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PRODUCTION
IN NIGERIA
OUR COMMISSIONS
AND OMISSIONS

by Akin A. Ademosun



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LIVESTOCK PRODUCTION IN NIGERIA: OUR COMMISSIONS AND OMISSIONS

by

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THE LIVESTOCK MISSION appointed in Nigeria by the Colonial Office in 1949 was probably the first to draw attention to the problems of livestock production in the country and the need to develop the industry. Since the report of the Mission in 1950, many attempts have been made to obtain data on the numbers of the different species of farm animals in Nigeria. The amount of success that has attended this exercise has been, at best, similar to that of the counting of human beings and has generally under-scored the famous statement of Benjamin Disraeli: "There are three kinds of lies: lies, damned lies and statistics." The question of census figures is even confounded in the case of animals because they never contest the statistics nor do they ask for any post-enumeration checks, for as George Eliot stated: "Animals are such agreeable friends—they ask no questions, they pass no criticisms."

Livestock census figures have generally been based on various forms of livestock taxation, livestock vaccination returns and small sample count estimates. As one can imagine, the results have been quite variable and, at best, "guesstimates". If one can use the cattle data as example: the Food and Agriculture Organization of the United Nations (FAO) in 1950 gave the cattle population in Nigeria as 5.3 million; the same source gave the figure for 1965 as 10.9 million. The Federal Office of Statistics gave a figure of 11.0 million in 1968 while in 1970, the FAO again returned a figure of 11.6 million while the 1971 figure by the National Livestock Development Committee was 9.6 million. In the Third National Development Plan a figure of 8.5 million is used. The discrepancy is even greater with other species of livestock which are not subjected to taxation and which are more uniformly distributed all over the country. Nevertheless, it is recognized that accurate statistics are required in order to objectively assess the present status and constructively plan for the future of livestock development in Nigeria.

Inaccurate as the livestock census figures in Nigeria may be, the fact remains that there is an urgent need for a concerted effort to develop the industry. It is commonly recognized that the level of animal protein in the diet of the average Nigerian is much less than that required for his general well-being. For instance, the FAO (1966) in 1963/64 estimated that the average Nigerian consumed 51g. of protein per day of which 6.6g. or thirteen percent was from animal sources. Estimated food supply data for 1974/75 indicate a daily total protein intake of 56.6g. of which 7.5g. or thirteen percent is from animal sources, while projections for 1980 indicate that 14.3% of total protein intake of 63.2g. would be derived from animal sources. Wide variations exist between the states not only in level and quality of protein intake but also in sources of protein foods. In the northern

states, the major sources of animal protein foods are milk, mutton and goat meat whereas in the southern states fish and beef furnish most of the animal protein sources in the diets. One must however appreciate that information on amounts of animal foods is rather incomplete as there are domestic animals such as cats, rabbits, dogs, horses and guinea pigs, consumed in appreciable amounts, for which data are not available. Also, there are some animals and birds such as rats, pigeons and parrots found around human habitations which occasionally enter into the dietary pattern of the people. Available meat supply from wild animals or game is also likely to be underestimated for "bush meat" forms a chief source of animal protein in the diets of rural communities particularly in the southern states. The point must, nevertheless, be made that, even with generous allowances for these other sources, animal protein intake in Nigeria is still grossly inadequate to meet requirements. The level of animal protein intake in Nigeria represents only about ten percent of the intake in countries like Denmark, USA, New Zealand and United Kingdom.

Proteins are very important to the processes of life. They are the principal constituents of the organs and soft tissues of the animal body and a liberal and continuous supply is needed in the food throughout life for growth and repair. As the Dutch chemist Gerald Mulder stated in 1839, "protein is unquestionably the most important of all known substances in living matter. Without it no life appears possible in our planet." The word "protein" from the Greek "proteios", meaning the first rank, made its first public appearance in Mulder's scientific papers. The Swedish chemist, Berzelious, had introduced it to him. We know that these important proteins can be obtained from plant and animal sources, but since there is a greater similarity among animals than between animals and plants, it is logical to expect that proteins obtained from animal sources will be more useful to man than protein from plant sources. The level of protein required in the diet per day is affected by the quality of the protein; the higher the level of animal proteins, the lower the total amount required. This is because of the higher digestibility and the better nutritive value of proteins of animal origin. Generally, the average Nigerian adult requires about 60g. of total protein per day of which about 27g. or forty-five percent should be derived from animal sources such as meat, milk, egg and fish.

Besides meeting the need for livestock production as a supplier of necessary proteins and other nutrients in our diets, farm animals have consistently contributed to the foreign exchange earnings in Nigeria. For instance, the earnings from the export of hides and skins from Nigeria was ₦9.2 million in 1964 and there are indications that

the 1980 estimate of ₦24 million has, in fact, been exceeded. In the open savannah areas of the north, animal power has been used for agricultural production. In fact, the animal-drawn plough may yet remain a useful source for the development of farm mechanization in certain parts of this country. Animal by-products such as blood and bone form important ingredients in the feeding of other animals; indeed, this is one of the areas of the industry that have not yet been adequately exploited in this country.

