

## STRESS RESULTING OF MANAGEMENT PRACTICES ON SHEEP HERDS

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### ABSTRACT

The present study was conducted to study the effect of some management practices applied in sheep farms on behaviors performance. Thirty five lambs with average weight of  $5.8 \pm 0.5$  kg and age  $15 \pm 1.6$  days and thirty eight ewes lambs with average weight of  $28 \pm 0.5$ kg in the first or second shearing seasons.

Behaviour standing idle and recumbence frequency were higher ( $P < 0.05$ ) significantly in castrated and docked lambs in comparison with control.

There was significant ( $p < 0.001$ ) decreased in walking behaviour in docked and castrated lambs, while calling behavior was significant ( $P < 0.01$ ) increase in comparison with control group

Suckling behaviour were significantly ( $P < 0.01$ ) decrease in docked (1.0) and castrated (2.4) lambs were significant ( $P < 0.01$ ) decrease than control (4.8) group, while no significant difference in try suckling and water drinking among the studied groups. Conversely, there was a significant ( $P < .01$ ) difference in feeding behaviour between groups.

Abnormal standing was significantly ( $P < 0.01$ ) increased with in castrated lambs (9.4) followed by docked lambs (8.8) were significant ( $P < 0.01$ ) increased in comparison with control (0.4) group. There was a significant ( $P < 0.01$ ) difference in abnormal lying between castrated (1.7) and docked lambs (0.5) lambs while it was not recorded in the control group.

There was no significant difference in ADG between groups during the period from birth to weaning except in the fourth week of age where a significant ( $P < 0.05$ ) increase in ADG noticed in docked (200.0g) than control (60.09g) lambs.

There was no significant difference in behaviour of shorn and unshorn ewes except in grooming behaviour which was significantly ( $P < 0.001$ ) in increased in shorn than unshorn ewes which was 10.3 in shorn and 1.3 in unshorn. Docking and castration might be more favorable compared untreated one.

**Key words:** *management practices, castration, docking, shearing. Behavior, performance.*

### INTRODUCTION

Raising sheep is important to farmer's economies where sheep can give milk, wool, and meat.

Stress is the biological response elicited when an individual being under a threat to its homeostasis (Moberg, 2000). The individuals tries to relieve stress (keep homeostasis) by behavior response or alteration of various physiological and biochemical response to readjust animals biology for possible new state of homeostasis with a different set- point (Yousef, 1988). This is carried out through a mechanism including the transmission of the stress to the hypothalamus via the neurotransmitters. The hypothalamus enhance the various body systems (neuroendocrine, immune, autonomic nervous) and behaviour.

A major advantage of behavior whether manifesting a rapid or slow onset, is that it is immediately seen thereby allowing speedy assessment unlike the rapid physiology responds that took some times after an event.

Docking and castration were managed as severe stressors that lambs may encounter as a part of routine husbandry (Turner, et. al., 2006).

Shearing is necessary for the well-being of sheep as in hot weather sheep with too much wool is extremely susceptible to heat stress. Shearing keeps stained wool and mud-

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contaminated wool separate from new fleece growth, however it could be of negative effect when applied at an inappropriate time. Another stress factor could result of shearing when animal exposed to wet weather either under severe cold or intense hot sunshine. Shearing itself is a stress on the animal. Corticoid levels increase regardless of the method used and it is believed that noise, heat and contact of the clippers induce this reaction (Rushen and Conghon, 1986; Hargreaves and Hutson, 1990).

### MATERIALS & METHODS

This study was carried out in Seds Agriculture Research Station belonging to Animal production Research Institute, Beni-Suef Governorate.

In the first experiment, forty apparently healthy lambs, 20 males and 20 females, with average weight  $5.8 \pm 0.5$  kg and aged 15-18 days were divided into four equal groups. Ten male lambs were castrated by Burdizzo and ten female lambs were docked surgically and the rest of lambs kept as control.

In the second experiment, thirty eight apparently healthy ewe lambs with average weight  $28 \pm 0.5$  kg in the first and second shearing season were used. Nine ewes were shorn at spring while 10 ewes were shorn at autumn season and the rest kept unshorn. All animals were housed in partially sheltered and fenced yards at a stocking rate  $1.1 \text{ m}^2/\text{head}$  on earth floor. Animals fed according to the Institute allowances (compatible with NRC).

#### Management Practices:

**Castration:** Ten male lambs were castrated by using bloodless castrating clamp (Burdizzo) which crush and cease (Thronton and Waterman-Pearson, 1999).

