



Effect of supplementing rumen-protected biotin in dairy cows - a practice test

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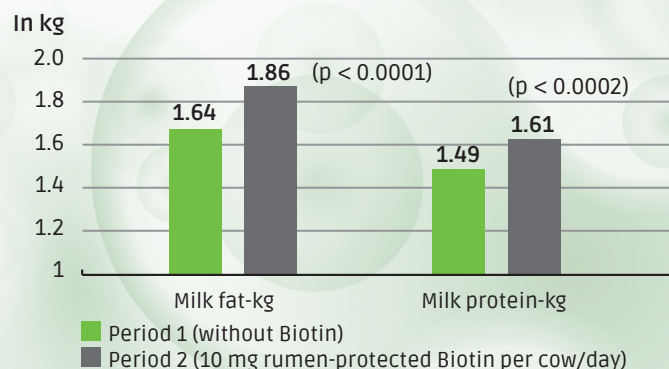
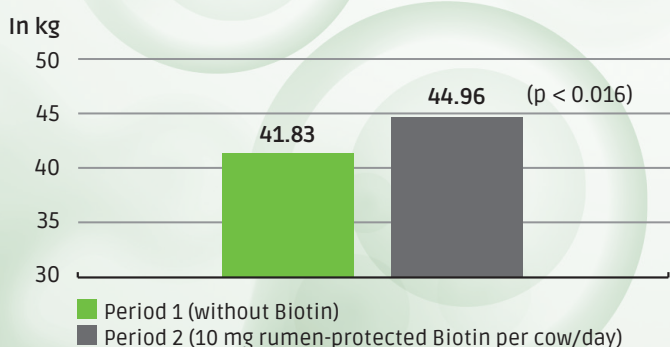
Introduction

Biotin, like all vitamins of the B-complex, can be produced by the rumen microorganisms of dairy cows. Until now, it was widely assumed that this ruminal synthesis, together with the intake through feed, ensures the supply of the dairy cow. In high-yielding dairy cows, there is increasing doubt whether the ruminal synthesis of water-soluble vitamins is sufficient. Trials showed that an allowance of 20 mg biotin per cow and day had positive effects on milk yield and hoof health (Chen et al., 2011). However, more than 45 percent of the biotin disappears before reaching the duodenum (Santschi et al., 2005). Furthermore, there is no direct correlation between the biotin entered from the feed and the biotin output after it leaves the rumen (Schröder, 2004). The aim of the present study was hence to test the effects of supplementing rumen-protected biotin under practical conditions and to examine the effects on milk yield and hoof health.

Material and Methods

- Practical farm in North Rhine-Westphalia with approx. 140 Holstein cows with an average lactation performance of approx. 13,100 kg/cow per year
- During the test period (February to December 2021), no feed changes occurred
- All animals received the same TMR (composition in table 1)
- The animals were kept in a free stall barn, milked twice a day and had free access to an open yard
- The feeding/lying place ratio was 1:1
- A milk control was carried out at the beginning of the test and then at intervals of approx. 30 days
- After the first five months, the diet was supplemented with 10 mg rumen-protected biotin per cow and day
- The first month (transit) of supplementing rumen-protected biotin is not included in the evaluation. The other five months are included
- From the milk controls, the individual cow data for milk quantity and milk constituents were recorded and the daily milk fat and milk protein quantity were calculated
- The data from 63 dairy cows per test period are included in the evaluation
- The average days of lactation (DIM) in the two periods were 190 days in the first period and 189 days in the supplement period

Results



Component	kg dry matter per cow and day
Corn silage (7.3 MJ NEL/kg TM)	8.5
Gras silage (7.4 MJ NEL/kg TM)	6.5
Alfalfa hay	1.4
Rapeseed meal	2.8
Soybean meal	1.1
Corn	3.4
Rye	1.4
Mineral feed Yeast + Salt + Calcium carbonate	0.4
Rumen-protected fat	0.27
BEWI-FATRIX® Biotin	1g per cow and day

Table 1: Composition of the fed TMR

Conclusions

- Adding rumen-protected biotin significantly increased the daily milk yield by 3.1 kg; the milk fat synthesis was significantly increased by 0.22 kg/cow/day; the milk protein synthesis was significantly increased by 0.12 kg/cow/day.
- The claw manager in charge confirmed that after the test period with biotin, no white-line defect was detectable in the herd.
- The effect of supplementing rumen-protected biotin shows that additional effects on milk yield can be expected at high milk yields and that claw health can be improved.

Literature:

- Chen, B.; Wang, C.; Wang, Y. M.; Liu, J. X. (2011): Effect of biotin on milk performance of dairy cattle: A meta-analysis; Veröffentlicht in: Journal of Dairy Science (94), S. 3537-3546.
- Santschi, D. E.; Berthiaume, R.; Matte, J. J.; Mustafa, A. F.; Girard, C. L. (2005): Fate of supplementary B-Vitamins in the gastrointestinal tract of Dairy Cows; Veröffentlicht in: Journal of Dairy Science (88), S. 2043-2054.
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