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PREDICTION OF LIVE BODY WEIGHT AND CARCASS TRAITS BY SOME LIVE BODY MEASUREMENTS IN BARKI LAMBS

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SUMMARY

The relationship among certain live body measurements (body length BL, heart girth HG and height at withers HW) and each of live body weight (LBW) and carcass traits were studied on 139 Barki lambs which slaughtered at 12 months of age. The study showed significant correlation coefficients between LBW, carcass traits and each of BL, HW and HG. Both BL and HG were responsible for 74 and 82% of the variation of LBW and 79 and 72 % of the variation in hot and chilled carcass weight, respectively. The measure of HG was an effective predictor and accounted for 67 %, 45 %, 61% and 61% of the variation in leg, loin, rack and shoulder cut weights, respectively. In conclusion, certain live body measurements can effectively predict the weights of live body, hot carcass, chilled carcass and prime cuts of Barki lambs.

***Keywords*: Barki, prediction, body measurements, body weight, carcass**

INTRODUCTION

Barki sheep are one of the main sheep breeds reared in Egypt and widespread along the North-West Coast zone of the country. Barki sheep production is the most widespread form of extensive animal production systems in Egypt. Under these conditions, weight determination is of a major interest by breeders and buyers from the market perspective. There are modern techniques to predict carcass composition of live lambs, such as X-ray computer tomography (Lambe *et al.*, 2003) and ultrasonic scanning (Bedhiaf Romdhani and Djemali, 2006). However, these methods are expensive and require high expertise and specialized equipments. Therefore, there is need for a cheap, fast and easy ways to predict body weight and carcass traits by sheep breeders. In this regard, rapid, inexpensive and feasible body measurements could be used for predicting carcass traits of lambs to be measured under field conditions. The accurate functions used to predict live weight or carcass traits from live animal measurements is having immense economic contribution to livestock production enterprises (Afolayan *et al*., 2006). Especially in extensive production system knowing an animal live weight is very important both for market and breeding purposes. Body measurement can be useful in defining the performance of animal. In literature, there are reports on the relationship between body measurements and performance traits (Atta and El Khidir, 2004, Janssens *et al*., 2004 and Afolayan *et al*., 2006). Yaprak *et al.* (2008) indicated that live body measurements can supply an accurate method to estimate important carcass traits. This study was conducted both to determine the usefulness of live body measurements variables such as body length, heart girth and height at withers of Barki lambs for predicting live body weight, hot carcass weight, chilled carcass weight and wholesale cuts of carcass, as a simple way for breeders and buyers. Also, the relationship between live body measurements of Barki lambs and weights of body and wholesale cuts was investigated.

MATERIALS AND METHODS

In total, 139 Barki fattened lambs at the animal production section of Maryout Research Station, at the Desert Research Center were used in to obtain data for this study. The experiment lasted from weaning (3 months of age) until the age of one year. During this period, each animal was kept in an individually designed independent shed (dimensions 120 width * 150 length * 135 high cm) with a dedicated place of feeding. The lambs were individually fed according to body weight measured every 15 days. Levels of feeding were calculated according to Kearl (1982) to cover nutritional requirements for 100g gain/day. At the end of the experiment, all lambs were slaughtered after 24h fasting in a slaughter and meat processing unit at Maryout Research Station. Just before slaughtering lambs were weighed to the nearest 100 g and their body measurements were taken using a measuring tape to the nearest 0.5cm. Body measurements recorded were: body length (BL): the distance between the point of shoulder and the pin bone; height at withers (HW): vertical distance from the withers to the floor and heart girth (HG): circumference of the body just behind the fore-legs. Each carcass was skinned and decapitated. External and internal offals were separated from the dressed carcass. Carcasses were weighed hot. Dressing percentage based on slaughter and empty body weight was calculated. Carcasses were chilled at an average temperature of 4° C for 24h (Frild *et al.*, 1963). After chilling, each chilled carcass was divided into seven joints (neck, shoulder, rack, flank, loin, leg and tail) according to the Egyptian wholesale mutton cuts (Hamada, 1976). Chilled carcasses and wholesale cuts were weighed.

Simple correlation coefficients between body measurements and weights of body and wholesale cuts were calculated and tested for significance. To predict weights of live body, hot carcass, chilled carcass weights and prime cuts (leg, loin, shoulder and rack) from body measurements of lambs, the stepwise procedure was used to select the variables for the prediction equations. The coefficient of determination (R^2) assessed the accuracy of the equations. Statistical analysis was conducted using SAS package program (SAS, 2005).

