

Early Weaning of Rahmani, Ossimi and Barki local Lambs

A.M. Aboul-Naga, E.A. Afifi and A.S. El-Shobokshy
*Animal Production Research Institute Faculty of
 Agricultural Sciences, and Faculty of Agriculture, Zagazig
 University, Egypt.*

LAMBS born over 3 seasons from 3 flocks of Rahmani, Ossimi and Barki sheep, lambing three times per two years, were early weaned at 6, 8 and 10 weeks of age. Number of lambs weaned in the three seasons were 620 lambs.

Lambs weaned at 10 weeks of age were of better growth performance than those weaned earlier, with non-significant weaning group variation in 16- and 24-week body weights. By 24 weeks of age, the present early weaned lambs performed similar to those weaned normally at 4 months of age. Season of lambing was the most important factor affecting growth of the early weaned lambs. The summer-born lambs were the heaviest at weaning and 16 weeks of age; where the spring-born lambs gained the best after weaning, and both were significantly heavier than autumn-born lambs. The autumn-born lambs showed a serious weaning check of 2-4 weeks, but this check did not exceed one week and a few days for the spring- and summer-born lambs, respectively. Ossimi lambs seem to withstand well the stress of early weaning, Barki lambs ranked second in this respect while the Rahmani lambs especially those weaned at six weeks of age performed the worst. Breed group and breed x weaning age interaction were statistically significant at 16 weeks of age.

Lamb losses from weaning till 16 weeks of age were 18.4, 11.2 and 3.4% for the 6-, 8- and 10- week weaning groups, respectively; the differences were significant ($P < 0.05$). Breed and season variation in mortality rates were highly significant. Rahmani and autumn-born lambs showed the greatest losses.

Animal Production Institute established a project in 1970 to investigate the productivity of the 3 main local breeds of sheep (Rahmani, Ossimi and Barki) under the system of three crops per two years. In this system early weaning of lambs is an obliged procedure with no other alternative. With the applicable aim of this work for sheep producers, artificial rearing of the lambs is avoided and early weaning on solid feeds is the procedure to be investigated.

Owen *et al.* (1969) and Robinson and Orskov (1975) stated that lambs did not consume reasonable quantities of dry feeds and commence rumination before the third week of their life. Large (1965) studied the development of the alimentary tract indicated that the growth of the rumen in the first five weeks is substantial. Therefore, six weeks of age was thought to be the earliest weaning age that can be applied under the prevailing local conditions with the least rearing problems. With a crop each 8 months and 5 months pregnancy, ten weeks is the longest suckling period that can be practiced. This leaves only two weeks for ewe to conceive for the next crop. Eight weeks weaning age was also tested as a moderate age in this respect. The present work reports on the lamb performance of the 3 main local breeds weaned at 6, 8, or 10 weeks of age. The effect of these weaning ages on the performance of the ewes in the next crops was reported in a separate study (Aboul-Naga, *et al.* 1978).

Material and Methods

The experimental work was carried out in Mehallet-Mousa Animal production Research Farm, 1972 to 1974. Three flocks from Rahmani, Ossimi and Barki sheep, bred three times per two years were involved in the study over the lambing seasons of October, 1972 (autumn season); June, 1973 (summer season) and February 1974 (spring season). All lambs born in the three seasons from the three flocks were included, totalling 620 head. These lambs involved 390 Rahmani, 169 Ossimi and 61 Barki lambs. Lambs born during the lambing season of October 1972 (autumn season) were weaned at 6, 8 or 10 weeks of age. In the lambing season of June, 1973 (Summer season), weaning at 6 weeks of age was thought to be risky, especially when the 6-week weaned lambs of the preceding lambing season (autumn) showed a high mortality rate. Therefore, lambs of that season were weaned at either 8 or 10 weeks of age. In the lambing season of February, 1974 (spring season) six-week weaning age was tested against 8-week weaning age. The lambs were assigned to different weaning age groups in each season, randomly within sex, date and type of birth. Each twin set was joined to one weaning age group. Two weeks before weaning, the lambs were started on solid feeds to stimulate rumen development. After weaning, they were fed *ad libitum* in group feeding on a ground concentrate mixture plus cutied Barseem in the autumn season or hay in the summer and spring seasons. The concentrate mixture contained 25% maize, 30% decorticated cottonseed meal, 20% extracted rice bran, 11% wheat bran, 7% corn gluten, 3% corn germ meal, 2% limestone, 1% bone meal, 0.5% salt and 0.5% mineral mixture. Lambs were allowed to drink 2 times daily. They were weighed at weaning and weekly thereafter up to 24 weeks of age. Lamb losses and autopsy observations were recorded.

