IMPACT OF DOCKING ON GROWTH TRAITS, CARCASS CHARACTERISTICS AND SOME BLOOD PARAMETERS OF MALE BARKI LAMBS

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SUMMARY

This study was conducted to evaluate the effect of docking on growth performance, carcass characteristics and some blood parameters of Barki lambs. A total number of 13, single-born, male Barki lambs with an average birth weight of 3.0 ± 0.20 kg were used Lambs were randomly assigned into two groups: docked group (n = 6) and undocked group (n = 7), as a control. Male lambs were docked within two days after birth by applying a tight rubber ring using an elastrator. The experimental period lasted for one year. The obtained results revealed that docked lambs were significantly (P<0.05) heavier than undocked lambs at weaning weight (90 days of age) and had better average daily gain. The docked lambs scored average weaning weight of 16.6 kg meanwhile the undocked lambs scored 14.85 kg and the average daily gain (ADG) was 149g and 139g, respectively. The docked lambs had a higher weights, ADG and total weight gain during the finishing period than undocked lambs. Total weight gains during the finishing period were 22.2 kg and 26.4 kg for the undocked and docked lambs with corresponding estimates for post weaning daily gain of 55.5 gm and 70.6 gm, respectively. Docked lambs were higher than undocked ones in slaughter weight (SW), post slaughter weight (PSW), empty body weight (EBW), hot carcass weight (HCW) and dressing percentage (DP). Results revealed that, Docked lambs exceeded the undocked ones by 15.6%, 16.6%, 15.9% and 17.7% in SW, PSW, EBW and HCW, respectively. No significant differences (p>0.05) between groups in moisture, fat percentages and collagen except for protein (19.71 and 18.89 %) for docking and control lambs, respectively. There was no significant difference (p<0.05) in cholesterol level between undocked and docked lambs at the end of fattening. The results indicated that the tail docking of Barki lambs at birth improved weight gain and desirable carcass characteristics compared to those of undocked lambs.

Keywords: Barki lambs, tail docking, growth performances, carcass characteristics, blood parameters

INTRODUCTION

Human population in Egypt has been increasing at a rapid rate of 2.8 % during the last ten years as reported by Central Agency for Public Mobilization and Statistics (CAPMS, 2015), a fact that makes the increasing rate of red meat production short of fulfilling the demand of such increasing population. Total domestic red meat production was 797 thousand tons, while consumption was 1400 thousand tons (50 % self sufficiency). Thus, Egypt faces a red meat gap challenges.

Mutton represents an important contribution to domestic red meat production, amounting 10% of the total domestic meat production in Egypt (CAPMS, conditions of the North Western Coastal area of Egypt. Research on that breed showed that Barki sheep are hardy but of low productivity. Due to the ever-increasing demand on red meat in Egypt, efforts are being made to adopt good management practices, primarily lamb, under which the Barki sheep produce. Undoubtedly, the main role of fat tail is to serve as an energy store, providing a survival buffer against periodic food scarcity such as in drought and winter (Nazifi*et al.,* 2010; Njidda and Isidahomen, 2011). However, docking operation as yet, is not a common practice in the areas that raise fat tailed animals, because consumers prefer carcass with undocked fat tail (Marai and Baghat, 2003). 2015). However, the current meat production of native sheep breeds is far from optimal. The traditional management practices, poor environmental conditions, economic limitations, lack of organizations among producers and genotypic characteristics of sheep are restrictive factors for optimum meat production. Short term solutions mainly depended on importing frozen meat and live animals. While, long term policies mainly depend on improving the biological performance of native livestock through improving productivity by applying better management practices and introducing suitable techniques to improve meat production.

Barki sheep have evolved under semi-arid

Therefore, the objectives of the current study were to evaluate the effect of tail docking on growth performance and carcass characteristics of fat-tailed male Barki lambs.

MATERIAL AND METHODS

Study location:

The current study was carried out at Tegzerty Experimental Farm for Animal Production, located at Siwa Oasis and belongs to Desert Research Center, Ministry of Agriculture and Land Reclamation. This station is located at 330 km south west of the Mediterranean shoreline and at 65 km east of the Libyan borders.