RESULTS AND DISCUSSION

Means, standard deviations, minimum and maximum values and coefficients of variation of different body measurements, body weight hot carcass wt, chilled carcass wt, dressing percentage and wholesale cuts of Barki lambs are shown in (Table 1). Generally, coefficient of variation (C.V.) of different body measurements in this study was small (less than 10%). This finding is in accordance with the results by Lavvaf (2012), Abdel-Moneim (2009) and Afolayan *et al*. (2006). On the other hand, Nigm *et al.* (1995) showed that the coefficient of variation of different body dimensions ranged 9-12 % with the exception of pelvis width (C.V.=18.7%) and round circumference (C.V. = 14 %) in Australian Merino sheep. In this study, the coefficient of variation of body weight was 17.78%, higher than that found by Afolayan *et al*. (2006).

Live Body Measurements and Body Weight

Body weight is a very important characteristic in animal husbandry as a selection criterion and measure of economic profit. Live weight might be affected by management, environment and feeding conditions. The correlation is one of the most common and most useful statistics that describes the relationship between two variables (e.g. Cam *et al.,* 2010). The attempts to predict accurately body weight from body measurements utilizes this characteristic of correlation. The accurate estimation of live weight from simple live body measurements is very important for livestock enterprises. For assessing the profitability a producer can measure all the body measurements easily from a live animal to determine body weight approximately.

Table 1. Means, standard deviation (S.D)., minimum (Min.) and maximum (Max.) values and coefficient of variation (C.V) of body weight and live body measurements of Barki lambs slaughtering at 12 of age

Item	Mean	S.D	Min	Max	C.V (%)
Body weight (kg)	43.02	7.65	25.00	58.00	17.78
Body length (cm)	71.50	6.85	60.00	88.00	9.58
Height at withers (cm)	74.90	5.95	62.00	90.00	7.94
Heart girth (cm)	99.58	8.18	76.00	120.00	8.21
Carcass Traits:					
Hot carcass wt (Kg)	20.62	3.92	10.10	30.00	19.01
Dressing % 1	47.87	2.59	39.55	53.24	5.41
Dressing % 2	55.52	2.91	45.20	60.30	5.24
Chilled carcass wt (kg)	19.86	3.88	10.00	29.00	19.54
Neck	1.630	0.38	0.700	2.600	23.31
Shoulder	4.007	0.83	2.100	5.700	20.70
Racks	4.900	1.11	2.400	7.800	22.65
Loin	1.280	0.29	0.700	2.200	22.66
Flank	1.108	0.29	0.100	2.100	26.13
Leg	6.300	1.12	3.300	8.600	17.78
Tail	0.740	0.29	0.200	1.700	39.19

The correlation coefficients of live body measurements with body weight of Barki lambs are summarized in (Table 2). Live body weight and body measurements (BL, HG, and HW) have positive and high correlations ($P < 0.01$). Sarti *et al.* (2003), Riva *et al*. (2004), Afolayan *et al*. (2006), Salako (2006), Shaker and Hammam (2008), Cankaya *et al*. (2009) and Cam *et al*. (2010) reported similar results between body weight and body measurements. Cam *et al*. (2010) reported that body weight and body measurements (chest depth, heart girth, withers height and rump height) have positive and high correlations. Nigm *et al.* (1995) showed that heart girth and chest depth had the highest correlations with body weight. In most studies, heart girth was found to be highly correlated with body weight in sheep (Topal and Macit, 2004, Atta and Khidir, 2004, Afolayan *et al*., 2006) and in goat (Nsoso *et al*., 2003 and Khan *et al*., 2006).

Table (2) shows that the hot carcass weight of Barki lambs was positively and significantly (P < 0.01) associated with BL, HG and HW. All body measurements of Barki lambs were positively and significantly correlated with chilled carcass weight. These results are confirmed by Nigm *et al.* (1995), Shaker and Hammam (2008) and Yaprak *et al.* (2008). Shaker and Hammam (2008) found that the hot carcass weight of Barki lambs was positively and significantly correlated with chest circumference and abdominal circumference. Yaprak *et al.* (2008) found positive and significant correlation of body length and heart girth circumference with cold carcass weight of Red Karaman lambs. On the other hand, no significant correlations were observed between body measurements of Barki lambs with the dressing percentage of their carcasses (Tables 2). This finding is in agreement with that of Yaprak *et al.* (2008) who reported that height at wither, body length and heart girth circumference of Red Karaman lambs were not significantly correlated with dressing percentage.

