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ARABIC SUMMARY	

SUMMARY

The present study was carried out at El-Gemmizah Experimental Station, belonging to Animal Production Research Institute, Agricultural Research Center, Ministry of Agriculture, Egypt, during the period from May 2005 to January 2006. This study was conducted to evaluate the effect of feeding Friesian cows on ration supplemented with two levels of yeast culture (YC) during the late pregnancy and 150 day-postpartum period under summer season conditions on their productive and reproductive performances.

A total of 15 lactating Friesian cows (2-4 lactations) was used in this study. Animals were chosen in late gestation period at approximately 30 days prepartum and divided into three groups, 5 animals in each.

- 1- G1: 5 cows were fed diet containing 7 kg concentrate feed mixture (CFM), 3 kg berseem hay (BH; 2nd cut) and 3 kg rice straw (RS) according to NRC (1988) requirements for dairy cows and was considered as a control group
- 2- G2: 5 cows were fed the control ration supplemented with 30 g/h/d from yeast culture (YC).
- 3- G3: 5 cows were fed the control ration supplemented with 50 g/h/d from YC.

The individual changes in live body weight of cows were monthly recorded, birth weight of calf, eating and ruminating behaviors over 12 h interval was superintended and nutrients digestion coefficients were determined.

Rumen liquor (RL) samples were taken for determination of pH value and concentration of ammonia-N and total volatile fatty acids, protozoal cell count and microbial protein yield.

Blood samples were taken at different pre- and post partum months for determination of some biochemical (total protein; TP, Albumin; AL, Globulin; GL, total lipids; TL, Cholesterol, Glucose, Creatinine), enzyme activity (AST and ALT), hormonal (T_3 and P_4) and haematological (Red and White blood cell count; RBC and WBC, Packed cell volume; PCV and Haemoglobin) parameters.

Milk yield and milk composition were recorded at different postpartum interval up to the 5th month.

After calving the interval elapsed for complete fetal membranes drop (FD, hour), uterine involution period (UI, day), uterine cervical closure (CC, day), interval from calving to first detected estrus (FPEI, day), service period length (SP, day), number of services per conception (NS/C), days open (DO), pregnancy rate (PR, %) and calving interval (CI, day) were recorded and data were statistically analyzed.

The obtained results could be summarized as the following:-

1. Feeding behavior parameters of experimental cows:

The effect of dietary YC supplementation on all feeding parameters were not significant.

2. Digestibility coefficients and nutritive value of experimental cows:

Digestibility coefficients of CP, CF and EE were higher ($P < 0.05$) in G3 than in both G1 and G2 (73.44 vs. 61.12 and 69.31% for CP, 69.55 vs. 53.16 and 63.69 for CF and 76.09 vs. 62.85 and 66.75% for EE). The effect of experimental group was not significant on digestibility coefficients of DM, OM and NFE. Dietary supplementation with 50 g YC/h/d (G3) improved nutritive values, being significant ($P < 0.05$) on DCP compared to G1 being 9.76 vs. 8.06% and it was 9.18% in G2, while TDN did not affected significantly by different experimental groups being, 65.79, 63.14 and 58.08% in G3, G2 and G1, respectively.

3. Rumen parameters of experimental cows:

All ruminal parameters (pH value, concentration of total volatile fatty acids; TVFA's and ammonia-N; $\text{NH}_3\text{-N}$) were not affected significantly by yeast culture supplementation.

Only diet of G3 group supplemented with higher level of YC significantly ($P < 0.05$) increased protozoal count in compared with G1, being 364.33 vs. 255.00 $\times 10^3$ cell/mm³ and microbial protein yield was 0.644 vs. 0.251 g/ml.

4. Blood parameters of experimental cows:

4.1. Haematological parameters:

as affected by different treatments, count of RBC was significantly ($P<0.05$) high greater in G3 than in G2 and G1, being 8.09 vs. 7.56 and 7.48 ($\times 10^6$ cells/mm³). The haemoglobin concentration was affected significantly ($P<0.05$) by experimental group being, 9.54, 9.86 and 10.47 g/dl in G1, G2 and G3, respectively. PCV percentages significantly ($P<0.05$) increased in G2 and G3 than in G1, being 33.67, 34.29 and 31.57%, respectively.

