

EFFECT OF LACTO-SACC ON FEED EFFICIENCY, SOME BLOOD CONSTITUENTS AND REPRODUCTIVE PERFORMANCE OF GROWING EGYPTIAN BUFFALO HEIFERS.

M. A. El-Ashry¹, H. M. El-Sayed¹, Hana M. El-Koussy², M.M. Khorshed¹, H.M. Saleh³ and A. K. Ammar²

- 1- Animal Production Department, Faculty of Agriculture, Ain Shams Univ., Cairo, Egypt.
- 2- Cattle Breeding Research Department, Animal Production Research Institute, Giza, Egypt.
- 3- Biological Applications Department, Nuclear Research Center, Atomic Energy Authority, Cairo, Egypt.

SUMMARY

Buffalo is considered the most important dairy farm animal in Egypt . The critical problems of the buffalo are modest daily gain, and retarded age at puberty, sexual maturity and first calving. Previous studies indicated that using non-hormonal growth promoters accelerated growth. The present study aims to assess the possibility of applying the growth promoters to the Egyptian buffalo heifers. A non-hormonal growth promoter called Lacto-Sacc composed mainly of *Saccharomyces cerevisiae* was used at the rate of 10-g /head/day (TR). Three groups of animals (4 animals /group) the first was given the TR for 3 days per week (T₁), the second was given the TR for 3 days every two weeks (T₂), and the third was left untreated as a control group (C). Starting from 6 months of age till maturity body weight was monthly recorded, blood samples were collected once weekly and both the cost of feed per Kg gain over the whole experimental period and the Price: Cost ratio were used as economic indicators. Progesterone determination was applied to detect age at puberty and for pregnancy diagnosis. Duration of this experiment was 18 months.

Results showed higher (P<0.05) average daily gain, and better feed efficiency for T₁ than T₂ and C, groups. Values for both serum total proteins and globulins were significantly (P<0.05) increased with treatments 1 and 2, while albumin was only increased significantly (P<0.05) with treatment 1 in comparison with C. However, serum creatinine showed insignificant increase. Treated animals had lower serum cholesterol (P<0.05) than that of control animals. Additionally, T₁ significantly increased GPT than those of T₂ and C. groups, however GOT was significantly (P<0.05) increased for groups T₁ and T₂ than control. Lacto-sac had no effect on serum progesterone concentrations at puberty, maturity and gestation. Results also proved that, treated heifers, achieved puberty and conception earlier by 1.3 and 4.7 months, respectively than control group. Animals in (T₁) showed better economic efficiency (P<0.05) compared to other groups. Consequently, it is recommended to apply Lacto-sacc supplement as growth promoter as a feed supplement through the rearing phase of Egyptian buffalo heifers.

Key words: *LACTO-SACC Buffalo heifers, reproductive performance.*

INTRODUCTION

Previous studies indicated that using non-hormonal growth promoters

accelerated growth. Generally, growth promoters could be classified into two types; hormonal and non hormonal

growth promoters. The effect of the latter is localized in animal digestive tract which minimize any deleterious effects on those who consume the meat of these animals (Smith *et al.*, 1983). Lacto-Sacc will be used in this study as a growth promoter for growing buffaloes heifers.

Buffaloes were shown to be well adapted to the prevailing environment in Egypt. There are roughly 3.28 million buffaloes against only 2.0 million cows. Small and medium scale farmers keep the large majority of these buffaloes. As a dairy animal; buffalo is ranked the first as it produces 1.6 million tons of milk per year (65% of the total national production of milk); besides it produces 149000 tons of red meat (35% of red meat) (Mourad, 1997).

Available reports revealed that age at first calving in Egyptian buffaloes ranged from 30.46 months (Elwan, 1991) to 39.89 months (Osman, 1997). It is well known that if conception occurs at an early age, it will primarily reduce rearing costs, although earlier calving may lead to a shorter productive life. Heifers that become pregnant at early age will continue to breed early and produce more milk and wean more kilograms of calves during their reproductive life.

In this study Lacto-Sacc, a feed additive promoter mainly composed of *Saccharomyces cerevisiae*, has been investigated for its effect on daily gain, feed efficiency, blood parameters and the onset of puberty and maturity on the growing female buffaloes.

MATERIALS AND METHODS

Twelve female buffalo calves from the Milk Replacer Research Center herd were used in this study for about 18 months. The average initial age was 6 months and mean live body weight was 150 kg (148, 151, and 152 Kg for T₁, T₂ and C, respectively). The animals were divided according to their live body

weight into three similar groups (4 heads per group) and randomly assigned to one of the following treatments:

Treatment 1 (T₁) : Animals received 10 grams of Lacto-sacc /head 3 consecutive days/ weekly.

