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Studies on Growth, Carcass Traits and Body Composition of Goats Raised either in Intensive or Pasture Conditions (2- Body Composition and Carcass Tissue Distribution)

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Abstract
A total of 32 weaned (90 days) males (16) and females (16) native kids were randomly allocated into two equal groups to be fed either concentrate or to be raised on pasture, and then slaughtered at 20 or 30 kg live body weight. Animals were slaughtered when each kid reached its target body weight. After chilling at 4°C for 24h, the carcass was split along the vertebral column in to two halves. The muscular tissue of the left half- carcass was separated into nine groups. Carcass fat and bones was also, separated and weighed.
Lean, fat, bone, lean: fat and lean: bone ratio averaged 64.08± 0.62%, 13.31±0.94%, 22.59±0.45%, 6.02± 0.58 and 2.98±0.09 respectively. Male kids had significantly ($p<0.05$) higher lean, lean: fat ratio and MG3 and MG4 than females. Kids raised on pasture had significantly ($p<0.05$) higher proportion of lean, bone and lean: fat ratio and lower proportion of MG3 than kids fed concentrate. Also, kids slaughtered at 30kg yielded significantly ($p<0.05$) lower lean,bone and higher fat than kids slaughtered at 20kg. Total non- carcass fat, carcass fat and total body fat as a percent of empty body weight averaged 1.856± 0.194% , 3.581± 0.261% and 5.437± 0.429%, respectively. Female kids , kids received concentrate and kids slaughtered at 30kg had significantly ($p<0.05$) higher proportion of total non carcass fat , total carcass fat and total body fat than male kids, kids raised on pasture and kids slaughtered at 20kg. Male kids had higher proportions of bone than females. Significant difference ($p<0.05$) was observed between the two feeding regimens in the weight of bones.
Keywords: Carcass Ttissue Distribution, Feeding Regimens, Goat.

1. Introduction

The importance of goat as meat producing animals is increasing worldwide. However, the meat production characteristics are not well studied in Iraq, unlike the other red meat –producing animals, such as sheep. Furthermore, distribution of carcass tissue is significant in determining carcass quality. Lean muscle, and to a lesser extent fat, are the major edible tissue of the carcass. Bone is not edible tissue but its proportion in the carcass affect those of other carcass tissue such as lean meat (Mahgoub and lodge 1981). Moreover, carcass tissue distribution is affected by several factors including stage of maturity and body size (Mahgoub et al., 2005), nutrition (El moula et al 1999; Oman et al., 1999 and Gursoy et al., 2011), breed (Cameron et al.,2001) and sex (Mahgoup et a l.,).

It is known that diet have been shown to be one of the main factors influencing the carcass yield, composition and qualities in many species including goat (Wood et al., 2008; Webb et al .,2005). Moreover, while some investigators reported that no significant differences exist in the proportion of lean whether the kids raised on pasture or concentrate (Dosky et al., 2009; Gursoy et al., 2011), on the other hand, Oman et al. (1999) and Herrera et al (2011) indicated that kids raised on concentrate surpassed significantly kids raised on pasture in lean and fat contents of their carcasses. Since Iraqi goat farming system, are mainly centered on grazing system, thus the objective of this study was to investigate carcass tissue distribution of male and female goat raised under two feeding regimens.

2. Material and Methods

2.1 Animals and Experimental Design

Sixteen weaned (90 day) entire male kids and 16 female kids raised at Animals farm, Faculty of Agriculture and Forestry, University of Duhok were used in this experiment. Full detail of management, feeding and slaughtering was described in our previous study (Alkass et al., 2013).
In brief, kids from each sex were divided equally to be fed either on concentrate or on pasture. Each main group was divided into two sub group to be slaughtered at 20 or 30 kg live weight. Animals were slaughtered when each individual kid reached its designated body weight. After chilling the carcass at 4°C for 24 h. the carcass was split along the vertebral column into two halves.

