# *5.SUMMARY AND CONCLUSION*

This study was carried out at El-Karada Animal Experimental Station, Kafer El-Sheikh governorate, which belongs to the Animal Production Research Institute, Ministry of Agriculture from October 2002 to June 2003. The duration of the field experiment was 8 months.

The objective of this study aimed to investigate the effect of adding Bospro and Gustor XXI (as feed additives) to rations on the production performances of production of fattening Friesian male calves.

Twenty-five male Friesian calves of about 9 months old and 187.6 kg live body weight were randomly divided into five similar groups (five for each group) were used in this experiment. The experimental groups were fed the following experimental rations :

Treatment (1): control : CFM + berseem hay + rice straw.

Treatment (2): control plus 30 g Bospro/head/day.

Treatment (3): control plus 45 g Bospro/head/day

Treatment (4): control plus 3 g Gustor XXI / kg ration.

Treatment (5): control plus 4.5 g Gustor XXI / kg ration.

Animals were fed according to **(NRC, 1984) and Salama** *et al.,* **(2001) method,** while **Salama** *et al.,* **(2001) method** increased 18% than **(NRC, 1984)** as TDN..

**The results obtained in this study can be summarized as follows :**

1- Comparing between the five experimental treatments indicated that all the experimental treatments had no significant effect on DM and NFE digestion coefficients. Also, $T_2$ recorded the highest ($P<0.05$) CP digestibility value, followed by T5, T3, T4 and $T_1$. The differences between T5 and T3 in CP digestibility were not significant, while those between T4 **and T1** were significant ($P<0.05$). Moreover, T2 showed the highest ($P<0.05$) EE digestibility, followed by T3, T5, T4 and $T_i$ with no significant differences

among those treatments. In addition, the $T_1$, $T_3$ and $T_5$ significantly ($P<0.05$) higher than $T_1$ and $T_4$ for digestibility of OM and CF.

2- $T_2$, $T_3$ and $T_5$ had significant ($P<0.05$) higher TDN and DCP values than $T_1$ and $T_4$. Also, $T_2$, $T_3$ and $T_5$ had significant ($P<0.05$) higher SV than $T_1$. Whereas, there were no significant differences between $T_1$ and $T_4$ in all nutritive values (TDN, DCP and SV), but $T_4$ had slightly higher nutritive values than

3- Bospro and Gustor XXI addition to the experimental rations increased insignificantly DM, TDN and SV intakes per head per day. $T_2$ insignificantly highest values of DM1, TDNI and SVI as kg / 11 / d, while $T_1$ achieved the lowest once. The DCP intake kg / h / d was almost significantly ($P<0.05$) increased by the addition of both Bospro and Gustor XXI compared with the control. Calves received diets supplemented with 30 g Bospro /h/d ($T_2$) had significantly higher DCPI (0.773 kg / d) than control group (0.663 kg/h/d) and $T_4$ (0.686 kg /h /d). The averages DMI, TDNI, SVI and DCPI / h /d increased gradually as period progress. The effect of interaction between period and treatments on feed intake (DM1, TDNI, DCP and SVI) were not significant.

4- Calves fed rations supplemented with Bospro and Gustor XXI were more efficient insignificantly ($P>0.05$) in DM conversion than control group. There were no significant differences in feed conversion values between all treatments and the control group. Results of feed conversion indicated that, calves of $T_2$ were more efficient in DMI, TDNI and SVI conversion than $T_1$, $T_3$, $T_4$ and $T_5$, while, $T_5$ treated animals were more efficient in DCP conversion than $T_1$, $T_2$, $T_3$ and $T_4$.

5- Values of feed cost / kg WG indicated that, $T_2$ and $T_5$ recorded the lowest values being 6.63 and 6.64 LE, respectively, whereas, $T_3$ and $T_4$ showed almost nearly the same values being 7.15 and 7.13 LE, respectively, and they were higher than that of $T_1$. $T_2$ and $T_5$ recorded higher economical efficiency values than the control, however, $T_3$ and $T_4$ had lower economical efficiency values. Also, calves received $T_2$ recorded the lowest feed cost / kg WG values and achieved the highest (best) economic efficiency values followed by $T_5$.

