Egyptian J. Anim. Prod.(1994) 31(1):1-14.

EVALUATION OF MEAT PRODUCTION FROM CULLED FEMALE BUFFALOES

M.A. Houria and S.S. Omar

Department of Animal Production, Faculty of Agriculture, University of Menofiya, Shibin El-Kom, Egypt

SUMMARY

Nineteen female buffaloes, belonging to the Experimental Farm of Menofiya Faculty of Agriculture, were slaughtered after culling and without subjecting them to finishing. Out of them, ten animals were culled in May (after a season of green forage) and those remaining in October (after a dry lot feeding). Buffaloes varied in age from 5 to 12 years and weighed on average 521.8 kg. They were culled due to reproductive failure or poor milk production.

Female buffaloes culled at a younger age (e.g., 5-7 years) significantly had a greater empty weight, hot carcass weight, empty weight of digestive tract, dressing percent, area and shape index of ribeye, coefficient of meat of the whole carcass and of 9-10-11th ribs cut and organoleptic test for tenderness as compared to those culled at a older age (e.g., >7-12 years). An opposite significant trend was found for cooling shrinkage %, full digestive tract, separable bone % of whole warm carcass, bone % of 9-10-11th ribs cut and fibre diameter of ribeye cuts. Other carcass characteristic studied e.g. weight of edible offals, weight of head, hide, four legs, lean/fat ratio, specific gravity, flavour and juiciness of longissimus dorsi did not have significant differences due to age at culling.

The feeding regime before culling significantly affected fibre diameter, flavour, juiciness and tenderness scores in the favour of green fodders as

Issued by Egyptian Society of Animal Production.

compared to dry lot feeding preceding culling.

The relatively high and positive correlations between dressing and boneless carcass percentages with some body measurements, specially thigh length and its circumference, may help in setting the parameters to determine the efficiency of meat production from culled female buffaloes.

It is concluded that the female buffaloes culled at a younger age had higher dressing value, lower percentage of bone and consequently a wider meat / bone ratio as compared to those culled at a older age.

Keywords: Buffalo, culled females, meat production

INTRODUCTION

Buffaloes contribute a great deal to agricultural economy in Egypt. Many characters of buffaloes have been thoroughly investigated. However, meat production and carcass quality of female buffaloes are lacking. The lack of such data is mainly due to the Egyptian rules, which prohibit slaughtering the females unless they are culled due to reproductive failure, poor milk production or accidental trauma and being not less than 5 years old in case of culled animals. Although the culling of animals represents yearly about 30% of the total count of the national buffalo herd, there are no data about the carcass quality of such animals, since they are individually directed to slaughter houses.

The present study was conducted to evaluate the carcass quality of such animals as affected by the age at culling as well as feeding regime before culling.

MATERIAL AND METHODS

Nineteen female buffaloes belonging to the Experimental Farm, Animal Production Department, Faculty of Agriculture, Menofiya University Shibin El-Kom, located in Mid-Delta. They varied in age from 5 to 12 years, weighing on the average 521.8 kg and were slaughtered after culling and without finishing. Ten buffaloes were culled in May after following a season of green fodder feeding and the remaining 9 in October after dry lot feeding. Such animals were culled either for their poor milk production or reproductive failure

e.g. (failing to conceive, frequent abortion, calving problems etc.).