Treatment 2 (T₂) : Animals received 10 grams of Lacto-sacc /head 3 consecutive days/ biweekly.

Treatment 3 (C) : Control animals did not receive Lacto-sacc.

The experiment continued till the age of 24 months with an average live body weight of about 351 Kg (346, 344, and 363 Kg for T₁, T₂ and C, respectively).

The chemical and biological composition of Lacto-Sacc. (From Altech company) are presented in Table (1).

The rations used in this experiment consisted of concentrate feed mixture rice straw and green berseem during winter or green maize (Darawa) during summer. Rations were offered individually to each animal twice a day according to El-Ashry allowances (1980) [Table, 2]. The animals were fed individually by offering the fresh berseem or maize at 7.0 a.m. followed by the concentrate feed mixture at 10.0 a.m. and finally rice straw was introduced at 3.0 p.m. daily. The feed refusals were recorded daily. Fresh tap water was available ad lib twice daily at 8.0 and 14.0 hr.

The chemical composition of feedstuffs used is presented in Table (3) and was analyzed according to A.O.A.C. (1990).

All animals were weighed once a month after a fasting period of 16 hours and their weights were recorded to the nearest kilogram. Feed efficiency was calculated as Kg dry matter consumed or Kg crude protein consumed per Kg gain. Blood sampling was carried out twice a week, from all animals before the morning feeding. About 10 ml blood

Table (1) Chemical and biological contents of the growth promoter, Lacto-sacc¹.

| Content | Amount |
|---|-----------------|
| Crude protein | 24% |
| Ether Extract | 9% |
| Crude fiber | 14% |
| <i>S. cerevisiae</i> ¹⁰²⁶ CFU / gm | 10 ⁸ |
| <i>Lactobacillus acidophilus</i> CFU / gm | 10 ⁸ |
| <i>Streptococcus faecium</i> CFU / gm | 10 ⁷ |
| Amylase | 800 Units/Kg |
| Cellulase | 200 Units/g |
| Protease | 4800 Units/Kg |

1- From Altech Company Egypt branch.

2-CFU stands for colony forming unit (No of viable colonies).

Table (2): Allowances^{*} for growing buffalo heifers (450-500 g/day).

| Live weight (Kg) | Required nutrients /head /day | | | | | |
|------------------|-------------------------------|---------|-----------|---------|--------|-----------------|
| | TDN Kg | DP g | Salt g | Ca g | P g | Carotene mg. |
| 100-149 | 3.5 | 450-500 | 15 | 20 | 10 | 35 |
| 150-199 | 3.7 | 470-520 | 15 | 25 | 13 | 35 |
| 200-249 | 3.9 | 500-550 | 20 | 27 | 16 | 40 |
| 250-299 | 4.1 | 525-575 | 25 | 30 | 17 | 55 |
| 300-349 | 4.3 | 540-600 | 30 | 35 | 20 | 60 |
| 350-399 | 4.5 | 580-610 | 35 | 38 | 23 | 70 |
| 400-499 | 4.7 | 600-640 | 40 | 42 | 24 | 80 |

* El-Ashry (1980)

Table (3): Chemical composition of the feedstuffs used in the experimental rations (% on DM basis)

| Feedstuffs | DM | OM | CP | CF | EE | NFE | Ash |
|---------------------------|------|------|------|------|-----|------|------|
| Concentrate feed mixture* | 91.3 | 87.7 | 14.9 | 14.1 | 2.0 | 56.7 | 12.3 |
| Rice straw | 91.9 | 83.1 | 3.2 | 35.9 | 1.0 | 43.0 | 16.9 |
| Berseem | 15.3 | 85.1 | 16.7 | 27.1 | 1.3 | 40.0 | 14.9 |
| Darawa | 19.5 | 89.7 | 5.1 | 30.9 | 1.2 | 52.5 | 10.3 |

* Concentrate feed mixture consists of 35% undecorticated cotton seed cake, 33% wheat bran 22% yellow corn, 4% rice bran, 3% molasses, 2% lime stone and 1% salt.

sample was collected from the jugular vein of each animal, immediately centrifuged at 4000 r.p.m. for 20 min., and the separated serum was kept at -20°C for chemical analysis. Chemical determinations of total blood serum proteins according to Armstrong and Carr, (1964), albumin according to Doumas *et al.* (1971), creatinine according to Henry, (1965), cholesterol according to (Watson, 1960) and transaminases; (GPT and GOT) according to Reitman and Frankel, (1957) were performed. The progesterone level was determined using radioimmunoassay kit (Kardjopranyoto *et al.*, 1981). Globulin and A: G ratio were calculated by difference based on the values of total proteins and albumin .

