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The Effect of Using Different Sources of Roughages and Enzymes in Muscles Weight and Fat Distribution in Carcass of Awassi Lambs

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Abstract **– This experiment have been done at the animal production department /college of Agriculture for period 2/8/2015 to 15/10/2015 to study the effect of using different sources of forages and enzymes in quality and quantity characteristics of meat in Awassi lamb.**

24 of Awassi lambs were used in this experiment average age were nine months' and average initial weight 29.84 ± 1.37 kg. And randomly in to six treatments (each treatment contains 4 animals).

- **The first treatment (T1): were fed on barley straw that treated with 8 ml of local enzyme.**
- **The second treatment (T2): were fed on alfalfa hay that treated with8 ml of local enzyme.**
- **The third treatment (T3): were fed on barley straw that treated with 8 gm of commercial enzyme.**
- **The fourth treatment (T4): were fed on alfalfa hay that treated with 8 gm of commercial enzyme.**
- **The fifth treatment (T5): were fed on barley straw without treatment (control).**
- **The sixth treatment (T6): were fed on alfalfa hay without treatment (control).**

The feeding was homogeneous along the experiment and concentrated was used as main diet in average 2.5% of body weight, animal were weighted periodically in each two weeks. And roughages were used ad libitium basis. Animals were subjected to veterinary care , in the end of experiment animal were slaughter and carcass were kept at 2°c for 24 h , measurements have been done included carcass characteristics , physical composition , muscle , bone and fat distribution in the carcass and in the animal's body.

The result of this experiment showed the following :

1- **The higher weight of muscles in pelvic, thoracic limbs and back in the fourth treatment (barley straw + commercial enzyme). While (T1, T2) showed less weight for the same muscle.**
2- **The enzymatic treatments (T1,T2,T3,T4) were recorded significant increase in weight and percentage of inter muscular fat as compared with control (T6), the second treatment had more significant as compared with control (T5,T6) in inter muscular fat weight and with (T5) in inter muscular fat percentage. While there were no significant effect between treatments in weight and percentage of subcutaneous, kidney and pelvic, tail fat and carcass fat.**
3- **Third treatment was recorded significant increase ($p< 0.05$) in weight of gut fat as compared with (T5). While T1 had more significant as compared with T3, T4, T5 in weight and percentage of heart fat.**
4- **No significant effect for enzymatic treatment as compared with control in total weight and percentage of fat.**
5- **There are significant decrease ($p<0.01$) in enzymatic treatment (T1, T2, T3, T3) of subcutaneous fat to intramuscular fat ratio.**

Keywords **– Muscles Weight, Exogenous Fibrolytic Enzymes, Fat Distribution.**

I. Introduction

The digestion of the cell wall components consider uncompleted in the rumen because of the existence of the complex- bonds between its components prevent its degradation in the rumen, therefore it's necessary to find other means to improve the use of roughages in the ruminants production system, and among these method the use of enzymes as an external adding to the roughage for the purpose of improving the digestion of the cell wall components [1]. In Europe the use of exogenous enzyme to the roughage has been increased at a rate of 13% between 1998-2008 and were used wildly in poultry and pigs; As for the ruminants has been few but the exogenous enzymes to the ruminants led to significant impact in the production of the meat by changing the roughage components, and that is by allowing the extraction of the main roughage components, to providing the benefit of the used of the consumer roughage better than abating from excretion animals waste [2]., and the used of enzymes in animals ration ruminants for the purposes of making a great use of carbohydrate, amine acid and minerals such as phosphorus and calcium by increasing the decomposition of the roughage, and the use of enzymes do not make any side effect on animals product [3, 4]. The majority of the studies focusing on the gain from using enzymes to improve the efficiency, and the mount of the roughage without considering the possibility of the changes in the carcass and the quality of the product meat, and also the using of the exogenous enzyme improve the digestion, but it respond depends on the enzymes dose and on the roughage type, and the use of the exogenous fiberolytic enzyme improve the economic income [5]. Also improve the ratio in kidneys [6]. There some studies notes that the improving in the carcass weight, body measurement, dressing percentage, shoulder and loin meat while their feed on the coarse roughage with enzymes which has significantly effect on the kidney fat [6]. While some studies confirmed an improvement in the qualities of the carcass and the meat including the hot and cold carcass weight, the weight of some of the internal organs, carcass length, thickness of the fat thickness, rib eye area and the weights of cuts fat. Also some chemical test happened on the cuts to determined the percentage of fat, protein, moisture, ash and collagen, and some other chemical qualities, the study results shows that's possible to use exogenous enzymes to improving the efficiency of the muscles and protein production [7].