**Docking:** Ten female lambs were tail docked by surgical amputation of tail by sharp scalpel and the incidence of hemorrhage was reduced through crushing the dock for 2 minutes by using Burdizzo. The Burdizzo was applied between the caudal vertebrae about 1.5 inch from the body to the tail. Local antibiotic were

administered for prevention of tetanus or any other infection may rested from open wound, as described by Susan (2007)

**Shearing:** Twenty ewes were chosen for this experiment over two shearing seasons. Hand shearing was applied in room, clean and dry place each ewe was restrained by tying the fore and hind limbs of the upper most side, while the animals was laterally lie on the other side. Shearing was begun from the neck toward the tail.

#### Behavioral and recording:

Behavioral patterns of castrated, docked and control lambs were recorded for 180 minutes after application of management practices with 2 minutes interval (as suggested by Molony *et. al.* . 1993, Molony and Rent 1997 and Molony *et. al.* ,1997).

The behavioral recording studies were carried for:

#### 1. Comfort behaviour:

This behaviour pattern was carried out as described by (Fraser and Broom, 1990) including the following:

**1.1. Standing idle:** it describes the pointless positioning with all four feet. It includes failed attempts at lying, as described by (Anderson 2003).

**1.2 Sternal recumbency:** Lambs were lie on the brisket where fore legs flexed beneath the thorax and the hind legs either flexed beneath body or the spinal column is held in a lateral to the side of the body (Fraser and Broom1990)

**1.3 Sleep:** The animals are recumbent on the brisket with the fore legs flexed beneath the thorax, the spinal column is held in a lateral arc, and the head is tucked or turned to the flanks or lie with their body resting on the object such as wall and the fore and hind limbs were extended with closed eyes.

**2. Body care behaviour:** This behaviour pattern was described by Fraser and Broom (1990) included the following:

**2.1 Grooming behaviour:** in which lambs scratch the accessible parts of the body with their teeth or claws.

**2.2 Elimination behaviour:** This include behaviour of urination and defecation.

**2.3 Social behaviour:** Include the following:

**I.** Walking which is locomotive behaviour through they house.

**II.** Playing; include playful running, jumping, and contering and butting.

**III.** Calling it is the behaviour of vocalization.

**2.4. Feeding behaviour.**

**2.4.1 Suckling:** Lambs obtained milk from their dams safely which indicated by tail wagging.

**2.4.2 Try suckling:** Lambs try to obtain some milk from one to both teats but fail in obtaining it.

**2.4.3 Drinking:** water drinking from the water through and application intervals.

**3. 5. Abnormal behaviour:**

To study the behaviour patterns of shorn ewes the following measurement were allied:

**3.5.1 Abnormal standing:** indicated by a standing lamb exhibiting unusual posture, including around, hunched appearance, unusual head positions, or exhibiting unusual immobility as described by (Lester, *et. al.* 1996)

**3.5.2 Abnormal lying :** indicated by lamb lying on its fore limbs carrying its hind quarters on higher object, or lamb lying pillow its back on the wall and its four limbs were extended, lamb lie with its body, neck and head parallel one of its fore limbs rested on higher objects

**3.5.3 Abnormal walking:** In which lambs walk with arched back, abduction of hind limbs and the animal walk very slowly

**3.5.4 Displacement activities:** Is an action that performed out of its normal context while the animal is in a state of stress.

**3.5.4.1 Restless score (points) :** which is sum of the number of times during a given period that a lamb stood up or lay down, with point awarded each time it stood up and point each

time it lay down . As described by (Lester, *et. al.*, 1996)

**3.5.4.2 Others:** such as pawing with fore limbs chewing trials for inedible objects and taking forage by mouth and throw it without chewing.

**Behavioral patterns recorded for shorn ewes were the following:**

**1- Growing behaviour:**

- **Oral grooming:** in which ewes scratch the accessible parts of the body with their teeth.
- **Head shaking:** in which ewes shake their heads from side to side.
- **Complete body shaking:** ewes make complete body shaking.

**2. Social behaviour:**

- **Walking:** It is the locomotive behaviour through the house.
- **Calling:** It is the behaviour of vocalization.
- **Butting:** which either playful butting or aggressive butting between ewes.

**3. Comfort behaviour:**

**Standing idle:** which describe the pointless poisoning with all four feet.

**4. Performance:**

Lamb performance was expressed as average daily gain (ADG) and changes in body measurements including (chest girth, height and length) from birth till puberty according to Virtala, *et. al.*, (1996) Sulieman, *et. al.*, (1990) and Atta & El khidir, (2004), respectively.

