Zagazig J. Agric. Res., Vol. 34 No.(6) 2007 1129-1144

EFFECT OF DIETARY YEAST CULTURE SUPPLEMENTATION ON EWE PERFORMANCE UNDER EGYPTIAN CONDITIONS

Ayyat, M.S. [1], G.A. Abd El-Rahman[1], Faten F. M. Abou Ammou[2] , and Y.H. Hafez[2]

1. Department of Animal Production, Faculty of Agriculture, Zagazig University, Zagazig, Egypt.
2. Animal Production Research Institute, Agriculture Research Center, Ministry of Agriculture, Egypt.

Accepted 9/9/2007

ABSTRACT: Ninety crossed (3/8 Finnish Landrace x 5/8 Ossimi) ewes of about 3-5 years old and of 45 kg average body weight were used in this trial. The animals were randomly assigned among six experimental treatments. Three groups were fed on 40% concentrate and 60% roughages ratio, while other three ewe groups were fed on 60% concentrate and 40% roughages ratio. Within each classification the first group fed on diet without any supplementation (as control group), the second group fed on the same diet of the first group but supplemented with 5 gm Moreyeast/kg ration/ head and the third group was fed on the diet of the first group and supplemented with 1 gm Dinaferm 1 B Yeast Culture (INF) /kg ration/ head. Increasing concentrate level in ewe rations significantly increased milk protein, total solids and total solids not fat concentrations, while concentration of fat and lactose insignificantly increased. On the other hand, milk lactose, total solids and total solids not fat concentrations in ewes milk at weaning affected significantly ($P<0.05$ or 0.01) with feeding system. Daily milk yield at lambing and weaning increased in ewes fed high concentrate diet. Milk composition and daily milk yield of ewes at birth and weaning insignificantly affected with yeast supplementation in ewes ration. Daily milk yield insignificantly increased by supplementing yeast in ewes diet. The interaction between feeding system and yeast supplementation in ewes diets insignificantly affected milk composition and daily milk yield. The results indicated that the serum total proteins and albumin concentrations increased in ewes

group fed high concentrate ration at the time of birth and lamb weaning. Ewes fed diet supplemented with Dinaferm yeast recorded higher serum total proteins and albumin than the other groups. Feeding system, yeast culture supplementation in diets and its interaction did not show significant differences between ewe groups on cholesterol and triglyceride concentrations at the time of birth and weaning. Yeast supplementation insignificantly increased the glucose level in ewes blood. Feeding system and dietary yeast supplementation did not show significant differences between ewe groups on the activaty of each GOT, GPT, concentration of urea and creatinine at the different experimental periods. Lambs produced from ewes fed high concentrate diet recorded higher live body weight at weaning by 8.50% than those fed low concentrate diet. The highest value of live body weight may attribute to the increase milk production due to the increase in the concentrate level in the diet. Supplementation of yeast in diets insignificantly increased weaning live body weight. Weaning live body weight increased by 4.67 and 6.25%, respectively in lamb groups produced from ewes fed diets supplemented with Moreyeast and Dinaferm yeast. Lambs produced from ewes fed high concentrate diet recorded higher daily gain during the suckling period by 11.82% than those fed low concentrate diet. Daily gain during the suckling period (0-8 weeks) increased by 4.29 and 5.71%, respectively in lamb groups produced from ewes fed diets supplemented with Moreyeast and Dinaferm yeast.

Key words: **Yeast, Moreyeast, Dinaferm yeast, ewes, lambs, milk, blood, gain.**

INTRODUCTION

Many investigators have attributed the beneficial effects of yeast culture preparations directly to changes in the ruminal fermentation and in the microbial population in the digestive tract (Williams and Newbold, 1990; Dawson, 1992; Newbold *et al.*, 1996; Wallace, 1996). Increased concentrations of the total anaerobic bacteria and cellulolytic bacteria in the rumen have been one of the most consistently measured responses to yeast culture in the rumen (Wiedmeier *et al.*, 1987; Harrison *et al.*, 1988; Dawson *et al.*, 1990; Newbold and Wallace, I992). However, other studies have also suggested that yeast culture preparations can enhance the growth of lactic acid-utilizing bacteria (Edwards, 1991;

Girard *et al.*, 1993), proteolytic bacteria (Yoon and Stern, 1996), and bacteria that convert molecular hydrogen to acetate in the rumen (Chaucheyras *et al.*, 1995b). In addition, yeast preparations have been shown to enhance the activities of fiber-digesting fungi in the rumen. Increased concentrations of beneficial microorganisms and enhanced microbial activities can be expected to lead to enhanced digestive processes and the destruction of metabolic intermediates that can result in ruminal dysfunction. The ability of yeast to stimulate specific groups of bacteria is consistent with many of the other physiological and metabolic effects of yeast observed in the rumen and can explain enhanced protein synthesis, improved ruminal stability, and improved microbial activities (Chaucheyras *et al.*, 1995a). Live yeast culture was reported to balance the energy and the acid-base metabolism in diary cattle, resulting in significantly higher milk production (Brydt *et al.*, 1995). The present experiment was conducted to study the effects of clusion yeast cells in diets of lambs and ewes on productive performance, rumenal activity, blood components, carcasses component under Egyptian conditions.

