EFFECT OF FEEDING *PANICUM MOMBASA* GRASS ON PRODUCTIVE TRAITS AND CARCASS CHARACTERISTICS OF LOCAL CROSS BREED GOATS

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ABSTRACT

The aim of this research was to study the effect of feeding of goat kids on *Panicum Mombasa* grass on productive traits, carcass characteristics and meat production. 25 of local cross breed male goat kids; average weight 18.3 kg were divided randomly to five treatments, the first one T1 was fed with wheat straw, T2 green alfalfa, T3 green *Panicum Mombasa*, T4 alfalfa hay and T5 *Panicum Mombasa* hay. Animals reared in single cages for two weeks as a preliminary period, the experiment period lasted for 70 days. Concentrate diet provided with 3% of body weight, roughage feeds provided freely. At the end of the experiment, three animals were slaughtered from each treatment randomly, data showed no positive effects were observed for feeding the *Punicum Mombasa* grass when compared with the traditional roughages feed used in Iraq for most of the productive traits and the carcasses and meat characteristics studied. At the same time, no negative effects were reported on the *Punicum Mombasa* feed in those traits and characteristics.

Key Words: Straw, alfalfa, hay, *panicum*, weight gain, ribs, chemical composition.
Part of M.Sc. thesis of the 1st author.

تأثير التغذية على اعشاب البونيكام مومباسا (*Panicum Mombasa*) في الصفات الانتاجية وخصائص ذبائح الماعز المحلي الخليط

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المستخلص

هدف هذا البحث الى دراسة تأثير تغذية صغار الماعز على اعشاب البونيكام *Panicum Mombasa* في صفاتها الانتاجية وصفات الذبائح واللحوم المنتجة منها. 25 رأس من جداء الماعز المحلي الخليط متوسط اوزانها 18.3 كغم وزعت عشوائياً على خمسة معاملات بواقع خمسة مكررات: المعاملة الاولى T1 تبن حنطة ، T2 جت أخضر، T3 بونيكام اخضر، T4 دريس الجت و T5 دريس البونيكام. التربية كانت في اقفاص مفردة، اول اسبوعين اعتبرت فترة تمهيدية، واستمرت التجربة لمدة 70يوم. نسبة العليقة المركزة كانت 3% من وزن الجسم وقدمت الاعلاف الخشنة بصورة حرة. عند انتهاء مدة التجربة ذبحت 3 حيوانات من كل معاملة عشوائيا وتم اخذ القياسات. اظهرت النتائج عدم وجود تأثيرات ايجابية تذكر للتغذية باعلاف البونيكام عند المقارنة مع الاعلاف الخشنة التقليدية المستخدمة في العراق لاغلب الصفات الانتاجية وصفات الذبائح واللحوم المدروسة، في نفس الوقت لم تسجل تأثيرات سلبية للتغذية على اعلاف البونيكام في تلك الصفات.

الكلمات المفتاحية: تبن، جت، دريس، *Panicum*، زيادة وزنية، اضلاع، تركيب كيميائي.
البحث مستل من رسالة ماجستير للباحث الاول