2.2 Physical Dissection

The muscular tissue of the left half –carcass was separated into nine groups following the procedures of

Butterfield (1988) for sheep. The nine muscle groups includes: muscle of the proximal hind limb(MG1), muscle of distal hind limb(MG2), muscles surrounding spinal column(MG3), muscles of abdominal wall(MG4), muscles of proximal forelimb(MG5), muscles of distal forelimb(MG6), muscles connecting the thorax to forelimb(MG7), muscles connecting the neck to forelimb(MG8) and intrinsic muscles of the neck and thorax(MG9).
Carcass fat including subcutaneous and intermuscular fat was separated from the left-half carcass. Non carcass fat is the sum of omental, mesenteric, pelvic, kidney, channel and cardiac fat. Bones of the left-half carcass was dissected out and weighed. Also, some individual bones of forelimbs (Scapula, Humerus, radius and ulna) and hind limbs (femur, tibia, and tuber) were weighed and their length was measured.

2.3 Statistical Analysis:

General Linear Model (SAS, 2002) was used to study the effect of sex, feeding system and slaughter weight on studied traits. Significant differences between means were assessed using Duncan Multiple range test (Duncan, 1955).

3.Result and discussion

3.1 Carcass tissue distribution

In the present study, lean, fat, bone percentages, lean: fat ratio and lean: bone ratio in the half carcass side averaged 64.08, 13.13, 22.59 %, 6.02 and 2.98, respectively (Table 1). The carcass composition of black goat appears to be broadly similar to other tropical goats including West African dwarf goat (Amegee, 1986); Kambing Katjang goat (Vidyadran et al., 1984) and Australian Feral goat (Ash and Norton 1987).
Male carcasses were significantly ($p<0.05$) leaner and less fatter as compared to females. These results are consistent with the findings of Mahgoub and Lu (1998) in Omani goat, Moraud-Fehr (1981); Warmington and Kirton, (1990) and Colmer-Rocher et al. (1992) in temperate goats, Butterfield, (1988) in sheep and Berg and Butterfield, (1976) in cattle. However, the percentage of bone and lean: bone ratio is not significantly differ between sexes. Also, El Moula et al. (1999) reported that male Sudan Desert goat had slightly higher proportion of bone (25.3%) than females (23.2%). while, some reports have indicated that bone proportion is significantly lower in females than males due to their higher proportions of fat (Pena et al., 2007).
Table (1) The effect of sex, feeding system and slaughter weight on physical dissection of half carcass of goat.

Traits		No	Lean %	Fat %	Bone %	Lean : fat ratio	Lean : bone ratio
Overall mean		31	64.08± 0.62	13.31± 0.94	22.59± 0.45	6.02± 0.58	2.98± 0.09
Sex	Male	16	65.12± 0.75 a	11.91± 1.08 b	22.95± 0.51 a	6.67± 0.93 a	2.84± 0.05 a
	Female	15	62.96± 0.94 b	14.81± 1.51 a	22.21± 0.77 a	5.32± 0.66 b	3.13± 0.17 a
Feed	Con	16	62.40± 0.83 b	16.18± 1.05 a	21.40± 0.38 b	4.29± 0.31 b	3.04± 0.13 a
	Pasture	15	65.86± 0.69 a	10.25± 1.17 b	23.86± 0.72 a	7.86± 0.95 a	2.92± 0.13 a
SWT	20kg	16	65.10± 0.86 a	10.91± 1.28 b	23.98± 0.65 a	7.66± 0.92 a	2.98± 0.17 a
	30kg	15	62.98± 0.83 b	15.87± 1.07 a	21.12± 0.35 b	4.27± 0.33 b	2.98± 0.04 a