The problems of Livestock Production in Nigeria

(i) Types of Animals

The growth of the livestock industry in Nigeria has been retarded by a number of problems. The animals that are indigenous to the humid tropics are small in size, have high mortality during growth, reach mature weight slowly and are generally low producers of meat, milk and eggs. It is this low productivity that has more seriously limited available animal protein than mere numbers of animals. For Africa has nearly as many cattle, nearly four times as many sheep and more than six times as many goats as North America. Yet the average animal protein intake in North America is over six times that in Africa. One can hardly see a bright future for Nigeria in this respect unless prompt action is taken. In 1960, it was estimated that there were eighteen cattle, thirteen sheep, forty-three goats, two pigs and one hundred and thirty-seven chickens for every one hundred Nigerians. The population then was about 63 million. Meanwhile the human population continues to increase at more than 2.5% while, for instance, cattle population is only increasing at 1.5%. We are breeding ourselves faster than we are breeding our animals. We are not planning to feed ourselves. Another problem is the slow rate of growth of our animals. Whereas an indigenous cow will be five or six years before reproducing or reaching slaughter weight, an imported cow can be slaughtered at one or two years, yielding at least twice as much meat as the local cow.

(ii) Systems of husbandry and the incidence of diseases

With respect to animal production, Nigeria can be divided into three zones—the Sudano-Sahelian zone to the north, the extensive, intermediate Guinea-Derived Savannah zone and the Forest zone to the South.

In the Sudano-Sahelian zone, made up of those areas approximately north of 1,000mm isohyet, the extensive system of husbandry is practised. During the rainy season, which only lasts 3–4 months, large concentrations of livestock are found in the northern parts of

the zone. But after the rains, as the surface water disappears, the animals are moved towards the less dry, but tsetse fly infested, Sudan areas. The animals have adapted to this nomadic or transhumance system of husbandry; this is the home of the large, long-legged sheep and goats and the humped zebu cattle, adapted to cover great distances and go without water for long periods. The dry atmosphere in this zone is not conducive to the proliferation of helminths and other parasites, nor to the spread of many infectious diseases. However, because the animals have to crowd around limited water holes, the transhumance and seasonal pastoralism offer opportunities for the spread of certain contagious diseases such as rinderpest, contagious bovine pleuropneumonia, anthrax and foot-and-mouth disease.

More important than diseases and parasitism however, is the problem of feeding and watering of animals in this zone. The animals depend mostly on the natural grassland for the supply of the nutrients required for maintenance and production. The grass species in this zone are mostly annuals representing the least productive grasses in Nigeria. At the height of the rains, the protein content of these grasses hardly exceeds six percent while it decreases to as low as two percent during the dry season. The low feeding quality of the natural grassland in the Sudano-Sahelian zone is largely responsible for the poor performance of the animals as measured by growth rate and productivity. Average body weight gain of animals in this zone under range conditions is less than 20kg. per ha per annum. The poor condition of the grassland in this zone has been aggravated in the last few years because of the unusual drought reported there. The effect has been particularly marked in Nigeria since about thirty percent of the cattle slaughtered in the country were imported from the Republics of Niger and Chad. This importation of cattle has recently been stopped by the producing countries leading to the importation of chilled meat instead.

A higher potential for livestock production exists in the Guinea-Derived Savannah zone, because the herbage is more productive and nutritious and the natural grassland is composed of grasses which are preferred by grazing animals. The system of husbandry is more sedentary and mixed farming is practised. There is a potential for development of big ranches in this zone where liveweight gains of 100kg. per ha per annum have been attained with the herbage. The major draw back is that this is the zone of the tsetse fly and therefore of trypanosomiasis which affects seventy-five percent of Nigeria's land area and constitutes a serious limiting factor to livestock production. The breeds of livestock which are tolerant to this disease are usually the indigenous ones with the characteristic low produc-

tivity, low feed efficiency and small size. Imported breeds which are more productive, are generally more susceptible to the debilitating effects of helminths, other parasites and diseases. The more important parasites are liver flukes, trypanosomes, nematodes and ticks while diseases such as brucellosis, steptothricosis and haemorrhagic septicaemia are not uncommon. Since about sixty percent of the cattle reaching southern markets are transported on the hoof across this zone, they reach the southern markets in a very deplorable state of health and well-being as a result of extremely low level of nutrition, lack of adequate drinking water, high temperatures and physical exhaustion. In addition, these animals also bring along diseases such as rinderpest, foot-and-mouth disease, anthrax and contagious bovine pleuropneumonia while they in turn pick up other diseases, particularly trypanosomiasis.

In the forest zone, the dwarf breeds of animals, adapted to the hot and humid tropics, are predominant. The system of husbandry is sedentary. Emphasis is on non-ruminant animal production, particularly poultry which are produced under the traditional free range system, although there are a few commercial poultry farms. These animals are subject to heavy parasitic infestations. Thus tapeworms, roundworms, caecal worms, gizzard worms and globular stomach worms are common in poultry while pigs are infested with lung-worms, kidney worms and whip worms.

Feed production and water supply do not constitute any serious problems. High forage dry matter yields in excess of 20 tons per ha have been recorded and the nutritive quality of the forage is comparatively high if appropriate management methods are applied. However, forage crop production in this zone has been limited by high establishment costs, rapid decline in nutritive value, inefficient conservation and competition by food crop production. The incidence of parasitic infestations is very high and trypanosomiasis constitutes a serious limitation to livestock production, especially for the exotic breeds. The small ruminants (sheep and goats) are very susceptible to stomatitis pneumoenteritis ("kata") and large numbers are lost annually because of this disease.

(iii) *Feeding and Nutrition*

The problem of feeding is one of the most serious ones facing the livestock farmer today. As de Leeuw and Brinkman stated, "at a given level of management and disease control, livestock production is a function of level of feeding." The requirements of the various classes of livestock for nutrients have been well documented for the temperate regions of the world. Little is known about the effect of the warm environment on nutrient requirements and utilization.