Experimental design:

At the first week of lambing season, a total number of 13, single-born, male Barki lambs with an average birth weight of 3.0±0.20 kg were used and randomly assigned into two groups: docked group (n= 6) and undocked group (n= 7), as a control. Male lambs were docked within two days after birth by applying a tight rubber ring using an elastrator. Rubber ring was fixed after the 2nd and before the 5th tail vertebras down the tail. After the tail docking operation, the tail fell off within 2 weeks. The experimental period lasted for one year. Lambs weights were recorded before the morning feeding at the beginning of the study and biweekly, thereafter, throughout the study period. At the end of finishing period, all lambs were slaughtered and carcass data were collected.

Management practices:

Lambs were kept with their dams for 3 months. All lambs were weaned at three months of age and then placed on a finishing diet. Male lambs were housed in shaded pens and fed twice a day with two equal meals at 09:00 AM and 15:00 PM and they had continuous access to fresh water and vitamin/mineral blocks over the experimental period. Docked and undocked lambs were fed according to NRC (1985). The experimental lambs were fed 0.50 kg to 1.0 kg/head/day concentrate mixture pellets (14 % crude protein) comprised of corn, wheat bran, unshelled cotton seed, limestone and salt, in addition, clover hay and rice straw were provided.

Blood samples:

Blood samples of volume 5 ml were collected from all lambs just before slaughter from the jugular vein and placed into tubes containing lithium heparin as anticoagulant. Blood samples were centrifuged at 3500 rpm for 20 min to obtain the plasma samples and stored at -20°C for the biochemical analysis. Serum urea, total protein, triglycerides, cholesterol and blood glucose concentrations were estimated.

Slaughter data:

At the end of the experiment, all lambs were slaughtered after fasting for 24 hrs. Carcasses were chilled at an average temperature of 4° C for 24 hrs (Frild *et al.*, 1963). Samples of eye muscle (*Longsimus dorssi*) were collected from the carcass (rib cut) to evaluate the physical and chemical properties of male Barki lambs meat.

Wholesale cuts and Physical components of 9-10-11 rib cut:

After chilling, each chilled carcass was cut into seven joints (neck, shoulder, rack, flank, loin, leg and tail) according to the Egyptian wholesale mutton cuts as described by Hamada (1976). Chilled carcasses and wholesale cuts were weighed to calculate percentages of chilled carcass weight. The 9-10-11 rib cuts were separated into its physical components (lean meat, fat and bone), which were expressed as percentages of the weight of the whole rib cut. The area of the cross section of the *Longsimus dorssi* (LD) muscle was measured among the 11th and the 12th rib using a polar plane meter.

Physical parameters:

Physical properties of meat including color, cooking loss percent, water-holding capacity (W.H.C), plasticity and shear force were determined. Meat color was measured using Croma Meter (Konica Minolta, model CR 410, Japan) calibrated with a white plate and light trap supplied by the manufacturer. Color was expressed using the CIE L, a, and b color system (CIE, 1976). A total of three spectral readings were taken for each sample on different locations of the muscle. Area of the cross section of L.D muscle was measured by tracing the exact area of the exposed muscles on acetate paper between the 11th and the 12th rib using polar plane meter.

Cooking loss was determined on about 100-grams (W1) of L.D muscle samples and boiled in water for 45 minutes, then left to be cooled at room temperature and weighed again (W2) to calculate cooking loss percentage (Bouton and Harris, 1989) using the formula: (W1-W2) / W1*100. Water holding capacity (WHC) and plasticity of lambs meat were estimated by the method of Wierbicki and Deatharage (1968) using the following equation: WHC = (A2 - A1), Where: A1 = inner area of plasticity (area of meat after pressing) cm^2, A2 = outer area (area of meat plus area of free water after pressing) cm^2. Both areas were determined using a planemeter.