MATERIALS AND METHODS

The study was conducted in the Department of Animal Production Faculty of Agriculture, Zagazig University, Zagazig, Egypt. The experimental work was carried out at Sakha Experimental Station, Kafer El- Sheikh Governorate, which belong to animal Production Research Institute, Ministry of Agriculture. The study started at June 2002 lasted for 20 months (February, 2004). Ninety crossed (3/8 Finnish Landrace x 5/8 Ossimi) ewes of about 3-5 years age and of 45 kg average body weight were used in this trial. The animals were randomly assigned among six experimental treatments. Three groups were fed on 40% concentrate and 60% roughages ratio, while other three ewe groups were fed on 60% concentrate and 40% roughages ratio. Within each classification the first group fed on diet without any supplementation (as control group), the second group was fed on the same diet of the first group but supplemented with 5 gm Moreyeast/kg ration/ head and the third group was fed on the diet of the first group and supplemented with 1 gm Dinaferm 1 B Yeast Culture (INF) /kg ration/ head.

The experimental diet contains 30% soybean meal- 25%

Cottonseed meal cake, 10% yellow corn, 25% Barely, 8% wheat bran and 2% minerals and Vitamins and wheat straw as roughage. Milk yield was determined at week intervals. Starting the first two weeks of lambing , lambs were kept with their dams all the time except at the day of milk estimation. Period lactation 8 weeks, lambs were speared from their ewes at 4 .00 pm prior to milk yield was determined two times on the days of estimation at 8.00 am and 4 h pm . Half udder of ewes were milked with hand and total milk yield was calculated by summation of milk yield per (8.00 am and 4 .00 pm). Samples of milk were taken for analysis from morning and afternoon milking once every two weeks. Milk was analyzed for total solids, fat, protein, lactose and solid not fat (SNF) and ash by the method of milk scan system. Blood samples were regularly collected from the jugular vein, taken individually from each animal of different groups before morning feeding (fasting) once every 28 days. Blood samples analysis were centrifuged at 4000 rpm for 20 minutes sera were collected and stored at - 20 C until analysis.

Blood Serum Analysis

Glucose

Spectro-photometric determination of serum glucose according to the method described by Trinder (1969).

Total proteins

Spectro-photometric determination of serum total protein according to the method described by Henry *et al*.,(1974).

Albumin

Spectro-photometric determination of serum albumin according to the method described by Doumas and Bigges,(1972).

GPT and GOT

Spectro-photometric determination of serum GPT and GOT according to the method described by Harold Varliy (1975).

Creatinine

Spectro-photometric determination of serum creatinine according to the method described by Folin (1934).

Urea

Spectro-photometric determineation of serum Uera-N according to the method described by Patton *et al*.(1977).

Cholesterol

Spectro-photometric determination of serum cholesterol according to the method described by Finley *et al*, (1978).

Triglycerides

Spectro-photo-metric etermination of serum Triglycerides according to the method described by Scheletter and Nussel (1975).The

data of the tow experiments were statistically analyzed by factorial experiment (Snedecor and Cochran, 1982) according to the following Model: $Y_{ijk} = \mu + D_i + Y_j + DY_{ij} + e_{ijk,}$

where Y_{ijkl} = an observation, μ = the overall mean, D_i = the fixed effect of i^{th} diets, Y_j = the fixed effect of j^{th} yeast supplement, DY_{ij} = the interaction between the i^{th} diets and j^{th} yeast supplement and e_{ijk} =random error. Significant differences were determined by Duncan's Multiple Range test (Duncan, 1955).

RESULTS AND DISCUSSION

Milk Composition and Yield

Milk proteins, total solids and solids not fat concentrations in ewes milk at birth are affected significantly (P<0.05 or 0.01) with feeding system (Table 1). Increasing concentrate level in ewe rations significantly increased milk proteins, total solids and solids not fat concentrations, while concentration of fat and lactose nsignificantly increased. On the other hand, milk lactose, total solids and solids not fat concentrations in ewes milk at weaning were affected significantly (P<0.05 or 0.01) with feeding system. Increasing concentrate level in ewe rations significantly increased milk lactose, total solids and solids not fat concentrations, while concentration of milk proteins and fat were insignificantly increased.