The formulation of livestock rations is therefore based on the requirement data from temperate countries, and may well be inaccurate for the tropics. Further, little has been done on the incorporation of locally available agricultural and industrial by-products into livestock rations.

For the purpose of discussing the problem of feeding and nutrition, farm animals can be divided into the simple-stomach (non-ruminant) and ruminant animals. The non-ruminant animals are closer to humans in their requirements for nutrients. Thus they depend on large quantities of grains such as maize and guinea corn to furnish about sixty-five percent of their rations. This indicates an element of competition between humans and non-ruminant farm animals and unless a country has a grain supply, surplus to its needs for human consumption, the competition is an unfair one since it is man who decides the priority. These animals also utilize other staples such as cassava as energy source, thus facing the same element of competition. Being non-ruminants, they also react to the quality of protein in their feeds; fortunately they depend more on industrial and agricultural waste products for these proteins. It is however customary to include in their rations certain additives such as medicants, antioxidants, sweeteners, binders and flavours, in addition to vitamins and minerals. These additives are included for several reasons. For one, the very high level of production that must be maintained by the animals calls for very intensive feeding. For example, a fowl in lay, weighing 1,600g., contains about 350g. protein, 270g. fat and 60g. minerals in its body. This bird, if it lays 240 eggs in one year, will have produced in its eggs alone about its own body weight of better quality protein than was fed to it, 1,400g. of fat and 1,500g. of mineral elements. During this period of one year its feed consumption would be about 40,000g.

Secondly, there is not much variation in the composition of animal feeds from day to day and in order to be persuaded to feed on a monotonous diet, these animals are often given additives such as sweeteners. Thirdly, large quantities of feed are prepared at a time and have to be stored over a period of time; therefore stabilizers such as anti-oxidants have to be included. Finally, the usual components of the rations do not contain high enough levels of the vitamins and mineral elements to meet the normal requirements of the animals so that additional sources of these nutrients have to be incorporated into the ration.

The sum total of all these is the high cost of feeding. It has been estimated that about seventy percent of the recurrent cost of production in a non-ruminant animal production enterprise is the cost of feeding. The situation has been aggravated in Nigeria because of

the increase in the price of feed ingredients in the last five years or so. For example, there has been a thirty percent increase in the price of maize and guinea corn, three hundred and forty-five percent increase in the price of groundnut cake, one hundred and thirty percent increase in the price of palm kernel cake, one hundred and eighty percent increase in the price of fish meal, seventy-five percent increase in the price of meat and bone meal, one hundred percent increase in the price of oyster shell and one hundred and fifty percent increase in the price of common salt over the average prices between 1970 and 1972. These are ingredients usually used in the rations of animals. Unfortunately, any attempt to reduce the level of feeding or the quality of the feed leads to an immediate reduction in the level of production. For the animal first of all meets its own body requirements for maintenance and it is only after this that excess nutrients are used for the productive process. This is why some small poultry farmers have had to resort to selling their chickens and trying some other means of livelihood in the face of the steep rise in the cost of feeding. The big farmers who have been able to stay in business have had to pass the increase in cost of production to consumers. Thus, in many areas in the country, the cost of eggs has risen by over one hundred percent in the last five years. This is also true of broiler and pig production.

The potential for improved ruminant livestock production exists in Nigeria. The ruminants, because of their unique digestive system, are able to live on roughages and need concentrate feeds only depending on the quality and amount of roughage feed available and the level of production of the animals. They offer the cheapest source of domestically produced animal protein available in Nigeria today; they do not call for intricate combinations of amino acids and vitamins. Over two-thirds of the country's land area is natural grassland. Although there is very little information on the productivity of the Nigerian grassland, it has been estimated that the production of the natural grassland in the southern parts of the Sudano-Sahelian zone is about 2,500kg. dry matter and about 80kg. crude protein per ha per year. This is enough to provide feed for an adult cow for a year. Productivity improves as one moves south from the Sudano-Sahelian zone particularly during the rains; but during the dry season it drops drastically when the fodder is made up of low quality herbage, young grass regrowth after burning, flood plain and swamp grassland, leaves and fruits of trees as well as crop residues.

One of the greatest limitations of natural grassland productivity, particularly in the north, is the provision of water. Sometimes cattle, sheep and goats have to cover up to 10 km. in search of water, thus expending energy that could be used for production. The congrega-

tion of animals in these few water holes also predisposes them to diseases and parasitism as well as overgrazing of the limited lush grassland around.

(iv) *Marketing and Distribution*

Over ninety percent of the cattle and about seventy percent of the sheep and goats in Nigeria are located in the Sudano-Sahelian zone where they are managed under the traditional methods mainly by the Fulanis. Under this system, the Fulanis depend on the milk from cattle for their livelihood; however, slaughter animals are often sold either because they are too difficult to maintain in the herd or to raise money for specific purposes such as taxes. Consequently, about fifty percent of the cattle slaughtered in Nigeria are slaughtered in the southern states. Close to sixty percent of these animals are transported from the north on the hoof while about equal numbers are transported by truck and rail. Truck shipment appears the most expensive because of high freight costs as a result of frequent accidents due to heavy traffic on relatively poor roads, bad driving habits, poor mechanical condition of the trucks, long driving hours and overloading. Animals being shipped from the far north remain in the trucks for two to three days without feed and water. With the improvement in road conditions and shorter driving hours, the cost of truck transportation may be reduced to the extent that it may be competitive with rail transportation or trekking. In any case, truck transportation is likely to remain a permanent feature of cattle movement from the north to the southern markets because it is fast and shrinkage losses are reduced to the minimum.

