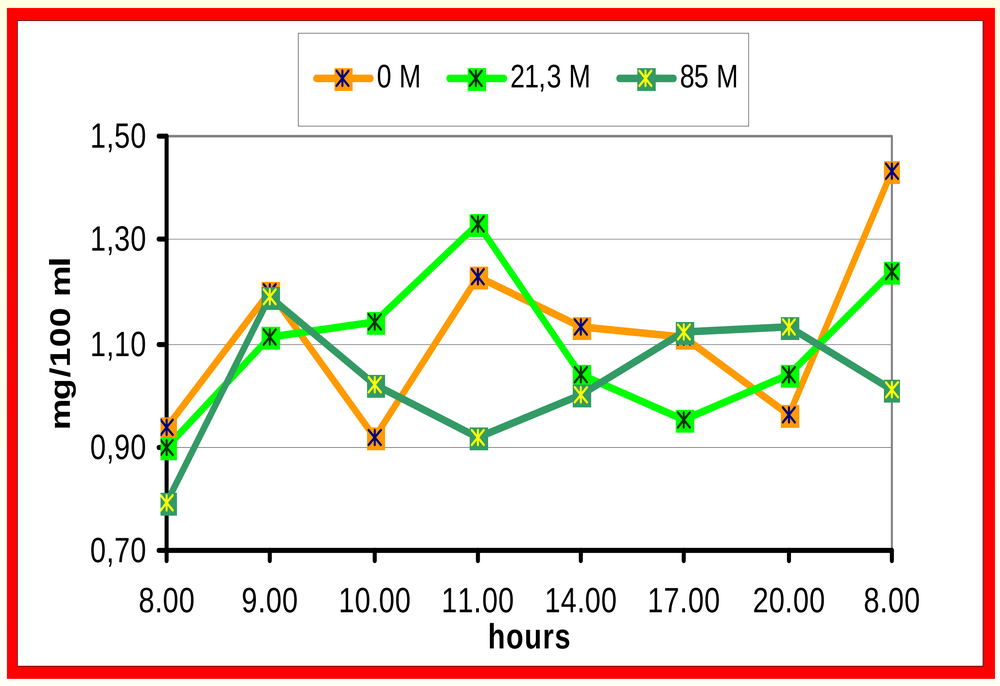

Figure 2- Kinetic of Lysine in blood

CONCLUSIONS

- High levels of Met (85 g/d) increase plasma Met concentration in the first 12 h after administration.
- Plasma Lysine bioavailability was unaffected by treatement.