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THE CONTRIBUTION OF SMALL SPECIES TO MEAT PRODUCTION IN DEVELOPING COUNTRIES

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INTRODUCTION

By far the major meat producing species in the world are cattle, pigs and poultry, which along with sheep account for approximately 98% of all meat produced in developed countries and 90% of that produced in developing countries (FAO, 1984a)

The above species dominate meat production in developed countries but, in developing countries, a significant proportion of meat (8%) is produced by other smaller species. Moreover, although the major meat producing species are kept in large numbers in some developing countries they are not always used for meat. India for example has the world's largest cattle population at 182 million (FAO, 1984a) but few are slaughtered for meat due to relegious taboos. Similar situations exist in S. Africa with the nomadic Masai Tribes and in countries, such as Pakistan, where the use of pigmeat is prevented by Moslem religious beliefs. In such countries certain species of animals which are not used in developed countries, make an important contribution to meat production. One of the most important of these, particularly in the tropics, is the goat. Other examples are certain species of rodents which, while being regarded as unorthodox food in developing countries, nevertheless make an important contribution to the rural and urban meat supplies in countries such as Peru, Ghana and Venezuela. Poultry are also important as meat producers, especially chickens which have played a vital and unique role in increasing meat production in urban areas of developing countries.

The above mentioned small species have been selected for discussion because of the unique contribution they have made, and are making, to meat production in developing countries.

POULTRY

The world production of poultry meat in 1983 was 28,624,000 metric tonnes (mt) of which 30.6% was produced in developing countries (FAO, 1984a).

In the rural areas of these countries, backyard or smallholder poultry production is important with respect to chickens, ducks and turkeys. In the case of chickens however, a major feature has been the speed and extent of the application of intensive large scale production in about two decades. Such large scale operations are highly automated and capital intensive. This has involved the introduction, with considerable effect, of modern technology, improved breeding stock and concentrate feeds in almost all developing countries (Williamson and Payne, 1978). The improved technology, feeds and breeding stock however are often imported from developed countries (Flock, 1983). Large scale commercial production is based on the use of improved hybrid stock which are mostly developed by large international poultry breeding companies. Even countries such as Brazil, which is one of the worlds leading exporters of poultry meat, are almost totally dependent on the import of such stock from western countries. Others such as India are developing their own breeding programmes. In many countries intensive enterprises were previously established by multinational companies, but there is now a trend for domestic companies to account for the bulk of meat production (Krostitz, 1984).

The migration of people from the rural to urban areas has lowered the per capita production of meat from ruminants in Latin America, Asia and Africa (Jasiorowski, 1973). The increasing demand for meat in urban areas has been greatly helped by expansion of commercial poultry production. During the 1970's demand for poultry meat in developing countries outstripped production to such an extent that by the beginning of the 1980's gross imports were about 1 million mt or ten times as much at the beginning of the 1970's. Declining prices of poultry meat relative to prices of other animal product have stimulated consumption further (Krostitz, 1984), and deficits have been met largely by imports from Europe and the USA. However, purchases of imported poultry meat reached a peak in 1981 and then began to decline (FAO, 1979b, 1984b). In Jamaica for example between 1969 and 1979 there was a 185% increase in broiler meat production. Imports of poultry meat in the same period increased from approximately 3,810 mt to 19,627 mt, highlighting the rapid increase in demand for poultry meat (Jamaica Livestock Assoc., 1983). Brazil is a prime example of this rapid increase in poultry production. In 1983 it produced 5.58% of total world poultry production and 18.22% of the total developing countries production (FAO, 1984a). In the same year exports reached 289,301 mt making it a leading exporting nation, second only to France (FAO, 1984b).

The extent to which modern poultry enterprises have developed appears to be closely related to the general socio-economic development of individual countries. In the high income and more urbanized countries of Latin America, North Africa and the Far East their share of the total national poultry

production is over 80%, and it has reached over 90% in some high income Near East countries. However, even in some lower income countries such as Pakistan, India and Ghana between one-third and two-thirds of poultry production now comes from the commercial sector (UN, 1983).

There has been a marked trend towards the establishment of fewer and larger poultry production units situated in or near urban areas. Some giant enterprises in the Middle East and Latin America are stocked with millions of birds. In 1971 the modern poultry sector in Morocco contributed less than 30% of the total poultry meat produced, by 1980 it had risen to 70%. Half a dozen farms with 60,000 birds or more now keep 50% of the country's commercial broiler flock (Krostitz, 1984).