4.2. Biochemical parameters:

Concentration of total protein (TP) and its fraction was affected significantly ($P<0.05$) by experimental group, being 7.29, 7.69 and 8.14 g/dl, in G1, G2 and G3, respectively, albumin concentration were, 3.92, 4.15 and 4.44 g/dl, in the same order and globulin concentration were, 3.37, 3.54 and 3.70 g/dl, respectively. Glucose concentration significantly ($P<0.05$) increased in each of G3 (55.72 mg/dl) and G2 (51.78 mg/dl) compared with G1 (47.76 mg/dl). Concentration of total lipids significantly ($P<0.05$) increased in G3 (0.79 g/dl), followed by G2 (0.69 g/dl) and finally G1 (0.59 g/dl). Results show that total cholesterol concentration was significantly ($P<0.05$) higher in G3 (228.59 mg/dl) and G2 (201.49 mg/dl) than in G1 (168.79 mg/dl). Creatinine concentration was affected significantly ($P<0.01$) by experimental group, being lower in G3 (0.88 mg/dl) than in G1 and G2 (1.12 and 1.11 mg/dl, respectively).

4.3. Enzyme activity:

Only the activity of AST was lower ($P < 0.01$) in G2 and G3 (23.48 and 16.62 IU/ml, respectively) than in G1 (32.05 IU/ml).

4.4. Hormone profile:

T_3 concentration was not affected by experimental group, being 59.72, 57.41 and 67.52 ng/ml in G1, G2 and G3.

5. Changes in live body weight of experimental cows:

At the interval from 3rd to 4th month postpartum body weight loss were reduced by feeding Friesian cows on diet supplemented with YC in G2 and G3, being -0.8 and 10.4 kg, respectively.

6. Milk production of experimental cows:-

6.1. Milk yield:

The overall means of MMY (monthly milk yield), ADMY (adjusted milk yield) and CDMY (corrected fat milk yield) were affected significantly ($P < 0.01$) by experimental group, being higher in G3 (444.4, 14.8 and 12.84 kg, respectively) followed by G2 (311.4, 10.37, 9.6 kg, respectively) than in G1 (298.2, 9.93 and 8.96 kg, respectively).

6.2. Milk composition and milk components yield:

Fat percentage was high ($P < 0.05$) in G2, G1 and G3, being 3.52, 3.35 and 3.13%, respectively. Although, fat yield was significantly ($P < 0.01$) higher in G3 than in both G2 and G1, being 0.45 vs. 0.35 and 0.33 kg, respectively.

Protein yield was ($P<0.01$) higher in G3 than in both G2 and G1, being 0.39 vs. 0.26 and 0.24 kg, respectively. Lactose percentage was ($P<0.05$) higher in G3 than in G2 and G1 (4.53 vs. 4.46 and 4.38%). Also, lactose yield was ($P<0.01$) higher in G3 than both G2 and G1, being 0.67 vs. 0.46 and 0.43 kg, respectively. The total solids yield (TS) was ($P<0.01$) higher in G3 than in both G2 and G1 (1.64 vs. 1.16 and 1.09 kg). Solids not fat yield (SNF) was ($P<0.01$) higher in G3 than in both G2 and G1 (1.18 vs. 0.81 and 0.76 kg). The overall means of SCC was ($P<0.01$) higher in G1 than in G2 and G3 (246.3 vs. 118.9 and 102.5 $\times 10^3$ /ml).

7. Productive and economic efficiency:

Milk production efficiency was significantly ($P<0.01$) higher in G3 than in G2 and G1

8. Reproductive performance of experimental cows:

8.1. Calving performance:

The overall means of CBW, FD, UI and CC were not affected significantly by experimental group, although CBW tended to be heavier in G3 and G2 than in G1 (37.4 and 36.2 vs. 34.4 kg) and duration of FD was longer in G2 (11.86 h) and G3 (7.86 h) than in G1 (3.61 h). While, period of UI and cervical closure was slightly longer in G2 (42.4 and 38.6 days) and shorter in G3 (35.2 and 31.2 days) than in G1 (39.6 and 35.4 days).

8.2. Reproductive efficiency measurements:

All reproductive efficiency measurements including PFEI, SP, NS/C, DO, CI, PR and progesterone levels were not affected significantly by yeast culture supplementation.

In conclusion, feeding Friesian cows on diet supplemented with yeast culture improved weight loss during the first five months of lactation, most nutrient digestibility coefficients, rumen function in term of increasing protozoal count and microbial protein yield. Also, yeast culture supplementation increased milk yield in term of adjusted milk yield and corrected fat milk yield and increased significantly yield of all milk components specially fat yield. In addition some improvement occurred in reproductive performance of lactating cows fed diet supplemented with yeast culture.

Finally, from economic point of view, the present study recommended feeding lactating Friesian cows from 30 days prepartum throughout lactation period on diet supplemented with 50 g of yeast culture per head per day had beneficial effect on milk yield and milk composition without any harmful effects on reproductive performance.