SOLUTION TO MEAT SHORTAGE: PRODUCTION OF PIGS, POULTRY AND RABBITS (WITH THE EMPHASIS ON POULTRY PRODUCTION)

By

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The global and regional problems of the production of sufficient animal protein for human consumption are briefly reviewed while the factors which immediately triggered the current meat-shortage crisis in Nigeria are highlighted. The existing constraints on animal production are examined in so far as they affected poultry production. Since pig, rabbit or poultry production in contrast to beef production, lends itself to rapid cropping, any of the former should find a place of priority in the solution to meat shortage problems in Nigeria. There are however various constraints and 3 of them namely problems of grains and feed, diseases and lack of adequate manpower, would appear to be the most formidable. The potentials of the local chicken are examined in the context of commercial poultry production but since the disease resistance and commercial potentials of these chickens are still insufficiently known, proved commercial exotic breeds should remain the material of choice for a revolutionised poultry meat and egg production in Nigeria.

ABSOLUTE AND RELATIVE ORGAN GROWTH IN THE PIG
1. THE MALE GENITAL TRACT

By

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SEVENTEEN boars, all born between the end of April and the beginning of June, 1975, were slaughtered at ages ranging from 1 to 9 months. The weights of the body (prior to slaughter) and of the whole genital tract, as well as of its parts, namely the testes, the epididymis, the vesicular gland and the bulbourethral glands (immediately after slaughter) were determined and subjected to a step-wise multiple regression analysis, using age or body weight as the independent variables.

The mean daily gain of 452 g from 1 to 9 months is typical of the live-weight growth in the Swine Physiology Unit of the University of Ibadan.

Age and reproductive organs were not as closely associated with each other (r = 0.96) as body weight and organ weight (r = 0.99), with the exception of the vesicular gland, which had a lower correlation with both age (r = 0.93) and with body weight (r = 0.93). The association between age and reproductive organ weight was best represented by a cubic curve, while the relationship between body weight and the various reproductive organs was predominantly quadratic in nature, as judged from the standard error of estimate.
METABOLISM OF BOAR SPERM MATEZOAA

1. Effect of storage temperatures and added coconut water on bacterial growth of boar semen

By

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The effect of two storage temperatures (10°-15°C, 18°-21°C) and the effect of the addition of four levels of coconut water to storage media for boar semen were tested, for the bacterial growth in the stored boar semen samples.

The effects due to the temperatures and to the coconut water were highly significant (P<0.01). It was established that bacterial growth in both the unextended and extended boar semen could be controlled by the use of the appropriate temperature and storage media.

EFFECT OF SEASONAL VARIATIONS ON EGG PRODUCTION OF CHICKENS IN THE UNIVERSITY OF NIGERIA POULTRY UNIT

By

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The records of egg production in the poultry unit of the University of Nigeria, Nsukka, provided the data which were statistically analyzed for the year 1973 and 1974, respectively. Average number of birds for the breeds studied were 490.78 for Thonger 909, 683.25 Harco, 1197.33 for Yarkon for 1973 and 446.88 Thonger 909, 402.88 Harco, 375.55 Yarkon and 1082.00 Brown Hyline for 1974.

The average egg production rates per hen per year in 1973 were as follows: 110.47 for Thonger 909; 140.77 for Harco; 208.02 for Yarkon, while the production for 1974 were 75.71 for Thonger 909, 101.09 for Harco, 26.32 for Yarkon and 209.74 for Brown Hyline. The Yarkon had the highest average percent mortality of 18.81% and 48.88% for 1973 and 1974 respectively. A general decline in the number of eggs produced by the breeds studied occurred from late August to early October in both 1973 and 1974.

Statistical analysis of variance reveal that there was no equality in the mean squares of both hen-day egg production and hen-housed egg production and mortality among the breeds studied. The inequality was statistically significant at 5% level of probability. There was equality
in the mean squares of hen house egg production within all the breeds and the same for hen-day egg production except for Yarkons which showed inequality in the mean square for hen-day production at 5% level of probability. Incomplete data made it impossible to analyse statistically the hen-housed and hen-day egg production within the Brown Hylines breed. Thornber 909 was consistently the poorest egg producer both in terms of annual average egg production per hen (110.47 eggs in 1973 and 75.71 eggs in 1974) as compared to Yarkons' 208.02 eggs in 1973 and Brown Hylines' 209.74 eggs in 1974) and hen-day rate of egg production (Thornbers' 47.07% as against Yarkon's 57.39% in 1973, and Thornbers' 31.27% as against Hylines' 63.87% in 1974). Intraglock variability in egg production among the four breeds was not statistically significant. Annual average mortality was 31.08% for 1973 and 95.38% for 1974 for the four breeds.

EFFECT OF PROTEIN DEFICIENT GARBAGE ON THE GROWTH RATE OF A GROUP OF WEANER PIGS

By

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It is essential to feed all livestock adequately in accordance with the right amount of the right kinds of food. The largest single item of cost in producing farm animals, is food, representing about 80 percent of the total cost of producing pigs because of their rapid growth.

The objective of this research is to investigate into the profitability of using garbage as the cheapest foods that will fulfill requirement efficiently and minimize waste, at least during the early stage of growth of the pigs. The experiment lasted for 15 weeks.

The graph of Average Weekly Body Weight Gain in kilograms versus time, in weeks, referring to the period of experiment used to illustrate the growth patterns showing the mean growth rate for the two groups. The mean growth curve for those on concentrate ration diverges more or less steadily from the growth curve of those on garbage feed and the greater difference at the 7th week of the experiment is relatively inconspicuous. At the 15th week the difference is still not remarkable.