Live body weight was recorded just before slaughtering and after fasting for 12 hr. Live body measurements were determined according to El-Kaschab et al. (1985). Weights of head, hide, four legs, heart, liver, kidneys, spleen, lungs and trachea, full and empty digestive tract, kidney fat and gut fat were individually recorded. The warm carcass was weighed without any attached offals and then divided into two identical halves. Each half was subdivided into two quarters, fore and hind between the 12th and 13th ribs. Each quarter, was weighed. The boneless meat of each quarter was separated and weighed. Separable bone in carcasses and boneless percent were calculated. Best ribs (9,10 and 11th) cut was separated from the left side and weighed, before and after chilling for 24 hours in a cooler at an average temperature of 4°C. Loss during such cooling period was converted to a percentage of the hot best ribs cut weight. The chilled cuts were then physically dissected into lean, fat and bone and separately weighed. Samples from longissimus dorsi muscle of the 9 th, 10 th, and 11 th ribs were used to determine the chemical composition of the meat e.g. moisture, protein, intramuscular fat and ash according to A.O.A.C. Methods (1980). Area of ribeye was measured by means of a clean plastic grid placed over the cut surface as described by USDA (1968). Shape index was calculated according to Darwish (1963). The specific gravity (Sp.G.) was calculated for fresh meat according to Soloviev (1966). Samples from longissimus dorsi muscle of the same ribs were used to determine the fibre diameter according to Diord (1962). Juiciness, flavour and tenderness scores were determined according to Larmond (1977). Statistical analysis was carried out according to Snedecor (1974).

RESULTS AND DISCUSSION

Data present in Table 1 indicate that empty body weight expressed as percentage of fasted weight was comparatively greater in the female buffaloes culled at a younger age (e.g., 5-7 years) as compared to those culled at a older age (e.g., >7-12 years) (83.1 vs. 78.8 %, respectively). The preceding feeding regime also

affected the percentage of empty body weight. The corresponding value for buffaloes culled in May was comparatively lower (79.6 %) than that for buffaloes culled in October (82.2 %). This difference may be due to differences in weight of digestive tract either being full or empty, which partially depends on nature of fodders. In general, the obtained values for percentage of empty body weight (Table 1) are comparatively lower than that obtained for male buffaloes (86.8 - 89.8 %) by Bedier et al. (1979). This differences may be due to effect of sex.

Table 1. Average slaughter data of female culled buffaloes

Items	Age at culling		Date of culling		Overall average
	5-7 Yr.	>7-12 Yr.	May	October	
No. of animals	6	13	10	9	19
Fasted Weigh,kg	513.0	530.5	523.0	520.5	521.8
Empty Weigh,kg	426.4	418.1	416.5	427.9	420.7
Empty Weigh, % (1)	83.1	78.8	79.6	82.2	80.6
Hot carcass Weight,kg	224.9**	200.5	225.6	215.2	222.5
Cooling shrinkage, %	2.0*	4.2	2.6	2.5	2.9
Edible offals (kg):					
Heart	1.76	1.74	1.75	1.75	1.74
Liver	6.20	6.92	6.50	6.62	6.56
Kidneys	1.40	1.48	1.45	1.43	1.44
Spleen	1.01	0.99	1.05	0.95	1.00
Lungs & trachea	7.30	10.00	8.65	8.65	8.65
Other components, kg:					
Head	31.00	27.20	30.00	28.50	29.20
Hide	37.10	33.20	34.50	35.80	35.30
Four legs	13.90	10.60	12.50	12.00	12.40
Full digestive tract	124.60*	144.50	142.50*	127.10	136.10
Empty digestive tract	38.00*	32.10	36.00	34.50	35.00
Separable fat (kg):					
Gut fat	6.01*	3.71	5.00	4.71	4.86
Kidney fat	2.60	1.75	2.55	1.80	2.18

(1) Based on fasted weight
* (P<0.05) ** (P<0.01)

Table 1 also indicates that the weight of hot carcass and percentage of cooling shrinkage, both were significantly affected by the age at culling. In this concern, buffaloes culled at young age had a significantly greater hot carcass weight (P<0.01) and lower percentage of cooling shrinkage (P<0.05) as compared to those

culled at older age. It is worthy mentioning that the younger female buffaloes were mainly culled for their reproductive failure.

