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EFFECTS OF AGE AND LIVEWEIGHT AT FIRST CALVING OF DAIRY HEIFERS ON PRODUCTION OVER THREE LACTATIONS

R.C. DOBOS [A], K.S. NANDRA [B], K. RILEY [B] and W.J. FULKERSON [C]

[A] NSW Agriculture Beef Industry Centre, Armidale, NSW 2351
[B] NSW Agriculture, Elizabeth Macarthur Agricultural Institute, Camden, NSW 2570
[C] Dept of Animal Science, M.C. Franklin Laboratory, University of Sydney, Camden, NSW 2570

First lactation production results of an experiment designed to assess the interaction between live weight at first calving (LWFC; 498, 549 and 595 kg) and age at first calving (AFC; 25, 30 and 34 months) on dairy heifer lifetime performance have been reported by Dobos *et al.* (2001). This paper reports on some of the results over three lactations from that experiment.

Details on the methodology and experimental design are given in Dobos *et al.* (2001). Briefly, 135 heifers began the experiment and were reared mainly on pasture to achieve the 3 different AFC and LWFC treatments. From first calving until the end of third lactation all heifers were run as one herd. During lactation, heifers were culled on set non-production criteria, primarily on the basis of non-pregnancy.

Univariate estimates of the response to a liveweight increase of 1 kg at first calving and to a month delay in age at first calving was obtained by linear regression within each AFC and LWFC treatment against either the actual LWFC or AFC for each lactation. The slopes for each lactation are reported in Table 1.

Table 1. Responses (slopes) to either a delay in AFC (/month) or an increase in LWFC (/kg) for each lactation. (P level of significance in parentheses)

Lactation	Milk (litres)	Fat (kg)	Protein (kg)
		AFC slope	
1	59.1 (0.023)	3.18 (0.001)	1.64 (0.025)
2	78.3 (0.015)	3.06 (0.029)	2.01 (0.028)
3	6.1 (0.829)	-0.49 (0.711)	0.08 (0.928)
		LWFC slope	
1	5.93 (<0.001)	0.269 (<0.001)	0.195 (<0.001)
2	5.56 (0.002)	0.248 (0.002)	0.199 (<0.001)
3	4.72 (0.003)	0.241 (<0.001)	0.171 (<0.001)

Production of heifers after 3 lactations and calving at 34 months was 9.4% and 2.8% more milk than heifers calving at 25 and 30 months, respectively. However, differences between lactations indicated that by the end of third lactation the younger heifers were producing similar quantities as their older herd mates. Heifers calving at 595 kg produced 7.9% and 3.6% more milk than heifers calving at 498 and 549 kg over the 3 lactations, respectively. The trend was for heavier heifers to produce more milk within each lactation. The combined effect of AFC and LWFC indicated that total lifetime production was more dependent on live weight than age.

DOBOS, R.C., NANDRA, K.S., RILEY, K., FULKERSON, W.J., LEAN, I.J. and KELLAWAY, R.C. (2001) *Aust. J. Exp. Agric.* **41**, 13-9

Email: robin.dobos@agric.nsw.gov.au