***Received:22/9/2019, Accepted:30/12/2019**

INTRODUCTION

The both types of agriculture, plant and animal, is one of the main pillars on which the economy of any country is based. It is the capital, source of labor and exploitation of the earth's wealth, as well as its utmost necessity in human nutrition, especially animal products because it contains animal protein, which is essential for human health and safety and is essential for human activity, vitality and growth and development of his body and intelligence. Animal production accounts for 20-30% of the agricultural economy in the Arab world, where its various products are the main source of animal protein, which is one of the necessary components of human nutrition, as the population increase in recent decades in the world, in addition to the high standard of living per capita and high levels of awareness healthy and cultural consumers led to increased demand for animal meat and especially goat meat (31,4). The number of goats in Iraq according to FAO estimates for 2017 is about 1,282,856 animals, and comes third after cows and sheep (15). Goats are of high genetic value, breeding does not need high cost and its management is simple and more resistant to epidemic diseases and parasites of sheep and cows, which made breeding more suitable for drought and low-yield agricultural areas, these advantages enabled the goat to continue to produce meat and milk in the harshest environmental conditions compared with other farms animals that do not tolerate harsh conditions reduce their productivity quickly (26). Goats are widely found in northern Iraq and goat meat is known to be more desirable in the northern areas than in the central and southern regions. Some statistics indicate that the per capita share of locally produced meat does not exceed 3.5 kg / capita / year (22). Most of the researches and studies aimed at increasing the proportion of animal production, including goats, which requires increasing the quantities of feed crops and provide good nutrition and intensive systems in breeding. Lack of fedder, high production costs, population growth, and the accompanying increase in demand for red meat have recently emerged as an acute problem of livestock breeding, which is worsening by the day. And the expansion of cities, and when you look at the agricultural and pastoral areas throughout Iraq, we find that more than 70% of the Iraqi soil is poor and bad and its climate is dry and hot desert with little rainfall (5-20 mm / year) and may reach 50° C in summer and therefore lack of plant. The cultivated areas are easy to irrigate became 20-30% of which is not valid for agriculture because of salinization (7). It is also noted that roughage feed sources (green and dry) produced in agricultural areas throughout Iraq are unable to provide the food needs of local livestock production. These factors encouraged researchers to try new methods for the purpose of increasing roughage feed produced in Iraq through a system of agricultural cycles, as well as adopting different methods to increase the efficiency of roughage and concentrated feed provided to animals and to find suitable feed alternatives (2,3,5) to support livestock production and reduce the use of concentrated feeds with high cost. In recent years, the use of *Panicum Mombasa* grass has been widespread in the world and the Arab world. It is currently called in the Arab world the blessed grass, *Panicum Mombasa* is a plant from African origin belonging to the gramineae family. It is considered one of the best types of fedder in the world as it has great economic feasibility for farmers and ranchers. Its high germination rate, in addition to being a perennial grass that lasts for decades, is an integrated element and can withstand the salinity of water, soil and high temperatures, but its performance is low in low temperatures, as it is suitable for feeding all kinds of livestock, horses, poultry, rabbits and will avail for other feeds (27,11), they help to multiply the production of milk and fattening (27,13,28). *Panicum Mombasa* grass is characterized by high annual production rate, reaching 12-15 padding / year, with high nutritional value and high foliage density, and is characterized by softness from leaves to roots. *Panicum Mombasa* is used as an energy source and therefore eliminates the use of barley and other feeder (23) in addition to its high protein content based on the type to about 8-16%, the first cut is to be 45-90 days after planting (20,21), and then a cut every 25-30 days (18), and therefore this grass is suitable for agriculture in the Iraqi territory as

it resists the difficult environmental conditions in Iraq, which encouraged us to conduct this study, especially with few studies available about it.Yousuf ,et.al (37) and Brown , et.al (9) reported that sheep fed on urea treated of *Panicum Mombasa* grass hay improved their weight gain and feeding efficiency.Viengsavanh and Ledin (34) and Karikari and Nyameasem (24) noted that the addition of *Panicum Mombasa* by 7.5% to a concentrated diet was better than the addition of 15% because of its positive effect on the quantitative characteristics of goat meat. In carcass cuts (shoulder, breast, flank and leg), respectively (214.0, 372.7, 210.0 and 483.3) gm compared to animal feeding on *Panicum* grass by 15% where the weight of the cuts respectively (178.3, 276.3, 181.3 and 392.3) gm. The aim of this study was to investigate the chemical analysis of a *Panicum Mombasa* grass and then compare local goat feeding green feed or hay with traditional feeds such as wheat straw and alfalfa.

MATERIALS AND METHODS

Experimental design

This study was conducted in the fields of the Veterinary Medicine - University of Tikrit for the period from 3/10/2018 to 27/12/2018 (84 days minus 14 days preliminary period) , where 25 animals of local cross breed male goat kids were reared with an average weight of 18.3 kg aged around 5 months purchased from one of the breeders In Salah Al-Deen governorate, it was distributed randomly to five groups, each group contained five replicates and was reared in shaded sheds in single cages of 1.75 x 1.85 m^2, where each cage was equipped with two feeds, one for concentrated feed and the other for roughage feed and a pot of drinking water with a capacity of 10 liters. Mineral salt cubes were left in front of all animals throughout the experiment. All animals were fed in the five groups for two weeks and were considered a preliminary period and then weighed before starting the experiment using a balance equipped with an iron cage capacity of 300 kg to represent that initial weight. All five treatments were fed with a standardized concentrated diets and their ratio is shown in Table (1) by 3% of body weight and two meals, the first in the morning at eight o'clock and the second in the evening at three o'clock, the percentages were adjusted weekly according to the weight gain in the weight of one animal, and roughage feed was provided Free (dry and green) for the duration of the experiment as follows: the first one (T1) was given wheat straw, Second treatment (T2) green alfalfa, third treatment (T3) green *Panicum Mombasa*, fourth treatment (T4) alfalfa hay ,and fifth treatment (T5) *Panicum Mombasa* hay.

