

# Effects of restricted feeding of prepubertal ewe lambs on growth performance, mammary gland development and first lactation (#M139)

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## Introduction

Currently, many producers feed their ewe lambs indistinctly of market lambs or replacement ewe lambs. They usually have free access to diets promoting rapid weight gain until they reach the acceptable weight for selection as a breeding animal.

Negative effects of rapid weight gain and fattening during early rearing on milk production have been reported in replacement dairy heifers<sup>1,2</sup> and suggested in ewes<sup>3,4</sup>.

High plane of nutrition during allometric growth reduces mammary gland development in dairy heifers<sup>5</sup>, goats<sup>6</sup> and ewes<sup>7</sup> and increased fat deposit in mammary gland of heifers<sup>8,9</sup> and ewes<sup>10,11,12</sup>.

Period of compensatory growth follows a period of restriction<sup>13,14 15,16</sup>.

The aim of this study was to determine the effects of restricted feeding before puberty on growth performances, mammary gland development and milk production in replacement ewe lambs.

## Materials & Methods

At weaning, 72 Dorset ewe lambs were assigned to either an *ad libitum* diet (A), a restricted diet with good quality forage (F), or a restricted diet with medium quality forage (R). The quantity of feeds offered to ewe lambs of group R and F was adjusted to get an ADG of 70 % of that of ewe lambs of A group. These diets were offered during 75 d following weaning to cover the allometric phase of mammary gland development. At the end of this period, 28 ewe lambs were slaughtered and their mammary gland was collected. Remaining ewes were bred and milked at their first lactation.

### Collected data

- ✓ Daily DMI from weaning to breeding
- ✓ Body weight
- ✓ Backfat depth, loin eye depth, wither height, hearth girth and body condition score
- ✓ Mammary gland composition
- ✓ Milk yield and its components (fat and protein content)

Data were analyzed by MIXED procedure using the SAS<sup>17</sup>. Pre-planned contrasts were used to compare treatments. Data repeated in time were analyzed using the REPEATED option.

## Results

Table 1. Mammary gland composition in prepubertal ewe lambs

Parameters	Treatments			± SEM	Treatment effect (P value)	Contrast (P value)	
	A	R	F			A vs R-F	R vs F
N	8	10	10	—	—	—	—
Age at slaughtering	134	136	132	2	NS	NS	NS
Live weight at slaughtering	47.23	40.60	41.30	1.80	<0.05	<0.01	NS
Parenchymal weight (g)	19.34	27.86	24.37	3.24	NS	0.087	NS
Fat pad weight (g)	91.21	61.94	64.44	8.69	<0.05	<0.05	NS
Total gland weight (g)	110.55	89.80	88.81	9.12	NS	0.060	NS
<b>Parenchymal composition</b>							
DNA content (mg)	58.70	80.26	71.92	8.25	NS	0.087	NS
Protein content (g)	1.24	1.74	1.52	0.18	NS	0.070	NS
Lipid content (mg)	10.56	14.17	12.98	2.01	NS	NS	NS
DFFT <sup>b</sup> content (mg)	1.19	1.81	1.50	0.18	<0.05	<0.05	NS

<sup>a</sup> A=ad libitum diet, R=restricted diet with medium quality forage, F=restricted diet with good quality forage

<sup>b</sup> Dry Fat Free Tissue

Table 2. ADG, DMI and Feed conversion of ewe lambs from weaning to first breeding

Parameters	Treatments <sup>a</sup>			± SEM	Treatment effect (P value)	Contrast (P value)	
	A	R	F			A vs R-F	R vs F
N <sup>b</sup>	21/13	24/14	24/14				
<b>ADG (g/d)</b>							
From weaning to 135 days old <sup>c</sup>	304.5	223.3	228.7	7.7	<0.0001	<0.0001	NS
From 135 days old to first breeding	147.3	179.2	174.9	6.1	<0.01	<0.001	NS
<b>DMI (kg DM/d)</b>							
From weaning to 135 days old	1.148	0.935	0.974	0.033	<0.0001	<0.0001	NS
From 135 days old to first breeding	1.457	1.477	1.457	0.027	NS	NS	NS
<b>Feed conversion (kg DM food/kg of weight gain)</b>							
From weaning to 135 days old	3.85	4.20	4.30	0.15	0.066	<0.05	NS
From 135 days old to first breeding	10.19	8.39	8.44	0.43	<0.01	<0.01	NS

<sup>a</sup> A=ad libitum diet, R=restricted diet with medium quality forage, F=restricted diet with good quality forage

<sup>b</sup> Nb of ewe lambs before 135 days old/ nb of ewe lambs remaining after slaughtering

<sup>c</sup> End of experimental diet correspond to 135 days old of ewe lambs

## References

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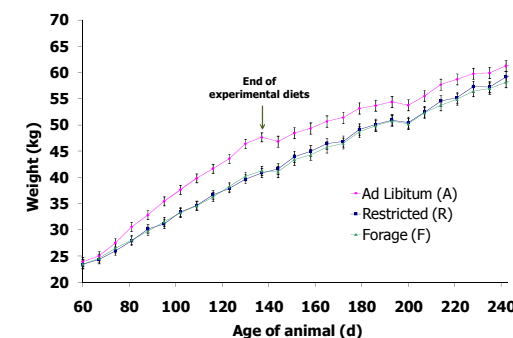


Figure 1. Weight evolution (kg) of ewe lambs from weaning (d60) to first breeding (d240).

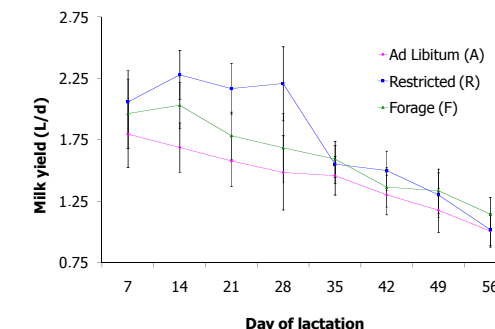


Figure 2. Standard<sup>18</sup> weekly milk yield of ewe lambs during their first lactation following three different diets between weaning and 135 days old. Contrast A vs R: P=0.075; contrast R vs F: P>0.10.

- All growth parameters show that ewe lambs were comparable at breeding (P<0.10).
- Fat and protein content of milk were similar between treatments. (P>0.10)

## Conclusion

### Restricted feeding of prepubertal ewe lambs:

- did not compromise their growth
- promoted a compensatory growth during the realimentation
- enhanced mammary development
- tended to increase their milk yield at first lactation

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