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Fattening Performance and Carcass Traits of Early Weaned Rahmani Lambs

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During two consecutive seasons : Jan-March and Sept. Nov. 1976, sixty five and fifty eight Rahmani male lambs weighing 30+0.5 kg with an average age of 6 months were used in an experiment to study the effects of weaning age (6 or 8 wks), level of feeding (A or B) and season on fattening performance and carcass traits. Within each season, at the end of ten - wks - fattening - period 7 to 8 lambs for each experimental group (2 weaning ages × 2 levels of feeding) were taken for slaughter studies.

Rate of gain were not significantly affected by any of the variables studied. Yet, slightly better gains and efficiency were observed in lambs weaned at 6 weeks of age than in lambs weaned at 8 weeks. The same trend was observed in lambs of the second season compared to those of the first season.

Carcass weight, dressing percentage, prime cuts percentage and area of longismus dorsi muscle were not affected by age at weaning, feeding level or season.

Increased energy : protein ratio in level B (10% higher energy and 15% less protein than in level A) resulted in significantly ($P < 0.01$) greater fat thickness over the twelveth rib and higher percentage of fatty tissues in the 9-10-11th rib cut. Values of both parameters were significantly ($P < 0.01$) higher in carcasses of the second season than in those of the first season.

It can be concluded that neither rate nor composition of gain was affected by the age at weaning, while only the composition of gain that was affected significantly by level of feeding and by season.

Early weaning of lambs has become a common practice with the advent of different systems of intensive sheep production. Reports made by several investigators, indicate that weaning lambs within the first six weeks of age usually resulted in reduced growth rate for few weeks post weaning (Brothera nd Whiteman, 1961, Orskov *et al.*, 1971 and Molenat and Theriez, 1972). Subsequent rate of gain, however, becomes equal or even faster than with lambs weaned at later ages (Bermejo, 1960, Yalcin *et al.*, 1968 and Makarechian *et al.*, 1973). In agreement with these findings, Swidan *et al.*, 1977 reported that weaning age had no significant effect on live weight of Rahmani male lambs when they reached 24 weeks of age.

In a series of experiments to evaluate the system of three lambings per two years currently suggested in Egypt, the present work was conducted to investigate the effect of weaning age, season and level of feeding on fattening performance and caecass traits of lambs.

Material and Methods

The experiment was carried out at El-Serw Exp. St. (Northern Delta), Animal Production Research Institute, Ministry of Agriculture, Egypt, during two consecutive lambing seasons; June-July975 and Feb.-March, 1976. Sixty five and fifty eight Rahmani male lambs were included in the first and second seasons, respectively. Lambs of each season were either weaned at 6 or 8 weeks of age and raised up to 30±0 5 kg live weight with an average age of six months. Lambs of the same weaning age were then assigned to be fattened on either one of two feeding levels (A or B) for a period of 10 weeks.

Rations

Rations used are based on two main levels of feeding suggested by Tommi (1963) for fattening male lambs of the fat-tailed-coarse wool sheep. Within each season, lambs of the two weaning ages on either level were offered three rations I, II, III when live weight ranged from 30-35, 35-40 and 50-45 kg. Resp.Rations used, nutritive value and daily allowances are presented in Table 1. Rations of level A are of narrower energy to protein ratio due to higher digestible protein and lower energy content than rations of the B level.

TABLE 1 Rations used within each level of feeding , their nutritive value and daily allowances.

Ingredients	Levels: A			B		
	Rations: I (30-35kg)	II (35-40kg)	III (40-45kg)	I (30-35kg)	II (35-40kg)	III (40-45kg)
Co-op feed. g[1]	900	850	600	470	430	500
Corn, g	—	110	400	380	550	550
Berseem hay,g	450	480	480	450	400	400
Total, g/day.	1350	1440	1480	1300	1380	1450
S.V[2]., g/day.	621	691 (avg.700)	788	693	792 (avg.772)	830
D.P.[2]g/day	135	138 (avg.134)	128	110	112 (avg.114)	120
Avg. S.V. : D. P. Ratio		5.24:1			6.77:1	

1, Percentage composition : cottonseed meal (corticated) 50, corn 20, rice bran 15, wheat bran 9, molasses 3, mineral mix 1, common salt 1, lime stone 1.

2, Starch value and digestible protein were calculated according to Animal and Poultry Nutrition, Bull. No 3. 1968.

Slaughter procedure

Seven or 8 fattened lambs weighing 40-45 kg for each experimental group (2 weaning ages × 2 levels×2 seasons) were fasted for 16 hr, weighed and slaughtered. Offals and thoracic and abdominal organs were removed and weighed. Weights of the gut contents were recorded to calculate dressing percentage on empty live weight basis. Carcasses were disjointed into wholesales cuts. The 9-10-11 rib cuts were chilled before being dessected to its lean, fatty tissues and bone. Longismus dorsi (eye muscle) area and fat thickness over the twelfth rib were measured .

