

ARRESTING ANIMAL PROTEIN INSUFFICIENCY IN NIGERIA: A MULTI-SECTIONAL APPROACH

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INTRODUCTION

The value of animal protein in human development cannot be over emphasized. Hence its sub-optimal consumption by a large percentage of Nigerians has become a major concern not only to livestock producers, but also to policy makers (Madubuike 1992). Protein consumption is important in the physical, mental and physiological development of man since it not only supports growth, mental development and replacement of worn out tissues, but also improves health maintenance and general well being. Igben (2000) had observed also that livestock and its by products enhance human nutrition, increase the level of employment and improve the capacity of the economy to generate and sustain increased personal income as well as export earnings.

The proteins from animal sources are superior to those from plants because animal proteins do not only possess better amino acid assortments, and are more readily assimilated, but are devoid of the enzyme inhibitors and other anti nutritional factors common in plant proteins. Over the years, many Nigerians have consistently consumed less of this animal protein as a result of the increasing costs of animal production with the consequent decrease in animal farming and subsequently animal products availability. The consequent low livestock to human population ratio in Nigeria over several years now has been compounded by the ever rising costs of animal feeds occasioned by the already critical competition between man and livestock for feed grains (Tegbe *et al* 1984). Furthermore the serious drought in various West African regions in the 1970s which dried up the vegetation (source of feed for most livestock particularly ruminants), drastically reduced livestock population (Ademe 1976), and the Nigerian livestock Industry has yet not fully recovered from the effects of this disaster.

In the light of this serious problem, Oyenuga (1973), Igben (2000) Madubuike (1992), had lamented that most Nigerians can no longer consume upto a quarter of the minimum 65g per caput animal protein intake level recommended by The Food and Agriculture Organization (FAO). Idufueko (1984) and Igben (2000) had presented the gruesome picture of the current animal protein demand and supply situation in Nigeria, concluding that the huge animal protein gap must be bridged before Nigerians could attain the FAO recommended daily animal protein intake.

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It is therefore obvious that the availability of animal proteins in Nigeria today is grossly inadequate and unsustainable given the rapidly increasing demand for animal proteins by the ever-increasing human population (Ekumankama 2000).

Although policy programmes in the Nigerian Livestock Industry are still centred on the conventional livestock (cattle, sheep, goats, pigs and poultry), their production has consistently remained low, given their huge capital requirements, high feed costs and poor management (Madubuike *et al* 2003; Mbanasor and Nwosu 2003). In the rural communities, livestock production has remained essentially the smallholdings kept for subsistence reasons, with inefficient management systems resulting in consistent low productivity. Even in the urban areas, where odor problems and other health considerations prohibit full-scale livestock farming, some livestock (particularly goats and sheep) may be seen roaming the streets scavenging for food and incidental forages. Elsewhere, the few efficiently managed commercial livestock farms are constantly threatened by high overhead costs and are closing down. Esonu *et al* (2001) had estimated that more than 50 percent of Nigeria's Poultry farms have closed down and another 30 percent forced to reduce their production capacity due to high costs of livestock feeds.

Madubuike *et al* (1999), Madubuike and Ekenyem (2001) had reported that livestock feeds today account for 70 to 80 percent of the cost of livestock production as against the 55 to 70 percent earlier reported by Pond and Maner (1974).

ATTEMPTS AT COMBATING MEAT SHORTAGES IN NIGERIA

Several suggestions have been offered either as short term, or long term measures to combat meat shortages in Nigeria. Idufueko (1984) had suggested emphasis on massive poultry production, but the limitations posed by undersupply and consequent high costs of feed grains and medications made the suggestion unsustainable. Oladele (1976) had earlier called for increased importation and increased local production of fish. Anene (2004) however observed that the case of increased fish importation as a means of boosting animal protein supply in Nigeria is not sustainable in view of the attendant heavy costs, health risks, and the recent Federal Government total ban on importation of livestock products; and rather suggested the improvement and adoption of local environmentally friendly fishing strategies, avoiding the use of dynamites, herbs and chemicals which deplete fish population irrespective of size and age. Yassen (1976) had suggested increased wildlife (game) production as a viable option, a suggestion that is also constrained by finances and logistics, including the difficulties with promulgation and enforcement of Government Laws for conservation and sustainability of wildlife species, laws against killing of wildlife without approval from appropriate authorities, high penalty for wildlife poaching and indiscriminate bush burning especially in established forests and game reserves. Intensive cattle production was not considered a better alternative given their heavy maintenance and pastures demands as well as their low reproduction rates and turnover.