Table 2. Dressing percentages and relative weights of different offals and organs to empty body weight of culled buffaloes

Items	Age at culling		Date of culling		Overall average
	5-7 Yr.	>7-12 Yr.	May	October	
Dressing, %(1)	46.84*	37.80	43.14	41.34	42.60
Dressing, % (2)	57.43*	47.96	54.17	51.22	52.90
Heart	0.41	0.42	0.42	0.41	0.41
Liver	1.45	1.65	1.56	1.55	1.56
Kidneys	0.33	0.35	0.35	0.33	0.34
Spleen	0.24	0.24	0.25	0.22	0.24
Lungs & trachea	1.71	2.39	2.08	2.02	2.06
Other components, kg:					
Head	7.25	6.58	6.84	6.66	6.94
Hide	8.68	7.94	8.28	8.37	8.39
Four legs	3.25	2.54	3.00	2.80	2.95
Full digestive tract	29.22	34.56	34.21	29.71	32.35
Empty digestive tract	8.91	7.68	8.64	8.06	8.32
Separable fat (kg):					
Gut fat	1.41*	0.89	1.20	1.10	1.15
Kidney fat	0.61	0.42	0.61	0.42	0.52
Separable fat,(3)	2.02*	1.31	1.81	1.52	1.68

1- Based on live body weight, 2- Based on empty body weight, 3- Separable fat, included gut and kidney fat.

* ($P<0.05$)

Results presented in Tables 1 and 2 indicate that the absolute weight and percentage of offals and organs were similar in all culled animals. At the same time, the values of hide percentage obtained in this study are lower than those given by Bedeir *et al.* (1979). They found that, the hide percentage for buffalo males based on empty weight was 12.8%. The average weight and percentage of separable fat indicated that animals culled at young age and those culled after green fodder season scored higher estimates of gut and kidney fat as compared to those culled at old age and after dry lot feeding (Tables 1 and 2). The differences were statistically significant ($P<0.05$). The dressing

percentage expressed in proportion to hot carcass weight based on live body weight and empty body weight was significantly ($P<0.05$) greater in buffaloes culled at a younger age than those culled at an older age. The same was true for those culled after green feeding as compared to those culled after dry feeding. Differences, however, were not significant. The values obtained were 46.84 vs. 37.80 % and 43.14 vs. 41.34 % as proportion of hot carcass weight to live body weight, and 57.43 vs. 47.96 % and 54.17 vs. 51.22% as proportion of hot carcass weight to empty weight, respectively. Similar values were reported by El-Koussiy et al. (1992) for buffalo males. However, Afifi et al. (1977) found it to be 56.89% in buffalo male calves, based on fasting weight and 61.3% for buffalo males (Bedeir et al., 1979).

Percentage of separable bone in the whole carcass was 20.9 % for animals culled at a younger age and 34.0 % for animals culled at an older age (Table 3). The values of boneless carcass percentage in whole carcass showed the opposite direction. The overall average percentage of boneless meat of culled females was 72.6%, represented as % of hot carcass. Values obtained in present study are lower than those reported by Bedeir et al. (1979) and El-Hakim (1971), who found corresponding values of 81.4 % and 82.8 % in buffalo males, respectively. However, they are almost similar to those reported by El-Koussy et al. (1992). They found that the value of boneless meat ranged from 70.01 to 74.52 % for buffalo calves fed green fodders. The fore and hind-quarters, expressed as percentages of hot carcass and empty body weight are given in Table 3. Hind-quarters were slightly lighter than fore quarters in most carcasses, however, animals culled at a younger age scored higher estimates of hind quarters (57.4 %). Therefore, these animals scored on average a higher value (3.79) for the coefficient of meat, with an overall average of 2.60. This may be attributed to the nature of body constitution of females. The obtained value of meat:bone ratio was lower than that obtained by Bedeir et al. (1979) (4.36 and 4.33 for castrated and non-castrated buffalo males, respectively. However, El-Koussy and Soliman (1988) found that the meat:bone ratio of Friesian calves fed green fodders ranged from 3.05 to 4.79.

