



EFFECT OF FEEDING REED WITH ADDITION OF ENZYMES MIXTURE AND PROBIOTIC ON BODY WEIGHT CHANGE AND SOME BLOOD MEASUREMENTS IN AWASSI EWES

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ABSTRACT

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The study was conducted in Nineveh Research Department at Ministry of Agriculture, Iraq, when a total of 21 Awassi ewes aged 2-3 years and weighing 48.61 ± 3.27 kg were used to evaluate the effect of feeding reed with addition of mixture of enzymes and probiotic on body weight and some blood parameters. The ewes were divided into three groups (7 ewes per treatment). The first treatment was fed daily concentrate diet (5kg/group) plus 3 kg of wheat straw. In the second group, the wheat straw was replaced with chopped common reed leaves while 2 gm of mixture of enzymes and probiotic was added. Results showed a significant increase ($p \leq 0.05$) in favor of the third treatment in the total weight gain of 5.00 kg and daily gain 70.85 g as compared with the second treatment 3.71 kg and 52.57 g respectively. Significantly ($p \leq 0.05$) increase was noted in blood total protein and globulin this was associated with a decrease in blood albumin in the second and third treatments compared to the first treatment. A significant increase ($p \leq 0.05$) was observed in the third treatment in the triglycerides 152.32 mg /dl compared to the first and second treatments 105.84 and 115.20 mg/dl. In general, it is possible to substitute common reed instead of wheat straw and to improve the efficiency of common reed utilization by adding a mixture of enzymes and probiotic.

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INTRODUCTION

Most of the sheep breeders in Iraq depend on roughage fodder from harvest residues and field crops residues to fill the bulk of the animals need for food compounds, and concentrated feeds was added in restricted quantities due to the high costs of concentrated feed materials, this may effect on production performance due to the low nutritional value of the roughage feeds especially wheat straw, which is the main roughage feed material used in animal nutrition because its high fiber and lignin content and low protein and energy content (Tufail *et al.*, 2018, Al-Dulaimi *et al.*, 2021). In order to improve the nutritional value of the roughages many chemicals, physical methods were used. Recently, it has become possible to add exogenous enzymes or bacteria as a probiotic which helps in increasing the digestibility, improving the rumen environment and the efficiency of energy utilization (Giraldo *et*

al. 2007, Salem et al. 2015 and López- Aguirre et al. 2016 Al-Taie and Altayeb, 2020) In addition, breeders' resort to finding alternatives to wheat straw, it is a high-priced, which may reach the same price in some seasons as barley. Common reed may represent alternative choice than wheat straw, it close in protein and metabolic energy content (Baran *et al.*, 2002 and Hassan et al. 2009), reed is used widely used in the marshlands for feeding buffaloes, because one of the plants that grows naturally and abundantly in the region. Marghany *et al.* (2005) explained that the use of reed in feeding sheep as an alternative to green fodder led to the reduction of production costs and enhancement of the profit's resources. This study was proposed to investigate the effect of feeding Awassi ewes on common reed with the addition of a mixture of enzymes and probiotic on body weight change and some blood parameters.

MATERIALS AND METHODS

The study was conducted in the Nineveh Research Department/ Ministry of Agriculture/ Iraq, using (21) dry and not pregnant Awassi ewes average body weights 48.61 ± 3.27 kg, and ages 2-3 years. The ewes were divided into three groups (7 ewes/group). Ewes in the all groups were fed with a restricted amount of concentrate feed 5 kg/ group daily, the concentrate feed consisting of barley, wheat bran, corn and soybean, table (1). Roughage fodder (wheat straw) was fed with an amount of 3 kg for the first group (T1), while the wheat straw was replaced with chopped common reed leaves in the second group (T2). In the third group (T3) 2 g of the enzyme mixture and the probiotic was added to the common reed leaves. Ewes were weighed every 15 days of the study period which lasted of 70 days.

Table (1): Chemical components and composition of the experimental diets.

Ingredients	%	straw	Common reed
Crushed barley	53		
Wheat bran	25		
Yalow corn	15		
Soybean meal	5		
limestone	1		
Sodium chloride	1		
Chemical composition %			
Dry matter	89.9	95.33	95.70
Organic matter	97.75	90.17	89.68
Crude protein	13.19	3.62	9.18
Ether extract	4.18	5.32	2.60
Crud fiber	6.22	34.64	nd
Metabolism energy, Mj/ kg	10.81	5.43	nd

Chemical composition was laboratory determined according to AOAC (2000), energy was calculated according to (Al-Khawaja *et al.*, 1978). nd: not determined.

At the end of the study, blood samples were drawn from the jugular vein using a plastic syringe, and the serum was separated using a centrifuge (3000/r/min) for a period 20 minutes, blood serum samples were analyzed for the determination of total protein, albumin, triglycerides and cholesterol (Biolabo, French) by

spectrophotometer (Biotech Engineering Management CO.LTD.UK)., globulin was calculated by subtracted albumin from total protein. Data were statistically analyzed within statistical program SAS (2010) using a one-way complete random design (CRD) and the significance within means were compared using Duncan test (1955).

