J. Agric. Sci. Mansoura Univ., 30 (1): 115 - 128, 2005

INFLUENCE OF FEEDING DIETS CONTAINING YEAST CULTURE ALONE OR WITH PREMIX ON REPRODUCTIVE PERFORMANCE OF LACTATING EGYPTIAN BUFFALOES.

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ABSTRACT

Twenty-one lactating Egyptian buffalo cows weighing 550-600 kg, aged 4-6 years and between 2-4 parities were divided into three experimental groups. All animals were fed basal diets containing corn silage; berseem hay, rice straw and concentrate feed mixture. The 1st group (control) was fed the basal diet without any supplementation, while the 2nd (G1) and third (G3) were daily supplemented with 20 g yeast culture (Gustor nature) and 20 g Gustor nature plus 35 g premix, respectively. The supplementation started one-month pre-partum and continued 6 months post-partum. Period elapsed from calving until each of placental drop and uterine involution. Also, reproductive measurements were recorded. Results revealed that mean period elapsed from calving until placenta drop significantly (P<0.05) decreased in G1 and G2 (5.07 and 4.64 h) than control group (8.14 h). The interval required for each of pregnant uterus to return intra-pelvic, postpartum cervical closure and uterine horns symmetry were earlier (P<0.05) in G1 (16.7, 24.0 and 25.7 d) and G2 (15.4, 24.4 and 22.7 d) than control group (29.5, 37.7 and 38.0 d), respectively. Buffalo cows in G1 and G2 showed higher intensity of oesrous activity (62.5 and 62.9%) than control group (44.5%). First postpartum ovulation interval was earlier (P<0.05) in G2 (20.3 d) than in G1 (29.0 d) or control group (30.0 d). First postpartum oestrus interval was insignificantly detected earlier in G1 (34.5 d) than in control (41.3 d) or G2 (44.6 d). Postpartum first service interval was insignificantly lower in the control group (41.3 d) than in G1 (42.6 d) or G2 (47.8 d). Average values of service period were 0, 3.5 and 12.3 d; number of services/conception was 1.0, 1.17 and 1.33; days open were 42.6, 51.3 and 54.2 d, and calving interval was 358, 364.7 and 373.2 d in G1, G2 and the control group, respectively, but the differences were not significant. Within the first 50 days postpartum, conception rate was 83.3, 66.7 and 50% in G1, G2 and the control group, respectively. Overall mean of ovarian cycle length was 22.2, 21.1 and 19.7 d; and number of ovarian cycles was 0.66, 1.5 and 0.83/buffalo cows in G1, G2 and the control group, respectively.

It could be seen that diet supplemented with 20 g Gustor nature/head/day (G1) during a month pre-partum and continued 6 months post-partum improved reproductive performance of Egyptian buffalo cows in terms of low number of services/conception, short service period length, less number of days open and short calving interval.

Keywords: Buffaloes, yeast culture, minerals, reproductive performance.

INTRODUCTION

Supplementation of yeast culture (YC) in ruminant diets to improve performance has been reviewed by Williams (1989). Results of Iwanska *et al.* (1999) suggested that mineral bioplexes stimulate the action of yeast culture in the rumen and the availability of nutrients in the mammary gland. The

relationship between nutrition and reproduction in ruminants is complex and often quite variable. However, nutrient supply is a component of the management system that is under the control of the farmer and needs to be carefully evaluating. Milk yield and fertility are principal factors affecting profitability of dairy herds. There are real fertility problems in the dairy herd and these increased as milk production increased (Boland, 2002) as well as positive correlations between both days open and number of service per conception, and milk production traits of Friesian cows (Aboul-Ela *et al.,* 2001). In addition, Grings *et al.* (1990) reported that one possible disadvantage of increasing milk production that it might decrease reproductive efficiency due to the high nutrients demand for lactating cow. Few attempts were conducted to study the effect of YC on productivity and reproductivity of lactating Friesian cows in Egypt (Abdel-Khalek, 2003).

The current work was carried out to study the effects of dietary supplementation of Gustor nature as YC either with or without premix supplementation on, postpartum reproductive performance as well as economic feed efficiency of lactating buffalo cows.