Least squares procedure were used for statistical analysis and the model adopted included the effects of weaning age, breed, season of lambing and breed x season of lambing interaction.

Results and Discussion

Body weight and growth performance

The overall weaning weight of the local lambs weaned at 6, 8 and 10 weeks of age was 9.78, 10.83 and 12.27 kg, respectively (Table 1). Differences between these figures were significant ($P < 0.01$). Post-weaning live body gain differed also significantly between the 3 weaning groups. Lambs weaned later at 10 weeks of age were of better growth performance than those weaned at either 6 or 8 weeks of age. However, with the differences in the length of growth periods, from weaning till 16 or 24 weeks of age, variation in body weights at these ages due to weaning age were statistically nonsignificant (Table 1). The lambs continued to weigh more with lengthening the suckling period, yet the differences attained significance only between 6-week and 10-week weaning groups. Similar trends had been reported by Salem (1966) on Barki lambs weaned at 45, 60 and 75 days, Sharafeldin and Ramadan (1969) on 10- and 12-week weaned Barki lambs and recently by Swidan *et al.* (1978) on Rahmani lambs weaned at either 6 or 7 weeks of age. The advantage of weaning at older ages reported by the later authors was greater than the corresponding figures in the present study 24.6 and 24.7 kg vs. 22.1 and 22.8 kg, respectively, for 24 week body weight. This may be due to the creep-feeding of their lambs from the second week of age, besides any possible managerial and environmental differences. Creep feeding promotes more rapid development of the rumen and is expected to reduce the early weaning stress (Pee *et al.*, 1969).

To determine the overall effect of the early weaning on the local lambs, the present estimates were compared with those reported by Aboul-Naga (1977) on the same flock for the normally weaned lambs at 4 months of age. At 16 weeks of age body weight of the present early weaned lambs was less than that of the normally weaned lambs; viz: 17.63, 16.39 and 16.29 kg vs 20.58, 20.27 and 20.59 kg for Ossimi, Rahmani and Barki lambs, respectively. However, at 24 weeks of age, the early weaned local lambs weighed almost the same as the normally weaned lambs (22.98, 23.38, and 22.31 kg vs 23.52, 23.66 and 23.77 kg for the three breeds, respectively). Stress of early weaning resulted in a lack increase in body weight, growth check, for some time. Thereafter, the lambs showed more desire to consume solid feeds and better feed utilization, through earlier rumen development and consequently better growth performance (Pee *et al.*, 1969; Owen, 1969; and Orskov *et al.*, 1973). The present early weaned lambs showed varying periods of growth check after weaning from less than one week to four weeks or more (Fig. 1). The degree of variation in the effect of weaning on growth depended on the season as well as age of weaning. Growth check was greatly recognizable in the autumn season, it ranged from less than two weeks for the 10-week weaned lambs of the 3 breeds to about four weeks or more for the 6 week weaned groups. In the spring seasons, it did not exceed one week for either 6- or 8- week weaning groups. Where, it was hardly detectable in the summer season for either 8-week or 10-week weaned lambs.

TABLE 1. Least squares constants, tests of significance and percent of variation (%V) of factors affecting bodyweights and growth performance of early weaned local lambs.

