

V. SUMMARY AND CONCLUSIONS

Thirty Friesian male-calves averaging 153 kg in L.B.W. with 258 days old, and thirty-five Friesian male-calves averaging 184 kg in L.B.W. with 344 days old from herd of Sakha (Karada), Animal Production Research Station (Ministry of Agriculture) were used in two successive experiments conducted throughout the summer of 1982 and 1983, respectively.

The study was conducted to examine the effect of feeding Napier grass, Sordan grass and Darawa as summer forages along with two different levels of concentrate on the performance of growing calves in the two experiments.

In each of the feeding experiments, the animals were divided into five similar groups and were randomly assigned to five feeding treatments. All calves were individually fed according to their body weights. During a green feeding period of 112 days, two levels of concentrate (1 and 2% of L.B.W.) were tested with both Napier grass and Sordan grass in the 1st feeding trial, and with both Napier grass and Darawa in the 2nd feeding trial, in comparison to a control ration containing 1% rice straw and 2% concentrates of L.B.W. During a finishing period of 98 days, all groups in

both feeding trials received a fattening ration containing rice straw and concentrates at a rate of 1 and 2.5% of L.B.W., respectively.

Two digestibility trials were conducted to determine the feeding values of the different rations used in the feeding trials. At the end of the 2nd feeding trial, two animals were randomly chosen from each group and were slaughtered to investigate the effect of feeding treatments on carcass characteristics.

The results and conclusions could be summarized as follows:

1) Average DM digestibility, during the 1st digestibility trial, was 73.87, 75.24, 75.20, 77.09 and 66.16% for A, B, C, D and E rations, while the average DM digestibility was 64.61, 71.63, 64.19, 71.87 and 63.58% for I, II, III, IV and V rations, during the 2nd digestibility trial. Rations containing summer forages and supplemented with concentrate has significantly higher digestibility coefficients than those of the control ration in the 1st trial. The digestion coefficients for all nutrients, except CP had increased with increasing the concentrate level in the diet in both 1st and 2nd digestibility trials.

2) Average DCP for rations A, B, C, D and E was 15.42, 16.16, 13.49, 14.42 and 9.32% respectively, during the 1st trial, while the corresponding values for rations I, II, III, IV and V during the 2nd trial was 10.24, 11.79,

5.74, 9.07 and 8.30%. There was a tendency for all the digestible nutrients, except the digestible CP, to increase with increasing the concentrate level from 1 to 2% of L.B.W. in the diets in both 1st and 2nd digestibility trials.

3) Average feeding values as TDN, SE and DE for rations A, B, C, D and E, during the 1st trial, were 70.39, 72.64, 73.80, 76.33 and 64.71% TDN; 61.99, 64.45, 64.68, 67.57 and 53.56% SE and 3.07, 3.21, 3.56, 3.69 and 3.29 Mcal/kg DM, respectively. Average feeding values as TDN, SE and DE for the rations I, II, III, IV and V were 61.99, 69.71, 61.89, 70.83, and 62.75% TDN; 52.46, 61.14, 53.55, 63.18 and 52.47% SE and 2.55, 3.33, 3.08, 3.48 and 2.84 Mcal/kg DM, respectively, during the 2nd trial.

4) Average daily DM consumption was 7.74, 8.43, 8.15 9.10 and 6.72 kg for calves fed rations A, B, C, D and E, respectively, during the whole period, in the 1st feeding trial, while the corresponding values, expressed as kg/100 kg L.B.W. were 3.23, 3.55, 3.43, 3.77 and 2.88 kg. In the 2nd feeding trial, the average daily DM consumption was 8.44, 9.24, 7.80, 8.96 and 8.18 kg for calves fed I, II, III, IV, and V rations, respectively, during the whole period, while the corresponding values, expressed as kg/100 kg L.B.W. were 3.03, 3.37, 2.80, 3.21 and 3.05 kg. The DM consumption from Sordan grass was significantly higher than that of Napier grass, during the 1st feeding trial, while the DM consumption from Napier grass during the 2nd feeding trial was significantly higher than that of Darawa.

5) Average daily body weight gains were 0.80, 0.83, 0.81, 0.84 and 0.77 kg for calves fed A, B, C, D and E rations, respectively, during the whole period in the 1st feeding trial, while the average daily gains were 0.88, 0.96, 0.92, 0.90 and 0.79 kg for calves fed rations I, II, III, IV and V, respectively, during the whole period in the 2nd feeding trial. The differences among groups in daily body weight gains were not significant in the 1st feeding trial. The calves which were fed control ration (V) in the 2nd feeding trial had significantly ($P < 0.05$) lower daily body weight gain than the other groups.

