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STUDIES ON SOME BEHAVIOURIAL ASPECTS, BODY PERFORMANCE, WOOL AND CARCASS TRAITS OF OSSIMI RAM LAMBS RAISED UNDER CLOSED STABLE OR OPEN SHED

M.A. Houria

Department of Animal Production, Faculty of Agriculture, University of Menofiya, Shibin El-Kom, Egypt

SUMMARY

A trial was done on 12 Ossimi male lambs, 6 months old to study body performance, carcass and wool traits and some behaviourial criteria under closed stable or open shed during a 12 months period. The experimental animals were allotted to two comparable groups of similar initial body weights. Group (a) was kept in a closed stable. Group (b) was kept under open shed. Animals were shorn to the skin when they reached 12 months old and at the end of the experimental period to estimate wool traits. Behaviourial criteria were recorded at biweekly intervals. At the end of the experiment, all animals were slaughtered and dressed out at 18 months of age.

Results of the study showed that the diurnal distribution of eating, rumination idling, standing and lying frequency and time spent in each during day (7.00 - 19.00 h) were significant different between the two groups. However, no consistent differences were found in this respect during the night (19.00 - 7.00 h).

Clean wool weight was significantly higher ($p<0.01$) in group (b)(1.40 kg) than group (a) (0.90 kg). This difference was about 55.6%. Wool fibre length differed significantly between the two groups, ($P< 0.01$) being 9.30 and 14.25 cm for the (a) and (b) groups, respectively. System of housing had a significant influence also on shrinkage. Fleeces of sheep kept in the closed stable shrank more compared to those kept under the open shed. No significant differences were

detected between the two groups regarding fibre diameter and medullated fibres.

At 6-12 months of age, the average daily gain was significantly (P< 0.01) lower in group (a) (113.17 g/day) than in group (b) (149.39 g/day). However, at 12-18 months of age, average daily gain was similar; 98.50 g/day for group (b) vs. 96.44 g/day for group (a). Between 6-18 months of age average daily gain was 18.25% higher in group (b). Feed efficiency was slightly better for lambs in the (b) group than those in the (a) group. Slaughter weight, empty body weight, tailless hot and cold carcass weights and dressing percentages of the (b) group were slightly higher than those of the (a) group. However, dressing percentage based on cold carcass weight with separable fat to empty body weight was significantly (P< 0.05%) higher in group (a) than in the group (b). No significant differences were found between weights or percentages of different organs and offals. However, the relative weight of pelt was significantly heavier in the (b) group than in the (a) group. Lambs raised under the open system were slightly higher in all of their carcass measurements than lambs raised under the closed system. However those differences were significant only with regard to fat thickness over the ninth rib. Lambs in the (b) group had a significantly higher lean percentage and lean/fat ratio over the 9,10,11 th ribs. Fat percentage was significantly less in the (b) group.

Keywords: Sheep, housing systems, wool, carcass, behaviour

INTRODUCTION

The relationship between housing system and performance of farm animals is of significant importance. In Egypt, it is well·established that the fattening performance of cattle and buffalo calves is better when animals are housed in a closed system away from direct sunlight. In studies with sheep Gabr et.al. (1986) demonstrated that an open housing system allowed better feeding behaviour. Omar (1992) reported that fattening Ossimi rams kept under dim light conditions is not recommended. Therefore, complementary studies are needed to evaluate feed intake, changes in body weight,

carcass and wool traits, as well as some ingestive behaviour of Ossimi lambs raised under two systems of housing (e.g., closed stable or open shed).

