

Performance of Rahmani Male-Lambs Weaned at Six or Eight Weeks of Age

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UTILIZING a system of 3 lambings per two years, early weaning of 144 Rahmani male-lambs was studied. Main effects studied in this work were: age at weaning (6 or 8 weeks), type of birth (singles or twins) and lambing season.

Lambs suckled their mothers freely from birth to weaning age. A ground starter was offered *ad-lib.* from the third week up to 20 kg live weight, then restricted amounts of a classical ration consisted of co-op. feed, corn and berseem hay was offered from 20 to 30 kg live weight. Lambs were weighed at birth and every seventh day throughout.

Results showed that weaning weights of single or twin lambs weaned at 8 weeks were heavier than those weaned at 6 weeks of age. Differences were not significant ($P < 0.05$) except between singles of the second season. Subsequent weights at 12, 16 and 24 weeks of age did not differ significantly among groups.

Post-weaning average daily gain (ADG) was significantly lower in single lambs weaned at 6 weeks than in singles weaned later. Differences gradually diminished to none as lambs advanced in age.

Post weaning ADG of twin lambs was not effected by the age at weaning. Besides there was no significant difference between the two seasons with regard to age at weaning, type of birth and live weight at 24 weeks of age.

Overall efficiency of feed utilization from weaning to 24 weeks of age seems to be slightly affected - if any, by weaning age.

Mortality rate tended to be higher in the groups of twin lambs weaned at 6 weeks of age than in other groups.

The present early weaned lambs were compared with that weaned at 4 months of age, they were lighter in weight at 24 weeks, however they gained better thereafter to overcome them at later stages.

Adoption of three lambings/two years is widely suggested in Egypt as a system for sheep production intensification. Under such a system, the interval between two successive lambings is a matter of eight months out of which five months are occupied by pregnancy. Early weaning of lambs born may be therefore regarded as a practice of no other practical alternative.

From a theoretical point of view, weaning is possible as soon as the lamb is physiological capable to live on nutrients other than its mother's milk (Brown, 1964). In local ewes peak lactation is attained at the second week (El-Gindi *et al.*, 1972) or within the first four weeks after parturition (Sharafeldin and Mostageer, 1961). Within this period, the introduction of solid diets high in readily available carbohydrates and low in fibre, have been reported by several workers to bring about favourable effects on the early development of rumen microbial population, rumen tissues and its papillary growth (Flatt *et al.*, 1958 and Bleichner and Ellis, 1968).

Studies on early weaning in Egypt is scarce. It was the object of this work, therefore, to study the performance of lambs weaned at 6 or 8 weeks of age, taking into consideration type of birth and lambing season, parameters for the study were: average daily gain (ADG) from birth to weaning, post weaning ADG, feed efficiency and mortality rate.

Material and Methods

Animals and treatments

The experiment was carried out on male lambs of two consecutive lambing seasons : June - July 1975 and February - March 1976 at El-Serw Exp. St., Animal production Research Institute, Ministry of Agriculture, Egypt.

In each season, lambs were divided into singles "S" and twins "T" and were assigned to be weaned at 6 or 8 wks. of age. Therefore the experimental groups in each lambing season were : S/6, S/8; and T/6, T/8.

Data were collected on a total of 73 and 71 weaned lambs during the first and second seasons, respectively.

Rations

Both groups of single or twin lambs were raised following one feeding regime. Feed allowances set out by the N.R.C. (1964) were found to be inadequate for 6 to 8 wks - old - lambs as their physiological age was not taken into consideration (Ranhotra and Jordan, 1966). Therefore, it was intended to use the allowances set out by Tommi (1963) for fat tailed, coarse wool sheep. Table I shows the experimental rations used according to the change in live wt. throughout the experimental period. Rations were formulated using the chemical composition and nutritive values given in Animal and Poultry Nutrition, Bull. No 3, 1968.

