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EFFECT OF NON-HORMONAL GROWTH PROMOTERS ON GROWTH, NUTRIENT DIGESTIBILITY AND FEED EFFICIENCY BY GROWING BUFFALO CALVES

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ABSTRACT

Fifteen growing buffalo calves (3.73 months old and 104 kg body weight) were used to study the effect of adding live dried baker's yeast (*Saccharomyces cerevisiae*, LDY) and Gustor natures (GN) on their performance. The calves were allocated randomly and equally on the basis of age and weight to one of three treatments. All treated groups were fed according to the allowance recommended by Animal Production Research Institute, Egypt. Treatments consisted of a basal ration without additives (control), control ration plus live dried baker's yeast (LDY) 5g /h /d (R2) or with added Gustor natures (GN) 5g / h / d (R3). Experimental period lasted 5, months,the main results showed that each of DM, OM, CP, CF, NFE, digestibility and feeding values (TDN, DCP) were similar for LDY and GN fed groups being better (P<0.05) relative to the control. While, EE digestibility was not affected by treatments. The DM intake was almost similar due to additives compared to the control . Daily gain and feed conversion (DM,TDN and DCP) were almost similar with the two additives (GN or LDY). However, both two supplemented groups were superior (P< 0.05) relative to the control. While , relative economic efficiency due to LDY or GN inclusion in the ration was 111.15 and 126.98 % , respectively as compared to the control. The pH values of rumen liquor was not affected by treatment. While, VFA and NH_3-N were improved (P<0.05) due to the addition of the two additive (GN or LDY) compared with the control. Inclusion of GN in the ration increased plasma total protein (p<0.05) relative to the other groups. Plasma globulin of the two additive groups was similar and was higher (P<0.01) relative to the control. The, A/G ratio and GPT activity were also similar for the two additive groups which were lower (P<0.01) relative to the control . Plasma albumin, GOT activity and urea concentration were not affected by treatments. From this study, it could be recommended to supplement 5g / h / d from live dried baker's yeast LDY or 5 g / h /d from gustor nature GN to the daily rations of growing buffalo calves to improve final body weight, total gain, daily gain. Also, they improve feed conversion and economic efficiency.

Keywords: Live dried yeast, Gustor Natures, buffalo calves, digestibility, performance, rumen parameters and blood parameters .

INTRODUCTION

In Egypt there is a significant increase in the demand for animal products, especially red meat which is mainly supplied from cows and buffalo meat. Farg , 2004 indicated that animal production depends on many factors such as breed, sex, age, and nutritional factors such as energy level , protein level, concentrate roughage ratio , vitamins , minerals and feed additives (growth promoters to the diets of animals to enhance growth , improve feed efficiency and animal performance).

In addition, several researches showed that live-cell yeast (*Saccharomyces cerevisiae*) can increase cellulose degradation in *in-vitro*

ruminal culture (Dawson and Hopkins, 1991) and can utilize rapidly fermentable carbohydrates reducing the production of lactate and thereby increasing rumen pH on high concentrate diets (Walli , 1994) . Others have reported that live dried baker's yeast and gustor natures additives improved calves performance, feed utilization (El-Ashry *et al*., 2001 and Farg, 2004) .
Moreover, Williams *et al*., (1990) and Erasmus *et al* ., (1992) reported that the microbial protein flow from the rumen was increased with the addition of yeast culture to the diet . Live yeast culture is very active in forming amino acids and vitamins , promotes fermentation by secreting various digesting enzymes within the ruminant stomach and stabilizes the flora in the stomach and intestines by supplying the nutrients which are necessary for their growth. Also, the addition of yeast culture increased dry matter intake , daily gain and feed efficiency (Mir and Mir, 1994) .

Since , *Saccharomyces cerevisiae* is of no risk on human health when included in the animal rations , (El-Ashry *et al*., 2001), the main objectives of this study were to investigate the effect of non-hormonal growth promoters (live dried baker's yeast or gustor natures) to the rations of growing buffalo calves on their performance, nutrients digestibilities , rumen parameters and some blood plasma constituents.