Live Body Measurements and Carcass Traits

The wholesale cuts of Barki carcasses (Table 2) were positively and significantly correlated with HG (P < 0.01), BL (P < 0.05) and HW (P < 0.05). The results of this study showed that the neck weight of Barki carcass was positively and significantly (P < 0.01) correlated with the live body measurements studied. Similar results were found in Rahmani sheep carcass, while the contrary was found in the Barki and Ossimi carcasses (Abdel-Moneim, 2009). Regarding the weight of the shoulder in Barki carcass, the current results showed that the correlation between shoulder weight and each of BL and HG were positive and high, 0.75 and 0.78%, respectively. The results are in agreement with the finding of Abdel-Moneim (2009) who found that the shoulder weight of Barki, Ossimi and Rahmany sheep carcasses were positively and significantly (P < 0.01) correlated with live body measurements. On the contrary, Cunningham *et al.* (1967) reported of no significant correlation between the live measurements and shoulder weight in sheep.

Table 2. Correlation coefficients of live body measurements with body weight and carcass traits of Barki lambs

Body weight and carcass traits	Correlation coefficients		
	BL	HW	HG
Body weight, kg	0.86**	0.73**	0.85**
Hot carcass weight, Kg	0.82**	0.69**	0.85**
Dressing % 1	0.05 ns	0.02ns	0.22*
Dressing % 2	0.09 ns	-0.10 ns	0.02 ns
Chilled carcass weight, kg	0.82**	0.70**	0.85**
Neck cut weight, kg	0.71**	0.60**	0.75**
Shoulder cut weight, kg	0.75**	0.63**	0.78**
Racks cut weight, kg	0.76**	0.65**	0.78**
Loin cut weight, kg	0.67**	0.54**	0.67**
Flank cut weight, kg	0.67**	0.56**	0.69**
Leg cut weight, kg	0.79**	0.69**	0.82**
Tail cut weight, kg	0.60**	0.47**	0.60**

BL; Body length, HW; Height at withers, HG; Heart girth. *= P < 0.05 ** = P < 0.01

The racks weight of Barki lambs carcass was positively and significantly (P<0.01) correlated with each of HG, BL and HW, respectively (Table 2). In this context, Abdel-Moneim (2009) found that only the body length of Barki ram lambs was positively and significantly (P<0.05) correlated with thoracic region weight. Thoracic region weight of Ossimi carcass was positively and significantly correlated with BL (P<0.01), HG (P<0.01), CD (P<0.01), RC (P<0.05) and PG (P<0.05), but in Rahmani carcass, there were positive association between HW (P<0.01), HG (P<0.01), CD (P<0.01), PG (P<0.01) and PW (P<0.05) and thoracic region weight.

Loin weight of Barki lambs carcass was positively and significantly (P<0.01) correlated with each of BL (67%), HG (67%) and HW (56%). Cunningham *et al.* (1967) found that simple correlation of live measurements with percentage retail loin was low. On the contrary, Abdel-Moneim (2009) found that the loin weight of both Barki and Rahmani carcasses were not significantly correlated with anybody measurements. Flank weight of Barki lambs carcass was positively (P<0.01) correlated with BL (67%), HG (69%) and HW (56%0), respectively. Abdel-Moneim (2009) reported that the flank weight of carcass was positively and significantly (P<0.05) associated with HG of Ossimi ram lambs and round circumference (RC) of Barki ones. Positive correlation coefficients between the flank weight of Rahmani carcass and BL (P<0.05), HG (P<0.01), and chest depth, CD (P<0.01) were obtained.

The tail weight of Barki lambs carcass was correlated with BL (60%), HG (60%) and HW (47%), respectively (Table 2). Yaprak *et al.* (2008) found that HW of Red Karaman lambs was positively (P<0.05) correlated with tail weight, while BL and HG had no significant correlation with the fat tail weight. Abdel-Moneim (2009) did not find any significant correlation between tail weight and body measurements of Barki ram lambs. Vatankhah and Talebi (2008) showed that the correlations between body weight of lamb and fat-tail measurements were generally positive.