The cooked samples were used for determining the shear force (kg). Samples were kept in refrigerator (4 - 5 ºC) for about 12 h, before estimating shear force using Instron Universal Testing Machine (Model 2519-105, USA). Cores from each sample were taken using cylinder of 0.5 inch in diameter. Cores were removed parallel to the longitudinal orientation of muscle fibers. The shear force machine was adjusted at crosshead speed of 200 mm/min according to the procedure outlined by Shackelford *et al.* (2004).

Chemical analysis:

Meat chemical analysis of the L.D muscle was determined using Food Scan™ Pro meat analyzer (Foss Analytical A/S, Model 78810, Denmark). According to the manufacturer's instructions, about 50-100 gm of raw meat, obtained from the 9th rib, were minced and put in the meat analyzer cup. The cup was inserted into the meat analyzer for scanning sample with infrared to determine the chemical components (moisture, protein, fat and collagen). Ash content was determined by burning samples in a muffle furnace at 600˚C for eight hrs. The pH value of lamb's meat was determined after slaughter and 24 hrs from slaughter using a pH meter (Portable Digital Waterproof HANNA model HI 9025).

Sensory Evaluation:

Samples from loin cut of each lamb were cooked

just after slaughter (boiled in tap water for 45 minutes). After cooking, samples were judged for sensory evaluation by serving to nine panelists in Maryout Research Station to evaluate aroma, flavor, tenderness, juiciness and palatability. Each trait was scored on a scale from 1 to 5 representing the grades of very poor, poor, fair, good and very good, respectively.

Statistical analysis:

The collected data of productive performance of the studied lambs, (initial live body weight, final live body weight, total weight gain and average daily gain (ADG)) throughout the pre-weaning and finishing periods, were statistically analyzed to compare variations in productive performance and carcass characteristics as influenced by tail docking using the General Linear Model (GLM) procedures described by SAS (2004). The following fixed effect linear model was applied:

$$Y_{ij} = \mu + t_i + e_{ij}$$

Where:

Y_{ij} = the observations,

μ = the overall mean,

t_j = the effect due to i^{th} experimental group, i = 1,2, and e_{ij} = random error associated with the ij^{th} observation. The significant differences among groups were tested according to Duncan's new multiple ranges test (Duncan, 1955). Some data that expressed as percentages were analyzed after transforming by arcsine transform methods.

RESULTS AND DISCUSSION

Growth performance:

Results of growth performance during the experimental period of the undocked lambs (control) and docked lambs are given in Table 1 and Figure 1. From Table1, it could be noticed that, the average initial birth weight was almost similar (3.17 kg vs. 3.13 kg) and with no significant difference. This result is in agreement with Isani *et al.* (2012) who reported that, the difference between birth weights of purebred docked and purebred undocked lambs was not significant. The obtained results revealed that, docked lambs were significantly ($P<0.05$) heavier than undocked lambs at weaning weight (90 days of age) and average daily gain. The docked lambs scored average weaning weight of 16.6 kg, meanwhile the undocked lambs scored 14.85kg and the average daily gain was 149g and 139g, respectively. These results are in agree with Naziha *et al.*(2011) who reported that, docked Barbarine lambs showed better pre-weaning growth than control ones. The obtained results confirmed that, docking with rubber ring did not typically affect live weight gain as reported by Kent *et al.*, (2000). In contrary, Al jassim *et al.* (2002), Mari and Behgat (2003), Moharrery (2007) and Isani *et al.* (2012) reported that, tail docking had no significant effect ($P>0.05$) on growth rate of lambs from birth to weaning.