MATERIALS AND METHODS

This study was conducted at EL-Gemmiza Experimental Station , Animal Production Research Institute, Ministry of Agriculture , Egypt .

The objective of this work was to investigate the effect of using two non-hormonal growth promoters on performance of growing buffalo calves.Live dried baker's yeast (*Saccharomyces cerevisiae*, LDY) was purchased from Sugar Integrated Industry Company (Hawamdia Chemicals Factory) which, according to the manufacturer, contained at least $20x10^9$ live cell / g from *Saccharomyces cerevisiae* .On the other hand , Gustor natures (GN) was imported from Spain allotted by Egypt company, which according to the manufacturer, composed of malic acids 167.2 g , *Saccharomyces cerevisiae* 4.10^{11} ucf Cepa Sc47 ($CEN^0 3$) and carrier (carbohydrates) / kg. Calves fed rations containing 57% concentrate and 53% roughage Table (1).Fifteen growing buffalo calves weighing about 104 kg aged 3.73 months were used in a growth feeding trial and were divided into three similar groups (5 in each).

Calves were allocated randomly and equally on the basis of age and weight to one of three treatments. Treatments consisted of a basal ration without additives (control, R1) or the basal ration with added live dried baker's yeast (*Saccharomyces cerevisiae*, LDY) 5 g / h / d (R2) or with added Gustor natures (GN) 5 g / h / d (R3). All treated groups were fed according to the recommended allowanc of Animal Production Research Institute, Egypt .
The concentrate feed mixture , berseem hay and rice straw were offered twice daily , the first at 9 a.m. while the second at 2 p.m. respectively . Additives for R2 and R3 (LDY and GN) were added as a top-dress on the mash concentrate feed mixture and mixed gently with the upper part of the

concentrate . Calves had access to fresh water twice daily, at 8 a.m. and at 4 p.m. Individual feed intake was recorded daily while body weight of each calf was recorded at the start of the experiment and biweekly until the study was completed .Treatment period lasted 5 months . Daily feed allowances of calves were changed quantitvely on biweekly basis according to changes in body weight of calves. Mineral blocks were available freely through the experimental period .According to the recorded feed intake from the concentrate feed mixture, berseem hay and rice straw throughout the experiment, the formulation of the ration of each treatment was calculated and tabulated in table (1). Nutrient composition of ingredients and additives of the rations and also the whole rations are presented in table (2).

Table (1) : Formulation of the tested rations :

Item	Rations		
	R_1	R_2	R_3
Concentrate feed mixture, (CFM)* %	57	57	57
Rice Straw, (RS) %	15	15	15
Berseem hay, (BH) %	28	28	28
LDY g / h / d **	0.00	5.00	0.00
GN g / h / d ***	0.00	0.00	5.00

***The ingredients of concentrate feed mixture (CFM) were: Corn grain 21%, undecorticated cotton seed cake 37 %, Wheat bran 38 %, Molasses 3 %, Limestone 0.5 % and Salt 0.5 % .**
**** Live dried baker's yeast *** Gustor natures**

At the end of the experiment which lasted 5 months, nutritive values of the experimental rations (R1, R2 and R3) were determined using three digestibility trials , which were carried out using silica (McDonald *et al*., 1995) as an internal marker. Nine adult rams were allocated at random to the three experimental groups and fed the same tested rations. Feedstuff and fecal samples were chemically analyzed according to the methods of A.O.A.C. (1995). Calves were bled before morning feed , each 2 month , in glass tubes containing EDTA. Blood was centrifuged just after taken to obtain plasma which was stored (- 20^0 C) until analyzed for total protein (Henry *et al .,* 1974)., albumin (Doumas *et al* .,1971), globulin (by calculations) , A / G ratio (by calculation) , urea (Fawcett and Scott, 1960) , and GOT and GPT (Reitman and Frankel , 1957).

