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Characteristics of Body Composition in a Group of Local South Darfur Male Goats

2: Non-Carcass Characteristics

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Abstract

Two groups of local intact black and intact white male goats were included in this study. The two goat groups did not perform exclusively to indicate genetic differences in their non-carcass parameters, but feed intake was significantly greater in the older goats (54.5 vs. 51.5 Kg). The heavier SW and HCW were associated with significantly increased feed intake and gastrointestinal tract contents weights but there was a significantly reduced percent empty gastrointestinal tract in association with the heavier HCW only. Also the percent values for the rumen relative to the gastrointestinal tract were significantly (P<0.05) bigger (20.6 vs. 23.3 % and 20.7 vs. 23.4 %) in the heavier SW and HCW but those of the pluck organs relative to the SW were significantly (P<0.05) smaller (2.61 vs. 2.3 % and 2.57 vs. 2.3 %) in the heavier weights of the SW and HCW contrasts. The animals in these contrast groups also exhibited lower percent values (13.88 vs. 12.63 %, P<0.05 and 13.79 vs. 12.63 %, P<0.05) for TEOC and (41.39 vs 40.39%, P<0.05 and 41.46 vs. 40.32%, P>0.05) for TNEOC, but they cropped more yield (54.45 vs 55.76%,P> 0.05 and 52.99 vs. 56.60%, P<0.001) for TUP. As concerns body maturity effect it was found that the greater body maturity in either respect, SW or EBW, increased significantly feed intake, P<0.01; P<0.05 and gastrointestinal tract contents' weights P<0.001; P<0.001, percent rumen mean value P<0.05; P>0.05, but inflicted a significant (P<0.001) reduction in the percent, empty gastrointestinal tract 8.82 vs. 7.06%; P<0.01 and 8.79 vs. 7.18%; P<0.01 and the percent TEOC mean values (13.92 vs. 12.20%; and 13.96 vs 12.25%; P< 0.001).

Key words: non-carcass characteristics, Rumen: abomasums, pluck organs, edible offal components, total usable components. Non total edible offal components,

المستخلص

لم يكن أداء مجموعتى الماعز المعنية بهذه الدراسة كافيا للإفادة بأن هنالك فروقات ذات أصل مورثى لسماتهما لغير- الذبيحة بينما كان القدر المأكول من العلف أكبر معنويا لدى الماعز الأكبر عمرا عنه لدى تلك التى تصغرها (54.5 / 51.5كجم). إرتبطت الأوزان الأثقل للذبح و الذبيحة

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غير المبردة بازدياد معنوى فى كمية العلف المأكول, وزن محتويات الجهاز المعدى- المعوى بينما كانت قمية النسبة المئوية للجهاز المعدى – المعوى الخال منخفضة فقط في حالة الذبيحة غير المبردة الأثقل وزنا. صاحبت القيم الأكبر لوزن الذبح ووزن الذبيحة غير المبردة قيما مرتفعة لأوزان الكرش المنسوبة إلى وزن الجهاز المعدى – العوى بما يقابل 20.6/ 23.3%, و 20.7/ 23.4%, على التوالى. أما القيم المئوية لوزن مجموعة الأعضاء الصدرية (القلب, الرئتين و القصبة الهوائية) المنسوبة إلى وزن الذبح فقد كانت معنويا منخفضة لأوزان الذبح و الذبيحة غير المبردة الأكثر ثقلا (2.3/2.61%, و 2.3/2.57% على التوالى). كذلك أظهرت الحيوانات بالمجموعات المتقابلة قيما للنسب المئوية متدنية معنويا (12.63/13.88% و 12.63/13.79%) لل TEOC و (41.39/ 40.39% و 40.32/41.46% غيرمعنوى) لل TNEOC, لكن نتجت عنها حصيلة أكبر (55.76/54.45% غير معنوى و 56.60/52.99%) لل TUP. أما فيما يختص بأثر حالة النضج الجسمانى فقد وجد أن حالة النضج الجسمانى المتقدم قد رافقتها زيادة معنوية فى كمية العلف الماكول, أوزان محتويات الجهاز المعدى المعوى, متوسط قيمة النسبة المئوية للكرش, بينما أحدثت إنخفاضا فى النسبة المئوية لل:الجهاز المعدى المعوى الخال, 7.06/8.82% و 7.18/8.79% و متوسط قيمة النسبة المئوية لل TEOC (12.20/13.92% و 12.25/13.96%)..