Classifications	Weaning weight			Daily gain (wean-16 weeks)			16-week weight			Daily gain (wean-24 Wk.)			24-wk weight		
	N	Const. \pm S.E.	%V	N	Const. \pm S.E.	%V	N	Const. \pm S.E.	%V	N	Const. \pm S.E.	%V	N	Const. \pm S.E.	%V
Overall mean:	605	10.96 \pm 0.15		501	102.5 \pm 3.0	1.25				455				22.89 \pm 0.27	1.69
Weaning age:		**	8.64		*									N.S.	
6 weeks	167	-1.18 \pm 0.25a		120	-11.0 \pm 5.0a			16.77 \pm 0.22			104.7 \pm 2.0			-0.84 \pm 0.46a	
8 weeks	270	-0.13 \pm 0.20b		232	0.1 \pm 3.9b			-0.51 \pm 0.36a			-10.7 \pm 3.4a	4.10		-0.18 \pm 0.37ab	
10 weeks	168	1.31 \pm 0.23c		149	10.9 \pm 4.6c	3.55		0.07 \pm 0.28ab			-0.1 \pm 2.7b			1.02 \pm 0.43b	
Breed:					**			0.44 \pm 0.34b			10.8 \pm 3.2c	0.47		N.S.	0.00
Rahmani (R)	381	N.S.		301	2.0 \pm 3.4a			-0.38 \pm 0.25a			1.4 \pm 2.4a			0.09 \pm 0.32a	
Ossimi (O)	166	-0.17 \pm 0.17a		149	16.7 \pm 3.9b			0.86 \pm 0.28b			5.0 \pm 2.6a			0.49 \pm 0.36a	
Barki (B)	58	-0.06 \pm 0.20a		51	-14.7 \pm 5.1a	38.67		-0.48 \pm 0.37a			6.4 \pm 3.5a			0.58 \pm 0.47a	
Season of lambing					*			**			**			-2.97 \pm 0.31a	27.68
October 1972														1.27 \pm 0.35b	
(Autumn)															
June 1973	204	0.23 \pm 0.26a		147	-46.2 \pm 3.3a			-3.36 \pm 0.24a			-18.4 \pm 2.3a			1.70 \pm 0.36b	0.00
(Summer)		**			18.3 \pm 3.6b			3.45 \pm 0.26b			-12.2 \pm 2.6a			N.S.	
February 1974	197	-0.94 \pm 0.16a		181	27.9 \pm 3.7b			-0.09 \pm 0.27c						0.03 \pm 0.48a	
(Spring)					**			*							
Breed \times Weaning															
age:	112	N.S.													
6 week (R)	163	-0.17 \pm 0.26a		173	-20.9 \pm 5.2a			-1.16 \pm 0.38a			30.6 \pm 2.6b			-0.15 \pm 0.42a	
8 week (R)	106	0.23 \pm 0.22a		72	4.1 \pm 4.4bc			0.54 \pm 0.32bc			N.S.			0.12 \pm 0.44a	
10 week (R)	106	-0.06 \pm 0.24a		136	16.8 \pm 4.8bd			0.62 \pm 0.35bc			-1.1 \pm 3.6a	36.38		0.20 \pm 0.54a	
6 week (O)	42	-0.50 \pm 0.30a		36	4.8 \pm 5.9bc			-0.05 \pm 0.43ac							
8 week (O)	81	-0.04 \pm 0.26a		74	5.4 \pm 5.0bc			0.16 \pm 0.37ac			-3.3 \pm 3.1a			-0.73 \pm 0.48a	
10 week (O)	43	0.54 \pm 0.28a		39	-10.2 \pm 5.5ac	4.47		-0.11 \pm 0.40ac			4.4 \pm 3.3			0.53 \pm 0.50a	
6 week (B)	13	0.67 \pm 0.40a		12	16.1 \pm 7.8bc			1.21 \pm 0.57ac			5.7 \pm 4.0a			-0.23 \pm 0.71a	
8 week (B)	26	-0.19 \pm 0.34a		22	-9.5 \pm 6.7ac			-0.70 \pm 0.49ac			0.7 \pm 3.7a			0.88 \pm 0.65a	
10 week (B)	19	-0.48 \pm 0.37a		17	6.6 \pm 7.2acd			-0.51 \pm 0.52ac			9.7 \pm 4.8a			-0.65 \pm 0.66a	