Rail transportation is cheap but it is slower, resulting in higher shrinkage losses than truck transportation. Also, freight charges are relatively high and animals remain in the coaches for three to four days without adequate feeding and watering. Shrinkage losses can be reduced by giving the animals adequate attention in transit and reducing the travelling time for trains; thus, rail transportation will become a more efficient means of beef distribution in Nigeria. Sheep and goats are transported by truck and rail and suffer the same fate as cattle transported by these means.

Costs incurred in trekking livestock include salvage and shrinkage losses as well as drovers fees and feeding costs. This method is slow and exposes the animals to diseases, injuries and parasitic debilitating conditions, the most important of which is trypanosomiasis. About fifty percent of the cattle reaching Ibadan after such treks have been known to be infected with trypanosomiasis. However, as long as animals have to be moved to collecting centres, trekking will remain

an important means of beef distribution in the tsetse-free areas of the north. In the north-south route, trypanosomiasis control will reduce salvage losses but when animals have to trek for weeks shrinkage losses will continue to constitute a severe constraint to trekking trade cattle.

No organized markets exist for the effective distribution of pigs and poultry. These products, including eggs, are handled through a chain of middlemen resulting in prohibitive consumer prices. As an example, the Fulanis in the north sell their milk at collection centres where the Ministries of Agriculture process the milk to products such as butter for sale to departmental stores. There is local production of milk yoghurt and other dairy products such as ghee, which are then sold through middlemen. These are low priced products and this procedure represents an inefficient way of milk marketing. Also, the lack of market information services and price incentives for quality products severely hinder effective distribution.

(v) *Infrastructure*

It has been estimated that seventy-two to eighty-two percent of the Nigerian population lives in rural communities and that over seventy percent of the population is engaged in agricultural production with almost ninety percent of all farm operations depending on human labour. Livestock production, as a sub-sector of agriculture, is subject to all the constraints of agricultural production. For instance, ninety percent of the poultry population in Nigeria is made up of local birds reared under the traditional free-range system. Thus it can be said that agricultural production in Nigeria depends essentially on peasant cultivation, and agricultural development must of necessity involve the improvement of the quality of life in the rural areas. At present rural life is characterized by high infantile mortality, malnutrition and undernutrition, ignorance, low incomes, inadequate supply of social amenities such as pipe-borne water, electricity, and health, educational and recreational facilities, poor condition of feeder roads and other transport facilities as well as poor sanitation. It is therefore no wonder that the labour force available for agricultural production is made up of old and middle-aged men and women. Most of the women of child bearing age are either pregnant or nursing as a result of lack of any family planning system that ensures the spacing out of the pregnancies. Most of the young men with little or no education migrate to the cities in search of white collar jobs thus depleting the quality and quantity of rural labour force for agricultural production.

This is a grave situation to be in, particularly in a country where:

- (a) next to petroleum, agriculture (including livestock and forestry) contributes almost fifty percent of the Gross Domestic Product,
- (b) agriculture furnishes the bulk of the employment opportunities,
- (c) increase in food production is lagging behind increase in population growth,
- (d) the demand for more and better quality foods is on the increase, and
- (e) industrialization is on the increase with its dependence on raw materials which are derived from agriculture.

The main objectives of agricultural development planning in Nigeria are as follows:

- (a) to ensure food supplies in adequate quantity and quality to keep pace with increase in population and urbanization, having regard to changing tastes and the need for fair and stable prices,
- (b) to significantly increase the production of agricultural raw materials to support domestic manufacturing activities,
- (c) to expand the production of export crops as foreign exchange earners, and
- (d) to create rural employment opportunities to absorb more of the increasing labour force in the nation and to stem the tide of rural-urban migration.

These are lofty objectives indeed but it will be impossible to achieve them until urgent and massive infrastructure development programmes, aimed at the improvement of the quality of life in the rural areas, are implemented by government.

(vi) *Lack of qualified manpower*

Livestock production is a complex undertaking which requires rather a large team of different professionals all working together to ensure that the production and the marketing and distribution systems are operating efficiently. There is acute shortage of qualified manpower at all levels in livestock production in Nigeria. The control of animal diseases requires a strong team of veterinarians and sub-professional staff, for the tropical environment is particularly conducive to the spread of infectious and non-infectious diseases as well as internal and external parasites. It is not known exactly how much the country loses from animal health problems annually, but trypanosomiasis remains one of the most serious livestock diseases in Nigeria today. By 1980 the tsetse eradication programme could have

covered about twenty-eight percent of Nigeria's land area, but much more will still need to be done. With the massive internal movement of animals in Nigeria, the establishment of control posts and quarantine stations, to control the transfer of diseases from one part of the country to another, is of utmost importance. It is also my considered opinion that meat inspection should be in the hands of the veterinarian as against the present practice by which sanitary inspectors handle meat inspection. These various aspects of animal health problems require the services of veterinarians in conjunction with their normal duties of disease prevention and cure.

Another area in which there is a serious manpower shortage in Nigeria is livestock extension. In the north, where the nomadic Fulanis rear their cattle, this need is particularly acute as they are spread over large areas and would only be exposed to animal health staff who are involved in inoculations. Whatever little information has become available from research hardly reaches the Fulanis. Yet Nigeria must continue to depend on the north for the supply of ruminant animals which today furnish nearly seventy-percent of all meat intake in the country. In the south, research information trickles down the line to the big poultry and pig farmers but by far the traditional free range system is still responsible for most of the animals produced in the south and it is for the small-scale farmers that extension services are lacking.