Table 3: Carcass characteristics of culled buffaloes

Items	Age at culling		Data of culling		Overall average
	5-7 Yr.	>7-12 Yr.	May	October	
No. of carcasses	6	13	10	9	19
Separable bone in carcass:					
Weight Kg	51.18*	68.17	58.88	61.98	61.86
% of warm carcass	20.90*	34.00	26.10	28.80	27.80
% of empty body	12.00	16.30	14.14	14.48	14.70
Boneless carcass					
Weight, kg	193.72**	132.33	166.72	153.22	160.65
% of warm carcass	79.10*	66.00	73.90	71.20	72.20
% of empty body	45.43*	31.65	40.02	35.81	38.19
Fore-quarters:					
% of warm carcass	42.60*	58.30	52.30	53.00	51.20
% of empty body	23.50	26.80	28.80	26.00	26.30
Bone, % of quarters	24.20	30.20	28.50	30.00	31.60
Hind-quarters :					
% of warm carcass	57.40*	41.70	47.70	47.00	48.80
% of empty body	31.60*	19.20	26.30	23.00	25.10
Bone, % of quarters	71.60*	37.80	23.70	27.60	24.00
Coefficient of meat (Meat, : Bone ratio)	3.79*	1.94	2.83	2.47	2.60

1, Meat proportion included the fat

* (P<0.05) ** (P<0.01)

In general the more convenient estimates of carcass quality under the conditions recorded for female buffaloes culled at a younger age as compared to those obtained for buffaloes culled at an older age could be evidently explained on the basis of the differences in the chronological age of such animals (5-7 vs. >7-12 years, respectively, Table 1). The animals have failed to reproduce, which naturally makes them unable to produce milk. At the same time several factors are responsible for the poor milk production mainly genetical, environmental, as well as aging of the animals. The former reason of low milk production i.e. genetical factors could be discovered yearly and so, such animals are also young in their ages at culling. An opposite trend could be coincide with the other two causes. As the average age of the buffaloes culled due to poor milk production was found to be >7-12 years. This may suggest that the causes of poor milk productivity of such animals is due to aging rather than the other two factors. The effect of feeding system

before culling was less prominent on these carcass traits. This may be due to the fact that regardless the feeding system, the nutritional requirements are carefully covered in this farm.

The best ribs cut (9,10 and 11th) is widely used for the prediction of the lean, fat and bone percentage in the whole carcass. Table 4 shows that the percentage of these tissues in the best ribs cut of culled buffaloes followed the same trend of the whole carcass. From results in Table 4, it could readily seen that animals culled at a younger age scored significantly higher estimates of shape index and area of eye muscle. Lean percentage and coefficient of meat followed the same trend, while the opposite was true for bone tissues. The overall percentage of bone in the best ribs cut was 23.5%, meanwhile this value was lower than that found by Ragab et al. (1966) and Salam et al. (1983) for buffalo males slaughtered at 24 and 6 months (30.0 and 37.3 %, respectively). Hammond (1932) found that muscular development in male animals was greater than in females, but the proportion of muscle to bone was not higher because of the greater thickening of bones in the former. Ziedan et al. (1984) reported that the female buffaloes at two years old had higher dressing value and lower percentage of bone as compared with male buffaloes at the same age.

Table 4. Means and standard errors of physical characteristics of the 9-10-11th ribs cut of culled buffaloes

Items	Age at culling		Date of culling		Overall average
	5-7 Yr.	>7-12 Yr.	May	October	
No.of cuts	6	13	10	9	19
Ribeye area, cm^2	80.1±3.3*	56.5±2.6	70.3±2.5	66.0±3.0	68.3±2.0
Shape index of ribeye	66.6±2.9*	44.5±2.2	57.1±2.2	54.3±2.7	55.6±2.5
Lean (L), %	70.5±2.8*	58.0±1.8	66.5±2.8	62.1±1.6	64.3±2.1
Fat (F), %	13.0±1.7	09.3±1.0	11.5±1.5	10.8±1.1	11.2±1.0
Bone (B), %	16.5±2.0*	32.5±3.5	22.0±2.6	27.0±3.3	24.5±2.1
L/F ratio	5.42	6.44	5.78	5.75	5.74
L/B ratio	4.27	1.77	3.02	2.30	2.62
Coefficient of meat	5.06	2.06	3.55	2.70	3.08

1, L+F/B ratio * ($P<0.05$)