N.S. = Not significant

* Significant

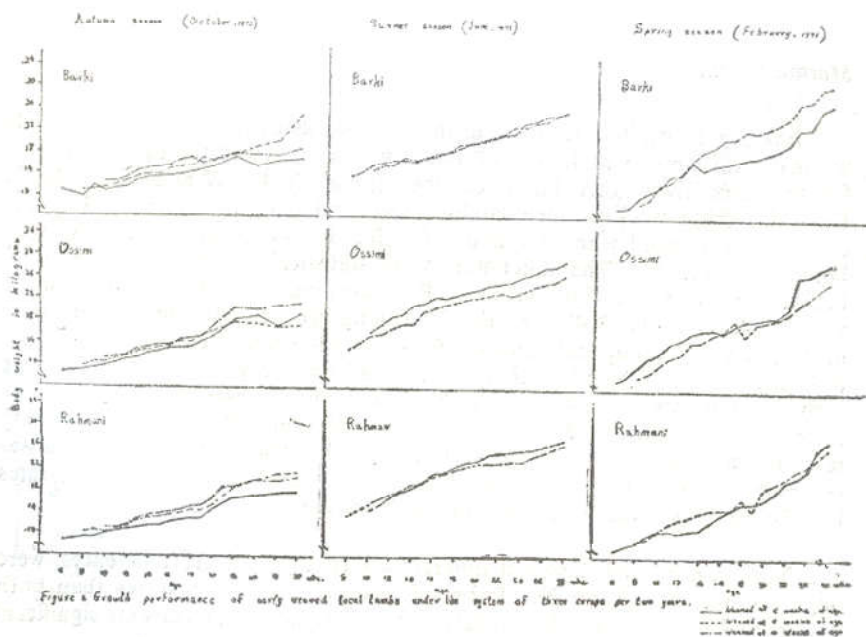
($P < 0.05$)

** Significant

($P < 0.01$)

» Estimates followed by the same symbol do not differ significantly from each other at 5% level by Duncan Multiple Range Test.

Considering breed differences, results showed that the 3 breeds had quite similar weaning weights (Table I). After weaning, Ossimi lambs showed better growth performance than either Rahmani or Barki lambs. Differences due to breed effects were significant ($P < 0.01$) at 16 weeks of age and diminished thereafter. The 3 local breeds showed further variable trends for the three weaning groups, causing significant ($P < 0.05$) breed X weaning age interaction at 16 weeks of age. Rahmani lambs weaned at 6 weeks of age were significantly ($P < .05$) less in their daily gain from weaning till 16 weeks of age than those weaned at either eight or 10 weeks of age. They did not show what can be called satisfactory growth rate till the 19th - 20th week of age (Fig 1). On the other hand, the 6-week Barki lambs gained significantly ($P < .05$) better than those weaned later at either 8 or 10 weeks of age. Early weaned Ossimi lambs showed less detectable variation with weaning ages than either Rahmani or Barki lambs. The higher twinning rate in Rahmani (25%) and the sharp decline in the milk curve of the Barki ewes after 6 weeks of lactation (M. Farag, unpublished data) may provide an explanation for the variable breed trends. Furthermore, the limited variation between the Ossimi weaning groups is inconsistent with the findings of Aboul-Naga (1977) who stated that Ossimi sheep seem to withstand variable environmental conditions and of good adaptability, while Rahmani is a more sensitive sheep to any variation in the managerial and environmental conditions.



Season of lambing was found to be the most important factor that affected body weight of lambs at weaning, 16 and 24 weeks of age and was responsible for 36.67, 47.42 and 27.68% of the total variation in these traits, respectively (Table 1). Summer-born lambs (June lambings) was the heaviest lambs at at weaning and at 16 weeks of age. But, the spring-born lambs (February lambings) were superior, in the post-weaning gain so that they became slightly heavier than the summer-born lambs at 24 weeks of age and both were significantly heavier than autumn born lambs (October lambings). Swidan *et al.* (1978) found also better performance of the early weaned June-born lambs at 12 and 16 weeks of age over that of February-born lambs, where seasonal differences decreased at 24 weeks of age on early weaned Rahmani lambs. These results are different from those reported for the normally weaned local lambs which showed lower performance of summer-born lambs and better performance of the winter-born ones. (Asker *et al.*, 1952, Karam, 1959 and others). Most of those authors attributed that to the availability of green fodder (Berseem) for the winter-born lambs and the hot ambient temperature in the summer months. The serious weaning check shown by the present autumn-born lambs is a basic element in their subsequent poor performance. The increasing consumption of solid feeds by the early weaned lambs, plus the decreasing maintenance requirements in the hot weather stated by Ames and Brinks (1977) may provide adequate allowances for better growth performance of the early weaned summer-born lambs.

