Utilization of Energy and Nitrogen of a Meat and Bone Meal Diet by young pigs.

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A 28-day metabolism and comparative slaughter experiment was conducted to determine the utilization of energy and nitrogen of a maize-meat and bone meal diet by young pigs. Sixteen crossbred (Yorkshire X Landrace X Poland China X Hampshire) pigs of average initial age and weight of 24 days and 4.5kg respectively were randomly allotted from litter outcome groups to four replications of four pens each. Meat and bone meal constituted 43% of the maize-meat and bone meal basal diet which was fed at 3.4 or 5% of body weight daily for treatments A to C. Treatment D was the initial slaughter group.

Average daily gain (ADG) and feed: gain (F:G) ratios were not significantly affected by levels of feeding. The apparent digestibility coefficients for dry matter, nitrogen and energy were also not significantly affected by level of feeding. Dry matter, nitrogen and energy apparent digestibility coefficients averaged 73.3, 81.5 and 80.4% respectively.

The energy of meat and bone meal in this study was poorly utilized by young pigs for energy gain as indicated by the high heat increment (HI) (P.01) with level of feeding. The energy values of meat and bone meal in kilocalories per gram dry matter were: gross energy (GE), 4.23; digestible energy (DE), 3.09; metabolizable energy (ME), 2.88; and net energy (NE), .86.

Utilization by Mature Does.

I.F. ADU & N.A. OGUNBIYI, National Animal Production Research Institute, Ahmadu Bello University, Zaria, Nigeria.

Feeding and metabolism trials were conducted to determine the voluntary feed intake and utilization in 24 penned Red Sokoto does aged about 2½ years and weighing between 24.5 and 27kg.

The does balanced for age and weight were randomly allotted to 4 concentrate supplement (0, 100, 200 and 400g/day) groups. Each dose, in addition, received Digitaria smutii hay ad libitum throughout the 14 — week experimental period.

The voluntary intake of hay when fed alone was 49.4g/W 0.75. Hay intake declined linearly with increasing concentrate level. The rate was 2.1g/day decline per unit increase in the percentage of concentrate in total dry matter intake.

Total dry matter energy intake increased with increasing concentrate level. Increasing concentrate intake significantly (P < 0.05) increased crude fibre digestibility. Within treatment, does consuming relatively more food also made higher liveweight gains. There was a highly significant correlation between live-weight and voluntary intake (r = .89, P<0.01).

Evaluation of Oil Supplemented Diets in Mature Sheep Nitrogen Metabolism.


The effects of Linseed Oil (LSO) on nitrogen metabolism in mature sheep equipped with permanent rumen and duodenal re-entrant cannulas were studied in a randomised block experiment. A basal diet of 200g hay and 400g concentrates daily providing about 5.8MJ ME and 13gN/d alone, or with supplements of 13, 26 and 40ml LSO/d were given in two equal portions at 0600 and 1800h. Increase in duodenal total N and microbial N flow were 55% and 29% respectively higher with the second increment of LSO than on the basal diet whereas with the largest increment they were reduced. The amounts of non-ammonia N(NAN) passing through the duodenum increased linearly as the concentration of oil in the basal diet was increased. Rumen and duodenal ammonia concentrations decreased as the concentration of oil was increased. Over a 12h feeding cycle the lowest ruminal ammonia concentrations were found 2 to 4h after a meal the concentration rising steadily to the pre-feeding value thereafter. The digestibility of N substances in the intestines decreased significantly with increasing concentration of LSO in the basal diet whereas the converse was true for faeces N excretion. There were no significant effects on N retention. It is concluded that with LSO supplemented diets it was not easy to predict the flow of nitrogenous substances to the duodenum.

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Effects of high protein supplement on energy requirements by growing steers.

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The effects of protein concentrate supplementation on the energy utilization and requirements of growing steers of White Fulani (Bunaji), crosses of N'Dama X German Brown and German Brown offered an all-roughage basal ration were investigated using energy balance technique.

Estimating the digestible energy (DE) or metabolizable energy (ME) requirements from the intercepts of DE or ME intakes (Kcal/Wkg ⁰.⁷⁵/day) at zero liveweight changes indicates that 211.8, 148.6 and 161.8 Kcal DE/Wkg and 118.7, 120.7 and 84.6 Kcal ME/Wkg ⁰.⁷⁵/day were needed for maintenance by these steers respectively.

These requirements for maintenance decreased by between 16.7% and 28.8%, and 32.4% for DE and ME respectively. On the contrary, supplementation increased the metabolizable energy cost of liveweight gains. The percentage increase were 28.3%, 10.4% and 25.5% for the White Fulani, Crosses and German Brown Steers respectively.