MATERIAL AND METHODS

This study was conducted for 12 months from October 1992 to October 1993. Twelve Ossimi males, 6 months old, at the beginning of the study, belonging to the Animal Behaviour Unit of the Faculty of Agriculture, Menofiya University. Animals were allotted into two comparable groups of similar average initial body weights. The first group (a) was kept in a ventilated closed stable. The second group (b) was kept under on open shed. Both groups were fed (3% of their live weight) a concentrate mixture (corticated cotton seed meal, 28%; wheat bran, 44%; yellow maize, 19%; rice bran, 3%; molasses, 3%; lime stone, 2% and common salt, 1%.), wheat straw and berseem (during green fodder season) or wheat straw and hay (during dry fodder season) ad. lib. The concentrates were offered once daily at 7.00h. Mineral blocks and fresh water were available at all times. Animals were weighed at the beginning of the experiment and thereafter at biweekly intervals until the end of the experiment. Weighing took place in the morning after an overnight holding of feed and water. Average daily feed intake was recorded for each group by calculating the differences between the weight offered and the residues. Animals in each group, were colour marked on the back for specific observations. For each of the marked individuals, frequency and time spent in feeding ruminating, standing and laying were done by persons and a time-lapse video recorder connected with two low light intensity television cameras for 24 hour periods at biweekly intervals for 12 months. Normally, natural light entered the stable through windows during the day (closed system). During the evening and night, artificial light was necessary to enable observations to be recorded in both the closed staple and open shed. Data were grouped to represent two periods of observations, i.e. 7.00 to 19.00h to represent day activities and 19.00 to 7.00h to represent night activities. In addition, data of ingestive behaviour were combined every 2 hours to provide information representing 12 consecutive periods for each group

separately.

All animals were carefully shorn to the skin when the lambs reached 12 months old. To estimate wool production, animals were shorn at the end of the experiment, representing 6 months wool growth. The fleece of each animal was weighed and the mean grease weight was calculated for each group. At shearing time, approximately 50 gm greasy wool samples were taken from the right mid-side of each animal. Unstretched staple length was measured, using a ruler. Shrinkage percentage was estimated by scouring greasy samples according to Orlov (1980). Clean fleece weight was determined of each animal. Fibre length was measured, against a ruler, on 200 fibres chosen at random from each cleaned sample. Fibre diameter was measured microscopically according to Orlov (1980) and Marai and Abd-Elsalam (1971) using about 250 fibers from each scored sample. The number of medullated fibres was recorded, while examining the fibre diameter.

At the end of the experiment, the animals were slaughtered after a 12 h fasting period. They were weighed just before and after slaughter. Blood weight was determined as the difference between the two weights and reported as a percentage of live body weight. Following slaughter and removing the pelt, the offals, thoracic and abdominal organs were removed and weighed. The contents of the digestive tract were also removed and their weight was subtracted from the slaughter live weight to obtain empty body weight. The weight of each part as a percentage of body weight was also calculated. The tail of each carcass was removed and its weight was recorded. Hot carcass, kidney and omentum fat were weighed separately. Carcasses were split longitudinally into two sides. Each left side was split into fore and hindquarters between the 12th and 13th ribs, and weighed. Hindquarter from each carcass were chilled for 24 hours at an average temperature of $4^{o}C$. Cold weight was used to determine the shrinkage percent during cooling. Some measurements were taken on the intact carcasses. They were: Heart girth and width at hips measured by methods similar to those of the corresponding measurements on the live lambs (Houria, 1979). Carcass length, was measured according to Yeats et al. (1975) from the anterior edge of the pubic bone to the mid-point of the junction between the bodies of

the last cervical and first thoracic vertebrae. Depth of chest, was measured according to Kempster et al. (1976) at the greatest depth of the side. The 9-10 & 11th rib section was removed from right side by making cuts in opposition to the anterior edges of ribs 9 and 12, stored in sealed polyethylene bags and chilled until physical analysis. Some measurements of fat on the chilled 9-10-11 rib cuts were taken according to those described by Galal et al. (1975): Fat thickness above the ninth rib midway between its junction with the vertebra and its end one above the ribeye muscle between the 11 th and 12 th ribs. Shape index was calculated according to Darwish (1963). Area of ribeye was measured by means of a clean plastic grid placed over the cut surface as described by the USDA (1968) technical bulletin. All rib cuts were dissected into lean, fat and bone.

The influence of the housing systems on the behaviourial aspects, body performance, wool and carcass traits were evaluated by applying the T-test according to Snedecor (1974).

RESULTS AND DISCUSSION

Behaviourial aspects

Data presented in Table 1 and Fig. 1 show that frequency and time spent in feeding activity for group (b) was significantly higher during day time as compared to group (a). On the other hand, no difference was found in eating activity between the two groups during night time. In general, the total eating time/ 24 h ranged from 308.7 (group a) to 427.0 minutes (Group b). These findings were confirmed by Gabr et al. (1986) who demonstrated that, open housing systems allow the animals to spend more time feeding than closed stable systems.