Table 3. Regression models for Predicting body weight (BW) and carcass traits in Barki lambs

	No	Regression models	R^2
Body weight at 12 months of age	1	BW = -25.87 + 0.96 BL (cm)	0.74
	2	BW = -39.54 + 0.58 BL + 0.41 HG	0.82
Hot carcass weight, kg	3	HCW = -19.97 + 0.41 HG	0.72
	4	HCW = -21.46 + 0.23 BL + 0.26 HG	0.79
Chilled carcass weight, kg	5	CCW = -20.35 + 0.40 HG (cm)	0.72
	6	CCW = -21.87 + 0.23 BL + 0.25 HG	0.79

BL; Body length, HG; Heart girth, BW; Body weight, HCW; Hot carcass weight, CCW; Chilled carcass weight.

Table 4. Regression models for Predicting prime cuts weights in Barki lambs carcass

	No	Regression models	R^2
Leg cut weight, kg	1	LGW = - 4.83 + 0.11 HG (cm)	0.67
	2	LGW = - 5.24 + 0.64 BL (cm) + 0.070 HG (cm)	0.72
Loin cut weight, kg	3	LOW = - 1.05 + 0.023 HG (cm)	0.45
	4	LOW = - 1.15 + 0.015 BL (cm) + 0.014 HG (cm)	0.50
Rack cut weight, kg	5	RKW = - 5.69 + 0.11 HG (cm)	0.61
	6	RKW = - 6.10 + 0.0.064 BL (cm) + 0.065 HG (cm)	0.67
Shoulder cut weight, kg	7	SHW = -3.87 + 0.078 HG	0.61
	8	SHW = - 4.16 + 0.044 BL + 0.050 HG	0.66

BL; Body length, HG; Heart girth, LGW; Leg cut weight, LOW; Loin cut weight, RKW; Rack cut weight, SHW; Shoulder cut weight.

Prediction equations of body weight from live body measurements:

The regression models for prediction of live body weight from live body measurements for Barki lambs are given in (Table 3). The most effective live body measurements predicting BW at 12 months of age was BL. This measure explains 74% of variation of BW in Barki lambs. Heart girth was another important indicator explaining 82% of the variation of BW in Barki lambs. The regression equations lead us to have a simple prediction formulation to apply for the body weight. Body measurements used in this study except HW could be used to predict the body weight accurately. The same result was found by Lavvaf *et al.* (2012) in the Afshari and Zandi sheep. Abdel- Moneim (2009) reported that BL alone contributed 47 % of the variation in the body weight of Barki ram lambs. In Ossimi ram lambs, paunch girth (PG) and BL were included in the model and the equation represented 93 % of the variation in BW of Ossimi ram lambs. The best equation for predicting live body weight of Rahmani ram lambs was when heart girth (HG) entered the equation with coefficient of determination (R^2) being 86%. Nigm *et al.* (1995) reported that HG was the best single predictor and accounted alone 77% of the variation in BW of Merino males.

There is a general agreement that body measurements may be used for predicting BW of sheep (Nigm *et al.*, 1995; Seker and Kul, 2001; Sarti *et al.*, 2003 and Shaker and Hammam, 2008). Sarti *et al.* (2003) used HG to predict BW of Italian Appenninica and Merinizzata meat sheep breeds with very high R^2 (0.99). Shaker and Hammam (2008) reported that the optimum equation for predicting live body weight of Barki male sheep was reached when thick tail circumference and BL were included in the equation (R^2 = 0.69). Most of the studies about BW prediction from body measurements indicated that HG is highly correlated with BW

Prediction Equations of Carcass Traits from Live Body Measurements:

The regression models for prediction of hot carcass weight and chilled carcass weight of Barki lambs from live body measurements is presented in Table 3. In predicting the hot and chilled carcass weight in Barki lambs, HG was an effective measure with the regression explaining 72% of the variation. While, BL predicts 79% of the variation in hot and chilled carcass weight. Similar result was found by Nigm *et al.* (1995) who reported that HG was the best variable to predict the hot carcass weight of Merino males (R^2 =0.73). The entry of chest depth increased R^2 slightly (to 0.80).

