CATTLE AND GRASSLAND
EFFECT OF UREA SUPPLEMENTATION IN DRY SEASON FEED
FOR NDAMA CATTLE

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TWENTY Ndama steers averaging 114 kg. were divided into four groups of five animals each and randomly assigned to treatments to study the effect of feeding maize silage supplemented with urea and a plant protein in addition to the normal grazing on the performance and growth during the dry season. The treatments were as follows: (a) Bush grazing of natural range land, (b) Grazing plus maize silage fed at 10 kg. per day, (c) Grazing plus maize silage at 8 kg. per day and groundnut cake at 1 kg. per day, and (d) Grazing plus maize silage at 8 kg. per day, groundnut cake at 0.5 kg. per day and feedgrade urea at 1.0 gm. per day. Water and salt licks were provided ad libitum, and the animals weighed every 28 days. At the end of the 110 days trial, the average weight gain per animal in the different treatments were as follows: (a) 3.0 kg., (b) 9.7 kg., (c) 8.9 kg., and (d) 8.2 kg. The results suggest the advantage of supplementing bush grazing with maize silage during the dry season, but appears to show no advantage with additional protein supplementation. The short duration of the trial in not allowing enough time for the cattle to get used to the protein supplements makes the inference from the results inconclusive as the weighbacks (feed left uneaten) were greater in rations containing the protein supplements in the initial stages of the experiment than towards the end.

GRASSLAND RESEARCH IN NIGERIA — A SURVEY WITH RECOMMENDATIONS

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GRASSLAND research in Nigeria, past and present, is briefly surveyed and recommendations for a future approach are provided. The considerable potential of the Nigerian environment for grassland farming and the tremendous amount of total research efforts applied are not reflected in the level of animal production which at this stage is low. This imbalance is attributed mostly to limited application of agronomic principles to animal nutrition problems. Significant liveweight gains during the rainy season and at least liveweight maintenance during drought periods are desirable and would suggest that emphasis be placed on a proper integration of the soil, plant and animal systems. Consequently, immediate active research is required into soil nutrient status and plant responses, range improvement to facilitate selective animal grazing of abundant, high quality plant components; increase in acreages of irrigated sown pastures; use of cheaper sources of supplementary feeds and judicious adjustment of stock numbers. The implications are that strong consideration be accorded improved plant species introduction, plant adaptation studies, mineral nutrient/grass legume balance, economics of fodder conservation and establishment of seed production units. Mention is made of effective channels of disseminating research findings and also the need for governmental financial support.
THE EXTENSION OF THE GRAZING PERIOD INTO THE DRY SEASON IN WESTERN STATE OF NIGERIA

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An important bottleneck to livestock production in Nigeria is the scarcity of grazable forage during the dry months of the year. Seasonal variation in pasture production is not peculiar to this country. In many developed countries the feeding of conserved materials (Hay and silage) with or without concentrate during scarcity period is not uncommon. In a developing country, irrigation of pasture land and conservation of forage for feeding in the dry season are cost-increasing procedures which are not attractive to private producers. Only on government and quasi-government institutions can silage and, to a less extent, hay, be found. However, by adopting suitable herbage management especially towards the close of the rains, green herbage could be produced far into the dry season. This will reduce the requirement for conserved materials. Two experiments on nitrogen fertiliser and the time of cutting management on Elephant grass, (Pennisetum purpureum), Guinea grass (S112) (Panicum maximum), and Guatemala (Tripsacum laxum) showed that N-fertiliser applied after the close of the rain had little effect on the dry season production of grass. Also nitrogen fertiliser applied during the early season had no residual effect on the yield of the herbage in the dry season. Cutting in late September or early October, however produced valuable green fodder in the following January. Cutting Elephant grass and Guinea grass in October, produced grazable forage of about 3500-4000 kg/ha, of dry herbage of 8% average crude protein content. Assuming an intake of about 15 kg dry herbage per day by the local cattle, the practice of cutting these pasture species in October and resting till January produces herbage that offers the stock about 200-250 grazing days per hectare. It was concluded that the time of the last cut at the close of the rains more than the nitrogen fertiliser application was effective in extending the grazing period into the dry season.

