

E. Scherzer, A. Steinwider, W. Starz, H. Rohrer, R. Pfister, M. Velik and W. Zollitsch (2020): **Effects of pasture or silage feeding of cows on the fatty acid pattern of milk** (in German). *Züchtungskunde*, 92, (2), 106-124.

Summary

Besides other factors the fatty acid content of cow's milk is influenced by feeding. In human nutrition, one aim is to reduce SFA intake and increase the supply of MUFA, PUFA, CLA and ω -3 fatty acids. The present study investigated the impact of full grazing (VW) or silage feeding with (S-KF+) or without concentrate supplementation (S-KF0) on milk fatty acid concentrations. Therefore the fatty acid pattern of the milk of 63 cows was studied over 3 years. The dairy cows of the pasture group were fed exclusively on a continuously grazed pasture (growth height 5.3 cm \pm 0.81). Grass silage was offered to the two groups fed indoors, whereby half of the cows additionally received concentrates (KF) according to their actual milk yield (S-KF+: KF kg per animal and day = 0.5 * kg daily milk – 18; but at a max. quantity of 8.5 kg KF per animal and day). In each experimental year, one third of the permanent grassland area was used for grazing, two thirds for silage production. For silage production the forage was cut four times per year at an average growth height of 15.4 cm (\pm 2.52), preserved in silage bales and fed to the indoor fed groups in the following winter. On average, the cows entered the experiment on the 46th (\pm 11.9) day in milk. The milk fatty acid data set included 74 (40.4%) individual daily milk samples from VW animals, 55 (30.1%) samples from animals in group S-KF0 and 54 (29.5%) samples from animals in group S-KF+. 104 (56.8%) milk samples were from cows of a Holstein Friesian genotype selected for lifetime performance, 43 (23.5%) from Austrian Simmental cows and 36 (19.7%) from Brown Swiss cows. Milk samples were also allocated to three experimental periods (seasonal groups) according to the experimental week. The milk fatty acid contents were determined by gas chromatography and data were statistically analysed with a mixed model.

The proportions of nutritionally important fatty acid groups in the milk from the grazing cows (VW) were significantly different from those of the silage fed groups (S-KF0, S-KF+). While the proportion of SFA in the milk of the VW group was significantly lower (VW 63.3 g/100 g FA, S-KF0 and S-KF+ each 71.5 g), the proportions of MUFA (VW 30.9 g, S-KF0 and S-KF+ each 24.4 g/100 g FA) and PUFA (VW 5.8 g and S-KF0 and S-KF+ 4.1 g/100 g FA) were markedly higher. The concentrations of CLA, ω -3 fatty acids and ω -6 fatty acids were also significantly higher in milk from the grazing group. The CLA and ω -3 fatty acid contents of the VW group were 2.3 g and 1.7 g/100 g FA, respectively.

In group S-KF0 these two fatty acids were 1.2 g and 1.4 g, and in group S-KF+ 1.1 g and 1.4 g/100 g FA, respectively. In contrast to the stable fed groups, the season and/or the days in milk affected the fatty acid concentration of the grazing group. In addition, breed and year effects were also observed for all groups. The restricted concentrate supplementation in the silage fed group S-KF+ only had a significant effect on the ω -6/ ω -3 fatty acid ratio as compared to S-KF0.

Keywords: dairy, organic farming, pasture, grazing, stable feeding, milk quality, fatty acids

Zitat (Deutsch):

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