Mortality rate

Average mortality rates from birth till 16 weeks of age of the present early weaned local lambs was 13.2% (Table 2) which is around the figures reported for the normally weaned lambs of the same flocks (Aboul-Naga, 1977). However, the 6-week weaned lambs showed relatively higher mortality rate of 19.2% compared with 13.8 and 6.6% for the 8-week and 10-week weaned lambs, respectively. The differences were statistically significant ($P < 0.05$) between the first and third groups. Post weaning losses till 16 weeks of age were 18.4, 11.2 and 3.4% for the 3 weaning groups, respectively, with significant ($P < 0.05$) group differences. These figures showed clearly that the relatively high losses in the 6 week weaned lambs was a direct influence for the early weaning stress and confirmed the growth check observed for these lambs after weaning. Swidan *et al.* (1978) reported, similarly, higher mortality rate for the 6-week than the 8-week weaned Rahmani lambs. Lamb losses continued to show higher rates for the 6-week weaned groups and lower rates for the 10-week weaning groups up to 24 weeks of age.

Variation in lamb losses at different stages, due to breed differences, were highly significant (Table 2). Rahmani recorded more lamb losses than both Ossimi and Barki breeds. Differences between the latter 2 breeds were significant.

TABLE 2. Least squares estimates, tests of significance and percent of variation (%V) of factors affecting mortality rate of early weaned local lambs at different stages.

Classifications	Mortality: birth till 16 weeks			Mortality: wean till 16 weeks			Mortality: birth till 24 weeks			Mortality: wean till 24 weeks		
	N	Const \pm S.E.	%V	N	Const \pm S.E.	%V	N	Const \pm S.E.	%V	N	Const \pm S.E.	%V
Overall mean:	620	0.132 \pm 0.019		606	0.110 \pm 0.018		620	0.172 \pm 0.020		606	0.152 \pm 0.020	
Weaning age:		N.S.	1.27		*	3.35			2.24		*	3.01
6 weeks	169	0.080 \pm 0.031a ⁺		168	0.074 \pm 0.031a		169	0.048 \pm 0.034a		168	0.059 \pm 0.034a	
8 weeks	278	0.006 \pm 0.025ab		270	0.002 \pm 0.024b		278	0.042 \pm 0.027a		270	0.040 \pm 0.027a	
10 weeks	173	-0.056 \pm 0.029b		168	-0.076 \pm 0.029c		173	-0.090 \pm 0.032b		168	-0.099 \pm 0.032b	
Breed:		**	2.59		**	2.85		**	4.17		**	4.29
Rahmani (R)	390	0.050 \pm 0.022a		381	0.056 \pm 0.021a		390	0.076 \pm 0.023a		381	0.082 \pm 0.023a	
Ossim (O)	169	-0.049 \pm 0.025bc		167	-0.033 \pm 0.024b		169	-0.077 \pm 0.027bc		167	-0.063 \pm 0.027b	
Barki (B)	61	-0.011 \pm 0.033ac		58	-0.033 \pm 0.032b		61	0.001 \pm 0.036ac		58	-0.019 \pm 0.035b	
Season of lambing:		**	14.23		**	9.51		**	14.89		**	10.55
October 1972	219	0.153 \pm 0.019a		205	0.117 \pm 0.019a		219	0.177 \pm 0.021a		205	0.145 \pm 0.021a	
(Autumn)												
June 1973	197	-0.055 \pm 0.023b		197	-0.028 \pm 0.023b		197	-0.081 \pm 0.025b		197	-0.057 \pm 0.025b	
(Summer)												
February 1974	204	-0.098 \pm 0.023b		204	-0.089 \pm 0.022c		204	-0.096 \pm 0.025b		204	-0.088 \pm 0.024b	
(Spring)												
Breed \times weaning age		N.S.	1.17		N.S.	2.00		*	3.47		*	4.64
6 week (R)	112	0.081 \pm 0.032a		112	0.090 \pm 0.031a		112	0.125 \pm 0.035a		112	0.134 \pm 0.035a	
8 week (R)	169	-0.045 \pm 0.028bc		163	-0.055 \pm 0.027bc		169	-0.090 \pm 0.030bc		163	-0.100 \pm 0.030bc	
10 week (R)	109	-0.036 \pm 0.031bc		106	-0.035 \pm 0.030ac		109	-0.035 \pm 0.033bcd		106	-0.034 \pm 0.033bcd	
6 week (O)	43	-0.015 \pm 0.037ac		43	-0.009 \pm 0.036ac		43	-0.006 \pm 0.040ac		43	-0.001 \pm 0.040acd	
8 week (O)	82	0.026 \pm 0.032ac		81	0.023 \pm 0.031ac		82	0.003 \pm 0.035bcd		81	-0.002 \pm 0.035bcd	
10 week (O)	44	-0.011 \pm 0.036ac		43	-0.014 \pm 0.035ac		44	0.003 \pm 0.039ac		43	0.001 \pm 0.038acd	
6 week (B)	14	-0.066 \pm 0.050ac		13	0.081 \pm 0.049ac		14	-0.119 \pm 0.040bcd		13	-0.135 \pm 0.054bce	
8 week (B)	27	0.019 \pm 0.043ac		26	0.032 \pm 0.042ac		27	0.087 \pm 0.046ac		26	0.102 \pm 0.046ade	
10 week (B)	20	0.047 \pm 0.046ac		19	0.049 \pm 0.045ac		20	0.032 \pm 0.050ad		19	0.033 \pm 0.050ad	