The diurnal frequency distribution of rumination and time spent/day showed significantly lower values in group (b) than in group (a). However animals in the two groups spent similar time in rumination during the night as compared to day time (Table 1 & Fig. 1). The total ruminating time/24 h varied from 373.0 (Group b) to 441.6 minutes (Group a). Sharafeldin and Shafie (1965) reported that various breeds of sheep tended to ruminate more when lying down in shade than when standing in

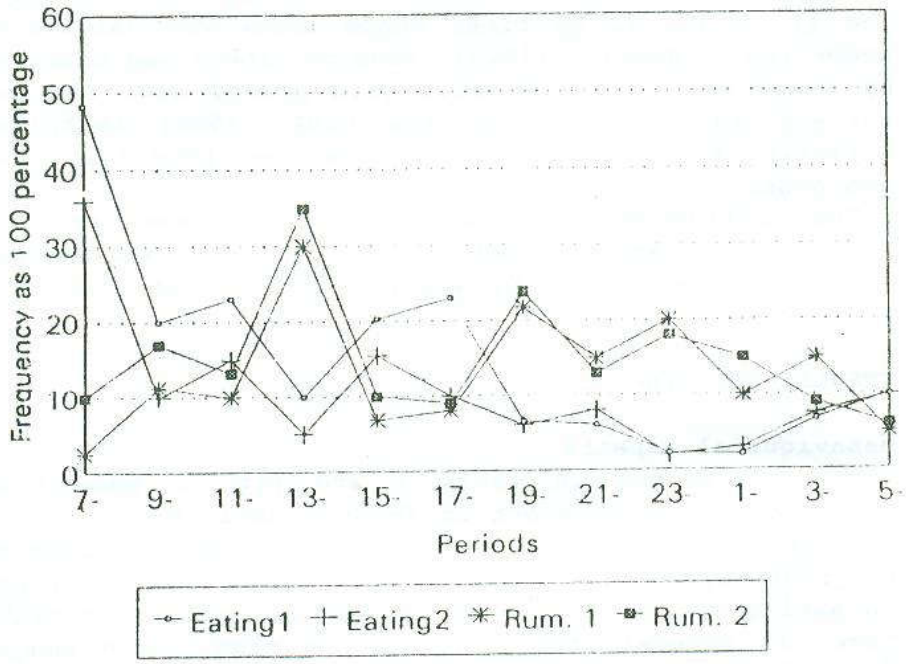

Fig. 1. Frequencies of eating and ruminating as percentages of two hours period. (1= Open shed, 2= Closed stable).

shade or sun. Gabr et al. (1986) found that the time consumed by animals in rumination was, generally more under closed than open housing.

Table 1. Time spent (minutes) by Ossimi male lambs in eating ruminating, idling, standing and lying /24 h day as affected by two housing systems (values represent as an verage of 24 estimates)

Item	Housing system: Closed stable (a) Mean±SE	%	Open shed (b) Mean±SE	%
Day time (7.00 - 19.00 h): (% from 12 h day time)				
Eating	220.7±10.6**	30.7	346.8±12.5	48.2
Ruminating	241.4±13.5*	33.5	180.8± 8.6	25.1
Idling	250.9±12.7*	34.8	185.4±10.7	25.8
Standing	269.5±10.5**	37.4	419.6±13.2	58.3
Lying	450.5±15.6*	62.6	300.4±14.3	41.7
Night time (19.00 -7.00 h): (% from 12 h night time)				
Eating	87.6± 8.6	12.2	80.2±10.5	11.1
Ruminating	200.2±12.5	27.8	192.2±11.6	26.2
Idling	430.2±15.8	59.8	444.6±12.4	61.8
Standing	168.8±11.2	23.4	174.2± 9.8	24.3
lying	551.2±18.1	76.6	544.8±16.7	75.7
Total time/24 h: (% from total time/24 h)				
Eating	308.3±16.5*	21.4	427.0±14.6	29.7
Ruminating	441.6±13.2*	30.7	373.0±15.3	25.9
Idling	681.1±15.6	47.3	630.0±11.9	43.8
Standing	438.8±11.7*	30.5	594.8±16.2	41.3
Lying	1001.2±20.2*	69.5	845.2±18.9	58.7

**P <0.01 *P <0.05

Idling includes the time among periods of eating, drinking and ruminating, whether animals are lying or standing. The total time spent in idling (day time) and less in the open system, as compared to closed system. This indicates that the increase in eating and rumination time caused reduction in the time spent idling (Table 1). Frequency and time spent in idling increased significantly as day time advanced, and became longer in the afternoon (Houria, 1989). This could be due to the satiation state of the animals and the increase in atmospheric temperature which in turn caused most of the sheep to tend to relax in shade. In open housing, the animals spent more time standing than in the closed system during the day. The opposite was true

for lying activity (Table 1).