Mean daily liveweight gains were 19.5%, 13.9% and 29.0% higher than those earlier reported using an all-roughage rations for the same class of steers.

Results from this study indicate that supplementation of an all-roughage basal rations with a high protein concentrate are two folds; improves performance as well as reduces the energy requirements with a consequent increase in the energy cost of liveweight gain of the steers.

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Evaluation of oil supplemented diets in mature sheep, 2. Energy Metabolism.

O.A. IKWUEGBU, National Veterinary Research Institute, Vom.

The effects of linseed oil (LSO) on energy digestion in 3 mature sheep equipped with permanent rumen and duodenal re-entrant cannulas were studied in a randomised block experiment. A basal diet of 200g hay and 400g concentrates daily providing about 5.8 MJME and 13gN/d, alone or with supplements of 13, 26 and 40ml LSO/d were given in two equal portions at 0600 and 1800h. Voluntary food intake was reduced by the addition of LSO. It was concluded that the concentration of oil and animal differences contributed to feed refusals. There was a decrease in apparent DM digestion in the stomach and the second increment of oil appeared to have the greatest effect. Little starch escaped ruminal fermentation on all diets. The maximum values in rumen total volatile fatty acids (VFA) Concentrations occurred 3 to 5h after feeding and were inversely related to minimum pH values. Maximum total VFA concentration bore no simple relationship to the amount of LSO in the diet and it was concluded from energy apparently digested in the stomach that VFA concentrations did not reflect production rates. Gross energy (GE) intake was increased maximally by 14% by LSO supplementation but the net effect was a shift in GE digestion to the intestines.

Potentials for Production of Alternative Protein Source for Swine in Nigeria.

T.S.B. TEGBE, National Animal production Research Institute, Ahmadu Bello University, Shika-Zaria.

With the take-off of the agro-industrial revolution in Nigeria, many agricultural and industrial by-products will be produced and the country will be faced with the imminent problem of waste disposal. Presently, most of the agricultural and industrial by-products that could be used for production of single cell protein (SCP) are wasted. The production of SCP cultured on by-products of the petroleum industry or agro-industrial waste is discussed.

The paper reviews some of the available literature on the utilization of SCP by swine. The use of SCP as an alternative protein source for non-ruminants could greatly reduce the competition that presently exist in this country between man and livestock for the very scarce gains and oil seeds.

Possible Mode of Preparation, Source of Local Salt Licks (Kanwa and Kantu) and their Chemical Compositions as Compared with Commercial Salt Lick.

T.A. GBODI, National Veterinary Research Institute, Biochemistry Division, Vom.

The Fulanis are normanq cattle rearers who are found along the West Coast of Africa from Senegal to the Camerouns. Those in the Northern part of Nigeria are known to routinely administer two types of mineral preparations called “Kanwa” and “Kantu” depending on method of preparation and source. They claimed that animals administered these preparations perform better than those not given. This paper discusses the possible modes of preparation, feeding regime and claimed effects and their chemical compositions as compared with commercial salt lick.

Estimating Protein Requirement for Maintenance & Production of Dairy-Cattle.

DOLAPO LUFA DEJU, National Animal Production Research Institute, Shika-Zaria.
Before maintenance requirement of Dairy cattle and for that matter, any class of livestock can be adequately assessed, there must be available more and better locally produced feed, since this is the key to increased animal production. There must be a complete reassessment of the ARC and NRC feeding standards for maintenance and production in view of the peculiar conditions existing in a tropical environment. It has been established that adequacy of dietary protein and optimum energy are both necessary for maximum production. The utilization of adequate protein diet is limited when energy is limiting. There is evidence that tropical ruminants may require less protein for maintenance because of low endogenous nitrogen loss and high efficiency of nitrogen utilization by cattle at N-equilibrium. The factors necessary for adequate estimation of maintenance requirements are more difficult to assess in the ruminants than in monogastric animals. Comparison of the various methods employed by researchers for the estimation of Endogenous Urinary Nitrogen integumental nitrogen loss, and metabolic fecal nitrogen are examined.


S.A. OJO & M.N. HARUNA

The exfoliate vaginal cytology of ten red Sokoto doe-goats were studied using papanicolau’s stain. 258 smears were collected and evaluated.

In estrus, smears were populated mostly by clumped anucleated superficial epithelial cells.

In metestrus and diestrus cell pictures were similar, small and large intermediate cells were dominant. The diestrus smears however showed a higher mean for large intermediate cells.

