Effect of allocation of fixed amounts of concentrates on milk yields and fertility of dairy cows

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Abstract

Nine Friesian (405+21 kg) and nine Ayrshire (394+ 18 kg) lactating dairy cows were used to determine the effects of reallocation of a fixed amount of concentrate feed to different phases of lactation on milk yield. They were blocked by breed and parity into six blocks and randomly assigned within block to the three treatments in a randomised complete block design. The treatments consisted of a commercial dairy meal concentrate supplementation supplied in two daily meals distributed at milking of two kg/day for 300 days (WL-2), four kg/day for 0-150 days of lactation (HL-4) and eight kg/day for 0-75 days of lactation (QL-8). All the animals grazed natural pasture (predominantly Kikuyu grass (pennisetum clandestinum) and had free access to un-chopped Rhodes grass (Chloris gayana) hay in the paddocks. The lactation yield (300 days) of cows in QL-8, 3155.0 kg, was significantly (P<0.05) higher than for cows in WL-2 (2543.6 kg) and HL-4 (2562.2 kg). Reallocation of concentrate (QL-8 vs WL-2) produced an extra 611 kg of milk. Significant (P<0.05) differences between QL-8 and the other treatments occurred in 0-150 days of lactation. No significant difference in milk production was observed between WL-2 and HL-4. Significant differences (P<0.05) were observed on live-weight changes of animals in QL-8 than cows in the other treatments in 0-75 days of lactation. Cows in WL-2 and HL-4 had a negative live-weight change, -379 and -162 g/day, respectively, while live-weight change of cows in QL-8 was 187 g/day. There was a general improvement of the body condition scores through the lactation period for all treatments. Cows on QL-8 had significantly (P<0.05) fewer days-open (79.7) compared to 98.7 and 106.3 for HL-4 and WL-2 respectively. Services per conception were similar for all treatments. The study demonstrated that it is possible to extract 611 kg of extra milk per cow's lactation by reallocating concentrate during the first 12 weeks after calving at 8 kg/day. The study also showed that concentrate feeding can be withdrawn altogether for the rest of a lactation period.