Daily milk yield at weaning of lambs was significantly (P<0.001) affected with the feeding system, while at birth insignificantly affected (Tables 1). Daily milk yield at lambing and weaning increased in ewes fed high concentrate diet. Soder and Holden (1999) found that a cow fed on total mixed ration containing rolled (barley, whole cottonseed, sugar beet pulp and molasses) differ in C:R ration (60 : 40 or 80 : 20 on DM basis) had no significant effect on milk yield and milk composition.Milk composition and daily milk yield of ewes at birth and weaning insignificantly affected with yeast supplementation in ewes ration. Daily milk yield insignificantly increased by supplemented yeast in ewes diet (Table 1). Soder and Holden (1999) found that feeding 20 g/day of live yeast+enzyme product (5 x 109 cfu/gram) fed both before and after calving had no effect on milk production during 13 weeks postpartum. Their conclusion was that predicting conditions for a favorable response to live yeast products is difficult.

Table 1. Means of milk composition % of ewes as affected with feeding system and yeast culture supplementation and its interactions at 4 weeks of birth

Items	Protein	Fat	Lactose	Total solids	Total solids not fat	Daily milk yield (g)
			At birth			
Effect of feeding system						
40 C : 60 R	4.894±0.15	6.431±0.15	5.360±0.20	16.684±0.24	10.253±0.20	732.57±32.32
60 C : 40 R	5.326±0.18	6.505±0.18	5.837±0.33	17.668±0.33	11.164±0.28	808.53±26.72
Significance	*	NS	NS	*	**	NS
Effect of yeast culture supplementation						
Control	4.968±0.12	6.408 ±0.25	5.75 ±0.24	17.125 ±0.28	10.718±0.21	736.50±52.18
5 g Moreyeast	5.067±0.12	6.587 ±0.22	5.489 ±0.2	17.143 ±0.36	10.556±0.30	795.20±31.98
1 g Dinaferm	5.397±0.30	6.355 ±0.12	5.76 ±0.25	17.512 ±0.49	11.157±0.44	779.80±32.55
Significance	NS	NS	NS	NS	NS	NS
Interaction between feeding system and yeast supplementation						
40 Concentrate : 60 Roughage						
Control	4.903±0.01	6.648±0.41	5.510±0.47	17.060±0.54	10.413±0.37	685.00±87.69
5 g Moreyeast	4.848±0.06	6.422±0.24	5.084±0.04	16.354±0.20	9.932±0.06	762.80±38.93
1 g Dinaferm	4.932±0.18	6.266±0.14	5.514±0.45	16.712±0.49	10.446±0.48	740.40±51.77
60 Concentrate : 40 Roughage						
Control	5.033±0.23	6.168±0.28	5.990±0.13	17.190 ±0.26	11.023±0.10	788.00±57.01
5 g Moreyeast	5.176±0.18	6.670±0.31	5.900±0.28	17.538 ±0.50	10.868±0.42	811.40±44.30
1 g Dinaferm	5.862±0.51	6.444±0.21	6.010±0.20	18.312 ±0.73	11.868±0.63	819.20±36.19
Significance	NS	NS	NS	NS	NS	NS
			At weaning			
Effect of feeding system						
40 C : 60 R	4.686±0.09	7.033±0.14	4.606±0.21	16.325±0.33	9.292±0.24	516.00±28.29
60 C : 40 R	4.853±0.13	6.912±0.16	4.856±0.06	16.622±0.21	9.710±0.15	634.63±19.15
Significance	NS	NS	NS	NS	NS	***
Effect of yeast culture supplementation						
Control	4.700±0.17	7.036 ±0.24	4.396±0.36	16.128±0.57	9.091±0.42	531.25±46.39
5 g Moreyeast	4.790±0.09	6.814 ±0.17	4.882±0.06	16.487±0.18	9.673±0.09	606.27±30.65
1 g Dinaferm	4.840±0.22	7.129 ±0.17	4.835±0.10	16.804±0.31	9.675±0.26	593.80±20.03
Significance	NS	NS	NS	NS	NS	NS
Interaction between feeding system and yeast supplementation						
40 Concentrate : 60 Roughage						
Control	4.570±0.31	7.092±0.38	3.975±0.68	15.638±1.11	8.545±0.73	492.00±36.61
5 g Moreyeast	4.764±0.07	7.042±0.25	4.876±0.06	16.682±0.29	9.640±0.07	537.20±53.48
1 g Dinaferm	4.702±0.12	6.976±0.12	4.840±0.17	16.518±0.15	9.542±0.19	564.40±35.61
60 Concentrate : 40 Roughage						
Control	4.820±0.18	6.980±0.37	4.818±0.15	16.618±0.37	9.638±0.23	633.80±38.76
5 g Moreyeast	4.804±0.22	6.700±0.21	4.885±0.09	16.389±0.22	9.689±0.13	640.80±34.04
1 g Dinaferm	4.978±0.44	7.282±0.31	4.830±0.15	17.090±0.61	9.808±0.50	623.20±10.29
Significance	NS	NS	NS	NS	NS	NS

* P<0.05 and ** P<0.01.