MATERIALS AND METHODS

The present study was carried out at El-Gemmizah Research Station, Gharbia Governorate, belonging to the Animal Production Research Institute (APRI), Agricultural Research Center, Ministry of Agriculture and Department of Animal Production, Faculty of Agriculture, Mansoura University.

Experimental animals and dietary groups:

Twenty-one Egyptian buffalo cows having 550-600 kg LBW and aged 4-6 years were divided into three experimental groups. Animals within each group were between 2-4 parities and were housed in open pens and fed in groups. Calving period of all buffalo cows used in this study lasted from June to August 2002.

The main basal diets was formulated from corn silage, berseem hay, rice straw and concentrate feed mixture to meet APRI (2002) recommendations required for pregnant and lactating Egyptian buffaloes. The daily feed allowance average was 10.5 kg DM/ head containing 14% CP on DM basis. The daily allowances were adjusted every 15 days according to changes in LBW, milk yield and milk fat percentage. The 1st (control) group was fed the basal diet without any supplementation, the 2nd (G1) and the 3rd (G2) groups daily received 20 g yeast culture (Gustor nature)/head and 20 g yeast culture plus 35 g premix /head, respectively. Fresh and clean drinking water was available at all times.

Gustor nature as a yeast culture was composed of malic acid salts, *Saccharomyces cerevisiae*, mould inhibitors, antisalmonella, antioxidants flavors and sweeteners. Contents per kg of premix were as follows:

Di-calcium phosphate	185.0 g	Sulphur	21 g
Potassium sulphate	54.0 g	Iron	50.2 mg
Manganese sulphate	24.8 g	Pantothenic acid	8 mg
Zinc oxide	10.0 g	Vitamin B_1	7 mg
Sodium chloride	100.0 g	Vitamin B_6	3 mg
Magnesium sulphate	43.5 g	Vitamin A	64 IU
Cobalt sulphate	287.0 mg	Vitamin E	64 IU

Feeding the experimental rations was started for one-month before the expected calving date and continued 6 months postpartum. All buffalo cows were allowed to nurse their calves for only four days postpartum (period of colostrum intake), thereafter, they were milked in the absence of their calves twice daily at 6 a.m. and 5 p.m.

Placental drop duration and uterine involution:

Time required for complete placental drop was individually recorded after calving. The reproductive tract was also rectally palpated once every two days till day 21 postpartum and once every three days after that, in order to assess the uterine involution according to El-Fadaly (1978).

Oestrous detection:

Buffaloes in all groups were visually observed for oestrus behavior using teaser bull introduced daily for 3 times (at 7:00, 12.00 and 4.00 h) and was allowed to run with females for 30 min. on each occasion.

Reproductive measurements:

Postpartum first ovulation interval (PPFVI) was determined by subtracting four days from the time at which plasma progesterone concentration reached a level <0.5 ng/ml and was sustained for two consecutive samples. This was based on the finding on changes in progesterone (P4) concentration in association with oestrus and ovulation in buffaloes according to Avenell *et al.* (1985) and El-Moghazy, 2003).

Time of the 1st occurrence of standing postpartum oestrus was recorded as postpartum first oestrus interval (PPFOI). A fertile bull naturally served buffaloes that had been detected in standing oestrus and then postpartum first service interval (PPFSI) was recorded.

Rectal palpation was performed 60 days after service for pregnancy diagnosis. Thereafter number of days open (DO), service period (SP) length and number of service per conception (NS/C) were recorded. Conception rate was determined as percentage of buffaloes, that were diagnosed pregnant in proportional to the total number of buffaloes served. This item was recorded for the 1st, 2nd and 3rd services. Calving interval (CI) was computed as gestation period length plus days open.

Progesterone profile:

Direct radioimmunoassy technique (RIA) was performed for determination of plasma progesterone concentration using antibody-coated

tubes kit (Diagnosis systems, laboratories Texas, USA) according to the manual outlined by the manufacture.

Statistical analysis:

The obtained results were statistically analyzed according to Snedecor and Cochran (1982). The differences between group means were tested using Duncan new multiple range test (Duncan, 1955). Statistical analysis of Chi-square ($\div^2$) as appropriate, according to Steel and Torrie (1980) for percentage of ovulations.

