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PROBIOTIC (LBC) IN BUFFALO HEIFERS RATION: 1- EFFECT ON PRODUCTIVE AND REPRODUCTIVE PERFORMANCE

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SUMMARY

A total of 23, 4 mo. old buffalo heifers and weighing 92-96 kg LBW were used to investigate the effect of lactobacillus concentrate (LBC) supplement, as a growth promoter, on productive and reproductive performance of buffalo heifers. Animals were divided into 4 groups according to weight. All animals were fed concentrate feed mixture and corn (70%) plus berseem hay + rice straw as roughage (30%) untill they reached 300 kg. Animals were given a daily supplement of 0, 6.5, 13 or 26 g LBC for G_1, G_2, G_3 and G_4 respectively.

The results showed that addition of LBC enhanced body weight gain ($P>0.05$) at different experimental growth intervals. The best growth response was observed with the level of 6.5 g LBC/h/d.

Starch value and digestible protein intakes decreased ($P>0.05$) as the level of LBC increased. Addition of low or medium levels of LBC enhanced feed efficiency ($P>0.05$).

Reproductive performance results showed that weight of the highest LBW, ($P<0.05$) at conception was noticed in animals supplemented with medium level of LBC in (13 g/d).

Keywords: Probiotic, lactobacillus, buffalo heifers and performance.

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INTRODUCTION

Most growth stimulants have been used to improve growth rate and feed efficiency of beef cattle. However, the results of these studies have not been recommended for breeding-stock, due to the possible adverse effect on reproductive traits.

The advantages of growth promoters on growth rate and feed efficiency would result not only decreasing the cost of maintaining and raising replacement heifers but also in accelerating physical development.

Lactic acid type of bacteria is known to utilize lactic acid, although it is not normally found in appreciable amounts in the gut unless in abnormal situations (Church, 1979). Their beneficial effect have been reported in several studies (Sandine et al. 1972; Tannock and Savag, 1974 and Donaldson, 1978). They have been used in fermented colostrum (Daniels et al. 1977; Rindsing and Bodah, 1977; Yu et al. 1976) and in human foods, and dairy products (Klaenhammer, 1982).

The dried commercial preparation of LBC have also been used in feeding dairy calves (Thomas et al. 1974) to prevent scouring and diarrhea (El-Garhy, 1982). Moreover it has been used for fattening buffalo calves (Hussein, 1986).

Therefore, the present study was carried out to investigate the effect of lactobacillus concentrate (LBC) as a feed additive on growth rate, feed intake, feed efficiency and reproductive perfomance of growing buffaloe heifers.

MATERIALS AND METHODS

A total number of 23 female buffalo calves, (about 4 months old, 91-96 kg live body weight, L.B.W) were used to investigate the effect of lactobacillus concentrate (LBC) supplement as growth promoter on productive and reproductive performance of buffalo female calves. Animals were divided into 4 similar groups according to weight. The first group, G1 (N=6), received no LBC (control diet) while the second, G2 (N=6), the third, G3 (N=5), and the fourth, G4 (N=6) groups received daily feed supplement of 6.5, 13, and 26 g LBC/h, respectively. All animals were fed up to 300 kg LBW. Rations were formulated from 70% concentrate feed

mixture and yellow corn plus 30% roughage (berseem hay and rice straw DM, basis). The concentrate feed mixture, CFM, composed of 35% undecorticated cottonseed cake, 33% wheat bran, 22% yellow corn, 4% rice bran, 3% molasses, 2% lime stone, and 1% salt. The chemical composition of the rations is shown in Table (1). The concentrate ration, CFM, and Yellow corn were offered once daily at 11:00 hr while the roughage (berseem hay and rice straw) was offered twice daily in two equal portions. The daily dose of LBC was offered orally to each animal in a small paper sac to insure that each animal had consumed its own dose. Animals were individually fed according to El-Ashry, (1980), while fresh water was available for the animals twice a day. Fasting body weight was recorded twice a month.

Table (1): Chemical composition of the feed mixture, yellow corn, rice straw and berseem hay (DM basis, %).