EFFECT OF ‘POOLING’ ON THE CRUDE PROTEIN CONTENT OF FOUR FORAGE SAMPLES

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Ten samples each of four forages (Stylosanthes guianensis, Stylosanthes humilis, Pennisetum purpureum and Digitaria smutthii) were individually analysed for crude protein. The ten samples for each forage were then bulked, and the four bulked samples were analysed for crude protein in six replicates. No significant differences (P<0.05) were obtained between any of the six replicates for each forage and the corresponding mean of the individual analysis; and all the six replicates fall within a 95% confidence limit about the mean from individual analysis. It was therefore concluded that where only the mean of a series of samples is required, the samples can be bulked and the crude protein analysis carried out on the bulked sample.
INFLUENCE OF PREPARTUM INCREASE IN NUTRIENT CONCENTRATION ON THE YIELD AND COMPOSITION OF MILK OF WHITE FULANI CATTLE AT IBADAN

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Three groups of White Fulani cows were offered, in addition to an ad libitum basal roughage ration, various amounts of concentrate mixture to provoke energy and protein for pregnancy allowances: at 125 (A), 100 (B) and 75% (C) of the ARC (1965) feeding standard for dairy cattle, during the last six to ten weeks of gestation. During 12 weeks of the ensuing lactation, all cows were fed fresh grass to satiety and concentrate mixture of the same formulation as in the dry period at a uniform rate which provided 1.47 Mcal metabolisable energy (ME) per kilogram milk produced. The animals were housed in individual stalls throughout the experimental period. Calf birth weights did not differ significantly between the treatment groups. Prepartum energy levels did not significantly affect the yields of milk, 4% fat-corrected milk (FCM) and solids-corrected milk (SCM). Percentages of fat, solids-not-fat (SNF) and total solids were not significantly different among the groups. Cows in treatment A produced milk of a significantly higher (P<0.01) protein content than the other two groups. There was a significant difference (P<0.01) between the treatment groups in the percentage lactose of the milk. Cows on treatments A and B being higher than those on treatment C. Supplementary concentrate feeding at the different levels prepartum, resulted in significant differences (P<0.02) of milk protein, lactose and solids-not-fat (SNF) production. Group B cows produced less fat than those in A (P<0.01) and C (P<0.05). Yields of total solids were almost the same for groups B and C, but significantly (P<0.01) less than that produced by group A cows. Differences in mineral production were all very small and non-significant.

OBSERVATIONS ON THE WHITE FULANI (BUNAJI) ZEBU CATTLE OF NORTHERN NIGERIA IN A SOUTHERN NIGERIA ENVIRONMENT, VI: THE RELATIONSHIP BETWEEN FEED INTAKE AND ANIMAL PRODUCTION OF LACTATING COWS AT IBADAN

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Data on individual feed intake, milk yield and liveweight measurements of 62 White Fulani cows at different stages of lactation, grazing with or without supplementary concentrate feeding were programmed in a computer to obtain regression equations relating the intake of feed and the associated parameters to the liveweight (LW), metabolic body size (LW 0.73), liveweight change (LWC), milk yield (MY) and stage of lactation (WL). The results showed a positive and highly significant (P<0.01) correlation between dry matter intake DMI, LW and LW 0.73 DMI was also positively and significantly (P<0.02) correlated with MY for cows supplemented at pasture, but non-significant for cows which received no supplementation.
The equations relating DMI to WL showed a negative correlation, which attained significance (P<0.05) for the supplemented cows. DMI was positively but non-significantly correlated with LWC. Daily digestible organic matter intake (DOMI) showed a positive and significant (P<0.05) correlation with LW and LW^{0.73}. It was also positively and significantly (P<0.01) correlated with MY. The correlation between DOMI and WL was positive and significant (P<0.001) for cows supplemented at pasture, but non-significant for cows without supplementation. DOMI was positively but non-significantly correlated with LWC. The results are compared with those in the literature and it is suggested that the term LW^{0.73} would be preferred in predicting feed intake for the lactating White Fulani cattle, since the F values were higher than those for the term LW particularly when both variables were associated with faecal output (FO), a term which together with organic matter digestibility, were used in calculating DMI and DOMI in these studies.