The data were statistically analyzed by used repeated measurements design. It was applied using GLM procedure of SAS (1998).

RESULTS AND DISCUSSION

Daily gain and feed efficiency

Lacto Sacc treatment increased ($P<0.05$) the average daily gain than that of the control group (Table, 4). These results are in agreement with the findings obtained by Nawale *et al.*, (1997) on Murrah and Purnathadi buffalo heifers, who reported that average daily gain ranged between 0.418 kg and 0.348 kg, respectively. Furthermore the current findings are in agreement with those obtained by Elwan (1991) and Fayed (1995) who found that feeding male buffalo calves ration supplemented with growth promoters (Lacto-Sacc, Acid Pack or Flavomycin) had significantly higher average daily gain than unsupplemented.

Heifer group supplemented weekly with Lacto-Sacc showed higher feed efficiency values than those supplemented every biweekly or those

without supplement ($P<0.05$) (Table, 4). The positive effects of Lacto-Sacc supplementation could be explained by better feed utilization and growth rate, which led to a significant improvement of feed efficiency for groups, fed Lacto-Sacc supplemented rations. The current results are noticeably lower than those reported by El-Baramony (1995) who reported that buffalo heifers DMI/Kg gain and CPI/Kg gain were 10.5 Kg and 1.84 Kg, respectively. However, Fayed (1995) reported that feed efficiency of buffalo calves was improved with Lacto-Sacc, supplement, which is in agreement with the current findings.

Some blood parameters

Average values of blood serum analysis are presented in Table (5). Data indicated significant ($P<0.05$) higher values for total proteins in treatment 1 than that of treatment 2 or that of the control . Serum proteins are mainly consisting of albumin and globulins, which are the most protein fractions having a wide variety of biological functions. The obtained values for total proteins are in agreement with Elwan (1991) and El-Baramony (1995) who reported that, mean values for total proteins in growing buffalo heifers were 7.5 and 6.95 g/dl, respectively.

Data presented in Table (5) indicated significant ($P<0.05$) higher values for albumin in treatment 1 compared with that of treatment 2 and that of the control group. However the differences between treatment 2 and control group were not-significant ($p>0.05$). The increase in serum albumin of heifers supplemented with Lacto-Sacc may be due to the role of growth promoter on decreasing the deamination of amino acids. Albumin acts as a significant mobile protein store for amino acids (White *et al.*, 1959).

Results also showed higher mean values ($P<0.05$) of serum globulins for

Table (4): Mean values for total gain, daily gain, DM consumed and feed efficiency resulting from the experimental treatments.

| Treatment s | Total gain (Kg) | Daily gain (kg/head) | DM consumed (Kg) | Feed efficiency | | |
|-------------|-----------------|----------------------|------------------|-------------------|--------|-------------------|
| | | | | Kg gain | DM/ Kg | Kg CP/ Kg gain |
| 1 | 198 | 0.44 ^a | 3663 | 18.5 ^a | | 2.19 ^a |
| 2 | 193 | 0.39 ^b | 3860 | 20.0 ^b | | 2.36 ^b |
| C | 211 | 0.36 ^c | 4241 | 20.1 ^b | | 2.38 ^b |

In each column means superscribed with different letters are significantly different (P<0.05)

Table (5) Mean values for total serum proteins, Albumin (A), Globulin (G), A/G, Creatinine, Cholesterol, GPT and GOT of buffalo heifers.

| Treatments | Total Proteins * gm/dl | Albumin* gm/dl | Globulins* gm/dl | A/G* ratio | Creatinine* mg/dl | Cholesterol* mg/dl | GPT* U/L | GOT* U/L |
|----------------|------------------------|-------------------|-------------------|------------|-------------------|--------------------|--------------------|--------------------|
| T ₁ | 7.72 ^a | 4.27 ^a | 3.45 ^a | 1.38 | 1.84 | 63.30 ^c | 45.62 ^a | 96.50 ^a |
| T ₂ | 7.07 ^b | 3.97 ^b | 3.09 ^b | 1.64 | 1.80 | 67.44 ^b | 41.07 ^c | 96.09 ^a |
| C | 6.52 ^c | 3.87 ^b | 2.63 ^c | 1.60 | 1.68 | 71.78 ^a | 42.11 ^b | 89.39 ^b |

In each column means superscribed with different letters are significantly different (P<0.05)

* Each value represents a mean of 48 determinations.