	Feed mixture	Yellow corn	Rice straw	Berseem hay
Dry matter	94.4	91.6	90.6	89.3
Crude protein	19.7	8.3	1.9	12.6
Crude fiber	11.4	4.6	35.4	26.5
Ether extract	5.5	4.1	1.7	2.3
Ash	8.7	1.6	18.5	12.9
Nitrogen free extract	54.7	81.4	42.5	45.7
Calculated starch value *	55	80	24	33
Calculated digestible protein *	13	6	0	8

* Calculated according to Abou-Raya (1967) values.

Chemical composition of different feedstuffs was determined according to A.O.A.C.(1986).

The detection of oestrus started from the seventh month of age by a bull teaser twice a day (at 8.30 and 16:00 hr.). The animals were mated at first oestrus after reaching 320 kg of live body weight. Pregnancy detection was made by rectal palpation and plasma progesterone level.

The least square procedure (Harvey, 1960) was followed for statistical analysis of the data at the computer center, Faculty of Agriculture, Ain Shams University, using an IBM computer.

RESULTS AND DISCUSSION

Data in Table (2) show the different growth responses when different levels of LBC (6.5, 13 & 26 g/h/d) were used in buffalo heifers diet. The best response was observed with the level of 6.5 g LBC/ h/d (G2). While at the level of 26 g LBC/ h/d a decrease in live body weight was recorded when compared with either the control or the over all mean of the different groups at different ages.

Table 2. Mean live body weights and cumulative daily gains of buffalo heifers fed ration supplemented with different levels of LBC during different experimental intervals.

Groups	Age of heifers (months)							over-all mean
	4*	6	9	12	15	18	21	
G1 LBW,kg	92±4	142± 5	212± 9	274±11	322±13	372±11	406±12	
ADG,g		722±50	772±80	685±60	534±60	545±40	378±40	606
G2 LBW,kg	95±4	157± 2	228± 6	299± 5	347± 5	385± 5	426±05	
ADG,g		774±30	794±60	784±40	538±40	424±50	454±40	628
G3 LBW,kg	93±5	142± 6	214± 4	286± 6	335± 3	378± 6	412±09	
ADG,g		748±60	796±40	800±50	542±40	482±50	373±40	624
G4 LBW,kg	96±5	138± 7	205± 9	268± 9	315± 8	351± 7	391±10	
ADG,g		718±70	735±70	709±40	513±120	402±50	452±80	588
LBW,kg**	94.2	145	215	282	330	371		409
ADG, g**		733	774	745	532	463	414	

* Start of the experiment.
** Overall mean.

After three months of the experiment, (age 6 month) animals of G2 (6.5 g LBC/h/d) had the highest LBW (157 Kg) which excelled the control group G1 by about 10%. Nevertheless, such difference decreased gradually as the animals reached 12 months old.

Differences in body weight of the different groups at three months intervals namely 6,9, 12, 15, 18 and 21 month old were not significant ($P>0.05$). On the other hand, statistical analysis for differences due to the treatment in body weight through out the whole experimental period proved to be significant at 5% level.

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AVERAGE DAILY GAIN:

The body weight gain for different groups are presented in Table (2). During the first stage of experiment (4-6 month) the second group, G2 (6.5 g L.B.C/h/d) showed the highest mean weight gain followed by the third group (13 g/d LBC).

From 6 to 9 months old, both groups 3 and 2 (13 and 6.5 g LBC/h/d) had the best gains values, while the least gain was recorded for group 4 (26 g LBC/h/d). Although, differences in gain between the best and worst treatment reach about 8%, yet statistical evaluation did not reveal significant differences ($P > 0.05$) among different groups during this experimental period.

During the third growing interval, the best gain values were obtained for groups 2 and 3 which excelled the control treatment by 14 and 17%, respectively. Nevertheless, these differences were not significant ($P > 0.05$).

During the first 3 experimental periods (i.e. 4-6; 6-9 and 9-12 months of age) mean daily gains of different treatments were between 685 and 800 g. Starting from the fourth experimental period, (i.e. after the 12th months of age), ADG fell markedly (between 20% and 35%) for the groups 1 and 3, respectively, with the overall mean of 29% for the differences between the third and fourth experimental period. From the 15th till the 18th month of age another drop was recorded in the over all mean of this period which represented 87% of that of the previous period (12-15 month). Again, a decrease of 11% in the over all ADG was recorded for the period 18-21 months old compared to the values obtained for 15-18 months old.