Table1. Least squares means±S.E. of body weight for undocked and docked Barki lambs during the experimental period

Trait	Overall $\bar{x}$ ±SE	Undocked lambs $\bar{x}$ ±SE	Docked lambs $\bar{x}$ ±SE
No. of lambs	13	7	6
Birth weight (kg)	3.17 ± 0.013	3.13 ± 0.02	3.17 ± 0.02
Initial weight (kg)	15.73 ± 0.41	14.85[a] ± 0.52	16.62[b] ± 0.3.5
Weight at 6 months (kg)	25 ± 1.98	22.6[a] ± 1.97	27.5[b] ± 1.42
Weight at 9 months (kg)	32.8 ± 1.04	29.9 ± 2.05	33.5 ± 0.65
Final weight (kg)	41.56 ± 1.68	38.56 ±2.51	44.56 ±1.38
Total weight gain (kg)	23.8	22.2	26.4
Daily weight gain (gm)	139.6 ± 0.04	130[a] ± 0.05	149[b] ± 0.03
Post weaning daily gain (gm)	63 ± 4.73	55.5 ± 8.05	70.6 ± 2.71

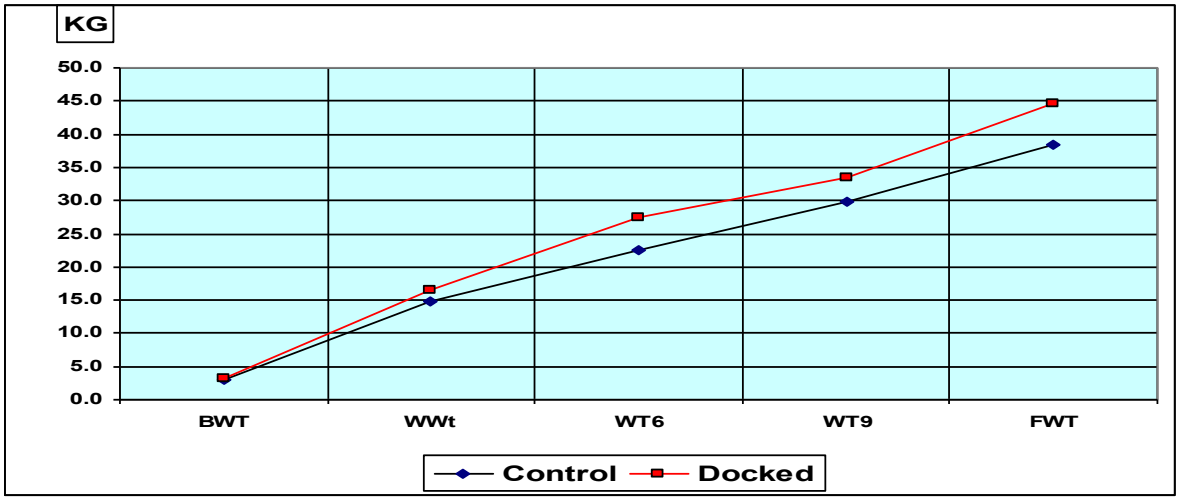

Figure 1. Live body weight changes of the studied lambs throughout the experimental period

Live body weight changes:

Live body weight changes of undocked and docked lambs during the finishing period are presented in Figure 1. Results showed that, the docked lambs had higher weights, ADG and total weight gain during the finishing period than undocked lambs. Total weight gains during the finishing period were 22.2 kg and 26.4 kg for the undocked and docked lambs with corresponding estimates for post weaning daily gain of 55.5 gm and 70.6 gm, respectively. These results are in accordance with those reported by Bicer *et al.* (1992), Al Jassim *et al.* (2002), Gokdal *et al.* (2003), Moharrery (2007) and Sarvar *et al.* (2009) who revealed that, the docking operation resulted in higher ADG and total weight gain in the fattening period than intact animals.

In contrast, Bingoal *et al.* (2006) and Dahal (2011) reported that growth traits (average daily gain, final body weight) in the fattening period were not significantly different between intact and docked lambs. Also, they found no significant differences between docked and intact lambs in ADG and total weight gain over the total period from birth to the end of fattening.