Kandil et al. (1988) stated that, the appetite of the lambs raised under a semi-open shed during summer was reduced resulting in relatively more time spent resting. Schmisseur et al. (1966) reported that animals rested more in loose housing systems than in free stalls. On the other hand, during the night time, no significant differences were detected between the two systems of housing for standing and laying activities. During the 24 hour observations, the times spent by animals kept under open shed were 29.7, 25.9, 43.8, 41.3 and 58.7% for eating, ruminating, idling, standing and laying, respectively. The same observations were 21.4, 30.7, 47.3, 30.5 and 69.5%, respectively for animals kept in closed housing. Housing system had a significant effect on time spent in eating, ruminating, standing and lying ($P< 0.05$, Table 1) during the 24 hour observations. From the present results, it is clear that the ingestive behaviour during day time is a good criterion for the prediction of the ingestive behaviour during 24 hour observations.

Wool characteristics

Wool characteristics of Ossimi males raised under two shelter systems are presented in Table (2). System of housing proved to have a significant effect ($P< 0.01$) on grease and clean fleece weights, staple and fibre length and shrinkage. It is worthy to note that the sheep in group (b) produced 55.6% more clean wool during the experimental period than those in the (a) group. Staple and fibre lengths were significantly longer in group (b) (9.52 and 14.25 cm, respectively) compared to (6.15 and 9.30 cm, for group (b), Table 2). This indicates that, wool growth is encouraged by exposure to the natural light. Omar (1992) found that, staple length was influenced by dim light, where rams kept under natural light had longer staple length than rams kept under dim light. It may also, be due in parts to differences in feed intake and body weights (Table, 3). On the other hand, fleeces of sheep kept in the closed housing system shrank more compared to those kept under the open shed ($p< 0.01$). Marai and Abd-Elsalam (1971) and Ashmawy and Al-Azzawi (1982) reported that, husbandry system had a significant effect on shrinkage in fleeces of sheep. They added that moisture in fleeces fluctuates in

keeping with the changing relative humidity and temperature of the surrounding atmosphere. On the other hand, no significant differences were detected between the two groups regarding the fibre diameter and medullated fibres%. Sheltering ram lambs in ventilated closed houses caused them to produce lighter fleeces with shorter and slightly finer fibers and higher shrinkage.

Table 2. Wool production and characteristics of Ossimi males raised under two housing systems

Item	Housing system	
	Closed stable(a) (Mean+SE)	Open shed(b) (Mean+SE)
No. of animals	6	6
Greasy fleece weight, kg	1.30±0.08**	1.82±0.12
Clean fleece weight, kg	0.90±0.05**	1.40±0.10
Staple length, cm	6.15±0.25**	9.52±0.36
Fibre length, cm	9.30±0.50**	14.25±0.58
Shrinkage, %	31.50±1.36**	23.20±0.98
Medullated fibres, %	3.25±0.59	3.12±0.68
Fibre diameter, Um	32.95+0.85	35.15+0.83

** P <0.01 * P <0.05

Performance and carcass characteristics

Table 3 shows the performance of growing Ossimi male lambs kept under either a closed stable or on open shed. Lower performance was exhibited by animals in group (a).The average body weight at 12 months of age was 47.17 and 53.09 kg for groups (a) and (b), respectively. Average daily gain was significantly ($p<0.01$) higher in group b (149.39 g/day) than in group (a) (113.17 g/day). Also, animals raised under open sheds (group b)consumed 20.8% more dry matter per day than those kept in a closed stable and the feed efficiency of group (b) was also better than that of group (a). On the other hand, average daily gain and feed efficiency were almost similar in the two groups between 12 and 18 months of age. From 6 to 18 months the average daily gain and feed efficiency for lambs in group (b) were slightly higher than those of group (a). Animals kept under the open system may attain higher rates of gain, simply by stimulating appetite and feed consumption. Gabr et. al.(1986) found that, under a closed housing system, the appetite of animals was reduced. Omar (1993) added that

subjecting Ossimi males to continuous dim light in a closed stable caused depression in body performance. Under conditions similar to the present study, the housing system of group b (open shed) is recommended, especially when fattening of lambs at 6-12 months of age.