RESULTS AND DISCUSSION

Placental drop:

Mean period elapsed from calving until drop of the fetal membranes significantly (P<0.05) decreased in G1 and G2 than that of the control group by about 38 and 43%, respectively (Table 1). The present values are in accordance with the normal values reported on cattle (1-8 hours) by El-Azab (1988); Stull and Phatak (1988) and Hafez (1990).

Table (1): Effect of dietary treatment on period elapsed from parturition until placental drop and uterine involution.

Item	Dietary group		
	Control	G1	G2
Placental drop interval (hour)	8.14±2.36[a]	5.07±1.30[b]	4.64±50.90[b]
Uterine involution (day):			
Normal uterine position	29.57±5.56[a]	16.71±1.60[b]	15.43±2.07[b]
Cervical closure	37.71±3.04[a]	24.00±1.73[b]	24.43±2.07[b]
Uterine horns symmetry	38.00±3.60[a]	25.71±2.93[b]	22.71±2.9[b]

a and b: Means denoted with different superscripts within the same raw are significantly (P<0.05) different. G1: 20 g Gustor nature G2: 20 g Gustor nature plus 35 g premix

Postpartum uterine involution:

Period elapsed for pregnant uterus to return intra-pelvic cavity after calving significantly (P<0.05) decreased in G1 and G2 by about 43 and 48% than that of the control group. The postpartum cervical closure significantly (P<0.05) decreased in control buffaloes (37.71 days) compared with G1 (24.0 days) and G2 (24.4 days). Postpartum uterine horns symmetry occurred significantly (P<0.05) earlier in G1 and G2 than in control one by about 12.3 and 15.3 days, respectively (Table 1).

The interval required for uterine horns to prove symmetry was associated with both the period elapsed for placental drop and the period of return the uterus to its normal condition in the pelvic.

The uterine involution is considered to be complete when both uterine horns return to equal or almost equal its non-graved size (Jainadeen, 1984 and Aboul-Ela *et al.,* 1985). In Friesian cows in Egypt, the uterine involution was completed by day 27.3-29.9 postpartum (Kadoom, 1991 and Mohamed, 1997), which is in good agreement with the present study.

Oestrous symptoms:

Table (2) indicates that supplementation of yeast culture either alone (G1) or plus premix (G2) led to increase bellowing behavior in buffaloes compared with the control group. Bellowing is considered the most reliable sign of oestrus behavior in Egyptian buffaloes under field conditions of small holders (Aboul-Ela, 1992 and Aboul-Ela *et al.,* 2000) or in large herds in absence of bull (Barkawi *et al.*, 1992).

Buffalo in G1 resulted in cessation of vaginal mucous discharge and decreased standing female to female, meanwhile those in G2 increased vaginal mucous discharge, response to finger massage and decreased standing female to female, restlessness and frequent urination. Such reduction in frequent urination may be attributed to the mineral balance, which affects water balance of the animals in G2. Also, the higher intensity of oestrous symptoms of buffalo cows in G1 and G2 may reflect differences in ovarian activity and release of ovarian hormones responsible for the manifestation of symptoms of oestrus.

In general, supplementation of diets with yeast culture (YC) or YC plus premix increased intensity of oestrous activity from 44.5% in the control group to 62.5 and 62.9% in G1 and G2, respectively.

Table (2): Percentage of incidence of oestrous symptoms (%).

Item	Dietary group		
	Control	G1	G2
Response to teaser bulls	100	100	100
Bellowing	77.8	87.5	80.0
Segregation & restlessness	83.3	75.0	70.0
Standing female to female	91.7	62.5	60.0
Frequent urination	75.0	75.0	40.0
Response to finger massage	41.7	37.5	60.0
Vaginal mucous discharge	18.2	0.0	30.0
Intensity of oestrous activity	44.5	62.5	62.9

G1: 20 g Gustor nature G2: 20 g Gustor nature plus 35 g premix

Postpartum first ovulation interval (PPFVI):

Data in table (3) revealed significantly ($P<0.05$) earlier PPFVI in G2 by about 10 and 9 days than that in G1 or control group, respectively. This was associated with greater frequency distribution (50.0%) of PPFVI less than 20 days after calving in G2 versus 33.3% in the control group. However, most buffalo cows in G1 (66.7%) proved PPFVI between 20 and 30 days after calving. The control group showed only 16.7% during this period. In spite the lower values of PPFVI in G2 than G1 (20.0 vs. 29.0 d), all buffalo cows in G1and G2 showed the first ovulation within 40 days postpartum versus 83.3% of buffalo cows in the control group.