Table (6): Average ages and weights at puberty and conception, and total feeding costs (economic efficiency) of experimental animals

| Treatments | Puberty | | Conception | | No. of services per conception | Mean Feed Cost / Kg gain ¹ (LE) | Mean Price / Cost Ratio |
|----------------|--------------|-------------|--------------------|-------------|--------------------------------|--|-------------------------|
| | Age (months) | Weight (Kg) | Age (months) | Weight (Kg) | | | |
| T ₁ | 18.13 | 295.50 | 20.37 ^a | 346.67 | 1.8 ^a | 7.8 ^a | 0.9 ^a |
| T ₂ | 18.10 | 277.50 | 21.06 ^a | 344.56 | 1.8 ^a | 8.5 ^b | 0.8 ^b |
| C | 19.45 | 272.25 | 25.07 ^b | 363.33 | 3.0 ^b | 8.5 ^b | 0.8 ^b |

In each column means superscribed with different letters are significantly different (P<0.05)

1- cost included price of growth promotor.

1 kg of BW = 6 LE, 1 kg of Lacto-sacc = 40 LE, 1 ton of CFM = 589 LE, 1 ton of Berseem = 35.8 LE. 1 ton of Darawaz 32.7 and 1 ton of straw = 59 LE.

both treatments 1 and 2 than that of the control. Differences in globulins concentration between groups were significant ($P < 0.05$). Data obtained indicated that there were no significant differences between the different groups regarding A/G ratio. (Table 5).

It is of interest to note that the present values for total serum proteins, albumin, globulins and A/G ratio either for the control group or for the different treated groups were within the normal range previously reported by several investigators working with buffalo calves (Yousef, 1985; El-Sayed, 1991 and Metwally, 1994). Total protein levels in blood serum could be considered as reliable indices reflecting the health and performance characteristics of the animal (Kumar *et al.*, 1980). Additionally, the present results are in agreement with these reported by Fayed (1995) who found that Lacto-Sacc treatment in growing buffalo calves led to a slight higher albumin values than that of the control group. However, Herrmann and Dedeckova, (1985), Shetaewi and Ross (1990) and Badawy (1992) reported that, using Lasolosid or Monensin did not affect globulin values.

The present results show slight but insignificant higher mean values of serum creatinine in treatments 1 & 2 than that of the control group. The present results are in agreement with those of Fayed (1995) who demonstrated that Lacto-Sacc or Flavomycin had no significant effect on serum creatinine values of the treated animals.

The present values for serum cholesterol for the three groups were ranging between 63.3 to 71.78 mg/dl and the differences among groups were significant ($P < 0.05$). Mean values of serum cholesterol for treated animals (T_1 and T_2) were significant lower than that of control animals. Lacto-Sacc may have led to somewhat alteration in bacterial

lipids content by stimulation of bacterial lipids synthesis (Williams, 1989). Furthermore, Lacto-Sacc as a yeast culture has anticholesteroleamic effect (Fuller, 1989).

The present values are within the range obtained by El-Sayed (1991), whose values ranged between 51 and 72 mg/dl for serum cholesterol in growing buffalo calves. In addition, Fayed (1995) found that values of serum cholesterol for growing buffaloe male calves ranged between 52-82 mg/dl. El-Baramony (1995) also, reported that cholesterol in buffalo heifers ranged between 47.9 to 87.6 mg/dl.

Concerning the effects of Lacto-Sacc on serum Glutamic-Pyruvic and Glutamic - Oxaloacetic transaminases, showed that treatment 1 had a significantly ($P < 0.05$) higher value of GPT than that of treatment 2 and control groups. The present findings are in agreement with the results of Shetaewi and Ross (1990) and Duff *et al.* (1994). Results of GOT showed similar trend for treatment 1 and treatment 2 while the control group had a significantly ($P < 0.05$) lower value. Results obtained by Badawy (1992) and Duff *et al.* (1994) were in agreement with the present findings.

When comparing the current findings with those of Elwan (1991) who reported that, GPT and GOT mean values in growing buffalo heifers ranged between 45.8 to 61.8 and 116.3 to 135.4 U/L respectively, the lower values in the present study may be due to differences in the plan of nutrition or to differences in the duration of the feeding experiment (20 months), which may result in differences in mean animal age.

Progesterone concentration in serum was used in this study as a tool to detect the sexual puberty in the different experimental groups. During prepuberal age (up to 504 days) the values for serum

progesterone ranged from (0.02-0.26), (0.02-0.59) and (0.02-0.64) ng/ml for T₁, T₂ and C, respectively (Fig.,1). The first ovulation was considered to occur when serum progesterone concentration equalled or exceeded 1.0 ng/ml for at least two consecutive samples (see Fig., 1). However, Fig. (2) shows progesterone concentration (ng/ml) in peripheral serum during early pregnancy for the different experimental groups. The progesterone levels were nearly identical to those obtained during the luteal phase of the estrous cycle. It was ranging between (2.6-6.2), (2.1-5.2) and (2.1-6.3)ng/ml for T₁, T₂ and C, respectively. The present values for progesterone concentration among the three groups were similar to those obtained by Elwan (1991) and Ibrahim (1989).