The difference in gain between the two groups of pig on concentrate ration and garbage feed, respectively, was not statistically significant at 5% level of probability; P = 0.05. It appears, therefore, that the effects of concentrate and garbage feeds on the growth rate of the pigs used for this experiment are identical for both groups, although those pigs were fed for only 105 days. The effect of feeding the garbage for a longer period of time - to different ages and weights - has not been determined in this Institution, at least since after the civil war. Further experiment for a longer period needs to be carried out.
THE STIMULATION TIME FOR COPULATION IN PURPOSEFUL STRANGE MATINGS OF HOUSE PIGEONS (COLUMBA LIVIA L.)

By

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The purposeful strange matings of house pigeons, in which mates were paired for 5 days in special nesting cells which allowed sight, auditory and contact stimulation without allowing "illegal" matings, have been found to break the monogamous matting behaviour of pigeons. Strange elite males were found to copulate with randomly selected females when placed together in mating pens. It was specifically found that over 90% of all copulations came within 5 minutes of introduction of female pigeons to strange elite male pigeons. Particularly interesting was the fact that many copulations (40%) came so fast that they were completed within one minute and that about 95% of all copulations occurred within 10 minutes of introduction of the mates. It was recognised that for practical purposes, it is recommended that strange mates be not allowed to stay more than 5 minutes together to save on enormous labours costs necessitated by close and continuous observations during copulations. The purposeful strange mating method was confirmed as a biotechnical way of polygamous pigeons for calculation of population parameters such as breeding value, heritability and genetic correlation between traits.

EFFECT OF ROTATION NUMBER ON PARAMETERS OF FERTILISATION OF POLYGAMOUSLY MATING DOMESTIC PIGEONS (COLUMBA LIVIA L.)

By

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The use of the rotation method involving special keeping techniques to circumvent the disadvantages of the monogamy of the house pigeon or to break this monogamous matting habit has been described and experimented on. Monogamy is the typical pairing bond in which a pair of pigeons maintains its mating bond for life and this is very disadvantageous from a breeding point of view. Under a monogamous mating system, it is difficult to make accurate calculations of breeding values, elite matings which enable the limitation of the number of male pigeons involved in breeding groups and to differentiate in any analysis the genetic or environmental contribution to population parameters. It was found that rotational mating method involving the rotation of either female or male pigeons was a satisfactory one in polygamising pigeons by biotechnical means. This was borne by the fact that no significant difference at 5% probability level were found in the percentage fertilisation and productivity rate in 7 rotations of mating pigeons. Also the regression (b = 0.72%) of percentage fertilisation on rotation number and the regression (b = 0.89%) of productivity rate on rotation number were found not to be significantly different from zero. The correlation coefficients attached to both regressions (r = 0.41 and r = 0.34) respectively were not significant at 5% probability level. Furthermore, the population structure afforded by the rotational method provided an ideal structure for progeny testing pigeons.
LOCAL PEPPERS AS SOURCES OF CAROTENE VITAMIN A AND COLOUR IN THE EGG YOLK

By

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Eggs and other poultry products are produced rapidly to alleviate low protein consumption. Acceptability of eggs depends partly on the yolk colour and two local peppers have been shown as good pigments of the egg yolk. Levels of 0.2, 4 and 6% Capsicum annuum and Capsicum frutescens included in the rations of laying hens did not affect egg production but 6% level of dietary pepper stimulated laying of large sized eggs.

C. annuum was more effective in stimulating deposition of carotene and vitamin A in the egg yolk than C. frutescens but generally the higher the level of dietary pepper the higher the yolk content of carotene and vitamin A. Corresponding levels of the two peppers produced similar colours in the egg yolk while at least 4% of either peppers produced colour rating of 18 and above on the Heimann-Curzer rotor scale.

EVALUATION OF THE OPERATING PERFORMANCE OF A CHEAP EXPERIMENTAL SMOKE HOUSE.

By

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A simple, low cost type of smoke-house was designed for use at farm-house level in the processing and preservation of meat and fish products. The smoke house consisting of a smoke producer, an inter- venting duct, a smoke chamber, hood and stack for spent-smoke exhaust was designed to use wood shaving sawdust or wood chips in generating smoke. By carefully regulating the adjustable shutter vent located on the smoke producer, operating temperatures of 34, 38, 49, 60 and 71°C were obtained and maintained for a period of three hours in each instance. A standard sausage formulation smoked at these different temperatures was found to suffer appreciable amount of shrinkage. These were more marked at the higher temperatures, although the temperature differences were not significant. Peak internal sausage temperatures were usually slightly below the operating temperatures. Leathal effects were also noted on the total bacteria as well as yeast and mold organisms.

It was also established that the level of ice flakes added in the basic sausage formulation greatly affected the proximate composition of the smoked and subsequently aged sausage product.
**ENDOGENOUS LOSSES OF NITROGEN AND PROTEIN REQUIREMENT FOR MAINTENANCE OF SHEEP**

**By**

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Four fistulated and four intact West African dwarf wether sheep maintained on hay and concentrate supplements were used for a study of metabolic faecal nitrogen (MEN) and endogenous urinary nitrogen (FUN). The composition of the faecal losses was examined. The values obtained enabled calculation of nitrogen requirement of the sheep for maintenance as well as the value of the experimental rations in the nutrition of the sheep.

Value of MEN obtained by two methods were 3.31 and 3.10 g/kg dry matter (DM) intake. Endogenous urinary nitrogen value was 0.024 g/day/metabolic weight ($W_{kg}^{0.75}$).

Chemical analysis of the faeces of the sheep showed that 21.1% of faecal nitrogen were present as undigested dietary nitrogen (UDN), 61.6% was present as microbial and endogenous nitrogen (MEN) and 17.3% as water-soluble nitrogen (WSN).

The biological values (BV) of the rations ranged from 85.7 to 100.0%, and the digestible crude protein (DCP) requirement for maintenance were 1.20 and 0.41 g/day/$W_{kg}^{0.75}$ during the trials.

Values obtained for endogenous losses and N requirement for maintenance were low compared with values reported for other breeds and this may indicate adaptation of the dwarf sheep for survival under inadequate dietary supply.