Abdel- Moneim (2009) reported that BL alone contributed 59% of the variation in hot carcass weight of Barki ram lambs. HW was the only significant (P<0.01) variable contributing to the variation of the hot carcass weight of Rahmani ram lambs with high R^2 (0.90). Three variables were used to predict the hot carcass weight of Ossimi ram lambs. The first of these was HG explaining 79% of the variation. The other variables were CD and PG explains 91% and 97% of the, respectively. It may be suggested to use BL and HW to predict hot carcass weight of the some Egyptian ram lambs. BL was the most significant (P<0.01) variable explaining alone 41% of the variation in hot carcass weight. R^2 was improved up to 0.53 by incorporating HW into the prediction equation.

Several studies have shown that HW, height at rump, BL, chest width and rump width of Awassi yearling ram lambs may be used for predicting the warm carcass weight (Seker and Kul, 2001, Marshall *et al*., 2005, Alsheikh *et al*., 2007 and Shaker and Hammam, 2008). Alsheikh *et al*. (2007) found that the regression coefficient of carcass weight on principle components of body size of fattened Barki lambs were positive (P< 0.05). Furthermore, Shaker and Hammam (2008) reported that the best equation for predicting the carcass weight of Barki lambs was attained when live body weight, body height and thick tail circumference were used (R^2 = 0.90). Marshall *et al*. (2005) used live weight, rump height and thorax depth to predict the weight of the half of the carcass of Pelibuey sheep with R^2 = 0.93.

Prediction Equations of Prime Cuts Weights from Live Body Measurements:

Regression models for predicting the prime cuts weights (leg, loin, rack and shoulder) of Barki lambs carcass from live body measurements represented in (Table 4). For predicting the leg weight in the carcass of Barki lambs, HG was an effective measure, with the regression explaining 67%. BL could predict 72% of the variation in leg cut weight. Abdel-Moneim (2009) reported that the prediction equation should include only round circumference (RC) to predict round weight for both Ossimi and Barki carcasses with accuracy of 67% and 60%, respectively. Similarly, HW is only needed to predict round weight of Rahmani carcass. This measure could predict 57% of the variation in round weight. The same author found that HG contributed 42% of the total variation in round weight of Egyptian ram lambs, irrespective of breed. RC was the second factor with a partial determination of 0.21 increasing the model's R^2 to 0.63. Anous and El-Sayed (2004) indicated that conformation, expressed by hind leg length, and the weight of the carcass were good predictors for muscle contents of the hind leg and its degree of muscling (R^2 = 0.59-0.86).

To predict the weight of the shoulder in carcass of Barki lambs, HG was an effective measure (R^2= 0.61). BL could predict 66% of variation in shoulder cut weight. The results are close to the ones by Abdel-Moneim (2009) who indicated that BL was the single significant (P<0.01) variable entered in the model to predict shoulder weight in Barki carcass with an accuracy of 70%. On the other hand, the same author found that CD only could predict 72% of the variation in shoulder weight in Ossimi carcass, while in Rahmani carcass, the prediction equation included HW and CD as explanatory variables with high R^2 (0.85 and 0.93, respectively). In this context, Marshall *et al*. (2005) indicated that slaughter weight and length of the rump can be used to predict shoulder weight with an accuracy of 84% in Pelibuey sheep.

In order to predict the rack weight in carcass of Barki lambs, HG was an effective measure (R^2 = 0.61), while BL could predict 67% of the variation. Similar results were reported by Abdel-Moneim (2009) found that BL could be used as a single predictor for the weight of thoracic region in Barki carcass with an accuracy of 40%. While HG and BL were used in the model, the predictions of thoracic region weight of Ossimi carcass had an accuracy of 86 and 98%, respectively.

HG alone was responsible for most of the variation in thoracic weight of Rahmani carcass with an accuracy of 89 %. In this context, Marshall *et al*. (2005) used different independent variables (slaughter weight, thoracic perimeter and length of the rump) to predict weight of ribs with accuracy of 80%.

In order to predict loin weight in carcass of Barki lambs, HG was an effective measure, as the regression explained 45%., while BL could predict 50% of the variation in loin cut weight.

In the end, we can say that the results of this study are in agreement with Nigm *et al.* (1995) who concluded that HG was the best single measurement for predicting different carcass traits of Merino males.

CONCLUSION

The results of this study showed that live body measurements are effective in predicting live body, hot carcass, chilled carcass and prime cuts weights of Barki lambs. Additionally, it was noticed that all body measurements used to predict the weights of live body and carcass cuts had positive regression coefficients. In order to increase income and shorten time needed for raising animals, it is recommended to consider live body measurements as alternative factors for predicting body weight and carcass traits.

