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Siegfried Debrah and
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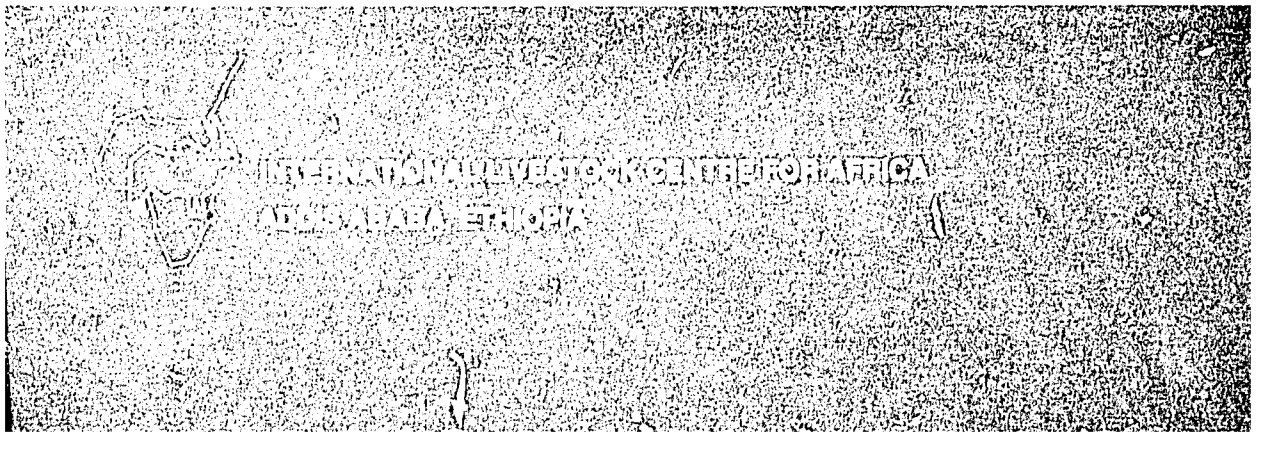
February 1991



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ABSTRACT

This study is part of a larger study on dairy marketing in Ethiopia, and concentrates on the producers' end of the marketing chain. Specifically, the markets of first sale used by dairy producers were identified and the marketing patterns of three categories of dairy producers (intra-urban, peri-urban and peasant) were investigated. The study was carried out on a sample of 173 dairy producers between February and July 1986, using structured questionnaires.

Fresh-milk sales averaged between 0.5 and 6 litres per lactating cow per day, with intra-urban and peri-urban producers specialising in fresh-milk sales. Most of the fresh milk was sold to catering and government institutions in Addis Ababa, from which net profits of EB 0.63 and EB 0.66/litre, respectively, were obtained. Peasant producers sold milk, butter and cheese, as specialised enterprises or in combination. Those peasant producers located near to a Dairy Development Enterprise milk collection centre sold more milk and less butter and cheese than those far away. High net profits was identified as an important motive guiding the choice of sales outlet.

KEY WORDS

/Ethiopia//milk products//marketing//marketing chain/ – /supplies//prices//production costs//urban areas/ /rural areas/

RESUME

L'enquête présentée ici s'inscrit dans le cadre d'une étude plus vaste effectuée sur la commercialisation des produits laitiers en Ethiopie. Elle est essentiellement consacrée au producteur et à sa place dans le circuit de commercialisation. De manière plus spécifique, elle identifie les premiers points de vente utilisés par les producteurs de lait et analyse les circuits de commercialisation empruntés par les opérateurs urbains, péri-urbains et ruraux. Effectués à partir de questionnaires entre février et juillet 1986, ces travaux portaient sur un échantillon de 173 producteurs de lait.

Le lait frais, dont les ventes variaient en moyenne de 0,5 à 6 litres par jour et par vache en lactation, était essentiellement écoulé par les producteurs urbains et péri-urbains. Les restaurants et les institutions gouvernementales d'Addis-Abeba constituaient leurs principaux clients et les bénéfices nets étaient estimés respectivement à 0,63 et 0,66 birr par litre pour ces deux groupes d'opérateurs. Pour leur part, les producteurs ruraux vendaient du lait, du beurre et/ou du fromage. Ceux d'entre eux qui étaient localisés à proximité des centres gouvernementaux de collecte de lait frais vendaient plus de lait et moins de beurre et de fromage que ceux habitant loin de telles structures. Cette étude a enfin permis d'établir que le niveau des profits constituait un élément majeur dans le choix du point de vente.

MOTS CLES

/Ethiopie//produits laitiers//commercialisation//circuit de commercialisation//offre//prix//coûts de production//zones urbaines//zone rurales/

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1. INTRODUCTION

DAIRY PRODUCTION IN SUB-SAHARAN AFRICA: FACTS AND FIGURES

Milk accounts for 16% of the total value of all food products produced from livestock in sub-Saharan Africa, estimated at US$ 18.3 billion in 1986 (FAO, 1986). Despite milk's contribution to gross domestic product and its value as a food, sub-Saharan Africa has failed to attain self-sufficiency in dairy production. The region has, therefore, depended on dairy imports (commercial and food aid) to satisfy rising domestic demand.