**EFFECT OF VARYING CONCENTRATE GRASSHAY RATIONS ON FEED INTAKE AND PERFORMANCE OF WEANER LAMBS**

**By**

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Twelve rams of the West African Dwarf Sheep of between 10-12 months of age and weighing between 15.7 and 24.6 kg were divided into four groups of 3 animals each. A group was assigned to one of four diets consisting of the following concentrate: grass hay ratios: 80:20; 60:40; 40:60 and 20:80. Feed intake, nutrient digestibilities and efficiency of feed utilization were measured.

As the level of grass hay increased, the contents of crude protein, ether extract, nitrogen-free extract (NFE) and gross energy of the diets decreased, while crude fibre and ash contents increased almost linearly. Voluntary feed intake decreased with increasing levels of grass hay except in diet 2 (60:40 concentrate: grass hay ratio). Generally, the digestion coefficients for dry matter, gross energy and ether extracts increased with increasing levels of grass hay, while those of crude protein, crude fibre and NFE decreased. With the exception of animals on diet 2 (60:40 concentrate: grass hay ratio) which had the highest daily body weight gain, average daily weight gain and efficiency of feed utilization decreased with increasing levels of grass hay.
OESTROGENIC ACTIVITY OF GUINEA GRASS AND STYLOSANTHES GRACILIS AT DIFFERENT STAGES OF GROWTH

By

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Purified oestrogenic substances obtained from twenty five grams of each of air-dried ground samples of the leaves and stem portions of guinea grass (Panicum maximum var. S 112) and Stylosanthes gracilis at four stages of growth were injected at low concentrations for four consecutive days into immature female mice weighing 8 to 10 grams in order to determine the oestrogenic activities of the forages at different stages of growth. The four stages of growth at which the forages were harvested for the determination were the early vegetative growth, full vegetative growth, early bloom stage and full bloom stage, with the harvest from each stage divided into the leaves and stem portions. A day after the last injection, the mice were sacrificed and their uteri removed and fixed in Bouin's fluid for 24 hours. The potencies of the extracts injected were determined by plotting the uterine weights obtained on a standard curve of mice receiving standardized doses of stilbestrol ranging from 0 to 0.04 micrograms. The mean values obtained for the potency of guinea grass were 0.30, 0.23, 1.41 and 0.86 micrograms of stilbestrol per kilogram for the leaves portion and 0.28, 0.15, 1.01 and 0.49 micrograms of stilbestrol per kilogram for the stem portion at growth stages respectively. Mean values for Stylosanthes gracilis leaves portion were 0.62, 0.85, 1.50 and 0.75 micrograms of stilbestrol per kilogram and those for the stem portion were 0.43, 0.62, 0.80 and 0.55 micrograms of stilbestrol per kilogram at the growth stages respectively. The results show that the oestrogenic content of Stylosanthes gracilis was significantly higher (P<0.05) than that of guinea grass. Significantly higher (P<0.05) activity was present in the leaves than in the stem portion, and that the potencies were significantly different at the various stages of growth.

AIMS OF SUCCESSFUL DAIRY CATTLE BREEDING

By

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The main aims of successful dairy cattle breeding are high production of milk, fast growth rate, good milking characters, good fertility, and good viability. These aims are achieved by performance testing, progeny testing, selection of bull dams, selection of bull sires and deep freezing of semen. In Sweden for instance out of 250,000 recorded cows, 3000 are chosen as bull dams and out of 300 selected bull calves, 150 are accepted after performance testing, 20 after progeny testing and 2 to 5 as bull sires per year.

After 25,000 doses of semen have been collected and frozen from each bull accepted after performance testing it is then slaughtered.

The bull's performance test measured by its growth rate is based on the adjusted percentage of the station mean. Its progeny test is based on the daughters' milk compared to other first calvers within the same breed under the same environmental conditions.
HETEROSES IN ANIMALS PRODUCTION

By

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Results are reported on crossbreeding of farm animals. Expression of heterosis in first generation (F1) progeny depended on species and trait. In beef cattle, growth rate was heterotic in crosses of German Brown x N'dama, and reproductive performance was superior in N'dama x Keteku crosses compared to the purebreds. Heterosis was obtained for growth (weight for age) in pigs in both three way and single crosses of exotic breeds, and in poultry when indigenous fowl was crossed with White Rock. No heterosis could be detected in weights of Permer x West African Dwarf sheep crosses. Crossbreds were not always heavier than the lighter breed. In dairy cattle in general, milk yield is not heterotic, but F1 Friesian x White Fulani daughters at Shika exceeded their indigenous dams by 50-100% in daily and total milk yield.

DURATION OF OESTROUS CYCLES OF N’DAMA HEIFERS

By

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Sixty heifers fed solely on pastures were observed for 284 oestrous cycles from June 1972 to May 1973. Two vasectomized bulls wearing marking harnesses were kept continously with the heifers on rotationally grazed paddocks. The marking harnesses were refilled on alternate days. An observer also watched the heifers from 7.00 to 10.00 hours and 16.00 to 19.00 hours daily. Oestrous cycle lengths ranged between 16 and 26 days with a mean of 20.4; 2.87 days, mode of 20 days and median of 21 days. 65.8% of the oestrous cycles lasted between 19 and 21 days and 75% of the cycles had a duration from 19 to 22 days. At periods when animals were loosing or just maintaining their weights cycles of short lengths of between 6 and 15 days in length were observed. The sum of two such succeeding cycles add up to a normal cycle. On few occasions cycle lengths of 38-42 days were observed. These cycles were considered as two normal cycles, as it was possible that both the vasectomized bull and the observer missed the intervening heat period, if it was shorter than the observation interval or if the bulls attention was distracted by another heifer that may have been in heat during the same time.
AGE AND WEIGHT AT PUBERTY IN N'DAMA HEIFERS

By

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Sixty-six weaned heifers, seven to twelve-months old, ranging in weight from 100-130 kg were assigned to two vasectomized bulls to determine the time of first standing oestrus. The heifers were weighed on the day of first standing oestrus. The study lasted from June 1972-June 1974, and the animals were kept on pastures throughout the period. Three animals that weighed about 130 kg at about 12 months of age exhibited oestrus within 30 days of commencement of the experiment and were excluded from the study because it was possible they had experienced oestrus earlier.