Table 1. formulation of concentrated diet (%)

Ingredient	%
Wheat Flour	70
Wheat bran	22
Soya bean meal	5
Salt and limestone	2.9
Premix	0.1
total	100

Seeds of the plant which obtained from one of the local processors were planted according to the recommendations in one of the greenhouses then transferred after reached to an appropriate size and moderation of the air to one of the Salah al-Deen agricultural fields. After the plant reached a suitable height, several samples of *Panicum Mombasa* and alfalfa were taken and chemical analysis was carried out to estimate the components of these plants, and the results was as shown in table (2).

Medicines and vaccines

All animals underwent a vaccination schedule and veterinary care for the duration of the experiment periodically to ensure their health and safety.

Table 2. Chemical analysis of roughage feed used in the experiment(%) as dry matter basis (DM)

Treatments Traits (%)	Wheat straw T1	Alfalfa T2	*Panicum Mombasa* grass T3	Alfalfa hay T4	*Panicum Mombasa* hay T5
Dry matter	93.95	65.17	68.31	90.14	87.45
Crude protein	3.84	10.01	10.35	14.33	16.66
Ether Extract	0.62	0.94	1.90	1.90	2.03
Ash	8.65	7.45	7.45	8.35	9.01
Crude fiber	42.12	40.31	38.53	38.15	30.14

Data collection

At the end of the experiment, feeds were cut off for 12 hours and continued with provide water after weighing to stabilizing the final weight. The total weight gain rate was calculated by subtracting the initial weight from the final weight of the animals at the end of the experiment . The daily weight gain rate was calculated by dividing the total weight gain rate by the experiment days. Feed conversion ratio was calculated by dividing the total concentrated feed intake by the total weight gain rate. After preparation for the slaughter, the feeds were cut off from the animals and 3 animals from each treatment were randomly weighed, this was the slaughter weight, then the slaughter which was carried out and hot carcasses were recorded including the kidneys and fat as well as the pelvic fat (16). The carcasses were cooled at 2° C for 24 hours and then weighed again and cold weight recorded. The carcass was split into two equal parts and the technical half of the right carcass was cut into main and secondary cuts according to (17). All the cuts were weighed and numbered. Suspended in the freezing chamber at -20° C, then transfer to polyethylene bags after 24 hours to the normal freezer and stored until the time of physical dissection of cuts components (lean, fat and bone). The empty body weight was calculated by subtracting the weight of the digestive contents (rumen and intestines) from the slaughter weight.

Dressing percentage was calculated in two ways:

Dressing percentage = cold carcass weight / slaughter weightX100

Dressing percentage = cold carcass weight / empty body weight X100

Rib eye area was measured by printing the outer boundary of the longissimus dorsi muscle from loin cut between the 12th and 13th ribs on transparent paper. The area was then calculated using an electronic planimeter type Topcon KP-92N. The fat thickness over the longissimus dorsi muscle was measured between the 12th and 13th ribs also above the rib eye muscle using digital caliper. The main and secondary cuts were placed in the refrigerator for 24 hours to remove the freezing state, then weighed and physically separated into their main lean, fat and bone components using medical scalpels and sharp knives in a refrigerated chamber to avoid evaporation as much as possible according to (10), and then the Percentages were calculated. After the components of the loin were separated from the cut, the (LD) muscle was taken and then packed with polyethylene bags and kept in the frozen (-18° C) until the chemical analysis was carried out in vitro to estimate moisture, fat, protein and ash ratio, according to (6).

Statistical analysis

The experimental data were analyzed using Complete Random Design (CRD) to study the effect of factors influencing the studied traits, using SAS program (30) and the averages of the coefficients were compared using the polynomial (12) to estimate the significant differences between the treatments and means.

