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Improving lamb growth rate using two strategies of supplemental nutrition either ewes at early lactation or suckling lambs

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ABSTRACT

For improving the growth rate of suckling lambs 2 experiments were conducted in a flock of Arabi sheep of Ramin Agricultural University to determine the effects of supplemental nutritional strategy either on lactating ewes or suckling lambs. In the first experiment 50 suckling male lambs were included in the experiment from day 14 until weaning (10 lambs/group). Four groups of lambs were randomly allocated to four supplemental protein diets treatment with the fifth group fed the conventional diet in a completely randomized design. In the second experiment the effect of supplemental feed in early lactation of ewes on growth rate of suckling lambs were studied. 3 equal groups of 9 ewes allocated into 3 different levels of supplemental feed (0, 350 and 700 g/d/ ewe) for a period of one month after lambing in a completely randomized design. In experiment 1, the average daily gain (ADG) of lambs fed the 4 supplemental diets were significantly higher ($p<0.05$) than control group (190 vs 148± 3.87 g/d). In experiment 2, the growth rate (g/d) of lambs reared by 2 offered supplemental feed group ewes were greater ($P<0.05$) than lambs reared by conventionally ewes. The ADG of lambs reared in above defined diets were 165±9.6, 198±9.1 and 204±9.1 g/d respectively. It is concluded that using both above strategies of supplementary nutrition can improve the growth rate of suckling lambs.

Keywords: Creep feed, lamb growth, lactating ewes, suckling lambs, sources of protein

INTRODUCTION

The results of previous experiments with Arabi sheep in Iran show that the growth rate of Arabi lamb during the suckling period (from birth to weaning at about day 100) is very slow particularly for lambs born in the autumn. (1,3,4) Poor quality and limited quantity of feed for lactating ewes was shown to limit milk production, which was the main reason for slow lamb growth (1, 2,3). On the other hand, in conventional Iranian sheep production systems, a limited quantity of low quality supplemental feed (creep feed) is offered to the suckling lambs. I hypothesized that with offering either a high quality supplemental feed to ewes at early lactation or offering a supplement to suckling lambs as a creep feed diet can improved lamb growth rate during suckling period .Therefore the aims of this study were to 1) compare the growth rate of suckled lambs fed experimental creep feed supplemental diets with the growth rate of lambs fed conventionally, and 2) compare the growth rate of lambs suckled from experimental supplemented ewes with the growth rate of lambs suckled from conventionally ewes.

MATERIALS AND METHODS

2 experiments were conducted in the Ramin Agricultural Research Unit of Shahid Chamran University to determine the effects of supplemental nutritional strategy either on lactating ewes or suckling lambs. In the first experiment 50 suckling male lambs with similar conditions (4.18±0.006-kg birth weight) from a flock of autumn lambing of Arabi sheep of university were included in the study from day 14 until weaning at day 94. The lambs were divided into five groups of 10 lambs. Four groups of lambs were randomly allocated to four supplemental protein diets treatments with the fifth group fed the conventional diet in a completely randomized design. The supplemental protein content of diet 1 to 4 were respectively soybean meal (SBM), SBM and poultry meal by product (PMB), cottonseed meal (CSM) and CSM and PMB. The high supplemental concentrate diets formulated according to NRC(1985) and had similar composition, but different source of protein(table 1).In the second experiment twenty-seven ewes with similar conditions from a flock of autumn lambing of Arabi sheep of university were included in the study. 3 equal groups of ewes allocated into 3 different levels of supplemental feed (0 (as conventionally similar to dry ewes), 350 and 700 grams/ ewe)) for a period of one month after lambing in a completely randomized design. The compositions of supplemental diets were similar to diet 3 in experiment 1.

RESULTS

In experiment 1, the average daily gain (ADG) of lambs fed diets 1,2,3, 4 and control during the 94-d experiment were respectively 180 ± 6.7, 192.25 ± 2.85, 195 ± 3.27, 192.75 ± 3.33 and 148.12 ± 3.87 g/day (table 2). Thus, the growth rates of suckling lambs fed the experimental diets were significantly higher ($p<0.05$) than control group. In particular the ADG of lambs in diet 3 was about 50 gram greater than in control group. The average dry matter intake of the creep feed in diet 1-4 was 260 g/day. In experiment 2, the growth rate (g/d) of lambs reared by 2 offered supplemental feed group ewes were greater ($P<0.05$) than lambs reared by conventionally ewes group during the whole period (10 weeks, table3). The ADG of lambs reared in above defined diets were 165±9.6, 198±9.1 and 204±9.1 g/d respectively. The differences of lamb growth rate between ewes offered 350 or 700-g/d supplemental feed were not significant ($P>0.05$). These results are shown that by offering 350 g/d supplemental feed can improve lamb growth rate.