Many developing countries have embarked on ambitious domestic poultry production programmes and have decided to import feed rather than poultry meat. The ocean transport of frozen poultry meat costs 2.5 times that of transporting sufficient concentrate feed to produce an equivalent amount of meat. An important step in many countries such as India is the establishment of vertically integrated broiler projects and more efficient marketing systems (Rao, 1982).

Traditional systems of poultry production are more frequently found in Africa, south of the Sahara, and in a number of lower income Asian countries. Although productivity is low from birds which scavenge around the homestead there is vitually no cash input involved (UN, 1983).

In those broiler industries where the feed supply is adequate birds of 1.4-1.7 kg livewieght are usually produced in 7-12 weeks, depending upon the success of the operation. In some S.E. Asian countries and Mexico they are marketed at smaller weights (Williamson and Payne, 1987; Owen, J.E., personal observation).

Ducks are most common in higher rainfall, riverine or coastal areas, such as the rice growing zones of S.E. Asia. The total numbers produced are small compared to chickens (FAO, 1984a). Turkeys are common in Latin American countries and are more popular in the dry tropics. These are kept both at subsistence level and intensive commercial levels (Williamson and Payne, 1978).

Where poultry are commercially produced as in the Philippines and Thailand, modern mechanised slaughter plants have the capacity to process up to 10,000 birds/hr or 75,000/day (Savic, 1981, Fine and Lathimore, 1982). This is especially true of industries geared to exporting frozen poultry carcases. Slaughter for home markets is often more labour intensive where numbers in the order of 1,000-3,000 birds/night may be dealt with. These are then sold fresh to consumers early in the morning avoiding the need for refrigerated transport, (Fine and Lathimore, 1982). In Pakistan consumers often purchase their birds live and have them slaughtered at the point of retail sale (Qureshi, 1981). There is no large processing industry, though a certain amount of curing and smoking is carried out in some developing countries (Anon, 1980; Sharma et al, 1973). In N. Mexico broilers are cured and smoked for sale in restaurants, and Christmas turkeys are cured and smoked for retail sale by large meat companies (Owen, J.E., personal observation). In India Tandoori chicken (salted chicken cooked in sauce) is very popular and is exported in frozen form to Europe (N. Sharma, personal communication, Indian Veterinary Research Institute, Izatnagar, UP, India).

GOATS

The world population of goats in 1983 was approximately 476 million (FAO, 1984a), about 94% of which existed in developing countries. Although in such areas goats are almost exclusively used for dairy production, in 1983 they produced 93% of the total world goat meat production of 2,043,000 mt. The bulk of this was produced in Africa (611,00 mt) and India, Pakistan and Bangladesh (570,000 mt) (FAO, 1984a), where it constitutes 8.5 and 25% respectively of total meat production.

The growing demand for goat meat, and the inability of several countries to provide adequate supplies, has resulted in a rise in price of this commodity. In areas such as the West Indies, parts of Africa, India, Malaysia and the Philippines goat meat has been the most expensive on the market (Devendra and Owen, 1982). Goats are largely produced in villages where they are often the most important and preferred source of meat (Owen, 1975).

Inadequate supply of goat meat has resulted in an increased export of feral goat meat from New Zealand and Australia to countries such as Fiji, the Caribbean and the Middle East (Devendra and Owen, 1982).

Unlike species such as cattles and pigs, meat goats have only recently been the subject of development and improvement programmes. Several governments such as Brazil, India (Owen, J.E., personal observation) and Kenya (Owen et al, 1977), have now set up National Goat Development Programmes. Consequently, the majority of goat meat produced is obtained from a large pool of unimproved indigenous varieties such as the East African Dwarf and the Criollo of Latin America. Some specialised meat producers have been developed in a few regions such as the Boer in South Africa and the Sirohi in India (Devendra, 1980). This species has undoubted potential to increase meat supplies for both rural and urban areas.

