Effect of Feeding Treated Wheat Straw With Urea on Growing Frisian Calves in Palestine

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استخدم في التجربة عشرة عجول فريزيان واستمرت التجربة لمدة "١٦٨" يومـــا حيـــث كان معدل وزن العجول المستخدمة في التجربة "٢١٠" كغم. قســـمت العجـــول عشـــوائيا إلـــى مجموعتين.

غذيت العجول في المجموعة الأولى على عليقه "أ" احتوت على ٧٥% علـــف مركـــز إضافة إلى ٢٥% قش قمح، أما المجموعة الثانية فقد غذيت على عليقه "ب" التي احتـــوت علـــى ٧٥% علف مركز مشابه للعلف المقدم المجموعة "أ" إضافة إلى ٢٥% من قش القمـــح المعـــامل باليوريا بمعدل ٢%. بينت التجربة أن العجول المغذاة على العليقـــه "ب" ازداد وزنـــها معنويـــا مقارنة بمعدل أوزان العجول في المجموعة "أ" حيث كان معدل الزيادة اليومية في الوزن "٧٣." و "٨٦." للعليقة "أ" و "ب" على الترتيب، كما أن نسب التحويل ازداد معنويا للعليقـــة ب ($P<.05$) مقارنة بالعليقة "أ" وبينت الدراسة أيضا أن معاملة القش باليوريا يمكن أن يزيد الدخـــل للمـــزارع المحلي كما أثبتت الدراسة جدوى إضافة اليوريا لعلائق العجول "ب".

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Abstract

A feeding trial was conducted for fattening frisian calves using treated wheat straw with urea to study the nutritional effect and search for higher income.

A feeding trial lasted for 168 days with ten growing Frisian calves averaging 210 kg tow similar groups.

Calves were divided into two groups, first group fed ration A, 75% concentrate mix plus 25% untreated wheat straw, while the second group fed ration B, 75% concentrate mix plus 25% treated wheat straw with 2% urea.

Average daily gain was significantly higher for calves fed ration B compared to those fed ration A.

Ration A. It was .73 and .86 kg for ration A and B, respectively. Animals fed rations containing treated wheat straw with urea, were significantly ($p<05$) better in feed conversion than those fed untreated wheat straw.

It is concluded that the weight gain obtained through the treatment of wheat straw with urea will increase the income of local farmers. However, under the current feed and meat prices in Palestine, urea treatment proves to be economically feasible

Introduction :

In the West Bank and Gaza strip there are more than 5 million tons of low quality roughages including wheat straw, barley straw and other crop residues (9). Most of these residues are available for animal feeding, the nutritive value of these materials can be improved by supplementation with urea, molasses and minerals. Some attempts have been made to improve and utilize such materials by treating with anhydrous ammonia or other chemicals, to increase the feeding quality (2;3;4;5;11).

Significant improvement of animal performance was observed when animals were fed rations containing treated residues with 5% urea(l;8;10;12).

Urea as a cheap source of nitrogen is widely used as a protein supplement in ruminant rations. There is a need for increased utilization of NPN in ruminant rations where there is a shortage in protein concentrates.

Despite the fact that the role of feeding urea to ruminants is well known there is little work, if any with local animals.

The objective of the present study was to investigate the effect of feeding rations containing concentrate mixtures, along with untreated or treated wheat hay with 2% urea, on the performance of growing Frisian calves.

Materials and Methods:

Ten male Frisian calves, averaging 210 kg live body weight, were obtained from the local market. Animals were divided into two similar groups (5 in each) and randomly assigned to two different rations.

Calves were divided into two groups. First group fed ration A, 75% concentrate mix plus 25% untreated wheat straw, while the second group fed ration B, 75% concentrate mix plus 25% treated wheat straw with 2%.

Urea was completely dissolved at a rate of 2 kg/ 100 liter water, to be sprayed on 100kg wheat hay. Treated hay was left after urea treatment 1-2 hrs, before being offered to animals. Concentrate mixture used, composed of 45% corn, 35% barley, 15% wheat bran,

4% soybean meal and 1% mineral premix. Animals were allowed to drink twice daily.

Live body weight and feed intake were recorded at weekly basis during the experiment period which lasted of 168 days. All data were analyzed statistically by the analysis of variance.

Results and Discussion:

Average daily consumption per head of the two groups are presented in Table (2). Dry matter (DM) intake from ration B was higher then that of ration A. DM intake recorded was 8.78 and 9.2kg/ head/ day for animals fed ration A and B, respectively. Corresponding DM intake / 100 kg live weight (L.B.w) was 2.146 and 2.328kg for the respective rations (Table 3).

It could be observed that the DM intake expressed as kg/ 100kg L.B.W. tended to show the food palatability of the retreated ration (ration B).

Concerning initial L.B.W, it can be seen the averages of initial body weights were nearly similar, being 210 ± 6.31 and 211.3 ± 5.8kg for animal groups fed rations A and B, respectively (table 4). Also, it could be observed that the increase in body weights over the experiment, for animals fed ration B was higher compared to that of the animals fed ration A. The same trend was observed with total gain, being 122.5 and 144.2kg for animals fed rations A and B. Corresponding values of daily gain was .726 and .857kg, showing significantly higher ($p<.05$) daily gain, with calves fed ration B, than those fed ration A (table 3).

Feeding ration containing treated wheat hay 2% urea (ration B) produced higher daily gain. The increase was 15%. Similar improvements were reported by other studies (6; 11; 5)

It could be noticed that animals fed rations containing treated wheat hay with urea tend to have significant improvement in feed utilization efficiency.

Table (4) showed that saving in each kg of gain is .54 NIS (New Israeli Sheqel). There is knowing there is that about 10 thousand calves are under fattening in Palestine and the average gain/calf if about 200kg. This means that total saving could be 1.1 millions NIS each year.