The exogenous enzymes that used in the ruminant consist either fungal source (Trichoderma Longibrachiatum, Aspergillus niger and oryzae. a). Or from bacterial source (Bacillus SPP.) which has cellulose effect or hemi-cellulose, which using in liquid or granules with the roughage [8]. There are some studies, that used the product enzymes by organism such as Xylanases and cellulases, are the most used in the ruminant and also Ferulic acid esterase, Proteases, phytases and amylases, which work on breaking the bridge ferulic acid and attacking the component that contain nitrogen and increased the absorption of phosphorus as well as improving the digestion [9, 10].

And according to Beauchemin [11] that enzymes used be more active in the roughage with high moisture such as silage rather than the dry roughage, that's for the important of the water in the hydrolysis of the cell wall enzymatically, those findings were to show the effect of using various rescores of roughage and enzymes in the muscles and fat deposition in the carcass of Awasi lambs in the hot summer season.

II. The Method and Materials

An experiment was performed in Animal production department - college of Agriculture -university of Baghdad / AL, Jadiriya. for a period from (20/5/2015- 2/8/2015), to study the effect of use different types of roughage and enzymes in muscles distribution and fat deposition in the carcass of the Awassi lambs under the hot summer season. Use in the experiment 12 lamb awassi average of age 9 months and the rang of the weight 29.84, ± 1.37 kg, and distributed for six treatment by four animal per treatment , the first treatment (T1) fed concentrate and wheat straw treated by (8ml) local enzyme , the second treatment (T2) fed concentrate and alfalfa hay treated by (8ml), local enzyme too. The third one (T3) fed on concentrate and wheat straw treated by (8 gm) of commercial enzyme, the forth treatment (T4) fed on concentrate and alfalfa hay treated by (8 gm) of commercial enzyme, while the fifth (T5) and the sixth (T6) treatments were as control. (T5) fed on concentrate and wheat straw untreated by enzymes and also (T6) fed on concentrate alfalfa hay untreated by enzymes. And these animals were distributed randomly on six detentions every detention for four animals. Commercial enzymes ZY1050-l were used. which was made by (Lohmann animal nutrition GmbH. zeppelinstr. 3.27472 cuxhaven.) company, and based on the instruction that was written on the powder mixture box which contain number of enzymes that contain B-glucanase (IUB3.2.1.6) (50) unit and Xylanase (IUB 3.2.1.8) (1000) unit of each gram of the powder. While the local crude liquid enzyme that called (HAMU) and made by AL-Khateeb [12], which used in solid fermentation. Which contain 20 gm as average to produce enzymes and moisturized the area with sterile water and then putting bacteria vaccine (Sterptomyces MS) to it and thenmix it all well, with coarse roughage by 1:10 (weight and value) and adjust the humidity to 65% with sterile water that contain 0.5% of ferment extract and keep it for 5 days , in 40̊c , after that the enzyme will be extracted by using 100 ml of sterile phosphate neuter (PH 7.0, 0.05 m) after that it will be mixed very well in cold weather for 30 minuet and flirted the mixture on filter paper and placed the output on Centrifuge for 4000 round for 5 minute at 4c and keep it under 20 c until it used .Wheat Straw and alfalfa hay treated handled with 32 ml of local enzyme (HAMU) or with 32 gm of commercial enzyme (ZY 1050-l) which used of 50 l of water ant put in a large plastic container and dipped in 4 kg of wheat straw or alfalfa hay with enzyme for 25 hour and then dried in the sun for 3-5 days, according to what AL-Wazeer [13]. Referee to. All the lambs have undergone experiment of health and care by the veterinary supervision and the nutrition system made from forage concentrate, which explains in table 1. Roughages intro-treated and untreated was barley and alfalfa hay given freely ad libtum, according to the amount remaining from the previous day and illustrates the second table (2) the chemical composition of feed coarse roughage foreground concentrated for animals. The fat that removed from the carcass, from the coccygeal vertebrae very well. Also the precipitate fat around the kidneys and around the pelvis were detached and weighed together with an electronic weighing scale 400 SF, capacity 10 kg, and precision 1g. The weighed residual fat residual fat of the left half of the carcass that contained subcutaneous fat, among muscles fat, half of kidneys and pelvis fat, and tail fat. The fat mentioned above was calculated according to the half quantity of the total fat of the empty body weight of the carcass. The precipitate fat around the heart, and rumen was calculated according to the half quantity of the total fat of the empty body weight of the carcass calculated according to the half quantity of the total fat of the empty body weight of carcass. Calculating the total fat of the animal according to the fat quantity of the total half of the carcass, laced with the precipitate fat around the innards, including the heart, rumen and Intestines. It was calculated according to the half weight of the empty body of the animal. The muscles were detached from three areas, the front, dorsal, and the back limbs in the right half of the animal body according to the half weight of the empty body of the animal. The muscles were Separated from three areas, the front, dorsal, and the back limbs in the right half of the animal body according to Butterfield's [14] method,. Each muscle was weighed after it was cleaned from the residual fat around it, with an electronic weighing scale type 400 SF, Chinese with capacity of 10 kg, and precision of 1g. A statistical analysis was made to the studied qualities with the statistical analysis program SAS [15] in a factorial experiment (3x2) was applied by a completely randomized design (CRD) and by using Duncan [16] polynomial test to compare the significant differences among the averages.