Considering the entire experimental period, the response for using, LBC, at the levels of 6.5 and 13 g/h/d, was increasing the average weight gain by 3.6% and 3% respectively, comparaed with the control group. On the other hand, the level of 26 g LBC/h/d resulted in decreasing live weight by 3%.

Data of the present study indicated that average daily gain, ADG, for LBC treated groups did not differ ($P > 0.05$) compared with the untreated control group. Moreover, earlier work by Hussein, (1986) on male buffalo calves found the same result. The present finding reveled that ADG of the growing female buffalo

heifers were 733, 774, 745, 532, 463 and 414 g/d. at 4-6, 7-9, 10-12, 13-15, 16-18 and 19-12 months of age. Such values are higher than those reported by El-Nouty (1971), who reported values of 420, 380, 590, 590, 610, 540 and 400 g/d for the respective age intervals. Also, the present results are higher than values reported by Ragab and Abdel-Salam (1962) which were 457, 389, 553 and 445 g/d during the periods from 4-6, 6-12, 12-18 and 18-24 months of age, respectively The high gains obtained in the present experiment are probably due to improved feeding. Ragab and Abdel-Salam (1962), found that, the average daily gain of female buffaloes from birth up to twenty four months age was 0.45 kg. This gain was lower than that obtained in the present study for the over all mean.

Feed intake

1. Starch Value :-

The nutritive value for the feed consumed was expressed as starch value (Table 3). Starch value intake (SVI) showed a slight increase when the level of LBC decreased. Using the level of 6.5 g LBC/h/d increased SVI when compared to values for groups which received 13 or 26 g LBC. Also it should be noted that the SVI of group 3 was slightly less than the control group during the first three experimental periods; i.e. up to 12th months old.

Table 3. Mean total starch value intake (SVI) and digestible protein intake (DPI) of buffalo heifers fed ration supplemented with different levels of LBC, kg.

Groups		Heifers age 6	9	12	15	18	21	over-all mean
G1	SVI	139^{a} ±14	246 ± 5	314±15	355^{a}± 8	383±10	405±16	307
	DPI	27^{a} ± 3	47^{A}± 1	58± 3	68 ± 2	78± 2	89± 3	61
G2	SVI	165^{b} ± 7	259 ± 5	323± 6	378^{b}± 3	399± 6	428± 3	325
	DPI	33^{b} ± 1	50^{A}± 1	60± 1	72 ± 1	82± 2	89± 1	64
G3	SVI	128^{ac}±11	244 ± 5	312± 3	361^{a}± 5	386± 2	422±11	309
	DPI	25^{ac}± 2	47^{A}± 1	57± 1	69 ± 2	79± 1	93± 5	62
G4	SVI	117^{c} ± 7	233 ± 9	307± 9	351^{a}± 7	375± 4	411± 8	299
	DPI	23^{c} ± 1	43^{B}± 2	57± 2	70 ± 2	76± 1	86± 3	59
	SVI*	137	246	314	361	386	416	
	DPI*	27	47	58	70	79	89	

* Overall mean.

a,b,c & A,B,C Values of different superscript in the same column for the same parameters are significantly different ($P<0.05$) & ($P<0.01$) resp.

The rate of increases in SVI was the highest during the first three experimental intervals, i.e. till heifes reached one year old. During the second year, rate of increase in intake decreased gradually. While at the fifth and sixth period, the rate of increase in starch value intake was almost the same.

2. Digestible Protein:-

As shown in Table 3, during the first experimental period, the DPI was the digestible protein intake highest for the G2 compared with the other groups. While, concerning the other experimental intervals the first and third groups were almost similar and were higher than that of group 4 ($P< 0.05$).

For the entire experimental period, highest DPI was recorded for G2 being 105% of the control group, while least intake was observed for G4 (96% of the control).

Pooling the data of DPI indicated that with the advance of experiment, intake increased with different rates. Maximum interval differences in DPI was recorded during the second interval as compared to the first one (73% increase). The rate of increase in DPI of the third interval was only 22% higher than that of the second period. The corresponding values were 19, 13 and 13% for the last 4 successive experimental intervals, respectively (Table 3).