Means with different letters within each column differ significantly ($P<0.05$) according to Duncan's test.
SWT= Slaughter weight, Lean, fat and bone was computed as a percent of left carcass weight.
It appears from the results presented in Table (1) that kids raised on pasture had significantly ($p<0.05$) higher proportion of lean (65.86vs.62.40%),bone (23.86vs.21.40%) and lean to fat ratio (7.86vs.4.29) and lower proportion of fat (10.25vs.16.18%) compared to kids fed concentrate. Since, kids raised on concentrate consumed feed with a higher energy, therefore, deposited fat at a faster rate than kids consumed forage only. Similar finding have been reported in the lean content (Daskiran et al.,2006), fat content (Oman et al.,1999; Alexander et al,2009;Gursoy et al., 2011 and Dosky et al., 2009) and bone content of the carcass (Misra and Prasad, 1996).
With increasing slaughter weight, body composition also changed which is in the line with those reported for other meat animal (Hammond, 1932). It seem that kids slaughtered at 20 kg had significantly ($p<0.05$) higher proportion of lean (65.10vs.62.98%), bone (23.98 vs.21.12%) and lean to fat ratio (7.66vs.4.27) and lower proportion of fat (10.91vs. 15.87 %) than kid slaughtered at 30kg (Table 1).The increase in live weight during the linear phase of growth, fat growth begins rather slowly, and then increases exponentially as the animal enters the fattening phase.

3.2 Muscle Distribution

Information related to muscle distribution depending on grouping in goat of males and females, as well as the effect of feeding system and slaughter weight is very scarce. Therefore, findings in the present study in this area are discussed in the light of the available information on carcass composition of goat as well as the more available information in sheep.
In the current investigation, proximal hind limb (MG1) comprised the highest proportion (29.61±0.57%) in the weight of side muscle and together with the MG3 and MG5 made about (54.50±0.71%) of the side muscle weight (Table 2). These muscle groups are known as expensive muscle group EMG (Butterfield, 1988). Also,

Mahgoub and Lodge (1996) reported that MG1, MG3 and MG5 made about 53-56% of the side muscle weight in Batina goat. However, the high proportions of high –priced cuts in the carcass (> 50%) indicate a good potentiality of the native breed of goats for meat production. Also, this result is in accordance with those reported by Mahgoub and Lodge, 1994) of Jabel Akhder goat.

Leg muscle group (MG1 and MG2) made about (35.01%) of side muscle weight. This result is attributed to the fact that immediately following birth large muscles in this group, in particular the Biceps Femoris, Middle gluteal and Semimembranosus muscles grew much faster than the musculature as a whole and hence the group soon assumes a higher proportion of total muscle weight than was the case at birth. Moreover, considerable development of this muscle group is essential for optimum locomotory performance in the adolescent and adult animal (Butterfield, 1988). The proportion of fore-quarter (MG5, MG6, MG7, MG8 and MG9) was (44.51%) of the carcass. Similarly, Mahgoub and Lodge (1996) indicated that 38% of total side muscle weight of Batina goat was found in fore- quarter.

Table (2) Effect of sex, feeding system, and slaughter weight on muscle groups percent.