**4.1. Average daily weight gain (ADG):** It was calculated according to (Awgicew, 2001 ) :

$$ADG = \frac{W_2 - W_1}{A} \times 1000$$

Where: ADG Average daily gain in gram.

W1= Birth weight or weight at the preceding age.

W2 = weight at a given age.

A = days between weighing dates.

**5. Statistical analysis:**

Results were statically analyzed by the use of one way ANOVA (F Test and T Test) according to (Snedecor and Cochran 1989).

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## RESULTS & DISCUSSION

### *Effect of castration and docking on comfort and body care behaviour in lambs:*

Data in Table (1) showed that behavior of standing idle more frequent ( $P < 0.05$ ) significantly in castrated (13.0) and docked (11.4) lambs than the control (4.4). This may be away to minimize stimulation of sensitized noiceptors, as found in damaged or inflamed tissues. Such result is parallel to that reported by Shuttet *et al.*, 1988; Murray, 1989; Molony *et al.*; 1993; Mellor; 1994; Robertson *et al.*, 1994; Molony *et al.*, 1995; Lester *et al.*, 1996; and Saleem *et al.*, 2003.

The count of recumbence frequency for castrated group was higher ( $P < 0.05$ ) significantly than docked and control group by 48.82 and 47.06%, respectively. This result might be attributed to that lambs may exhibit the position which is comfortable for them and can minimize pain. The same data were obtained by (Hand Werker and Reeh 1991; Mahrous 2001; Saleem *et al.* 2003 and Jaggin *et al.* 2006). Further more, the lower ( $P < 0.05$ ) significantly for frequency of sheep in dock group than castrated or control group may be pointed to the pain produced by castration and docking procedures.

**Table (1): Effect of castration and docking on comfort and body care behaviour in lambs.**

Behavioral pattern	Male			Female			$\pm SE^3$
	Control	Castrated	$\pm SE^1$	Control	Docked	$\pm SE^2$	
<b><i>Comfort behaviour</i></b>							
Standing idle	4.33 $\pm$ 0.3 <sup>Bb</sup>	13.0 $\pm$ 2.5 <sup>Aa</sup>	$\pm$ 1.49	4.33 $\pm$ 0.3 <sup>Bb</sup>	11.4 $\pm$ 1.9 <sup>Aa</sup>	$\pm$ 1.05	$\pm$ 1.29
Decumbency	9.00 $\pm$ 0.6 <sup>Bb</sup>	17.0 $\pm$ 1.6 <sup>Aa</sup>	$\pm$ 1.16	9.00 $\pm$ 1.5 <sup>B</sup>	9.0 $\pm$ 0.9 <sup>B</sup>	$\pm$ 1.35	$\pm$ 1.25
Sleep	8.33 $\pm$ 0.3 <sup>A</sup>	7.5 $\pm$ 1.2 <sup>A</sup>	$\pm$ 1.05	8.33 $\pm$ 1.3 <sup>Aa</sup>	3.0 $\pm$ 0.5 <sup>Bb</sup>	$\pm$ 1.03	$\pm$ 1.04
<b><i>Body care</i></b>							
Grooming behaviour	0.00 $\pm$ 0.0 <sup>Bb</sup>	1.0 $\pm$ 0.3 <sup>Ba</sup>	$\pm$ 0.00	0.00 $\pm$ 0.0 <sup>Bb</sup>	1.33 $\pm$ 0.3 <sup>Aa</sup>	$\pm$ 0.24	$\pm$ 0.17
Detection	0.00 $\pm$ 0.0	0.1 $\pm$ 0.1	$\pm$ 0.00	0.00 $\pm$ 0.0	0.00 $\pm$ 0.0	$\pm$ 0.00	$\pm$ 0.00
Urination	0.67 $\pm$ 0.3	0.2 $\pm$ 0.2	$\pm$ 0.24	0.33 $\pm$ 0.3	0.2 $\pm$ 0.1	$\pm$ 0.24	$\pm$ 0.24

Results are expressed as means  $\pm$  standard error ( $\pm SE$ , 1= for Castrated 2= for Docked and 3= for Castrated and Docked).

The behaviour patterns were recorded as a frequency.

<sup>a,b,c</sup> superscripts within the rows indicates significant difference at  $P < 0.05$ .