Reproductive parameters and economic efficiency:

Average ages and weights at puberty and conception and economic efficiency values are represented in Table (6). The average age at puberty for treatments 1 and 2 slightly higher than control group. Although the differences between the three groups were not significant ($p>0.05$), these values represented more than one month reduction in average age at puberty while age at first conception was significantly reduced by 4-5 months in response to dietary treatments as compared to the control group. Consequently, this will help in decreasing rearing costs, gaining earlier fertile services and obtaining longer productive lives.

The difference between the first treated group (T₁) and the control group was just about month with regard to age at sexual puberty. The gap was wider with regard to age at conception (Table, 6). Statistically, age at first conception was significantly ($P<0.05$) lower in the

treated groups compared to the control group, while the difference between T₁ and T₂ was not significant ($p>0.05$). This is due to better expression of heat by the treated animals compared to the control. Reduction of rearing cost by about 4 - 4.7 months would be a considerable financial achievement. The age at first conception obtained in the present experiment is within the range reported by Barkawi *et al.* (1988) and Mourad (1997) for buffalo.

Regarding live weight at sexual puberty, the differences between the three groups were not significant ($p>0.05$). Treatment 1 had the heaviest mean weight -followed by treatment 2 then the control. The current recorded weights are within the range reported by El-Ashry (1993), who showed that the range of weight at puberty of female buffaloes was between 231 and 309kg. The obtained weights lie outside the range reported by Ali *et al.* (1979). They reported that, the overall live weight means at puberty were 310.3 ± 7.8 and 269 kg. This may be explained by the fact that weight at puberty combined with age at puberty could vary considerably due to such interacting reasons, as the season of birth, the breed, nutrition level, ambient temperature, among other factors (Metry, 1996).

Results obtained from this experiment indicate that Lacto-Sacc treated animals tend to conceive at lighter body weights than the control. However differences between the different groups were not significant ($P>0.05$). The obtained weight at conception was in agreement with that of El-Ashry (1993) and Ali *et al.*, (1980) who reported that under proper management and nutrition, weight at conception in buffalo heifers could reach 351 kg. In this respect, Barkawi *et al.*, (1988) found that the first ovulation occurred at a mean age of 24.7 month while body weight ranged from 256 to

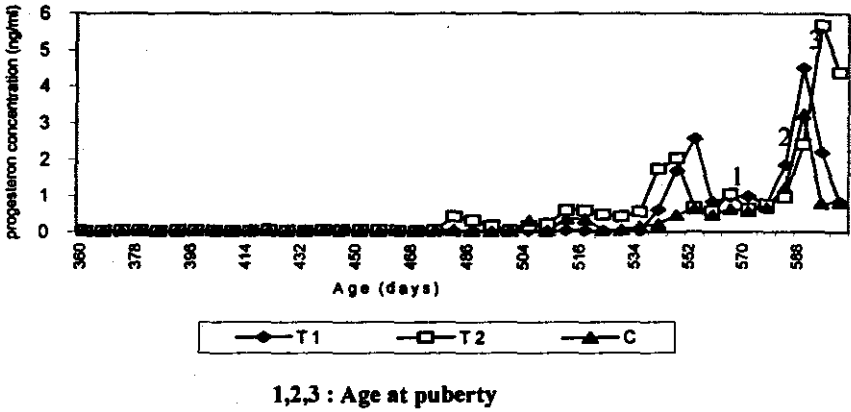


Fig. (1): Mean serum progesterone concentration of heifer groups (pre-puberty and sexual maturity).

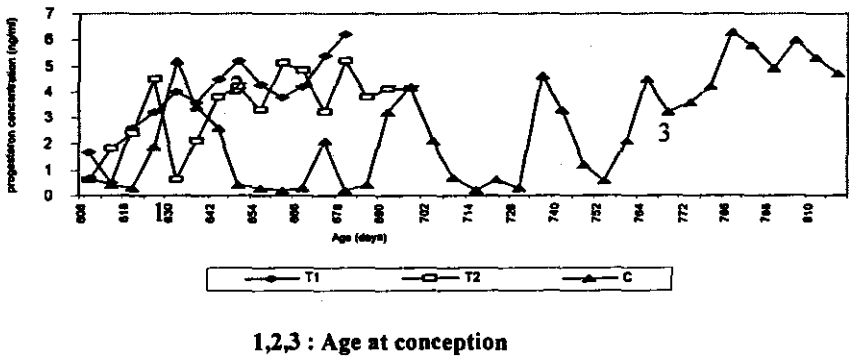


Fig. (2): Mean serum progesterone concentration of heifer groups (early pregnancy)