One can go on and discuss the various areas where animal scientists and sub-professionals are required for meaningful exploitation of the livestock potential in this country. Such areas include livestock management, animal nutrition, reproductive and environmental physiology, animal breeding, pasture agronomy and meat processing and technology. The tropical environment, where over fifty percent of the cattle, about thirty five percent each of the pigs and sheep as well as sixty-five percent of the goats live, offers a challenge to the animal scientist trained in any of these areas. Mere importation of animals and information from the temperate regions to the tropics cannot be sufficient to achieve the desired production levels from the animals.

Market surveys of meat, milk, egg and poultry are at present totally lacking in Nigeria. The Nigerian Livestock and Meat Authority has established the semblance of a market reporting system for cattle, sheep and goats in the northern states. But due to inadequate staffing, the quarterly returns rendered by the Authority are so scanty that one wonders whether the exercise itself does not constitute a waste of the resources of this country. Ideally, the Authority should cover the whole country and all species of farm animals. The Third National Development Plan admits that "the difficulties that were encoun-

tered in the implementation of projects in the Second Plan period, made it clear that a general shortage of qualified personnel has become a major constraint to agricultural development". Unless adequate steps are taken now to implement the Third Plan, particularly as it relates to manpower training, the Fourth Plan may blame the unsuccessful implementation of the Third Plan on manpower shortage.

(vii) *Other considerations*

Livestock production is expensive, requiring high capital investments in land, acquisition of foundation stock, erection of buildings and other structures such as silos, purchase of equipment and establishment of pasture or improvement of natural grassland. It is this high capital investment in commercial livestock production that has caused the industry today to remain largely in the hands of peasants who depend essentially on the traditional free range system of livestock keeping. A few big poultry farmers exist in the south while big piggeries and ranches are left to governments and corporations. Credit facilities with generous terms will have to be extended to prospective farmers before any rapid transformation can take place in the present system by which livestock are kept as scavengers.

The land tenure system is such that heavy investment is required for land acquisition. This is particularly true in the forest zone in the south. Fortunately, this situation is not as serious as it looks since this zone is more conducive to the production of pigs and poultry which require less land than the bigger animals. But in the derived savannah zone which may yet become our ruminant animal and grain production belt, the land tenure system may constitute a serious threat to animal production, particularly to the establishment of big ranches, depending on the improvement of the natural grassland and dry season supplemental feeding. In the northern states where over ninety percent of the cattle are to be found, the nomadic herdsmen own no lands of their own and this insecurity of land ownership has led to improper utilization of the land to the detriment of the animals.

By and large, livestock production is still in the hands of illiterate farmers who operate on a very small scale using traditional free range methods and do not benefit sufficiently from the results of research efforts and improved technology because their system of husbandry is not amenable to the innovations which research and technology bring.

Our Commissions

The objectives of the livestock production programmes of the government are:

1. to be self-sufficient in the supply of meat and other livestock products so as to save foreign exchange,
2. to improve rural incomes,
3. to provide rural employment opportunities,
4. to improve human nutrition,
5. to effect proper land use and maintain the ecosystem.

To achieve these objectives the governments of the Federation have provided for an expenditure of ₦344.05 million on the livestock subsector during the current Third National Development Plan period. This represents 15.6% of the ₦2,201.18 million provided for the whole agricultural sector. The provisions for other subsectors are crops 74.8%, forestry 5.0% and fishery 4.6% of the total provision for the agricultural sector. In order to achieve these objectives, the government intends to:

- (a) abolish *jangali* (cattle tax),
- (b) settle the nomadic herdmen by the creation of grazing reserves and relocation of the national herd,
- (c) improve beef cattle production through:
 - (i) establishment of national breeding centres,
 - (ii) provision of artificial insemination services,
 - (iii) tsetse fly eradication,
 - (iv) encouragement of commercial livestock production,
 - (v) introduction of typano-tolerant breeds and
 - (vi) establishment of livestock feed company;
- (d) Government will also participate in direct production of beef and dairy cattle,
- (e) encourage improved production of sheep, goats, pigs and poultry and
- (f) improve the quality and processing of hides and skins and other livestock products.

I will now comment on some of these programmes:

Jangali

Jangali is the tax paid by the herdsmen on each head of cattle. This method of raising revenue has been severely criticised because (i) it taxes capital rather than income (ii) it hinders the collection of vital statistics needed for meaningful development planning (iii) it generates a suspicious relationship between officials and cattle

owners. On the credit side, it can be argued that in order to raise cash to pay the tax, cattle owners have had to sell slaughter animals thus indirectly creating a balance such that the herd continued to grow in size towards the limit of the optimum quantity possible. On balance, however, *jangali* has proved a hindrance to livestock development in Nigeria and it is gratifying to note that, despite a revenue of about ₦4 million annually realised from *jangali*, the tax has now been abolished. The loss of this revenue to government is more than compensated by the improvements in livestock production that can be achieved.