Generally, it should be noted that differences in starch value and digestible protein intakes due to age proved to be highly significant ($P<0.01$).

Feed efficiency:-

1. Starch Value Efficiency (SVE):-

The efficiency of utilization, calculated as starch value consumed/kg live body gain improved with advancing of different experimental intervals. Starting from the 2nd experimental interval, the rate of improvement per interval was 30%, 35%, 74%, 16% and 21% for the five successive experimental intervals, respectively. The sudden drop in SVE during 12-15 months old may mainly due to the marked drop in daily gain, as function of age.

Differences in SVE for different experimental intervals were not significant ($P>0.05$).

2. Digestible protein efficiency (DPE):-

The data of protein efficiency values (Table 4) were very close in the first three groups; i.e 0, 6.5 and 13 g LBC/h/d during different experimental intervals and through out the whole period. The overall mean efficiency value for group 4 (26 g LBC/ h) through out the whole experiment was found to be 89% of the control group.

Tabes 4. Mean starch value efficiency (SVE) and digestible protein efficiency (DPE) of buffalo heifers fed ration supplemented with different levels of LBC (Kg/Kg LBW).

Groups	Heifers age 6	9	12	15	18	21	over-all mean
G1 SVE	2.82±0.2	3.75±0.4	5.27±0.4	7.78±0.7	8.12±0.7	12.93±1.2	6.78
DPE	0.55±0.4	0.72±0.9	0.97±0.8	1.50±0.2	1.65±0.2	2.72±0.3	1.35
G2 SVE	2.67±0.1	3.70±0.2	4.67±0.2	8.02±0.5	11.28±1.5	10.85±0.9	6.87
DPE	0.55±0.4	0.68±0.1	0.87±0.1	1.53±0.1	2.32±0.3	2.25±0.1	1.37
G3 SVE	2.77±0.2	3.48±0.1	4.93±0.5	7.77±0.4	9.30±1.1	13.06±1.2	6.89
DPE	0.55±0.4	0.67±0.1	0.92±0.1	1.50±0.1	1.92±0.2	2.84±0.2	1.40
G4 SVE	3.02±0.3	3.80±0.6	4.92±0.4	10.87±3.7	11.22±1.5	11.35±1.6	7.53
DPE	0.57±0.6	0.70±0.1	0.90±0.1	2.18±0.7	2.28±0.3	2.38±0.3	1.50
SVE*	2.82	3.68	4.95	8.61	9.98		12.05
DPE*	0.56	0.69	0.92	1.68	2.04		2.55

* Overall mean.

It is clear that the overall protein efficiency differed for different interval. There was a continuous decline in protein efficiency with the advancement of age. Rates of decline in efficiency were 23, 33, 83, 21 and 25% from intervals 1 to 2; 2 to 3; 3 to 4; 4 to 5 and 5 to 6, respectively ($P>0.05$).

Reproductive performance:-

The data of (Table 5) show that weight of buffalo heifers at conception was affected ($P>0.05$) by using LBC. The highest body weight at conception was in the medium level of L.B.C (375 kg), followed by the minimum level of LBC (372.3 kg). compared with the control group (360.7 kg). The highest level of LBC had a negative effect on suppressed body weight at conception (337 kg).

Table 5. Number of heifers, mean values of initial weight, weight at conception, absolute weight gain & as percentage of control, age at conception & as percentage of control and no. of services for the buffalo heifers of the different experimental groups.

Item	Level of LBC (g/h/d)				Overall experimental mean
	0	6.5	13	26	
No. of heifers	6	6	5	6	
Initial weight (kg)	91.5±3	94.5± 4	94.8± 4	95.8± 4	94.2
Wight at conception(kg)	360.7±9	372.3±14	375.0±16	337.7±15	361.4
Average weight gain on trail (g/d)	608±31	628.0±31	624.0±34	588.7±36	612
% of control	100	103.3	102.6	96.7	
Age at conception(d)	542±43	531±32	542±30	527±38	535.7
% of control	100	97.9	100.1	97.4	
NO. of services till conception	2.0±0.5	2.0±0.0	1.4±0.3	1.5±0.2	1.73

The average age at conception of different group were 542, 531, 542 and 527 days for the respective levels of LBC (0, 6.5, 13 and 26 g/h/d). It means that first and third groups were similar in their effect on age at conception but were higher than the effect of the second level (P>0.05).

