

FASTING AS A TECHNIQUE FOR USE IN DAIRY CATTLE NUTRITION EXPERIMENTS

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In feeding experiments with dairy cows, estimates of live weight change (LWC) are confounded by gut-fill (Hughes 1976) and those of body condition score change (CSC) are subjective. The aim of this experiment was to determine whether fasting as a technique could improve the estimates of LWC and CSC, and the relation between the two, in nutrition experiments with lactating dairy cows.

Seventy-two cows in mid-lactation were allocated to three levels of fast (0, 24 and 48 h). During the period before, and for four days after, fasting all cows grazed perennial pasture at an allowance of 38 kg DM/cow/day. Following refeeding, the cows from each fasting treatment were allocated to one of two levels of pasture allocation (either 37 or 16 kg DM/cow/day) for the next 22 days. At the end of this period, the fasting treatments were repeated. Daily milk yield (MY) and live weight (LW) were measured for each cow and condition score (CS) was recorded daily during fasting and refeeding, and at the start and finish of underfeeding. The results were analysed by regression and Duncan's new multiple range test using the "Teddy Bear" program, after covariate correction for between-cow variation.

The responses of MY, LW and CS to fasting were curvilinear; the MY and LW of cows that were fasted for 48 h were reduced by 65 and 12%, respectively, and observers assigned a lower CS. The MY, LW and CS of the fasted cows had not fully recovered after four days of refeeding (Table 1).

TABLE 1 Effects of fasting on MY (kg/cow/day), LWC (kg/cow) and CSC at the end of refeeding and during the subsequent underfeeding experiment

	Period of fast (h)					
	Refeeding			Underfeeding		
	0	24	48	0	24	48
MY	20.5 ^{a†}	18.4 ^b	16.8 ^c	17.8 ^x	17.5 ^x	17.6 ^x
LWC	0 ^a	-1 ^a	-16 ^b	-7 ^x	-42 ^y	-14 ^z
CSC	0 ^a	-0.2 ^b	-0.4 ^c	0 ^x	-0.2 ^y	-0.4 ^z

† Means in rows not followed by the same letter differ significantly ($P < 0.05$).

During underfeeding DM intake, MY, LWC and CSC for high and low feeding were 11.0 and 7.3 kg/cow/day, 20.1 and 15.1 kg/cow/day, -7 and -34 kg/cow and 0 and -0.4 of a CS, respectively ($P < 0.01$). The effect of fasting on these responses is shown in Table 1. Fasting did not affect the variability of MY, LWC or CSC as described by the standard deviation about each mean; these averaged ± 1.5 , ± 17 and ± 0.4 , respectively. Also, the relation between LWC and CSC was not affected by fasting; there was $27.0(\pm 5.5)$ kg LW/CS.

The results of this experiment showed that the technique of fasting did not improve estimates of LWC and CSC because the variability of these estimates was not reduced and the length of the period of fast has been shown not to influence the LWC/CSC relationship. Furthermore, a period of prolonged fasting prior to a short term experiment may alter the response to level of feeding.

HUGHES, J.G. (1976). *Anim. Breed. Abstr.* 44:7 11.

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