At the beginning of the third week of age, suckling lambs were creep fed liberal amounts of an available starter composed of a wide variety of ingredients and a small portion of good quality berseem hay (Ration 1). Thus all lambs were accustomed to eating solid feed prior to weaning in an attempt to minimize the usual reduction in growth rate at weaning. Post weaning feeding continued on the same ration to all lambs. In each group, as the live weight of lamb changed to 20 ± 0.5 kg, it was transferred from ration 1 to ration 2, then to ration 3, as its live weight reached 25 ± 0.5 kg, while on ration 2 and 3, lambs were fed restricted amounts of concentrates and berseem hay.

TABLE 1. Ingredients used in rations formulation and daily allowances (g/head).

Ingredients given at	Rations offered		
	I (- 20 kg)	II (20-25 kg)	III (25-30 kg)
Starter (a)	ad.lib	-	-
Coop feed (b)	-	600	650
corn	-	150	130
Berseem hay	ad.lib	300	350
S.V.	640*	510	534
D.P. **	150*	111	120
Ration concentration	2.7	2.0	2.0

(a) percentage composition : decort., cotton-seed meal 30, ground maize 25, rice bran 20, wheat bran 11, corn gluten 7, corn germ meal 3, lime stone 2, bone meal 1, common salt 0.5 and mineral mix. 0.5.

(b) percentage composition : Cottonseed cakes 65, rice bran 20, wheat bran 9, molasses 3, mineral mix 1, common salt 1.

* Starch value and digestible protein (g)/kg starter.

** Approximate figures calculated as Mcal of ME/kg D.M.

Statistical analysis were performed according to Snedecor (1956) and the weighted means method for analysis of variance was followed.

Results and Discussion

Live-weight at different ages

Data presented in Table 2, show average liveweights of lambs in different experimental groups at different ages during the two seasons. Within each season and within each type of birth no significant differences existed between liveweight at the age of six wks. Liveweights at weaning tended to be higher for single or twin lambs weaned at 8 wks. of age. The differences these lambs had over those weaned at 6 wks., though being consistent, they were not significant ($P < 0.05$) except in the case of singles of the second season.

TABLE 2. Mean live body weights (\pm SD) in different groups of lambs at different-ages during two lambing seasons.

		Weights at:					
		birth	6 wks.	Weaning	12wks.	16wks.	24wks.
Lambing season:							
1 st	6 wks	4.55 \pm .15	12.50 \pm .31	12.50 \pm .31	15.39 \pm .59	18.55 \pm .67	26.10 \pm .68
Singles	8 wks	4.52 \pm .14	11.72 \pm .42	13.36 \pm .33	15.87 \pm .81	18.96 \pm .60	27.13 \pm .64
	6 wks	4.21 \pm .16	10.68 \pm .56	10.68 \pm .56	15.05 \pm .59	18.18 \pm .80	26.33 \pm .85
Twins	8 wks	4.00 \pm .10	10.18 \pm .50	11.81 \pm .44	14.0 \pm .78	17.21 \pm 1.04	24.95 \pm .39
2 nd	6 wks	4.25 \pm .48	12.25 \pm .48	12.25 \pm .48	14.59 \pm .94	17.25 \pm .45	27.04 \pm .47
Singles	8 wks	4.40 \pm .15	12.45 \pm .46	14.03 \pm .56	15.85 \pm .63	18.35 \pm .67	26.56 \pm 1.08
	6 wks	4.00 \pm .14	10.11 \pm .32	10.11 \pm .32	12.23 \pm .77	15.11 \pm .73	25.67 \pm .94
Twins	8 wks	4.03 \pm .16	9.64 \pm .44	10.31 \pm .55	12.6 \pm .63	14.44 \pm .67	23.27 \pm .66

During both seasons differences between liveweights of single lambs were not significant at any of the post-weaning ages 12, 16 or 24 wks. However, slight difference at the age of 24 wks can be observed in favour of single lambs weaned at 8 wks during the first season and in favour of those weaned at 6 wks, during the second season. These findings are in fair agreement with those reported by Hinds *et al.* (1960), Lewis *et al.* (1960) and Yalcin *et al.* (1968) with different breeds.