REFERENCES

Abdel–Moneim, A. Y., 2009. Body and carcass characteristics of Ossimi, Barki and Rahmani ram lambs raised under intensive production system. Egyptian Journal of Sheep and Goat Sciences, 4 (2): 1 – 16.

Afolayan, R. A., I.A. Adeyinka and C. A. M. Lakpini, 2006. The estimation of live weight from body measurements in Yankasa sheep. Czech Journal of Animal Science, 51:343-348.

Alsheikh, S. M., A.H. Hammam and M. M. Mokhtar, 2007. Prediction of some carcass components of fattened Barki lambs using principal components techniques. Egyptian Journal of Animal Production, 44 (1): 63 – 70.

Anous, M.R. and M. EL-Sayed, 2004. Value of conformation as an indicator of muscle contents and degree of muscling of the hind leg in lambs. Journal of Agriculture Science. Mansoura University, 29 (3): 1103–1110.

Atta, M. and O.A. El Khidir, 2004. Use of heart grith, wither height and scapuloischial length for predication of Nilotic sheep. Small Ruminant Research, 55: 233-237.

Bedhiaf Romdhani, S. and M. Djemali, 2006. Estimation of sheep carcass traits by ultrasound technology. Livestock Science, 101: 294-299.

Cam, M.A., M.Olfaz and E.Soydan, 2010. Body measurements reflect body weights and carcass yields in Karayaka sheep. Asian Journal of Animal and Veterinary Advances, 5(2): 120 – 127.

Cankaya, S., A. Altop, M. Olfaz and G. Erener, 2009. Canonical correlation analysis for estimation of relationships between some traits measured at pre and post slaughtering periods in Karayaka hoggets. Anadolu Journal of Agriculture Science, 24:61-66.

Cunningham, N.L., Z.L. Carpenter, G.T. King, O.D. Butler and J.M. Shelton, 1967. Relationship of linear measurements and certain carcass characteristics to retail value, quality and tenderness of ewe, wether and ram lambs. Journal Animal Science, 26: 683-687.

Frild, R.A., Kemp, J.D. and W.Y. Varney, 1963. Indices for lamb carcass composition. Journal of Animal Science, 22: 218-221

Hamada, M.K.O., 1976. Mutton and wool production, Dar El-Maaref, Alexandria, Egypt (in Arabic). Journal of Animal Science, 9:389–396.

Janssens, S., D. Winandy, A. Tylleman, Ch. Delmotte, W.van Moeseke and W. Vandepitte, 2004. The linear assessment scheme for sheep in Belgium: Breed averages and assessor quality. Small Ruminant Research, 51:85-95.

Kearl, L.C., 1982. Nutrient Requirements of Ruminants in Developing Countries. International Feedstuffs Institute. Utah Agriculture Experiment Experiment. Station. Utah State University, Logan, USA.

Khan, H., F. Muhammah, R. Ahmed, G. Nawaz, Rahimullah and M. Zubair, 2006. Relationship of body weight with linear body measurements in goats. Journal Agriculture Biological Science, 1: 51-54.

Lambe, N.R., M.J. Young, K.A. McLean, J. Conington and G. Simm, 2003. Prediction of total body tissue weights in Scotish Blackface ewes using computed tomography scanning. Animal Science, 76: 191-197.

Lavvaf, A., A. Noshari and T. Farahvash, 2012. Evaluation of the relationship between body measurements and carcass traits of finishing Afshari and Zandi rams. Asian Journal of Animal and Veterinary Advances, 7(2):187-192.

Marshall, W., M. Collantes, A. Corchado, J.A. Bertot, F. Uña, V. Torres and L. Sarduy, 2005. Prediction of the carcass, tissue composition and regional traits in Pelibuey sheep supplemented with poultry litter and soybean meal. Cuban Journal of Agriculture Science, 39(1): 33-40.

Nigm, A. A., O.M. Abdalla, M.B. Aboul-Ela, H.M. Kamel and M.A. Ahmed, 1995. Meat characteristics of sheep and goat breeds commonly consumed in U.A.E. 2. Use of body dimensions for predicting body and carcass weights. Emirates Journal of Agriculture Science, 7: 39-54.

Nsoso, B.S.J., A.A. Aganga, B.P. Moganetsi and S.O. Tshwenyane, 2003. Birth weight, body condition score and heart girth in indigenous Tswana goats during dry and wet season in Southeast Botswenyane. Livestock Research. Rural Development, Vol.15.