Introduction

The population of goats in the Sudan comes to about 30 millions (MARE, 2012), small poor families can benefit from rearing goats and market their total edible offal products in addition to their meat produce. It is also understood that for realized meat production eating habits such as those of consuming some of the non-carcass products of the slaughtered animals should be evaluated as this adds to make up the total usable product. In this respect, Melaku and Betsha (2008) obtained 14.03, 41.65 and 56.23% for the total edible offal component, total non-edible offal component and the total usable product, respectively. These values were either promoted or demoted by the increase in slaughter weight by different levels of feed supplementation.

The present study is conducted to assess how much promotion may be attainable to improve the total usable product in meat goats, under the effect of slaughter and hot carcass weights or different body maturities using some carcass and non-carcass characteristics of the local goat.

Materials and Methods

Experimental Procedure

Thirty seven white (30) white and (7) Black intact male goats born in the farm of the Faculty of Veterinary Science were collected for this study. The goat flock belonged to the University of Nyala and the Muslim Aid Organization (Muslim Aid, UK) Sudan Office. Males of 15.95±0.61Kg and 17.81±1.36Kg for the white and black respectively were slaughtered at an age ranging from 165 to 584 days for the study and as a demonstration to improved meat production for the family and community as well. In the process about 400Kg edible meat were distributed to such families after the needed scientific data were obtained. In addition about 52Kg were contributed as TEOC.

Preparation Solanum dubium coat extract

Twenty grams of the crushed coats were shaken with 100 ml distilled water and then the mixture was blended by agitator for 15 min until the mixture became homogeneous. Coat extract was placed in the refrigerator at 4ºC for 24 hr, filtered and 20 ml of the extract was used for coagulation.

Housing

This was composed of reticulated bamboo slats in the kraaling area. Partial shading was provided to alleviate the stress of rain and direct sun rays during the day. The experimental male goats were kept in same but individual pens to allow for individual performance recording. Feeding utensils, waterers, mineral salt blocks and animal and pen identification were made accessible. Due attention

for hygiene, medical care and preventative measures were strictly considered.

Feeding and slaughter procedures

The routine feeding practice in the farm was to send all the flocks to graze and browse in the early morning and turn them back in the early evening into the kraaling pens. At times, when scarcity ensues in the range material, supportive kraal feeding was resorted to whence agricultural by-products and supplemental feed mix was provided. But the experimental animals were ad lib fed a meshed ration containing Sorghum vulgare (caudatum) grains, decorticated groundnut cakes and groundnut hulls (Table 1). Common salt and calcium carbonate were given at the rate of 20 g/Kg in the fed ration. The ration was provided for 60 days in the morning with topping in the evening and taking records on the weigh-back the following morning to permit calculating daily consumption. It was moistened in the feeder every time, it was introduced to reduce the risk of its inhalation by the feeding animal. At the end of the trial the final live weight/slaughter weight was taken, as an average of three consecutive 12 hours fasted live weight, with free access to drinking water, for each animal. All animals were immediately killed thereafter following Muslim rituals

Data preparations

These included the weights (Kg) of the following:-
Feed intake, Blood, pelt +head+ feet, Pluck organs (trachea +lungs + heart).
Internal fat (mesenteric + omental fat).
Gastrointestinal tract contents.
Empty gastrointestinal tract, GI, (rumen, reticulum, omasum, abomasum, small intestine and large intestine).
Rumen and abomasum (each).
Liver.