Carcass characteristics:

The results in Table 2 showed that, docked lambs were higher than undocked ones in slaughter weight (SW), post slaughter weight(PSW), empty body weight (EBW), hot carcass weight (HCW) and dressing percentage (DP). The results declared that, there are significant differences ($P<0.05$) between undocked lambs and the docked ones in PSW and EBW, while tail docking had no significant effect ($P<0.05$) on HCW and dressing percentage. Results in Table (2) revealed that, docked lambs exceeded the undocked ones by 15.6%, 16.6%, 17.7% and 17.4% in SW, PSW, EBW and HCW, respectively. These findings are consistent with those of Shelton *et al.* (1991), Gokdal *et al.* (2003), Mari and Bahgat (2003) and Bingol *et al.* (2006) who found that the carcass weight and dressing percentage of docked were higher than that of undocked lambs. Similar results for slaughter weight, warm and cold carcass weights were reported by Isani *et al*., (2012), while disagree with Snyman *et al.* (2002).

Table 2. Least squares means ± SE of Carcass characteristics for undocked and docked male Barki lambs

Traits	Overall mean	Undocked lambs	Docked lambs
	$\bar{x}$ ± SE	$\bar{x}$ ±SE	$\bar{x}$ ±SE
Slaughter weight (kg)	41.56 ± 1.68	38.56 ± 2.50	44.56 ± 1.38
Post slaughter weight	40.04 ± 1.61	36.97[a] ± 2.3	43.11[b] ± 1.29
Empty body weight (kg)	35.91 ± 1.38	33.26[b] ± 1.95	38.56[a] ± 1.15
Hot carcass weight (kg)	21.06 ± 0.94	19.34 ± 1.39	22.77 ± 0.75
Dressing %			
% of slaughter weight	50.60 ± 0.60	50.09 ± 1.01	51.11 ± 1.70
% of empty body weight	58.50 ± 0.62	57.95 ± 1.03	59.05 ± 0.72
Organs and offals %[1]			
Head	8.46 ± 0.17	8.44 ± 0.16	8.49 ± 0.32
Feet	2.77 ± 0.09	2.92 ± 0.15	2.61 ± 0.06
Pelt	10.46 ± 0.27	10.79 ± 0.29	10.13 ± 0.43
Lungs & trachea	1.59 ± 0.16	1.67 ± 0.30	1.52 ± 0.15
Heart	0.45 ± 0.04	0.51 ± 0.05	0.38 ± 0.02
Liver	1.048 ± 0.10	1.36 ± 0.10	1.60 ± 0.17
Kidneys	0.33 ± 0.01	0.34 ± 0.03	0.32 ± 0.01
Spleen	0.75 ± 0.25	0.55 ± 0.34	1.0 ± 0.35
Testes	0.75 ± 0.04	0.72 ± 0.06	0.77 ± 0.06
Abdominal fat	0.78 ± 0.13	0.37 ± 0.26	0.82 ± 0.09
Kidneys fat	0.511 ± 0.21	0.39 ± 0.23	0.63 ± 0.36
Non-edible parts[2]	21.70 ± 0.38	22.16 ± 0.57	21.23 ± 0.47
Edible parts[3]	2.28 ±.010	2.21 ± 0.11	2.30 ± 0.17

1, Expressed as a percentage of empty body wt, 2, Non-edible parts (head +feet + pelt), 3, edible parts (heart + liver + kidneys). Means, within row with different superscripts are significantly different ($P<0.05$).

On the other hand, results showed that, there was no significant difference between docked and undocked lambs in DP although the docked lambs scored a higher value than the undocked one (59.95 *vs* 57.75), respectively. These results are in agreement with Sarvar *et al.* (2009). At the same time, docked lambs had higher weight of head, liver, spleen, testes, abdominal fat, kidney fat and edible parts than undocked lambs, but the differences were not significant. While, docked lambs had lower weights (kg) for offals items (heart, lungs, pelt, and feet). These results disagree with Al Jassim *et al.* (2002), Mari and Behgat (2003), Gokdal *et al.* (2003) and Bingol *et al.* (2006) who also reported a lower offal item weight (kg) for undocked than docked lambs. The obtained results were in agreement with Isani *et al*. (2012), Sarvar *et al*. (2009) and Moharry (2007).