Specific gravity (Sp.G.) was calculated for fresh meat and the values are presented in Table 5. It could be observed that for fresh meat, higher Sp.G. was recorded for animals culled at young age and those culled after green fodder season, being 1.19 and 1.17, respectively. The overall average of Sp.G. was 1.14 for fresh meat. Volovinskaia et al. (1959) noticed a proportional relationship between protein content and Sp.G. of fresh meat. Results of chemical composition of longissimus dorsi muscle are presented in Table 5. It is clear that animals culled at young age had the lowest fat (3.8 %) and the highest protein percentage (24.20). These results could be explained on the basis that, the protein content of carcass increase with increasing age for young animals and that is due to growth of muscles, while old animals showed a little reduction in protein content, which may be ascribed to the marked increase in fat in the meat (Hammond, 1932). The overall averages of percentages of moisture, protein, fat and ash were 70.80, 23.70, 4.40 and 1.10, in their respective order. Comparable estimates for chemical composition of longissimus dorsi muscle of buffalo males were reported by Salem et al. (1983) and Nigm et al. (1983). It could be observed that meat of culled females has less moisture and higher protein, fat and ash percentages. Flavour values on a 15-point scale, 1=lacking flavour, 15=intense flavour., Juiciness valuse on a 15-point scale, 1=dry, 15=very juicy.,Tenderness values on a 15-point scale, 1=very though, 15=very tender.

From data presented in Table 5, it could be noticed that, increasing of organoleptic tests (fibre diameter, flavour, juiciness and tenderness) for females culled at young age. Tenderness and fibre diameter scored significantly higher estimates in these animals. On the other hand, females culled after green fodder season had significantly higher score estimates for flavour, juiciness and tenderness. Compared to those culled after dry lot feeding. Fibre diameter followed the same trend. In general, meat from females culled was not far from those found of meat from males in muscle fibre diameter (Ali, 1974). From the present study, it could be noticed that animals culled at young age (5-7 years) and those culled after green fodder season produced a higher coefficient of meat and more acceptable meat. Further studies on finishing and carcass characteristics of

female buffaloes culled at old age (>7-12 years) are need to throw more light upon their efficiency in meat production.

Table 5. Means and standard errors of chemical analysis (% from fresh weight) and organoleptic tests of longissimus dorsi muscle of the culled buffaloes

Items	Age at culling		Date of culling		Overall average
	5-7 Yr.	>7-12 Yr.	May	October	
Specific gravity (Sp.G)	1.19	1.09	1.17	1.11	1.14
Chemical analysis :					
Moisture, %	69.3±1.2*	65.5±2.4	67.9±2.5	66.9±2.2	67.4±1.1
Protein, %	23.2±0.7*	19.1±0.6	21.7±0.6	20.7±0.4	21.2±0.8
Fat, %	6.0±0.3	14.0±0.2	21.0±0.2*	8.0±0.2	10.0±0.6
Ash, %	1.5±0.1*	0.7±0.1	1.3±0.1	0.9±0.1	1.1±0.1
Organoleptic tests:					
Fibre diameter,microns	26.50*	31.90	26.10*	31.90	29.15
Flavour	6.50	5.50	7.80*	4.20	5.98
Juiciness	7.22	5.88	8.50*	4.50	6.50
Tenderness	9.50*	5.90	10.00*	5.40	7.80

* ($P<0.05$)

Table 6 presents correlations between some carcass characteristics and live body weight and body measurements of culled females buffaloes. The correlation coefficient between body weight and each of body measurements were positive and significant. The abdomen circumference showed the highest values in this respect. On the other hand, the correlation coefficient between carcass weight, dressing and boneless carcass percentages with various body measures studied were positive or negative. The thigh length and its circumference showed the highest values in this respect (Table 6), where correlations were positive and highly significant.