There was a wide variation in the age at which puberty was attained and this occurred at a low of 370 days and a high of 1079 days, with a mean of 672 days. The variation in weight at puberty was not as widespread, 135-218 kg and a mean of 185 kg. The mean rate of gain up to puberty was 280 gm.

60% of the heifers had their first oestrus between 395 and 730 days; and 55% were between 140-170 kg in weight at puberty.

COBALT AND IRON CONTENTS OF NINETEEN RANGE FORAGE SPECIES AT TWO DIFFERENT GROWTH PERIODS IN NORTHERN NIGERIA

By

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At the meristematic (flush) and mature vegetation (bloom) growth periods in 1975, 19 native forage species from a grazing field in the Northern guinea savanna of Northern Nigeria were sampled. In both grass and browse species, mean contents of cobalt (Co) and iron (Fe) decreased with increasing age (P<0.01). The average Co levels tended to be more concentrated in the browse species either at flush or at bloom. However, the average Fe levels in the grass species at flush were about 50% higher than in browse. The reverse was true for the average Fe concentrations at bloom. All species of forage types contained adequate amounts of Co and Fe at both meristematic and mature vegetation.
NATURAL FORAGES OF NORTHERN NIGERIA. 2. MINERAL STATUS OF SOME OF THE GRASS AND BROWSE SPECIES FROM THE NORTHERN GUINEA SAVANNA DURING THE RAINY SEASON

By

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During the wet season in August of 1975, the protein and mineral contents of nine native grass and ten browse species were estimated and the results compared with those of a similar study carried out on the same forage species at meristematic growth in April of the same year. All forages were sampled from Shika in the northern guinea savanna rangeland.

The average protein declined from 14.94% in April to 7.50% in August. This was true for all the individual grass species, with deficient protein values of 0.65% in Andropogon gayanus, 0.81% in Brachystelia jubata, 0.63% in Hypachtria dissoluta and 0.85% in Urelytrum muricatum. 40% of the browse species consisting of Psorospermum guineense, Khaya senegalensis, Dichrostachys cinerea and Mimosia pigra had higher protein values in August than in April, at mature vegetation and at meristematic flush, respectively. While the average protein decreased by about 50% in the grasses, a smaller decrease of about 4% was obtained in the browse species. Contents of P, K, Ca, Mg, Zn and Cu in the grasses declined, while the Na value of 0.038 was 90% higher in August than in April. With the exception of Ca which increased from 0.70% in April to 0.93% in August, contents of P, K, Ca, Mg, Zn and Cu in the browse species declined at maturity.

The average protein content was 42% higher in the browse species than in the grasses. The minerals P, Ca, Mg, and Cu were more concentrated in the browse than in the grasses, with a significant difference (P<0.01) for Ca. The opposite was true for K, Na, and Zn, with a significant difference (P<0.05) for K.

Mg and Cu were barely adequate in the grasses, while all the forages were deficient in P, Na, and Zn. Ca was deficient in the grass species alone. It was concluded that P, Na, Zn, Ca, and probably Mg and K were generally deficient in the diets of grazing Zebu cattle and other animals including sheep and goats, during the end of the dry season in April and in the late wet season in August.

DEVELOPING THE DAIRY GOAT: EARLY PROBLEMS

By

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The local goat is a free-ranging animal used primarily for meat. The early problems (this paper focuses on 2 of these: establishment of confined local goat herd and kid mortality) encountered in trying to change the local goat into a dairy type by means of crossbreeding with exotic breeds are discussed.
THE SUBSTITUTION OF MOLASSES FOR MAIZE IN THE PRODUCTION RATION FOR DAIRY COWS

By

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Four lactating cows, each of the German Holstein and German Brown breeds were randomly assigned to either a conventional milk production ration containing 65% maize plus groundnut cake, palm kernel meal and a mineral supplement (Ration A); or to a ration in which approximately 38% of the maize in Ration A was replaced by sugar cane molasses (Ration B). The trial lasted 12 weeks during which milk yields were recorded and samples analysed for fat, protein, lactose and minerals. Milk yield, 4% fat-corrected milk, and solids-corrected milk were significantly higher (P<0.05) for cows on Ration A as compared to those on Ration B. Cows on Ration B produced milk with consistently higher percentage fat, proteins, minerals and lactose, although the differences were not significant.

The yields of protein and minerals were significantly higher (P<0.05) for the cows on Ration A, whilst differences in fat and lactose yield were not statistically significant.

The results are discussed in the light of the possible use of molasses as a means of reducing milk production costs in Nigerian dairies.

OBSERVATIONS ON THE WHITE FULANI (BUNAJI) ZEBU CATTLE OF NORTHERN NIGERIA IN A SOUTHERN NIGERIA ENVIRONMENT

VIII: The utilization of improved tropical grass/legume pasture mixtures by lactating Cows at Ibadan