Also, the interaction between feeding system and yeast supplementation in ewes diets insignificantly affected milk composition and daily milk yield.

Blood Serum Components

Serum total proteins and albumin

Feeding system, yeast culture supplementation in diets and its interaction did not show significant differences between ewes groups on total proteins and albumin at the different experimental period (Table 2). The results indicated that the serum total protein and albumin concentrations increased in ewes group fed high concentrate ration at the time of birth and lamb weaning. The concentrations of serum total proteins and albumin increased with yeast supplement-ation in ewe diets (Table 2). Ewes fed diet supplemented with Dinaferm yeast recorded higher blood total protein and albumin than the other groups. El-Badawi *et al.* (1998), who showed that the total protein content in blood was stable when the animal diet were supplemented by yeast culture, reported similar results. While, El-Ashry *et al.* (2002) indicated that plasma total protein and globulin concentrations tended to increase with yeast culture supplementation.

Serum fat and glucose

Feeding system, yeast culture supplementation in diets and its interaction did not show significant differences between ewe groups on cholesterol and triglyceride concentrations at the time of birth and weaning (Table 2).Feeding system did not show significant differences between ewe groups on glucose level at the beginning of the experiment and the time of birth, while at the time of weaning glucose level was affected significantly ($P<0.01$). The glucose level in ewes serum increased with increasing the concentrate level in diets (Table 2).Yeast culture supplementation in diets did not show significant differences between ewe groups on cholesterol and triglyceride concentrations at the different experimental periods (Table 2).Yeast supplementation insignif-icantly increased the glucose level in ewes serum.

Serum transaminase enzymes

Feeding system did not show significant differences between ewe groups on the activaty of either GOT or GPT at the different experimental periods (Table 3). The obtained results may indicate that the ewes fed high or low concentrate did not affect liver function.

Table 2. Means of some blood serum components of ewes as affected with feeding system and yeast culture supplementation and its interactions at 4 weeks of birth

Items	Total Protein	Albumin	Glucose	Cholesterol	Triglyceride
			At birth		
Effect of feeding system					
40 C : 60 R	7.32±0.10	4.61±0.17	48.14±3.02	71.00±12.39	25.07±2.18
60 C : 40 R	7.55±0.22	4.90±0.23	49.37±2.04	62.58±3.77	28.21±3.41
Significance	NS	NS	NS	NS	NS
Effect of yeast culture supplementation					
Control	7.38 ±0.13	4.62 ±0.26	48.00±3.45	79.63 ±21.19	29.88±3.73
5 g Moreyeast	7.44 ±0.26	4.70 ±0.27	50.00±3.08	63.87 ±7.23	26.47±3.24
1 g Dinaferm	7.55 ±0.18	5.02 ±0.20	47.80 ±2.11	58.80 ±6.01	25.10±4.51
Significance	NS	NS	NS	NS	NS
Interaction between feeding system and yeast supplementation					
40 Concentrate : 60 Roughage					
Control	7.32±0.24	4.17±0.15	44.50±3.80	100.0 ±4.69	26.75±4.87
5 g Moreyeast	7.45±0.19	4.67±0.19	52.80±7.73	60.40 ±8.23	27.00 ±2.55
1 g Dinaferm	7.20±0.10	4.91±0.38	46.40±2.36	58.40 ±7.05	21.80±4.29
60 Concentrate : 40 Roughage					
Control	7.44±0.15	5.06±0.40	51.50±5.75	59.25 ±8.98	33.00±5.89
5 g Moreyeast	7.43±0.39	4.72±0.40	48.60±2.85	65.60 ±10.28	26.20±4.80
1 g Dinaferm	7.89±0.28	5.13±0.17	49.20±21.52	59.20 ±10.62	28.40±8.21
Significance	NS	NS	NS	NS	NS
			At weaning		
Effect of feeding system					
40 C : 60 R	6.98±0.07	4.21±0.24	38.86±2.74	68.21±3.84	31.21±3.46
60 C : 40 R	7.17±0.12	4.46±0.30	47.26±1.87	76.37±5.78	39.26±3.89
Significance	NS	NS	**	NS	NS
Effect of yeast culture supplementation					
Control	7.04 ±0.13	4.04 ±0.19	41.50±3.92	73.75±7.99	43.50±6.53
5 g Moreyeast	7.03 ±0.14	4.31 ±0.29	42.46±1.82	71.53±6.69	31.80±4.21
1 g Dinaferm	7.22 ±0.10	4.69 ±0.54	47.3 ±3.92	74.30±4.26	35.80±3.42
Significance	NS	NS	NS	NS	NS
Interaction between feeding system and yeast supplementation					
40 Concentrate : 60 Roughage					
Control	6.97±0.14	3.83±0.10	34.50±4.17	67.50±9.33	33.75±6.861
5 g Moreyeast	6.92±0.46	4.64±0.65	39.20±2.03	67.80±8.35	24.60±4.69
1 g Dinaferm	7.03±0.04	4.09±0.05	42.00±6.90	69.20±3.40	35.80±6.40
60 Concentrate : 40 Roughage					
Control	7.12±0.22	4.25±0.35	48.50±4.66	80.00±13.58	53.25±9.42
5 g Moreyeast	7.08±0.19	4.14±0.13	44.10±2.43	73.40±9.37	35.40±5.66
1 g Dinaferm	7.40±0.15	5.28±1.07	52.60±2.73	79.4 0±7.55	35.80±3.44
Significance	NS	NS	NS	NS	NS