RESULTS AND DISCUSSION

Results in Table (2) indicate no significant differences between treatments in the initial weight 48.71, 49.00 and 48.14 kg, also the final weights did not differ significantly between treatments 52.71, 52.71 and 53.14 kg, respectively. Replacing the common reed instead of wheat straw in the second treatment (T2), led to decrease but non-significant in the total weight gain 3.71 kg and the daily weight gain of 52.57 g compared to the first treatment (T1) which was 4.00 kg and 56.71 g respectively, this may be due to a high level of cellulose and lignin in reed as compared wheat straw. While the addition of the enzyme mixture and probiotic to the reed in (T3) increase significantly ($p \leq 0.05$) weight gain 5.00 kg and daily gain 70.85 g, as compared to the second treatment. In this regard, Hassan et al. (2009) indicated that the use of different percentages of reed silage did not lead to significant differences in the weights of Awassi lambs, and that the addition of the probiotic significantly improved the weight gain of lambs fed the different percentages of reed silage, Baran et al. (2002) mentioned the possibility of using reed as a roughage feed for ruminants, Saeed and Al-Sultani (2017) noted that the use of reed or reed silage did not lead to significant differences in lambs weight gain. Also, many studies agreed that the addition of enzymes and probiotics leads to an improvement in rumen fermentation and a significant increase in weight gain (Salem et al., 2011, Salem et al., 2013). The results was agreed with Lopeze-Auirre et al., (2016) that indicated adding enzymes to the roughage feed did not improve the amount of feed intake, but led to an improvement in the daily weight gain, the reason for this may be to improved nutrient digestion Through the positive correlation between the enzyme and the microorganisms present in the rumen and the ability of the enzyme to break down the complex cellulose bonds in the fibers, it was confirmed by Gado et al. (2006) that adding the enzyme led to increase in NDF digestion and rumen fermentation process, thus reducing the ammonia produced in the rumen by incorporating it with microbial protein.

Table (2): effect of reed and mixture of enzymes and probiotic in ewes weight gain.

Item	T1 wheat straw	T2 reed	T3 reed with E+P
Initial weight kg	48.71±1.45	49.00±1.15	48.14±1.26
Final weight kg	52.71±1.53	52.71±1.12	53.14±1.31
Total body gain kg	4.00±0.30 ab	3.71±0.29 b	5.00±0.48 a
Daily gain g/day	56.71±4.47 ab	52.57±4.17 b	70.85±6.92 a

Means for each parameter in the same raw with different superscript are significantly different ($P \leq 0.05$), E= Enzyme mixture, P= Probiotic.

Table (3): effect of reed and mixture of enzymes and probiotic in some blood measurements in Awassi ewes.

Item	T1 wheat straw	T2 reed	T3 reed with E+P
Total protein g/dl	6.22±0.18 b	7.36±0.17 a	7.04±0.11 a
Albumin g/dl	3.14±0.05 a	3.06±0.08 ab	2.90±0.06 b
Globulin g/dl	3.28±0.23 b	4.30±0.10 a	4.14±0.17 a
Cholesterol mg/dl	82.74±7.02	91.66±4.19	74.90±5.19
Triglyceride mg/dl	105.84±5.52 b	115.20±8.84 b	152.32±9.17 a
Urea mg/dl	33.18±5.30	32.09±3.66	35.06±5.12

Means for each parameter in the same raw with different superscript are significantly different ($P \leq 0.05$)

E= Enzyme mixture, P= Probiotic.

In the present work, a significant increase in serum total protein was found in ewes fed common reed (T2) and reed with the mixture enzyme and probiotic (T3) which was 7.36 and 7.04 g/dl as compare to T1 (6.22 g/dl) respectively. The same trend was found in serum globulin that was 4.30 and 4.14 g/dl for T2, T3 and 3.28 g/dl for control, respectively. In contrasts significant decrease ($p \leq 0.05$) was noted in blood albumin in the third treatment by 2.90 g/dl as compared to the first treatment 3.14 g/dl. cholesterol concentration significantly ($p \leq 0.05$) increases in the (T2) 91.66 mg/dl compared with the (T1) and (T3) 82.74 and 74.90 mg /dl, but the differences were not at the level of significance. while the significant differences in the concentration of triglycerides ($p \leq 0.05$) in the third treatment were 152.32 mg/100ml compared to the first and second treatments 105.84 and 115.20 mg/dl. while no significant differences were recorded in the concentration of urea 33.18, 32.09 and 35.06 mg/dl. these results did not agree with the result that obtained by El-Talty et al. (2015), who find no significant effect of feeding reed silage or reed silage with lactic acid bacteria on total protein, albumin and globulin with a significant decrease in blood urea in lambs. Also, Mokhtarpour and Jahantigh (2018) found no significant effect of reed or reed silage on blood protein values with a significant increase in urea concentration. Hassan *et al.* (2009) showed that different levels of reed silage and the probiotic had no significant effect on total blood protein concentration, it led to a significant decrease in blood urea concentration compared to the control treatment. Faryhal *et al.* (2022) reported that lambs fed on alfalfa, sesbania and reeds showed no significant differences in blood parameters.