Creation of grazing reserves and the relocation of the national herd

Lack of adequate grazing land has placed serious limitation on the development of beef cattle production in Nigeria. These beef animals furnish about forty percent of the total meat intake of Nigerians and it is essential that suitable grazing land be reserved for them. For grazing reserves to be effective, however, the following conditions must be satisfied:

- (i) The reserves must ensure supply of good quality year round fodder for livestock. In the absence of this, supplementary feed programme must ensure good quality concentrate feed particularly during the dry season.
- (ii) Adequate water supply from boreholes, dams and wells must be provided for animals and herdsmen.
- (iii) Location must be in tsetse free areas or use of trypano-tolerant breeds of cattle must be sought.
- (iv) Adequate supply of competent veterinary, range management and livestock extension staff must be established.
- (v) Marketing and distribution channels for livestock and livestock products must be adequate.

The potential for the development of large grazing reserves exists in Nigeria. About 70 million ha of the country's land area of over 90 million ha is cultivable. As of now, less than half of the potential agricultural land is cultivated and most of the uncultivated land is located in the north. A target of 2.4 million ha is envisaged to come under grazing reserves by the end of the plan period. At present the North Eastern State has over one hundred grazing reserves covering about 10,000 sq. km. of land. The North Central, Kwara, North Western and South Eastern State governments propose to establish grazing reserves by 1980. The establishment of grazing reserves is hindered by two factors—lack of suitable staff and the lengthy process

required to create a reserve. Selection of suitable areas will be assisted by the land use survey which has already been carried out in some parts of the country.

The advantages of establishing grazing reserves, for which nearly ₦20million has been provided by Federal and state governments, include:

- (a) even distribution of livestock resulting in better utilization of grazing land,
- (b) better nutrition of cattle and other ruminants,
- (c) reduction in the seasonal pastoralism of the Fulani herdsmen with the attendant incidence of trypanosomiasis and other diseases,
- (d) with the abolition of *jangali*, the chance that more reliable livestock census may be obtained,
- (e) the reserves serving as marketing and distribution centres for livestock products resulting in more meaningful market information and
- (f) livestock extension services becoming more effective.

A substantial proportion of the national herd is located in the Sudano-Sahelian zone, north of the 11th parallel. The incidence of drought in this zone, lasting six months or more, has led to the seasonal movement of herdsmen and their herds southwards to the tsetse infested areas. The programme to relocate the national herd seeks to develop about 8.5 million ha of new pasture land in the central region of the country for about 3 million cattle. The advantages and constraints of relocating the national herd are similar to those of establishing grazing reserves. In addition, there must be adequate provision for chemotherapy against trypanosomiasis. The ethnosociological implications of settling a nomadic people must be given very serious consideration for this programme to succeed.

The programme, which will cost the government almost ₦21 million, confirms the point that some of us have made over the years—“THAT THE CENTRAL REGION OF NIGERIA OFFERS THE GREATEST POTENTIAL FOR RUMINANT LIVESTOCK PRODUCTION IN THE COUNTRY.” The region has a rainfall of between 1,000 and 1,500 mm. per year leading to the availability of highly productive natural grassland. There is a potential for the further improvement of this natural grassland for efficient utilization by grazing animals or for conservation as hay or silage. The potential for massive grain production for human and animal feed and the use of crop residues as supplemental feed during the few critical months of the year, is immense. The region is closer

to the big southern markets so that the problems of marketing and distribution will be considerably reduced. The only disadvantage of this region over the more northerly area is the tsetse fly. This problem can be solved by the use of trypanotolerant breeds of animals, extermination of the tsetse fly using ground and aerial spraying as well as biological control, chemotherapy against trypanosomiasis or any combination of these methods. It is gratifying to note that all these are contained in the Plan.

Sheep and Goat production

Nearly all the sheep and goats in Nigeria are raised under the extensive system yet they contribute about thirty percent of the total meat intake. In addition, they produce valuable skins for both export and the local leather industry. Most state governments propose the establishment of ranches for sheep and goats during the plan period while the Federal government will carry out feasibility studies on the establishment of breeding and fattening centres. Compared with the gigantic programme for beef cattle production, the sheep and goat programmes typify the neglect to which these two species of livestock have been subjected by succeeding governments of this country. There are definite problems associated with the husbandry, disease control, breeding and nutrition of these animals which, if faced squarely, will increase their role as provider of meat and foreign exchange.

Pig and Poultry production

Improvement in pig and poultry production represents one avenue for a rapid increase in animal protein production in this country. This is because there is a greater turn-over rate, less land is required and the buildings and other facilities required in their production can be cheaper and simpler than for ruminant animals. The devastating drought of a few years ago which caused serious losses to cattle, sheep and goats is a pointer to the fact that poultry and pig production should be given greater emphasis in our development programmes. Unfortunately the state and Federal government programmes do not reflect this emphasis. There are only a few commercial piggeries in the Western, East Central, South Eastern, North Western, Kano and Rivers states while the majority of birds are kept under the traditional extensive system with its characteristic low productivity and slow growth rate. The country still depends on importation for its supply of foundation stock of these animals while feed costs have seriously limited production.

With this background, it is distressing that little attention has been paid to these animals in the development plan. For example, only

about eight percent of the total proposed expenditure for the livestock subsector is allocated directly to poultry and pig production while no mention was made about research into such areas as environmental physiology, feed utilization, breeding and disease control.

Our Omissions

The programmes contained in the current development plan as they relate to the livestock subsector will not achieve the objectives set out for the subsector because they are not comprehensive enough and have left out certain areas vital to the achievement of the objectives. It is in this light that I propose to highlight the areas of omission in the plan.