Table 1. Concentrate component.

Component	%
Barley grains	40
Wheat bran	35
yellow corn	13
Soybean meal	7.5
Sunflower oil	2.5
Salts and lime	2

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Volume 5, Issue 4, ISSN (Online) 2319-1473

Table 2 the chemical Composition of Concentrate Diet and Roughages (on DM% basis)

Component / Treatments	%DM	OM	CP	EE	CF	Ash
Concentrate	91.18	88.14	14.49	5.36	13.00	11.86
T1 straw + local	91.38	88.35	3.53	1.67	51.96	11.65
T2 hay + local	91.20	90.25	14.79	4.08	51.89	9.75
T3 straw + commercial	92.29	88.80	3.85	1.22	52.03	11.20
T4 hay + commercial	90.79	89.01	14.65	4.30	53.45	10.99
T5 straw control	90.92	89.71	3.70	2.02	47.05	10.29
T6 hay control	91.96	86.87	14.84	2.42	35.78	13.13

III. Results and Discussion

The figure (1) shows the overlap to using different sources of the roughage and enzymes to the weight of the first set of the main muscles that belong to the back limbs of the left half of the carcass. Semimembranosus (SM), Biceps Femora's (BF), Semitendinosus (ST), and Rectus Femora's RF). The fourth treatment showed significantly increase (p<0.01) in the weight if (SM) muscle which weighs 219 g over the first, second, fifth, and sixth treatments for it had reached 175, 175, 190, 185 g respectively. The third 210 g treatment has reached significantly increasing (p<0.01) over the first and the second treatment, whereas the second treatment reached an significant decrease (p<0.01) in the (BF) muscle weight Compared to other treatments for it has reached 167 g whereas the first, the third, fourth, and the sixth treatments recorded significant decreasing (p< 0.01) for it has reached 197, 219, 215, 211 g compared to the fifth treatment which reached 261g. It was has noticed that there was significant decreasing (p<0.05) in the (ST) muscle weight of the second treatment that reaches 167 g compared to the fifth which reached 84 gm. The fourth treatment scored the heights weight of (RF) muscle in significantly (p<0.05) for it has reached 123 g compared to the first, the second, the third, and the fifth treatments which scored 95, 96,98,97 g. There were no incorporeal differences between the sixth treatment and other treatment. The increments (significant and mathematical) that happened to the weights of the muscles in the fourth treatment especially and the enzymes treatment generally might be attributed to the increased in the Microorganisms and protein made by rumen Microorganisms [17] which belongs to the rumen bacteria capacity of improving the process of digesting roughages that release the nutrient because of exogenous fibrolytic enzymes [18], and increasing energy [19]. And this goes along with what Salem [20] have found, when he used exogenous fibrolytic enzymes in feeding calves an significant increment happened in the nitrogen of the rumen, in the short-chained fatty acids, and also Allantois has been increased, an increment in the live weight in the rate of 16%.