Table (2) : Chemical analysis of feedstuffs and experimental basal ration, DM %

Item	DM	Nutrient % of DM					
		OM	CP	CF	EE	NFE	Ash
Concentrate feed Mixture, (CFM)	86.39	91.02	16.73	10.24	2.76	61.29	8.98
Rice Straw	91.89	79.65	2.57	37.67	1.70	37.71	20.35
Berseem hay	88.92	86.73	9.81	29.16	2.39	45.37	13.27
Basal rations	87.92	88.11	12.68	19.65	2.50	53.28	11.89

All rams were used to obtain rumen fluid samples using stomach tube at (pre-feeding) 0, at 1 hours, 3 hours and 6 hours post-feeding to determine the concentrations of volatile fatty acid (VFA) and ammonia nitrogen (NH_3-N). Rumen fluid was strained through four layers of cheesecloth ; and pH was immediately measured using a hand pH-meter with glass electrode , then 2 ml H_2SO_4 (50% v/v) were added to retard ammonia loss. Samples were frozen for subsequent analysis for ammonia according to Al-Rabbat *et al*., (1971) , and total volatile fatty acids as described by Warner (1964).

Data of initial weight , final weight , weight gain and nutrients digestibility were analyzed as an one way analysis of variance while data of daily gain, feed conversion, ruminal microbial activity and plasma constituents were analyzed as repeated measurements, using general liner procedure of SAS (1995). Differences among means were evaluated using Duncan (1955).

RESULTS AND DISCUSSION

The results of digestibility coefficients and nutritive value of experimental rations are shown in table (3) . Supplementing basal ration with gustor nature (GN, R_3) or live dried baker's yeast (LDY, R_2) increased ($P<0.05$) DM, OM, CP, CF and NFE digestibility coefficients as compared to the control (R_1) . While , DM, OM, CP, CF and NFE digestibility were slightly higher for (R_3) than (R_2), but differences were not significant . Digestibility of EE was not affected by treatments. Feeding values of the rations (TDN and DCP) were similar for GN or LDY (R_3 , R_2) supplemented rations , being higher ($P<0.05$) relative to the control. The results obtained match those of Metwally *et al*., (2001) ; Al-Dabeeb and Ahmed , (2002) and Farg , (2004) who found that LDY or GN supplementation improved the digestibility of all nutrients. Walli, (1994) reported that *Saccharomyces cerevisiae* is unable to establish permanently in the rumen ecosystem .

Table (3): Nutrients digestibilities and nutritive value of the experimental rations .

Item	Treatments		
	R_1	R_2	R_3
Nutrients digestibility %			
DM	$68.69^b \pm 1.36$	$71.57^{ab} \pm 1.63$	$73.87^a \pm 1.29$
OM	$69.69^b \pm 1.36$	$73.75^{ab} \pm 1.57$	$74.88^a \pm 0.96$
CP	$68.68^b \pm 0.79$	$72.20^{ab} \pm 0.99$	$74.75^a \pm 1.35$
CF	$51.24^b \pm 1.43$	$55.71^a \pm 1.97$	$56.99^a \pm 1.12$
NFE	$67.10^b \pm 0.72$	$70.49^a \pm 0.46$	$71.27^a \pm 1.74$
EE	71.42 ± 1.36	71.63 ± 0.81	72.12 ± 0.67
Feeding values, %			
TDN	$57.47^b \pm 0.72$	$60.53^a \pm 0.33$	$61.40^a \pm 0.89$
DCP	$8.31^b \pm 0.10$	$8.60^{ab} \pm 0.12$	$8.79^a \pm 0.16$

a and b : Means bearing different letters in the same row are significantly different (P< 0.05)