By

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Sixteen White Fulani cows (343 kg) were blocked according to stage of lactation and assigned to four tropical grass/legume pasture mixtures, consisting varying proportions of one, two or three of the following grass species — Cynodon dactylon var. robusta, Pennisetum purpureum and Panicum maximum and two legumes Centrosema pubescens and Stylosanthes gracilis. Herbage availability, herbage consumption as well as milk yield and composition were measured over four — 28 day periods in a 4 x 4 Latin Square design. There were no differences in milk yield and composition of the cows on the different pasture mixtures, except the percentage milk protein, for which differences attained significance at the 5% level. Although estimated available herbage dry matter averaged 29.70 kg/cow/day (range 25.26 to 33.64) the cows consumed only an average of 9.64 kg/day (range 8.82 to 10.74), a percentage utilization of 32.4 (range 26.21 to 42.51). Crude fibre content of the herbage was high average 34.42% (32.24 to 35.85%), whilst organic matter digestibility was low — average 62.36% (range 60.75 to 65.73%). The daily intake of nutrients was adequate to support the production of up to 10 kg milk, without loss of body tissues, but the cows only averaged 2.2 kg and lost weight.
EFFECTS OF SUPPLEMENTAL PROTEIN SOURCES ON PERFORMANCE AND CARCASS CHARACTERISTICS OF FEEDLOT BULLS FED CONCENTRATE-SILAGE RATIONS

By

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For seventy-seven days, forty-eight cross-bred bulls were individually fed to appetite on four high-concentrate diets in a feedlot trial to study the effects of supplemental nitrogen sources (dry brewer’s grain, uncooked cotton seed cake, defatted cotton seed cake, and whole uncooked cotton seed) on feedlot performance and carcass characteristics. The forty-eight bulls were randomly assigned to four ration treatments and each of the 12 bulls per ration was individually fed for 77 days. Intake and live weight changes of each bull were recorded. Digestibility coefficients of the rations were determined by total collection technique.

Carcass traits of each slaughtered bull were recorded, and economics of the rations was comparatively assessed. Bulls fed the two cotton seed cake supplemented diets (rations 2 and 3) were consistently and significantly (P<0.05) superior in rates of live weight gain and feed conversion to the bulls fed either dry brewer’s grain or cotton seed-supplemented diets. Rations 2 and 3 were significantly more economically advantageous than rations 1 and 4. Ration 1 consistently gave the poorest results while rations 2, 3 and 4 were equal in average cost per unit live weight gain.

Although there was no significant difference between treatments in dressing-out percentage, treatments two and three resulted in better loin eye area value than the other two treatments. Further studies are suggested in this area before firm recommendations could be made as to which of the cotton seed cake is more economically advantageous.

THE NUTRITIVE VALUE OF HAY FROM FOUR GRASS SPECIES CUT AT FOUR STAGES OF GROWTH AT IBADAN

By

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Four grass species namely: Cynodon dactylon var. robustus (M); Pennisetum purpureum (N); Cynodon dactylon var. nlemfuensis (P) and Panicum maximum (Q), each in the 4th, 6th and 8th weeks of regrowth, were cut in the fourth and fifth years of grazing for hay, (ie. 1972 and 1973). Digestion trials with West African Dwarf Sheep showed that the dry matter digestibility ranged from 37.8 ± 2.84 % and 64.3 ± 0.10 (mean 51.06 %) in treatment N conserved in the eighth week of regrowth to approximately 52.1 ± 2.98 and 83.2 ± 7.20 % in treatment Q conserved in the sixth and eighth week of regrowth in 1972 and 1973 respectively.
The crude protein digestibility in general was very low, the means being 38.0 ± 7.70 \%, and 54.1 \% in treatments M and Q respectively. The apparent digestibility of energy varied between 43.1 \% for treatment M hay made in the fourth week of regrowth to 84.1 \% for treatment Q conserved in the eighth week.

The mean digestible crude protein intakes per kilogramme of metabolic weight were 1.50, 0.93, 1.45, and 1.83g/kg W 0.75 per head per day for treatments, M, N, P, and Q respectively, while the corresponding mean values for digestible energy intakes were 105.2, 109.8, 124.1 and 192.9g/kg W 0.75 per head per day for the same treatments. The metabolizable energy (Mcal/kgDM1) varied between 1.53 Mcal/kgDM1 in treatment M conserved in the fourth week of regrowth to 3.62 Mcal/kgDM1 in treatment Q hay made in the eighth week of regrowth. The overall means were 1.85, 2.61, 2.23, and 3.15 Mcal/kgDM1 intake for treatments M, N, P, and Q respectively. Analysis of variance showed that the differences in apparent dry matter digestibilities between treatments, year of cutting for hay and the interaction between the stages of maturity and year of cutting were statistically significant (P < 0.001). There were no significant differences (P > 0.05) either between treatments or between stages of maturity, in the extent to which the crude protein was digested. The energy content of Panicum maximum hay was digested to a greater extent than that of C. nlemfuensis var robustus (P < 0.01) and C. nlemfuensis var nlemfuensis (P < 0.05).

REPRODUCTIVE PERFORMANCE OF RANCH-READED TRYPANO-TOLERANT BEEF CATTLE BREEDS IN THE SOUTHERN GUINEA SAVANNAH OF NIGERIA

By

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Calving records of 1787 N'Dama, 355 Keteku and 372 N'Dama x Keteku crossbred cows born and bred at Upper Ogun Cattle Ranch between 1952 and 1974 were analysed. The average age at first calving (AFC) of the N'Dama, Keteku and Crossbred cows were 1449 (48 months), 1429 (47 months) and 1295 (43 months) days respectively. The average for the herd was 1424 days (47 months). Crossbreds showed a 9.3 \% heterosis for this trait under the same extensive management systems. There was a highly significant difference in the AFC of Crossbred and other cows in the herd (p < 0.01), but there was no significant difference between N'Dama and Keteku cows for AFC. Frequency distribution tables showed that 19, 23, 19, 15, 9, and 15 \% of Keteku cows calf first at 3, 4, 4, 3, 5 and above 5 years of age respectively. Similar figures for Crossbred cows were 35, 21, 18, 7, 7 and 11 \% while for the N'Damas these were 15, 23, 21, 12, 8 and 21 \% at the stated ages.