Whilst Eun [21] found that by using external bastes dissolving enzymes in the fattening diets of the calves in the rate of 1, 2 g/kg dry matter did not affect growth qualities, nevertheless, the hay treatments has exceeded significant in the (BF) muscle weight. Whereas the commercial enzyme and the control s has been significant decreased compared to the local enzyme treatment in the (BF) muscle weight. The commercial enzyme got a significant increase against the local enzyme and control treatments in (SM) muscle weight.

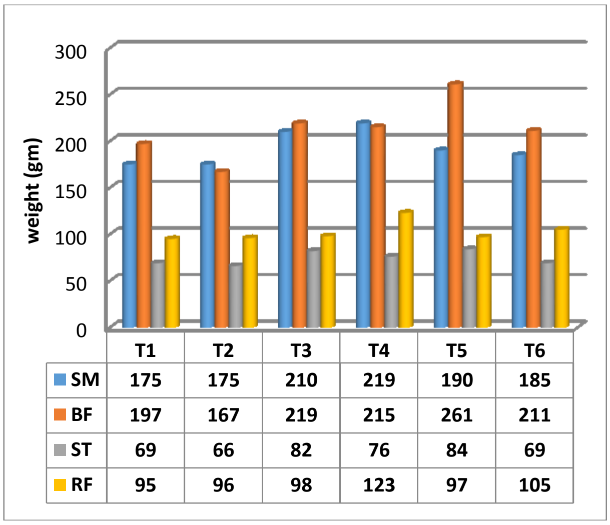

Fig. 1. Shows the overlap to using different sources of the roughage and enzymes to the weight of the first set of the main muscles that belong to the back limbs of the left half of the carcass.

Figure (2) shows the overlap effect by using different sources of roughages and enzymes in the second set weight of the main muscles that belongs to the back limbs of the left half of the carcass (Ad) Usinguctor, Gracilis (G), Vustus Lateralis (VL), Vustus Medialis (VM), and Vustus Intermedialis (VI). The results showed that there is a significant decrease (p<0.01) in the weight of (AD) muscle in the first, second, and the sixth treatment that reached 60, 63, 75 g respectively compared to the fifth treatment which has reached 94 g. Also it shows a significant increase (p<0.01) in the third treatment that came to 82 g compared to the first and second treatment. The results shows a significant increase (p<0.05) in the weight of (G) muscle in the third treatment which recorded 46g compared to the second which came to 28g with any significantly differences among other treatments. The results also shows a significant decrease (p<0.01) in the weight of (VL) muscle in the first, second, third, fourth, and fifth treatments that came to 110, 103, 123, 128, 134 compared to the sixth treatment that reached 163g. A significant decrease (p<0.01) in the first and second treatments in comparison with the fifth treatment. And an incorporeal rising has been noticed in the fourth treatment at the expense of the second treatment. The results refers to a significant increasing (p<0.05) in the weight of (VM) muscle in the first and second treatment that came to 26,25 g compared to the fifth treatment which reached 55g. Nevertheless, the (VM) muscle has not experienced any significant change among these treatments; the fifth treatment scored its highest rate which is 40g. On the other hand the lowest rate the second treatment has reached for was 22g. There was a significant decrease in both, local and commercial enzyme treatments over control treatment in the weight if (VL, A) muscles. The commercial enzyme exceeded significant increasing in the weight of the (G) muscle, and in the domestic enzyme treatments in the weight of (V, M) muscles, over the control treatment. There was not any significant effect for the kind of the used roughages, and the results came to the weights of the second part of the main muscles that belong to the back limbs was similar to the results of the first part of the main muscles that belong to the previously mentioned back limbs weights. The Main Muscle of the Back Area The figure (3) illustrates the effect of the overlap by using different sources if roughages and enzymes to the weight of the long back muscle Longissimus Doris (LD). The results refer to significant increasing (p<0.05) in the fourth treatment that reaches 466.50 g compared to other treatments. As it can be seen that there is a significant increase (p<0.05) in the third treatment that reaches 456.50 g, over the first ,second, fifth, and the sixth treatment which came to 418.25, 447.50, 439.75, 409.50 g respectively. The second treatment exceeded with 447.50 significantly increase (p<0.05) over the first, fifth, and the sixth treatment. Whereas the first treatment scored significant increasing (p<0.05) over the sixth treatment that came to 418.25 g whilst the very treatment itself was low significantly (p<0.05) with the control treatment (T5) that reached 418.25 g. This superiority of the fourth treatment could be explained by the result of the mathematic and significant increase of the treatment itself in some traits, like the rise of the meat rate in the main parts of the carcass out of the commercial enzyme effect and the efficiency of making benefit from it. This is an indicator of the increment of the efficiency in the production of the muscles to those treatments at the expense of fat sedimentation in it. The types of roughages or enzymes have no significant effect on the weight of any muscle (LD). The figure 4 show the interference effect and using different sources of roughage and enzymes in the front side muscles to the left side half of the carcass Infra Spinatus (IS), Supra Spinatus (SP), Subscapula (SC), Triceps Brachii (TB), Biceps Brachii (BB) and Brachiilis (BI).