Table 3. Feeding performance of Ossimi male lambs raised under two housing systems

Item	Housing system Closed stable(a) mean±SE	Open shed(b) mean±SE
From 6 to 12 months old:		
No. of animals	6	6
Initial weight, kg	26.80± 1.50	26.20± 1.95
Final weight, kg	47.17± 2.3 5	53.09± 2.10
Daily gain, g/day	113.17±11.50**	149.39±12.60
Feed intake, kg DM/head/day	1.20	1.45
Feed efficiency,kg DM/kg gain	10.60	9.73
From 12 to 18 month old:		
Initial weight, kg	47.17± 2.35	53.09± 2.10
Final weight, kg	64.53± 2.68	70.82± 2.75
Daily gain, g/day	96.44± 6.30	98.50± 6.50
Feed intake, kg DM/head/day	1.30	1.30
Feed efficiency, kg DM/kg/gain	13.50	13.20
From 6 to 18 months old:		
Initial weight, kg	26.80± 1.50	26.20± 1.95
Final weight, kg	64.53± 2.68	70.82± 2.75
Daily gain, g/day	104.81± 8.15	123.94±10.20
Feed intake, kg DM/head/day	1.24	1.40
Feed efficiency, kg DM/kg gain	11.83	11.30

** P< 0.01

Data presented in Tables (4 and 5) show that, some carcass traits were affected by housing system. Animals in group (b) expressed slightly heavier fasted weights, empty body weights and hot and cold carcass weights as compared to group (a). Similarly, no significant differences were detected between two groups regarding weight of head, legs and internal organs (Table 5). The separable fat was significantly greater in group (a)

than that in group (b), which may be explained by the observation (Table 1), animals in group (a) were less active. Consequently, the net energy was probably in fat deposition rather than in muscling. The pelt was significantly lighter in group (a). Dressing percentage based on hot carcass weight was slightly higher in group (b) (53.51 %) vs. 51.16% in group (a). Dressing percentage based on chilled carcass weight was found to be similar for both the (a) and (b) groups. This is probably due to the high shrinkage during chilling in the carcasses of group (b) (5.25%) as compared to group (a) (2.08%). Dressing percentage on the basis of chilled carcass with separable fat was significantly higher ($P<0.05$) in group (a) than in group (b). When weights of the different internal offals and organs shown in Table (5) were related to empty body weight, no significant differences were obtained between the two groups. However, the weight of separable fat was heavier in group (a) (17.46%) than in group (b) (12.28%) ($P<0.05$%). The opposite was true for pelt percentage.

Table 4. Carcass traits of Ossimi males raised under two housing systems

Item	Housing system Closed stable (a) mean±SE	Open shed (b) mean± SE
No. of animals	6	6
Fasted body weight, kg	63.50±1.36	68.84±a.50
Loss during fasting,%	1.60	2.80
Empty body weight, kg (EBW)	57.21±1.80	61.26±1.36
Empty body weight,%[1]	90.10	89.00
Hot carcass weight, kg (HCW)	29.27±1.30	32.78±1.30
Cooling shrinkage,%[2]	2.10	5.25
Cold carcass weight, kg (CCW)	28.66±1.15	31.06±1.24
Dressing percentages:[3]		
% weight of hot carcass, separable fat removed[4]	51.61	53.51
% weight of hot carcass with sparable fat[4]	68.62	65.79
% weight of cold carcass, separable fat removed[4]	50.10	50.70
% weight of cold carcass with Separable fat[4]	67.56	62.98*

1. Percent of fasted weight
2. Percent of hot carcass weight.
3. Values expressed as % of EBW
* $P<0.05$
4. Separable fat include omentum, kidney fat and fat tail

Average measurements taken on carcasses of Ossimi male lambs for the (a) and (b) groups are listed in Table (6). No significant differences were evident from the results except thickness over the 9th rib was higher in group (a). Table (7) show the physical composition of 9-10-11 th rib cuts of sheep kept under two housing systems. sheep in group (b) had significantly more lean and a greater lean/fat ratio. However, fat percent of group (a) was significantly higher than group (b) (28.15 vs. 14.10%, respectively).