It is of interest to notice that the results of testes volume (measured by water displacement) showed that, the docked lambs scored higher volume than control ones, (300 vs. 200 ml) respectively. This may be due to leptin secretion from fat tissue especially from the fat tail. Yildiz *et al.* (2003) found a significant correlation between plasma leptin and LH pulse frequency which affects the testes development. In this respect, Mummer *et al*. (2010) concluded that, the effect of docking fat tail on testicles can be taken an account in terms of reproductive and fat relation in fat tailed sheep.

Wholesale cuts:

Chilled carcass weight and wholesale cuts percentages of the two groups are presented in Table 3. Results indicated that chilled carcass weights of docked lambs were higher than control ones with insignificant effects (P>0.05) between groups. This result is in disagreement with Isani *et al.* (2012) who found that docked lambs have a higher (P<0.05) cold carcass weight than undocked lambs. Results in Table (3) reveled that, docked lambs scored higher weights of rack, (25.01kg *vs*. 24.67kg) loin, (7.04kg vs. 6.22kg) and flank percentages (P<0.05) than control ones due to tail docking (6.57 vs. 5.07), respectively. Furthermore, the other wholesale cuts showed almost similar, these results are in agreement with Sarvar *et al.* (2009).

Table 3. Least squares means ± SE of chilled carcass, wholesale cuts and physical components of 9-10-11 rib cut for undocked and docked male Barki lambs

Traits	Overall mean	Undocked Lambs	Docked lambs
	$\bar{x}$ ±SE	$\bar{x}$ ±SE	$\bar{x}$ ±SE
Chilled carcass wt (kg)	20.2 ± 0.86	19.0 ±1.44	21.4 ± 0.71
Wholesale cuts (%)[1]			
Neck	8.30 ± 0.48	8.25 ± 0.33	8.34 ± 0.10
Shoulder	19.44 ± 0.35	19.41 ± 0.34	19.48 ± 0.67
Rack	24.48 ± 0.52	24.67 ± 0.57	25..01 ± 0.93
Flank	5.82 ± 0.35	5.07 ± 0.30	6.57 ± 0.41
Loin	6.63 ± 0.49	6.22 ± 0.84	7.04 ± 0.55
Leg	33.38 ± 0.61	33.20 ± 1.02	33.56 ± 0.79
Tail	1.59 ± 0.55	3.18^{a} ± 0.27	0.00^{b} ± 0.00
9-10-11 rib cut wt. (kg)			
Physical components (%)2 of 9-10-11 rib cut			
Lean meat	50.49 ± 4.18	52.15 ± 3.45	48.83 ± 4.53
Fat	19.74 ± 2.43	18.6 ± 1.60	20 ± 2.69
Loss	6.47 ± 0.44	6.65 ± 0.734	6.28 ± 0.55
Lean meat : Fat ratio	2.66 ± 0.15	2.84 ± 0.182	2.49 ± 0.23
Lean meat : Bone ratio	2.09 ± 0.14	2.06 ± 0.104	2.13 ± 0.28
Bone %	24.7 ± 1.07	25.4 ± 2.07	24.0 ± 0.79

1, Based on chilled carcass wt, 2, Based on rib cut wt.
Means, within row with, different superscripts are significantly different (P <0.05).

Physical components of rib cut:

From Table 3, the results reveled that, there was a significant difference between the control and docked lambs in tail weight (3.18 kg *vs.* 0.0), respectively, since, no fat deposition around the tail head of docked lambs. This result is in disagreement with Naziha *et al.* (2011) and Bingol *et al.* (2006) who reported that, docking of the fat tail of Barbarine lambs did not prevent some fat deposition around the tail head. However, internal fat weight was higher in docking lambs than control ones with no significant difference.

Regarding the results in Table 3, docking operation had no significant (P<0.05) effect on fat and lean percentages of the two groups. However, docked lambs scored higher fat % (20.0%) than control ones (18.6%). In this context, the lean meat % of docked lambs was lower than control lambs (48.83 *vs.* 52.15) and the difference was not significant. These findings disagree with Isani *et al*. (2012). Results revealed that, both bone %, lean meat: bone ratio and lean meat: fat ratio did not differ between docked and control lambs.