Livestock production

The cattle production programmes, particularly as they relate to beef cattle, are quite comprehensive and dairy cattle production will continue to be in the hands of government and public institutions as long as incentives and infrastructure are sub-standard. We can improve on the present low birth and mature weight as well as slow growth rate of our local breeds of sheep and goats by cross breeding with imported breeds which can be adapted to the climate. This has been done successfully in the Western and some northern states. It will encourage the supply of improved stock to farmers and the ultimate intensive production of these animals. With regards to pig and poultry production, there should be definite programmes aimed at a massive increase in stock. To this end, more poultry and pig production centres should be established to ensure regular supply of proven genetic material to the private sector. The poultry production enterprise in this country is sufficiently advanced to be left in the hands of commercial poultry producers but government should continue to ensure the regular supply of foundation stock, cheaper feed and other incentives. It is interesting to note that only the East Central and Western States mention turkeys in their poultry programmes. In some countries a substantial part of the poultry industry depends on birds such as pheasants and quails. In Nigeria, we can meet more of our animal protein requirements from guinea fowls, ducks and geese. It is regrettable that there is no plan to exploit the use of these birds, particularly the guinea fowl which is abundant in a wild state in the north and ducks which are kept in many parts of the south under the traditional system.

Rabbit production represents another area by which animal protein production can be rapidly increased. Unfortunately, rabbit meat is not well liked in certain parts of the country. What is required

here is a good extension programme by livestock men and home economists. Rabbit production lends itself to a wide range of possibilities. A small backyard unit containing two to four females and one male can furnish meat for varying and strengthening the family diet, bigger units can provide part-time employment and ensure a steady income. Young Farmers' Clubs can engage in rabbit production as a useful Club activity. With a gestation period of one month and weaning at two months, it is possible to have four litters a year. Housing and feeding facilities for rabbits can be very cheap and simple while a substantial part of the feed can be provided by common herbage crops and weeds. With all these possibilities, it is disheartening that only three governments have made provisions for rabbit production. The Benue Plateau government is to spend ₦15,000 to establish twelve rabbit centres. The North Central state government has provided for ₦500,000 without any programme description, while the Western State government will establish nine centres for ₦340,000.

Livestock Research

Livestock research policy in Nigeria has only recently been defined. The policy is to conduct basic, applied and technological research into animal production and disease control with the objective of providing scientific and technical knowledge for improving the quantity and quality of the livestock population of the country so that the livestock subsector can provide the animal protein requirements of the people.

Section I of the Agricultural Research Institute Decree No. 35 of 1973 empowers the Commissioner for Agriculture to make an Order for the establishment of Research Institutes. The Research Institutes (Establishment etc.) Order 1975 was subsequently made. Under it, fourteen Research Institutes were established. Four of these are concerned with livestock. Both the Nigerian Institute for Trypanosomiasis Research and the National Veterinary Research Institute are concerned with disease control while the Leather Research Institute is concerned with animal product. Thus only the National Animal Production Research Institute of Nigeria is concerned with animal production and should cover all aspects of beef and dairy cattle, sheep and goat, poultry and rabbit production. If this is to be done, the institute will be unwieldy. A comparison with crop production is relevant at this stage. The Cocoa Research Institute of Nigeria is concerned with cocoa production and such minor crops as Kola, Coffee and Cashew, the Nigerian Institute for Oil Palm Research is concerned with oil palm and some other palms such as raffia palm, the Rubber Research Institute of Nigeria is con-

cerned with rubber alone. Besides these three, there are three other Research Institutes concerned with root crops, cereals and horticultural crops, respectively.

Another anomaly with the National Animal Production Research Institute of Nigeria is that it is the only one out of fourteen research institutes not under the control of the Agricultural Research Council of Nigeria. Rather, the Order states that it "shall be subject to the control of Ahmadu Bello University". This is like specifying that the Cocoa Research Institute of Nigeria should be under the control of the University of Ife or that the Rubber Research Institute should be tied to the apron strings of the University of Benin. The proposal is even more absurd when it is realized that Ahmadu Bello University has done little or nothing in the area of pig and poultry production. It is therefore not surprising that in defining the field of research under the Institute only cattle, sheep and goat production is covered and there is no mention of pig, poultry and rabbit production research. It is against this background that I call on the Federal government to establish the following Research Institutes:

- (1) The Nigerian Institute for Trypanosomiasis Research (already established) to be concerned with the control of trypanosomiasis.
- (2) The National Veterinary Research Institute (already established) to be concerned with the control of animal diseases generally and the production of vaccines and sera. I think it is wrong to saddle this Institute with responsibility for animal nutrition research and research into "the introduction of exotic stock to improve meat, milk and egg production".
- (3) The Animal Products Research Institute of Nigeria (proposed) which will perform the present functions of the Leather Research Institute of Nigeria as well as be involved in research in dairying and meat technology.
- (4) The Poultry Research Institute of Nigeria (proposed) to be involved in research into the production of the domestic fowl, guinea fowl, ducks, geese and turkeys.
- (5) The Animal Production Research Institute of Nigeria (already established) to be concerned with research into cattle, sheep and goat production.
- (6) The National Institute for Research in Pig Production (proposed) to be involved in pig and rabbit production as well as to be concerned with the standardization and quality control of manufactured animal feeds.
- (7) The Grassland Research Institute of Nigeria (proposed) to be concerned with research into the productivity, nutritive

value and improvement of Nigeria's vast natural grassland and improved pastures.

Each of the Research Institutes concerned with the different animal species will be involved in research in climatology, environmental and reproductive physiology, livestock shelters, nutrition, breeding and selection, economics of livestock production and socio-economic problems as well as the control of specific diseases. All the Research Institutes MUST operate under the control of the Agricultural Research Council of Nigeria.