### *Effect of castration and docking on social behaviour of lambs:*

The results in Table (2) show that there was significant ( $p < 0.001$ ) decrease in walking behaviour for docked (2.0) and castrated (3.7) than control (6.5) group. This finding may be due to the pain produced by castration and docking procedures that make the lamb prefer to spend most time in resting rather than walking to minimize pain. This is in agreement with Shutt *et al.* (1988), Mellor *et al.* (2000), Mahrous (2001) and Saleem (2003). Furthermore, there was significant ( $P < 0.01$ ) increase in calling behaviour in docked (22.4) and castrated (4.5) than control (0.1) group. This reaction appeared to be related to time required to fully crush the scrotum. These results can lead to conclude that castration and

docking of lambs decreased their active behaviour (walking and playing) and increased the calling behaviour.

### **Effect of castration and docking on feeding behaviour of lambs:**

Table (3) show significant decrease ( $P < 0.01$ ) in suckling frequency of docked (1.0) and castrated (2.4) than control (4.8) group. This might be due to the distress caused by pain, a result in accordance with Saleem *et al.* (2003) and Jagging *et al.* (2006). There was no significant difference in try suckling between the studied groups. Conversely, there was a significant ( $P < 0.01$ ) difference in feeding behaviour between groups. Such results may be also due to pain encountered in treated animals. There was no significant difference in

drinking behavior. It appeared that castration and docking of lambs lead to decrease suckling and feeding frequencies but they have no significant effect on try suckling or drinking frequency.

**Table (2) : Effects of castration and docking on social behaviour of lambs**

<u>Behavioural patterns</u>	Male			Female			±SE <sup>3</sup>
	Control	Castrated	±SE <sup>1</sup>	Control	Docked	±SE <sup>2</sup>	
Walking	6.53±0.98 <sup>A</sup>	3.7±0.7 <sup>BC</sup>	±0.80	5.43±0.56 <sup>Aa</sup>	2.0±0.6 <sup>Cb</sup>	±0.45	±0.65
Playing	0.38±0.06 <sup>Aa</sup>	0.1±0.0 <sup>Bb</sup>	±0.04	0.23±0.03 <sup>AB</sup>	0.3±0.2 <sup>A</sup>	±0.05	±0.04
Calling	0.10±0.00 <sup>Cb</sup>	4.5±0.3 <sup>Ba</sup>	±0.47	0.10±0.00 <sup>Cb</sup>	22.4±2.7 <sup>Aa</sup>	±2.37	±1.71

Results are expressed as means ±standard error (±SE, 1= for Castrated 2= for Docked and 3= for Castrated and Docked).

The behaviour patterns were recorded as a frequency.

<sup>a,b,c</sup> superscripts within the rows indicates significant difference at P < 0.05.

**Table (3): Effects of castration and docking on feeding behaviour of lambs.**

<u>Behavioural patterns</u>	Male			Female			±SE <sup>3</sup>
	Control	Castrated	±SE <sup>1</sup>	Control	Docked	±SE <sup>2</sup>	
Suckling	4.80±0.7 <sup>Aa</sup>	2.40±0.6 <sup>Bb</sup>	±0.60	4.80±0.3 <sup>Aa</sup>	1.00±0.3 <sup>Bb</sup>	±0.23	±0.43
Try Suckling	1.10±0.2	1.60±0.2	±0.20	1.03±0.2 <sup>b</sup>	1.20±0.1 <sup>a</sup>	±0.16	±0.18
Ingestion	3.40±0.5 <sup>Aa</sup>	0.00±0.0 <sup>Bb</sup>	±0.35	3.37±0.6 <sup>Aa</sup>	0.00±0.0 <sup>Bb</sup>	±0.40	±0.38
Drinking	0.10±0.0 <sup>Bb</sup>	0.50±0.1 <sup>Aa</sup>	±0.04	0.10±0.0 <sup>Bb</sup>	0.20±0.3 <sup>Ba</sup>	±0.20	±0.03

Results are expressed as means ±standard error (±SE, 1= for Castrated 2= for Docked and 3= for Castrated and Docked).

The behaviour patterns were recorded as a frequency.

<sup>a,b,c</sup> superscripts within the rows indicates significant difference at P < 0.05.

**Relationship between castration or docking of lambs and their abnormal behaviour:**

As shown in Table (4) there was significant (P<0.01) increase in abnormal standing for castrated (9.4) followed by docked (8.8) in comparison with control (0.4) group. This support that lambs apply the posture, such as arching his back or statue standing, can relive or decrease pain, a matter compatible with the report of Grant (2004).