Resumption of the postpartum ovarian activity was mainly affected by nutritional status of the animals during the early postpartum period, especially energy and mineral requirements. The shorter PPFVI of buffaloes in G2 and more frequent PPFVI within 30-40 days after calving of buffalo cows in G1

and G2 sugested beneficial effect of dietary supplementation of YC alone or YC plus premix.

In good agreement with the present results, PPFVI was almost shorter in Friesian cows supplemented with YC (Abdel-Khalek, 2003). El-Keraby *et al*. (1981) reported that feeding system was the main factor affecting PPFVI in Egyptian buffaloes.

Calving is followed by a period of ovarian inactivity and sexual quietness before reproductive cycle recommencement. The period from parturition to 1st ovulation shows a wide variation among individuals and it is affected by many factors (e.g. milk production, suckling, parity, nutritional level and season of calving). The delay in resuming ovarian cyclicity was found to be the main reason for the long calving interval (Aboul-Ela *et al*., 1987).

Egyptian buffaloes showed wide variation in the average of PPFVI. Resumption of ovarian activity may occur as early as 30 days postpartum (EL-Shafie *et al*., 1983). Furthermore, El-Moghazy (2003) found that PPFVI averaged between 28.0 and 31.9 d, respectively, in Egyptian buffaloes. This was indicated in this study, where PPFVI were 30.0, 29.0 and 20.0 days in control, G1 and G2, respectively. However, it may be also delayed beyond 90 days postpartum (Zeitoun and Fathelbab, 1994). Most studies indicated that high percentage of Egyptian buffaloes (90%) have the ability to resume their ovarian activity within 2-3 months postpartum (Youssef, 1992; Barkawi, 1993 and El-Moghazy, 2003).

Generally, the shorter PPFVI in all groups obtained in this study was attributed to 3 times daily introducing of male with females. Mokhless *et al*. (1995) indicated that bull exposure twice daily significantly shortened the length of PPFVI.

Table (3): Least squares means of postpartum first ovulation (PPFVI), oestrus (PPFOI), and service (PPFSI) intervals, service period, number of services/conception (NS/C), days open, and calving interval.

Measur	Dietary group		
	Control	G1	G2
PPFVI (day)	30.00±3.80[a]	29.00±2.20[a]	20.33±2.45[b]
PPFOI (day)	41.33± 5.05	34.50± 7.34	44.67±9.46
PPFSI (day)	41.33±5.05	42.67±7.39	47.83± 8.73
Service period (day)	12.30± 14.35	0.00 ± 0.0	3.50± 8.57
NS/C	1.33±0.516	1.00± 0.00	1.17±0.41
Days open	54.17±16.73	42.67±7.39	51.33± 14.19
Calving interval (day)	373.17±21.52	358.0 ±6.49	364.67±12.75

a and b: Group means denoted with different superscripts within the same raw are significantly different at P<0.01.

Postpartum first oestrus interval (PPFOI):

Average PPFOI of buffalo cows in G1 was insignificantly earlier by about 10 and 7 days than those in G2 and control group, respectively (Table

3). The present length of PPFOI is in good agreement with that reported by El-Shafie *et al*. (1983), who reported that PPFOI ranged between 30 and 44 days. Length of PPFOI showed wide variation in Egyptian buffaloes. El-Wardani (1990&1995) and Barkawi *et al*. (1998) reported longer averages (55 to 91 d) of PPFOI than that obtained in this study**.**

The obtained shorter PPFOI in all dietary groups than those reported in most studies may be due to the variation in managerial system, particularly in respect to frequency and regime of oestrous detection (Aboul-Ela *et al*., 1987). Improving oestrous detection methods (El-Wardani, 1990) and increasing the frequency of teasing rounds per day (Khattab and Ashmawy, 1988) may affect positively the determination of first postpartum oestrus.