The proestrus smears showed high proportion of nucleated superficial cells with evidence of early cornification.

High yields of leukocytes in smears are suggestive of reproductive tract infection.

In pregnancy the smears were predominantly populated by nucleated superficial cells. Concurrent progesterone and estrogen assays with exfoliate vaginal smears during the various cyclical phases are indicated.

The results of this study should be useful in estrus and pregnancy detection as well as in the early diagnosis of reproductive failure and genital tract pathology.

Dairy Potential of Bunaji (White Fulani) and Bokoloji (Sokoto Gudali) Breeds.

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B.A. OYEJOLA, Institute for Agricultural Research, P.M.B. 1044, Zaria, Nigeria.

Lactation and reproductive data of 573 Bunaji (White Fulani) and 315 Bokoloji (Sokoto Gudali) calvings were studied. Milk yield was significantly different between breeds, the least squares mean being 1105 and 1069kg in Bokoloji and Bunaji breeds respectively. Lactation lengths were also significantly different being 254 and 230 days in Bokoloji and Bunaji respectively. The difference in milk yield between the two breeds is not explainable solely in terms of the variation in lactation length since breed differences were significant even when lactation length was included as a covariate. Milk yield increased with parity in both breeds, the percentage increase in 2nd and 3rd parities over the
first being 21.3% and 44.7% respectively. However, most of the parity differences were due to variation in lactation length since adjustment for lactation length resulted in milk yield being very similar in all parities. The overall calving interval for the two breeds was 365.1 days and did not differ between breeds. Parity had a significant effect on calving interval; the calving interval after the first parity being significantly longer by about 18 days than later parities.

**Effect of Creep-Feeding on the Performance of N’Dama Calves. Body Measurements and Conformation.**

**C.C. NWOSU, B.O. ASUQUO, L.N. NWAKALOR, T.A. ADEGBOLA AND T.N. KAMALU.**

Fourteen N’Dama calves averaging 34.12 ± 2.67kg in weight and ten weeks of age, in two groups, were used to investigate the effect of creep-feeding on the pre-weaning performance of beef calves at the University of Nigeria farm. The groups were balanced for number, age, sex and body weight and allotted at random to two nutritional treatments. Treatment for the control group comprised solely grazing and suckling while in the treatment group, calves were creep-fed with a creep ration containing 13.1% crude protein and 3.27 Mcals/kg digestible energy in addition to the suckling and grazing. Between 0.5kg and 0.75kg of the ration was fed per head per day to calves in the treatment group under shade during the trial period which lasted from 10 to 28 weeks. Prophylactic treatments, salt lick and water were provided to all calves.

The average ration intake per calf was 82.5kg during the period. Linear body measurements taken on all calves at monthly intervals gave percentage differences of 4.5 in heart girth, 3.5 for body length and 6 for height at withers in favour of the creep-fed group at weaning (seven months). With the scoring of the calves at weaning, the creep-fed calves graded choice in quality (5) while the non-creep-fed calves graded good (4). The research also reduced the calf mortality at the farm from birth to weaning by 7.1%. Simple correlation estimates between traits for both groups at six months of age revealed significant association of the body weight to the body length ($r=0.93$), heart girth ($r=0.81$) and height at withers ($r=0.51$). Results showed that the creep-fed calves developed faster than the non-creep-fed calves and were of better beef quality. Thus it can be suggested that improved nutritional status for N’Dama calves pre-weaning could enhance better performance.

**Crossbreeding of Exotic and Local Pigs Biometrical Changes in Body Conformation.**

**L.N. NWAKALOR, Department of Animal Science, University of Nigeria, Nsukka.**

Ten biometrical measurements and counts of number of nipples were taken on Large white, Local, and crossbred ($F_1$ and $F_2$) pigs at the University of Nigeria pig Unit at eight different ages, from 3 to 72 weeks. The objectives were to study quantitatively the changes in body conformation that took place as crossbreeding progressed, examine how the changes are related to age and study the interrelationship among the various traits.

Results show that body measurements in crossbred pigs were intermediate between those of the Large white and the Local pigs, the Large white having significantly the greatest body dimensions in all traits measured; there were no significant dif-
ferences between the F₁ and F₂ crossbred pigs. Regressions of four primary traits on age within breeds showed a similar trend; the Large white had fastest growth in the four traits.

Correlation coefficients among all the body measurements were positive and highly significant for the four genotypes studied. The most highly correlated traits to one another were body weight, body length, heart girth circumference and height at withers (r = 0.93 to 0.99).

In practical terms, measurement of any one of the last three characteristics can be used to calibrate a weigh tape for rapid determination of weights of animals where physical weighing is not possible.