6) Average feed efficiency values expressed as kg gain/kg SE intake were 0.180, 0.166, 0.167, 0.151 and 0.213 kg for calves fed A, B, C, D and E rations, respectively, during the whole period in the 1st feeding trial, while the corresponding averages for feed efficiency expressed as kg SE required per kg weight gain were 5.562, 6.046, 5.998, 6.640 and 4.720 kg. Average kg gain/kg SE intake for the calves fed I, II, III, IV and V rations were 0.202, 0.185, 0.229, 0.172 and 0.189 kg, respectively, during the whole period in the 2nd feeding trial. Corresponding averages for kg SE required/kg weight gain were 5.067, 5.481, 4.458, 5.889 and 5.515 kg. The differences in feed efficiency were highly significant ($P < 0.01$) between calves fed control ration and those fed the other rations during the 1st feeding trial, and also between calves fed ration III and those fed the other rations during the 2nd feeding trial.

7) Average economical efficiency values expressed as the ratio of price of the weight gain to the cost of feed consumed were 1.207, 1.091, 1.209, 1.059 and 1.151 for the calves fed A, B, C, D and E rations, respectively, during the whole period in the 1st feeding trial, while the average values during the whole period in the 2nd feeding trial were 1.128, 1.085, 1.076, 0.906, and 0.974 for the calves fed I, II, III, IV and V rations, respectively. Economical efficiency of calves fed Napier grass was higher than those fed Sordan grass when supplemented with concentrate at a rate of 2% of L.B.W. during the whole period in the 1st feeding trial. Economical efficiency of rations containing Napier grass were the most economic of all the other rations during the whole period in the 2nd feeding trial. Feed cost per kg weight gain was L.E. 0.870, 0.963, 0.869, 0.993 and 0.913 for A, B, C, D and E rations, respectively, during the whole period in the 1st feeding trial, while the average values in the 2nd feeding trial were L.E. 0.931, 0.968, 0.976, 1.159 and 1.078 for I, II, III, IV and V rations, respectively. The results revealed that the feed cost per kg weight gain for calves fed summer forages was increased with increasing concentrate level in rations during the whole period in both 1st and 2nd feeding trials.

8) Average dressing percentages based on fasting live weight were 58.82, 58.91, 58.93, 61.14 and 54.71% for the calves fed I, II, III, IV and V rations, respectively, in the 2nd trial. The differences among groups in dressing percentage were not significant.

9) Average boneless meat percentages were 79.64, 80.45, 80.04, 80.08 and 75.79% for the calves fed the five respective rations, and the differences were not significant.

10) Average carcass components were: 67.92, 64.71, 71.23, 65.33 and 63.70% muscle; 20.36, 19.55, 19.96, 19.92 and 24.21% bone and 11.72, 15.74, 8.81, 14.75 and 12.09% fat for the carcasses of calves fed I, II, III, IV and V rations, respectively. The percentages of muscle and bone of carcasses were not affected by different feeding treatments, and only significant differences ($P < 0.05$) were found in fat percentage between carcasses of calves fed rations containing low and high concentrate levels.

11) Average muscle: bone ratio was 3.34, 3.31, 3.57, 3.28 and 2.63 for carcasses of calves fed the five respective rations. The average muscle: bone ratio for the calves fed ration (V) was lower than those of calves fed ration containing Napier grass or Darawa.

12) The averages physical characteristics were 28.90, 29.65, 15.10, 20.75 and 26.75 cm² eye muscle area; 3.15, 3.40, 3.37, 3.30 and 4.11 cm² tenderness; 2.95, 4.40, 3.66, 1.60, and 1.63 cm² water holding capacity (WHC) and 0.655, 0.643, 0.638, 0.768 and 0.339 colour intensity, for the carcasses of calves fed I, II, III, IV and V rations, respectively.

13) The chemical composition of the eye muscle (Longissimus dorsi) was on the average 75.77, 76.97, 76.58, 77.33 and 76.68% moisture; 85.98, 87.01, 87.68, 88.55 and 88.48%

CP; 8.74, 7.94, 6.65, 6.57 and 6.28% EE, and 5.28, 5.05, 5.67, 4.88 and 5.24% ash (on DM basis) for the carcasses of calves fed the five respective rations.

It could be concluded that increasing the level of concentrate from 1 to 2% of L.B.W. in the rations of groups fed summer forages improved slightly body weight gain and dressing percentage, increased significantly fat percentage and decreased muscle percentage, while each of boneless meat and bone percentages did not nearly change.

Due to the fact that too much fat deposition in the carcass does not satisfy the consumer and moreover it is uneconomic for the producer, hence it is recommended to feed calves, before finishing period, with summer forages supplemented with low level of concentrates at the rate of 1% of body weight. Such practice ensures satisfactory body weight gain with high feed efficiency and low feed costs to produce 1 kg weight gain.