Digestibility of organic matter (OM) during the grazing period and the winter feeding period depending on the content of crude fiber

P. Kühne[1], H. Scholz[1], G. Heckenberger[2]
[1] Anhalt University of Applied Sciences, Bernburg, Germany
[2] State Institute for Agriculture and Horticulture Saxony-Anhalt, Iden, Germany

Introduction

To achieve a good reproductive performance of suckler cows and a high daily gain of their calves particularly a performance based supply is important. In the EU often there are two opposite interests: Extensive use of grassland versus achieving high animal performance to ensure an economical production. An increased extensivation can lead to a decrease in digestibility of grass during the grazing period. The aim of the investigation was to determine the differences in the digestibility of grass (organic matter) between the farms.

Material and Methods

7 farms with suckler cows were involved into the investigation from May until December 2018. During the grazing season 2018 was sampling feces from 5 suckler cows in each 7 beef cattle farm´s every month (May until September). The farms can be divided into [1] intensive pasture management with more than 100 kg nitrogen per hectare or [2] semi-intensive pasture management with less than 100 kg N/ha and [3] ecologically farms without nitrogen fertilizer on grassland. Feces were analyzed for digestibility of organic matter in the laboratory LKS Lichtenwalde after the method from LUKAS et al. (2005). During the winter period was sampling feces two times and analyzed for digestibility (9 farms with each 5-10 suckler cows for analysis). In the whole time of the investigation were sampling silage (winter period) and samples from the grassland (grazing period) and analyzed for nutrient and energy content.

Statistical analysis took place with ANOVA with fixed effects of farms (1-7), month (May until September) and number of lactations (1-7 lactations) using SPSS Version 25.0. An alpha of 0.05 was used for all statistical tests.

Results

Digestibility of organic matter during the grazing period 2018 was 71 % with variation from average 65 % to 74 % in the individual farms (table 1). Digestibility of dry matter should be more than 67 % for scoring in “high digestibility” (National Research Institute Finland NRIF, 2017) and affected the feed intake of suckler cows. Between the content of crude fiber (CF) and the digestibility of OM (DOM) was a correlation according to PEARSON of r = - 0.845 (p = 0.034) observed. However, it should be also calculate that the management of the pasture and the residual feed (sward height) has an important influence.

Table 1: digestibility of OM during the grazing season on different farms

farm	1	2	3	4	5	6	7
Crude fiber (%)	-	32.6	29.2	23.5	25.9	31.6	33.3
Digestibility (%)	-	68.5	74.4	74.0	73.6	67.4	64.9

In the winter feeding period was an average digestibility of 65 % observed in grass silage, grass hay or Total Mixed Ration (TMR). Results of digestibility during the winter feeding period are presented in table 2 with variations from 54 % to 75 %. DRENNAN and MCGEE (2004) found a decrease in dry matter intake and live weight gain of suckler cows offered silage with low digestibility in contrast to feed products with moderate digestibility. An effect of crude fiber in the ration on digestibility wasn´t found (DRENNAN and MCGEE, 2004). Between the content of crude fiber (CF) and the digestibility of OM (DOM) during the winter feeding period was a correlation according to PEARSON of r = - 0.616 (p = 0.004) and to SPEARMAN of r = - 0.743 (p ≤ 0.001) observed.

Table 2: average digestibility of OM during winter feeding period on in different farms

farm	1	2	3	4	5	6	7	8	9	10
CF (%)	26.3	35.4	32.6	33.9	35.3	36.3	31.7	24.2	31.1	26.3
DOM (%)	69.5	65.1	74.9	53.8	68.2	57.3	65.6	71.7	69,4	70.0

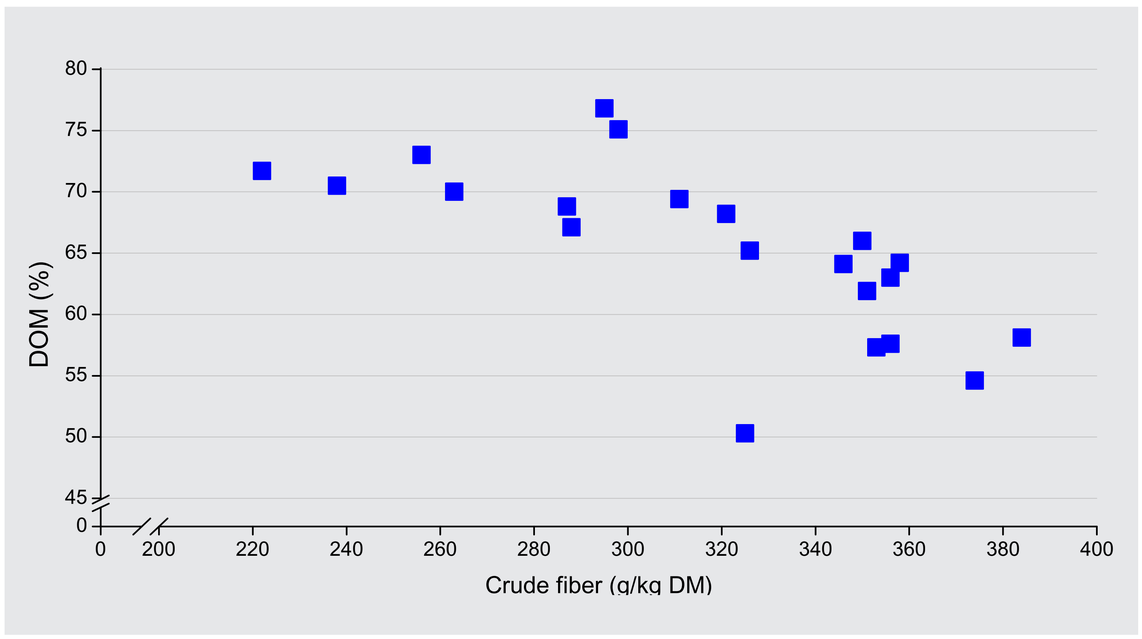

Figure 1: digestibility of OM and content of crude fiber in the ration during the winter feeding period

Conclusions

The results of the present study suggest that digestibility of organic matter (OM) in suckler cows can be considerably influenced by content of crude fiber in the silages or the ration (TMR) during the winter feeding period. Getting rations work out of feed quality and body condition score of suckler cows will ensure the cows on correct condition for the calving period. Against this background, operational optimization is always crucial.