Statistical analysis were performed according to the unweighed means methods of analysis of variance described by Snedecor (1960).

Results and Discussion

Rate of gain and feed conversion

The effect of age at weaning, level of feeding and season on rate of gain and feed conversion are illustrated in Table 2. Analysis of data presented reveals that rate of gain was not significantly affected by any of the three variables studied. However, broad trends can be observed.

Within each level of feeding, slightly better gain and efficiency were in groups of lambs weaned at the age of six wks compared to those weaned at 8 wks. Similar findings have been reported by Hinds *et al.*, (1960), and Orskov *et al.* (1971), indicated significantly better gains and feed conversion with lambs weaned at 6 wks. compared to those weaned at 13 wks. of age.

In the present work better performance was also observed during the second season (Sept. - Nov.) than in the first season (Jan. - March) with lambs weaned at either ages . Such possible seasonal advantage may be explained in light of recent reports by Brink and Ames (1975) and Ames and Brink (1977). They pointed out reduced nutrient digestibility, average daily gain and efficiency in cold weather compared to thermal neutral temperatures. Apparently, net energy for gain (NEg) is a smaller portion of total NE during cold when NE for maintenance increases and intake is fixed. In the present experiment, weather parameters were not measured. However, fattening period of the first season was almost carried out during winter months where ambient temperature is around its minimum particularly in regions of northern Delta.

Comparing feed conversion on the two levels of feeding, it is obvious that dietary energy of level A (10 lower than B) and dietary protein of the B level (15% lower than A) were utilized more efficiently than energy of level B and protein of level A, respectively. However, it is not behind the interest of this paper to clarify optimum allowances of energy and protein that gives maximum gains and efficiency values in fattening of indigenous lambs . Yet, it can be pointed out that values obtained herein for rate of gain (188 to 211g)

TABLE 2 Average daily gain (ADG) ± SE and feed conversion in different groups.

	Season: 1st				2			
	Feeding level :A		B		A		B	
	Weaning age (Wks) 6	8	6	8	6	8	6	8
No of lambs	15	17	15	18	13	17	12	16
Initial wt. kg	29.8±0.08	29.9±0.07	29.8±0.07	29.8±0.07	29.8±0.09	29.8±0.09	29.8±0.09	29.7±0.06
Final wt. kg.,	43.6±0.44	43.2±0.40	43.6±0.27	43.5±0.39	44.6±0.39	43 7±0.52	43.8±0.38	43 5±0.46
Total gain, kg	13.8±0.41	13.2±0.39	13.8±0.28	13.7±0.35	14.8±0.35	13.9±0.45	14.0±0.55	13.8±0.42
ADG, g.	198±5.89	189±5.61	197±3.98	196±5.13	211±4.86	199±6.50	199±4.99	196±6.64
Feed conversion :								
S.V./kg gain	3.47	3.61	3.91	3.97	3.25	3.38	3.86	3.89
D.P./kg gain	0.700	0.740	0.590	0.590	0.650	0.700	0.57J	0.58

TABLE 3. Effect of season, level of feeding and weaning age on carcass traits of Rahmani male lambs.

Traits	Season : 1st				2nd			
	Feeding level : A		B		A		B	
	Weaning age (wks.) 6	8	6	8	6	8	6	8
No of lambs	7	8	7	8	7	8	7	8
slaughter Wt., kg.	42.6±0.62	42.4±0.65	42.1±0.47	42.7±0.42	44.2±0.42	44.1±0.63	44.1±0.39	43.8±0.51
Warm carcass, kg.	20.5±0.37	20.7±0.43	20.5±0.41	20.9±0.33	21,1±0.40	20.8±0.38	21.3±0.26	20 9±0.42
Dressing[1] %	54.2±0.84	55.3±0.42	54.8±1.07	55.2±0.72	55.4±0.63	55.1±0.69	55.4±0.31	55.2±0.65
Prime cuts[2] %	73.0±1.11	73.3±1.07	71.2±0.69	72.0±1.34	73.1±0.68	71.9±0.55	70.3±0.61	73.3±0.70
Separable fat[3], kg.	3.4±0.34	3.1±0.23	3.5±0.34	3.6±0.29	2.8±0.13	2.8±0.16	3.2±0.15	268±0.07
Fat thickness, mm.	1.8±0.47	3.0±0.33	3.8±0.39	3.8±0.40	3.4±0.52	2.9±0.51	5.7±0.43	5.4±0.49
Dissecting9-10-11 th rib cut.								
Lean %	69.7±1.92	66.5±2.04	62.9±2.51	66.4±1.02	64.2±1.32	64.5±1.51	59.8±1.40	60.1±0.84
Fat %	8.8±2.61	9.5±1.55	12.7±1.93	10.4±2.05	12.0±1.00	12.3±0.90	16.4±1.08	16.1±0.59
Bone %	21.1±1.73	20.8±0.73	22.0±1.64	20.4±1.75	22.2±0.40	22.1±0.74	22.2±0.67	22.7±0.74
Eye Muscle-Area, cm²	12.8±0.55	13.2±1.02	12.6±0.85	13.2±0.85	13.1±1.05	13.00±0.59	13.00±0.87	12.8±0.57