Data on the non-carcass parameters were presented as percentage (percent) of the slaughter weight (SW).

In addition the rumen and abomasum were presented as percentage (percent) of the empty gastrointestinal tract, (each), and as rumen: abomasum ratio (Kg/Kg).

Other productivity parameters were considered namely, total edible offal component, (TEOC), Total non-edible offal component, (TNEOC) and total usable product, (TUP) as percentages of the slaughter weight, following Melaku and Betsha (2008), who described that the TUP equals the sum of the dressing percent and TEOC. And that the TEOC comprised the weights of blood, heart, trachea, lungs, spleen, internal fat, liver, empty gut and kidneys, whereas the TNEOC comprised the weights of skin, head, genital organs, gall bladder, gut fill and feet. But in our present study blood and kidneys were exempted from the TEOC since blood is not considered usable in this country while the kidneys were left intact in the carcass. On the other hand the TNEOC, for our case, included the blood but excluded the genitals and gall bladder because the former were not measured while the latter was contained in the weight of the liver. Accordingly the TUP, here, was similarly revised to be fit the description of TEOC and TNEOC undertaken in this study.

To estimate body maturity two indicators were produced for the goats in this study to test the effect of body maturity on the parameters studied. These were estimated as quotients of the division of the SW or the EBW of the individual by its birth weight (BW); viz: SW/BW or EBW/BW. This was based on the inference of Meyer (1964) that in

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sheep, male lambs at birth are only 4-5% of their mature body weight.

Statistical analysis

The data obtained were statistically manipulated using the analysis of variance and the linear model and t-test of the SPSS version 14. Means (x) and standard errors (SE) were obtained for the different parameters under colour, age, slaughter weight, hot carcass weight, body maturity and each effect the relevant parameters were compared and tested for statistical significance (P). The effect of colour was ruled out, being not significant and the data were pooled over for the test of the remaining effects.

Results

The results of this study are presented in various tables of which Table (2A) shows some of the slaughter parameters of these goats. Goat colour (designating breed type) had no significantly discriminate influence on either of the parameters investigated, but the mean values tending to be larger for the black goats except for dressing percent, which tended to be slightly bigger in the white goats. On the other hand age effect (Table 2B) is clearly expressed with higher means for slaughter, empty body, hot carcass, feed intake weights and carcass length, in the age group 2 (540-584 days) than those of age group 1 (165-277days). Being highly significantly different at P<0.001, P<0.001, P<0.001, P<0.01 and P<0.001, respectively. However these two age groups had very similar and non-significantly different values for gastrointestinal tract percentages, relative to the slaughter weight.

Table 3(A and B) presents the results of the effects of SW (A) and HCW (B) on some non-carcass parameters. For example in Table 3A the heavier SW was associated with greater feed intake (55.28 vs. 47.42%, P<0.001) and bigger gastrointestinal contents weight (3.89 vs. 2.59%, P<0.001). Likewise, the percent rumen weight in the empty gastrointestinal tract weight was greater (23.34 vs. 20.62%, P<0.05) but the percent of the pluck organs weight in the SW (2.30 vs. 2.61%) was significantly (P<0.05) reduced in the heavier SW group. The remaining other values for organs, systems and body parts, measured on SW, empty gastrointestinal tract or as rumen/ abomasum ratio (Table 3A) depicted inconsistent and non-significant variations among the contrasting parameters of the two SW groups, 1 and 2, (Table 3A).The total edible offal component (TEOC) and the total non-edible offal component (TNEOC) had lesser percent values (12.63 vs. 13.88%, P<0.05 and 40.39 vs. 41.39%, P>0.05, respectively) in the heavier SW group 2 in contrast to group1 (Table 3A). However, the total usable product (TUP) tended non-significantly to be greater (55.76 vs. 54.45%, P>0.05) in that group (group 2).