Physical properties of meat:

Physical meat quality parameters were comparable between the two groups except for the water holding capacity which was more favorable in docked compared to undocked (Table 4). Water holding capacity of meat was better in lambs docked possibly because of having more bound water to their muscle fibers. Thus, their ability will be better for retaining more water within its muscle fibers. Tenderness values obtained are considered to be within the acceptable range as well. No significant differences were observed between the two groups for shear force, cooking loss and water holding capacity, while, plasticity was significantly different between the two groups.

Field *et al.* (1971) stated in his review that shear force values around 3.6 kg/cm^2 or less have acceptable tenderness for goat and sheep meat. These results are comparable with the findings of Qudsieh (2006) for male lambs slaughtered at different live

weights. Lightness (*L**), redness (*a**) and yellowness (*b**) values of LD muscle were comparable among the three diets groups.

Table 4. Least squares means±SE of physic-chemical properties of meat quality for undocked and docked male Barki lambs

Traits	Overall	Undocked Lambs	Docked lambs
	$\bar{x}$ ±SE	$\bar{x}$ ±SE	$\bar{x}$ ±SE
Physical properties of meat:			
Cooking loss	116.16 ± 5.99	124.88 ± 9.17	107.44 ± 6.27
Shear force	3.57 ± 0.17	3.63 ± 0.23	3.51 ± 0.27
Fluid expressible loss	0.42 ± 0.025	0.46 ± 0.025	0.38 ± 0.037
Color parameters:			
L (lightness)	41.59 ± 1.119	40.36 ± 1.938	42.55 ± 1.193
a (redness)	19.04 ± 0.316	18.89 ± 0.747	19.18 ± 0.259
b (yellowness)	7.68 ± 0.319	7.50 ± 0.584	7.85 ± 0.318
Chemical composition of meat:			
Moisture	74.49 ± 0.26	74.82 ± 0.31	74.16 ± 0.39
Protein	19.30 ± 0.20	18.89^{a} ± 0.32	19.71^{b} ± 0.09
Fat	3.79 ± 0.19	3.45 ± 0.20	4.13 ± 0.27
Collagen	1.46 ± 0.07	1.56 ± 0.06	1.36 ± 0.12
pH	6.50 ± 0.09	6.42 ± 0.03	6.57 ± 0.12

Means, within row with, different superscripts are significantly different (P <0.05).

Chemical composition of meat:

Results revealed no significant difference (P>0.05) between groups in moisture, fat percentages and collagen except for protein (19.71 and 18.89 %) for docked and control lambs, respectively (table 4). This result agree with Sarvar *et al.* (2009) who found that, quantities of crude protein in the five parts of the left half of the carcass were higher for docked than intact lambs (P >0.05) and the lipid component of these five parts was higher for docked than intact lambs (P >0.05), but lipid content of the ribs part was significantly different (P<0.05). In accordance with the results of Snyman *et al.* (2002), inthis investigation ash content of the carcass of docked lambs was higher than intact lambs (P>0.05).

On the other hand, it has been reported that docking of fat-tail sheep had no significant (P>0.05), effect on chemical composition of the carcass (Bingol *et al.,* 2006; Moharrery, 2007), who showed that docked lambs had higher fat and lower protein and moisture percentage in meat and a decreased (P<0.05) carcass fat content. The pH value depends on glycogen level at slaughter. Therefore, lack of differences inultimate pH values between groups indicated that treatment had no significant effect on the muscle glycogen content at slaughter. The pH values for all groups were within the range at which meat is considered to be tender (Qudsieh, 2006).

Sensory properties:

Significant differences (P <0.05) for the aroma, flavor, tenderness, and juiciness were observed between groups. Panelists were able to detect differences among samples of meat. The meat of docked lambs had higher score in meat acceptability than those of undocked lambs.

Blood parameters

The blood parameters of the two groups at the end of fattening period are presented in Table 5. Results showed that, urea, total protein, glucose and triglycerides, were almost similar in the undocked and docked lambs. There was no significant difference (P>0.05) in cholesterol level between undocked and docked lambs at the end of fattening. These results disagree with Sarvar *et al.* (2009) who found that, there was a significant difference (P<0.05) in cholesterol level between intact and docked lambs at the end of fattening.