The results point to the existence of a significant decrease (P<0.05) in muscle weight (IS) of the third treatment amounting to 87 g in comparison to treatment five, amounting to 113 gm, while treatment four transcen- -ded (P<0.05), amounting to 113gm up on the third treatment. The first, second and third treatment amounting 30 - 55 - 59 g on the progression recorded reduction (P<0.01) in muscle weight (SP) compared with a control treatment 5.6 which reached 93,88 gm on the progression, the forth treatment witness high significant (P<0.01) in comparison with the first, second and third treatment which reached 95 gm, the muscles weight (BB) achieved a significant decreased (P0.01), for the second treatment which reached 20gm in comparison with the fifth treatment that which reached 36 gm

The (TB, SC) muscles did not wetness any significant difference between the treatments and reached the highest weight for them in treatment for 4 and 5 (26. 187 grams) progression, while the first and the second treatment recorded less weight to them(18. 105 g). The muscle (BI) did not see any significant change between the treatments as well. The results for the weights of the muscles of the main parties to the front similar to the results of the weights of the first and second section of the muscles of the main parties to the back which was aforementioned.

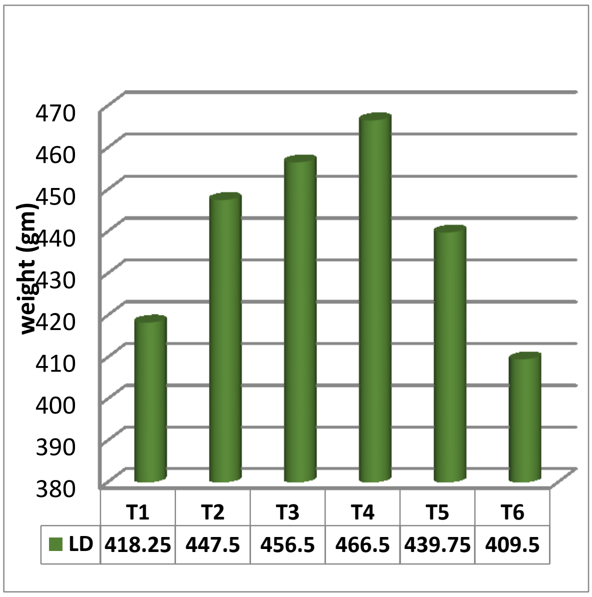

Chart (3) illustrates the effect of the overlap by using different sources if roughages and enzymes to the weight of the long back muscle Longissimus Doris (LD).