Selection for one trait in the parent breeds would result in rapid genetic improvement in other traits. Crossbred pigs have shown substantial improvement in conformational characteristics over their pure local parents, hence in their meat yielding capacity.

Studies of Estrus Phenomena in Yankasa and Uda Breeds of Sheep and the Yankasa Crosses.

S.A. OJO, I.S. KUTEYI & I.F. ADU, Ahmadu Bello University, Zaria.

Estrus phenomena in Yankasa and Uda breeds of sheep and Yankasa crosses were investigated for age at first estrus, length of estrus cycle, duration of estrus and relationship between the birth-weights, daily body weight gains and the time of first estrus manifestation.

The mean ages at first estrus were 241.5 days for Yankasa ewe lambs, 343.5 days for Uda, 306.0 days for Yankasa X Wesleyndale and 275 days for Yankasa X Suffolk.

The mean duration of first estrus was 18.0 hours for Yankasa, 12.5 hours for Uda, 21.5 hours for Yankasa X Wesleyndale and 24 hours for Yankasa X Suffolk.

For Yankasa it appears that the higher the birthweights, the earlier the first estrus manifestation but this does not hold for the other group.

Seasonal Variation in the Ovarian Activity of Yankasa Sheep and Sokoto Red Goats

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A total of 141 pairs of ovaries from Sokoto red goats and 75 pairs from Yankasa sheep were collected from Zaria abattoir to study seasonal variation in the ovarian activity. The ovarian biometry and ovulation rates were determined for the different seasons.

It was found that right ovary weighed more than the left ovary in Yankasa sheep and this difference was significant during the rainy and pre-dry seasons. The right ovarian width was greater than the left ovarian width in the sheep. This was not statistically significant. In the case of the goat, the right ovarian width was greater than the left and this was significant during the rainy season. The right ovarian length was significantly greater than the left during the pre-dry season in the sheep.

Corpora lutea were observed during the different seasons. The left and right ovary compared favourably during the rainy seasons as judged by ovulation rate. Drastic differences occurred between the left and right ovary during pre-rainy and
dry seasons in the goat and sheep respectively.

Ovarian activity appeared to be all year round. More corpora lutea were observed during the rainy season. Difference in ovarian biometry observed during the rainy and pre-dry seasons might be due to plenty of feed and pasture occurring during these seasons. Based on this, study ovarian activity is more during the rainy season (June to September).

Onset and Duration of Fertility in Domestic Fowl

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The onset of fertility in hens following the introduction of cocks, the time of attainment of maximum fertility and the duration and pattern of fertility following the withdrawal of cocks were studied using Hypeco Gold line pullets and cocks in the poultry unit of the University of Nigeria Farm. Fifteen 56 week old cocks previously housed together and 120 pullets, 28 weeks old at the start of the experiment were used. The hens and cocks were randomly assigned to 3 groups giving a mating ratio of 1 to 8. Egg collection was done twice daily — morning and evenings, setting one a week and culling was on the 7th and 18th day of setting. The experiment lasted for 88 days.

The results were as follows: percentage production was 60; no fertile egg was collected in the first 24 hours of the introduction of the cocks; between 23 and 29 percent fertility was recorded in the three pens on the second day and these figures rose to 80 and 87 percent by the end of the first week; maximum fertility of about 95 percent was attained by the 12 to 14th day.

Following the withdrawal of the cocks after the peak of fertility, 80 percent fertility and over was maintained for the first 8 days and declined thereafter to 70, 50, 25, 5 and 0 percent by day 9, 12, 19, 29 and 31 following the removal of the cocks. The practical implications of this were also discussed.

Growth of Nigerian Dwarf Sheep and their Crosses

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Birth records and weights at 3, 6, 9 and 12 months were used to evaluate growth and survival rate of Nigerian Dwarf Sheep (NDS) and their crosses with Yankasa, Uda and Permer rams.

The crosses were significantly (P 0.05) heavier than NDS at all ages except at weaning (3 month). Most crosses attained the mean NDS 12th month weight of 20.17kg in 9 months. Except at weaning, the crosses survived better than NDS at all ages.

Least squares estimates showed that besides breed, type of birth, sex of lamb, age of ewe and season of raising the lambs significantly (P 0.05) influenced lamb growth at all ages save at weaning. However, season and ewe age were the only significant environmental effects that influenced lambs survival to weaning.