Table 5. Weight (kg) and percentage of offals and organs of Ossimi males raised under two housing systems

Item	Housing system: Closed stable (a) Mean±SE	% [1]	Open shed (b) Mean±SE	% [1]
No. of carcasses	6		6	
Head	3.69±0.18	6.50	4.10±0.21	6.69
Pelt	5.03±0.25*	8.79*	6.85±0.32	11.18
Four legs	1.25±0.05	3.85	1.35±0.10	2.20
Digestive tract empty	3.36±0.12	5.87	3.52±0.16	5.75
Liver	0.96±0.11	1.68	0.95±0.05	1.55
Heart	0.23±0.02	0.40	0.25±0.03	0.41
Lungs and Trachea	0.75±0.12	1.31	0.80±0.05	1.31
Kidneys	0.25±0.02	0.44	0.25±0.01	0.41
Spleen	0.10±0.01	0.17	0.10±0.01	0.16
Testicles	0.38±0.12	0.66	0.50±0.03	0.82
Omentum fat	1.53±0.25*	2.67*	1.12±0.15	1.83
Kidney fat	1.46±0.18*	2.55*	0.90±0.18	1.47
Tail fat	7.00±0.45*	12.24*	5.50±0.35	8.98
Separable fat (2)	9.99±0.65*	17.46*	7.52±0.41	12.28
Edible meat (3)	2.67±0.19	4.67	2.85±0.16	4.85
Non-edible components (4)	13.33±1.15	23.30	15.82±1.20	25.82
Blood	1.95±0.20	3.41	2.29±0.11	3.74

1 All percentages related to empty body weight
2 Includes, omentum, kidney fat and fat tail
3 Includes, liver, heart, lungs Trachea, kidneys, spleen and testicles
4 Includes, head, pelt, four legs and empty digestive tract
* P< 0.05

Finally, sheltering sheep in an open housing system, especially during the growing period produce leaner carcasses and heavier fleeces as judged by more wool length and slightly greater fibre diameter (Table 1) as well as less shrinkage. Further, investigation of effect of housing on a larger number of sheep, with different factors that may affect sheep production under farming

and field conditions are encouraged.

Table 6. Carcass measurements of Ossimi lambs raised under two housing systems

Item	Housing system: Closed stable (a) mean±SE	Open shed (b) mean±SE
No. of carcasses	6	6
Carcass length, cm	54.75±1.60	56.30±1.65
Heart girth, cm	68.90±1.15	71.55±1.25
Width at hip, cm	14.25±0.55	15.75±0.40
Depth of chest, cm	26.50±0.56	27.11±0.72
Length of the silver side of the leg, cm	36.48±0.85	37.65±1.30
Girth of glutaeobiceps, cm	30.48±0.85	31.24±1.05
Fat thickness over the rib, mm	5.50±0.36*	3.10±0.22
Fat Thickness over the longissimus dorsi, mm	3.25±0.15	2.15±0.08
Shape index of eye muscle, %	74.50	76.09
Rebeye area, cm^2	12.58±2.50	15.20±2.15

P <0.05

Table 7. Composition of 9-10-11th rib cuts of Ossimi males raised under two housing systems

Item	Housing system: Closed stable (a) mean±SE	Open shed (b) mean±SE
Total weight of 9-10-11th rib cuts, gm:	948.90±50.10	950.50±40.30
Lean (L):		
Weight (g)	511.52±30.16*	651.09±50.25
" (%)	53.91± 1.65*	68.50± 2.30
Fat (F):		
Weight (g)	267.12±20.15*	134.02±15.25
" (%)	28.15± 1.20*	14.10± 0.85
Bone (B):		
Weight (g)	170.33±15.21	165.39±12.22
" (%)	17.94± 0.75	17.40± 1.11
L/F ratio	1.92± 0.33*	4.86± 0.65
L/B ratio	2.23± 0.65	3.94± 0.20
Coefficient of meatiness[1]	4.57± 0.28	4.75± 0.35

* P<0.05, 1 Meat included fat : bone.