The over all mean number of services till conception was 1.73 (Table 5). Groups 1 and 2 required the same number of services per conception (2 services). Group (3) and group (4) had 1.4 and 1.5 services per conception.

The results from this study showed that age at conception for all groups were 536 days (17.9 months); for treated groups (ranged from 528 days; 17.6 months to 542 day ; 17.1 months). The corresponding value for the control group was 542 days (18.1 months). Such data are less than those reported by Ragab et al. 1953; 30.2 months); Bedeir et al. 1978 (23.7 months); Das and Balaine, 1985 (34.3 months); Pereira et al. 1985; 41 months.

The data indicated that age at conception was 17.9 months which was very close to those reported by El-Ashry (1988) & Mohamed et al., (1980). Such data which confirm conception at younger age buffalo heifers is undoubtly due to plane of nutrition developed during the last two decades. El-Ashry and El-Serafy (1981) had the first report on the effect of improved management package on reaching conception at 16-18 months of age

(360-380 kg weight) and first calving at 27-28 months of agein Egypt.

Mean body Weight at conception was 361 kg which is higher than that reported by El-Nouty (1971) (347.5 kg) and by Ali Mohamed et al., (1980) (351.07 kg). However it was in agreement with that reported by Afifi et al., (1979).

From the results of the present study, it may be conclude that L B C can be used in heifers rations with low levels i.e 6.5 g/h/d to enhance productive and reproductive performance.

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REFERENCES

Abou-Raya, A.K., 1967. Animal and Poultry Nutrition. 1st Ed. Dar El-Maaref. Cairo, Arabic Test Book

Afifi, Y., M.A. El-Ashry, M. El-Fouly, M. Kirrall and I. Buselim, 1979. The effect of different planes of nutrition on growth and reproductive performances of buffalo heifers. Agric. Res. Rev. 56: 39-49.

A.O.A.C., 1986. Association Of Official Analytical Chemists Official Methods of Analysis. Washington. D. C.

Bedeir, L.H., M.S. Saleh Youssef, F. Omara and H. Abdel-Halim, 1978. The effect of introducing silage in summer rations on the performance of female buffaloe calves and heifers. Agric. Res. Rev. 56 (7): 79-93.

Church, D.C., 1979. "Digestive Physiology and Nutrition of Ruminant". Volume (3). 3rd edition Oxford press, Inc. 1427 S.E. Stark. ortland, Oregon 97214.

Daniels, L.B., J.R.Hall, Q.R.Hornsby, and J. A. Collins, 1977. Feeding naturally fermented, cultured, and direct acidified colostrum to dairy calves. J. Dairy Sci. 60: 992.

Das, D., and D.S. Balaine, 1985. Production performance of Indian buffaloes. Buffalo Bulletin 1985 (4): 63-66.

Donaldson, R.M., 1978. Role of indigenous enteric bacteria in intestinal function and disease. Pages 2807-2837 in "Handbook of Physiol". Amer. Physiol. Soc. Washington, D. C.

El-Ashry, M.A., 1980. Final Report For Milk Replacers Project. Egyption Acadimic of Scienfific Research.

El-Ashry, M.A., 1988. Impact of feeding and management on maturity in buffaloes. II World Buffalo Congress, New Delhi.India. Proceedings Volume II, part II.

El-Ashry, M.A. and A.M. El-Serafy, 1981. Effect of milk replaces diets on post weaning performance and carcass measurement of buffalo calves. Indian. J. Anim. Sci., 51:4.

El-Garhy, M.M. (1982). Studies on the digestive troubles of the newly born calves. M.V.Sc. Thesis, Fac. of Vet. Med., Cairo University, Cairo, Egypt.

El-Nouty, F.E., 1971. "The effect of different feeding systems Before and after weaning on age at puberty and age at first conception in buffalo heifers". M.Sc. Thesis, Fac. of Agriculture, Ain Shams University, Cairo, Egypt.