The fast growth and high survival rate of the crosses can be exploited to improve mutton production from the small size and early maturing NDS.
Semen Quality of Yankasa Rams

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Three Yankasa rams were ejaculated 4 times/wk for 3 wks in the dry season and 3 wks in the wet season in Zaria. Each collection period was preceded by a 2-wk adjustment period during which semen was collected at the same frequency as in the experimental periods.

Mean values of semen traits examined were: Volume, 0.5 ml; motility, 66%; concentration, 5.4 x 10^9 sperm/ml; live sperm, 75%; morphologically normal sperm, 97%; and pH, 7.1.

Significantly, higher values were obtained for semen volume, pH, motility and live sperm in the wet season compared to the dry season. Ram differences were significant for semen volume and motility only.

Studies on Formaldehyde Preservation of Ram Semen for Artificial Insemination.


Experiments were conducted on the use of formaldehyde for preserving ram semen intended for artificial insemination. A concentration of 0.005% formaldehyde in phosphate buffered saline (PBS) achieved complete immobilization of ram spermatozoa while also yielding good recovery of sperm motility after its removal by washing. At a higher formaldehyde concentration (0.01%) recovery rate declined with increasing dilution rate.

Incubation of spermatozoa in PBS containing 0.005% formaldehyde beyond 6 h at 5, 15 or 25°C resulted in poor recovery rates. Of the incubation temperatures, eosin uptake was lowest at 25°C. During 4 h post-wash incubation at 30°C sperm motility was significantly affected by prewash formaldehyde concentration which had no effect on the proportion of eosinophilic spermatozoa.


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In NAPRI cattle ranch in Shika, the number of devastating diseases has been minimal, through the strict management practices adopted. The total Clinical cases handled between 1978 and 1980 were respectively 292, 322 and 371. While the mortality rates were 7.72, 10.66 and 9.72% respectively. And from the view point of the above, the cattle population in NAPRI have been enjoying some good health.

The diseases of major concern include, Heartwater (Cowdria ruminantium) Anaplasmosis (A. marginale), Calfscours (colibacillosis), Mastitis, Pneumonia Helminthiasis, Abortion, Metritis, Retained Placenta, Dystocia, etc.
matophilosis (D. Congotensis), Cutaneous "Shika" Ulcer, Lumpy skin disease, Infectious Keratoconjunctivitis and Malignant catarhal fever.

The Diagnosis and Significance of Avian Fungal Infections

DR. J.C. ONONIUWU & B.O. CHUKWUKERE, Diagnostic and Investigation Division, National Veterinary Research Institute, Vom.

Fungi work both for and against poultry farmers. Their presence in litter represent a major factor in raising the pH of litter, so that disease causing bacteria do not persist. However, some species can produce disease either by direct invasion of tissues or by the production of toxins which are ingested by birds. It is important that the presence of disease producing fungi be recognized in poultry as soon as practicable, so that prompt corrective measures be initiated. All too often a feed or litter sample that is contaminated which can be analyzed in the laboratory may not be available. Hence other key characteristics must be kept in mind so that mycosis can be recognized and not be confused with maladies such as infectious diseases, nutritional problems, management failures and environmental stresses.

In this paper, the most important diseases that poultry acquire from moulds and their great economic importance are emphasized. The toxin from moulds may be responsible for many of the unsolved poultry disease problems, knowledge of specific clinical signs helpful in recognizing fungal infections are highlighted. Clinical signs and lesions of each avian fungal infection will be discussed. Finally, attention is drawn to the need for research towards finding simple tests for toxicity, better fungicides, which fungi are responsible and how the metabolites of fungi affect the growth and feed conversion of our poultry population.


Rumen Inpaction with Indigestible Garbage: (A Taste of bad Management and an Enigma to Clinical Diagnosis).

U.S. ABDULLAHI, & G.S.A. MUHAMMED, Surgery and Medicine Department Faculty of Veterinary Medicine, Ahmadu Bello University, Zaria.

Inpaction of the rumen with indigestible garbage is reported in cattle and sheep raised in the traditional husbandry, within Zaria township and its suburbs. The condition hitherto considered a simple management and environmental problem is gaining prominence in clinical practice, as indicated in a three year case record. Attendant problems in the diagnosis of cases with inadequate history are described. It is suggested that the condition owing to its seasonal incidence during the later months of the dry season (February to April) is associated with low calorie mulnutrition and inadequate mineral supplementation to livestock during the period. The careless manner of garbage disposal of especially synthetic materials used for packing mineral substances like farm fertilizers is discouraged. The threat of rumen inpaction to economic livestock production in Nigeria is discussed.
Rinderpest: Herd Immunity Status of Cattle in some Northern State of Nigeria.