However , Kung *et al* ., (1997) found that , anaerobic ruminal fluid that had been supplemented with malt extract , yeast cell remained viable and metabolically active for up to 48 h , as indicated by the production of ethanol . Moreover , the improved CF and CP digestibility , in the present study as a result of the inclusion of LDY and GN in the rations may be due to the large amounts of L-malic acid in LDY and GN which may stimulate growth of lactate utilizers such as *Selenomonas ruminatium* , thereby reducing ruminal lactate concentration (Nisbet and Martin , 1991). Moreover, Harrison *et al*., (1988) showed that yeast culture supplemented with the rations of cows had resulted in increasing the total number of bacteria and cellulolytic bacteria with decreasing ammonia concentration in the rumen. Other investigators , El-Shaer (2003) with sheep and El-Ashry *et al* ., (2001) with buffaloes reported that yeast culture supplementation improved feeding value (TDN and DCP) of tested diets (Farg , 2004) with buffaloes .

The results of calves performance are shown in table (4). Final weight of calves received GN (R3) was similar to the the final weight of calves on the LDY (R_2) treatment. On the other hand , calves fed GN or LDY were heavier (6.98 and 4.1%, respectively) relative to the control (R_1). Weight gain and average daily gain followed the same trend ($P<0.05$). Daily DM intake was not affected by treatments . Feed conversion values of rations (kg DM and TDN / kg gain) were slightly improved (5.09 and 1.94 % , respectively) due to GN (R_3) addition , as compared to LDY (R_2) addition . At the same time , it was improved ($P<0.05$) relative to the control by (9.41 and 12.07% , respectively) duo to GN supplementation and by (4.12 and 9.94% , respectively). Conversion of DCP was improved but insignificantly due to GN addition as compared to LDY fed-group , however it was significantly ($P<0.05$) improved relative to the control (R_1) .The improved performance of GN or LDY –fed groups, in the present stud, despite the unchanged DMI may be related to improved nutrient digestibility (table 3) or improved ruminal fermentative activity as indicated by the many research findings of Olson *et al*., (1994) and Newblod *et al*., (1995) who indicated that these enhancements may had directly stimulated the microbial growth and activity . However, Fayed (2001) reported that the DMI and body weight gain were not significantly effected by LDY or GN supplementation. While, Nicholson , (1977) reported that inclusion of DVYC or brewers dried yeast in a 75% dry rolled barley based ration of Hereford cattle (333 kg) had improved daily gain and feed efficiency relative to the control ration. Other reports by El-Ashry *et al* ., (2001) Farg , (2004) showed that addition of yeast culture or gustor nature improved daily gain and nutrients (DM , TDN , and DCP) conversion by buffalo heifers .

Results of economic of LDY or GN inclusion in the rations on weight gain are shown in table (4). The high values of return over feed and additives costs, (3.53 LE) was recorded for R_3 (GN) group followed by R_2 (LDY) group (3.09 LE).The control (R1) was ranked the third, (2.78 LE). Relative economic efficiency due to LDY or GN inclusion in the rations was 111.15 and 126.98 % respectively as compared to the control.

Table (4): Effect of live dried yeast or gustor natures on performance of growing buffalo calves .

Item	Treatments		
	R_1	R_2	R_3
No. of animals	5	5	5
Experimetal periods , d	150	150	150
AV.Initial LBW, kg	104.00 ± 5.54	104.40 ± 4.55	103.60 ± 6.41
AV.final LBW, kg	197.70^{b} ± 2.81	205.80^{ab} ± 2.63	211.50^{a} ± 5.63
Total BW gain , kg	96.36^{b} ± 6.51	101.40^{ab} ± 6.85	107.90^{a} ± 9.50
AV.daily gain , kg	0.642^{b} ± 0.04	0.676^{ab} ± 0.05	0.719^{a} ± 0.06
DMI kg / h / d	5.52 ± 0.33	5.56 ± 0.27	5.62 ± 0.43
Feed conversion :			
DM intake kg / kg gain	8.60^{b} ± 0.32	8.26^{ab} ± 0.60	7.86^{a} ± 0.38
Kg TDN / kg gain	5.20^{b} ± 0.28	4.73^{a} ± 0.51	4.64^{a} ± 0.29
Kg DCP / kg gain	0.748^{b} ± 0.38	0.664^{a} ± 0.38	0.671^{a} ± 0.38
Economic efficiency L.E/h/d:			
Gain value , L.E[1]	7.70	8.11	8.63
Feed cost , L.E[2]	4.92	4.93	5.02
Additives cost , L.E[3]	0.00	0.09	0.08
Return , L.E	2.78	3.09	3.53
Relative economic efficiency [4]	100	111.15	126.98

a and b : means bearing different letters in the same row are significantly different (P<0.05)

