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Influence of dietary energy concentration on the empty body composition of growing Fleckvieh bulls

Einfluss der Energiekonzentration in der Ration auf die Leerkörperzusammensetzung von wachsenden Fleckviehbullen

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The performance potential of Fleckvieh (German Simmental) fattening bulls has been improved by selective breeding during past decades. This might have also affected the carcass tissue composition as well as chemical body composition and hence energy and nutrient requirements of animals during fattening. In order to reevaluate the deposition of energy and nutrients and the chemical and body tissue composition of growing Fleckvieh bulls of modern type, a feeding and slaughter experiment was conducted. The present abstract presents data on empty body tissue composition of bulls slaughtered in different weight categories after feeding diets with varying energy concentrations.

Methods: 72 Fleckvieh bulls (age: 42 d, body weight (BW) 80 kg) were fed with restricted amounts of milk replacer (120 g/l) and a concentrates/hay-based total mixed ration (TMR) until weaning at an average BW of 121 kg and subsequently on a TMR based on maize silage and concentrates for ad libitum intake. The fattening period was initiated at an average BW of 225 kg, when the bulls were allocated to a normal and a high energy treatment group with 11.6 and 12.4 MJ ME/kg DM, respectively. Individual feed intake was recorded daily and BW was determined in four-weeks intervals. The bulls were slaughtered in five weight groups with 120 (n=8), 200 (n=10), 400 (n=18), 600 (n=18), and 780 kg (n=18) final live weights. During slaughtering and carcass processing, the empty body weight was determined as final live weight minus the contents of urinary bladder and gastrointestinal (GI) tract and the whole empty body was anatomized to body tissues as hide, blood, organs, empty GI tract, body fat, muscle, bone and tendon. Statistical analysis was performed using Proc GLM of SAS (Version 9.3). Results are shown in ranges and standard error and were compared by SNK method with values of $p < 0.05$ stated as significant.

Results: The empty body weights of weight groups 120, 200, 400, 600, and 780 kg were 104, 176, 370, 553 and 734 kg, respectively. Since there were only minor effects of dietary energy concentration on empty body tissue composition in normal and high energy treatment groups, the combined results of both animal groups are shown. Muscle and tendon percentage of empty body weight, with average of 42.9 % ± 0.5 and 4.2 % ± 0.1 , respectively, did not vary between weight groups. During growth, the percentage of blood, organs, GI tract, and bone decreased ($p < 0.05$; blood: 6.0-4.0 % ± 0.1 ; organs: 7.2-5.7 % ± 0.1 ; GI tract: 7.4-3.9 % ± 0.2 ; bone: 19.0-11.1 % ± 0.2), while hide and body fat percentage increased ($p < 0.05$) from 9.2 to 10.5 % ± 0.2 and 3.7 to 18.5 % ± 0.6 , respectively.

Conclusions: The empty body compositions of modern type Fleckvieh bulls corresponded widely to literature data from past decades (1). During growth, the amount of body fat increased mainly at the expense of bone tissue. A decrease of muscle tissue in higher weight classes could not be observed. Variations in dietary energy concentrations within margins found under practical conditions did not alter the body composition to a relevant extent.

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1) SCHULZ E., OSLAGE H.J., DAENICKE R. (1974): Fortschritte in der Tierphysiologie und Tierernährung, Heft 4

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