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SUMMARY AND CONCLUSION

The present work was carried out at El-Gemmizah Research Station, Gharbia Governorate, belonging to the Animal Production Research Institute (APRI), Agricultural Research Center, Ministry of Agriculture in participation with Department of Animal Production Faculty of Agriculture, Mansoura University, during the period from July 2003 to October 2004.

A total of 24 Egyptian buffalo calves was used in this study at 7-11 months of age and 197±12.09 kg LBW. The experimental animals were divided into similar three groups according to LBW and age. All animals were fed concentrate feed mixture (CFM), berseem hay (BH) and rice straw (RS) according to the recommendation of Animal Production Research institute (2003) for growing calves. The 1st group was fed CFM, BH and RS (control ration G1), and the 2nd (G2) and 3rd (G3) groups were fed the control diet supplemented with yeast culture (20 and 30 g YC (Gustor nature)/h/d, respectively)

Buffalo calves in all groups were fed the experimental diet from 8 up to conception. LBW, ADG, feed conversion, digestibility coefficients, rumen and blood parameters were determined. Also, LBW and age at puberty, 1st service and conception as well as ovarian activity and progesterone concentration were studied.

The results could be summarized as following:

1. Chemical composition of experimental diets:

Adding 20 (G2) and 30 (G3) g YC resulted in increases in CP content as compared to the control diet(G1) (14.62 and 15.00% vs. 14.00% respectively).

2. Average daily feed intake:

2.1. Average daily DM intakes in all groups ranged 2.81-2.87 kg CFM/h, 1.48-1.57 kg RS/, 2.32-2.44 kg BH/h and 6.61-6.88 kg total DM/h.

2.2. Daily intake as TDN ranged 4.16-4.45 kg, however, as CP and DCP intakes markedly increased in G2 and G3 as compared to the G1 (0.885 and 0.917 vs. 0.852 kg CP/h and 0.684 and 0.743 vs. 0.521 kg DCP/h).

3. Digestibility coefficients and nutritive values:

3.1. Digestibility of OM decreased ($P<0.05$) in G3 than in the D1 (G1) (71.87 vs. 73.76%), while digestion of CP, CF and NFE increased ($P<0.001$, $P<0.05$ and $P<0.05$, respectively) in G2 and G3 than in G1 (76.47 and 76.79 vs. 60.73%; 64.27 and 64.55 vs. 59.39%, and 71.57 and 73.40 vs. 66.01% respectively). The differences between G2 and G3 were not significant for all nutrients digestibility.

3.2. Nutritive values as TDN (66.50 and 65.36 vs. 61.21%) and DCP (10.55 and 10.97 vs. 7.90%) value increased ($P>0.05$) in G2 and G3 than G1. The differences between G2 and G3 were not significant.

4. Rumen parameters:

4.1. Values of pH values ranged between 5.75 and 6.68 in all groups.

4.2. Overall mean of TVFA's concentration increased ($P<0.05$) by about 27 and 35% in G2 and G3, respectively, than in G1.

4.3. Overall concentration of NH_3-N tended to be higher G2 and G3 than G1.

4.4. Ruminal protozoa count did not differ significantly as affected by YC supplementation, but microbial protein yield increased ($P>0.05$) by about 79 and 97% in G2 and G3 than G1.

5. Blood biochemical parameters:

5.1. Overall mean of concentration of total proteins, albumin, globulin and AL/GL ratio as well as concentrations of total cholesterol were not significantly affected by YC supplementation.

5.2. Concentrations of total lipids were higher($P>0.05$) in G2 and G3 that in G1(0.39 and 0.43 vs. 0.29 mg/dl respectively).

6. Growth performance:

6.1. LBW of all group were not significantly different between 8-11 months of age. At 12 months of age, buffalo calves in G3 were significantly ($P<0.05$) heavier than those fed the control diet (G1). However, those in G2 were insignificantly heavier than those fed the control diet (G1) and insignificantly lighter than those in G3. At 13, 14 and 15 months of age buffalo calves in G3 were significantly ($P<0.05$) heavier by about 8, 8.8 and 10.2%, respectively, than those fed the control diet(G1). However, buffalo calves in G2 were insignificantly heavier by about 2, 2.2 and 3.6%, respectively, than those fed the control diet(G1). Yet, increasing level of YC supplementation from 20 to 30 g in diets of buffalo calves resulted in significant ($P<0.05$) increase in LBW by about 6, 6.5 and 6.4%, respectively.