1, Calculated on empty live weight basis. 2, Prime cuts included are : hind quarters, lion, shoulders and rack

3, Separable fat included : omentum, kidney fat and fat of the tail.

TABLE 4. **Pooled effects of season, level of feeding and weaning age on carcass traits.**

Traits	Season			Level			Weaning age		
	lst	2nd	Significance of difference	A	B	Significance of difference	6	8	Significance of difference
Slaughter wt. kg.	42.4	44.1	**	43.3	43.2		43.2	43.3	
Garcass wt. kg	20.7	21.1		20.8	20.9		20.8	20.8	
Dressing %	54.9	55.3		55.0	55.2		55.0	55.2	
Prime cuts %	72.4	72.2		72.8	71.8		71.9	72.7	
Separable fat, kg.	3.4	2.9	**	3.0	3.3		3.2	3.1	
Fat thickness mm.	3.1	4.4	**	2.8	4.7	**	3.7	3.8	
Dissecting the rib cut									
Lean %	66.4	62.1	**	66.2	62.4	**	64.2	64.4	
Fat %	10.4	14.2	*	10.7	13.9	*	12.5	12.0	
Bone %	21.1	22.3		21.6	21.8		21.9	21.5	
Eye muscle area, cm^2	12.9	13.0		13.0	12.9		12.9	13.0	

**Differences are significant ($P<0.01$)

and feed conversion (3.25 to 3.97 kg S.V./ 1kg gain) are higher than those (122 - 172 g and 3.55 - 5.55 kg.S.V.) reported by Soliman (1971) in his interesting thesis on the alllowances for fattening lambs using 3 × 3 levels of energy and protein. What should be hinted at is that more investigation is required to achieve maximum productive potentiality of local sheep.

Carcass composition

The influence of age at weaning level of feeding and season on different carcass traits are shown in Table 3. ANOVA of data presented reveals that weaning age had no effect on any of the carcass traits ($P<0.05$). Fat thickness over the twelfth rib and fatty tissues percentage of the 9-10-11 *th* rib cut were significantly higher ($P<0.01$ in carcasses of lambs on the B level than those on level A.

Physical composition of the 9-10-11 *th* rib cut is considered a reliable estimate representing the whole carcass with regard to its lean, fatty tissues and bone content (Lathan *et al.*, 1966).

From data summarized in Table 4, it can be, therefore, concluded that higher level of energy and wider energy : protein ratio(level B) resulted in greater fat deposition in lamb carcasses on this level than those of lambs on level A (less energy and higher protein intakes). In agreement were reports made by Soliman (1971), Craddock (1974) and Menke (1976) who has postulated that composition of growth is related to amounts of energy and protein available surplus to maintenance.

Values obtained for fat thickness and fat percentage were found to be significantly higher ($p<0.01$) in carcasses of the second season than in those of the first season (Table 4). Since meesuremehts of the separable fat included kidney, omentum fat and the most variable; fat af the tail consequently it is not easy to interpret the significant difference observed between the two seasons.

References

Ames, D.R. and Brink, D.R. (1977) Effect of temperature on lambs performance and protein efficiency ratio. *J. Anim. Sci.* **44**, 136.

Bermejo, Z.A. (1960) Preliminary experiment on the early weaning of lambs. A.B.A. **29**, 1489.

Brink, D.R. and Ames D.R. (1975) Effect of ambient temperature on lambs performance. *J. Anim. Sci.* **21**, 264 *(Abstr.)*

Brother, D.G. and Whiteman, J.V. (1961) Influence of early weaning on creep-fed milk lambs when weaned on weight or on age. *J. Anim. Sci.* **20**, 420.

Craddock. B.F. Field R.A. and Riely, M.L. (1974) Effect of protein and energy levels on lamb carcass composition. *J. Anim Sci* **39**, 325.

Hinds, F.C.Marsfield. M.E. and Lewis, J.M.,(1960)Early weaning of lambs, a comparison of the performance of lambs weaned at six and nine weeks of age, *J. Anim Sci.* **19,** 1306.

