

## Effects of underfeeding Awassi ewes in late pregnancy and early lactation on body weight changes and milk production

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In the Middle East and parts of Turkey, Awassi sheep traditionally graze rangeland for most of the year, and lambing is spread throughout the winter. Late pregnancy and early lactation occur when grazing is limiting. As a consequence sheep are fed straw, cereal grains and other supplements. It is difficult to feed according to requirements during pregnancy, and sheep often have to mobilize body reserves. In countries where there is pressure on land and feed grain is imported, farmers are increasingly feeding low-roughage high-grain winter diets.

We conducted a factorial experiment with 48 individually-penned ewes to compare responses to recent AFRC (1993) allowances, with responses to four types of underfeeding that farmers tend to employ : (F1) feeding for maternal body weight loss in the last 3 weeks of pregnancy ; (F2) feeding so as to mobilize energy reserves in early lactation ; (F3) feeding a reduced level of protein (similar to the older ARC (1984) allowances) in both early and mid-lactation ; and (F4) feeding a low-roughage diet

(calculated to provide 12 MJ of metabolisable energy (ME) per kg DM) in mid-lactation. Rations included cottonseed cake, barley, barley straw and minerals, and a single changeover design for F4 was used in mid-lactation.

The ewes suckled a lamb for 42 days, and hand milking was started gradually from day 29. Important or statistically significant details of performance are shown in table. Under-feeding in late pregnancy (F1) had no lasting effect on lamb or ewe. The reduction in energy level in early lactation (F2) was equivalent to feeding 330 g less barley daily. It resulted in a smaller body weight loss than was planned and a 90 g/day reduction in milk yield ; the difference in milk yield did not significantly persist into mid-lactation. The high-fibre diet (F4 control) contained 43-57 % straw and increased the volume of milk by 10 % and milk fat yield by 25 %. Our results confirm the Awassi's tolerance to underfeeding energy or protein and emphasise the value of roughage in lactation.

Type of underfeeding		Level of feeding		SE of difference	Significance probability
Time	Effect observed	Requirement	Underfed		
<i>F1 : Fed for maternal body weight loss in last 3 weeks of pregnancy</i>					
Days -24 to -3	Body weight gain (kg)	2.70	0.67	0.460	0.0001
Days 18-59	Body weight loss (kg)	-2.97	-1.48	0.494	0.0046
Days 0-42	Lamb growth (g/day)	262	247	8.8	0.093
Days 46-59	Milk yield (g/day)	838	773	54.2	0.24
<i>F2 : Fed for 0.15 kg/d body weight loss (assuming constant milk yield) on days 18-59</i>					
Days 18-59	Dietary ME (MJ/day)	14.9	10.8		
Days 18-42	Lamb growth (g/day)	236	212	9.3	0.014
Days 18-59	Body weight loss (kg)	-1.29	-3.16	0.474	0.0003
Days 46-59	Milk yield (g/day)	862	749	52.9	0.039
<i>F3 : Fed ARC rather than AFRC protein levels on days 18-101</i>					
Days 18-101	Dietary protein (g/kg DM)	170.6	136.8		
Days 46-59	Milk yield (g/day)	831	780	52.7	0.34
Days 60-101	Milk yield (g/day)	510	477	50.9	0.52
	Milk protein (g/litre)	51.81	50.44	0.885	0.13
<i>F4 : Fed a low-fibre diet (ca 10 % straw) on days 60-101 (change-over on day 81)</i>					
Days 60-80	Milk yield (g/day)	541	485	33.4	0.11
Days 81-101	Milk yield (g/day)	373	346	18.4	0.16
Days 60-101	Milk fat (g/litre)	73.4	64.5	1.05	0.0001
	Milk protein (g/litre)	50.93	52.24	0.396	0.0028
	Milk solids (g/litre)	178.6	169.4	1.24	0.0001