Einfluss der Alpung auf produktionstechnische und physiologische Parameter von Kühen mit mittleren bis hohen Milchleistungen

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Publication Date:
1985

Permanent Link:
https://doi.org/10.3929/ethz-a-000361531

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Diss. ETH Nr. 7868

Einfluss der Alpung auf produktionstechnische und physiologische Parameter von Kühen mit mittleren bis hohen Milchleistungen

Abhandlung
zur Erlangung des Titels eines
Doktors der Technischen Wissenschaften
der
EIDGENOESSISCHEN TECHNISCHEN HOCHSCHULE ZUERICH

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SUMMARY

The influence of summering on milk production, body weight, milk somatic cell count, energy and protein metabolism and on some haematological parameters of dairy cows with high, intermediate and low milk production potential was studied in a project during a three year period. In the first year 29, in each of the following 2 years 30 dairy cows (Fleckvieh, Holstein-Friesian and Braunvieh x Brown Swiss) were kept on a alpine pasture at 2000 m above sea level from June to the beginning of September (alpine group). In the second and in the third year 17, resp. 16 cows were observed over the whole lactation period at the research station Chamau at 400 m above sea level (control group). All cows calved in March and were in the second or the third lactation. During summering, the alpine group was kept on pasture day and night and only mineral salt, but no concentrates, was fed. Before and after summering, both groups were kept at the research station Chamau and fed with grass, corn pellets and concentrates. The cows were kept in the same group only for one year. For different analyses, the animals were grouped in cows with high, intermediate and low milk production potential, according to their 50 days milk yield and independently of the breed.

The main results are:

- The average energy corrected milk (ECM) lactation yield of the control group was 6148 (± 1430) and for the alpine group 5443 kg (± 890).

- During summering the average daily milk production, the fat, protein and lactose content of the alpine group were 17.0, 4.14, 3.10, 4.84 resp.; corresponding values for the control group were 21.8, 3.84, 3.24, 4.96 resp.

- A genotype-environment interaction between production potential and environment (alpine pasture - research station) was found. The reduction of the lactation yield due to summering was 1044 (-31 %), 622 (-21 %), 256 kg ECM (-11 %) within the high, intermediate and low production group respectively.

- The body weight loss during the transfer and first 24 hours on the alpine pasture was 46 kg. There was no difference in body weight loss between cows of different milk production potential.
During summering the alpine group had higher concentrations of non-esterified fatty acids and ketone bodies (only at the beginning of summering) and lower concentrations of triiodothyrine, insulin, glucose, urea, protein and albumin.

Changes in milk somatic cell counts, haematological parameters, hormone and metabolite concentrations due to summering were similar for cows of the different production potential groups.