RESULTS AND DISCUSSION

Table 3 shows the effect of *Panicum Mombasa* grass feeding on weights measurements and production characteristics of local cross breed goat. Regarding the final weight, there is a significant increase ($P \leq 0.05$) of the treatment T4 comparative to the first treatment T1, and we note that there is a significant increase of

the others treatment groups (T2, T3 and T5) on the first treatment T1. The means were 20.94, 24.50, 24.96, 25.90 and 24.06 kg for the treatments T1, T2, T3, T4 and T5 respectively. For the total and daily weight gain, we notice a significant increase (P≤0.05) for the treatments T2, T3, T4 and T5, which weighed 6.40, 6.29, 7.60 and 6.05kg for the total weight gain, and 91.43, 89.86, 108.57 and 86.43g/day for the daily weight gain when compared with the treatment T1 which recorded the lowest rate of total weight gain which was 2.86 kg, and the daily weight gain (41.00) g. The mean of feed consumption did not indicate significant differences between treatments, but there was a clear arithmetic superiority of the treatments T2, T3, T4 and T5 compared with treatment T1, the means were 35.36, 41.78, 41.24, 41.42 and 38.73 kg for the treatments T1, T2, T3, T4 and T5 respectively. The mean of feed conversion ratio showed a significant increase (P≤0.05) for treatment T1 over the rest treatments, the means were 12.11, 6.78, 6.60, 5.61 and 6.89 g feed / g weight gain for treatments T1, T2, T3, T4 and T5 respectively. These results were consistent with those of Wildeus, et.al. (35) which indicated that there was no significant difference in final weight between the alfalfa hay and grass hay treatments, and that the alfalfa hay treatment outweighed the grass hay treatment in the daily weight gain rate. May be this is due to the ratio of protein or energy to protein ratio between the two treatments. It also agreed with the findings of Titi, et.al. (33) which indicated a decrease in feed consumption for young goats introduced by barley straw instead of alfalfa hay, and stated that this decrease may be due to the low rate of straw digestion and the speed of rumen passage, but it disagreed with the findings explain that there was no improvement in the daily weight gain. The results were also in agreement with Raouf and Al-sherwani (29), indicating that there was an improvement in daily weight gain, dry matter intake and feed conversion ratio when adding alfalfa hay as roughage feed in the lamb diets, they added that the addition of alfalfa hay to the diets has increased the amount of nutrients eaten, which has positively reflected on the weight increases and the efficiency of feed conversion. Results also agreed with Han et.al. (19) when feeding local Korean calves for 98 days, they pointed out that the ratio of grass hay to rice straw in diet did not affect the amount of dry matter intake while there was a significant improvement in the weight gain, they explained the improvement in protein intake and high cellulose and hemicellulose content in straw, and possibly due to higher digestibility and energy available of hay compared with straw. It also agreed with Bamigboye et.al. (8) that they found the using of *Panicum Mombasa* had positive effects in feed intake, daily weight gain, and fee efficiency. This study also agreed with the results of Eyoh et.al. (14) which reported that feeding goats on *Panicum Mombasa* in different forms (fresh, withered, silage and straw) had no significant effect on final weight, slaughter weight, daily weight gain and feed conversion ratio. It could be said that the improvement in feed conversion ratio of T2, T3, T4 and T5 treatments was due to increased feed consumption and higher daily and total weight increase and final weight compared to T1 straw treatment. Table 4 shows the effect of *Panicum Mombasa* grass feeding on carcass weights and dressing percentage of local cross breed goat. It can be seen that there are no significant differences between treatments for each of these traits: slaughter weight, empty body weight, hot weight, cold weight and dressing percentage based on slaughter weight. As for the dressing percentage based on empty weight, we note

Table 3. Effect of feeding *Panicum Mombasa* grass on weights measurements and production characteristics of local cross breed goat (Mean±SE)