** P<0.01.

Table 3. Means of some blood serum components of ewes as affected with feed system and yeast culture supplementation and its interactions at 4 weeks of birth

Items	GPT	GOT	Urea	Createnine
		At birth		
Effect of feed system				
40 C : 60 R	20.00±0.84	29.00±2.39	40.64±0.63	1.66±0.05
60 C : 40 R	16.84±1.14	24.68±1.70	41.42±1.21	1.58±0.06
Significance	NS	NS	NS	NS
Effect of yeast culture supplementation				
Control	19.75 ±0.94	30.75 ±2.09	41.75±1.22	1.69±0.08
5 g Moreyeast	17.93 ±1.42	26.20 ±2.29	40.87±1.44	1.56±0.06
1 g Dinaferm	17.30 ±1.28	23.60 ±2.56	40.90±0.77	1.63±0.08
Significance	NS	NS	NS	NS
Interaction between feeding system and yeast supplementation				
40 Concentrate : 60 Roughage				
Control	19.50±2.00	33.50±2.60	40.75±1.03	1.73±0.09
5 g Moreyeast	21.40±1.40	29.41±4.20	40.20±1.32	1.61±0.04
1 g Dinaferm	18.60±1.03	25.00±4.68	41.00±1.10	1.64±0.11
60 Concentrate : 40 Roughage				
Control	19.50±0.29	28.00±2.94	42.75±2.29	1.64±0.13
5 g Moreyeast	16.20±1.81	24.60±2.73	41.20±2.10	1.53±0.08
1 g Dinaferm	16.00±2.35	22.20±2.58	40.80±1.20	1.62±0.11
Significance	NS	NS	NS	NS
		At weaning		
Effect of feeding system				
40 C : 60 R	18.57±1.19	28.29±2.79	44.00±1.79	1.67±0.06
60 C : 40 R	18.63±1.27	24.37±1.89	44.58±1.53	1.63±0.05
Significance	NS	NS	NS	NS
Effect of yeast culture supplementation				
Control	21.38±1.19^{a}	34.75±2.45^{a}	51.00±1.74^{a}	1.87±0.06^{a}
5 g Moreyeast	16.20±0.94^{b}	22.33±1.66^{b}	43.07±1.70^{b}	1.58±0.06^{b}
1 g Dinaferm	20.00±2.03^{a}	24.60±3.36^{b}	40.90±1.12^{b}	1.56±0.06^{b}
Significance	*	**	***	**
Interaction between feeding system and yeast supplementation				
40 Concentrate : 60 Roughage				
Control	20.75±1.11	35.50±2.90	51.75±3.20	1.91±0.11
5 g Moreyeast	16.60±0.93	23.20±2.65	40.60±1.21	1.53±0.06
1 g Dinaferm	16.80±3.06	27.60±6.45	41.20±2.15	1.62±0.10
60 Concentrate : 40 Roughage				
Control	22.00±2.27	34.00±4.38	50.25±1.89	1.83±0.08
5 g Moreyeast	16.00±1.37	21.90±2.19	44.30±2.44	1.61±0.08
1 g Dinaferm	21.20±2.92	21.60±2.14	40.60±0.98	1.50±0.05
Significance	NS	NS	NS	NS

** P<0.01 and *** P<0.001.

Yeast culture supplementation in diets did not show significant differences between ewes groups on GOT and GPT at the beginning of the experiment and at the lambing time, while at the weaning time GOT and GPT activaty were affected significantly (P<0.01 and 0.05, respectively, Table 3). This may due to reflect the normal physiological status and normal liver function with yeast supplementation in the diet. El-Ashry *et al.* (2002) indicated that GPT activity of plasma was not affected by treatments while GOT activity level tended to decrease with Live dried baker's yeast addition.

Blood serum urea and serum creatinine

Feeding system did not show significant differences between ewe groups on the concentration of blood urea and creatinine at the different experimental period (Table 3). The obtained results may indicate that the ewes fed high or low concentrate did not affect the kidney function.