Differences in weaning weights due to the age at weaning were much more pronounced between single lambs than between twin lambs. This may be due to that the amount of mother's milk shared by the two sucklings is too limited to affect significantly lambs liveweights if weaning is retarded from 6 to 8 wks. of age. This is in close agreement with that recently indicated by Walsingham *et al.* (1975) who reported that twin lambs are less affected than singles by the age at weaning. Furthermore, it is shown in the present work (Table 2 and Fig. 1 and 2.) that twin lambs weaned earlier attained slightly heavier live weights at the ages of 12, 16 and 24 wks of age during both seasons. Differences, however were not statistically significant.

Post-weaning average daily gain (ADG)

The effect of age at weaning on growth rate at different age intervals; 6-12, 6-16 and 6-24 weeks, are shown in Table 3. From data presented, it can be observed that post weaning ADG tended to be higher in all groups during the first season than during the second season. Although differences, were not significant ($P < 0.05$)

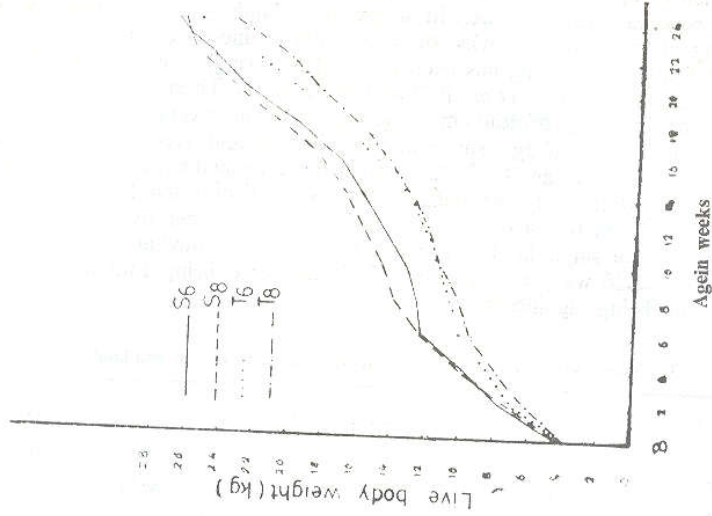


Fig. 2. Effect of age at weaning on growth rate of single (s) and twin (T) male lambs- The 2nd season.

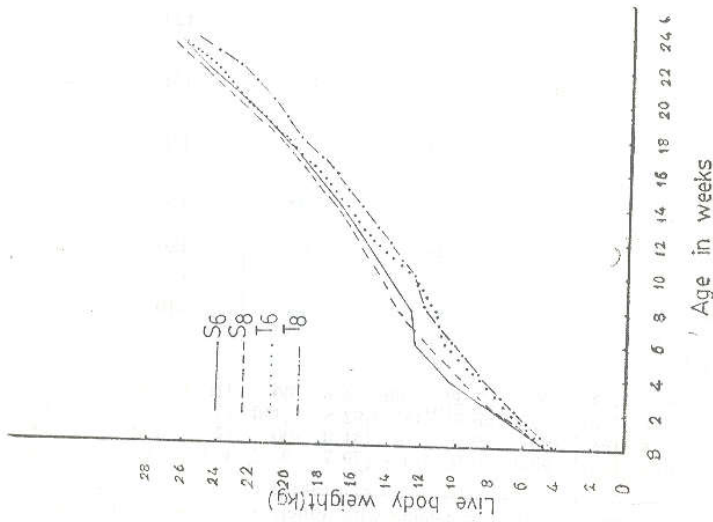


Fig. 1 Effect of age at weaning on growth rate of single (s) and twin (T) male - The 2nd season.

When compared to other age intervals ADG during the interval 6-12 wks. of age was markedly the lowest in all groups of lambs. This is definitely due to weaning at either 6 or 8 wks. of age. Such reduced or checked rate of growth following weaning has been reported by several workers (Brothers and Whiteman, 1961, Orskov *et al.*, 1971 and Molenat and Theriez, 1972). The reduction is much more profound among groups of singles weaned at the earlier age. Weaned at 8 wks. of age, single lambs gained weight average of two seasons at a rate of as much as 51.5% faster than those weaned earlier. This difference which was statistically significant ($P < 0.05$) diminished to only 24% and 9.2% at 6-16 or 6-24 wks. Nevertheless, at an average liveweight of 30 kg, average ages of single lambs weaned at 6 and those weaned at 8 wks of age were 25.91 and 25.20 wks, respectively. This difference, being a matter of five days is far from being significant.