1- On the basis of a price of 12 LE / kg gain

2- On the basis of a price of 0.97 LE / kg of CFM; a price of 0.75 of LE /kg berseem hay and a price of 0.15 LE / kg of rice straw .

3- On the basis of a price of 18 LE / kg LDY and- a price of 16 LE / kg GN.

4- Assuming that economic efficiency of the control equals 100 .

To clarify the mode of action of LDY or GN , ruminal microbial activity was evaluated as pH and concentrations of ammonia-N and volatile fatty acids (VFA). These values are illustrated in table (5). No differences in the pH values were found due to the LDY or GN supplementation within each sampling time . Yoon and Stern (1996); Putnam *et al*.,(1997) and Al-Dabeeb and Ahmed (2002) reported similar results. With time of sampling advancement, pH values tended to be decreased at 1 and 3 hours post-feeding, while highest values were obtained at zero time (before feeding).

Before feeding (at zero time) ammonia-N concentration was lower with the control ration than LDY or GN supplementation at all times studied . The GN supplementation significantly increased (P<0.05) ammonia-N concentration over the control at all times . After the first hour , ammonia-N concentrations started to decline to reach the minimum at 6 hr post-feeding . Al-Dabeeb and Ahmed , (2002); Farg , (2004) reported similar trends .

The lowest VFA level was reported before feeding for all dietary treatments . At 1 hr after feeding , sheep fed GN ration showed higher (P<0.05) VFA concentration followed by those fed LDY ration. The same trend was observed at 3 hr then declined at 6 hr . The increase in VFA concentrations at 3 hr post-feeding lead to the decrease observed in pH values. Al-Dabeeb and Ahmed, (2002) and Farg (2004) concluded similar effect .

In general, the microbial activity was increased with the advance in time reaching the maximum activity at 3 hr after feeding then declined (table 5) . Similar trend was reported by Putnam *et al* ., (1997) and Taie *et al* ., (1998). This may have been due to the increase in the bacterial counts and activity (Erasmus, *et al* ., 1992 ; Yoon and Stern , 1996) . Newbold *et al* ., (1996) reported that some strains of yeast are effective whereas others are not . They suggested that the ability of different yeast preparations to stimulate the viable count of bacteria in the sheep rumen appears to correspond with their ability to remove O_2 from rumen fluid . The amount of O_2 entering the rumen of sheep daily was calculated to be in the range of 11.5- 38 liters through saliva, food and diffusion of the blood of the host animal (Czerkawski *et al* ., 1969 and Newbold *et al* ., 1996). Oxygen is know to be toxic to anaerobic bacteria and it inhibits the growth of rumen bacteria in pure culture studies (Loesche , 1969 and Marounek and Wallace , 1984).

Results of some plasma parameter are presented in table (6). Buffalo calves fed GN had significantly (P<0.05) increased plasma total protein than LDY or control .On the other hand , plasma albumin concentration and A/G ratio were similar for the LDY and GN groups but were lower relative to the control . Inclusion of LDY or GN in the rations increased plasma globulin concentrations (P<0.01) relative to the control groups. Also, the data indicated that urea was similar for LDY and GN groups being higher relative to the control. Plasma GOT activity was not affected by treatments . While , GPT activity was similar for LDY on GN groups with a tendency to decrease relative to the control (P<0.01) . All values as previously mentioned were in the normal ranges .

Table (5): Ruminal fluid pH ,total VFA meq / 100ml and NH_3-N mg / 100ml values of sheep fed the different experimental rations.

