LIVE WEIGHT, AGE AND PRODUCTIVITY RELATIONSHIPS FOR DAIRY HERDS IN SOUTH-EAST QUEENSLAND

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Moss (1993) proposed a theoretical relationship between herd productivity and liveweight of cows, and suggested that replacement heifers calve at 85% of mature live weight. To test this relationship data were obtained for 2100 animals on 14 commercial dairy farms in the West Moreton region of south-east Queensland. Farms with production levels from 3500 to 8700 litres(L)/cow were selected, and all animals above 12 months of age were weighed immediately after morning milking during a 4-week period in summer 1994.

Mature liveweight of cows at calving Y (kg) increased from 560 to 730 kg with increasing production X (L/cow) (Figure 1):-

\[ Y = 433 + 0.034X \quad (R^2 = 0.91; \text{P}<0.0001; \text{RSD} \pm 16.2) \]

For lactating cows this relationship was less precise with cows at various stages of lactation. As herd productivity increased, cows lost more weight, using body condition to support milk production:-

\[ Y = 433 + 0.019X \quad (R^2 = 0.44; \text{P}<0.01; \text{RSD} \pm 35.2) \]

Liveweight of heifers at 2 years varied from 340 to 500 kg while pi-calving liveweight ranged from 400 to 620 kg with a mean of 536 (± 16) kg for herds above 5500 L (Figure 1). Average age of heifers at calving was 29.8 (± 2.5) months (range 25 to 34 months), with higher production farms calving younger - 24 days per 1000 L increase in yield. Farms in the range 4500 to 6500 L calved heifers close to 85% of the liveweight of mature cows in the herd and produced 82% of the milk in first lactation, 96% in second lactation and >100% in third lactation (Figure 2). In contrast, farms averaging <4500 or > 6500 L calved heifers at 78% of mature weight and production in the first lactation was 69 and 79% of mature cows respectively. In both groups mature levels of production were reached at the fourth or later lactations.

Figure 1. Predicted (---) and observed (----) relationships between herd productivity and live weight of cows and heifers at calving.

Heifers which calved close to 85% of their mature weight can be as productive as mature cows by their third lactation. As herd productivity is increased, liveweight targets for heifers should also be increased, and pre-calving liveweight of 85% of mature size is recommended.