TABLE 3 Mean ADG of lambs weaned at different ages during two lamb in seasons.

		Age intervals, in wks.				Av. age at 30 kg. liv wt (wks)e
		Birth-6	6-12	6-16	6-24	
Lambing season: 1st	6 wks	189	71 (a)	86	116	26.21
	Singles	8 wks	171	100 (b)	104	129
	6 wks	154	89	99	129	26.00
Twins	8 wks	146	94	102	131	26.25
2nd	6 wks	190	42 (a)	61	118	25.56
Singles	8 wks	192	69 (b)	77	126	24.65
	6 wks	143	49	63	120	27.11
Twins	8 wks	133	53	63	110	28.63
Overall average of two seasons and relative						
values	6 wks	189.5 100	57.3 ^(a) 100	74.6 100	116.9 100	25.91
singles	8 wks	180.5 95.1	86.8 ^(b) 151.5	92.5 124.0	127.7 109.2	25.20
	6 wks	148.7 100	69.0 100	81.0 100	124.9 100	26.74
Twins	8 wks	138.5 93.1	70.0 101.4	79.7 98.4	119.0 95.3	27.61

(a) and (b) means on the same column with different are superscripts significantly different ($P < 0.05$).

It may be indicated, therefore, that the greater check in growth rate that single lambs received when weaned at 6 wks. of age, was compensated for thereafter by a relatively higher rate of growth than that attained by single lambs weaned at 8 wks. Similar findings have been pointed out by Bermejo (1960), Yalcin *et al.* (1968) and Makarechian *et al.* (1973).

As far as twin lambs are concerned, differences between groups were not always in the same direction or magnitude. No significant differences were detected during the interval of 6 - 12 wks of age between ADG of lambs weaned at different ages. On the average of the two seasons, the difference was as low as 1.4% in favour of twins weaned at 8 wks. Such a low difference, however, was later inversed in favour of twin lambs weaned earlier.

Efficiency of feed utilization

Data regarding feed efficiency (kg S.V./1 kg gain) in different groups of lambs are summarized in Table 4. During the period from weaning up to 16 wks of age, single lambs weaned at 8 wks showed better efficiency than those weaned at 6 wks. of age. This is mainly due to the greater check in rate of growth received by lambs weaned earlier. This advantage, however, was almost inversed during the following period from 16 to 24 wks. of age. Thus through the entire period from weaning up to 24 wks. of age, efficiency ratios were 3.21 and 3.11 kg. S.V./kg gain for single lambs weaned at 6 and 8 weeks of age, respectively. It seems, therefore, that the overall efficiency is slightly or not affected by the age of weaning.

Twin lambs weaned at 6 wks, were consistently more efficient than those weaned at 8 wks. and more than single lambs weaned at either ages. As this advantage persisted through the entire period from weaning to 24 wks of age, it may be a reflection of enhanced development of rumen function.

TABLE 4. Efficiency of feed utilization of lambs weaned at different ages (kg.S.V./1 kg gain).

	1st Season		2nd Season		Average	
	6	8	6	8	6	8
Weaning -16 wks.	4.24	3.76	4.41	4.08	4.31	3.90
Singles 16 -24 wks.	2.84	2.91	2.77	3.30	2.81	3.08
Weaning -24 wks.	3.26	3.14	3.16	3.07	3.21	3.11
Weaning -16 wks.	3.49	3.98	4.41	4.27	3.90	4.15
Twins 16 -24 wks.	2.40	2.81	2.40	2.61	2.40	2.89
Weaning -24 wks.	2.96	3.09	3.05	3.13	3.00	3.11

Mortality rate

Table 5 exhibits the number of lambs died and mortality percentages in different groups. It is worthy to note that all death losses took place during the period from weaning to 16 wks. of age. It seems that the number of lambs included in the different groups may not lead to reliable estimation for the effect of weaning age on rate of mortality. Yet, it can be observed that the number of lambs died is remarkably high in the group of twins weaned at 6 weeks of age.

