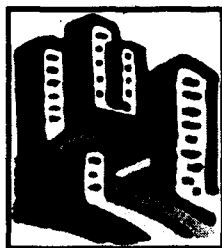


**PERI-URBAN LIVESTOCK
PRODUCTION SYSTEMS
IN SUB-SAHARAN AFRICA**

by
O.B. Smith and E.A. Olaloku
(1998)



**Cities Feeding People Series
Report 24**

ARCHV
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no. 108521

PERI-URBAN LIVESTOCK PRODUCTION SYSTEMS IN SUB-SAHARAN AFRICA

by

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ABSTRACT

Urban farming in its various forms not only survived from such early times as the Aztec and Mayan civilization to the present day, but has also grown in importance and scope in recent times. This paper presents appropriate statistics that demonstrate the importance of the currently expanding urban and peri-urban livestock production sector. It suggests that the observed growth is a response to market demands arising from rapid urbanization. A variety of urban and peri-urban livestock production systems are succinctly described, and technical, institutional and policy related constraints responsible for the less than optimum performance of the systems as well as opportunities for alleviating the constraints are reviewed. It concludes that the many peri-urban livestock production units that grace the African city landscape not only contribute substantially to meeting the specialised food requirements of city dwellers, but also have the potential to contribute to meeting national food security goals. In order to realize this potential, however, the sector will need a boost from productivity-improving technologies, and support from enabling policy incentives, as well as efficient institutional support services.

INTRODUCTION

Urban agriculture or the production and marketing of food and non-food crops, tree crops and livestock in and around built up urban centres, as opposed to in and around rural areas, is not a modern or recent phenomenon. According to Mougeot (1994), its origins could be traced to as far back as to the Incaic, Aztec and Mayan civilizations. From such early times to the present era, city dwellers have produced a significant proportion of their food needs. Burland (1976) reported that dogs and turkeys were raised, and vegetables produced in the small towns of Tilatico and Ticoman in the pre-Olmec valley of Mexico some 4000 years ago. Recent archeological evidence revealed agricultural drainage schemes in Roman Imperial sites of Timgad in Algeria and Volubilis in Morocco and also suggested that ancient Greek cities were self-sufficient in goat milk and olive oil (Mougeot 1994). Urban farming in its various forms has not only survived and persisted from such early times through the era of industrialization, but has grown in importance and scope in recent times.

IMPORTANCE AND SCOPE OF URBAN AGRICULTURE

Evidence of spatial growth and economic importance of urban agriculture in general, and urban livestock production in particular in many African cities and capitals are well documented in the literature. According to Mosha (1991), livestock population in and around Dar es Salaam increased dramatically between 1985 and 1989, with poultry population going from 500,000 to about 800,000. During the same period, swine and dairy cattle populations in many parts of the continent, increased three-fold from 2600 to over 6000.

About 25% to 36% of surveyed households in and within a 5 km radius of Kampala are engaged in the production and marketing of staple food crops such as cassava, maize and beans, as well as poultry eggs and meat, pigs and small ruminants (Maxwell 1994). These activities contribute up to 40% of calories (Jamal 1988), and 70% of poultry products needs of the city dwellers (Maxwell 1994).

Results of a comprehensive urban households survey carried out by Lee-

Smith and Memon (1994) which covered 6 cities in Kenya, showed that 17% of the respondents kept livestock. The estimated 1.4 million heads of livestock kept in all Kenya towns at the time of the survey were worth about \$17 million USD.

Further evidence of the growing importance of the sector in Africa, is provided by the following statistics:

According to Baah (1994), 25% of the 4.5 million small ruminants in Ghana are raised by people living in and around cities and towns. He indicated that urban producers holding these animals not only contribute substantially to the animal protein needs of the urban community, but also benefit economically, with a resultant improvement in their standard of living. Centres (1991) also stressed the economic benefit accruing to a large number of people that supply inputs and marketing services to the 20,000 households that rear animals in and around Bamako in Mali. National statistics quoted by van der Bliet (1992) for the livestock population in Nairobi: 25,000 cattle, 30,000 small ruminants, 30,000 pigs, 8,500 rabbits and 350,000 poultry hint at the important contribution of the sector to protein needs of the urban population. A survey carried out by Gefu (1992) in Zaria, a Nigerian university town, revealed that 80% of respondents keep livestock, raising goats, poultry and sheep, primarily to meet immediate household needs, but also to supplement family income.