K.A. MAJIYAGBE, and C.I. NWOSUH, National Veterinary Research Institute, Vom.

The extensive use of the tissue culture rinderpest vaccine (TCRV) made the JP 15 rinderpest campaign a success. However, recent reports of outbreaks in certain parts of the country have endangered this success. With the confirmation of the outbreak in one of the Northern States (Sokoto) a survey program was started to determine the herd immunity status of cattle in some states of the country using sera samples collected from abattoirs. The report of this survey is hereby presented and discussed in the light of control measures needed to prevent further spread of the disease to other areas of the country.

Trypanotolerance: An Additional Measure Towards the Control of Animal Trypanosomiasis.

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Trypanosomiasis still remains one of the most important factors limiting the development of livestock industry in Nigeria as well as other parts of Africa. The control of this important disease is therefore highly necessary for increasing agricultural production as well as much needed animal protein in Nigeria. The limitation of chemotherapy, immunotherapy and tsetse fly control as effective control methods has stimulated interest in the use of trypanotolerant breeds of livestock as one of the additional efforts towards the control of animal trypanosomiasis. Trypanotolerance is often described as the ability of certain breeds of cattle, sheep, goats and some game animals to survive and be productive, without the aid of trypanocidal drugs, in areas infested with tsetse flies where other breeds cannot.

A great difference in susceptibility among different breeds of cattle has been noted in Nigeria. The Zebu is highly susceptible, while N'Dama and Muturu breeds are considerably tolerant to trypanosomal infection. The present study uses generations of animals born and bred in a tsetse free environment to compare the clinical and haematological responses as well as performance in terms of weight gains of Muturu, N'Dama and Zebu to experimental infection with Trypanosoma vivax. The results as well as those of other workers strongly indicate the superior ability of the Muturu and N'Dama to limit parasitaemia, anaemia and maintain better body condition than the Zebu. It is therefore strongly advocated that interest be stimulated in breeding of the trypanotolerant breeds of cattle particularly in the moist savana and forest areas of the country where tsetse challenge is high.

The Probable effect of Leptospirosis on Livestock Production in Nigeria.

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Leptospirosis is an important zoonosis recognized all over the world but poorly studied in Nigeria. Economic losses due to the disease are staggering and result from abortion, early foetal deaths, infertility, milk loss, lowered protein production and general unthriftness in animals. Many
undiagnosed abortions have been reported from the Government and private livestock farms. Some of these farms have been forced to close down because of repeated abortion storms. Reports from Veterinary Clinics all over Nigeria indicate that similar undiagnosed abortions and infertility problems have been seen in dogs, pigs, sheep and goats. Nigeria is currently embarking on Green Revolution and huge sums of money are committed to animal production. Every year, the Federal Livestock Department, farmers and livestock production companies in Nigeria import a lot of animals for meat production, breeding or for upgrading purposes without screening for leptospirosis.

Preliminary studies carried out in and around Vom recently showed high leptospiiral antibodies in cattle. The picture may not be very different in other livestock and in other parts of Nigeria. It is not unlikely that most of the undiagnosed abortion and infertility problems in our livestock may probably be due to leptospirosis.

**Mycotoxicosis**

T.A. GBODI, National Veterinary Research Institute, Biochemistry Division, Vom.

Surveys have shown that the incidence of mycotoxins and the occurrence of mycotoxicoses are not restricted to particular climatic or geographical region. Moulds are abundant in tropical climates because of the favourable environmental factors such as high humidity and temperature which enhance their growth. Nigeria being a tropical country is no exception. Little work has been done in Nigeria with regards to mycotoxicosis in livestock. This paper discusses the problems involved in mycotoxic work, effects of mycotoxin on livestock, mycotoxins analysis, diagnosis of mycotoxicosis, control measures and public health implications.

**Disease Conditions Encountered in Sheep and Goats at Offa Veterinary Clinic, Kwara State, Nigeria.**

G. MOHAMMED and S.N.A. SAIDU, Faculty of Veterinary Medicine, Ahmadu Bello University, Zaria, Nigeria.

A survey was carried out to identify disease conditions occurring in sheep and goats at the Offa Veterinary Clinic during the period February, 1976 to June 1981.

Conditions affecting the gastrointestinal (1354 cases) and integumentary (1075 cases) systems were most prevalent, followed by those of the urogenital (682 cases) and respiratory (471 cases) systems with the nervous system least involved with 16 cases during the period. Among the disease conditions, helminthiasis was most prevalent (1180 cases) followed by wound (433 cases), goat “Kata” (242 cases) and mastitis (228 cases).