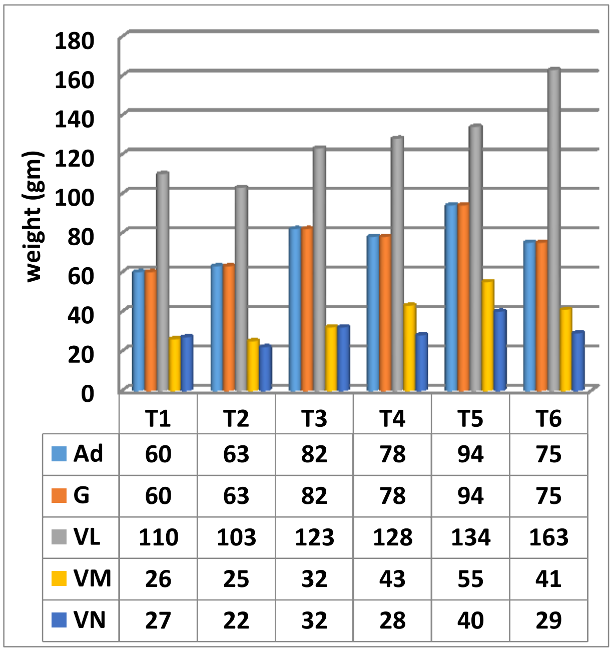

Fig. 2. Shows the overlap effect by using different sources of roughages and enzymes in the second set weight of the main muscles that belongs to the back limbs of the left half of the carcass.

International Journal of Agriculture Innovations and Research
Volume 5, Issue 4, ISSN (Online) 2319-1473

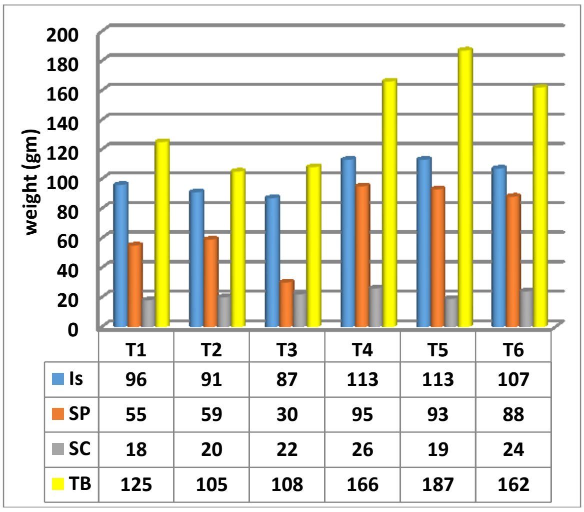

Fig. 4. Show the interference effect and using different sources of roughage and enzymes in the front side muscles to the left side half of the carcass.

Table (3) shows the effect of overlap using different sources of roughage and enzymes in the carcass fat the table show there were no significant differences between the treatments in weight and percentage of subcutaneous fat. The fourth treatment reached less valuable (432.50) while the first treatment was worth less (372.75 g.) while there were high differences significant ($p< 0.01$) in intermuscular fat weight, while the second treatment reached (84.25 g) highly significant ($P<0.01$) on both control treatments outperformed the rest of the enzymatic treatment significantly also ($p<0.01$) on the control treatment T6. Outperformed all treatment enzymes significantly ($p<0.05$).on the six treatment T6. And the average of the intermuscular fat. While the kidneys and pelvis fat did not witness any significant change between treatment and reached the highest value of its weight in the treatment six (32. 50 g) and the lowest value in the treatment five (15 g), and the Weight of the tail fat did not witness any significant difference between the treatment also reached highest value in the treatment six (920.00 g). And the lowest value in the treatment four (637.50 gm) while the percentage weight did not experience a change ($p<0.01$), between the treatments, while the percentage and the weights of the fat for the half of the carcass did not witness any significant difference between the treatment, and the second treatment Superior mathematically from the rest of the treatment weighing (1414.000 g). And the fourth treatment recorded less weight and highest average (1149.93 g) (.95.42%) and the results mentioned show us that exogenous fibrolytic enzyme both types local and commercial have increased the deposition of intermuscular fat and the muscle it reduced tail fat compared with control treatment, which tend to deposition of fat in the tail, and this was such evidence of improved carcass traits which may be return mainly to the effect of using exogenous fibrolytic enzyme, also notes that local enzyme may improve intermuscular and according to subcutaneous fat compared to the local enzyme treatment, which has improved the proportion of intermuscular fat to subcutaneous fat compared to the commercial enzyme treatments, which outweigh mathematically in the percentage of subcutaneous fat and this It indicates that the local enzyme effect in improving the quality of carcass if used at higher levels.