Additionally, there was a significant (P<0.01) difference in frequency of abnormal lying between castrated (1.7) and docked (0.5) lambs while it was not recorded with the control group. These results may be attributed to that lambs (c & d) tried to avoid touching the painful parts. The given results are in line with that announced by Kent *et. al.* (1995); Molony *et. al.* (1997) and Mahrous (2001).

**Table (4): Relationship between castration or docking of lambs and abnormal behaviors.**

<u>Behavioural patterns</u>	Male			Female			±SE <sup>3</sup>
	Control	Castrated	±SE <sup>1</sup>	Control	Docked	±SE <sup>2</sup>	
<b><u>Abnormal behaviour</u></b>							
Standing	0.40±0.06 <sup>Bb</sup>	9.4±1.4 <sup>Aa</sup>	±0.98	0.40±0.1 <sup>Bb</sup>	8.8±1.3 <sup>Aa</sup>	±0.94	±0.96
Lying	0.00±0.00 <sup>Cb</sup>	1.7±0.3 <sup>Aa</sup>	±0.18	0.00±0.0 <sup>Cb</sup>	0.5±0.1 <sup>Ba</sup>	±0.04	±0.13
Walking	0.00±0.00 <sup>Cb</sup>	1.7±0.3 <sup>Aa</sup>	±0.18	0.00±0.0 <sup>Cb</sup>	1.2±0.2 <sup>Ba</sup>	±0.12	±0.16
<b><u>Displacement activities</u></b>							
Restlessness score	0.80±0.12 <sup>Bb</sup>	3.7±0.6 <sup>Aa</sup>	±0.40	0.83±0.1 <sup>Bb</sup>	2.9±0.4 <sup>Aa</sup>	±0.31	±0.36
Others	0.00±0.00 <sup>Cb</sup>	1.2±0.2 <sup>Ba</sup>	±0.12	0.00±0.0 <sup>Cb</sup>	2.1±0.3 <sup>Aa</sup>	±0.22	±0.18

(SE, 1= for Castrated 2= for Docked and 3= for Castrated and Docked).

The behaviour patterns were recorded as a frequency.

<sup>a,b,c</sup> superscripts within the rows indicates significant difference at P < 0.05.

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**Table (5): Effect of castration and docking on average daily weight gain (g/h/d) throughout the period from birth to weaning:**

Item	Age (week)							
	2	4	6	8	10	12	14	16
<b><i>Average daily weight gain for castrated male lambs:</i></b>								
Castrated	180.0 ±80.0	200.0 ± 20.0	100.0 ± 0.0	100.0 ±0.0	100.0 ±0.0	100.0 ±0.0	150.0 ±30.0	86.0 ±10.0
Control	260.0 ±30.0	100.0 ± 20.0	90.0 ±10.0	100.0 ±0.0	100.0 ±40.0	150.0 ±50.0	150.0 ±70.0	100.0 ±30.0
<b><i>Average daily weight gain for docked female lambs:</i></b>								
Docked	180 ±40	200.0 ± 10.0	100.0 ±3.0	100.0 ±0.0	70.0 ±10.0	100.0 ±4.0	60.0 ±20.0	100.0 ±30.0
Control	200.0 ±50.0	60.0 ± 40.0	100.0 ±10.0	100.0 ±4.0	80.0 ±10.0	70.0 ±40.0	60.0 ±0.0	150.0 ±70

Results are expressed as means ±standard error (S.E).

\*superscripts within the rows indicates significant difference at  $p < 0.05$ .

***Effect of castration or docking on average daily gain weight from birth to weaning in lambs:***

Data in Table (5) show no significant difference in average daily gain, a finding which is in close agreement with that of Pang *et. al.* (2006). There was no significant difference in ADG between groups through the period from birth till weaning except in the fourth week of age where a significant ( $P < 0.05$ ) increase in ADG in docked (200.0g) than control (60.09) was noticed. This trend is supported by that of Shelton (1990) and Rhods *et. al.* (1994). This may be due to the obvious decrease in weight gain of control, in this

week, rather than being related to the comparable increase in ADG of docked lambs. This may be confirmed by the observation that this significant difference was not found except this age (the fourth week).

***Effect of castration and docking on ADG throughout the period from weaning to puberty of lamb:***

As shown in Table (6) there was no significant difference in ADG between castrated or docked lambs and control lambs throughout the period from weaning to puberty.