Yeast culture supplementation in diets did not show significant differences between ewe groups on urea and creatinine concentrations at the beginning of the experiment and at the lambing time, while at the weaning time affected significantly (P<0.001 and 0.01, respectively, Table 3). El-Badawi *et al.* (1998) showed that the higher supplementation level of yeast culture was associated with a higher (p<0.05) blood plasma urea-N. Also, Ibrahim *et al.*, (2002) showed that only significant difference was detected between control and Moreyeast diet in the urea-N concentration.

Interaction between feeding system and yeast supplementation did not show significant differences between ewe groups on the concentration of blood urea and creatinine at the different experimental periods (Table 3).

Pre-Weaning Body Weight and Gain

Lambs pre-weaning live body weight was insignificant affected with feeding system, while weaning live body weight was affected significantly (P<0.05, Table 4). Lambs produced from ewes fed high concentrate diet recorded higher live body weight at weaning by 8.50% than those fed low concentrate diet. The highest value of live body weight may be attributed to the increase in milk production due to the increase in the concentrate level in the diet.

Lambs pre-weaning live body weight insignificantly was affected with yeast culture supplementation or the interaction between feeding system and yeast supplementation (Table 4). Supplementation of

Table 4. Means of pre-weaning weight (kg) and gain (kg) of lambs as affected with feeding system and yeast culture supplementation and its interactions at 4 weeks of age

Items	Birth	2 Weeks	4 Weeks	6 Weeks	Weaning	0-8 Weeks
Effect of feeding system						
40 C : 60 R	3.71±0.18	6.95±0.25	9.51±0.32	12.46±0.31	15.05±0.39	0.203±0.01
60 C : 40 R	3.65±0.13	6.90±0.14	9.56±0.20	13.02±0.27	16.33±0.33	0.227±0.01
Significance	NS	NS	NS	NS	*	*
Effect of yeast culture supplementation						
Control	3.53±0.18	6.86±0.33	9.18±0.29	12.17±0.25	15.20±0.35	0.210±0.01
5 g Moreyeast	3.70±0.15	6.92±0.16	9.63±0.26	13.01±0.33	15.91±0.48	0.219±0.01
1 g Dinaferm	3.75±0.23	6.98±0.24	9.68±0.35	13.01±0.41	16.15±0.46	0.222±0.01
Significance	NS	NS	NS	NS	NS	NS
Interaction between feeding system and yeast supplementation						
40 Concentrate : 60 Roughage						
Control	3.31±0.24	6.87±0.67	9.12±0.58	11.84±0.39	14.66±0.53	0.205±0.01
5 g Moreyeast	4.00±0.20	7.06±0.15	9.69±0.43	12.61±0.24	15.08±0.90	0.190±0.02
1 g Dinaferm	3.80±0.37	6.93±0.45	9.67±0.66	12.84±0.72	15.64±0.63	0.212±0.01
60 Concentrate : 40 Roughage						
Control	3.75±0.25	6.85±0.23	9.25±0.24	12.49±0.25	15.74±0.28	0.215±0.00
5 g Moreyeast	3.59±0.18	6.87±0.22	9.61±0.33	13.15±0.44	16.35±0.53	0.229±0.01
1 g Dinaferm	3.70±0.30	7.02±0.25	9.68±0.33	13.17±0.47	16.66±0.65	0.232±0.01
Significance	NS	NS	NS	NS	NS	NS

* P<0.05.

yeast in diets insignificantly increased weaning live body weight. Weaning live body weight increased by 4.67 and 6.25%, respectively in lamb group produced from ewes fed diets supplemented with Moreyeast and Dinaferm yeast respectively.

Lambs pre-weaning daily gain (0-4 weeks) was significantly ffected (P<0.05) by feeding system. Lambs produced from ewes fed high concentrate diet recorded higher daily gain during the suckling period (0-4 weeks) by 11.82% than those fed low concentrate diet. The highest value of live body weight may be attributed to the increase the milk

production due to the increase in the concentrate level in the diet.

Lambs pre-weaning body gain insignificantly were affected with yeast culture supplementation or the interaction between feeding

system and yeast supplementation (Table 4). Supplementation of yeast in diets insignificantly increased pre-weaning body gain. Daily gain during the suckling period (0-8 weeks) increased by 4.29 and 5.71%, respectively in lambs group produce from ewes fed diets supplemented with Moreyeast and Dinaferm yeast respectively.

REFERENCES

Brydt, E., A. Bata., P. Lasztity., K. Vajdovich and G. Nagy.1995. Effect of viable Saccharomyces cervisiae on the ruminal fermentation, acid-base metabolism and milk production on dairy cows. Magyar Allatorvosok Lipja. 50, 543.

Chaucheyras, E., G. Fonty, G. Bertin and P. Gouet.1995a. Effects of live *Saccharomyces cerevisiae* cells on zoospore germination, growth and cellulolytic activity of the rumen anaerobic fungus, *Neocallimastix frontalis* MCH3. Current Microbiology. 3 1:20 1.