+ * Estimates followed by the same symbol do not differ significantly at 5% level

from weaning till either 16 or 24 weeks of age while from Ossimi only when mortality rate was estimated from birth till either 16 or 24 weeks of age. Ossimi lambs seemed to withstand well the early weaning procedure in either livability or growth performance.

Breed X weaning age interaction proved to be statistically significant for lamb losses from birth and weaning till 24 weeks of age. The greatest losses in these periods were recorded for Rahmani lambs weaned at 6 weeks of age (28.6%), while Barki lambs weaned at the same age showed losses of only 1.7%. Light body weights of the Rahmani lambs weaned at 6 weeks of age and higher twinning rate in this breed might be the basic cause for such high mortality rate. From another point of view, Barki lambs gave more evidence for their hardiness as a desert breed.

Season of lambing had highly significant effects on lamb losses of the early weaned lambs (Table 2). Autumnborn lambs showed significantly the highest mortality rate from birth till 16 and 24 weeks of age (28.5 and 34.9% vs. 7.7, 3.4% and 9.1, 7.6 for the summer and spring born lambs, respectively). The effect of season of lambing on mortality rate started after birth but was enlarged with the early weaning of the lambs. The most frequent causes of death were: enteritis and pneumonia (55.4 and 29.8% respectively).

It can be concluded, therefore, that early weaning of the local lambs had no detrimental effect as far as the performance of lambs at marketing age (6 months) or breeding age (yearling) is considered. However, it is better to avoid 6-week weaning age especially in the autumn season and for Rahmani lambs. If creep-feeding of the lambs is available, early weaning of the lambs is expected to give better results. Taking in consideration the results of Atcul-Nage *et al.* (1978) which showed that the nursing local ewes can conceive and reproduce successfully 6-8 weeks after lambing as far as suckling had been terminated, it can be recommended to wean the lambs produced in the first weeks of the lambing season at 10 weeks of age, while those born late in the season can be weaned at 8 weeks of age.

References

- Aboul-Naga, A.M. (1977) Location effect on the lamb performance of three indigenous breeds of sheep under subtropical conditions of Egypt. *Indian J. Anim. Sci.* **47**, 29.
- Aboul-Naga, A.M., El-Shobokshy, A.S. and Affi, E.A. (1980) Effect of length of suckling period on the performance of the local ewes bred three times per two years. *Egypt. J. Anim. Prod.* **20**, (in press).
- Ames, D.R. and Brink, D. R. (1977) Effect of temperature on lambs performance and protein efficiency ratio. *J. Anim. Sci.*, **44**, 136.
- Asker, A.A., Ragab, M.T. and Kadi, M.R. (1952) The influence of some environmental factors affecting weight of Ossimi and Rahmani sheep. *Fac. Agric. Foud Ist Univ. Bull.* **19**,

Egypt. J. Anim. Prod. **20**, No. 2 (1980).