These statistics and others in literature, demonstrate the growing importance of the sector, which thus plays important roles in the life of various classes of the population. Such roles include:

- provision of employment and income to the unemployed or low income urban families;
- provision of supplementary income to the employed, poorly paid, middle class urban dwellers;
- contribution to the food security of urban households that cannot afford to purchase all of its food needs;

- on a more global basis, the sector reduces the gap between food demand in the city and supply from the rural areas where production is declining, and marketing and distribution are inefficient because of inadequate infrastructure; and
- source of commercial and economic activity for the well to do who can invest in intensive urban-based meat and milk production to cater to the specialized demands of the city dwellers.

These are not negligible roles and functions, and underscores the growing importance of the sector. A phenomenon attributable to a number of factors.

FACTORS RESPONSIBLE FOR RAPID GROWTH OF THE SECTOR:

There is a consensus in the literature that the observed rapid growth and expansion of urban farming in Africa is a response to market demands arising from rapid urbanization and, paradoxically, economic impoverishment of the population. Sub-Saharan Africa as a whole is experiencing fairly high rates of urbanization. Currently, 30% of the population lives in urban areas, a figure that may reach over 50% by the year 2025 (Table 1: Urbanization Rates in Sub-Saharan Africa).

Such rapid urbanization has, in many countries, led to a rapid increase in food demand accompanied by a change in food habits, often not satisfied by rural production. Urban farming has therefore emerged as an alternative strategy to respond to this increasing, and sometimes specialised, market demand.

The increasing prominence of the sector has also been promoted by the economic impoverishment in many of the countries. The economic crises of the 1980s, followed by the structural adjustment programmes of the 1990s have had the combined effect of drastically lowering income and purchasing power. The urban household which was most hard hit, and stretched to the limit, responded by engaging in urban farming, to diversify sources of income, and improve family nutrition.

Table 1: Urbanization Rates in Sub-Saharan Africa	
Year	Urban Population (% of total population)
1960	11.8
1965	13.7
1970	15.9
1975	18.8
1980	22.0
1985	25.4
1990	29.0
2000	36.3
2010	43.5
2025	54.2

Source: United Nations 1985.

URBAN LIVESTOCK PRODUCTION SYSTEMS

Livestock reared in an urban setting are the usual conventional animals like cattle for milk, small ruminants and pigs for meat, poultry for eggs and meat. Some non-conventional species like rabbits and snails are becoming popular as well. On the basis of the primary purpose, these production systems can be classified as subsistent or commercial.

Subsistent production systems: Primary purpose is to meet family needs, and involves little or no commercial exchanges. Many urban families indeed keep a few chickens, two to three sheep or goats for occasional consumption. Little or no investment is made into the feeding or health care of the animals. The animals scavenge for a large part of their required feed, but are supplemented with household kitchen wastes, as and when available. Performance is therefore poor and mortality high.

Commercial production systems: Primary purpose is to raise enough animals for sale, and secondarily for occasional home consumption. Depending on the size of the enterprise, such commercial concerns are

either smallholder or large-scale enterprises.

Commercial smallholder: The main distinguishing feature of these units is a substantial but unremunerated family labour input. A typical smallholder commercially oriented small ruminant production system in Ghana was described by Baah (1994). Following a diagnostic survey of small ruminant production in two cities - Kumasi and Effiduasi - in the Ashanti region of Ghana, the author indicated that several households kept either sheep or goat or a combination of both species, with flock sizes ranging from 1 to 15 per household. According to the study, the majority of respondents (62%) kept goats for commercial exploitation.

A popular system of management was by confinement in the backyard, particularly for households close to city centres. Producers fed their animals a variety of feeds, some of which were purchased. Other financial inputs went into prophylactic health converge against common major diseases through vaccination and anthelmintic treatments. Labour was required mainly for feed procurement and distribution, as well as animal house sanitation, and was provided by family members. Producers marketed their animals mainly at the farm gate directly to consumers or to middle men.