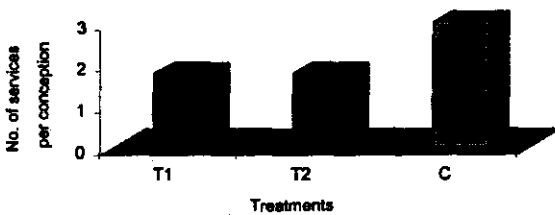


Fig. (3): Effect of different supplementations with Lacto-Sacc on the number of services per conception

390 kg in buffalo heifers. These values were higher than estimates reached in this study. However, age at fertile service and corresponding body weight were within the range obtained by Ibrahim (1989) being 14-20.8 months and 324-389kg live body weights, respectively.

Sexual puberty and maturity data obtained from this experiment are in agreement with those reported by Hafez (1955). There was a difference between weight at conception in this study, (344 – 364 kg) and that reported by El-Shafie *et al.* (1983), which was 314.8 kg. This may be explained by many interacting reasons, such as the season of birth, nutrition level, ambient temperature and possibly others.

Number of services per conception presented in Table (6). Showed that the treated groups (T₁ and T₂) required two services for each conception, while the control group (C) required three (Fig. 3). This indicates that, with treatment growth promoter enhanced the nutritional and reproductive status of the animals; consequently reducing the number of services per conception. In agreement with the present study, Afifi *et al.* (1978) reported that the better the nutrition in the prepuberal heifers the less the number of services per conception. Concerning reproduction performance, heifers in this study were more efficient when compared with the values obtained by Barkawi *et al.* (1988).

Conclusion

This study indicated that age at puberty and conception were remarkably decreased in heifers fed Lacto-sacc promoter. This could be due to a positive effect of the used growth promoter on improving ovarian function and heat expression. Consequently, this was reflected on better economic efficiency based on both the feed cost including the promoter and the Price: Cost ratio per Kg

gained, particularly for the animals treated 3 days a week (T₁) over the other groups. These results support the recommendation of implementing this promoter in the current feeding systems of the Egyptian Buffaloes.

REFERENCES

- A.O.A.C. (1990). Official Methods of Analysis 13rd ed. Association of Analytical Chemists. Washington, D.C., U.S.A.
- Afifi, Y. A.; M.A. El-Ashry, M.A. El-Fouly, A.K. Kirrella and I.A. Abou-Selim (1978). The effect of different plans of nutrition on growth and reproductive performance of buffalo heifers. *Agric. Res. Rev.* 56 (7):39-49.
- Ali, A.M.; H. Abdel Rahman and M.A. El-Ashry (1979). Ovarian development in Egyptian buffalo heifers. *Monoufia J. Agric. Res.*, 2 : 101-116.
- Ali A. M.; M.A. El-Ashry and A.M. El-Serafy (1980). Reproductive performance of buffalo heifers bred at young age. *Indian J. Anim. Sci.*, 5(1) : 8-10.
- Armstrong, W.D. and C.W. Carr (1964). *Physiological chemistry: Laboratory directions.* 3rd Ed. U.S.A. Bunge Publishing Co. Minneapolis, Minnesota. P:75.
- Badawy, E. S. (1992). Some biological effects of rumen fermentation modifier (Monensin) on buffalo-heifers with special reference to sexual puperty. Ph. D. Thesis Fac. Of Vet. Med., Cairo Univ.
- Barakawi, A.H; E.M. Mikhless and L.H. Bedeir (1988). Environmental factors affecting age at puberty in Egyptian buffaloes. *Proceedings VI world Conference on Animal Production, Helsinki.*
- Doumas, B.; W. Walson and H.Blgga, (1971). Albumin standards and