Lathan, T.R., Moody, W.G. and Kemp, D (1966) Techniques for estimating lamb carcass composition . *J.Anim. Sci.* 25, 492.

Makarechian, M., Farid A., Sedfidbakht, N. and Mostagav M.S. (1973) The infuence of breed and weaning age on feedlot performance of Iranian fat-tailed-sheep. *Iranian J. Agric. Res.* 2, 21.

Menk e, K.H. (1976) A system for factorial analysis of energy and protein requirements and for feed evaluation. Feed Composition, Animal Nutrition Requirement, and Computerization of Diets. First International Symposium. Utah St.Univ. *(G.f. J. Anim. Sci.* 44, 36, 1977)

Ministry of Agriculture, Egypt, (1968) Animal and Poultry Nutrition, "*Bull. No* 3.

Molenat, G. and Theriez, M. (1970) Artifical milk feeding of lambs determining the age for weaning. *Nutr. Abst. & Revs.* **42,** 219.

Orskov, E. Fraser, C., Gill, G.C. and Elizabeth L. Corse (1971) The effect in an intensive production system of type of cereals and time of weaning on the performance of lambs *Ainm. Prod.* **13,** 485.

Snedecor, G.W. (1960) *Statistical Methods.* State Press ol. Ames, Iowa.

Soliman, H.S. (1971) Allowances of starch and protein for fattening lambs. *M. Se Thesis,* Faculty of agriculture, Ain Shams University.

Suidan. F., El-Shobokshy, A.S . Aboul-Naga, A.M. and Abbas, A.M. (1977) Three lambings per two years from ewes of local breeds. 1-Performance of Rahmani male-lambs weaned at six or eight weeks of age *J.Anim. Priod. U.A.R.* (in Press).

Tommi, M.F. (1963) "*Rations and Allowances for Farm Animals*" Sel-Khoz. Isdot, Moscow.

Yalcin, B.C., Aktas, G. ani Sirik, C.M. (1953) Effect of weanin : at different ages on growth of lambs and milk yield of the ewe. *Nutr. Abstr. Revs.* **39,** 585

كفاءة تسمين وصفات الذبيحة للحوالى الرحمانى المقطومة مبكرا

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خلال موسمين متتاليين (يناير – مارس – سبتمبر – نوفمبر سنة ١٩٧٦) استخدم ٦٥ ، ٥٨ من حوالى الرحمانى بوزن ٣٠±٥ر كجم ومتوسط عمر ستة شهور فى تجربة لدراسة تأثير عمر الفطام (عند ٦ أو ٨ أسابيع) مستوى التغذية (أ أو ب) والموسم على تسمين هذه الحوالى وصفات الذبائح منها .

فى نهاية فترة التسمين التى أستمرت لمدة ١٠ أسابيع فى كل من الموسمين أخذ عدد من الحوالى المسمنة (من ٧ ـ ٨) لكل مجموعة تجريبية (٢ عمر فطام × ٢ مستوى تغذية) وذلك لاجراء الدراسات المتعلقة بصفات الذبائح.

وقد اتضح أن معدل الزيادة فى الوزن (١٨٨ ـ ٢١١ جم/ يوميا) خلال فترة التسمين لم تتأثر معنويا بأى من المتغيرات موضع الدراسة الا أنه كان هناك اتجاها لتحسن معدل الزيادة فى الوزن وكفاءة التحويل الغذائى فى الحملان المفطومة على عمر ٦ أسابيع ـ كذلك لوحظ نفس الاتجاه فى مجموعات حوالى الموسم الثانى (سبتمبر ـ نوفمبر) .

دلت النتائج أيضا على أن المتغيرات موضع الدراسة ليس لها تأثير معنوى على وزن الذبيحة ، النسبة المئوية للتصافى ، النسبة المئوية لقطع الدرجة الأولى فى الذبيحة أو مساحة العضلة العينية .

الا أن النتائج المتحصل عليها دلت على أن اتساع نسبة الطاقة : البروتين فى المستوى ب و ١٠٪ طاقة أعلى ـ ١٥٪ بروتين أقل من المستوى ا ، أدت الى زيادة معنوية فى سمك طبقة الدهن فوق الضلع ١٢ وكذلك النسبة المئوية لأنسجة الدهن فى قطعة الضلوع ٩ ـ ١٠ ـ ١١ كذلك كانت هناك زيادة معنوية فى القياسين السابقين فى ذبائح حوالى الموسم الثانى عنها فى ذبائح الموسم الأول .

وعلى ذلك يمكن استخلاص أن معدل الزيادة فى الوزن أو تركيب هذه الزيادة لم تتأثر بعمر الفطام الا أن تركيب الزيادة الوزنية فقط هو الذى تأثر معنويا بمستوى التغذية أو بموسم التسمين .