It is worthy noting that, about 66.7% of buffalo cows in G1 showed their first oestrous behavior within the 30-40 days postpartum versus 50% in G2 and 16.7% in the control group. The shorter length of PPFOI in G1 was in association with the highest percentage of animals displaying postpartum first oestrus within 40 days from calving (66.7%) as compared to 50 and 16.7% in G2 and control group, respectively. El-Wardani (1990) recorded as less as 62% of first oestrus cases within 60 d postpartum.

Postpartum first service interval (PPFSI):

Average PPFSI was insignificantly earlier in G1 and control group by about 5 days than in G2 (Table 3). It is of interest to note that PPFSI was in close with PPFOI in buffaloes of control group, whereas all control buffaloes were detected in heat within more than 40 days postpartum. On the other hand, 66.7% of buffaloes in G1 were detected in heat within 30-40 days postpartum, and 16.7% in G2 were detected in heat within 60-70 days postpartum, which delayed their PPFSI than PPFOI.

In accordance with the present results, Abdel-Khalek (2003) found insignificant differences in PPFSI between Friesian cows fed YC and the controls. The present average of PPFSI was slightly shorter than 43.8 d as obtained by El-Wardani (1995). Average PPFSI was 63.8 d under experimental conditions (Mahdy *et al.,* 2001) and 108.6 d (El-Wardani *et al*., 2000) and 90.5 days (El-Moghazy, 2003) under field condition.

Percentages of animals receiving the first service within the first 40 days postpartum were higher in control group and G1 (50% in each) than in G2 (16.7%). Within two months postpartum all control buffaloes as well as 83.3 and 66.7% in G1 and G2, respectively, were mated. El-Moghazy (2003**)** found that percentage of animals receiving the first service within two and three months postpartum were 40.1 and 64.6%, respectively. Percentage of Egyptian buffaloes receiving their first service within three months increased from 75.9% in control group to be 96.5% for intensively heat-detected group (El-Wardani, 1995).

The obtained shorter PPFSI in all groups than those reported in the previous studies was mainly in relation with continues observation of heat by introducing bull as a teaser to detect oestrus. Mokhless *et al*. (1995**)** indicated that bull exposure twice daily shortened PPFSI, but the difference was not significant.

Service period length (SP):

As a result of conceiving all buffalo cows of G1 at the 1st service, SP length was 0 d. The corresponding periods were 12.3 and 3.5 days in control group and G2, respectively (Table 3). It is worthy noting that, all buffalo cows in G1 (100%) did not show service period and required one service to conceive versus 66.7 and 83.3% of buffalo cows in control group and G2. However, 33.3% of the control buffaloes and 16.7% in G2 required less than one month to conceive. This means that buffaloes in all groups showed SP of less than one month.

In accordance with the results of control group, El-Moghazy (2003) found that average SP length was about 15 days in buffaloes raised on small breeders in Egypt. In Egyptian buffaloes, mean of SP was found to range from 19 to 76 d (Youssef, 1992 and El-Moghazy, 2003).

Number of services per conception (NS/C):

All buffalo cows in G1 were conceived from the 1st service. The corresponding numbers were 1.33 and 1.17 services/conception in control group and G2, respectively (Table 3).

Number of services per conception in Egyptian buffaloes ranged between 1.3 and 2.4 **(**Youssef, 1992, El-Wardani, 1995 and El-Moghazy, 2003). The low average NS/C of Egyptian buffaloes obtained in all groups in this study (1.0-1.33 services) agreed with that reported by El-Wardani *et al*. (2000**)**, being 1.2 services under smallholdings conditions, but was lower than those reported on Egyptian buffaloes under experimental conditions (1.5 and 4.8 services) by El-Wardani (1995) and Mahdy et *al*. (2001), respectively. Under smallholdings conditions, El-Moghazy (2003) found that overall percentages of animals required 1, 2, 3, 4 services for conception were 79.4, 15.1, 3.0 and 2.5%, respectively. Under state farm conditions, El-Wardani (1995) found that about two third of buffalo cows (60%) have the ability to conceive from the first service as compared to about 100% in G1, 33.3% in control and 16.7% in G2.