Chaucheyras, F., G. Fonty, G. Bertin and P. Gouet.1995b. In vitro H2 utilization by a ruminal acetogenic bacterium cultivated alone or in with *an Archaea methanogen* is stimulated by a probiotic strain of *Saccharomyces cerevisiae*. Appl. Environ. Microbiology. 6 1:3466.

Dawson K.A. 1992. Current and future role of yeast culture in animal production. A review of research over the last six years. In: Supplement to the Proceedings of Alltech's 8th Annual Symposium. Alltech Technical Publications, Nicholasville, KY.

Dawson, K. A. , K. E. Newman and J. A. Boling . 1990. Effect of microbial supplements containibg yeast and lactobacilli on roughage-fed ruminal microbial activites.J. Anim. Sci., 63: 3392 – 3398.

Dumas, B. T. and H. G. Biggs. 1972. In Standard Methods of Clinical Chemistry Vol7. Academic Prees, New York, P 175.

Duncan D.B. 1955. Multiple Range and Multiple F-test. Biometrics, 11: 1-42.

Edwards, I.E. 1991. Practical uses of yeast culture in beef production: Insight into its mode of action. In: Biotechnology in the Feed Industry, Vol.VI. Alltech Technical Publications, Nicholasville, KY.

El-Ashry.M.A. Zeba A.Motagally and Y. A. Maareck.2002. Effect of live dried baker's yeast with or without acidification of milk

and yeast culture on performance of suckling buffalo calves. Egypptian J. Nitrition and Feeds. 5: 31-41.

El-Badawi, A.Y., H.M. Gado and M.A. Tawila.1998. Influence of dietary yeast culture on the lactation performance of goats. J. Agric. Sci., Ain Shams Univ., Cairo, 6 : 111.

Finley, P.R. 1978. Clin. Chem. 24:931.

Folin, O.Z. 1934. Phys. Chem. 268:228

Girard, I.D., C.R. Jones, and K.A. Dawson. 1993. Lactic acid utilization rumensimulating cultures receiving a yeast culture supplement. J. Anim. Sci. 71 (Suppl. 1): 288.

Harrison, G.A., R.W. Hemken, K.A. Dawson, R.J. Harmon and K.B. Barker. 1988. Influence of addition of yeast culture supplement to diets of lactating dairy cows on ruminal function and microbial populations. J. Dairy Sci. 71:2967-2975.

Harod Varliy. 1975. Practical Clinical Biochemistry 4th Ed:pp (294).

Henry, R. J., D, C. Cannon and M, D. Hagerstown. 1974. pp421-511.

Ibrahim, Fathia. A., Ahmed, M.E. Ahmed, A. El-Shewy and Faten F. Abou Ammou. 2002. Effect of commercial microbial supplements on performance of lactating Zaraibi goats . Proc., 1 st Ann. Sc. Conf. Animal and Fish Prod. Mansoura 24-25 Sep.

Newbold CJ, Wallace RJ, McIntosh FM. 1996. Mode of action of the yeast Saccharomyces cerevisiae as a feed additive for ruminants, British Journal of Nutrition, 76 (2): 249-261.

Newbold, C, J. and R.J. Wallace 1992. The effect of yeast and distillery by-products on the fermentation in the rumen simulation technique (Rusitec). Anim. Prod. 54:504.

Patton, C J., S. R. Crouch. 1977. Anal. Chem., 49. 464-469.

Scheletter , G. and E. Nussel. 1975. Arbbeitsmed Soziamed Pracentimed 10: 25.

Snedecor, G.W. and G.W. Cochran.1982. *Statistical Methods*. 6th Edition. Iowa State University Press, Ames., USA.

Soder, K.J. and L.A. Holden. 1999. Dry matter intake and milk yield and composition of cows fed yeast prepartum and postpartum. J.Dairy Sci.82: 605.

Trinder, P. 1969. Ann. Clin. Biochem., 6,24.

Wallace, R.J. 1996. The mode of action of yeast culture in

modifying rumen fermentation. In: Proceedings of Alltech's 12th Annual Symposium on Biotechnology in the Feed Industry. Nottingham University Press, Loughborough, Leics. UK.

Wiedmeier R.D., M.J. Arambel and J.L. Walters.1987. Effects of yeast culture and Aspergillus oryzae fermentation extract on ruminal characteristics and nutrirents digestion. Journal of Dairy Science, 70: 2063-2068.

Williams P.E.V. and C.J. Newbold. 1990. The effects of novel microorganisms on rumen fermentation and ruminant productivity. Proceeding of 24th University of Norttingham Feed Manufactures Conference Sutton Bonington, Loughborough, Leics.

Yoon, I.K. and M.D. Stern. 1991. Influence of various levels of *Lactobacillus acidophilus* supplementation of fermentation by rumen micro-organisms in continuous culture. In Proceeding of 21st Biennial Conference on Rumen Function. Chicago, IL p 35.