Other areas where a lot more has to be done in order to improve animal production are:

- (i) manpower training at all levels especially in livestock extension and research,
- (ii) provision of capital for farmers especially through the Nigerian Agricultural Bank,
- (iii) marketing and distribution information; this should be provided by the Nigerian Livestock and Meat Authority, and
- (iv) provision of basic infrastructure particularly in the rural areas.

The Role of the University of Ife

Work in the Department of Animal Science is aimed at assisting government to meet its declared objectives as they relate to livestock production. Our scientists have established certain nutrient requirement levels for poultry, rabbits, pigs, sheep and goats while various forage species have been investigated as feed for rabbits. Realizing the relatively high cost of feeding non-ruminant animals, the department has been involved in finding alternative feeds which can be obtained cheaply. In this respect discarded cocoa beans and brewers' dried grains have been investigated as substitutes for grains and some protein supplements. Acceptable levels of brewers' dried grains, obtained from our breweries, have been established for poultry and pigs while a method for reducing the theobromine content of discarded cocoa beans, to encourage feeding at fairly high levels, has been established. The use of cocoa husks as a supplement to forages in ruminant animal feeding is being investigated.

These agricultural and industrial by-products offer an opportunity for the use of unconventional feed ingredients in livestock rations without any adverse effect on the productivity and well-being of the animals. Our search for cheaper but effective feeds has also resulted in the use of "luru" (*Adansonia digitata*) and stylo (*Stylosanthes gracilis*) as replacements for imported alfalfa leaf meal in poultry rations. Cassava, as the most widely grown crop in Nigeria, with its

high productivity, is a major source of energy for man in the tropics. The Department of Animal Science is currently cooperating with the Department of Chemistry, the Department of Agricultural Economics and the International Development Research Centre to establish acceptable levels of cassava meal in the rations of pigs, poultry, rabbits, cattle, sheep and goats. If cassava proves to be advantageous, then our economists will assess the economics of feeding cassava to livestock.

With the potential for high forage production under our environment, our scientists have been engaged in the evaluation of the nutritive value of several forage crops. Using sheep and goats as test animals, they have established the optimum stage of growth at which to harvest such forage crops as elephant grass, guinea grass, gamba grass, giant star grass and stylo in order to combine the best quality in terms of yield and nutritive value. We are also cooperating with the Department of Biological Sciences, Institute of Agricultural Research and Training and the International Atomic Energy Agency, to study the productivity and the effect of management techniques on our natural grasslands.

It is our hope to intensify our efforts in establishing nutrient requirement levels (particularly energy, protein and mineral) for all classes of farm animals under our environment in order to assist the government in the standardization and quality control of manufactured livestock feeds in Nigeria. The search for cheap feed ingredients to provide the required nutrients will continue in our effort to reduce the cost of livestock feeding while investigations into the productivity and nutritive value of improved pastures and natural grasslands in the rainforest and derived savannah zones will be intensified in order to provide good quality herbage for ruminant animals. The problem of dry season feeding of ruminant animals will be investigated using drought resistant grasses such as *Cynodon nlemfuensis* (giant star grass) and supplemental feeds such as brewers' dried grains and cocoa husks.

The management of our local sheep and goats posed serious problems to early researchers and they were content with condemning the animals to the fate of living on kitchen wastes and bush grazing. We have been able to show that these animals can be raised in confinement and it has been possible with the help of our colleagues in the Department of Agricultural Engineering to design cheap but effective shelters and paddocks for these animals. Using artificially dried herbage with supplemental feeding, we have established the energy requirements of these animals for maintenance. Important information on the reproduction and growth of these animals has been obtained while crossing of the local dwarf goat with a dairy

breed has resulted in crosses of higher birth weight, faster growth rate and bigger animals at maturity.

Livestock improvement by selection and breeding has been given priority in the research programmes of our Department of Animal Science. For all classes of livestock—poultry, pigs, sheep, goats, beef and dairy cattle—the local breeds have been evaluated side by side with exotic breeds in order to obtain basic information on the performance of our local breeds of animals under improved management conditions. The local breeds have the desirable characteristics of adaptation to the environment and disease resistance while exotic breeds are generally more efficient feed converters and are more productive. With poultry, we have demonstrated improvement in performance of the local chicken by selection. Lines for crossing within and between the different breeds have been developed, while research is in progress on the effect of housing and season on growth rate, egg production, fertility and hatchability. With pigs it has been demonstrated that the local pig might require lower levels of protein in its diet while the ability of the local pig to wean a higher percentage of its piglets might suggest a superior mothering ability.

To ensure success in any animal production enterprise, basic health and disease control principles must be strictly observed. The tropical environment is particularly suited to the proliferation of a large number of internal and external parasites which have had very adverse effects on the productivity of livestock. Research in the Department of Animal Science has helped to identify the commonest and most important helminth parasites of sheep, goat, cattle and local chickens. Our animal health specialists are presently engaged in studies aimed at the control of these parasites.

Animal production is essentially a processing industry aimed at converting raw materials into finished products. The process must ensure a judicious combination of all inputs in order to maximize profit. This has been the guiding principle of research in the Department of Animal Science, which has been orientated towards solving practical problems of animal production. In this task we have a team of animal nutritionists, livestock management experts, animal breeders, reproductive physiologists and veterinarians. The magnitude of the problems ahead of us is such that the department will continue to expand with regards to staff and facilities in order to consolidate its undergraduate curriculum, intensify its postgraduate programmes and strengthen its research activities.