

## SOWS CATABOLISE FAT AND MUSCLE IN LACTATION

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The energy and nitrogen (N) requirements of lactation often exceeds that which the sow can consume and they may lose up to one-quarter of their bodyweight in an attempt to maximize milk production (Mullan and Williams, 1989). Nutrient requirements have been calculated on the premise that most of this loss is fat without considering the possibility that muscle is catabolised to supply milk N. In a 2 x 2 factorial experiment gilts were given daily either 2.7 (H) or 1.5 (L) kg food during gestation and fed either ad libitum (H) or 2.0 kg (L) during a 31-day lactation. Sows were slaughtered (n = 73) at various stages of lactation and body composition of the carcass determined by dissection. Prediction equations were then calculated and applied to the animals shown in the following table to estimate fat and muscle changes during lactation.

	H-H	H-L	L-H	L-L	sed
No. of animals	42	36	53	36	
Post-farrowing:					
liveweight (kg)	171 <sup>ad</sup>	170 <sup>a</sup>	126 <sup>b</sup>	127 <sup>b</sup>	2.94
carcass fat (kg)	53.9 <sup>a</sup>	54.2 <sup>a</sup>	29.2 <sup>b</sup>	28.8 <sup>b</sup>	1.43
carcass muscle (kg)	50.7 <sup>a</sup>	51.1 <sup>a</sup>	40.8 <sup>b</sup>	41.1 <sup>b</sup>	1.01
Intake during lactation:					
energy (MJ ME/d)	48.1 <sup>b</sup>	24.0 <sup>c</sup>	70.1 <sup>a</sup>	25.7 <sup>c</sup>	2.68
N (g digestible N/d)	69.8 <sup>b</sup>	42.3 <sup>c</sup>	101.7 <sup>a</sup>	45.2 <sup>c</sup>	3.83
Balance:					
energy (MJ ME/d)	-28.8 <sup>b</sup>	-47.4 <sup>c</sup>	-1.0 <sup>a</sup>	-35.1 <sup>b</sup>	3.69
N (g digestible N/d)	-38.4 <sup>b</sup>	-56.4 <sup>c</sup>	-0.7 <sup>a</sup>	-38.5 <sup>b</sup>	4.86
Change during lactation:					
liveweight (kg)	-31 <sup>b</sup>	-45 <sup>c</sup>	-4 <sup>a</sup>	-30 <sup>b</sup>	3.09
carcass fat (kg)	-13.8 <sup>b</sup>	-22.3 <sup>c</sup>	-0.3 <sup>a</sup>	-15.1 <sup>b</sup>	1.66
carcass muscle (kg)	-8.7 <sup>b</sup>	-12.2 <sup>c</sup>	-1.9 <sup>a</sup>	-8.0 <sup>b</sup>	0.87

ϕ Within rows, means not followed by a common superscript differ significantly ( $P < 0.05$ )

In accordance with nutrient balance, sows catabolised both fat and muscle tissue in an attempt to maintain milk production. Of the fat catabolised, approximately 640 (s.e. 117.9) g/kg was subcutaneous, 260 (s.e. 18.3) g/kg intermuscular and the remainder was either flare, mesenteric or omental fat. These data show the extent to which sows catabolise maternal tissue in an attempt to maintain milk production and demonstrate that both protein and fat reserves are mobilised.

MULLAN, B.P. and WILLIAMS, I.H. (1989). *Anim. Prod.* 48: 449.

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