V. SUMMARY AND CONCLUSION

This study was carried out in Sids Research Station, Animal Production Research Institute, Ministry of Agriculture, during 1987. The objectives of this study were to study the effect of treating soybean straw and corn stover with 3% anhydrous ammonia on the feeding qualities of both roughages and the performance of growing Friesian calves throughout a feeding trial continued for 252 days in two successive periods, each lasted for 126 days.

Twenty five Friesian calves averaging 243 kg of live body weight and having about 13 months old were divided into five similar groups distributed randomly. Each received one of the five following experimental rations during the first feeding period: (a) untreated soybean straw ad-lib plus 3 kg concentrate feed mixture/head/day, (b) ammoniated soybean straw ad-lib. plus 3 kg concentrate feed mixture/head/day, (c) untreated corn stover ad-lib. plus 3 kg concentrate feed mixture/head/day, (d) ammoniated corn stover ad-lib. plus 3 kg concentrate feed mixture/head/day and (e) rice straw ad-lib. plus 3 kg concentrate feed mixture/head/day (control). In the second feeding period, calves in all groups were fed on rations consisted of concentrate feed mixture and rice straw according to Shehata Allowances (1970). These allowances were changed every two weeks according to change in animal live body weight. Five digestibility trials

were conducted during the first feeding period to determine the digestibility and feeding values of the experimental rations. At the end of feeding trial, two representative animals from each group were slaughtered for carcass test. Results of this study could be summarized as follows :

1. Ammonia treatment increased CP concent of soybean straw and corn stover from 7.27 to 13.42% and from 3.61 to 12.48% (about 85 and 246%), respectively. Whereas CF content decreased from 44.10 to 42.35% and 46.99 to 43.45% (about 4-8%) in soybean straw and corn stover with ammonia treatment, respectively.

2. Values recorded for nutrients digestibility were DM 79.64, 79.71, 78.08, 79.34 and 75.08%, CP 76.24, 81.66, 74.63, 77.29 and 66.31%, EE 80.01, 86.67, 76.78, 84.70 and 76.11%, CF 74.59, 76.79, 78.46, 79.51 and 74.45%, NFE 87.58, 85.94,81.70, 83.05, and 80.55%, OM 81.52, 82.32, 79.35, 80.98 and 76.61% and GE 81.48, 81.17, 78.85, 79.21 and 73.47% for rations A, B, C, D and E, respectively, indicating that ammonia treatment increased the apparant digestibility of most nutrients in both roughages. However, the differences due to ammonia treatment of both soy-

bean straw and corn stover were significant ($P < 0.05$) for EE digestibility, whereas there were no significant differences due to ammoniation with regard to DM, CP, CF, NFE, OM and GE digestibilities.

3. Average DCP values were 9.42, 12.86, 6.94, 11.61 and 6.59% for rations A, B, C, D and E, respectively. Values of DCP in rations containing ammoniated roughages were significantly ($P < 0.05$) higher than those in rations including untreated ones.

4. Averages of feeding value were 58.68, 61.55, 56.52, 59.73 and 51.35 as SV and 75.21, 77.90, 74.76, 77.11 and 68.09 as TDN for rations A, B, C, D and E respectively. Ammoniation of either soybean straw or corn stover slightly improved feeding values in terms of SV and TDN, but the differences were not significant.

5. Averages of daily DM intake from ammoniated roughages (either soybean straw or corn stover) were significantly ($P < 0.05$) higher than those from the untreated ones during the first feeding period. The voluntary intakes in this period were 4.05, 5.02, 4.52, 5.42 and 4.30 kg DM/calf/day for rations A, B, C, D and E, respectively. Averages of daily DM intake during the second feeding

period were 3.66,3.88,3.76,3.32 and 3.64 kg from rice straw and 7.35, 7.87, 7.54, 6.71 and 7.35 kg from the concentrate for rations A, B, C, D and E, respectively. The corresponding intakes recorded over the entire period were 3.85, 4.45, 4.14, 4.37 and 3.97 kg from roughages and 5.05, 5.31, 5.16, 4.73 and 5.05 kg from the concentrate. Differences in daily DM intake from either roughages or concentrate during the second or entire feeding periods were not significant.

6. Values of average daily gain at the first feeding period were 0.540, 0.735, 0.630, 0.783 and 0.613 kg for calves fed rations A, B, C, D and E, respectively. The corresponding values were 1.014, 1.075, 1.035, 0.914 and 1.003 kg at the second feeding period, and 0.777, 0.905, 0.833, 0.848 and 0.808 kg at the entire feeding period. Differences in daily gain during the first period were significant ($P < 0.05$), whereas, no significant differences in daily gain were detected throughout the second and entire feeding periods. However, calves fed ammoniated roughages gained signifi - cantly ($P < 0.05$) more daily weights than those fed untreated ones.

7. Calves fed ammoniated roughages (either soybean straw or corn stover) showed better production efficiency and feed conversion values than those fed untreated ones during the first feeding period. However, the differences in both production efficiency and feed conversion values due to ammoniation of soybean straw were significant ($P < 0.01$ and $P < 0.05$), while those attributed to ammoniation of corn stover were not significant. In the second feeding period, production efficiency and feed conversion values were almost similar, whereas, values obtained during the entire period indicated that ammoniation of soybean straw and corn stover slightly improved both production efficiency and feed conversion values. However, the differences were not significant during the second and entire feeding periods.

8. Ammoniation of soybean straw and corn stover decreased feed cost/kg gain values in the first feeding period by 18.84% and 11.11% as compared with untreated ones, respectively. However, values of feed cost/kg gain recorded in second feeding period were almost similar for all experimental rations, while values calculated during the entire period showed a trend similar to that observed in the first feeding period, but the effect of ammoniation was less pronounced.

The corresponding values on DM basis were 87.14, 86.87, 87.00, 87.59 and 87.74% for CP, 8.36, 8.44, 8.40, 7.63 and 7.60% for EE and 4.50, 4.69, 4.60, 4.78, and 4.66% for ash. Differences in chemical composition of eye muscle for calves fed the experimental rations were not significant.

Results obtained in the present study indicated that ammonia treatment increased CP content of soybean straw and corn stover, while it decreased its contents from CF. Inclusion of ammoniated roughages in the experimental rations improved both digestibility and feeding values of these rations. Also, ammoniated roughages increased daily intakes and daily gains of Friesian calves during the feeding trial. Moreover, ammoniation improved feed efficiency and economic feed efficiency of both roughages. Accordingly, it is recommended to use ammoniated soybean straw and corn stover in rations of growing Friesian calves to improve weight gains, feed efficiency, and economic feed efficiency values.