Using teaser male for heat detection may be the main reason in reducing number of services required per conception (1.0-1.33, Table 3). These results indicated a slight impact on CR due to YC or YC plus premix supplementation.

Days open (DO):

Buffalo cows in G1 showed the shortest period of DO (42.7 days). The respective values in G2 and control group were nearly similar, being 51.3 and 54.2 days (Table 3). Similar results were reported by Nigm (1996) and El-Moghazy (2003). The lower values of DO in G1 was associated with greater frequency distribution of animals showing DO less than 40 days (50%) and about 16.7% had DO >50-60 days However, the longest DO in G2 and control groups was associated with about 33.3% of buffaloes in each had DO > 60-70 days and >70 days, respectively. El-Wardani (1995) reported that 58.6% of buffalo cows having DO of 90 days and El-Moghazy (2003) found that 58% of buffaloes having DO of ≤60 days.

The remarkable variation among the estimated values of DO in this study and those reported by other investigators may be probably due to differences in physiological, managerial and/or climatic conditions. This finding emphasizes that DO is apparently not specific to the species, but could be shortened by improving managerial practices particularly oestrus detection. In intensively heat-detected group of Egyptian buffaloes, El-Wardani (1995) found that DO was 60.4 d as compared to 105.9 d in the control group. Also**,** introducing a male to female buffaloes for heat detection in this study may be the reason of decreasing length of DO in all groups. Mokhless *et al*. (1995) indicated that bull exposure twice daily insignificantly shortened DO of Egyptian buffaloes.

The obtained values of DO (Table 3) may also suggest a beneficial effect of feeding buffalo cows on diets supplemented with YC alone rather than YC plus premix on DO (42.7 vs. 51.3 days). El-Keraby *et al.* (1981) found that DO was 96.4, 82.5 and 140.9 d for buffalo cows fed clover only, clover plus concentrate and rice straw, and concentrate or rice straw, respectively, which verified the effect of feeding system on DO values.

Calving interval:

As a results of decreasing PPFOI, PPFSI, SP and, in turn DO in response to feeding diets supplemented with YC alone, less values of CI (358 d) were obtained in G1. Intermediate values were obtained in G2 (364.7 days) and the greatest values were recorded for the control buffaloes (373.2 days, Table 3).

It is of interest to note that only one animal of the control group (16.7%) showed CI less than 350 days versus 100, 83.3 and 50% of buffaloes in G1, G2 and control, respectively, recorded CI length ranging from 350 to 380. Consequently, 16.7% of buffalo cows in G2 and 33.3% of control group, showed CI more than 380 days (Table 3).

In Egyptian buffaloes, CI varied from 471 to 585 d (Mahdy *et al*., 2001 and El-Moghazy, 2003). Youssef (1992) attributed the variations in CI due to delay of resumption of ovarian activity (31.6%), delay of time at which she-buffalo displays its first postpartum heat (10.3%), longer service period (57.2%), and gestation length (0.9%). In addition, management practices, in particular level and type of feeding during late pre-partum and early postpartum period are largely responsible for increasing CI, and this could be corrected by dietary supplementation. Buffalo breeders to reach CI to about 13 months. This figure was attained in the present study in G1 and G2 through dietary supplementation with YC alone or YC plus premix.

Conception rate (%):

Within the first 50 days postpartum, buffalo cows in G1 showed the highest CR (83.3%), followed by G2 (66.7%) and the control group (50%). Within 50-60 days postpartum, 16.7% of buffalo cows in each of G1 and control group were conceived, while none of buffaloes in G2 were conceived during this period. Within 60-70 days postpartum, an opposite situation was observed. However within more than 70 days postpartum about 16.6 and 33.3% of buffalo cows in G2 and control group were conceived (Table 4).

Based on cumulative values of conception rate (Table 4), all buffalo cows in G1 conceived within two months postpartum versus 66.7% either in G2 or control group. Within 70 days postpartum cumulative conception rates only increased in G2 to be 83.3% and remained unchanged in the control group. Within 80 days postpartum, all buffalo cows in both G2 and control group conceived (Table 4).