About 14,000 calving records of 3226 dams at the ranch for the years 1952 through 1974 were also investigated. The average calving interval (ACAI) exclusive of figures for abortion and calf deaths at parturition which were not available was 631 (20.7 months), 641 (21.1 months), and 606 (19.9 months) days for N'Dama, Keteku and Crossbred cows respectively.
The average for the herd was 628 (21 months) days. Crossbred cows also showed a 4.7 % heterosis for the trait although there was no significant differences between the three breeds. Frequency tabulation for ACAA showed that 15, 13, 15, 9, 9, 8, 8, and 23 % of Keteku cows have an average calving interval of 12, 14, 16, 18, 20, 22, 24 an above 24 months respectively. Crossbreds have figures of 9, 13, 17, 14, 11, 7, 6 and 23 %. For ranch-reared N'Dama cows, the figures were 12, 12, 12, 11, 7, 6 and 28 %. Similar figures for the foundation dams were 7, 14, 19, 16, 14, 8, 5 and 17 %.

Annual calf production per cow was 0.58, 0.57 and 0.66 calves respectively for N'Dama, Keteku and Crossbred cows. The results showed that although there had been no or very little artificial selection on the ranch, the reproductive performance of these trypamine-tolerant breeds can be significantly improved by culling the poorest 20 % of the herd population. If the nutrition is improved and systematic breeding plans evolved tremendous improvement can be expected from these indigenous breeds in the Southern Guinea and Derived Savannah belts of Nigeria.

**PUBERTY IN EWE LAMBS OF THE NIGERIAN DWARF SHEEP**

By

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The incidence of the first behavioural oestrus (Puberty) in 18 ewe lambs was investigated to determine the effect of the plane of nutrition on it. The ewe lambs were weaned from the breeding flock of the University of Ibadan in two groups: one group in December/January at an average age of 125 (86-156) days and body weight of 8 (7.5-10.5) kg; the second group in October at an average age of 156 (140-175) days and body weight of 8 (7.5-9.5) kg. The ewe lambs were randomly allotted and reared on two planes of nutrition: one exclusively on roughage (grazing/and hay); the second supplemented with concentrate at the rate of 454 g/day from weaning to puberty. The ewe lambs were checked for standing heat with two vasectomised rams twice daily — mornings and evenings. The results obtained are as follows:

<table>
<thead>
<tr>
<th>Age at Puberty (days)</th>
<th>Roughage alone</th>
<th>Roughage + Concentrate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>139.5 ± 7.8</td>
<td>262 ± 16.6</td>
</tr>
<tr>
<td></td>
<td>(130 - 178)</td>
<td>(175 - 345)</td>
</tr>
</tbody>
</table>

| Body weight at puberty (kg) | 14.6 ± 0.9     | 16.0 ± 0.7             |
|                            | (12.0 - 17.0)  | (11.0 - 20.0)          |

| Average daily gain (gm) - | 29.4 ± 4.7     | 73.0 ± 6.6             |
| ing to puberty            | (11.0 - 44.0)  | (50.0 - 125.0)         |

Ewe lambs born as single attained puberty at a young age but higher body weight (both not significant) than twins. Ewe lambs fed supplement ration had a significantly higher growth rate and attained puberty at a significantly younger age and higher body weight than ewes fed on roughage only. This significant reduction in the age at puberty through better feeding is of considerable economic importance because it potentially increases the reproductive life span of the animals.
LAMB NURSING IN THE NIGERIAN DWARF SHEEP

By

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University of Ifeadan.

Lamb nursing was studied in 28 ewes of the Nigerian Dwarf Sheep. Of these, five had a second crop of lambs. Throughout the period of study which in four ewes started during the hot dry season (January) while in others started during the rainy season (June-October), the ewes received supplement ration at the rate of 454g/day. Both ewes and lambs were weighed once a week until weaning.

A strong maternal relationship with the lambs was observed at birth. However, cases of temporary rejection of the lambs and a case of premature maternal instinct resulting in a pregnant ewe successfully stealing a lamb were noticed. The incidence of group nursing within the flock was common as the lambs became older. All surviving lambs (survival rate 87%) were weaned at 100 days of age. In seven ewes, nursing lasted only 40 (20-66) days because two ewes died after 20 and 29 days of nursing leaving their lambs to be fostered by others; the remaining three lost their lambs after 50 (31-66) days of nursing.

The ewes generally lost weight during nursing at an overall weekly rate of 0.13 kg. A highly significant negative correlation (-0.83) was obtained between their total weekly weights and the weeks of nursing. The weight loss was significantly greater in the first seven weeks than in the second, with 95% of the losses at the first four weeks of nursing. The lambs were weaned at a mean body weight of 10.14 ± 0.38 (7.0-14.5) kg. The relationship between the weekly lamb weights and the corresponding ewe weights is negative (-0.87) and highly significant. The greatest lamb growth rate occurred during the first three weeks of nursing. Seasonal influences had no significant effect on these weight changes.

HAEMATOLOGICAL PARAMETERS OF ZEBU, ZEBU/FRIESIAN AND FRIESIAN LACTATING COWS

By

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Zaria.

Haematological values of apparently healthy Zebu, Zebu/Friesian and Friesian lactating dairy cows were determined during January and February 1976. Zebu/Friesian cows had significantly higher (P<.01) haematocrit and haemoglobin values than Zebu or Friesian cows. Both absolute and differential leukocyte values of Zebu/Friesian and Friesian cows were similar. Zebu cows had significantly higher (P<.01) total leukocyte and eosinophil values than Zebu/Friesian or Friesian cows. Haematological values of all cows determined compared favourably with values reported elsewhere. It is suggested that the reported values are representative and may form baseline values for the respective herds.
EXPERIENCES WITH THE USE OF SYNTHETIC STEROIDS FOR THE INDUCTION OF OESTRUS IN ANOEUSTOUS SOWS

BY

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University of Ibadan.

Over the past few years, sows or gilts with a history of anoestrus were carefully observed daily for at least three weeks with a vasectomized boar.

28 sows with a confirmed anoestrous condition were then treated with a single 1-ml dose of one of three different synthetic androgen-oestrogen combinations, some in August, some in November, and most of them in February or March, the hottest months in Nigeria.