Swine production lends itself extremely well to an urban environment characterized by land scarcity, because pigs can be easily raised in confinement without the critical land requirement of the dairy enterprise. The more successful swine producers confine their animals in houses that vary in sophistication from the makeshift, to the roofed and concrete floor houses, depending on market demand for pork, and the means of the producer. Where market demand is high, producers invest more in infrastructure, in order to meet the demand.

Smallholder urban or peri-urban commercially-oriented milk production enterprises are common in and around many African cities. In Kenya, these units flourish, and have been described as one of the major development success stories occurring in sub-Saharan Africa (Staal and Shapiro 1994). Productivity of these units has been sufficiently high to more or less keep pace with increasing demand for milk and milk products in Kenya and probably accounts to a large extent to the low level of

Kenya's dairy imports compared to other sub-Saharan African countries (Olaloku *et al.* 1990).

These units located within or close to major cities, have herd sizes of about 10 cows, kept under an intensive zero-grazing regime. Financial inputs go towards the purchase of improved crossbred animals, production of farm-grown fodder where land is available, purchase of supplementary feeds and payment for veterinary services and hired labour. Family labour still plays some role, but hired labour is utilized as well. Milk is marketed through formal and organized co-operatives, as well through informal channels to local traders and individual consumers.

The main characteristics of urban dairy production units in Addis Ababa are summarized in Table 2.

Characteristics	Production Scale	
	Large	Small
Land Holding	Nil	Nil
Herd Structure		
• Number of cows	14	2
• Breed	Crosses	Crosses
Milk Yield (Litres/Lactation/Cow)	3505	1808
Marketing Channel	Informal	Informal

Both large and small-scale urban producers are described as backyard producers because with no land holdings, all operations are carried out within family compounds measuring 275m² and 39m² for the large and small operators respectively. The animals are fed on road side grazing supplemented with purchased fodder and concentrates. Performance is rather mediocre, given the improved genotypes used. Both large and small-scale producers market their milk mainly through the informal channel, selling directly to individual consumers, institutions, informal

processors and traders.

Similar smallholder dairy units are common in many West African cities such as in and around Bamako in Mali, or the Accra plains in Ghana. In general these, for a variety of reasons which will be examined later, have not been as successful and efficient as the Kenya smallholder producers.

In Bamako, private and communal dairies were two types of urban and peri-urban dairy systems described by Debrah (1993). Private dairies with single ownership, were located within a 25 to 40 km radius of Bamako, and had an average of 15 milking cows per herd. The animals were mainly local zebus (75%), with some improved crossed breeds (15%), and were fed mainly on grazed forage, with some concentrate supplements, and received good veterinary care. The communal dairies under communal ownership, and located within Bamako city limits had 8 milking cows/herd. The animals, mainly local breeds, were fed on pasture and crop residues, and received limited veterinary care. Private dairies tended to market the bulk of their product through formal channel, while the communal dairies preferred the informal route.

The author concluded that peri-urban dairy production is an important activity in Bamako, and has the potential to be economically viable, if the performance of the animals could be improved to raise milk off take/cow, in order to make feeding, marketing and labour costs acceptable, relative to milk output.

Commercial large scale: Distinguishing feature is remunerated family labour when involved, or completely commercial with little or no family input except at management level. Parastatals in many countries practice this system. The units are usually situated at the outskirts of towns and cities, where land is available for growing fodder, which constitutes the main feed source, supplemented with purchased concentrates. When run as private concerns, the required inputs in the form of improved genotypes, adequate nutrition, effective health coverage and management are supplied, making the system potentially economic when supported by good pricing policies and effective infrastructural support systems.

CONSTRAINTS AND OPPORTUNITIES

In none of the systems reviewed above is performance optimum nor is the potential economic returns achieved. Technical, institutional and policy-related constraints are responsible for this less than optimum performance. Opportunities exist, however, to alleviate these constraints and make peri-urban livestock production, particularly dairy production, more attractive.

Technical constraints: In general, peri-urban dairy production in Africa is characterized by low milk yields. In comparison to production levels in other regions, milk yields in Africa have been reported to be 2.5 times lower than in Latin America and Asia, 10 times lower than in Europe, and 15 times lower than in North America. Following a two-year evaluation of three major milk production systems around Bamako in Mali, Debrah (1993) concluded that feeding, marketing and labour costs were too high, relative to milk output, for the enterprise to be profitable, and that milk off take/cow/day was too low. Technical constraints responsible for such low productivity, revolve around three factors: 1) limited milk production potential of local genotypes, 2) seasonal quantitative, and 3) qualitative feed shortages, and poor management and health care.