The results on Table 3B indicate that the heavier HCW was associated with more feed intake, more gastrointestinal tract content weights, less percent empty gastrointestinal tract, but more percent rumen per gastrointestinal tract and lesser percent pluck organs weights. The mean values for these were respectively as follows: 55.83 vs. 47.00; P<0.001, 3.91vs 2.66; P<0.001, 7.41 vs. 8.86; P<0.05, 23.40 vs. 20.72; P<0.05 and 2.31 vs. 2.57; P<0.05. The remaining body parts, organs and systems in Table 3B are shown to have non-significantly varying differences between contrasting mean values of each of the parameters. The TEOC and TNEOC percent values (Table 3B) were smaller (12.63 vs 13.79%, P<0.05 and 40.32

vs. 41.46%, P<0.05, respectively) in the heavier HCW than in the lighter HCW group, while the TUP values were significantly bigger (56.60 vs. 52.99%, P<0.001) in the former HCW group.

The results shown in Table 4 depict the effect of body maturity, measured in the context of SW (4A) or EBW (4B) and birth weight (BW), on some non-carcass parameters. For example, there were increased feed intake, gastrointestinal tract content weights but a reduced percent value for tract content and empty tract weights, in the higher body maturity (Table 4A) than in the contrasting lesser body maturity. The contrasting values for these parameters respectively, were: 55.00 vs. 50.33%; P<0.01, 4.00 vs. 2.91%; P<0.001, 19.46 vs. 20.33%; P > 0.05 and 7.06 vs. 8.82%; P< 0.001. On the other hand the greater body maturity (2) was associated with a bigger percent value for the rumen in the gastrointestinal tract as compared with the percent value for the same parameter in the lesser body maturity (1): 23.78 vs. 21.07%; P<0.05. The remaining parameters of Table 4A were performed in a non-significantly different manner between the body maturity groups 1 and 2. The TEOC percent value was highly significant (P<0.001) smaller in the subgroup 2 (Table 4A) than in the subgroup 1 (12.20 vs. 13.92%). The percent values for TNEOC and TUP were non-significantly different in the relevant subgroups.

The results for feed intake and gastrointestinal tract content weights, percent contents and empty tract in Table 4B expressed similar values and trends as was described above for (Table 4A).The respective mean values (Table 4B) being: 54.50 vs. 50.65%; P<0.05, 3.96 vs. 2.89%; P<0.001, 19.55 vs. 20.27%; P>0.05 and 7.18 vs. 8.79%; P<0.01. As for the remaining parameters of Table 4B, the corresponding mean values for each individual parameter presented a variable and inconsistent trend which is non-significantly different in between the two body maturity subgroups 1 and 2. The mean percent value for TEOC (Table 4B) was significantly reduced (12.25 vs. 13.96% P <0.001) but those for TNEOC and TUP were non-significantly different in the two maturity subgroups

ISSN: 243456

Table (1):

Gross and calculated chemical composition of the ration in offer

Feed ingredients	Percent inclusion
Gross composition:-	
Sorghum vulgare (caudatum) grains	22.0
Decorticated groundnut cakes	32.0
Groundnut hulls	46.0
Chemical composition *:-	
Dry matter (DM)	95.97
Oil	40.65
Crude protein	19.28
Crude fiber	33.19
Ash	6.23
Metabolizable energy Mj/Kg DM	9.89

* According to Ellis, N. (1981).

Table (2) : Some Slaughter parameters of male Sudanese goats

	(A)			(B)		
Treatments / Parameters	White N=(30) x±se	Black N=(7) x±se	Level of significance	Age (1) N= (13) x±se	Age (2) N= (24) x±se	Level of significance
Slaughter weight, Kg	15.95±0.61	17.81±1.36	NS	14.61±1.25	19.15±0.81	***
Empty body weight, Kg	13.34±0.61	14.50±1.00	NS	10.91±0.91	14.99±0.44	***
Hot carcass weight, Kg	6.86±0.31	7.20±0.68	NS	6.04±0.62	8.02±0.41	***
Killing out% (on slaughter weight)	41.20±1.54	40.59±3.40	NS	41.05±3.12	40.56±2.04	NS
Feed intake, Kg	51.61±0.97	54.30±2.15	NS	51.46±1.94	54.46±1.29	**
Carcass length (CL), Cm	43.79±0.64	45.88±1.41	NS	43.19±1.30	46.47±0.85	***
Gastro-intestinal (GI) contents % of slaughter weight	19.66±0.82	21.26±1.82	NS	20.38±1.67	20.54±1.09	NS