Traits	Overal mean	Sex		Feeding system		Slaughter weight kg		Significant		
		Male	Female	Conc.	Pasture	20	30	S	F	STW
No	31	16	15	16	15	16	15			
MG 1 %	29.61± 0.57	29.03 ±0.67	30.22 ± 0.93	29.64± 0.92	29.57± 0.68	27.54 ±0.36	31.81±0.78	n.s.	n.s.	*
MG 2 %	5.40± 0.08	5.40 ± 0.10	5.40 ± 0.13	5.31± 0.13	5.49± 0.09	5.62 ± 0.10	5.17 ± 0.09	n.s.	n.s.	*
MG 3 %	10.66± 0.26	11.02± 0.36	10.27 ± 0.37	11.21 ± 0.34	10.07 ± 0.36	10.20± 0.47	11.15± 0.15	*	*	*
MG 4 %	9.24± 0.22	9.70± 0.29	8.75± 0.29	9.25± 0.33	9.23± 0.29	9.17± 0.27	9.32± 0.35	*	n.s.	n.s.
MG 5 %	14.22± 0.24	14.25± 0.26	14.20± 0.44	13.95± 0.34	14.52± 0.36	14.06 ±0.35	14.39 ±0.36	n.s.	n.s.	n.s.
MG 6 %	3.41 ± 0.11	3.50 ± 0.13	3.31 ± 0.18	3.51 ± 0.16	3.30 ± 0.15	3.56 ± 0.15	3.25± 0.16	n.s.	n.s.	n.s.
MG 7 %	8.71 ± 0.28	8.60± 0.42	8.82± 0.38	9.00 ±0.43	8.39 ±0.35	9.53 ± 0.28	7.83± 0.39	n.s.	n.s.	*
MG 8 %	6.95 ± 0.35	6.44± 0.54	7.49 ± 0.42	6.54 ± 0.51	7.37± 0.48	7.43± 0.53	6.43± 0.43	n.s.	n.s.	n.s.
MG9 %	11.22 ± 0.29	11.64± 0.41	10.77 ± 0.40	11.08 ± 0.32	11.36± 0.52	11.95 ±0.34	10.44 ±0.41	n.s.	n.s.	*
EMG %	54.50 ± 0.71	54.31± 0.82	54.70 ± 1.21	54.81 ± 1.11	54.16 ± 0.90	51.81 ±0.74	57.36± 0.70	n.s.	n.s.	*

MG= Muscle group, EMG= Expensive muscle group, S=sex, F=feeding system, STW= slaughter weight , * = $p<0.05$, n.s.= non-significant

In the present work, males had significantly a higher percentage of MG3, MG4 and MG9 than females (32.36 vs. 29.77%) (Table 2).This results is mainly due to the effect of sex hormone (Butterfield, 1988). However, some reports have indicated that differences in the proportions of muscles groups due to the effect of sex may reach up to 3% (Mahgoub et al., 2005). This result indicates that differences in muscle distribution in goat due to sex are not very large and are unlikely to have a commercial impact on meat from these goats.

No significant differences exist in all percentage of muscle groups between the two feeding regimens except that kids fed concentrate had significantly ($p<0.05$) higher percentage of MG3 (11.22 vs.10.07%) and marginally lower percentage of MG2 (5.31vs.5.49%),MG5(13.95vs. 14.52%),MG8 (6.54vs. 7.37%) and MG9 (11.08vs. 11.36%) compared to kid raised on pasture (Table 2). Since the function of MG2 is locomotion of all degrees of efficiency (Butterfield,1988), therefore, this group of muscles is expected to develop more faster in kids raised on pasture compared with kids kept indoor. To our knowledge, no information is available on the effect of feeding system on muscle distribution in goat; therefore, comparing the results of this study with others is impossible.

Muscles of MG1, MG3 and expensive muscle group increased significantly ($p<0.05$) with increasing slaughter weight. Whereas those of MG2, MG7 and MG9 were significantly ($p<0.05$) decreased by increasing slaughter weight (Table 2). Work with Omani goats (Mahgoub and Lodge,1996; Mahgoub,1997; Mahgoub et al.,2005) indicate that the degree of maturing influenced the muscle distribution in the carcass, resulting in differences in proportion of individual and groups of muscles. Similar results were reported in temperate (Butterfield, 1988) and tropical (Mahgoub and Lodge, 1994) sheep.

3.3 Fat Partitioning

It is well established that fat is the most variable tissue in the carcass and it varies not only in its total amount but also its distribution between the various deposits which alter markedly during growth and the proportions and location of fat in the body are important in meat animals (Mahgoub et al., 2012). It appears from Table (3) that among fat depots, intermuscular fat contributed the highest proportion of empty body weight (2.052 ± 0.179%) followed by subcutaneous (1.52 ± 0.128%), Omental and mesenteric (1.105 ± 0.125%) and kidney and pelvic fat (0.751± 0.084), respectively. In general, the values of fat depots obtained in the current work is lower than those in Batina goat (Mahgoub and Lodge , 1996) , Omani Jabel Akhdar (Mahgoub and lodge, 1998)and South African goat (Simela et al,2011). Female kids surpassed significantly ($p<0.05$) male kids in all fat depots. The reason is due mainly that female kids mature earlier and laid down fat at a faster rate than male kids. These results were in agreement with the findings reported earlier by Mahgoub and Lodge (1996), Bonvillani et al. (2010), Simela et al.,(2011), Wildeus et al. (2007) and Teixeira et al.(2011).