The choice of increased pigs production as a possible solution to meat shortages in Nigeria, based on its high prolificacy, fecundity fast growth and multiplication rates has been

championed. According to Madubuike (1992), pigs can survive on a wide range of unorthodox feeds, including animal wastes (Madubuike and Pond 1985), Brewers dried grains and other agro-industrial wastes (Babatunde *et al* 1974; Madubuike 1988a). Unlike cattle, which require large grazing fields, a large pig farm can be successfully accommodated on an area ordinarily enough for one dairy cow. Unfortunately some religious groups forbid widespread consumption of pork. Goats, on account of their hardiness are able to survive even on refuse and incidental vegetation and will graze on grasses too short for cattle and too dry for sheep, as well as on those plant materials not usually consumed by other ruminants. Although their housing demands and production costs are low, their low reproductive rates and turnover appear to be a serious limitation (Ademosun 1987, Madubuike 1988b). Recently, Jokthan (2000) had suggested increased rabbit production as a veritable alternative, given its low production cost, short gestation period and high prolificacy, but noted the constraint of non-universal acceptability of rabbit meat. However, Nodu (2000) in supporting the case for increased rabbit production noted that increased availability of rabbit meat and its sustained awareness campaigns will increase acceptability and consumption of rabbit meat.

With the apparent inability of the conventional livestock (cattle, sheep, goats, pigs and poultry) to substantially generate enough animal protein to enable Nigerians meet the minimum recommended animal protein intake, the potentials of micro-livestock or mini-livestock were evaluated. Microlivestock or minilivestock, are the small sized animals, vertebrates or invertebrates, aquatic or terrestrial, of weight usually fewer than twenty kilograms, and usually gathered from the wild (Ebenebe 2000). The mini-livestock, whose husbandry had been neglected over the years, has recently started generating considerable interest and investment by livestock farmers because of their low production costs (Oji 2000) and their enormous potentials in contributing to the total available animal protein (Awah 2000). They cost less to raise, represent less of financial risks, produce faster return on investment, allow flexibility of production and are often very efficient converters of feeds (Madubuike 2000). Their prolificacy, rusticity and large capacity to convert kitchen refuse and farm straw into meat, make them promising livestock species which landless household can raise with little capital even in their backyard. Consequently, (Ebenebe 2000) suggested the integration of mini-livestock production (non-conventional meat sources) into our farming system, to help bridge the animal protein gap in Nigeria, observing that the huge potential contributions of the mini-livestock have been under-estimated by scientists and policy makers in the agricultural sector.

Snail meat particularly the African giant snail (*Archachatina marginata*, and *Achatina achatina*) has been reported to be nutritious containing about 60% protein on dry matter basis (Stievener 1992) and rich in essential amino acids (Imeivbore 1990). Other mini-livestock with considerable potentials includes the grasscutter and giant rat (Hardouin 1992), guinea pigs, quails, lizards (Cicogna 1992), although their potentials have not been fully investigated.

UTILIZATION OF UNORTHODOX FEED RESOURCES IN ANIMAL PRODUCTION

Given the ever increasing costs of the conventional feed ingredients in livestock production, which perpetuate increased livestock production costs, efforts have been directed at sourcing unorthodox feed resources with a view to reducing costs of livestock production and making livestock products available at affordable prizes.

Various unorthodox feed materials have been used in livestock feeding with differing degrees of success, all aimed at reducing feed costs. Cattle wastes have been fed to cattle without deleterious effects (Shake *et al* 1977, Lamn *et al* 1979). Poultry manure (Cross *et al* 1978; Arndt *et al* 1979), and pig faeces (Smith and Wheeler 1979) have been fed to cattle with some success. The success recorded appears to lie in the fact that cattle possess rumen microbial organisms capable of digesting the fibre in animal wastes.