One of the interest objectives of the present study is to compare its results on the performance of the early weaned lambs, either at 6 or 8 weeks with that weaned commonly in the country at four months of age. Aboul-Naga (1977) had analysed the data accumulated on the present Rahmani flocks over 15 years, starting from 1957. He reported an average of 29.88 kg for 120 days weaning weight, which is higher than the present figures. However, according to his estimates for daily gain after weaning, body weight at 24 weeks of age can be estimated to be 26.79 kg which is around the estimates of the present early weaned lambs. Furthermore, his results showed that lambs weaned at four months of age take about 28.43 weeks to attain 30 kg body weight *vr.* an average of 26 weeks in the present study. This means that the early weaned lambs gained better in weight in later stages than those weaned at 4 months of age, most probably due to early development of their rumen function. From another point, the comparison for mortality rate was not in favour of the 6 weeks weaned lambs, especially the twin born ones where that weaned at 8 weeks showed reasonable loss rates comparable well with that weaned at 4 months age (10.5 *vr.* 9.0, respectively).

TABLE 5. Mortality percentage of lambs weaned at different ages.

	1st Season		2nd Season		Average	
	6	8	6	8	6	8
No. of lambs weaned	21	25	20	20	41	45
Singles No. of lambs died	2	2	4	3	6	5
Mortality %	9.5	8.0	20	15	14.6	11.1
No. of lambs weaned	14	13	13	18	27	31
Twins No. of lambs died	3	1	4	2	7	3
Mortality %	21.4	7.7	30.8	11.1	25.9	9.7

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انتاجية الحملان الرحمانى المفطومة عند عمر ستة أو ثمانية أسابيع

فهمى سويدان ، عادل أبو النجا ، أحمد الشيكشى و عبد الكريم عباس

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تحت نظام انتاج ٣ ولادات كل سنتين من النعاج المحلية أجريت هذه التجربة لدراسة تأثير الفطام المبكر عند عمر ستة أو ثمانية أسابيع على الحملان الرحمانى الذكور (فرادى ، توأم) المولودة فى موسمين متتاليين .
وتتلخص النتائج المتحصل عليها فيما يلى :

١ - متوسط الوزن عند الفطام للحملان المفطومة عند عمر ثمانية أسابيع كما أعلى قليلا منه للحملان المفطومة عند عمر ستة أسابيع - الا أن الفروق لم تكن معنوية احصائيا الا بين الحملان الفرادى فى الموسم الثانى - كذلك لم توجد فروق معنوية احصائيا فى متوسط الوزن عند أعمار ١٢ ، ١٦ ، ٢٤ أسابيع للمجموعات المختلفة .

٢ - معدل الزيادة اليومية فى الوزن بعد الفطام كانت أقل (بفارق معنوي) فى الحملان الفرادى المفطومة عند عمر ٦ أسابيع من الفرادى المفطومة عند عمر ٨ أسابيع - الا أن الفرق تضاعف الى حد كبير وفقد معنويته الاحصائية بتقدم الحملان فى العمر .

٣ - كانت درجة تأثير التوائم أقل بكثير من الفرادى من حيث معدل اليومية فى الوزن بعد الفطام . واتضح أن التوائم المفطومة مبكرا كان معدل الزيادة فى الوزن فيها مساويا أو أعلى منه فى التوائم المفطومة عند عمر ٨ أسابيع .

٤ - كفاءة التحويل الغذائى فى الفترة من الفطام حتى عمر ٢٤ أسبوع يبدو أنها لم تتأثر اطلاقا أو تأثرت بدرجة طفيفة بالعمر عند الفطام .

٥ - معدل النفوق كان مرتفعا فى مجموعات التوائم المفطومة عند عمر ستة أسابيع عنه فى باقى مجموعات التوائم أو الفرادى .