Also, kids received concentrate had significantly ($p<0.05$) higher proportion of fat depots than kids raised on pasture (Table 3) This findings is due to the fact that kids on a high plane of nutrition tended to have higher

energy intake than kids raised on pasture. This result is similar to the findings of Daskiran et al. (2006) and Dosky et al. (2009). Kids slaughtered at 30kg had significantly ($p<0.05$) higher fat depots than kids slaughtered at 20kg (Table 3). As the animal grew up, and fat is a late maturing tissue therefore the deposition increased. This result is resemble those reported earlier by (Zimerman et al., (2008); Bonvillani et al. (2010); Simela et al. (2011) who showed that subcutaneous and intermuscular fat proportion was significantly increased by increasing slaughter weight.

3.4 Fat Partitioning as Percent of Total Body Fat

Fat content in the body of goat expressed as proportion from total body fat are given in Figure (1). Intermuscular fat had the highest proportion (38.15± 1.95) followed by subcutaneous fat (29.50± 1.59%),

Table (3) Effect of sex, feeding system, and slaughter weight on fat partitioning expressed as percent of empty body weight.

Traits	Overal mean	Sex		Feeding system		Slaughter weight kg		Significant		
		Male	Female	Conc.	Pasture	20	30	S	F	STW
No	31	16	15	16	15	16	15			
Omental & mesentric fat	1.105±0.125	0.803± 0.106	1.426±0.205	1.597±0.143	0.579±0.087	0.949±0.204	1.270±0.133	*	*	*
Kidney & Pelvic fat %	0.751±0.084	0.462± 0.070	1.059±0.113	0.955±0.111	0.533±0.104	0.741±0.139	0.761±0.097	*	*	n,s
Total non carcass fat %	1.856±0.194	1.265± 0.154	2.485±0.291	2.552±0.237	1.133±0.163	0.691±0.321	.031± 0.210	*	*	*
Subcutaneous fat %	1.528±0.128	1.238±0.119	1.836±0.208	1.988±0.160	1.026±0.092	1.406±0.191	1.658±0.169	*	*	*
Inter muscular fat %	2.052±0.179	1.962± 0.251	2.149±0.262	2.358±0.222	1.726±0.266	1.454±0.181	2.690±0.219	n,s	n,s	*
Total carcass fat %	3.581±0.261	3.201± 0.289	3.986±0.428	4.357±0.286	2.753±0.336	2.860±0.345	349± 0.189	*	*	*
Total carcass fat %	5.437±0.429	4.467± 0.432	6.472±0.674	6.910±0.469	3.866±0.473	4.552±0.649	6.381±0.459	*	*	*

n.s. = not significant, *= $p<0.05$, S= sex, F= feeding system, STW= slaughter weight

omental and mesenteric fat (19.006±1.10%) and kidney and pelvic fat (13.32±1.24%). Similar result was found by Mahgoub and Lodge,(1998) that intermuscular fat recorded the highest proportion of total body fat followed by subcutaneous fat , omental and mesenteric fat, kidney and pelvic fat.