N= number of animals

x±se= Mean± standard error

NS= Not significant; **=P<0.01; ***=P<0.001

Age (1): 165- 277 days, Age (2): 540- 584 days

Table (3): Effect of slaughter-(A) and Hot carcass- weight(B) on some non- carcass traits in male Sudanese goats

	(A)			(B)		
treatments / traits	Slaughter weight (SW) ranges (Kg) (1) 7.0--- 15.4 N= (12) x±se	(2) 16.0-----24.4 N=(25) x±se	P	Hot carcass weight (HCW) ranges (Kg) (2) 2.6-----6.4 N=(13) x±se	(2) 6.6-------10.4 N=(25) x±se	P
Feed intake, Kg	47.42±1.25	55.28±0.81	***	47.00±0.96	55.83±0.73	***
Gastro-intestinal contents:						
Weight, Kg	2.59±0.22	3.89±0.16	***	2.66±0.23	3.91±0.46	***
Percent /SW	20.62±0.71	19.53±0.99	NS	20.58±0.83	19.51±1.00	NS
Empty gastro-intestinal tract (GI),						
Percent of SW	8.74±0.34	7.52±0.40	NS	8.86±0.35	7.41±0.40	*
Rumen, percent/GI	20.62±0.93	23.34±0.76	*	20.72±1.05	23.40±0.72	*
Abomasum, percent/GI	6.98±0.38	7.26±0.39	NS	7.40±0.61	7.04±0.31	NS
Rumen: Abomasum, Kg/Kg	3.03±0.20	3.41±0.21	NS	2.96±0.22	3.47±0.20	NS
Pelt+head+feet, percent/SW	16.88±0.40	15.58±0.75	NS	16.93±0.35	15.50±0.78	NS
Blood, percent/SW	3.89±0.23	3.76±0.23	NS	3.95±0.24	3.73±0.23	NS
Pluck, percent/SW	2.61±0.06	2.30±0.08	*	2.57±0.06	2.31±0.09	*
Liver, percent/SW	1.79±0.05	1.65±0.04	NS	1.76±0.06	1.66±0.04	NS
internal fat, percent/SW	0.73±0.29	0.92±0.11	NS	0.59±0.27	1.00±0.10	NS
TEOC, percent/SW	13.88±0.50	12.63±0.30	*	13.79±0.52	12.63±0.29	*
TNEOC, percent/SW	41.39±0.72	40.39±0.58	NS	41.46±1.00	40.32±0.45	NS
TUP, percent/SW	54.45±1.10	55.76±0.74	NS	52.99±0.95	56.60±0.68	***

N= number of animals x±se= mean ± standard error P = statistical significance for means of traits within SW ranges (1) and (2), and HCW ranges (1) and (2), NS = not significant, *,**,*** , different levels of statistical significance between traits means, TEOC = total edible offal components ,TNEOC total non-edible offal components, and TUP = total usable product as percentage of SW.

Table (4): Effect of body maturity measured in terms of the relation of: Slaughter weight (SW) (A)or Empty bodyweight (EBW)(B),with Birth weight (BW) on some non-carcass traits in male Sudanese goats.