6- Results obtained showed that ruminal pH values tended to decrease insignificantly ruminal pH gradually as period progress for all treatments. The maximum pH values (P<0.05) throughout all the different periods of the feeding trial were shown at 0 hrs of feeding, whereas the lowest values (P<0.05) were stated at 3 hrs post feeding and increase (P<0.05) after that at 6 hrs post feeding. There were no significant differences between treatments at the start of the experiment. After 2 months, $T_2$, $T_3$ and $T_5$ recorded significantly (P<0.05) lower ruminal pH values as compared with $T_i$ and 14. After 4 months, $T_{,,}$ $T_3$ and $T_5$ groups showed also significantly (P<0.05) lower ruminal pH as compared with $T_1$. While, $T_4$ showed an intermediate value without significant different between other treatments. After 6 months, all supplemented groups with either Bospro and Gustor XXI had lower ruminal pH values than the control group, but the differences were not significant among all treatments. The overall means indicated that the same trend observed after 4 months, as $T_3$ and $T_5$ recorded significantly (P<0.05) lower ruminal pH values as compared with Ti. Whereas, $T_4$ showed an intermediate value without significant differences between treatments. The ruminal pH values ranged form 5.92 to 6.93. The present data showed that the interaction between treatment x time was not significant, while period x time was significant (P<0.05) effects on ruminal pH of calves.

7- Data indicated a gradual decrease in ruminal $NH_3$-N values as period progress, up to after 4 months. After 6 months ruminal $NH_3$-N values increased. The differences in pooled NH3-N values were only significant between values at the start of the experiment and those after 4 months. Results obtained showed that the NH3-N concentration was minimum before feeding, and increased after feeding, it reached the peak at 3 hrs post feeding then decreased at 6 hrs post feeding throughout all the feeding trial periods. At the start of the experiment there were no significant differences between treatments. After 2 months, the rations contained the low and high levels of Gustor XXI ($T_4$ and T5) recorded the lowest (P<0.05) NH3-N concentrations, while, those contained the low and

high levels of Bospro ($T_2$ and $T_3$) achieved the highest ones. The same pattern observed with $NH_3$-N concentrations after 2 months, but the differences between all treatments were not significant either after 4 or 6 months. The overall means showed that, T4 and Ts along with $T_i$ recorded the lowest N1-$1_3$-N concentrations, whereas T, and T3 showed the highest ones. The differences in $NH_3$-N concentrations between T3 and each of T1, T4 and T5 were significant ($P<0.05$), whereas those between T, and T3 were not significant. Ruminal $NH_3$-N concentrations ranged form 13.77 to 19.00 mg/100m1 at different times. The present data showed that the interaction between treatment x time and period x time were not significant effects on ruminal $NH_3$-N of calves.

8- The ruminal TVFA's concentration of all diets reached the highest ($P<0.05$) level after 3 hrs post feeding then declined at 6 hrs post feeding. Data showed a significant ($P<0.05$) increase in ruminal TVFA's concentration in all periods after feeding the experimental rations, also, there is a gradual increase ($P>0.05$) in ruminal TVFA's as period progress. Concerning the effect of treatments on TVFA's concentration, overall means showed that, T2 recorded the highest ($P<0.05$) concentration and $T_1$ showed the lowest ($P<0.05$) one. Moreover, the differences in TVFA's concentrations between all treatments were significant ($P<0.05$) except those between T3 and T5 were not significant. The present data showed that the interaction between treatment x time and period x time were significant ($P<0.01$) effects on ruminal TVFA's of calves.

9- Results obtained revealed that TP concentration in blood plasma of calves of T, was significantly higher than the other groups. Also, TP concentration for $T_3$, T4 and T5 were significantly higher than that for $T_1$. After 4 and 6 months, values of TP concentration were higher than at the start of the experiment and after 2 months. Also, alter 2 months, values were higher than at the start of the experiment.

10- Results revealed that Al concentration in blood plasma of calves of T, was significantly higher than that of $T_1$ and T4. Whereas, there were no significant differences in Al concentration between T1, T3, T4 and T5. Values of Al

concentration after 2, 4 and 6 months were significantly higher than that at the start of the experiment. Moreover, no significant differences in Al concentration were detected between the values after 2, 4 and 6 months, but the highest value was obtained after 2 months.