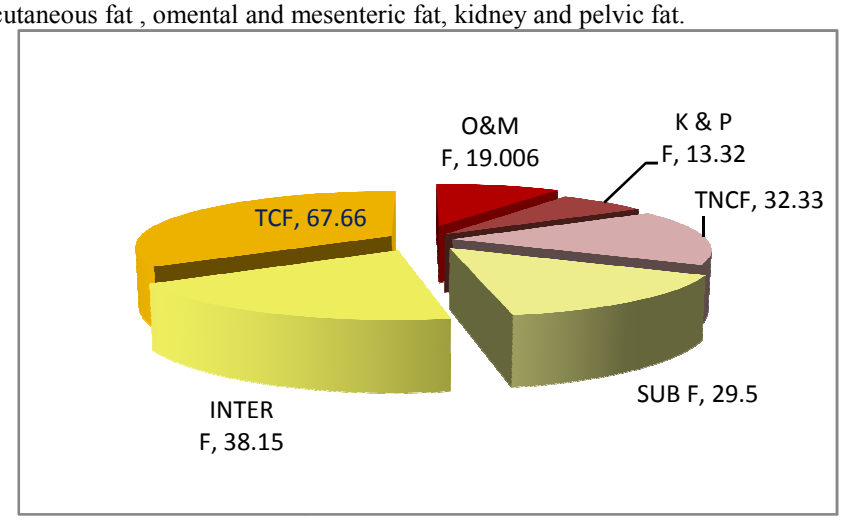

Figure 1. Overall mean of fat partitioning as percent of total body fat

Sub= subcutaneous fat, TCF= Total carcass fat, O & M F = Omental and mesenteric fat, K & P F= Kidney and pelvic fat , TNCF=Total non carcass fat

3.5 Bone Distribution

The proportion of hind limbs bone was higher than fore limbs bone as weight of total body bone, (29.31 vs. 24.57%) (Table 4). Femure bone had the higher proportion (10.28± 0.34%) than other individual bones in hind limbs and fore limbs bones, while humerus represents the highest proportion in fore limbs compared to radius and ulna and scapula bone. Mahgoub and Lodge,(1994) stated that the proportion of hind limbs and fore limbs bones was 23.6% and 23.2%, respectively in Batina goat.

As a proportion of total carcass bone, male kids had higher proportions in all individual bones of fore and hind limbs bones. This result may be due to the secretion of sex hormones (Mahgoub, 1988).This result is in agreement with the findings of Mahgoub and Lodge, (1996) and Mahgoub et al. (2005) who noticed that bucks had higher proportion of fore and hind limbs bone than females as a proportion of total carcass bone.

No significant difference was observed between the two feeding regimes in the weight of bones (Table 4). However, kids raised on pasture had marginally higher proportion of individual bones of fore limbs (26.36vs.22.86%) and hind limbs (30.92 vs. 27.81%) than kids received concentrate. This difference may due to the fact that kids raised on pasture are browse which hence their neck and limbs are being more developed than those received concentrate.

Individual bones of fore and hind limbs were not significantly differ between kids slaughtered at 20kg and 30kg live weight (Table 4). Tibia and pelvic bones of hind limbs (19.8 vs. 18.3%) and humerus, radius and ulna and scapula bones of fore limbs (27.02 vs. 22.21%) had higher proportion in kid slaughter at 30kg than kids slaughtered at 20kg except femure bone of hind limbs had higher proportion (10.66 vs. 9.88%) in kids slaughtered at 20kg live weight. This result confirms the findings of Mahgoub et al. (2005) that male Omani Jebel Akhdar goat slaughtered at heavier weight (28kg) had higher proportion of fore limbs than goat slaughtered at 11kg.

Table (4) Effect of sex, feeding system and slaughter weight on weight of some individual bones (as % of total half carcass bone).