- measurement of serum with bromocresol green. *Clin. Chem. Acta*, 31:87.
- Duff, G. C.; M. L. Galyean; M. E. Branine and D. M. Hallford (1994). Effects of Lasalocid and Monensin plus tylosin on serum metabolic hormones and clinical chemistry profiles of beef steers fed a 90% concentrate diet. *J. Anim. Sci.* 72:1049.
- El-Ashry M. A. (1980). The final report for milk replacer project for buffalo calves. The Egyptian Academy for Scientific Res. and Technology.
- El-Ashry M.A. (1993). Impact of feeding on maturity and sexual performance of buffalo. Prospects of buffalo production in the Mediterranean and the Middle East. *EAAP* 62, 278:284.
- El-Baramony, M. (1995). The response of growing buffalo calves to different concentration of energy in their rations. MSc. Thesis Fac. Of Agric. Ain Shams Univ.
- El-Sayed, H. M. A. (1991). Performance of growing ruminants on high energy density diets. Ph.D. Thesis Fac. of Agric. Ain Shams Univ.
- El-Shafie, M. M.; A. M. A. Borady; H. M. Mourad and R. M. Khattab (1983). Physiological and seasonal factors affecting reproductive performance of Egyptian buffalo heifers. *Egyptian J. of Anim. Prod.* 23 (1/2) 1-14.
- Elwan, K.M. (1991). Effect of including poultry wastes in rations on growth and reproductive performance of buffalo heifers. Ph. D. Thesis Fac. Agric, Ain Shams Univ.
- Fayed, M. M. A. (1995). Factors affecting productive performance of buffalo male calves till slaughter. Ph.D. Thesis Fac. Of Agric. Ain Shams Univ.
- Fuller, R. (1989). Probiotics in man and animals. *A Rev. J. Appl. Bacteriol.*, 66 : 365.
- Hafez, E. S. E. (1955). Puberty in the buffalo animals. *J. Agric., Sci., Camb.*, 46:137-142.
- Henry, R. J. (1965). *Clinical Chemistry. Principals and Technics*, P. 293.
- Herrmann, H. and J. Dedeckova (1985). Efficiency of the preparation Bovatec R (Lasalocid) in fattening steers. *Biologiczace a Cheizace Zivocisne Vyrology, Veterinaria* 21 (6) 525.
- Ibrahim, N.S. (1989). Puberty and associated phenomena in Egyptian buffaloes. M.Sc. Thesis, Fac. of Agric. Ain Shams Univ. Cairo, Egypt.
- Kardjopranyoto, S.; S. Soewarsina and S. Partodihardjo (1981). The use of radioimmunoassay, in the measurement of swamp buffalo, serum concentration of FSH, LH, Progesterone and Oestrogen of cycling females. IAEA, Vienna.
- Kumar, N.; U. B. Singh and D. N.Verma. (1980). Effect of different levels of dietary protein and energy on growth of male buffalo calves. *Ind. J. Anim. Sci.* 51:513.
- Metry G. H. (1996). Buffalo the main dairy animal in Egypt. Academy of Scientific Research and Technology.
- Metwally, A. A. A. (1994). Puberty and related phenomena in male Egyptian buffalo calves and its relation to plane of nutrition. MSc. Thesis Fac. Agric. Ain Shams Univ.
- Mourad, K. A. (1997). Buffaloes in Egypt. *Buffalo Bulletin* 16:81.
- Nawale, K. G.; A. M. Deshmuke; V. G. Atkare; A. S. Gampawar and A. B. Deshmukh (1997). Studies on the growth rate of Purnathadi buffalo calves from birth to thirteen weeks. *Indian Veterinary Journal* 1997, 74: 7, 587-589.
- Osman, H.Z. (1997). Some environmental and physiological

- problems affecting Egyptian buffaloes performance. Ph.D. Thesis, Ain Shams University, Egypt.
- Reitman, S. and S. Frankel (1957). A calorimetric method for the determination of serum glutamic oxaloacetic and glutamic pyruvic transaminases. *Amer. J. Clin. Path.*, 28 : 56.
- SAS (1998). Statistical Analysis System. SAS user's Guide: Statistics. SAS Institute Inc. Editors, Cary, NC.
- Shetaawi, M. M. and T. T. Ross (1990). Effect of Lasalocid on performance, serum chemistry and hormone profiles of feedlot lambs. *Sheep Research Journal*, 6(3):39.
- Smith, J; K. Reffett, N. Bradly and N. Gay (1983). Growth and efficiency of calves fed lasalocid and monensin. *J. Anim. Sci* 57. Suppl. 56.
- Watson, D. (1960). A simple method for the determination of serum cholesterol. *Clin. Chem. Acta.*, 5:637.
- White A.; H. P. Emil and S. Dewitt (1959). *Principales of Biochemistry*. 2nd ed. McGraw-Hill Book Company, INC. London, UK.
- Williams, P.E.V. (1989). The mode of action of yeast culture in ruminal diets. A review of the effect of rumen fermentation patterns. Pp. 65 in *Biotechnology in the feed industry*. Alltech Tech. Publ. Nicholasville.
- Yousef, H. A. (1985). Effect of age on some blood tests in Egyptian buffaloes. M.Sc. Thesis, Agric. Sci. Ain Shams Univ.