	(A)			(B)		
Treatments / Traits	Body maturity (SW/BW) indicator ranges (1) 4.00 ---10.00 N= (18) x±se	(2) 10.10 -- 17.50 N= (19) x±se	P	Body maturity (EBW/BW) indicator ranges (1) 3.38 ----- 7.63 N= (17) x±se	(2) 7.81 ---- 14.67 N= (19) x±se	P
Feed intake, Kg	50.33±1.34	55.00±1.01	**	50.65±1.39	54.50±1.08	*
Gastro-intestinal tract contents:						
Weight, Kg	2.91±0.19	4.00±0.20	***	2.89±0.20	3.96±0.19	***
Percent /SW	20.33±0.64	19.46±1.25	NS	20.27±0.68	19.55±1.19	NS
Empty gastro-intestinal tract (GI),						
Percent of SW	8.82±0.29	7.06±0.45	***	8.79±0.30	7.18±0.45	**
Rumen, percent/GI	21.07±0.97	23.78±0.69	*	21.26±1.01	23.48±0.72	NS
Abomasum, percent/GI	7.08±0.46	7.25±0.37	NS	7.16±0.48	7.17±0.36	NS
Rumen: Abomasum, Kg/Kg	3.15±0.24	3.42±0.20	NS	3.16±0.25	3.41±0.19	NS
Pelt+ head + feet, percent/SW	16.73±0.30	15.32±0.98	NS	16.73±0.31	15.38±0.94	NS
Blood, percent/SW	3.92±0.20	3.69±0.27	NS	3.92±0.21	3.71±0.26	NS
Pluck, percent/SW	2.52±0.08	2.29±0.09	NS	2.52±0.09	2.29±0.09	NS
Liver, percent/SW	1.74±0.05	1.66±0.04	NS	1.76±0.05	1.64±0.04	NS
Internal Mesenteric fat, percent/SW	0.83±0.21	0.88±0.13	NS	0.88±0.21	0.84±0.13	NS
TEOC	13.92±0.40	12.20±0.27	***	13.96±0.43	12.25±0.26	***
TNEOC	40.98±0.78	40.47±0.52	NS	40.92±0.82	40.54±0.50	NS
TUP	55.14±0.89	55.52±0.87	NS	55.17±0.94	55.47±0.83	NS

N= number of animals, x±se= mean ± standard error ,P_1P_2 = statistical significance for means of traits within SW/BW and within EBW/BW indicator ranges in (1) and (2), NS = not significant, *,**,***, different levels of statistical significance between means, TEOC = total edible offal components ,TNEOC = total non-edible offal components, and TUP = total usable product as percentage of SW.

Discussion

Theparameters dealing with carcass characteristics shown in Table 2 (A and B) have already been discussed in part1 of this study. However in the percent study, the gastrointestinal (GI) content were not significantly (P> 0.05) different between the black and white nor between the two age

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groups of the goats. But earlier, Kirton (1970) observed that such contents weight were bigger in male than in female goats. Although the genetic variation on the gastrointestinal contents is not clearly established the effect of age on that parameter is fairly more understandable, since it is related in one way or another to the maturity and physiological status of the animal and other physical considerations of the feed as well. Carles (1983) inferred that, in the early life of the lamb, the sequence of systems development is of the order: the nervous, circulatory respiratory, with the alimentary system just beginning its development.

As for the effect of slaughter (SW) and hot carcass (HCW) weights on the offal components in the present study Table3 (A and B), our data indicate a significantly more response only for the gastrointestinal tract (GI) contents weight for both the higher SW and HCW weights (P<0.001), the percent rumen (P<0.05) of the GI and the proportion of the total usable product (Up) in the HCW, while the mean value of the TUP only tended to be non-significantly (P>0.05) bigger in the greater SW weight than in the lesser SW weight.

On the other hand the effect of the greater SW and HCW weights on the percent empty GI, pluck organs and the total edible offal components (TEOC) was negative, with significantly (P<0.05) smaller mean values under the higher SW and HCW weights excepting a non-significantly (P>0.05) similar trend for the empty GI mean value in the SW.