6.2. Overall daily gain was significantly ($P<0.05$) higher by about 21.6 and 16.2% in G3 than G2 and G1, respectively.

6.3. Feed conversion (kg intake/ kg gain) showed significantly ($P<0.05$) the lowest values as DM, CP and TDN and the highest values as DCP in G3, followed by moderate values in G2. Meanwhile, G1 showed the opposite trends.

7. Economic efficiency:

Higher economic feed efficiency was recorded for G3 (151%), than G2 (147%). However, those in the control group showed the lowest feed economic efficiency (144%).

8. Reproductive performance:

8.1. Live body weight at puberty tended to be heavier in G2 by about 6 kg and in G3 by about 11 kg than G1 (345.0, 328 and 339 kg, respectively).

8.2. Live body weight at 1st service tended to be heavier by about 8 and 7 kg in G2 and G3, respectively than that of G1 (361.5, 360.2 and 353.7 kg, respectively).

8.3. Live body weight at conception of heifers in G2 and G3 was insignificantly heavier by about 4.0 and 8.0 kg than that of G1 (363.5, 371.3 and 359.8 kg, respectively).

8.4. Age at puberty was significantly (P>0.05) earlier by about 74 days in buffalo heifers of G3 than G1 and was insignificantly earlier by about 31 days in heifers of G2 than G1.

8.5. Age at 1st service was earlier by about 55 days in G3 than G1 and was earlier by about 29 days in G2 than G1.

8.6. Age at conception was significantly (P>0.05) earlier by about 9.5% in G3 and was insignificantly earlier by about 6.5% in G2 than G1, but. it insignificantly decreased by about 3.2% in G3 as compared to G2.

8.7. No ovulations occurred in heifers of G1. However in G2, two animals showed two ovarian cycles ending with silent ovulation versus 5 cycles in 5 heifers in G3 justly prior to puberty. From puberty to 1st service, four animals in each group showed ovarian cycles, being the highest in G1 (6 cycles, averaging one/animal), moderate in G2 (5 cycles, averaging 0.83/animal) and the lowest in G3 (4 cycles, averaging 0.67/animal). From the 1st service to conception, two animals in G1 showed 3 ovarian cycles with average of 0.50/animal and one animal in G2 showed one cycle averaging 0.17/animal, while 3 animals in G3 showed 3 cycles averaging 0.50/animal.

8.8. Overall length of oestrous cycles from pre-puberty up to conception was the highest in heifers of G3 (26.1 days), moderate in G1 (20.3 days) and the lowest in G2 (17.3 days).

8.9. Overall number of all ovulations during the period from pre-puberty up to conception was greater in G3 (3.0/animal) than that in G1 and G2 (2.5 and 2.33/animal, respectively). Number of silent ovulations was the greatest in G3 (0.83/animal), followed by that in G2 (0.50/animal), and the least was in G1 (0.33/animal).

8.10. Pre-puberty*:* Average Pg concentration tended to be the highest in G3 (1.971 ng/ml), followed by G1 (1.403 ng/ml) and the lowest values were observed in G2 (0.957 ng/ml). Age at Pg peak tended to be lower in G2 and G3 (491.5 and 472.1 days, respectively) as compared with G1 (519.6 days), being lower in G3 than G2. However, all group differences in age at Pg peak were insignificant.

8.11. From puberty to 1st service: Average and peak of Pg concentration, and interval to peak insignificantly showed the highest values in G3, moderate in G1 and the lowest values in G2.

8.12. The interval to Pg peak within the ovarian cycles was significantly affected (P>0.05) by the dietary treatment however-`9, average Pg concentration and Pg peak did not differ significantly among experimental groups

8.13. Average Pg concentration and Pg peak did not significantly differ among experimental groups, although maximum Pg concentration during the first two weeks of pregnancy was the highest in G3, moderate in G1 and the lowest in G2.

8.14. Number of services per conception and service period were lower in G2 (1.17 and 3.8 days) and higher in G3 (1.5 and 14.7 days) than that in G1 (1.33 and 10.8 days).