Table 6. Correlation coefficients between some carcass characteristics and live weight and body measurements of culled buffalo females

Items	Live body weight, Kg	Carcass weight, Kg	Dressing, %	Boneless carcass, %	Separable bone in carcass, %
Live body weight	1.000	0.690	0.485	0.268	0.569
Body length	0.366	-0.045	-0.136	0.324	0.166
Rump length	0.763	0.321	0.201	0.122	0.517
Thigh length	0.832	0.810	0.590	0.644	-0.225
Shoulder height	0.856	0.489	0.250	0.199	0.512
Hip height	0.757	0.170	-0.150	-0.124	0.681
Knee height	0.112	-0.162	-0.040	-0.162	0.123
Hock height	0.444	-0.152	-0.090	-0.087	0.254
Chest depth	0.860	0.407	0.310	0.266	0.533
Abdomen depth	0.700	0.714	-0.421	-0.004	0.610
Chest circumference	0.818	0.462	0.286	0.154	0.556
Abdomen circumference	0.900	0.655	-0.350	0.275	0.546
Thigh circumference	0.580	0.838	0.765	0.641	0.099
Head width	0.696	0.103	-0.110	-0.055	0.445
Shoulder width	0.766	0.602	0.295	0.187	0.337
Hip width	0.672	0.540	0.168	0.024	0.528
Chest width	0.222	0.224	0.460	0.579	-0.718
Rump width	0.161	-0.477	-0.451	-0.538	0.393

REFERENCES

A.O.A.C., 1980. Official Methods of Analysis The Association of Official Analytical, Washington Chemists, D.C.,P.1001.

Afifi, Y.A., H.A. El-Koussy, S.S. El-Khishin and M.A. El-Ashry, 1977. Production of meat from Egyptian buffaloes. II- The effect of using different sources of roughage on carcass traits. Egypt. J. of Anim. prod., Vol. 17 (2), 165-171.

Ali, W.A., 1974. Comparative studies on some characteristics of the muscle tissues of some local meats, M. Sc. Thesis, Faculty of Home Economic, Helwan University.

Bedeir, L.H., F. El-Sabban, I.A. Abou-Selim and S.Omara, 1979. Effect of castration at different ages on feed lot performance, slaughter and carcass characteristics of water buffalo male calves. II- Slaughter and carcass characteristics. Agric. Res. Rev., Vol. 57(6), 9-18.

Darwish, Y.H., 1963. Meat Production. Ist Ed., Anglo, Egypt, Pub.(in arabic).

Diord, K., 1962. Practical microtecnique and histochemistry. Academy of science Pub. Hungary, Budapest.

El-Hakim, A.M., 1971. Meat production from male buffalo calves M.Sc.Thesis, Faculty of Agriculture Ain-Shams University.

El-Kaschab, S., A.A. Kandil, M. Abdel-Latif and S. El-Menshaways, 1985. Growth traits and body measurements of fattening buffalo calves. Menofiya J. Agric. Res., 10(1), 201-214.

El-Koussy,H. and A.S. Soliman, 1988. Studies on Friesian calves for meat production. 1. Meat characteristics of Friesian calves fed on green forages. Annals Agric. Sci., Fac. Agric., Ain-Shams Univ., 33(1), 335-346.

El-Koussy, H., S.A. Ibrahim and H. Ganim, 1992. The effect of feeding clover ryegrass mixture on growth performance and carcass quality of buffalo calves. Annals Agric. Sci., Ain Shams Univ., Cairo, 37(1), 103-111.

Hammonad, J. 1932. In growth and development of mutton qualities in the sheep.oliver and Boyed. Lond.

Larmond, E., 1977. Laboratory methods for sensory evaluation of food. Research Branch, Can Dept. of Agric.Pub.No. 1637.P 74

Nigm, A. A, A. Mostageer, M.A. Morsy, M.A.I. Salem and F. Pirchner, 1983. Chemical composition of meat of buffaloes and cattle. Egypt. J. of Anim. Prod., 33(1-2), 89-94.

Ragab, M.T., M.Y.H. Darwish and A.G.A. Malek, 1966. Meat production from Egyptian buffaloes. II- Physical and chemical characteristics of buffaloes meat. Egypt. J. of Anim. Prod. Vol. 6 : 31-.