In the literature, some of the studies, for instance, Pena et al. (2007) suggested that higher SW decreased the percentage of subproducts and internal organs but significantly increased the percentage of intestines and fat depots. Also Faizur Rahman (2007) noted that the liver weight was significantly (0.01) correlated with some physical body measurements at 12 months of age in goats and he depicted some correlation values for these. He also recorded significant (P<0.01) relationship for the rib-saddle length with the liver weight. Elbushra (2013) also reported significantly (P< 0.05) heavier livers for similar SW of intact and castrates in Desert goats.

Furthermore Melaku and Betsha (2008) showed that the proportion of the edible offal was increased by nutritional improvement, which lead to an increased SW and HCW weights. Unlike that, the total edible offal proportion TEOC in our present study was not promoted by the greater SW or HCW weights, but it was significantly (P<0.05) bigger in the lesser SW and HCW weights and that might, probably, be due, partly, to its nature, as a resultant of the smaller SW or HCW and partly, due to the greater components values as is shown in Table3 (A and B).

The total non-edible offal component proportion (TNEOC) follows the same trend but with non-significantly (P>0.05) different mean values of the greater and lesser SW and HCW weights. However, the total usable product (TUP) proportion, the most crucial aspect in goat meat production, tended to be reversed in the higher weights groups, being non-significantly (P<0.05) bigger in the greater SW weight but highly significantly (P<0.001)higher in the greater HCW weight group. Melaku and Betsha (2008) related a similar promotion in TUP to the contribution of an increased dressing percentage in the TUP of the greater SW and HCW weights. In addition Pena et al. (2007) obtained a non-significantly (P>0.05) decrease in the percentage non-carcass and

internal organs in association with significant (P< 0.05) increase in slaughter weight from 8.19 to 15.27Kg. The GI proportion, in the present study, was non-significantly (P>0.05) and significantly (P<0.05) decreased in the greater SW and HCW, respectively. This reduction trend may be attributed to the non-significantly (P>0.05) tendency of an increased internal fat.

The remaining organs, parts and systems, appearing in Table3 (A and B) present invariably inconsistent and non-significant (P>0.05) trends which indicated greater rumen : abomasum and internal fat values but lesser pelt-head + feet, blood and liver proportional values in the greater SW and HCW weights. Earlier, kirton (1970) indicated that at 20Kg body weight, males had heavier skins and heads whereas the stomachs, omental fat, livers lungs with tracheas and the spleens were heavier for the female goats. Also Perez et al. (2001) obtained significantly (P< 0.05) different values for the head, lungs + trachea, empty digestive tract, feet and skin but whithout showing any trends in between them, as concerns these body components at 10Kg body weight and the liver, heart, kidney and blood were similar between the treatment groups. The present study tends to have similar results as those of Pena et al. (2007) which showed that higher SW reduced the percent blood skin, head, feet, lungs and trachea, heart, liver, spleen and thymus. But Todaro et al. (2006) obtained very similar values for the hide and head for kids under different feeding treatments or of different types of birth slaughtered at similar (9.43 vs 9.56 Kg) or different (10.5 vs. 8.43Kg) body weights, respectively. However the observations of Melaku and Betsha (2008), were towards a significantly increased percent values for the blood (2.92 vs. 3.69), liver (1.14 vs 1.7), internal fat (1.64 vs 3.57) for the better treatment goats due to a greater SW and they, further, indicated that greater SW non-significantly reduced the proportion of the head in the SW. Pena et al. (2007), combining the overall slaughter products, concluded that their data suggested that feed evaluation for meat production should not only consider carcass weight and dressing percentage but, should also take into consideration the yield of total usable product in traditions where edible offal components are consumed.

Considering Table 4 (A and B), the trends exhibited indicate very similar response as is shown in Table3 (A and B) for the parameters studied. This is in fact a reflection of the very intimate relationship between body weight and body maturity. Probably the performance between the data in the two tables, vary mainly at the level of the trends magnitudes and/or the level of the probability of occurrence depending on the level of variability of each parameter.

To conclude it is worthwhile assessing the added value to the total usable product that may be obtained to improve the productivity index of the goat in meat production. This counted for about 13% extra product to the traditional meat productivity in the goat in this

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