DISCUSSION

The results of previous experiments with Arabi sheep in Iran show that the growth rate of Arabi lamb during the suckling period (from birth to weaning at about day 100) is very slow particularly for lambs born in the autumn. The ADG of 125 and 120 g/d in suckling lambs were respectively reported by Dabiri (1999), and Dabiri and Mosavi (2000) for the same flock of Arabi sheep in conventional system with low quality and quantity of supplemental feed. A similar low growth rate (100 g/d) of lambs was reported by Jume et al.(1985) for Arabi breed sheep of Iraq in native condition system. These values are much lower than the results of ADG in 2 present experiments (about 200 g/d) with using supplementary feed for the same breed of Arabi sheep. A low growth rate of suckling lambs about 150 gram/day have been reported by Eskandari Nasab and Emam Jomeh Kashan (2000) for Naeini and Karakul Iranian breed sheep in native condition system with limited creep feed supplementary diets .On the other hand in agreement with the result of present experiments, several published papers from shiraz university (6, 7, 9).have shown an ADG of 200

gram/day or more for suckling lambs of Karakul, Mehraban and naeini of Iranian breed sheep, where they were offered and adlibtum creep feed diets.

IMPLECATION

The results of these 2 experiments indicate that the strategy of 2 methods of supplementary nutrition has a positive role for producing heavier lambs, but it looks like that cost of feed would be lower in method 2, when a 350g/d supplemental feed are offered to early stage of lactating ewes.

Table 1-Ingredient and chemical composition of the ration

treatments / **ingredients**	**Diet 1 SBM**	**Diet2 SBM+ PMB**	**Diet3 CSM**	**Diet4 CSM+ PMB**
barley	78.4	77.3	74	77.2
SBM	8	4.2	-	-
CSM	-	-	10.7	5.1
PMB	-	3.47	-	3.132
Wheat bran	4.8	5.56	6.4	5
Bagass	6.2	6.9	5.7	7
Limestone	0.6	0.6	1.4	0.5
Oyster	0.5	0.5	0.5	0.5
Salt	0.5	0.5	0.5	0.5
Mineral sup	0.5	0.5	0.5	0.5
Vitamin sup	0.5	0.5	0.5	0.5
% chemical composition				
Dry matter	89.74	87.89	87.58	88.11
CP	16	16	16	16
TDN	79.6	79.7	78.7	79.3
NDF	22.38	22.25	24.02	22.91
ADF	8.62	8.45	9.77	8.94
Lignin	1.79	1.78	2.5	2.11
Ca	0.48	0.51	0.62	0.53
P	0.23	0.23	0.31	0.27
K	0.83	0.77	0.83	0.75
Na	0.26	0.3	0.27	0.3
Mg	0.17	0.16	0.19	0.17

Table 2-Means of live weight, daily weight gain and dry matter intake of suckling lambs fed from different source of protein.

Traits \ Treatments	**Diet 1 SBM**	**Diet2 SBM+ PMB**	**Diet3 CSM**	**Diet4 CSM+ PMB**	**control**
Live weight(kg)	4.2^{a}±0.15	4.187^{a}±0.14	4.198^{a}±0.14	4.175^{a}±0.11	4.15^{a}±0.19
Daily weight gain(g)	180^{b}±6.27	192.2^{ab}±2.85	195^{a}±3.27	192.7^{ab}±3.33	148.1^{c}±3.87
Dry matter intake9(g/d)	213.7	269.8	294.7	269.6	-

a,b,c: Means within rows with no common superscripts differ significantly (P<0.05).

Table 3- Means of live weight, daily weight gain

Traits \ Treatments	Lactating ewes without creep feed	Lactating ewes with 350 gram creep feed	Lactating ewes with 700gram creep feed
Live weight(kg)	4.47^{a}±0.22	4.09^{a}±0.22	4.29^{a}±0.22
Daily weight gain(g)	165^{b}±9.1	198^{a}±9.1	204^{a}±9.1

a,b: Means within rows with no common superscripts differ significantly (P<0.05).

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