

## Estimate of maintenance energy requirements of Salers beef cows during mid-pregnancy

M Petit, P Kabré, J Agabriel

INRA, laboratoire Lactation et Élevage des ruminants, centre de Clermont-Thaix,  
63122 Saint-Genès-Champanelle, France

Twenty-one Salers nearly-mature (4 – 7 yr old) non-lactating cows were used during mid-pregnancy (from the 2nd to the 7th month) to estimate their maintenance energy requirements. They were allocated for 156 d to 1 of the 3 following treatments: 75 (H), 63 (M) or 52 (L) g dry matter (DM) per kg initial metabolic live-weight ( $LW^{0.75}$ ) and per d of a diet composed of 95% hay and a 5% mixture of soya bean meal and barley. Minerals were added. The hay contained 309 g crude fiber and 22 g N per kg DM.

The cows were housed in an unheated stable (between 5 – 15°C) in tying stalls. Initial LW and body condition score (BCS) were 588 kg and 1.8 (on a 5-unit scale) respectively. Changes in LW (averaged for 2 successive days) and BCS (averaged for 2 operators) were obtained between the ends of a pre- and post-experimental period of 2 wk during which all cows received the H-diet. Corrected LW (CLW) were calculated by deducting the weights of conceptus estimated from fetuses' ages and calves' birth weights (INRA, 1988). Net energy intake (ex-

pressed as net energy for lactation, NEL) was estimated from the digestibility of energy observed on 3 H-cows (0.64) and 3 L-cows (0.61). NEL available for maintenance and maternal energy gain or loss (NEL maint) was calculated by deducting NEL for pregnancy (INRA, 1988) from NEL intake.

Changes in LW, CLW and BCS differed between treatments (table I). Relationships between NEL maint and CLW change or BCS change obtained for all cows were highly significant ( $r = 0.88$  and  $0.73$  respectively). Maintenance requirements were estimated on corresponding principal axes for either no change in CLW or no change in BCS: 60 or 58 kcal NEL (100 or 97 kcal ME) per kg  $CLW^{0.75}$  respectively. These values were in accordance with those published previously in the literature. The slopes of the principal axes were used as estimates of the changes in NEL intake per kg CLW gained (9.5 Mcal NEL or 15.8 Mcal ME) or per unit change in BCS (318 Mcal NEL or 530 Mcal ME).

**Table I.** Changes in weight and condition score of pregnant Salers cows fed different levels of energy.

	NEL intake/ $LW^{0.75}$ (Kcal)		
	67	83	99
Change in LW (kg)	44 <sup>a</sup>	69 <sup>b</sup>	97 <sup>c</sup>
Change in conceptus-free LW (kg)	0 <sup>a</sup>	22 <sup>b</sup>	51 <sup>c</sup>
Change in BCS (unit)	0.2 <sup>a</sup>	0.8 <sup>ab</sup>	1.4 <sup>b</sup>

Values on the same line with different letters in superscript are significantly different ( $P < 0.05$ ).