Treatments Traits	Wheat straw T1	Alfalfa T2	*Panicum Mombasa* grass T3	Alfalfa hay T4	*Panicum Mombasa* hay T5
Initial weight (kg)	18.08±2.25 a	18.10±1.16 a	18.67±2.11 a	18.30±1.03 a	18.01±0.81 a
Final weight (kg)	20.94±1.63 b	24.50±1.28 ab	24.96±2.43 ab	25.90±0.70 a	24.06±1.79 ab
Total weight gain (kg)	2.86±0.84 b	6.40±0.657 a	6.29±0.40 a	7.60±0.64 a	6.05±1.11 a
Daily weight gain (g/d)	40.86±12.00 b	91.43±9.43 a	89.86±6.80 a	108.57±9.29 a	86.43±15.86 a
Total Feed consumption (kg)	35.36±2.55 a	41.78±2.98 a	41.24±3.41 a	41.42±1.64 a	38.73±3.15 a
Feed conversion ratio (kg consumed feed/kg weight gain)	12.36±0.795 a	6.53±0.93 b	6.56±0.49 b	5.45±0.51 b	6.40±0.98 b

Differences between letters horizontally indicate significant differences between means (P≤0.05)

that treatment T1 (54.34) increase significantly (P≤0.05) comparative with T3 treatment (51.20) and arithmetically with the other treatments. The differences between slaughter weight in this table and the final weight in the previous table are due to the selection of only three animals from each treatment for slaughter, in addition to the existence of several days between the process of taking the final weight and slaughter weight, which led to the existence of these differences. Although there are no significant differences between the treatments in Table 4, we can record arithmetic differences in the dressing percentage based on slaughter weight and significant (P≤0.05) in the dressing percentage based on empty weight in favor with treatment T1 compared with treatment T3, and arithmetic with other treatments. These significant differences between the different treatments in the dressing percentage of T1 comparative to other treatments may be due to the increase in the straw consumption of these treatment animals despite the high palatability of green fodder as a result of lower temperatures during the experiment period and the tendency of animals to consume dry materials below green. This conclusion may be supported by the arithmetic decrease in concentrated feed consumption in the previous table of straw treatment (T1). In spite of this decrease in the consumption of concentrate and the high consumption of straw, we note the arithmetic superiority of this treatment (T1) over the rest of the treatments in dressing percentage due to the arithmetic decrease in carcass weights and high slaughter weight and the empty weight of treatments T2, T3, T4 and T5 compared with T1 treatment. These findings were consistent with Wildeus et.al.(35) results which confirmed the superiority of alfalfa hay treatment on grass hay treatment in cold weight and dressing percentage of Spanish young goats carcasses, researchers point out that this superiority is due to the deferent of the proteins level between the two treatments. It also agreed with Titi et.al. (33) where they indicated that there were no significant differences between the treatments in the dressing percentage of Shami goat kids carcasses offered to them barley straw instead of alfalfa hay. It also agreed with Theurer et.al. (32) that measurements of calf carcasses were unaffected when alfalfa hay was replaced by wheat straw. Similarly with Abdulla (1) who stated that the characteristics of carcasses and meat did not differ significantly between the treatments containing alfalfa hay or barley straw provided to Awassi sheep. It also agreed with the results of Eyoh et.al.(14) which indicated that feeding the goats on *Panicum Mombasa* in different forms (fresh, withered, silage and straw) did not have a significant effect on slaughter weight, hot weight and dressing percentage. In the other hand, these results differed with those of Yang et.al. (36) in a cattle nutrition experiment that showed the speed of feed passage was higher and the ammonia emissions were significantly less when feeding on hay compared to rice straw.

Table 4. Effect of feeding *Panicum Mombasa* grass on carcass weights and dressing percentage of local cross breed goat (Mean±SE)

Treatments Traits	Wheat straw T1	Alfalfa T2	*Panicum Mombasa* grass T3	Alfalfa hay T4	*Panicum Mombasa* hay T5
Slaughter weight (kg)	22.82±0.80 a	22.66±0.49 a	22.82±1.61 a	24.93±0.07 a	22.83±0.42 a
Hot carcass weight (kg)	11.15±0.22 a	10.78±0.11 a	10.57±0.96 a	11.82±0.47 a	10.65±0.15 a
Cold carcass weight (kg)	10.83±0.21 a	10.48±0.11 a	10.26±0.93 a	11.47±0.46 a	10.35±0.15 a
Empty body weight (kg)	19.85±0.56 a	20.24±0.36 a	20.04±1.73 a	21.97±0.51 a	20.39±0.513 a
Contents of the gut weight(kg)	2.97±0.19 a	2.42±0.18 a	2.78±0.29 a	2.96±0.56 a	2.44±0.55 a
Dressing percentage 1 (%)	47.46±0.86 a	46.25±0.55 a	44.96±1.31 a	46.01±1.91 a	45.34±1.31 a
Dressing percentage 2 (%)	54.34±0.54 a	51.75±0.55 ab	51.20±0.63 b	52.21±0.89 ab	52.09±1.55 ab