Table 5. Estimates of blood parameters of the two groups at the end of finishing period

Items	Undocked lambs	Docked lambs
	$\bar{x}$ ±SE	$\bar{x}$ ±SE
Urea	39.8±1.82	40.600±1.40
Total protein	7.840±0.15	8.06±0.12
Glucose	59.800±2.38	62.3.0±4.78
Triglycerides	24.400±1.90	25.06±3.0
Total Cholesterol	54.5.300±3.86	50.10±3.50
T3	1.9±0.01	2.4±0.02
T4	5.58±0.048	6.88±0.08

Total protein, g/dl; urea, mg/dl; total cholesterol, mg/dl; triglyceride, mg/dl glucose, mg/dl

CONCLUSIONS

Docking of Barki sheep breed may be an effective way to improve growth rates (from birth – weaning) and from weaning till 12 month . In addition to, docking operation lead to, improve carcass characteristics, better distribution of fat into the muscle so the docking carcass was marbling than undocked, moreover, no fat deposition around the tail head of docking lambs.

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أثر قطع الذيل على صفات النمو وصفات الذبيحة وبعض مقاييس الدم فى ذكور الحملان البرقى

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أُجريت هذه الدراسة بهدف دراسة تأثير قطع الذيل على صفات النمو وصفات الذبيحة وبعض مقاييس الدم لذكور الحملان البرقى. أُستخدم فى هذه الدراسة عدد ١٣ حمل ذكر برقى متوسط وزن الميلاد لها ثلاثة كجم وزعت الحملان عشوائيا الى مجموعتين الأولى مجموعة مقطوعة الذيل والمجموعة الثانية سليمة غير مقطوعة الذيل (كنترول) . تم تركيب الحلقات المطاطية بواسطة الة التركيب للحملان بعد يومين من الولادة. استمرت التجربة لمدة عام وكانت النتائج كالتالى: كانت الحملان مقطوعة الذيل أعلى معنويا فى وزن الفطام وكذلك معدل النمو اليومى من الميلاد وحتى عمر الفطام (٩٠ يوم) ١٦.٦كجم ، ١٤.٨٥ كجم ومعدل نمو يومى ١٤٩جم ، ١٣٩جم على التوالى. كذلك أثناء فترة التسمين سجلت الحملان مقطوعة الذيل وزن أعلى و معدلات نمو اعلى عن المجموعة غير مقطوعة الذيل ، ٢٦.٤ كجم ، ٢٢.٢ كجم ، ٥٥.٥ جم ، ٧٠.٦ جم على التوالى. كانت الحملان مقطوعة الذيل اعلى معنويا عن الحملان الغير مقطوعة الذيل فى، وزن الذبح – وزن بعد الذبح – وزن الجسم الفارغ – وزن الذبيحة الساخن – ونسبة التصافى وكانت نسب الزيادة كالتالى ١٥.٦% ، ١٦.٦% ، ١٥.٩%، و ١٧.٧% لكلا من: وزن الذبح – وزن بعد الذبح – وزن الجسم الفارغ - وزن الذبيحة الساخن، على التوالى. لم يكن هناك فروق معنوية بين المجموعتين فى نسبة الرطوبة ، نسبة الدهن ، والكولاجين فيما عدا فى نسبة البروتين (١٧.٩١ – ١٨.٨٩) حيث كان الفرق معنوى لهذا المقياس بين المجموعة المقطوعة الذيل عن المجموعة الغير مقطوعة على التوالى. كذلك لم يكن هناك فروق معنوية بين المجموعتين فى نسبة الكوليستيرول فى نهاية فترة التسمين. أوضحت الدراسة أن قطع الذيل للحملان البرقى عند الميلاد يحسن الوزن المكتسب وكذلك يحسن من صفات الذبيحة عن الحملان البرقى غير مقطوعة الذيل.