

## **7. INCREASING MILK PRODUCTION FROM DAIRY CATTLE IN A HOT ENVIRONMENT THROUGH MANAGEMENT INTERVENTIONS.**

**Mlengeya, M.M., MSc (Agric.) (1996)**

*Supervisors: Prof. R. E. L. Kurwijila*

A study was carried out to evaluate the physiological and milk production responses of *Bos taurus* dairy cows to chilled drinking water with or without electrolyte supplementation at 3% sodium chloride in the diet. Twelve lactating dairy cows were randomly assigned to a 2 x 2 factorial experiment. Factors studied were drinking water temperature and sodium chloride levels. The 11 week trial constituted of three weeks of standardization period, one week of adjustment and seven weeks of experiment. Parameters investigated were respiration rates, rectal temperatures, water and feed intakes and milk yield and composition. The range of average maximum ambient temperature of 28.8-41 °C and temperature humidity index (THI) of 75.7-77.4 were often above the critical levels (24-27°C and 72 THI) for optimum dairy cattle performance. Maximum and minimum relative humidity averaged 43 and 87% respectively. All factors investigated were not significantly altered by drinking water temperature or electrolyte supplementation. However, dry matter intake (DMI) and 4% fat corrected milk (FCM) yield were slightly higher for cows on 3% NaCl diet given chilled water by 7.14% (100 g/kg BW<sup>0.75</sup>) and 12.86% (1.07 kg/day) respectively. There were no significant differences among treatments for percentage milk fat, protein, solid not fat and total solids. Least square means of total water consumption for cows given chilled water were 51.62 kg/day for 3% NaCl and 50.72 kg/day for 1% NaCl diets. For the group given unchilled water throughout, their water intakes were 49.28 and 48.79 kg/day for 1% and 3% NaCl diets respectively. Chilled water had greater cooling capacity than unchilled water. It was concluded that, higher responses in DMI and milk yield can be achieved by using chilled drinking water and 3% sodium chloride. The benefit: cost ratio obtained from sales of additional milk produced as a result of using chilled water was 4.38:1 while that of using 3% NaCl in a diet was

24.25:1. It is economically feasible to use chilled water and 3% sodium chloride in diets as means of increasing milk yield during heat stress periods.