Differences between letters horizontally indicate significant differences between means (P≤0.05)
1- based on slaughter weight 2- based on empty body weight

Table 5 shows the effect of *Panicum Mombasa* grass feeding on carcass cuts percentage, rib eye area and fat thickness of local cross breed goat. There was no significant effect of different treatments in percentages of loin, ribs, flank, neck and breast, while there was significant decrease (P≤0.05) of treatment T5 leg (27.34) compared to T4 (31.14) and T1 (31.32), shoulder cuts of T5 (22.92) and T3 (22.94) compared to T1 (26.43), and fore shank cut of T2 (7.21) compared to T5 (9.04). In general there are no clear significant differences between the different treatments, but there is an arithmetic decrease of the treatments T2, T3, T4 and T5 compared with the treatment T1, these differences may be a reflection or a result of low carcass weights for these treatments. These findings were consistent with those indicated by Wildeus et.al. (35) when feeding goat kids on alfalfa hay and grass hay, and with Eyoh et.al. (14) when feeding goats on various forms of *Panicum Mombasa* grass, which indicated no significant effects of these treatments on main and secondary cuts percentage weights. From the results of rib eye area and fat thickness we can see that there are no significant effects between the different treatments in these two measurements. The average area of rib eye muscle was 6.69, 6.23, 6.40, 6.36 and 6.16, while the mean of fat thickness was 2.29, 1.92, 2.13, 1.89 and 2.22 for treatments T1, T2, T3, T4 and T5 respectively. These results were consistent with those indicated by Wildeus et.al. (35) when feeding goat kids on the alfalfa hay and grass hay, and with Titi et.al. (33) when feeding the Shami goat kids at different substitution ratios for barley straw with alfalfa hay, and with Eyoh et.al. (14) results when feeding goats on various forms of *Panicum Mombasa* grass which indicated that there was no significant effect of these various treatments on rib eye area muscle and fat thickness. Tables 6 and 7 show the effect of *Panicum Mombasa* grass feeding on physical dissection of main and secondary cuts, respectively of local cross breed goat carcasses. The data in table 6 of leg cut indicate a significant decrease (P≤0.05) in lean percentages for T3 (65.20) and T5 (64.73) compared with the other treatments (68.9, 69.93 and 70.10), and there was a significant increase (P≤ 0.05) in fat percentages of T3 (13.20) and T5 (12.43) compared to other treatments (8.3, 9.4 and 8.33). As for the rib, the data indicated a significant increase (P≤0.05) in lean ratio for treatment T2 (62.70) compared with treatment T5 (55.9). As for the shoulder, the data indicated a significant decrease (P≤0.05) in lean ratio for T3 (61.73) and T5 (62.53) compared with T2 (67.77).

Table 5. Effect of feeding *Panicum Mombasa* grass on carcass cuts percentage, rib eye area and fat thickness of local cross breed goat (Mean±SE)

Treatments	Main cuts				
Traits (%)	Wheat straw T1	Alfalfa T2	*Panicum Mombasa* grass T3	Alfalfa hay T4	*Panicum Mombasa* hay T5
Loin	6.92±0.159 a	6.83±0.04 a	7.24±0.31 a	7.04±0.76 a	8.03±0.22 a
Ribs	9.05±0.330 a	8.91±0.14 a	8.34±0.34 a	8.60±0.53 a	8.94±0.25 a
Leg	31.32±0.74 a	29.84±1.22 ab	30.34±1.36 ab	31.14±1.18 a	27.34±0.60 b
Shoulder	26.43±0.71 a	24.89±1.04 ab	22.94±0.53 b	24.25±0.81 ab	22.92±0.23 b
	Secondary cuts				
Treatments					
Traits (%)	Wheat straw T1	Alfalfa T2	*Panicum Mombasa* grass T3	Alfalfa hay T4	*Panicum Mombasa* hay T5
Fore shank	7.63±0.22 ab	7.21±0.34 b	8.21±0.50 ab	7.75±0.28 ab	9.04±0.86 a
Flank	2.97±0.24 a	3.78±0.41 a	2.84±0.46 a	3.69±0.16 a	3.71±0.21 a
Neck	5.67±0.18 a	5.76±0.19 a	6.09±0.38 a	6.21±0.35 a	5.90±0.65 a
Breast	8.24±0.63 a	8.43±0.39 a	8.97±0.21 a	8.95±0.88 a	9.023±0.70 a
	Rib eye area, fat thickness				
Rib eye area (cm^2)	22.82±0.80 a	22.66±0.49 a	22.82±1.61 a	24.93±0.07 a	22.83±0.42 a
Fat thickness (mm)	11.15±0.22 a	10.78±0.11 a	10.57±0.96 a	11.82±0.47 a	10.65±0.15 a