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دراسات على بعض المظاهر السلوكية، أداء الجسم وصفات كل من الصوف والذبيحة لحملان الأوسيمى الموضوعة تحت حظائر مقفلة أو مظلات مفتوحة

محمد عطية حورية

قسم الإنتاج الحيوانى، كلية الزراعة، جامعة المنوفية

أجريت هذه الدراسة على حملان الأوسيمى الذكور (عمر ٦ شهور)، بهدف معرفة تأثير وضع الحيوانات تحت نظامين من المسكن على بعض المظاهر السلوكية اليومية، أداء الجسم وصفات كل من الصوف والذبيحة أثناء فترة التسمين والتى إستمرت ١٢ شهر. وقد أستخدم فى هذا البحث ١٢ من حملان الأوسيمى الذكور فى عمر ٦ شهور مقسمة إلى مجموعتين متوازنتين. المجموعة (أ) وضعت فى حظيرة مقفلة جيدة التهوية والاضاءة لمدة ١٢ شهر أما المجموعة الثانية (ب) فقد وضعت فى حوشة مفتوحة مزودة بمظلة خلال فترة التسمين. تم تسجيل بعض الصفات السلوكيةاليومية كل أسبوعين لجميع الحيوانات تحت الدراسة. وقد تم جز جميع الحيوانات عندما بلغت من العمر ١٢ شهر وأيضا فى نهاية التجربة لتقدير بعض صفات الصوف خلال فترة نمو ٦ شهور (من١٢ إلى ١٨ شهر). وفى نهاية التجربة تم ذبح جميع الحيوانات وأجرى تقييم للذبائح.

وفيما يلى موجز لأهم النتائج المحتصل عليها :

١- بمقارنة الحيوانات فى المجموعتين وجد أن هناك فرق معنوى للأنشطة السلوكية اليومية الخاصة بالتغذية والاجترار والرقاد وأيضا الوقوف، وذلك خلال فترات الملاحظة نهارا (من ٧ صباحا إلى ٧ مساء)، ولكن لم يلاحظ أى فروق معنوية لهذه الأنشطة بين المجموعتين خلال فترة الملاحظة ليلا(من ٧ مساء إلى ٧ صباحا) .

٢- سجلت الحيوانات فى المجموعة (ب) زيادة معنوية فى كل من وزن الصوف النظيف وطول الصوف، أيضا كان هناك زيادة غير معنوية فى قطر الياف الصوف. وقد كان لنظام المسكن تأثير معنوى على كل من نسبتى الفقد فى الصوف وكذلك الكمب، حيث أعطت الحيوانات فى المجموعة(أ) جزات خفيفة ذات صوف قصير مع وجود نسبة فقد عالية من الصوف أثناء عملية الغسيل .

٣- سجلت حيوانات المجموعة (ب) زيادة معنوية فى معدل النمو اليومى من عمر ٦ إلى ١٢ شهر (١٤٩,٣٩جرام يوميا) مقارنة بالمجموعة(ا) (١١٣,١٧جرام يوميا) ولكن عند عمر ١٢ إلى ١٨ شهر كان معدل النمو اليومى متماثل فى المجموعتين، وعموما أدى نظام المسكن المفتوح إلى زيادة غير معنوية فى معدل النمو اليومى بمقدار ١٨،٢٥٪ خلال فترة التجربة من ٦ إلى ١٨ شهر ، هذا وقد كانت الحيوانات فى المجموعة (ب) هى الأكثر فى الغذاء المأكول يوميا وأحسن فى الكفاءة الغذائية.

٤- سجلت الحيوانات فى المجموعة(ب) زيادة غير معنوية فى بعض صفات الذبيحة ولكن هذه الزيادة كانت معنوية فى وزن الفروة، على العكس من ذلك سجلت المجموعة (ا) زيادة معنوية فى معدل ترسيب الدهن المخزن (المفضل) من النتائج السابقة يمكن القول أن وضع حملان الأغنام خلال فترة التسمين تحت نظام المسكن المفتوح أدى إلى تنشيط التغذية مما نتج عن ذلك زيادة المأكول وزيادة فى معدل النمو اليومى فى الجسم والصوف.