Salem, M.A.I., A.A. Nigm and A.S. Abdel-Aziz, 1983. Changes in carcass characteristics of Egyptian buffaloes during the first six months of age. Egypt. J. of Anim. Prod. 23 (1-2), 77-88.

Snedecor, G.W., 1974. Statistical methods, applied to experiments in agriculture and biology. The Iowa State College Press. Ames.

Soloviev, V.E., 1966. Meat ageing. Ist Ed., Food Industry Pub., pp 178-242 (Moscow).

U.S.D.A., 1968. United States Department of Agriculture, Yield grades for beef. Marketing Bulletin No. 45

Volovinskaia, V.P., B.Y. Kalman, N.V. Reranov, D.S. Mindlina, L.M. Sheremetker and E.Z. Khramoging, 1959. Determination of specific weight of meat by-products and half finished meat products. Meat Ind. Sci. Tech. pp. 55-63 (Moscow).

Ziedan, M., A. Taha, M.F. Sedik and S. Roushdy, 1984. Efficiency of buffaloes as meat production animals. Egypt. J. of Anim. Prod. Vol. 24(1-2), 107-110.

تقييم إنتاج اللحم من إناث الجاموس المستبعدة

محمد عطيه حوريه – سعيد سعيد عمر

قسم الإنتاج الحيوانى – كلية الزراعة – جامعة المنوفية

استخدم فى هذه الدراسة ١٩ من اناث الجاموس المستبعدة من مزرعة – كلية الزراعة – جامعة المنوفية لانخفاض كفاءتها التناسلية والانتاجية. تم ذبح هذه الاناث بدون انهاء (تجهيز) لدراسة صفات الذبيحة وتقييم كفاءتها فى انتاج اللحم. تم استبعاد تسعة منها فى شهر مايو (بعد التغذية على موسم العلف الاخضر) ، والباقى تم استبعاده فى شهر أكتوبر (بعد التغذية على موسم العلف الجاف) وكانت أعمار اناث الجاموس تتراوح ما بين ٥ الى ١٢ سنة بمتوسط وزن ٥٢١,٨ كجم. هذه الحيوانات استبعدت . ويمكن تلخيص أهم النتائج المتحصل عليها فيما يلى :

حققت اناث الجاموس المستبعدة عند أعمار صغيرة نسبيا (٥–٧ سنة) قيم عالية المعنوية لكل من وزن الذبيحة الساخن ، وزن القناة الهضمية ، نسبة التصافى . أيضا حققت هذه الحيوانات قيم أعلى بالنسبة للتركيب الكيماوى للحم من بروتين . وكانت لحومها أكثر طراوة . أيضا حققت قيم عالية فى كل من مساحة العضلة العينية ودليل شكلها وبالتالى كان معامل اللحم لها عالى ، هذا مقارنة بالحيوانات المستبعدة عند أعمار كبيرة (أكبر من ٧ سنوات) . على العكس حققت الاناث المستبعدة عند أعمار صغيرة قيم منخفضة فى كل من نسبة العظام فى الذبيحة والفقد بالتبريد وكذلك نسبة الدهون باللحم بالاضافة الى قلة قطر ألياف اللحم . هذا وقد وجد أن باقى صفات الذبيحة المدروسة لم تتأثر معنويا بالعمر عند الاستبعاد .

كانت لحوم الاناث المستبعدة والمسبوقة بالتغذية على أعلاف خضراء أفضل فى صفاتها الطبيعية من حيث النكهة والعصيرية وطراوة اللحم وكذلك قطر الالياف هذا مقارنة بالاناث المستبعدة والمسبوقة بالتغذية على الاعلاف الجافة .

كان الارتباط أكبر ما يمكن (موجب ومعنوى) بين كل من نسبتى التصافى والتشافى وكل من محيط وطول الفخد . لذلك يمكن الاعتماد على هذين المقياسين فى التنبؤ بكفاءة انتاج اللحم من اناث الجاموس عند الاستبعاد .