Table 3. Shows the effect of overlap using different sources of roughage and enzymes in the carcass which is contain subcutaneous, intermusculer kidneys fat (M ±Std**).**

Treatments	subcutaneous		intermusculer		Kidneys and pelvic fat		Tail fat		Carcass fat	
	gm	%	gm	%	gm	%	gm	%	gm	%
T1	372.75 ±55.95	27.19 ±172	71.50 ±10.4ab	5.22 ±35.00	27.50 ±2.50	2.01 ±0.11	822.50 ±277.50	60.00 ±2.58	1294.25 ±206.35	94.41 ±0.40
T2	431.50 ±15.56	28.88 ±2.64	84.25 ±14.58a	5.64 ±0.75	21.55 ±4.01	1.44 ±0.01	877.5 ±267.50	58.72 ±3.32	1414.80 ±165.90	94.68 ±0.77
T3	429.75 ±26.47	29.74 ±1.29	56.50 ±6.00ab	5.29 ±0.16	18.55 ±3.60	1.28 ±0.03	832.50 ±167.50	57.62 ±1.76	1357.30 ±118.00	93.94 ±0.33
T4	432.50 ±38.75	35.89 ±0.85	62.75 ±4.50ab	5.21 ±0.19	17.175 ±7.17	1.43 ±0.15	637.50 ±112.50	52.90 ±1.02	1149.93 ±103.08	95.42 ±0.13
T5	373.05 ±0.75	27.09 ±3.05	51.50 ±4.69bc	3.74 ±0.56	15.00 ±5.00	1.09 ±0.02	880.00 ±370.00	63.90 ±3.90	1319.55 ±242.94	95.82 ±0.31
T6	374.75 ±31.75	26.11 ±3.67	30.50 ±0.42c	2.12 ±0.18	32.5 ±12.50	2.26 ±0.42	920.00 ±240.00	64.09 ±4,20	1357.75 ±81.575	94.58 ±0.80
	n.s	n.s	**	*	n.s	n.s	n.s	n.s	n.s	n.s

Different letters within the same column indicate the existence of significant differences between the averages
T1: straw + local T2 : hay+ local T3 : straw+ commercial T4 : hay+commercial T5 : straw control T6 : hay control

Table (4) show the effect of using different source of roughage and enzymes to the fat weight and its average in the heart and the rumen of the carcass , and the result show us that there is significant increased (p<.0.05) in the fat weight of the rumen for the third treatment which reached 65gm in comparison with the forth treatment which reached 32.75 gm, and also a great increased notes (p<0.01) in the fat of the heart to the first treatment which reached 36.63 gm in comparison with third, fourth and fifth treatment, which reached (22.50 gm, 22.50 gm, 18.75 gm), consecutively and for the percentage for the rumen fat which didn't notes any significant change between the treatments which reached its highest values in the third treatment (4.50 %), while the less average was in the fourth treatment which reached 2.72 % , while the average of the fat was high in the heart in the first treatment (2.67%) in comparison with the third, fourth and the fifth treatment (1.56, 1.87.1 36 %) consecutively. And there was no significant change in the weight and the average of the fat in the entail between the treatment which reached it highest weight and average in the third treatment (87.50 gm , 6.06 %), and the less value in the forth and the fifth treatment (55.25 gm, 4.18 %), and in general the enzymes changed the deposits and distribution of the fat in animals, so the first treatment (wheat straw+ local enzyme) toward the fat deposits around the rumen and the heart and the tail fat, in general, enzymes changed the pattern of deposition of fat in the animals was a tendency for the first treatment (wheat straw + Local enzyme) towards the deposition of fat around the rumen and the heart and the tail fat Which indicates the average of the tail weight-to- cold weight and fat tail while the treatment 3 (wheat straw + commercial enzyme) have tended to deposition of subcutaneous fat and that the percentage of fat refers to it subcutaneous and the thickness thickness of fat, with these results, we find that the treatment with commercial enzyme and local may increase fat deposition.