Poor husbandry methods were seen to attribute to most of the disease conditions seen in the clinic. A case of ectopic pregnancy was recorded during the period.

**The Proportion of Proximate Body Composition from Body Weight of Pigs.**


Sixty-two Yorkshire pigs (5 to 104 kg body weight and 42 to 217 days of age) made up of 36 barrows and 26 gilts were slaughtered after 18 hours of fasting, and their bodies were ground and analyzed for
moisture, fat, protein, and ash, and their body energy values were determined. A rectilinear model, \( Y = a + bX \), and a curvilinear model, \( Y = ax^b \), were fitted to the data with the weights of the chemical components or the gross energy value as the predictands and the shrunk empty body weight (SEBW) as the predictor.

The relationship between the weights of protein, fat, water and the amount of energy in the empty body, on the one hand, and SEBW, on the other hand, was curvilinear but the relationship between the weight of ash in the empty body and SEBW was linear and the curvilinear models.

However, the coefficient of variation between the measured and the predicted chemical components was reduced by as much as 63 to 76% by using the our-vilinear model rather than the linear one for water, fat, and energy, but was increased by as much as 95% for ash.

We conclude that body weight is an accurate predictor of body composition in pigs, and since it is easier and less expensive to measure than more sophisticated indirect methods, it should have wider applicability.

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The Merits of the Indigenous Goats as a Competitive Meat Producer in Meeting Nigerians’ Protein Requirements.

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Data on the merits of the goat as a competitive meat producer is presented. This is done so that it might provide some stimulus to livestock Scientists to give the indigenous goat more attention and thereby make available information for change of policy on goats by the livestock policy makers of our land.

The following aspects deserve urgent research into. Difference in age at first kidding, role of the age of the doe in kid birth weight, effect of different nutritional levels during gestation on birth weight, causes of abortion and kid mortality during the first five months of life.

The goat’s dislike for cold and high humidity need further elucidation as well as the problem of pneumoenteritis. Multiple births has been extolled as desirable but possible advantag a meat producer be given a cautious appraisal by the Nigerian Livestock policy makers.

Wholesale and Retail Cuts from the White Fulani Cattle

O.A. OHAJURUKA, Department of Animal Science, Ahmadu Bello University, Zaria.

Unlike in the more developed countries of the world, cattle throughout Nigeria are slaughtered and sold mainly by local meat processors without standardization or grading of cuts. Cutting and sale of beef as standard wholesale and retail cuts like Round steak, Sirloin steak, Blade roast, Pike peaks roasts etc., has several advantages over the local system. I ensures uniformity of standards, minimizes meat adulteration, facilitate grading and increases the efficiency of meat marketing. One of the many constraints in the adoption of improved meat processing techniques by most meat processing establishments in Nigeria, is the dearth of information about the relationships between the live weight of our in degenous stock and
Data from some two hundred and seventy three slaughtered White Fulani bull carcasses were analysed to assess the average dressing percent and yield of the various wholesale and retail cuts obtainable from the animals. Also the correlation coefficients and regression equations for the different wholesale cuts in relation to both animal liveweight and cold carcass weight were computed. The analysis of variance carried out showed most of the results to be highly significant.

Available data suggests a correlation between the liveweight of the White Fulani bull and its carcass weight. The wholesale and retail cuts too have shown a definite relationship with both the animal liveweight and its carcass weight. Thus from computed regression equations it should be possible to estimate the yield of any given wholesale cut within a narrow margin of error given a knowledge of either the cold carcass weight or the liveweight of the White Fulani bull.

Information on this will help to provide a guide to those interested in meat processing and marketing and to serve as a basis for comparison in beef cattle improvement programmes in Nigeria.

**Bilateral Symmetry and Prediction of side and slaughter weights in Pigs.**

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The problem of carcass analysis with inadequate facilities in the tropics is examined in relation to prediction of side and slaughter weights using partial and multiple regression techniques. Predictions of slaughter weights based on, and of the left side weights from slaughter weights were consistently more accurate than for the right side regardless of sex and slaughter weights.

**The Effect of Slaughter Weight on Organ and By-Product Weight in Pig Carcass.**

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The weights of various organs and by-products from pigs are described. The weights were registered from 101 animals selected at six different slaughter weights ranging from 22 to 97kg. Slaughter weight had a highly significant influence on the weight of all organs and by-products studied such as liver, spleen, kidney, heart, hair, skin, head, blood, bone and kidney fat. Heavier slaughter weights below 74kg may be more advantageous in terms of the amount of by-products obtained without producing excessively fat carcasses. The effects of breed and sex did not significantly influence organ and by-product weights. The proportion of organs declined while non-organ by-products increased in proportion with increasing body weight. The enhancement of profits from pig production by utilization of abattoir by-products for food, feed and industrial production is discussed.