Goats are generally slaughtered in rural areas, but in some cases they are slaughtered in large modern meat plants such as in New Zealand, or Lobatsi in Botswana from where carcases exported to South Africa (Owen, et al, 1977). The meat is usually sold fresh or chilled and in rural areas is sold and consumed on the day of slaughter. In such instances it is sold hot without refrigeration (Owen, personal observation). Very little processing is carried out on goat meat which has largely

been neglected in this respect, however investigations carried out in the USA, have indicated that goat meat has very good processing qualities when used for sausage production (Eggen et al, 1971), and in India it has been used by small processors for this purpose (N. Sharma, personal communication, Indian Veterinary Research Institute, Izatnagar, UP, India).

RODENTS

Rodents most commonly used for meat in developing countries are species of grasscutter (Thryonomys spp.), capybara (Hydrochoerus hydrochaeris), guinea pig, rat and mouse, and have several advantages to offer over traditional livestock, such as; high reproductive rates; numbers are high in densely populated areas where larger animals are often scarce; in the case of domesticated species husbandry skills are relatively simple; economic risks are minimal; the majority of rodents are small in size, facilitating rapid consumption in areas of high ambient temperature and where refrigerated storage is limited.

The greatest use of rodents as food probably occurs in Africa where the grasscutter or cane rat (Thryonomys swinderianus Temminck), pouched giant rat (Cricetomys gambianus and emini), porcupines (Hystrix and Anterus spp.), mice and squirrels are readily consumed (Den Hartog and De Vos, 1973). In Ghana the grasscutter (5-9 kg liveweight) is sold fresh or smoked. In June 1970-71 78,073 kg of fresh meat was sold in one market in Ghana, a further 109,714 kg is estimated to have been sold direct to traditional restaurants and other markets (Asibey, 1974). The meat is considered a delicacy and often commands a higher retail value than beef, pork or mutton (Asibey, 1974).

African rodents are traditionally harvested by hunting or trapping but, domestication programmes involving the grasscutter and giant pouched rat are currently in progress.

In South America large numbers of capybara and guinea pigs are consumed annually by both rural and urban populations, and these two rodents have now reached an advanced stage of domestication. The capybara is the largest living rodent reaching weights of up to 75.8 kg (Donaldson et al, 1975). In Colombia and Venezuela the carcase is salted and marketed entire in 50 kg packs. The meat has also been used successfully to produce various types of sausage (Gonzalez-Jimenez, 1977).

Large numbers of Indians in Bolivia, Ecuador and Peru raise guinea pigs in their own homes as a source of meat. It has been estimated that Peruvians consume some 70 million guinea pigs a year (Vietmeyer, 1984). These rodents are extremely easy to rear and the meat fetches a high price in local markets. It has now become more profitable to raise guinea pigs on mountain farms in Ecuador than traditional livestock (Vietmeyer, 1984). With small subsistence farmers being so prevalent in developing countries the rearing of rodents would enable more rural inhabitants to become meat producers.

SUMMARY AND DISCUSSION

Over the past few decades growth in the demand for meat products has shifted from the developed to the developing countries. Consumption of meat products in the former has tended to level off whilst in the latter demand for and consumption of meat has been increasing. This has been stimulated by factors such as rapid population growth of more than 2% per annum, high rates of urbanisation and in many cases, rapid westernisation of diet.

Production trends have only partially followed those of demand, the most notable being made by large scale intensive broiler production. This has been largely an urban phenomenon, and has been prominent in practically all developing countries. In the rural areas the nature of the demand for meat has not altered like that of the urban areas. Here goats which are traditional meat producers play an important role in the production of meat under extensive low input systems. This species is however still considerably under-exploited.

Wild and domesticated rodent species provide meat for both rural and urban consumption in a variety of Latin American and African countries.

Other small species, not discussed in the preceeding text, which also have a special role in meat production in developing countries, are antelopes such as blesbok and impala. These are both cropped from wild populations and also farmed. Others include rabbits, species of reptiles and amphibians and the Giant African Snail.

In order to improve their domestic production and supply of meat developing countries should

- Make increased efforts to develop their own independent poultry breeding and feed industries using where possible locally available feed ingredients
- Carry out more development work on the improvement of indigenous breeds of goat, their production and marketing systems
- Carry out more investigations into the use of domesticated species of rodents such as guinea pigs and capybaras to extend and increase their use
- Develop processed meat products based on locally available meat sources such as poultry and other species mentioned
- Encourage the use of meat from other non-conventional sources, such as rabbits, particularly for rural consumption.

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