Riva, J., R.Rizzi, S. Marelli and L.G. Cavalchini, 2004. Body measurements in Bergamasca sheep. Small Ruminants Research, 55: 221-227.

Salako, A.E., 2006. Application of morphological indices in the assessment of type and function in sheep. International Journal of Morphology, 24: 13-18.

Sarti, F.M., L. Castelli, D. Bogani and F. Panella, 2003. The measurement of chest girth as an alternative to weight determination in the performance recording of meat sheep. Itallan. Journal of Animal Science, 2:123-129.

SAS., 2005. SAS User's Guide: Statistics. SAS Inst. Inc., Cary, NC., USA.

Seker, I. and S. Kul, 2001. The relationships between live body weight, body measurements and some carcass characteristics at different ages of Awassi yearling ram lambs. Saglk Bilimleri Dergisi, Firat Universitesi, 15 (2): 353- 360.

Shaker, Y.M. and A.A. Hammam, 2008. Using some body measurements and physiological responses as predictors for live body, hot carcass and lung weights and lung volume of male Barki sheep. Journal of Agriculture Science, Mansoura University, 33 (9):6383–6391.

Topal, M. and M. Macit, 2004. Predication of body weight from body measurements in Morkaraman sheep. Journal of Applied Animal Researcher, 25: 97-100.

Vatankhah, M. and M.A. Talebi, 2008. Genetic parameters of body weight and fat – tail measurements in lambs. Small Ruminant Research 75: 1-6.

Yaprak, M., F. Koycegiz, M. Kutluca, E. Emsen and H.W. Ockerman, 2008. Canonical correlation analysis of body measurements, growth performance and carcass traits of Red Karaman lambs. Journal of Animal Veterinary Advance, 7(2): 130-136.

التنبؤ بوزن الجسم الحى وصفات الذبيحة بواسطة بعض مقاييس الجسم لحملان الأغنام البرقى

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أستخدم فى هذه الدراسة عدد 139 من حملان الأغنام البرقى والتى ذبحت على عمر 12 شهر بهدف دراسة وتقييم العلاقة بين بعض مقاييس الجسم ووزن الجسم الحى وصفات الذبيحة ، حيث أجريت هذه الدراسة بمحطة بحوث مريوط التابعة لمركز بحوث الصحراء – وزارة الزراعة واستصلاح الأراضى. وأوضحت النتائج وجود معاملات أرتباط موجبة ومعنوية بين مقاييس الجسم (طول الجسم ، محيط الجسم ، ارتفاع الجسم) وكل من وزن الجسم الحى ووزن الذبيحة الساخن والبارد و أوزان قطعيات الذبيحة التجارية.

ويعتبر كل من محيط الجسم وطول الجسم هما الأكثر تأثيراً فى التنبؤ بوزن الجسم الحى حيث يتنبأ كل منهما بحوالى 82 ، 74 من الاختلاف فى وزن الجسم للحملان البرقى. وأتضح من الدراسة أن معاملات الانحدار لمقاييس الجسم المستخدمة للتنبؤ بوزن الجسم كانت موجبة وللتنبؤ بوزن الذبيحة الساخن والبارد فإن معامل الانحدار لكل من محيط الجسم وطول الجسم كان 79 ، 72% على التوالى.

وللتنبؤ بأوزان قطعيات الذبيحة التجارية فى ذبائح الحملان البرقى نجد أن معامل الدقة (R^2) لمقياس محيط الجسم بمفرده 67 ، 45، 61، 61% لقطعيات الفخذ ، وبيت الكلاوى ، الضلوع ، والكتف على التوالى. بينما عند استخدام معادلة تضمنت طول الجسم ومحيط الجسم معاً فإن معاملات الدقة (R^2) كانت 72 ، 50، 67، 66 % على التوالى لهذه القطعيات بنفس الترتيب.

وأوضحت نتائج هذه الدراسة أن بعض مقاييس الجسم الحى لها أهمية كبيرة فى توقع وزن الجسم الحى ووزن الذبيحة الساخن والبارد وأوزان قطعيات الذبيحة الرئيسية فى حملان الأغنام البرقى بالأضافة إلى أن هذه العلاقات الموجبة يمكن الأستفادة منها عند فرز واختيار الحملان البرقى عند شرائها أوإعدادها للتربية أو التسمين.