THE YIELD, INTAKE AND ANIMAL PRODUCTION OF FOUR TROPICAL GRASS SPECIES AT IBADAN

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The yield, intake and animal production of four grass species namely: Cynodon nlemfuensis var. robustus, Pennisetum purpureum Schum, Cynodon nlemfuensis var. nlemfuensis (lb8) Panicum maximum Jacq. designated as treatments M, N, P and Q respectively, were studied over a 1,226 day period. Each treatment was grazed at three stages of growth: four week, six week and eight week intervals.

Total dry matter yields for the whole period ranged from approximately 22 metric tons for treatment N, grazed at an interval of four weeks to 65 metric tons for treatment Q, grazed every eight weeks. The mean dry matter yields per day varied between approximately 18 kg for treatment N, grazed at four week intervals and 53 kg for treatment Q, grazed at eight week intervals.

With the exception of treatment N, dry matter intake (by sheep) per kg of metabolic weight per day decreased with increased maturity and ranged from approximately 86 kg in treatment P, grazed every four weeks and 43 kg in treatment N, grazed at the same period.

Treatment means for the whole period of live weight increases of grazing Zebu steers gave daily increase of 369 g per head in treatment Q, followed by treatment N, with 316 g and treatments P and M, with 308 g and 220 g respectively. Analysis of variance indicated highly significant differences between seasons, years and between treatments (P<0.01) but the interactions between treatments and years were not significant. When seasonal for the whole period data were pooled for each treatment the differences between treatments and between periods were statistically significant at the 5% level of probability. Treatment Q was significantly superior to treatment M (P<0.01) and treatments N and P were significantly different from treatment M (P<0.05). The differences between treatments Q and P, Q and N and, N and P were not statistically significant.
Comparison of Soyabean Meal, Starea and Urea in Feed-lot Supplements, and of Soyabean Meal and Starea Blocks as Protein Supplements for Cattle on Weathered Range

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Feedlot: A growth and finishing trial was conducted to compare soyabean meal (SBM), Starea (a processed intimate mixture of gelatinized starch and urea) and urea as practical feedlot supplements. Five rations were supplemented with SBM, SBM-Urea (50:50 ratio), Urea, Sorghum Starea-70 (SS-70) and Wheat Starea-70 (WS-70). The rations contained equivalent amounts of crude protein (11.6%) and digestible energy. The supplementary nitrogen sources contributed about 21% of the total dietary protein. One hundred and five feeder Angus steers having an average initial body weight of about 281.8 kg were randomly allotted to 15 pens of seven steers each. Three pens were assigned to each of the above five protein supplemented rations. At the conclusion of the 168-day trial, performance and carcass data were analysed. Although none of the differences, except kidney fat, tested were statistically significant (P<0.05), certain trends were evident. Dry matter consumption and daily gains tended to be greater on SBM supplemented ration. Consumption and gains on WS-70, SBM-urea and SS-70 were similar though SS-70 was observed to be higher than the others in gains and almost equal to SBM. Feed conversion on SBM and SS-70 was about equal and better than on SBM-urea, urea or WS-70. Steers on urea were least efficient in feed conversion. Cost of gain was lower on SS-70 while SBM and SBM-Urea appeared to be more expensive. Urea and WS-70 were intermediate in costs. Carcass analysis showed percent kidney fat to be significantly lower (P<0.05) on SBM-Urea. All other traits were similar on all rations. However, large rib eye muscle and good marbling score were indicated by steers on SS-70. These steers also tended to grade higher.

Range. Fifty-two pregnant cows (Hereford and Angus) were divided according to weight (466.4 kg average) and age (5 years) into two groups of 26 animals each. One group had access to Soyabean blocks and the other to Starea blocks. The blocks were the main sources of nitrogen. Each 28 days, the cows were weighed and rotated between two adjacent pastures (Kansas Flint hills range). Salt and minerals were made available. At the end of the 84-day trial, weight changes and block consumption and loss were examined. Cow weight changes were similar with both supplements. Consumption of Starea supplement declined throughout the trial, while soyabean meal block consumption remained constant. Subsequent calf weaning weights and cow rebreeding dates were slightly in favour of Starea blocks though differences were not significant (P>0.10).