Later, about 60% (Youssef, 1992) and 60% (El-Wardani, 1995) of Egyptian buffalo cows conceived in the first ovulatory oestrus. Recently, El-Moghazy (2003) found that 75.8% of buffaloes conceived from one service.

Table (4): Actual and cumulative conception rate (CR) of buffalo cows at successive postpartum days.

Postpartum day	Dietary group		
	Control	G1	G2
Actual CR (%):			
< 50 d	50.0	83.3	66.7
50-60 d	16.7	16.7	-
60-70 d	-	-	16.7
> 70 d	33.3	-	16.6
Cumulative CR (%):			
< 50 d	50.0	83.3	66.7
60 d	66.7	100.0	66.7
70 d	66.7	-	83.3
80 d	100.0	-	100.0

Ovarian cycle length:

Data in table (5) show that the 1st ovarian cycle length was short (<17 days) in the control cows and normal (18-24 days) in those of G1 and G2. However, the 2nd and 3rd ovarian cycle was almost normal in all groups. Overall mean of ovarian cycle length was slightly higher in G1 and G2 than the control groups.

The present results indicated that dietary supplementations resulted in normal length of the first ovarian cycle (El-Moghazy, 2003), but as overall means of the ovarian cycle length did not differ among the experimental groups. However, feeding buffalo cows on YC alone decreased the incidence of the 2nd oestrous cycles because most buffalo cows in G1 were conceived at the 1st service.

Table (5): Ovarian cycle length (day) of buffalo cows.

Ovulatory cycle	Control		G1*		G2	
	n	Length (d)	n	Length (d)	n	Length (d)
1st Cycle	5	16.2	4	22.2	6	20.2
2nd Cycle	1	20.0	-	-	2	22.0
3rd Cycle	1	23.0	-	-	1	21.0
Overall mean	7	19.7±1.8	4	22.2± 3.7	9	21.1±0.58

n: Number of ovarian cycles

*** Three animals in this group conceived at the first postpartum oestrus**

When the total number of ovarian cycles was classified into, oestrous and anoestrus ovulatory cycles (Table 6), it was found that total number of ovarian cycles was higher in G2 and lower in G1 as compared to the control group. It is worthy noting that the total number of ovulatory cycles/cow in G1 was associated with oestrous behavior reaching 0% silent ovulatory cycles versus 11% in G2 and 20% in control group.

Table (6): Ovarian cycles of buffalo cows subjected to different dietary treatment.

Ovulatory cycle/cow	Dietary group		
	Control	G1	G2
Total number of ovulatory cycles/cow	0.83	0.66	1.50
Number of oestrous ovulatory cycles/cow	0.66	0.66	1.33
Number of anoestrus ovulatory cycles /cow	0.17	-	0.17
Anoestrous ovulatory cycles %	20	0	11

Percentage of ovulation with oestrous activity was 80% in G1, 69.2% in the control group, and 53.3% in G2. This resulted in higher percentage of incidence of silent ovulations in G2, followed by the control group, while G1 showed the least incidence of silent ovulations (Table 7). However, the differences in this respect were not significant ($X^2 = 1.99$)

It was observed that incidence of the silent ovulations occurred with the first postpartum ovulation, which is in accordance with the findings of El-Wardani (1995) and El-Moghazy (2003).

Table (7): Ovarian activity of buffalo cows subjected to different dietary treatments.

Item	Dietary group					
	Control		G1		G2	
	n	%	n	%	n	%
Total number of ovulations	13	100	10	100	15	100
Number of ovulations with oestrus	9	69.2	8	80	8	53.3
Number of silent ovulations	4	30.7	2	20	7	46.7
Incidence of silent ovulation:						
1st Ovulation	3	75	2	100	6	85.7
2nd Ovulation	1	25	-	-	1	14.3

This may indicate the pronounced improvement in oestrous detection in buffalo cows of G1 as compared to G2 and control group. This finding indicated the impact of YC alone on reproduction of buffalo cows in G1 in term of marked enhancement in most postpartum reproductive parameters as compared to those fed YC plus premix or those in the control group.