Harvey, W.R., 1960. Least squares analysis of data with unequal subclass numbers ARS-20-8, ARS, USDA, Belt sville, Ma. U.S.A.

Hussein, H.M., 1986. Effect of different feeding systems on some blood parameters in male buffalo calves. Ph.D.Thesis, Fac. of Agricultural, Ain Shams University, Cairo, Egypt.

Klaenhammer, T.R., 1982. Microbiological considerations in selection and preparation of lactobacillus strains for use as dietary adjuncts. J. Dairy Sci. 65: 1339.

Mohamed, A.A. M.A. El-Ashry and A.M. El-Serafy, 1980. Reproductive performance of buffalo heifers bred at young age. Indian J. Anim. Sci., 50 (1) 8-10.

Pereira, B.M.A.O.; L.N.A.; De Silva, A.M. Karunaratne, 1985. Studies on reproductive endocrinology and factors influencing fertility in dairy and draught buffaloes in Srilanka. International Atomic Energy Agency (1984) B-28.

Ragab, M.T. and A.S. Abdel-Salam, 1962. The effect of sex and months of calving on body weight and growth rate of Egyptian cattle and buffaloes. J. Anim. Prod. U.A.R. 11: 109.

Ragab, M.T., A.A. Asker, and M.S. Ghazy, 1953. Effect of age on total milk yield and length of lactation period in Egyptian buffaloes. Indian J. Dairy Sci., 6:181.

Rindsing, R.B., and G.W. Bodah, 1977. Performance of calves fed colostrum naturally fermented or preserved milk by propionic acid or formaldehyde. J. Dairy Sci. 60: 79.

Sandine, W.E., K.S. Muralidhara, P.R. Elliker and D.C. England, 1972. Lactic acid bacteria in food and health; a review with special reference to enteropathogenic E.Coli as well as certain enteric diseases and their treatment with antibiotics and lactobacilli.J.Milk and Food Technol.35:691.

Tannock, G.W. and D.C. Savage, 1974. Microbial interference between indigenous yeast and lactobacilli in the rodent stomach. J. Bacterial., 198: 1278.

Thomas, R.O., R.C. Hatch and W.V. Thayne, 1974. Effect of lactobacillus acidophilus as an additive to the feed of baby calves. West Virginia Agric., Forest 5:15.

Yu, Y., J.B. Stome and M.R. Wilson, 1976. Fermented colostrum for Holstein replacement calf rearing. J. Dairy Sci. 936.

منشطات النمو LBC فى علائق عجلات الجاموس:١- التأثير على الاداء الانتاجى والتناسلى

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استخدم فى هذه الدراسة عدد ٢٣ عجلة جاموس على عمر حوالى ٤ شهور ومتوسط وزن ٩١-٩٥ كجم. قسمت الحيوانات عشوائيا الى اربعة مجاميع غذيت المجموعة الاولى - مجموعة المقارنة - على عليقة قاعدية تتكون من العلف الموحد والذرة الصفراء كمركزات ودريس البرسيم وقش الارز كمواد خشنة بحيث كانت نسبة المركز الى الخشن هى ٧٠ : ٣٠ بينما غذيت المجموعات الثانية والثالثة والرابعة على العليقة القاعدية مضاف اليها ٦,٥ و١٣ و٢٦ جم مركز اللاكتوباسيلس (LBC) يوميا لكل رأس.

أظهرت النتائج أن اضافة LBC يحسن من معدلات النمو ووزن الحيوانات الحى زيادة غير معنوية وأظهرت المجموعة الثانية أعلى إستجابة لزيادة النمو .

كما أوضحت الدراسة أن اضافة المنشط ادى الى زيادة طفيفة فى المأكول من معادل النشا والبروتين المهضوم بانخفاض مستوى اضافة منشط النمو . كما لوحظ أن الكفاءة الغذائية تتحسن عند اضافة ٦,٥ و ١٣ جم/رأس/يوم.

كما كان لمنشط النمو تأثير على زيادة وزن الحيوان الحى عند أول التلقيح والتلقيح المخصب.