**The Green Revolution and Meat Availability in Nigeria: an Economic Perspective.**

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The present study appraises current trends in meat supply and demand in Nigeria. Against this background, the paper examines the relevance of the Green Revolution programme. The nature of the
Changes in Egg weight in the Local Chickens of Nigeria

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Eggs laid by F₁ outbred Local Chickens from Nsukka, Owerri and Awgu localities were weighed in four phases as follows: phase I comprising the first three months of lay, phase II or the sixth month of lay, phase III or the ninth month of lay and phase IV comprising the twelfth month of lay. Altogether data obtained from 1256 eggs were statistically analyzed. The birds used in the experiment were raised on deep-litter from day-old to end of laying and under the same system of management. The study was undertaken to calculate the egg weight of Local Chickens from the sampled populations and to relate the weight at each phase to the proceeding or succeeding phase. The data showed that there was a continuous increase in average egg weight from point of lay to annual egg production. Egg weights for the four phases of Nsukka chickens were as follows: phase I 44.09g ± 4.50; phase II 45.83g ± 3.26; phase III 46.66g ± 3.01 and phase IV 48.00g ± 2.82. Corresponding data for Owerri eggs were respectively, 45.09g ± 3.62; 47.22g ± 2.79; 2.7 47.31g ± 3.40 and 48.82g ± 2.83. For Awgu egg weights, the figures were similarly: 43.47g ± 4.34; 45.67g ± 2.77; 45.73g ± 4.49 and 46.44g ± 2.77. The egg weight of all local Chickens on deep-litter for all phases tested was 42.72g ± 6.19g which was far heavier than the 28.50 to 35.63g reported in literature as egg weights for Local Chickens raised on extensive systems. It appears that system of management and age of laying affect egg weights of Local Chickens.

Small Ruminant Production in Nigeria: Role of Extension.

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A number of factors have been identified as constituting bottlenecks to increased and improved livestock production in Nigeria. One such problem is the lack of adequately trained manpower at all levels to solve the country’s livestock problems. This lack of manpower has seriously affected the performance of extension services in the country.

This paper therefore focuses attention on how livestock production (especially sheep and goats) can be improved through an effective extension service. Of special interest is the production of small ruminants which have a wider geographical spread in the country. The paper argues that any meaningful programme of livestock production especially sheep and goats will have to involve the invaluable role of the extension agent in educating and encouraging the rural-based stockowners about improved systems of production. It is further argued that the extension agent who is viewed as the bridge between the various research bodies in the country and their principal client (the livestock farmer) has a noble role to play in identifying problem areas concerning recommended practices as well as attempting to solve problems.
Preliminary Observations on Egg Producing Ability of Village Hatched Local Chickens raised on Deep-litter.

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Thirty-eight, 34 and 35 village hatch local cockerel and pullet chickens of unknown ages, that survived out of several hundreds purchased from open markets at Nsukka, Awgu and Owerri localities, were used in an egg performance test. The birds adapted to scavenging habits in the villages were raised on deep-litter and vaccinated against prevalent diseases. Feed and water were supplied ad-libitum during a 12 month egg production test. The experiment was aimed at characterizing the annual egg production pattern of village chickens under better management during the later part of their lives and ascertaining whether location of acquisition had any effect on the egg performance of local Chickens generally. The average number of eggs per hen per year and average annual percent hen-day production (survivor's average age) was 93, 26%, 87 and 23%, and 87 and 24% respectively for Nsukka, Awgu and Owerri hens. An overall average percent hen-day production was 24%. Mean food intake per bird per year and average food eaten per bird per day were respectively 26.13kg and 71.59g for Nsukka, 26.78kg and 73.36g for Awgu and 28.81kg and 78.92g for Owerri fowls. Corresponding water data unadjusted for loss due to evaporation were 54.841 and 150.23ml for Nsukka, 55.481, and 151ml for Awgu, 78.411, and 214ml for Owerri birds. A significant correlation \( r = -0.68 \) (P 0.05) and non-significant \( r = 0.47 \) and \( r = -0.43 \) were found for Nsukka, Awgu and Owerri chickens respectively. Laying mortality percent was Nsukka 17.00%, Awgu 15.78% and Owerri 37.83%. Though it was found uneconomical to keep a village hatched local hen per year on deep-litter for egg production, selection and larger population size could improve on the economics of Local Chickens raised from day-old to end of lay.

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