-Differences between letters horizontally indicate significant differences between means (P≤0.05)

For loin cut, there was a significant decrease (P≤0.05) in bone ratio for treatment T2 (22.6) compared with T1 (29.5) and T5 (28.4). The results in Table 8 for the neck cut indicated a significant decrease (P≤0.05) in lean ratio for T3 (65.67) and T5 (65.97) compared with T1 (70.9) and T2 (70.3), and a significant increase (P≤0.05) in fat ratio for the treatments (T3) (8.23) and T5 (8.70) compared to the rest treatments (4.4, 4.27 and 4.97). The results of breast cut showed a significant increase (P≤0.05) in fat ratio for treatment T3 (29.0) compared with T1 (20.7), T2 (22.53) and T4 (20.97), as well as significant decrease (P≤0.05) in bone ratio for treatment T3 (20.30) compared to the first treatment T1 (25.2) .We note from the results of tables 6 and 7 that there is a conflict in significant differences, although small and not clear of differences in means between the treatments, but the general trend (significantly and arithmetically) was the reduction of lean ratios and high fat ratios for most of the cuts, which may also be due to the overall decrease in carcass weights compared with the first treatment T1. Table 8 shows the effect of *Panicum Mombasa* grass feeding on chemical composition of longissimus dorsi muscle of local cross breed goat. There were no significant effects of different treatments on moisture, averages were 74.83, 73.64, 75.26, 74.40 and 73.81 for T1, T2, T3, T4 and T5 respectively. For the results of the protein ratio, we also noted that there were no significant effects of the different treatments on the protein ratio where the averages reached to 15.07, 17.72, 15.06, 16.60 and 16.75 for the treatments T1, T2, T3, T4 and T5 respectively. No significant differences were recorded between the different treatments in fat ratio, averaging 6.74, 7.45, 7.39, 7.41 and 7.37 for the treatments T1, T2, T3, T4 and T5 respectively. Also there were no significant differences between the different treatments in ash ratio, averaging 1.40, 1.39, 1.59, 1.75 and 1.59 for the treatments T1, T2, T3, T4 and T5 respectively

Table 6. Effect of feeding *Panicum Mombasa* grass on physical dissection of main cuts of local cross breed goat carcasses (Mean±SE)

Traits			Treatments: Wheat straw T1	Alfalfa T2	*Panicum Mombasa* grass T3	Alfalfa hay T4	*Panicum Mombasa* hay T5
Leg	%	lean	68.9±0.64 a	69.93±1.38 a	65.20±1.15 b	70.10±0.26 a	64.73±0.48 b
		fat	8.3±0.62 b	9.4±0.75 b	13.20±1.45 a	8.33±0.34 b	12.43±0.91 a
		bone	22.80±0.61 a	20.67±0.64 a	21.6±0.56 a	21.53±0.45 a	22.83±1.27 a
Ribs	%	lean	59.53±0.58 ab	62.70±1.25 a	56.70±3.22 ab	57.63±2.25 ab	55.9±1.16 b
		fat	12.8±1.39 a	15.13±1.91 a	19.50±1.51 a	15.1±3.96 a	18.7±1.81 a
		bone	27.73±1.63 a	22.20±1.19 a	23.77±2.53 a	27.27±1.11 a	25.40±2.31 a
Shoulder	%	lean	63.87±1.13 ab	67.77±1.36 a	61.73±0.38 b	66.77±2.64 ab	62.53±1.17 b
		fat	14.33±1.05 a	14.50±0.32 a	18.60±1.30 a	12.87±3.02 a	17.23±1.90 a
		bone	21.80±1.17 a	17.73±1.28 a	19.67±1.08 a	20.40±0.60 a	20.27±2.13 a
Loin	%	lean	59.4±1.99 a	61.30±0.32 a	55.9±2.51 a	60.6±3.21 a	55.2±1.05 a
		fat	11.0±1.4 a	16.0±1.84 a	16.47±0.95 a	14.3±2.92 a	16.4±1.51 a
		bone	29.5±0.78 a	22.6±1.54 b	27.7±2.77 ab	25.1±1.14 ab	28.4±0.78 a