It could seen that diet supplemented with 20 g Gustor nature/head/day (G1) during one-month pre-partum and during post-partum has resulted in the highest reproductive performance of Egyptian buffalo

cows in terms of low number of services/conception, shortened service period length, reduced number of days open and short calving interval.

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تـأثير التغذيـة علـى علائـق محتويـة علـى مزرعـة الخميـرة (جاسـتور) أو مزرعـة الخميرة مع مخلـوط الأمـلاح المعدنيـة و الفيتامينـات علـى الأداء التناسلي للجـاموس المصري الحلاب.

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أستخدم فى هذه الدراسة ٢١ جاموسة متعددة عدد مرات الولادة (٢-٤ ولادات) تراوح وزنها بين٥٥٠-٦٠٠ كجم و عمرها ٤-٦ سنوات قسمت إلى ثلاث مجموعات متشابهة فى الوزن، إنتاج اللبن فى الموسم السابق وعدد الولادات (٧ حيوانات فى كل مجموعة). تم تغذية جميع الحيوانات على عليقه مركزة، دريس برسيم، سيلاج ذرة وقش الأرز لمدة شهر قبل الولادة ولمدة ٦ شهور بعد الولادة مباشرة ،وتركت المجموعة الأولى بدون إضافات كمجموعة مقارنة بينما تم إضافة مزرعة خميره (٢٠ جم جاستور/رأس/يوم للمجموعة الثانية) أو إضافة ٢٠ جم جاستور/رأس/يوم +٣٥ جم مخلوط الأملاح المعدنية و الفيتامينات (المجموعة الثالثة) . تم أخذ القياسات التناسلية المختلفة خلال فترة ما بعد الولادة.
أظهرت النتائج ما يلي:
١-كانت الفترة من الولادة إلى كل من نزول الأغشية المشيمية، رجوع الرحم إلى داخل منطقة الحوض، انغلاق عنق الرحم و تماثل قرني الرحم أقصر معنويا فى مجموعتي المعاملة (الخميرة أو الخميرة ومخلوط الأملاح المعدنية والفيتامينات) عن مجموعة المقارنة .
٢- زادت أيضا حدة مظاهر الشياع فى مجموعتي المعاملة عن مجموعة المقارنة (٦٢,٥%، ٦٢,٩% و ٤٤,٥%، على الترتيب.
٣- انخفضت الفترة من الولادة حتى أول تبويض معنويا فى المجموعة الثالثة (٢٠,٣ يوم) عن المجموعة الثانية والمقارنة (٢٩ و ٣٠ يوم، على الترتيب). ٤- تحسنت الفترة من الولادة حتى أول شياع - أول تلقيح - أول تلقيح مخصب" الأيام المفتوحة"و كذلك فترة التلقيح والفترة بين ولادتين نتيجة المعاملة بالخميرة بدون أو مع مخلوط الأملاح المعدنية والفيتامينات وكان معدل التحسن غير معنوي. ٥- كان عدد التلقيحات اللازمة للإخصاب ١، ١,١٧ و ١,٣٣ فى المجموعة الأولى، الثانية و المقارنة، على الترتيب. ٦- خلال ٥٠ يوم من فترة ما بعد الولادة كان معدل الإخصاب فى المجموعة الأولى أعلى (٨٣,٣%) عن الثانية (٦٦,٧%) أو المقارنة (٥٠%). ٧- كان طول الدورة المبيضية ٢٢,٢، ٢١,١ و ١٩,٧ يوم وبلغ عدد الدورات المبيضية ٠,٦٦، ١,٥ و ٠,٨٣ / جاموسة فى المجموعة الأولى، الثانية و المقارنة، على الترتيب ولم تكن الفروق معنوية.
وهذه الدراسة توضح أن إضافة ٢٠ جم من مزرعة الخميرة (جاستور) إلى علائق الجاموس الحلاب/رأس/يوم تؤدى إلى تحسن فى الأداء التناسلي للجاموس المصري وذلك عن طريق تقليل كل من عدد التلقيحات اللازمة للإخصاب وطول فترة التلقيح و الأيام المفتوحة و الفترة بين ولادتين.