Traits	Overal mean	Sex		Feeding system		Slaughter weight kg		Significant		
		Male	Female	Conc.	Pasture	20	30	S	F	ST W
No	31	16	15	16	15	16	15			
pelvic bone %	9.06 ± 0.47	9.82 ± 0.86	8.24 ± 0.26	8.69 ± 0.35	9.45 ± 0.91	8.52 ± 0.31	9.62 ±0.92	n,s	n,s	n,s
Femure %	10.28± 0.34	10.81±0.60	9.71 ± 0.26	9.86 ± 0.27	10.73 ± 0.64	10.66±0.23	9.88 ±0.66	n,s	n,s	n,s
Tibia%	9.97± 0.48	10.79 ±0.86	9.10 ± 0.27	9.26 ± 0.32	10.74 ± 0.91	9.78 ± 0.43	10.18±0.9	n,s	n,s	n,s
Scapula %	7.26 ± 1.70	8.93 ± 3.28	5.48 ± 0.32	5.77 ± 0.35	8.85 ± 3.51	5.19 ± 0.23	9.47 ±3.47	n,s	n,s	n,s
Humerus%	9.13 ± 0.35	9.72 ± 0.64	8.50 ± 0.19	8.83 ± 0.18	9.45 ± 0.71	8.88 ± 0.17	9.40 ±0.72	n,s	n,s	n,s
Radius & ulna %	8.17 ± 0.27	8.45 ± 0.48	7.86 ± 0.22	8.26 ± 0.21	8.06 ± 0.52	8.14 ± 0.21	8.20 ±0.52	n,s	n,s	n,s

n.s. = not significant , S=Sex, F= Feed system, S TW =Slaughter weight.

It seems from Table (5) that hind limb bones grew faster and have longer length than fore limbs bones. Tibia had longer length (20.74± 0.36cm) than other individual bones of hind and fore limbs bones. Male kids had numerically longer fore and hind limbs than female kids. This result is in agreement with finding of Mahgoub and Lodge, (1996) in Omani Batina goat. Also, no significant difference was observed between kids raised on pasture and kids received concentrate. Kids slaughtered at 30kg had significantly ($p<0.05$) longer fore and hind limbs than kids slaughtered at 20kg live weight. Kids slaughtered at 30 kg had significantly ($p<0.05$) longer tibia (22.06 vs. 19.50cm) followed by scapula (20.78 vs. 17.42cm) and radius and ulna (19.80 vs. 18.47cm) than kids slaughtered at 20kg.This result may be due to the degree of maturity in kids slaughtered at heavier weights.

Table (5) Effect of sex, feeding system, and slaughter weight on the length of some individual bones.

Traits	Overal mean	Sex		Feeding system		Slaughter weight kg		Significant		
		Male	Female	Conc.	Pasture	20	30	S	F	ST W
No	31	16	15	16	15	16	15			
Pelvic Bone cm	18.63± 0.24	18.69± 0.32	18.58± 0.36	18.68± 0.32	18.60± 0.36	17.55± 0.19	19.79± 0.17	n,s	n,s	n,s
Femure cm	17.63± 0.29	17.60±0.39	17.67± 0.44	17.44± 0.22	17.81± 0.52	16.65± 0.19	18.68± 0.42	n,s	n,s	n,s
Tibia cm	20.74± 0.36	20.77±0.63	20.71± 0.35	20.28± 0.42	21.18± 0.57	19.50± 0.24	22.06± 0.52	n,s	n,s	n,s
Scapula cm	19.05± 0.38	19.33±0.60	18.75± 0.47	18.79± 0.49	19.29± 0.59	17.42± 0.19	20.78 ±0.44	n,s	n,s	n,s
Humerus cm	16.31± 0.35	16.16±0.44	10.57	15.74± 0.39	16.85± 0.56	15.15± 0.31	17.55± 0.49	n,s	n,s	n,s
Radius & ulna cm	19.11± 0.25	19.16±0.23	19.06± 0.46	19.05± 0.29	19.18± 0.41	18.47±0.33	19.80± 0.29	n,s	n,s	n,s

n.s. = not significant , S=Sex, F= Feed system, S TW =Slaughter weight

4. Conclusion

It can be concluded that male kids and those raised on pasture and slaughtered at 20 kg live body weight are more leaner than females, kids feed on concentrate and kids slaughtered at 30kg live body weight. Therefore, it can be suggested to fatten kids on pasture rather than concentrate from economic point of view.The highest proportion among fat depots is the intermuscular fat.

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