Only 39% of the treated animals became oestrus, 75% in August, 67% in November, and 22% in February or March, the differences in the successful treatment rate being significant (chi-square 6.2; P<0.05). Evidence will be presented that higher dosages of the hormones are required for heat-stressed anoestrous females.

REASONS FOR SLAUGHTER IN A RURAL SLAUGHTER-SLAB

BY

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A survey was carried out in a rural slaughter-slab near Funtua during 1972 and 1973. The age, sex, and health condition of cattle and small ruminants were recorded with the assistance of the local butchers. The total number of 449 cattle, 307 sheep and 909 goats were recorded to be slaughtered.

The number of female cattle was considerably higher than the number of males, especially at the end of the dry season. Many of the females were however of older age, the average age in the dry season was 6.9 years. Most of the cattle slaughtered were suspected of some disease, only 28.9% were considered to be healthy. The main conditions reported were "samore" (unthriftness), 51.9%; "hanta" (liverfluke), 6.5%; and "kirei" (streptotrichosis), 2.5%. Others were old age, broken legs, and foot and mouth disease. At the end of the dry season, many cattle were slaughtered in bad condition and nearly 80% were suspected of "samore". This name covers a wide range of unthrifty conditions among which are trypanosomiasis, fascioliasis and gastro-intestinal helminthiasis. A random sample of 51 cattle which were closely examined, showed however that the butchers' and owners' diagnoses were often wrong. The sheep and goats were generally in a better condition and the main problems were diarrhea and unthriftness, both often associated with gastro-intestinal helminthiasis.
PATHOLOGY AND BACTERIOLOGY OF ABORTION IN SHEEP EXPERIMENTALLY INFECTED WITH CORYNEBACTERIUM PSEUDOTUBERCULOSIS

By

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Six ewes in the second half of pregnancy were infected intravenously with C. pseudotuberculosis. Two ewes aborted at 13 and 22 days post-inoculation (PI), respectively; two had full-term, weak, infected lambs at 41 and 55 days PI, respectively; and two had normal lambs at 54 and 59 days PI, respectively. C. pseudotuberculosis was isolated from the uterine contents of the four ewes with infected foetuses and lambs, the abomasal contents of the aborted foetuses and infected lambs, and the cotyledons of the aborted foetuses and the infected twins. Recovery of C. pseudotuberculosis from the tissues and fluids of aborted foetuses and infected lambs was variable: cotyledons 83.3%, abomasal contents 83.3%, peritoneal fluid 60.0%, lung 50.0%, liver 33.3% and pleural fluid 33.3%. It was not influenced by foetal autolysis. C. pseudotuberculosis was isolated from the lungs of three ewes, pleural fluid of one, urine of three, and from the liver, kidney and peritoneal fluid of one. Gram-positive coccobacilli were demonstrated in the caruncles of four of the six test ewes, and in the cotyledons, lung and liver of the aborted foetuses.

Grossly, the placentas of aborted foetuses were brown and reddish-brown, oedematous, autolysed and had enlarged cotyledons. The oedematous fluid was brown. Microscopically, the main lesions were in the foetal-maternal interdigitation of the placemom and were: hyperaemia of septal vessels, vasculitis, leucocytosis in the hilar, central and basal zones, necrosis of chorionic villi and maternal septa, and bacteria in vessels, mesenchyme and chorionic epithelium. These lesions were accompanied by endometritis with leucocytosis in the epithelium and in and around the glands. The gross and microscopic foetal findings were limited to autolysis.

An explanation of the pathogenesis of genital C. pseudotuberculosis infection in pregnant ewes is bacteremia and possible localization in the basal zone of the maternal caruncles, development of placitis resulting in a variable degree of placental dysfunction depending upon the extent of inflammation. This results in a variable degree of foetal hypoxia and foetal pituitary-adrenal dysfunction foetal infection occurs and the foetus may die and be aborted within two to three weeks PI, or endometrial infection may be less severe and persist and the lamb is born infected some six to eight weeks PI.
THE EFFECTS OF COMMON DISEASES OF SHEEP AND GOATS ON LIVESTOCK PRODUCTION IN NIGERIA

By

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Sheep and goat population in Nigeria is estimated to be between 30 and 33 million. These play a major role as sources of meat in Nigeria. (when compared to 10 million heads of cattle estimated)

A review of literature of the most common diseases of sheep and goats was made from 1928 to 1975. The diseases covered were those which had been cited by the various authors as causing the most deleterious effects on sheep and goat production in Nigeria. Gastrointestinal parasites were indicated as posing the greatest problem mainly due to the subacute Haemonchosis and chronic helminthosis caused by mixed infection of, among others, Trichostrongylus spp, Oesophagostomum sp and Giagera. Streptococcosis and demodicosis were mentioned as causing severe economic losses due to the effect on skin and leather quality. Heart water was reported as causing acute death. The Pneumonia complex was cited as causing progressive weight loss and death; it is a cause of great economic loss especially in Southern Nigeria. Others mentioned include Trypanosomiasis, Piroplasmosis, Coccidioides lymphadenitis, foot rot, Blue tongue and noxhotis.

The paper gives economic figures on losses due to these diseases and discusses practical approach to tackling the problem as well as raising suggestions about areas where further research is most needed.

BOVINE TUMOURS: A REPORT OF TWO CASES IN IBADAN

By

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A 14 year old White Fulani cow with a history of grossly enlarged horn base which pits on digital pressure was admitted on a tentative diagnosis of cornual haematoma. It did not respond to antibiotic treatment. A confirmatory diagnosis of cornual carcinoma was made after surgical intervention and humane slaughter was recommended.

To other case, a 3½ year old Brown Swiss cow with a history of swelling of the gluteal region was also tentatively diagnosed as gluteal haematoma. Histopathological report of a biopsy specimen gave a confirmatory diagnosis of gluteal rhabdomyosarcoma.