Sampling time	Treatments		
	R_1	R_2	R3
Ruminal pH			
at zero time	6.46 ± 0.20	6.74 ± 0.06	6.72 ± 0.07
1hr . after feeding	5.99 ± 0.08	5.92 ± 0.10	5.82 ± 0.06
3hr . after feeding	6.02 ± 0.10	6.00 ± 0.06	6.13 ± 0.08
6hr . after feeding	6.39 ± 0.22	6.45 ± 0.22	6.59 ± 0.28
Ruminal NH_3-N :			
at zero time	30.20 ± 0.9	31.30 ± 1.12	32.06 ± 0.95
1hr . after feeding	38.96^{b}± 0.64	39.41^{ab}± 1.14	41.96^{a} ± 1.64
3hr . after feeding	36.17^{b}± 0.33	37.48^{ab}± 1.32	38.95^{a} ± 1.85
6hr . after feeding	28.78^{b}± 1.04	29.44^{ab}± 0.62	30.40^{a} ± 1.07
Ruminal VFA :			
at zero time	7.56^{b} ± 0.52	8.66^{a} ± 0.45	8.97^{a} ± 0.44
1hr . after feeding	13.17^{b}± 0.29	13.72^{ab}± 0.55	14.94^{a} ± 0.16
3hr . after feeding	13.92^{b}± 0.09	13.96^{ab}± 0.66	15.19^{a} ± 0.27
6hr . after feeding	9.64^{b}± 0.96	9.81^{ab} ± 0.56	10.50^{a} ± 0.53

A and b : Means bearing different letters in the same row are significantly different (P< 0.05) .

Table (6): The effect of experimental rations on some blood plasma parameter of buffalo calves .

Plasma parameter	**Treatments**		
	R_1	**R_2**	**R_3**
Total protein , g / 100 ml	$5.52^{b} \pm 0.29$	$5.43^{b} \pm 0.34$	$6.08^{a} \pm 0.32$
Albumin , g / 100 ml	3.22 ± 0.12	3.16 ± 0.25	3.15 ± 0.14
Globulin , g / 100 ml	$2.17^{b} \pm 0.10$	$2.74^{a} \pm 0.28$	$2.64^{a} \pm 0.25$
A / G Ratio	$1.58^{a} \pm 0.07$	$1.18^{ab} \pm 0.16$	$1.23^{ab} \pm 0.17$
Urea mg / 100 ml	35.39 ± 1.53	36.03 ± 2.44	36.87 ± 2.45
Got , (u / L)	142.47 ± 5.29	141.73 ± 10.82	139.14 ± 7.21
Gpt , (u / L)	$49.60^{a} \pm 2.48$	$43.85^{ab} \pm 3.96$	$42.58^{ab} \pm 1.19$

a and b: means bearing different letters in the same row with different superscripts differ significantly ($P<0.05$).

These results agree with those reported by Abo-El-Nor and Kholif (1998) ; El-Ashry *et al* ., (2001) and Farg (2004) who reported increases in total protein and globulin concentration with a decrease in GOT and GPT activity in serum of buffaloes due to yeast culture supplementation .

Implications

From this study, it could be recommended to supplement 5g / h / d from live dried baker's yeast LDY or 5 g / h /d from gustor nature GN to the daily rations of growing buffalo calves improved final body weight , total gain and daily gain . Also , they improved feed conversion and economic efficiency , which were reflected on increasing the return LE by 11.15 and 26.98 % , respectively over the return of the control ration.