Poultry wastes did not produce equally good results when fed to poultry, because chickens lack the ability to digest fibre, which is high in poultry wastes (Nesheim *et al* 1979). Pig faeces (Madubuike and Pond 1985), cane molasses (Babatunde *et al* 1974), rice and rice bran (Robies and Ewan 1985), Brewers dried grains (Babatunde *et al* 1975, Madubuike 1988a, 1994), have been successfully incorporated in pig diets with good results, producing pork at lower costs. Recently rubber seed cake (Madubuike *et al* 2003), cotton seed meal (Ikurior and Fetuga 1985), Pine apple wine sediment (Anyachie and Nkwocha 2003) have also been used in pig diets with considerable reduction in production costs. In each case however, nutrient digestibility was considerably reduced because of the inability of pigs to completely digest the fibre in these products.

Some of these unorthodox feed ingredients are often toxic, or contain some antinutritional factors. In a trial with white star apple (*chrysophyllum albidum*) and Physic nut (*Jatropha curcas*) as feed ingredients for rats, Madubuike and Ogbonna (2003) reported that while white star apple seeds may be used as feed ingredient, physic nut contains curcasine which renders it toxic in large doses, as well as a purgative agent (phytotoxin curcin) which in high does induces vomiting, both of which make physic nut unsuitable as feed ingredient for rats, since decortication and heavy heat treatment were unable to destroy the anti-nutritional agents in physic nut.

Leaf meals from various plants have also been tried as feed ingredients for livestock. In a recent study, Ekenyem (2004) reported good performance in both broilers and pigs when fed *Ipomoea asarifolia* leaf meals, noting however that because of the high fibre content of the leaves, digestibility of the leaf meal was reduced as their dietary levels increased, as both poultry and pigs were unable to effectively digest the fibre in the leaf meals.

Consequently, safety (non-toxicity) and digestibility the non-conventional feed resources are some of the problems that must be contended with to maximize their utilization as livestock feeds.

RECOMMENDATIONS

A multi-sectoral approach (involving the livestock producer, the crop producer, the researchers and the policy makers) is hereby recommended as a pragmatic strategy for bridging the serious problem of the widening animal protein gap in Nigeria.

Since the ultimate answer lies in the massive production of livestock species at the lowest possible cost, all the sources of production leakages at all stages must be re-examined and appropriate solutions put in place. Sequel to the fact that the costs of cereals and pulses which are the conventional sources of energy and protein are steadily increasing, arising from stiff competition between man and livestock for these products, the strong need arises to emphasize the massive production of these crops.

The genetic improvement of the crops, adoption of appropriate cultural practices and application of modern technologies will obviously achieve massive production of these crops to guarantee cheap and sustainable cereals and pulses production to adequately meet the demands of man and his livestock. This has become necessary because most of the alternative feed resources (non-conventional sources), including agro and industrial by-products, leaves of various shrubs and legumes, have in practical terms supported but not adequately sustained the livestock production situation. The contents of high fibre, anti-nutritional factors and some toxic substances in these non-conventional feed sources interfere with nutrient metabolism leading to sub-optimal livestock performances.

The continued use of safe, non-toxic agro-and industrial by products in conventional livestock production will certainly augment total animal protein supply and consequently reduce their costs to encourage affordability and consumption of meat by the masses.

The rural communities should be encouraged into sustainable exploitation of small scale artisan fisheries through adoption of environmentally friendly fishing strategies, discouraging them however from the use of dynamites, herbs and other dangerous chemicals which deplete fish population irrespective of age and size. Such measures will boost local fish production and increase animal protein availability, while reducing fish importation with its attendant high costs and associated health risks.

With the realization of the enormous protein potentials of the mini-livestock information on their improved husbandry technologies should be widely disseminated to encourage household productions. The granting of subsidies to potential mini-livestock producers is also suggested to improve their commitment to accelerate their production.

Finally, the Government interest in the Livestock Sector needs to be seriously aroused. According to Mbanasor and Nwosu (2003), if government budgetary allocation is an indicator of the emphasis placed on a sector, one may argue with some justification, that the livestock sector has suffered neglect relative to the crop sector, as the livestock sector has consistently received barely 10% of the allocations to the crop sector, in the 1st, 2nd, 3rd and 4th National Development plans respectively. It is therefore suggested that Government should make appreciable financial commitments to livestock projects and services. The livestock sector should be provided with conducive policy environment to enable it enhance the much desired sustainable development, which in turn will boost animal protein supply to meet the protein demands of Nigerians at affordable prizes.

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