Many local indigenous breeds of cattle have developed adaptive traits for disease resistance, heat tolerance and ability to utilize poor quality feeds. This adaptation to the natural environment, is often not accompanied by high performance traits, and neither have these breeds been selected for high milk production. Low genetic potential for milk production is therefore a limiting factor, which could be, and is being addressed on a short-term basis, by cross breeding with proven milk producing breeds. This short-term action must, however, be accompanied by longer term selection and breeding plans that incorporate the conservation of desirable indigenous germplasm. In the short run, therefore, urban producers who have the financial means and management know-how should exploit animals that have been crossbred towards the local breed to increase milk output, and economic returns. Such crossbred animals benefit from the local breed adaptation to local feeds, diseases and the environment.

Seasonal quantitative and qualitative feed shortage is perhaps the major constraint to improved production and productivity of peri-urban dairy

enterprises, and farmers usually cite it as a priority problem to be tackled by research. Appropriate feed packages suitable for urban dairy producers are available and continue to be developed. These are built around improved fodder cultivation including leguminous forages, where land is available, the improvement of poor quality forages and crop residues, including the utilization of multi-nutrient blocks, and efficient supplementation of grazed pastures (Smith 1993). What is often lacking are policy incentives that encourage their adoption and utilization.

Institutional constraints: A weak infrastructural base and poor support services have been repeatedly shown to adversely affect output and economic returns of urban dairy units. Inadequate infrastructure such as poor feeder roads, unreliable power supply, inefficient cooling and processing capacity can discourage production or result in economic losses. According to Shapiro *et al.* (1992), these factors that constitute formidable constraints to distribution and marketing, could discourage production because of the perishability of milk. Small-scale peri-urban dairying is often linked to, or engages in, the collection of milk from rural areas. Adequate infrastructural facilities are needed for linking rural supply to urban demand, to allow for an efficient network of milk collection, processing and distribution.

Institutional support services in terms of credit facilities, health delivery, input supply and distribution, and technical advisory services are of crucial importance to the successful management of peri-urban dairy units, but are often not adequately provided. While a high incidence of disease entities, particularly in tropical areas, is known to constitute a serious barrier to high animal productivity, poor delivery of veterinary services in many African countries complicates the situation. Available services are thinly spread and ineffective, as are drug availability and distribution. A suggested solution which is gaining acceptance is the privatization of veterinary delivery services. Because farmers have demonstrated willingness to pay for efficient services, private veterinary services are gaining grounds, giving farmers the confidence to make the necessary investments for improved productivity.

Access to credit facilities is necessary to cover the comparatively high cost of establishing and running even small-scale dairy farms. Credit would be

required for upgrading local cattle, and even where the production system is based on indigenous breeds, substantial investment would still be required to ensure adequate nutrition, disease control and an effective product marketing strategy. According to Winrock (1992), the ties between extension services and research institutions that generate new agricultural technology are weak, thus the two-way communication needed between research workers and farmers is poorly developed in most countries. In other words, there is a need to develop strong technical advisory services that will ensure a successful transfer of appropriate technologies to farmers for improved performance. The current lack of such cost-effective means of transferring technology constitutes a serious constraint.

Policy related constraints: According to the World Bank (1981), government policies play a crucial role in livestock development. They not only affect the economic environment, but also directly affect production, marketing, consumption and external trade in livestock products. Policy issues that may constrain or promote the dairy industry performances include: foreign exchange, dairy import, and commodity price policies.

Jansen (1992) noted that in Nigeria, smallholder dairy production and processing near urban areas were not well developed, because until recently, imported milk products were so cheap in Naira (local currency) terms that there was hardly any incentive to produce milk locally in urban areas.

After the devaluation of the Naira, however, the situation changed, and production and processing of local dairy products have become increasingly attractive. In other words, high currency exchange rates may discourage local production and development of the dairy industry. Import and consumer-price subsidy have the same effect of reducing local production, because although domestic consumption increases as a result of cheap imports, local production, sales and profits decline (Shapouri and Rosen 1992).

