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*Summary only*

## HEAT PRODUCED BY YOUNG JERSEY AND FRIESIAN CALVES IN COLD ENVIRONMENTS

C. W. HOLMES and N. R. McCLEAN  
*Massey University, Palmerston North*

Four Jersey calves and four Friesian calves, aged between 7 and 30 days, were exposed to eight different environmental conditions, which were intended to range from comfortable to cold. Each calf was exposed to each condition twice and each exposure lasted one day. Air temperature was controlled at one of four levels, 20°, 12°, 7° or 3°C, and at each temperature wind speed was controlled at either 0.8 or 5.6 km/h. Each calf was kept in an open-circuit calorimeter chamber during the exposures and heat production was calculated from the measurement of oxygen consumption and carbon dioxide production.

The lower air temperature caused increases in the heat production of all calves; in addition the faster wind speed caused further increases in heat production at the lower temperatures. Heat production measured at 3°C, at 0.8 or 5.6 km/h windspeed was expressed relative to heat production measured at 20°C and 0.8 km/h. Increases calculated in this way were 20% and 39% for Jersey calves and 13% and 29% for Friesian calves (0.8 and 5.6 km/h, respectively, at 3°C).

The results indicated that the Friesian calves were affected to a smaller extent than the Jersey calves by the colder conditions in this experiment. The greater resistance of the Friesian calves to cold conditions was associated with a greater weight of hair coat per unit area of skin, and larger body size. Maximum whole body insulation was approximately 14% greater for the Friesian calves than for the Jerseys.

Values were calculated for the lower critical temperature at 0.8 km/h wind speed; these were 11° and 9°C for the Jerseys and Friesians, respectively; increasing the wind speed to 5.6 km/h increased these by 3 to 4°C.