تأثير استخدام اللاكتوساك على الكفاءة الغذائية وبعض قياسات الدم والأداء التناسلي لعجلات الجاموس المصري النامية

محمد العشري^١ - حمدي السيد^٢ - هناء القوصي^٣ - محمود خور شيد^١ - هشام صالح^٢ - أحمد عمار^١

- ١- قسم الإنتاج الحيواني - كلية الزراعة - جامعة عين شمس - القاهرة - مصر .
- ٢- قسم بحوث تربية الأبقار - معهد بحوث الإنتاج الحيواني - الجزيرة - مصر .
- ٣- قسم للتطبيقات البيولوجية - مركز البحوث النووية - هيئة الطاقة الذرية - القاهرة - مصر .

يعتبر الجاموس المصري من أهم حيوانات اللبن المزرعية في مصر وأهم عيوبه هو انخفاض معدل نموه اليومي - التأخر في العمر عند البلوغ الجنسي - النضج الجنسي والعمر عند الوضع الأول ونلت الدراسات السابقة على أن استخدام منشطات النمو غير الهرمونية تشجع النمو وتهدف هذه التجربة إلى دراسة إمكانية استخدام منشط النمو في عجلات الجاموس المصري . وقد أضيف اللاكتوساك كأحد أنواع المنشطات غير الهرمونية إلى العلائق بمعدل ١٠ جرام/رأس/يوم لمدة ثلاثة أيام متعاقبة كل أسبوع (المجموعة الأولى) و ١٠ جرام /رأس/يوم لمدة ثلاثة أيام متعاقبة كل أسبوعين (المجموعة الثانية) وبدون أى إضافة (المجموعة الضابطة) وتم تسجيل وزن الحيوان شهرياً ابتداء من عمر ٦ شهور حتى نهاية التجربة وتم جمع عينات الدم أسبوعياً لتقدير بعض البيانات عليها . تم تقدير تكاليف المأكول من المنشط لكل كيلو جرام نمو ونسبته إلى سعر البيع بالنسبة لتكاليف ١ كجم نمو وذلك لاستخدامهم كدليل للكفاءة الاقتصادية . وتم تقدير هرمون البروجستيرون في سيرم الدم كدليل للعمر عند البلوغ الجنسي وحدث الحمل. وقد أستمرت التجربة مدة ١٨ شهراً .

أظهرت النتائج ارتفاع معدل النمو اليومي والكفاءة الغذائية معنوياً بالنسبة للمجموعة الأولى والثانية مقارنة بالمجموعة الضابطة. كما أوضحت النتائج أن تركيز البروتينات الكلية والجلوبيولينات الكلية في سيرم الدم ترتفع معنوياً في المجموعة الأولى والثانية بينما يزيد تركيز الألبومين في المجموعة الأولى فقط عنها في المجموعة الضابطة بينما وجد أن المجموعات المعاملة (الأولى والثانية) ينخفض فيها تركيز الكوليستيرول في سيرم الدم مقارنة بالمجموعة الضابطة بالإضافة إلى ارتفاع في نشاط أنزيمات الكبد (جلوتاميك بيروفيك و جلوتاميك أوكسالوأستيك) الناقله لمجموعة الأمين في المجموعة الأولى معنوياً عنها في المجموعة الثانية بينما كان التركيز منخفض في المجموعة الضابطة ولم يحدث أى اختلافات معنوية بين المجموعات الثلاثة لتركيز الكرياتينين وهرمون البروجستيرون في سيرم الدم خلال مراحل البلوغ الجنسي وحتى مراحل الحمل المبكر. أظهرت النتائج للمجموعات المعاملة (الأولى والثانية) مقارنة بالمجموعة الضابطة أن العمر عند البلوغ الجنسي كان أكبر بكثير من شهر في حين أن الفرق في العمر عند التلقيح المخصبة كان ٤,٣ شهر كما إنخفض عدد التلقيحات اللازمة للأخصاب إلى ١,٨ تلقيحاً بالنسبة للمجموعات المعاملة مقارنة بالمجموعة الضابطة (٣ تلقيحات) .

كما أظهرت النتائج ارتفاع الكفاءة الاقتصادية للمجموعة الأولى مقارنة بالمجموعات الأخرى. والنتائج السابقة تدعم إمكانية استخدام اللاكتوساك بمعدل ١٠ جم/رأس/يوم لمدة ثلاثة أيام متعاقبة كل أسبوع (المعاملة الأولى) كأفضل النتائج المتحصل عليها دون ظهور أعراض غير مرغوبة على الحيوانات .