**Table (6): Effect of castration and docking on average daily weight gain (g/h/d) throughout the period from birth to weaning:**

Item	Age (months)							
	5	6	7	8	9	10	11	12
<b><i>Effect of castrated male on ADG from birth to weaning:</i></b>								
Castrated	200.0 ±40	70.0 ± 10.0	100.0 ±3.0	100.0 ±30.0	100.0 ±30.0	150.0 ±3.0	50.0 ±20.0	100.0 ±30.0
Control	150.0 ±50.0	80.0 ± 10.0	100.0 ±10.0	100.0 ±30.0	100.0 ±30.0	140.0 ±20.0	100.0 ±3.0	100.0 ±0.0
<b><i>Effect of Docked female on ADG from birth to weaning:</i></b>								
Docked	76.0 ±10	79.0 ± 30.0	80.0 ±2.0	100.0 ±30.0	85.0 ±7.0	115.0 ±15.0	100.0 ±0.0	115.0 ±15.0
Control	22.0 ±10.0	60.0 ± 38.0	90.0 ±30.0	125.0 ±25.0	125.0 ±30.0	125.0 ±20.0	105.0 ±20.0	97.0 ±0.0

Results are expressed as means ±standard error (S.E).

\*superscripts within the rows indicates significant difference at  $p < 0.05$ .

**Table (7): Relationship between shearing and some behaviour patterns of ewes.**

Behavioral Patterns	Groups	
	Shorn	unshorn
<b><u>Grooming behaviour</u></b>		
Oral Grooming	10.3±0.9***	1.3±0.3
Head Shaking	1.0±0.6	1.7±0.7
Complete body Shaking	1.7±0.3	1.0±0.6
<b><u>Social behaviour</u></b>		
calling	1.3±0.7	1.3±0.7
walking	41.0±1.5	41.3±0.8
butting	1.0±0.6	0.7±0.7
<b><u>Comfort behaviour</u></b>		
Standing idle	3.0±0.6	4.3±1.3
<b><u>Feeding behaviour</u></b>		
Eating con	7.0±1.2	8.0±1.2
Eating hay	22.7±2.3	22.0±1.5
Drinking water	3.0±1.0	3.7±0.3

Results are expressed as means ±standard error (S.E).

The behaviour patterns were recorded as a frequency.

\*\*\* Superscripts within the rows indicates significant difference at  $p < 0.0001$ .

***Relationship between shearing and some behaviour patterns of ewes:***

Table (7) show that there was no significant difference in behaviour of shorn and un shorn ewe except grooming behaviour which was significantly ( $P < 0.001$ ) increased in shorn than unshorn ewes (10.3 vs. 1.3, respectively). This trend is also supported by Benjamin and Patricia (2004), and Hart and Pryor (2004), whom reported that immediately after shearing the skin undoubtedly shows different set of cutaneous stimuli compared to the status under the fully fleeced condition and possibly evokes some grooming or rubbing.

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### الملخص العربي

#### الإجهاد الناجم عن بعض نظم الرعاية في قطعان الأغنام

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تمت الدراسة على عدد 40 حمل (ذكور واناث) بمتوسط وزن  $0.5 \pm 5.8$  كجم ومتوسط عمر 15-18 يوم وكذلك 38 حولية بمتوسط وزن  $0.5 \pm 28$  كجم اما بموسم الجز الاول او الثانى لها.

1 - خصى الحملان نتج عنه زيادة معنوية فى الوقوف الساكن والنداء وعدم الراحة وبعض الانماط السلوكية فى الوقوف والرقاد والمشى كما نتج نقص معنوى فى سلوك النوم والمشى.

2 - لم يكن هناك تأثير معنوى للخصى وقطع الذيل على كفاءة النمو فى الحملان .

3 - نتج عن جز الصوف زيادة معنوية فى سلوك العناية بالجسم.

تم اجراء خصى لعدد 10 حملان باستخدام اداة الهرس- كما تم قطع الذيل جراحيا لعدد 10 حوليات اما باقى الحملان فقط تركت كمجموعات مقارنة. كما تم جز عدد 9 حوليات فى الخريف وكذلك جز 10 حوليات فى الربيع مع جعل مجموعة مقارنة لكل منهما . تم دراسة تأثير الخصى وقطع الذيل على سلوك الراحة ورعاية الجسم والسلوك الاجتماعى وعلى سلوك التغذية للحملان . كما درست العلاقة بين الخصى وقطع الذيل والسلوك الشاذ على معدل النمو من الولادة وحتى

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