Table (4): The economic feasibility of substituting reeds instated of wheat straw in ewes diets daily.

	T1 wheat straw	T2 reed	T3 reed with E+P
Concentrate feed cost/day. thousand dinars	2.635	2.635	2.635
Roughage feed cost/day. thousand dinars	1.500	0.300	0.320
Total cost/day thousand dinars	4.135	2.965	2.955
total cost during the study (70 days). thousand dinars	289.45	207.550	206.85
The cost of feeding per ewe. thousand dinars	41.35	650.29	29.550
The cost of a kilogram of weight gain. thousand dinars	10.373	7.991	5.91

- The price of wheat straw (500 dinars/kg) and total cost of wheat straw feeding daily is (1500) dinars.
- The cost of reeds harvesting and crushing (100) dinars/kg and total cost is (300) dinars daily.
- The cost of addition (2g) of enzymes mixture and probiotic is (15) dinars/day.
- The cost of adding (5 kg) of concentrate daily is 2.635

Data in Table (4) showed that feeding the common reed in the second treatment saved (81.0) thousand during the study period compared to feeding on straw in the first treatment and this is equivalent to (11.7) thousand per ewe, which represent about (28.29%) of total cost.

Like that feeding the common reed with the addition of the enzyme of (82.60) thousand compared with the first treatment that was fed on hay, and this is equivalent to (11.800) thousand for each ewe which represent about of (28.53%) of total cost. Otherwise in the (T2) the ewes were fed with reeds instead of wheat straw, the total weight gain was (3.71) kg, which is less than the first treatment (4 kg), the cost of each kg of total gain is (7.991) thousand dinars with less by (22.96%) as compered (T1). While in the third treatment was a total weight gain 5kg/ewe and the cost of each kg of total gain is (5.91) thousand dinars, which is less than T2 by (26.04%) and T1 (43.0%) respectively.

CONCLUSION

Results of the current study indicate the possibility of using chopped common reed leaves instead of straw in feeding Awassi ewes without a negative effect on the weight of the ewes, and the probiotic addition with the mixture of enzymes significantly improves the weight gain and reduces the costs of breeding. The use of reeds in ewes' diets as a substitute for hay can reduce feeding and consequently production costs and expenditures, and enhance the breeder's economic to ability more than 20%.

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CONFLICT TO INTEREST

Conflict to interest: author declare no conflicts of interest regarding the publish this article.

تأثير تغذية القصب مع اضافة خليط الانزيمات والمعزز الحيوي في التغير بوزن الجسم وبعض قياسات

الدم في النعاج العواسية

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الخلاصة

اجريت الدراسة في قسم بحوث نينوى التابع لوزارة الزراعة العراقية باستخدام احدى وعشرون نعجة عواسية متوسط اوزانها 48.61 ± 3.27 كغم واعمارها تتراوح بين 2-3 سنوات، وزعت النعاج الى ثلاث مجاميع (7 نعاج / مجموعة)، غذيت النعاج في المجاميع الثلاث بكمية 5 كغم / مجموعة و 3 كغم تبين الحنطة بالمجموعة الاولى بينما استبدل التبن بأوراق القصب المجروش في المجموعة الثانية، فيما اضيف 2 غم من خليط الانزيمات والمعزز الحيوي الى أوراق القصب بالمجموعة الثالثة. بينت النتائج وجود زيادة معنوية ($p \leq 0.05$) لصالح المعاملة الثالثة والتي غذيت على القصب مع اضافة خليط الانزيمات في معدل الزيادة الوزنية الكلية 5.00 كغم واليومية 70.85 غم/ يوم مقارنة بالمعاملة الثانية 3.71 كغم و 52.57 غم/ يوم على التوالي، ازداد معنويا ($p \leq 0.05$) تركيز البروتين الكلي والكلوبولين وقد ترافق ذلك مع انخفاض الالبومين بالدم في المعاملتين الثانية والثالثة مقارنة بالمعاملة الاولى. كما لوحظ زيادة معنوية ($0.05 >$) عند اضافة المعزز الحيوي وخليط الانزيمات الى القصب في المعاملة الثالثة في تركيز الكليسيريدات الثلاثية 152.32 ملغم/ 100مل مقارنة بالمعاملتين الاولى والثانية 105.84 و 115.20 ملغم/ 100 مل. عموما يمكن احلال القصب بدلا من التبن كعلف خشن رخيص الثمن وتحسين كفاءة الاستفادة من الغذاء بإضافة خليط الانزيمات الى العلف المتناول.

الكلمات الدالة: تبن، قصب، خليط انزيمات، نعاج عواسية.

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