The carcasses of the two animals were condemned at post mortem.
SERUM ZINC LEVELS IN HEALTHY AND DERMATOPHILUS CONGOLENSIS INFECTED CATTLE

By

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University of Ibadan.

Following from the speculation of Friot and Calvet (1971) that bovine cutaneous streptothricosis might be bound up with zinc deficiencies, the serum zinc level in two breeds of cattle including healthy and Dermatophilus Congolensis-infected cattle was studied by atomic absorption spectrophotometry.

The zinc level per 100 ml/ug of serum was significantly higher (P<0.01) in the White Fulani (419.64) than in the N'Dama cattle (343.00) and significantly higher in the healthy than in the infected White Fulani cattle (375.00).

The relevance of the serum zinc level in the White Fulani (susceptible) and the N'Dama (resistant) to Dermatophilus infection will be discussed.

ECONOMIC IMPORTANCE OF TICK INFESTATION OF LIVESTOCK IN NIGERIA IN RELATION TO PHYSICAL DAMAGES AND ENSANGUINATION

By

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Ibadan.

Two species of ticks, Amblyomma variagatum and Hyalomma rupipes, which had been shown to be of veterinary importance in Nigeria, were fed on rabbits, sheep and goats. The physical damages done to the skin, the changes in the blood values of the animals on which they were fed, and the amount of blood imbibed by each developmental stage of the ticks were investigated.

Results show that the extensive skin damage and the anaemia resulting from the ensanguination by the ticks are some of the limiting factors in animal production in Nigeria.
THE NATURE, ECONOMICS AND PUBLIC HEALTH ASPECTS OF BOVINE BRUCELLOSIS IN NIGERIA

By

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Bovine Brucellosis is a disease of cattle which causes abortions, retained placenta, infertility and economic losses in calf production in the affected herds. This disease has been diagnosed in various parts of the country (Esuruoso, 1974). Although some herds were found to be free, others were moderately infected, while others were heavily infected. Unfortunately, some of the heavily infected cattle herds were at the breeding centres from where animals were usually sold out to beginners about to start their own foundation herds. Therefore, a trail of brucellosis could be followed to many of these herds.

From currently available information it is estimated that direct losses due to bovine brucellosis alone in Oyo State is around ₦200,000 per 10,000 adult female cattle per annum. Losses in other parts of the country can only be estimated when more work has been done to find out the status of most of the herds in relation to the incidence or prevalence of brucellosis. But it is also noteworthy that apart from causing economic losses, the disease is readily transmitted from animals to man causing a serious debilitating and crippling disease.

THE CONTROL OF FIELD OUTBREAK OF NEWCASTLE DISEASE USING AUTOGENOUS SERUM

By

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Two experiments were performed in order to determine the effects of autogenous serum in the control of Newcastle disease. In the first experiment, 90 infected birds, aged 6 weeks, were randomly distributed into two equal groups. Autogenous serum collected from infected birds was injected into the treated group. Both treated and control groups were given supportive treatment. The survival rate of treated birds on the sixth day was 17.78% while that of the control group on the second day was 0%.

In a second experiment, 180 infected birds, aged 4 weeks, were randomly distributed into two equal groups. The two groups were subjected to the same treatments as in experiment I. The survival rate of the treated birds, after 48 days was 66.67% while that of the control birds was 38.87%.

The usefulness of autogenous serum, supportive treatment and the economic importance of Newcastle disease in Nigeria are discussed.
SOME BACTERIOLOGICAL AND CLINICAL OBSERVATIONS ON BOVINE INFECTIOUS KERATOCONJUNCTIVITIS

By

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Federal Department of Veterinary Research
Vom.

A group of pure bred Friesians, White Fulani (Zebu) cattle and their crosses aged from 3 to 15 months were evaluated subjectively for the presence or absence of infectious keratoconjunctivitis for a period of one year. Bacteriological examination was done on all animals that were affected and, at the end of the experiment, on those that did not show any sign of the disease. Moraxella bovis, Streptococcus sp., Staphylococcus sp., Neisseria sp., Corynebacterium sp., and enterobacteriaceae were cultured from the affected eyes. From the normal eyes, only Diplococci, Bacillus sp., and the enterobacteriaceae were isolated.

The Friesians and their crosses with the White Fulani were affected at various periods of the study while no single case was observed amongst the pure bred White Fulani cattle. No reinfection was found to occur in the same eyes of animals that had recovered. Factors which may be responsible for the natural resistance of the Fulani animals are discussed.

HISTOPATHOLOGY OF EXPERIMENTAL EPIDERMAL INFECTION OF CHICKEN WITH DERMATOPHILUS CONGOLENSIS

By

K. A. O. Sansi
Federal Department of Veterinary Research
Vom.

Experimental Dermatophilus infection of the epidermis of chicken was produced for the first time associated with injections of dexamethasone (azium). Dermatophilus organisms invaded the follicular epithelium and proliferated in the follicular cavity of the feather follicle. There was dermal inflammatory response to Dermatophilus inoculation with or without the administration of azium, although lowered cellular response and reduced fibroplasia resulted with azium injections. It is suggested that lowered inflammatory response and stress induced by azium might be responsible for the establishment of Dermatophilus infection of the skin of the White Leghorn cockerel.
ANIMAL virus diseases in Nigeria are not numerous but extremely important because of the resulting economic loss in livestock morbidity and mortality particularly in the large ruminants. Chief among the virus diseases is rinderpest, which was responsible for the loss of 25,000 heads of cattle between 1957 and 1962. Efforts to upgrade local stock by cross-breeding with exotic breeds have often met with failure as these imported breeds succumb to viral diseases such as blue tongue and foot-and-mouth disease which only cause mild infections in the local stock. The role of virus diseases in the smaller ruminants and poultry is difficult to assess as a result of inadequate reporting and absence of laboratory diagnosis.