Differences between letters horizontally indicate significant differences between means (P≤0.05)

Table 7. Effect of feeding *Panicum Mombasa* grass on physical dissection of secondary cuts of local cross breed goat carcasses (Mean ± SE)

Traits			Treatments: Wheat straw T1	Alfalfa T2	*Panicum Mombasa* grass T3	Alfalfa hay T4	*Panicum Mombasa* hay T5
Neck	%	lean	70.9±0.99 a	70.3±1.36 a	65.67±1.54 b	67.7±1.50 ab	65.97±0.87 b
		fat	4.4±0.35 b	4.27±0.82 b	8.23±0.79 a	4.97±0.26 b	8.70±1.64 a
		bone	24.7±0.84 a	25.47±0.62 a	26.07±0.95 a	27.37±1.48 a	25.33±2.42 a
Flan	%	lean	81.63±1.85 a	81.87±1.73 a	78.07±1.53 a	82.97±3.25 a	80.93±3.23 a
		fat	18.6±1.85 a	18.13±1.73 a	22.20±1.50 a	17.03±3.25 a	19.07±3.23 a
Breast	%	lean	54.10±1.95 a	55.63±1.68 a	50.70±1.55 a	56.83±2.88 a	54.47±0.24 a
		fat	20.70±0.72 b	22.53±1.73 b	.29.0±2.29 a	20.97±2.37 b	24.10±0.29 ab
		bone	25.20±1.44 a	21.87±1.59 ab	20.30±1.42 b	22.20±0.66 ab	21.47±0.38 ab
Fore shank	%	lean	61.77±2.53 a	62.10±0.45 a	60.70±0.55 a	62.63±2.19 a	62.27±0.93 a
		fat	7.47±0.47 a	7.83±0.67 a	09.9±1.06 a	6.83±1.44 a	11.27±1.42 a
		bone	30.77±2.34 a	30.0±0.52 a	29.33±1.53 a	30.57±1.36 a	26.5±0.72 a

-Differences between letters horizontally indicate significant differences between means (P≤0.05)

Table 8. Effect of feeding *Panicum Mombasa* grass on chemical composition of longissimus dorsi muscle of local cross breed goat (Mean±SE)

Treatments Traits (%)	Wheat straw T1	Alfalfa T2	*Panicum Mombasa* grass T3	Alfalfa hay T4	*Panicum Mombasa* hay T5
Moisture	74.83±1.40 a	73.64±0.87 a	75.26±1.31 a	74.40±0.64 a	73.81±1.16 a
Protein	16.07±0.54 a	16.55±0.40 a	15.06±0.71 a	15.60±1.00 a	16.30±1.20 a
Fat	6.74±0.28 a	7.45±0.63 a	7.39±0.38 a	7.41±0.28 a	7.37±0.55 a
Ash	1.40±0.22 a	1.39±0.18 a	1.59±0.09 a	1.75±0.05 a	1.59±0.11 a

Differences between letters horizontally indicate significant differences between means (P≤0.05)

Chemical analysis of feeds showed no preference for *Panicum Mombasa* grass (green or hay) over conventional green fodder used in Iraq (green alfalfa and alfalfa hay) in terms of protein content, even on alfalfa and straw in the production traits and characteristics of carcasses and meat of domestic goats. At the same time, there was no harm to feeding with *Panicum Mombasa* grass when compared with traditional roughage feed (alfalfa and straw). The preference of using remains depending on the extent of field productivity of the plant according to the seasons and the extent and how the breeder and farmer benefit from the high foliage density of the plant.

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