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تأثير منشطات النمو غير الهرمونية على النمو ومعاملات الهضم و الكفاءة الغذائية لعجول الجاموس النامية

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تهدف هذه الدراسة إلى معرفة تأثير إضافة خميرة الخباز الجافة الحية و الجاسترو على النمو ومعاملات الهضم و الكفاءة الغذائية وبعض قياسات سائل الكرش والدم لعجول الجاموس النامية . استخدم ١٥ عجل جاموسي نامي عمر ٣,٧٣ شهر بمتوسط وزن ١٠٤ كجم في تجربة نمو قسمت الحيوانات إلى ثلاثة مجاميع متشابهة كل مجموعة تتكون من ٥ حيوانات. وزعت المجاميع عشوائيا لتتناول إحدى العلائق التجريبية الثلاث : المجموعة الأولي تم فيها تغذية العجول على علف مركز و دريس برسيم وقش أرز على أساس ١٠٠ % من احتياجات مجموع المركبات الغذائية المهضومة والبروتين المهضوم بموجب مقررات معهد بحوث الإنتاج الحيواني بدون أى إضافات (مجموعة المقارنة) المجموعة الثانية استخدم فيها العليقة الاساسية مضاف إليها ٥ جم / راس / يوم من خميرة الخباز الجافة الحية . المجموعة الثالثة استخدام فيها العليقة السابقة مضاف إليها ٥ جم / راس / يوم من الجاسترو . وقد استمرت التجربة خمس شهور . **وكانت أهم النتائج ما يلي:**

- تحسنت معنويا معاملات هضم كلا من المادة الجافة والعضوية والبروتين والألياف الخام والمستخلص الخالي من الازوت نتيجة إضافة خميرة الخباز الجافة الحية و الجاسترو وذلك بالمقارنة بمجموعة الكنترول . بينما معامل هضم المستخلص الاثيرى لم يتأثر بالمعاملات المختلفة.
- تحسنت معنويا معدل النمو اليومي والكفاءة التحويلية للغذاء على أساس (كجم مأكول من المادة الجافة أو من مجموع المركبات الغذائية المهضومة أو من البروتين المهضوم اللازم لإنتاج كجم زيادة فى الوزن) نتيجة إضافة خميرة الخباز الجافة الحية و الجاسترو وذلك بالمقارنة بمجموعة الكنترول . بينما لم يتأثر كمية المأكول اليومي من الغذاء بالمعاملات المختلفة.
- تحسنت أيضا الكفاءة الاقتصادية نتيجة إضافة خميرة الخباز الجافة الحية و الجاسترو بنسبة ١١,١٥ و ٢٦,٩٨ % على التوالي بالمقارنة بالكنترول .
- كما أظهرت النتائج أيضا أن التغذية على كلا من العلائق المضاف إليها خميرة الخباز الجافة الحية و الجاسترو حسنت تخمرات الكرش خاصة تركيز الأحماض الدهنية الطيارة و الامونيا والتي تدل على ارتفاع نشاط الكائنات الحية الدقيقة بالكرش.
- كما أوضحت النتائج أيضا أن إضافة الجاسترو إلى علائق الحيوانات رفعت مستوى البروتين الكلى ببلازما الدم بالمقارنة بالمجموعتين الآخرين وكذلك إضافة كلا من الخميرة الخباز الجافة الحية و الجاسترو أدت إلى تحسن معنوي فى مستوى الجلوبيولين ببلازما الدم بالمقارنة بالكنترول بينما انخفضت معنويا قيم كلا من نسبة الالبيومين الى الجلوبيولين ونشاط انزيم GPT ببلازما الدم لكلا من مجموعتين خميرة الخباز الجافة الحية و الجاسترو وذلك بالمقارنة بمجموعة الكنترول.
- لم تتأثر معنويا قيم كلا من الالبيومين و تركيز اليوريا و نشاط إنزيم GOT فى جميع المعاملات دون تأثر بالإضافات.
- من هذه الدراسة أتضح أن إضافة الخميرة الخباز الجافة الحية و الجاسترو أعطت أفضل النتائج من حيث الهضم والنمو ومعدل الأداء الإنتاجي و أفضل مردود اقتصادي لعجول الجاموس.
- لذلك يمكن التوصية بإضافة الخميرة الخباز الجافة الحية و الجاسترو الى علائق عجول الجاموس النامي حيث أعطت أفضل نتائج لكل من الهضم و الكفاءة الغذائية والنمو ومعدل الأداء الإنتاجي .