تأثير إضافة الخميرة الحية في الغذاء على أداء النعاج تحت الظروف المصرية

محمد صلاح عياط[1]- جمال الدين علي عبدالرحمن[1]

فاتن فهمي محمد أبو عمو[2]- يوسف حسين حافظ حنفي[2]

١. قسم الإنتاج الحيواني- كلية الزراعة- جامعة الزقازيق- مصر

٢. معهد بحوث الإنتاج الحيواني- مركز البحوث الزراعية- مصر

أجريت هذه الدراسة باستخدام ٩٠ نعجة خليط (٨/٣ فنلندي x ٨/٥ أوسيمي) بمتوسط وزن ٤٥ كجم أعمارها تراوحت من ٣ و ٥ سنوات و قسمت النعاج عشوائيا إلى ٦ مجاميع (١٥ نعجة لكل مجموعة) تحت نظامين غذائين (٤٠% مركز: ٦٠% مالي) و (٦٠% مركز: ٤٠% مالي) ثلاث مجاميع تحت كل نظام أو مستوي غذائي.

و قد تم تقدير كل من كمية أو محصول البن اليومي و مكونات اللبن و قياسات الدم للنعاج خلال المراحل الفسيولوجية المختلفة و وزن الحملان عند الميلاد حتى الفطام . كل مستوي غذائي يشمل المجموعة الأولى الكنترول (العليقة بدون إضافة الخميرة) والمجموعة الثانية(إضافة ٥جرام خميرة الموريست/ ١كجم علف/ راس) و المجموعة الثالثة (إضافة ١جرام خميرة الدينافيرم/ ١كجم علف/ راس).

أوضحت النتائج ان هناك تحسنا معنويا عند مستوى معنوي(٠,٠٥) لكل من نسبة بروتين اللبن ونسبة الجوامد الكلية بالدهن و تحسن معنوي عند مستوى(٠,٠١) للجوامد الكلية بدون الدهن للمجاميع التي غذيت على مستوى مرتفعه في نسبة المركز بالمقارنة بالمنخفضة في المركز بينما زيادة الدهن و سكر اللاكتوز في اللبن كانت زيادة غير معنوية عند فترة الميلاد . زيادة محصول اللبن اليومي لمجاميع التي غذيت على مستوى مرتفع في نسبة المركزعند الميلاد (الولادة) و الفطام للحملان . لم يحدث تاثيرا معنويا في كل من تركيب و محصول اللبن اليومي للنعاج التي غذيت على الخميرة خلال فترتي الميلاد و الفطام . لم يحدث تاثيرا معنويا خلال التداخل ما بين نظام التغذية و إضافة الخميرة في كل من تركيب و محصول اللبن اليومي .

كما أظهرت النتائج زيادة في مستوي كل من البروتينات الكلية والألبيومين في دم النعاج التي غذيت علي مستوي مرتفع من العليقة المركزة والمضاف إليها ١جرام دينافيرم بالمقارنة بباقي المجاميع. بينما لم يحدث تأثير معنوياً للتداخل ما بين نظام التغذية والخميرة علي كل من تركيز الكوليسترول والدهون الثلاثية في الدم. أدت إضافة الخميرة إلي زيادة غير معنوية عند (٠,٠٥%) لمستوى الجلوكوز في مجاميع دم النعاج ، كما أنه لم يحدث تأثر معنوي في نشاط إنزيمات الكبد (GPT، GOT) و تركيز (اليوريا و الكرياتينين) لمجاميع النعاج التي غذيت على نظام الغذائي و المضاف إليها الخميرة. كما أدت زيادة نسبة العلف المركز في العليقة إلي زيادة وزن الفطام للحملان بنسبة ٨,٥% بالمقارنة بالمستوي المنخفض في العليقة المركزة وهذه الزيادة نتيجة لزيادة كمية أو محصول اللبن اليومي للنعاج المغذاه علي نسبة مرتفعة من العليقة المركزة.

كما أدت إضافة خميرة الموريست والدينافيرم إلي زيادة غير معنوية عند مستوي (٠,٠٥%) بمعدل ٤,٦٧%، ٦,٢٥% مقارنة لمجموعة الكنترول علي التوالي. ارتفاع معدل النمو اليومي لحملان النعاج التي غذيت على عليقة مرتفعة في نسبة المركز بنسبة ١١,٨٣% مقارنة بحملان النعاج التي غذيت عليقة منخفضة في نسبة المركز.

أدت إضافة كل من خميرة الموريست والدينافيرم إلي زيادة معدل النمو اليومي للحملان من فترة الميلاد إلى الفطام (٠-٨ اسابيع) بنسبة ٤,٢٩%، ٥,٧١% بالمقارنة بالكنترول علي التوالي.