Table 1: Chemical composition of experimental diets:

Item	Ration A	Ration B
Dry matter	92.1	92.8
Crude protein	12.8	**13.7**
Fat	**3.9**	**3.9**
Crude fiber	21.0	21.2
Ash	**6.1**	**6.3**

Table 2: Average daily feed consumption:

Item	Ration A	Ration B
Average daily feed consumption (kg/ calf)		
Concentrate mixture	5.38	4.90
wheat hay	3.40	4.30
total DM	8.78	9.20
Average daily DM consumption (kg/ 100 kgL.B.W)	1.315	1.240
Concentrate mixture	.831	1.088
wheat hav	2.146	2.328
total DM		

Table 3: Average body weight and total gain in animals fed the two experimental rations.

Interval Periods (days)	Experimental rations			
	Ration A		Ration B	
	Body weight (kg)	Total gain (kg)	Body weight (kg)	Total gain (kg)
0	210.1 ±6.31)'	-	211.3(5.8)	-
0-28	240.3 ± 4.5)	**30.2 ±.31)**	235.6 (4.9)	24.3 **(.21)**
29-56	264.9 ± 7.2)	**24.6 ± .25)**	265.9(8.1)	30.3 **(.29)**
57-84	292.7 + 6.9)	**27.8 ± .26)**	287.8 (7.5)	21.9 **(.20)**
85- 112	310.8 ± 8.1)	**18.1 ±.19)**	317.2(5.0)	29.4 **(.3)**
113- 140	320.4 ±7.8)	**9.6 ±.11)**	335. (6.2)	17.8 **(.15)**
141 - 168	332.6 ±9.1)	**12.2 ±.12)**	355.5 (4.9)	20.5 **(.22)**
During the whole Expenmental period: 168 days		168 days		
Total gain (kg/head) 144.3		122.5		
Daily gain (kg/head) .86		.73		
[1] Mean ± SD				

Table 4: Zootechnical and economical results of calves fatter ing trial.

Item	Unit	Ration A	Ration B
No. of calves	**(NO.)**	**5**	**5**
Days of experiment	**(day)**	**168**	**168**
Initial mean weight	**(kg)**	**210.1(6.31)**	**211.3(5.8)**
Final mean **weight**	**(kg)**	**332.6(9.1)**	**355.5 (4.9)**
Mean daily _gain	**(fi/ day)**	**730.1 (10.3) a**	860.5(11.5) b
Daily feed intake	**(kg/ day)**	**8.78(1.3)**	**9.2 (2.0)**
Feed conversion efficiency	**(kg diet/ kg gain)**	**12.04a**	**10.71b**
Cost of total j>ain	**(NIS)***	1474.9	**1545.45**
Cost of diets	**(NIS/ kg diet)**	**.561**	**.58**
Cost of 1 ka sain	**(NIS/ kg gain)**	**6.75a**	**6.21b**
1 NIS = .3$			
Neans within a row followed by different letters are significantly different (P<05)			

* NIS: new Israeli sheqel.

References

i-Abdei Aziz A.MA. The utilization of agricultural by- products in ruminant feeding Ph.D. Thesis, Fac. agric, Ain shams Univ., Egypt. 1986.

2-Bovvman J.G.P., Sowe 11 B.F. and Paterson J.A. Liquid supplementation for ruminants fed low quality forage diets. Anim. Feed Sci. and Tech. SS (102): 105- 138, 1995.

3-Chermit I. A., Teller E. Vanbelle. M and Collignon J.,: Effect of ammonia or urea treatment of straw on chewing behavior and ruminal digestion processes in non-lactating dairy cows. Anim. Feed Sci and Tech 47 (102): 41-51, 1994.

4-Etman K.E.L., Kourit L .6, Hathout M.K and El Nouby H.M. Liquid supplementation of some crop residues for feeding growing Frisian calves. The Third Egyptian/ British Conf. on animal, fish and Poultry- production, Alexendria, 7-10 Oct. 1989.

5-Kourit L.S, EL Koussy H. and Etman K. E. I. Effect of feeding treated chopped corn stalks with urea on growing Fresian calves, intake, digestibility of rations and performance of calves. Annals Agric. Sci. Ain Shams Univ., Cairo, 36(2). 1991.

6-Matter B.E.M. Some nutritional studies for determming the feeding qualities of certain feed. Ph.D. Thesis. Fac. Of Agric. Mansoura Univ. Egypt. 1989.

7-Mgheni D.M., kimambo A.E., Sundstol F. and Madsen J. Influence and growth performance of goats fed rice straw diets. Anim. Feed Sci. and Tech. 44 (3-4): 209-220, 1993.

8-Mohamed A.E.H. Feeding ruminants with treated agricultural by- products to raise their nutritive value. M.S thesis, Fac, of Agric. Cairo univ. 1988.

9-Rural Research Center (RJR.C). Statistical Report of Agriculture in the West Bank. An-Najah National University. 1992.

10-Samplath K.T., Word CD. Prasad C.S. Effect of urea and by- products on the in-vitro fermentation of wheat straw. Sci of Food and Agric. 67(3): 323-328, 1995.

11-Talha M.A. Nutritive value of ammonia treated wheat straw. Indian Journal Anim. Sci. 57(*8) 1990.

12-Vanbaichem J., Oosting S.J., Lammerswienhoven S.C.W. Leffering C.P. Ammonia Treatment of wheat straw. 1. Voluntary intake, chewing behavior, rumen pool size and turnover and partition of digestion along the gastro-intestinal tract of sheep. Netherland J. of Agric. Sci: 41(2)111- 133. 1993.