11- Data showed that there were no significant differences in globulin (G) concentration and Al / G ratio in blood plasma of calves of all treatments. G concentration increased gradually, while Al / G ratio decreased gradually as period progress.

12- Results obtained revealed that, urea-N concentration in blood plasma of calves of T, was significantly higher than those of other groups. Also, values of urea-N concentration of T3, T4 and T5 were significantly higher than that of $T_1$. No significant differences detected between T3 and T5. The concentrations of urea-N almost increased gradually as period progress.

13- Pooled data showed that, total BWG and daily BWG of the animals followed the growth sigmoid curve. Data showed that, the average initial LBW of calves was almost equal at the beginning of the feeding trial and there were no significant differences between treatments. At the end of first feeding period (60 days), calves fed **17** and T3 had insignificantly higher final LBW, total and daily BWG values than those fed $T_1$, 14 and T5. In the same time, Gustor XXI supplementation of the experimental diets ($T_4$ and $T_5$) improved ($P>0.05$) LBW, total and daily BWG as compared with $T_i$. Whereas, throughout the second, third and fourth periods of the feeding trial, calves fed on rations T2, T3 and T5 had insignificantly higher final LBW, total and daily BWG than those fed rations $T_i$ and T4. However, calves of T2 recorded the highest LBW, total and daily BWG values throughout all periods of the experimental trial. Results indicated that, there were no significant differences in both LBW, total and daily BWG of calves during all experimental periods due to treatments effect. Results of the overall feeding period (240 days) showed that, T2 had significantly ($P<0.05$) higher total gain and daily BWG values than those of $T_1$

and 14, whereas, T3 and T5 recorded insignificantly (P>0.05) higher total and daily BWG values than those of $T_1$ and T4.

14- The averages of HG, BL, HW, HH, WS, WH, WP and RL during the experimental periods and AG, AH, AD and CD at the end of the experiment for Friesian calves fed the experimental diets did not differ between all treatments.

15- Supplemented groups were insignificantly higher than control group for carcass length and round length. The highest value of dressing percentages at all status was recorded by 1·7, however, the lowest value recorded by T4. The weights and percentages of boneless meat increased significantly (P<0.05) with Bospro addition (T2). It could be noticed that groups supplemented with Bospro ($T_2$ and $T_3$) and Gustor XXI ($T_4$ and $T_5$) were higher than control group in boneless meat weights, however, group which supplemented with low level of Gustor XXI ($T_4$) only was lower than control group in boneless meat percentages. The average of bone weight was slightly higher for calves supplemented groups than for control group. However, percentages of bone increased significantly (P<0.05) with the low level of Gustor XXI ($T_4$).

16-Supplemented groups were better than control group and T, was the best group in weights of fore and hind quarters and its boneless meat weights. The weights and percentages of offals, organs and fat of some organs increased slightly in most cases by low level of Bospro. Also, the control group recorded the highest fat percentage and T2 recorded the smallest value and treated groups had higher lean percentage insignificantly (P>0.05) than control group.

17-The *Longissimus dorsi* area of the carcasses increased insignificantly (P>0.05) with supplemented groups with Bospro and Gustor XXI. The Gustor XXI groups have the highest values of average fat depth over *L. dorsi* followed by Bospro groups and control group recorded the smallest figure. The tenderness was increased significantly (P<0.05) with group supplemented with 30 g Bospro /h/d as compared with $T_1$ (control) and 14 groups. $T_1$ (control) and T4 groups were significantly higher (P<0.05) than T2 (30 g Bospro/h/d) and T3

groups. There were no significant (P>0.05) differences between treatments of CP, EE and ash contents of meat of rib cut.

It could be concluded that, supplementation of the diet for fattening calves with Bospro in the rate of (30 g / h /d) or Gustor XXI in the rate of (4.5 g /kg ration) improves the growth performance with increasing the digestibility coefficients, feed conversion, economic efficiency and have also a beneficial effect on some rumen and blood parameters. However, they have a limited effect on carcass characteristics.