Direct commodity price control by government is a common phenomenon in Africa. Shapouri and Rosen (1992) listed a number of criteria used for the determination of commodity prices: cost of production, fair return to producers, fair price to consumers, import-export parity price, commodity

profitability, food security and political acceptability. Fair price to consumers and political acceptability apparently have always received major consideration, and this is particularly true for dairy products pricing which is often tailored to satisfy the politically vocal urban dwellers. Such pricing controls are often inadequately enforced, particularly at the informal market where the majority of local producers market their output. The high transaction costs in such markets penalize local production (Winrock 1992).

Staal and Shapiro (1994) illustrated the above scenario with the situation in Kenya in the 1980s, when the Kenya Cooperative Creameries (KCC) dominated the formal dairy sub-sector from producer to retailer, as it had official monopoly on processed milk sales in urban areas, and was the major buyer of raw milk at the farm gate, paying the official Kenya Dairy Board controlled price. The informal market, initially disadvantage in terms of volume sales, gradually acquired a larger share of the market, for two main reasons. Firstly, input prices paid by the producers increased faster than the official farm-gate milk prices, and secondly, raw milk prices on the informal market rose relative to the official prices. Most producers therefore channelled their products to the informal sector. The end result apparently was a severe shortage of dairy products on the formal market. This underscores the need for a more favourable price policy and market liberalization in order to stimulate dairy development.

Such a policy change was implemented in the 1990s in Kenya when dairy prices were decontrolled. In a study of the impact of these changes on smallholder peri-urban producers using the Policy Analysis Matrix approach, Staal and Shapiro (1994) reported that the price policy reform removed 20% - 30% of the negative policy effects of producer price controls, and that although producer profits and welfare were improved, producer disincentives still existed. They concluded that evidence from their studies and from elsewhere, confirm that non-price factors such as regulations and credit restrictions may continue to hinder dairy development in spite of favourable price policies.

CONCLUDING REMARKS

In view of the important contribution of the sector to meeting the specialized food needs of an ever growing urban population, as well as to improving the economic status and welfare of needy urban dwellers, urban and peri-urban livestock production needs to be recognized as an important component of the national livestock industry. In this context, it should benefit from appropriate and enabling policy support, albeit, within the framework of an overall livestock policy and development plan.

A number of policy issues that need to be addressed have been discussed earlier. One that needs special emphasis at this point is the issue of access to and ownership of land. Peri-urban dairy producers in particular, will not invest in some of the available productivity improving technologies if they do not have access to or own required land. This particularly thorny issue needs to be adroitly addressed to ensure the producers continuous access to land, accompanied by the development of necessary infrastructures. Adequate government investment in essential infrastructure, to reduce unit production cost as an incentive to private investment, is an unavoidable prerequisite for the well-being of the sector.

Urban and peri-urban production units are often in very close proximity to high concentrations of people, raising the spectre of zoonosis; that is, the transfer of diseases from animals to humans. Such problems may arise from improper animal waste disposal systems, and from unhygienic processing of animal products such as the highly perishable milk, sold through informal channels.

The problem is real and needs to be addressed through sensitization and education of producers. New hygienic methods of recycling and reusing liquid and solid livestock wastes need to be developed, to reduce the problem of urban environment pollution.

Finally, it is evident that the many peri-urban livestock production units that grace the urban landscape in many African cities contribute a substantial portion of the specialized food requirements of the city dwellers. More significantly, the sector has the potential to contribute in no small measure to meeting the food security goals of many of the countries. In order to

realize this potential, however, the sector will need a boost from productivity- improving technologies, and support from a more favourable socio-economic policy environment, as well as efficient institutional support services.

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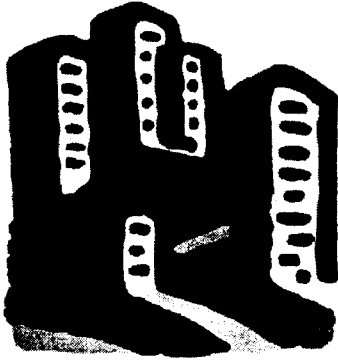
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