- Karam, H.A. (1959) Birth, weaning and yearling weights of Rahmani sheep. I. Effect of some environmental factors II. Heritability estimates and correlation. *Emp. J. Exp. Agric.*, **27**, 313.
- Large, R.V. (1965) The artificial rearing of lambs *J. Agric. Sci.* **65**, 101.
- Rksov, E.R., Fraser, C. and Gill, J.C. (1973) A note on the effect of time of weaning and weight at slaughter on feed utilization of intensively fed lambs. *Anim. Prod.* **16**, 311.
- Owen, J.B., Davies, D.A.R. and Ridgman, W.J. (1969) The control of voluntary food intake in ruminants. *Anim. Prod.* **11**, 511.
- Poe, S.E., Glimp, H.A., Deweese, W.P. and Mitchell, G.E. (1969) Effect of preweaning diet on the growth and development of early weaned lambs. *J. Anim. Sci.* **28**, 401.
- Robinson, J.J. and Rskov, E.R. (1975) An integrated approach to improving the biological efficiency of sheep meat production. *World Rev. Anim. Prod.* **11**, 63.
- Salem, H.A. (1966) Studies on different feeding systems of suckling lambs and its effect on growth and meat *M. Sc. Thesis*, Alex. Univ., Fac. Agric.
- Sharafeldin, M.A. and Ramadan, I.A. (1959) A note on the effect of weaning age on lamb production. *Anim. Prod.* **11**, 569.
- Swidan, F., Aboul-Naga, A.M., El-Shobokshy, A.S. and Abbas, A.M. (1978) Performance of Rahmani male lambs weaned at six or 8 weeks of age. *Egypt. J. Anim. Prod.* **18**, (in press).

القطام المبكر للحملان المحلية من الرحمانى والأوسيمى والبرقى

عادل أبو النجا ، عزت عطا عفيفى واحمد الشبكش

شملت الدراسة ٦٢٠ حملا ناتجة من ٣ قطعان من أغنام الرحمانى والأوسيمى والبرقى (تربية تحت نظام ٣ ولادات كل سنتين) على مدى ثلاث مواسم متعاقبة وقد تم نظام الحملان على أعمار ٦ أو ٨ أو ١٠ أسابيع من عمرها .

أظهرت النتائج أن الحملان المقطومة على عمر ١٠ أسابيع كانت أفضل في نموها عن الحملان المقطومة على أعمار ٦ أو ٨ أسابيع . إلا أن الفروق بين هذه المجموعات كانت غير معنوية عند أعمار ١٦ ، ٢٤ أسبوع . قاربت حملان هذه الدراسة المقطومة مبكرا في وزنها عند عمر ٢٤ أسبوع تلك التى قطعت اعتياديا على عمر ٤ شهور .

كان موسم الولادة هو أكثر العوامل تأثيرا على وزن وكفاءة نمو الحملان حيث كانت الحملان المولودة في الصيف أثقل وزنا عند القطام وعند عمر ١٦ أسبوع بينما أظهرت الحملان المولودة في الربيع أعلى كفاءة نمو بعد القطام وكلا المجموعتين كانت أثقل وزنا معنويا من تلك المولودة في الخريف .

ظهرت على الحملان المولودة في الخريف صدمة قطام استمرت لمدة ٢ - ٤ أسابيع بينما لم تتعدى أسبوع واحد وبضعة أيام للحملان المولودة في الربيع والصيف على التوالي .

بالنسبة لجميع السلالات الداخلة في التجربة فإن حملان الأوسيمى لم تتأثر كثيراً بقطامها مبكراً وتلتها حملان البرقى بينما حملان الرحمانى وخاصة تلك المقطومة على عمر ٦ أسابيع تأثرت كفاءة نموها كثيراً بالقطام المبكر . وكانت الاختلافات بين السلالات والتداخل بينها وبين أعمار القطام معنوية عند عمر ١٦ أسبوع .

بلغت نسبة النفوق حتى عمر ١٦ أسبوع ١٨.٤ ، ١١.٢ ، ٢.٤٪ للحملان المقطومة عند ٦ ، ٨ ، ١٠ أسابيع على التوالي وكانت الاختلافات بينها معنوية (على مستوى ٥٪) كما أن اختلافات بين السلالات والمواسم في هذا المجال كانت عالية المعنوية ، أعلى نسب للنفوق ظهرت في حملان الرحمانى والحملان المولودة في الخريف .