Table (5) show the effect of using different sources of feed and enzymes in total fat and the rate of weight in the left empty half of the body. It showed that there is no significant differences between the treatments in the total fat weight the rate reached its highest value in the second treatment which reached (1494 g and 10.68%) while the lowest value in the fourth treatment (1205 g, and 8.30%) and the reason for the increase computational develop--ments in weight and percent of total fat of the animal has not returned back due to exogenous enzymes and to the fed by the concentrated roughage Using enzymes Foreign analyst for both types of fibers or quality of feed but attributed the reason to the age of the animals used in the experiment or compensatory growth resulting from the nutrition center Roughage.

Table 6 shows the effect to using different sources of roughage and enzymes in the average of the subcutaneous to the intermusculer fat. There were observed a significant decrease (p <0.01) for the first. second, third, fourth and the fifth which reached (5.21, 5.12, 5.62, 6.89, 7.25) in Compared with sixth which reached to (12.29) and the decreasing of significant difference between the other treatment, but there was low notes in the proportion of subcutaneous fat to the intermusculer fat, between the feed treated with local enzymes and the feed treated commer- -cial enzyme was the best in the deposition of fat and distribute the rest of the treatment, this was the best qualities of good quality of good quality and desired in the meat that's compatible with the reported results that mentioned. And while treatments commercial enzyme and local dropped significantly for the control treatment in the percentage of subcutaneous fat to the intermusculer fat while there was no significant effect of wheat straw and alfalfa hay on it.

Table 4. Show the effect of using different source of roughage and enzymes to the fat weight and its average in the heart and the rumen of the carcass.

Factors / Treatments	Rumen fat Gm	Rumen fat %	Heart fat gm	Heart fat%	Entrails fat gm	Entrails fat %
T1 straw + local	40.00 ± 2.00ab	2.92 ± 0.42	36.63 ± 1.63a	2.67 ± 0.39a	76.63 ± 3.63	5.59 ± 0.81
T2 hay + local	50.42 ± 19.58ab	3.37 ± 1.40	29.05 ± 1.55ab	1.94 ± 0.15ab	79.47 ± 21.13	5.32 ± 3.34
T3 straw + commercial	65.00 ± 10.25a	4.50 ± 0.40	22.50 ± 2.50b	1.56 ± 0.27b	87.50 ± 12.75	6.06 ± 0.67
T4 hay + commercial	32.75 ± 0.25b	2.72 ± 0.25	22.50 ± 2.50b	1.87 ± 0.01b	55.25 ± 2.75	4.58 ± 0.26
T5 straw control	38.75 ± 1.25ab	2.81 ± 0.70	18.75 ± 6.25b	1.36 ± 0.07b	57.50 ± 7.50	4.18 ± 0.77
T6 hay control	48.75 ± 6.25ab	3.40 ± 0.09	29.00 ± 4.00ab	2.02 ± 0.09ab	77.75 ± 10.25	5.42 ± 0.18
	*	n.s	**	*	n.s	n.s

Different letters within the same column indicate the existence of significant differences between the averages.

Table 5. Show the effect of using different sources of feed and enzymes in total fat and the rate of weight in the left empty half of the body (M ± Std).

Factors / Treatments	weight(gm)	(%)
T1 straw + local	1370.88 ± 416.33	9.28 ± 0.92
T2 hay + local	1494.27 ± 313.76	10.68 ± 1.15
T3 straw + commercial	1444.80 ± 233.50	9.85 ± 0.11
T4 hay + commercial	1205.18 ± 208.42	8.30 ± 0.05
T5 straw control	1377.05 ± 490.88	10.66 ± 1.97
T6 hay control	1435.50 ± 173.40	9.38 ± 1.79
	n.s	n.s

Table 6. Shows the effect to using different sources of roughage and enzymes in the average of the subcutaneous to the intermusculer fat. (M ± Std)

Factor / Treatments	Subcutaneous : Intermusculer
T1 straw + local	**5.21 ±1.11a**
T2 hay + local	**5.12 ±0.36a**
T3 straw + commercial	**5.62 ±0.34a**
T4 hay + commercial	**6.89 ±0.22a**
T5 straw control	**7.25 ±0.59a**
T6 hay control	**12.29 ±0.54b**
	**

Different letters within the same column indicate the existence of significant differences between the averages

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