Commercial dairy imports have increased steadily since 1960. In 1980, approximately 5% of the region's total revenue from agricultural, forestry and fishery exports was spent on imports of dairy products (von Massow, 1985). In 1981, dairy food aid received by sub-Saharan Africa was valued at US$ 140 million, or 16% of the total value (US$ 875 million) of all dairy imports (commercial and food aid) into the region (FAO, 1984).

Between 1970 and 1980, the human population in sub-Saharan Africa increased annually by an average of 2.9% overall and by an average of 6% in urban areas. During the same period, per capita income grew at 0.8% per year (World Bank, 1981), and cow milk production grew at 3.5% per year (Addis Anteneh et al, 1988). If urban population, per capita income and cow milk production continue to grow at these rates, the already large imbalance between domestic supply of, and demand for, dairy products is likely to worsen by the year 2000. This implies that sub-Saharan Africa will continue to rely on dairy imports to satisfy domestic demand. Because of foreign exchange constraints, however, many countries in the region cannot afford to continue importing dairy products and are instead attempting to develop domestic dairy sectors through upgrading their local herds, the use of artificial insemination and improvements in dairy marketing systems (Mbogoh, 1984).

In sub-Saharan Africa, dairy products are marketed through formal or informal systems. The formal system (which is usually controlled by government) includes organised collection, processing and distribution of fresh milk and other dairy products at official, government-controlled prices. Examples of formal marketing systems in Africa are the Kenya Cooperative Creameries, the Dairy Development Enterprise of Ethiopia, the Dairy Produce Board of Zambia, the Dairy Marketing Board of Zimbabwe and the Union laitière de Bamako of Mali. Informal marketing involves sales directly from producers to consumers or indirectly through itinerant traders and other intermediaries. Prices in the informal market are usually not controlled and tend to be higher than those in the formal system. A survey of dairy prices (ILCA, 1979) suggests that prices in the informal dairy market can be three times as high as those in the formal market.

Dairy development and marketing policies in sub-Saharan Africa have been studied by Mbogoh (1984). In order to be able to evaluate and compare different dairy marketing systems in sub-Saharan Africa, detailed country studies are needed to determine the marketing options of producers, the purchasing patterns of consumers and the activities of intermediaries. ILCA has been conducting a study of this kind in Ethiopia, and some of its results are presented in this report.

DAIRY PRODUCTION AND DISTRIBUTION IN ETHIOPIA

Dairy production systems

Ethiopia has the largest livestock population in Africa, comprising about 26 million cattle, 24 million

sheep, 17 million goats, 7 million equines, 1 million camels and 52 million poultry (FAO, 1981). In 1984, there were about 8.33 million cows and heifers older than two years, of which 65% were in milk (AACM, 1984). Milk output in Ethiopia grew by 1.7% per year between 1965 and 1976, and by 1.1% per year from 1976 to 1985.

Based on average annual cow milk production of 782 000 t between 1961 and 1980, and an average human population of 28.8 million over the same period, FAO (1981) estimated milk production in Ethiopia to be about 27 kg/person per year. By 1985, given an estimated human population of 35.4 million and cow milk output of 595 000 t, cow milk production in Ethiopia had dropped to 17 kg/person, but was still higher than the 15.7 kg/person in sub-Saharan Africa as a whole in the same year.

There are pastoral, agropastoral and intensive systems of livestock production in Ethiopia. In the highlands,[1] where about 70% of the human and livestock populations are, mixed crop–livestock farming is typically practised within the same management unit. In the lowlands,[2] however, livestock husbandry predominates, and there is little or no crop farming.

The most important contribution of livestock to agricultural production in the highlands is the provision of draught power. Milk and meat are relatively unimportant, but cows are milked to provide the family with fresh milk, butter and cheese, and surpluses beyond the family's needs are sold. In the lowlands, milk production for family consumption and sale is the primary activity. Live animals are also sold to purchase food grains and to obtain cash for other household needs.

The indigenous (or traditional) mixed farming and pastoral/agropastoral systems rely mainly on local breeds which produce 400–680 kg of milk per cow per lactation period of less than seven months (Gryseels and Anderson, 1983; Nicholson, 1983). In contrast, the modern, intensive system, which comprises cooperative, state and privately owned dairy farms,[3] uses exotic breeds and their crosses. Production is oriented towards supplying milk and milk products to the urban populations of Addis Ababa and Asmara. Accurate estimates of milk production in the intensive systems are difficult to obtain as some milk from the cooperatives is sold privately, while state and private farms often do not keep proper records. Based on field surveys of some cooperative farms, AACM (1984) estimated that milk production per cow in the cooperatives is approximately 1120 litres over a 279-day lactation period, or 4 litres/cow per day. The same study reported an output of 2500 litres (9 litres/cow per day) over the same lactation period on the state dairy farms.

Fresh-milk distribution

In Ethiopia, fresh milk is distributed through the informal and formal marketing systems. The informal market involves direct delivery of fresh milk by producers to consumers in the immediate neighbourhood and sales to itinerant traders or individuals in nearby towns. Milk is transported to towns on foot, by donkey, by horse or by public transport, and commands a higher price there than when sold in the neighbourhood, to cover transport costs.

The formal milk-marketing system is dominated by the government-controlled Dairy Development Enterprise (DDE) which functions as a milk collector, processor and distributor. The DDE facilities in Addis Ababa and Asmara have processing capacities of 60 000 and 7000 litres/day, respectively.

Table 1 shows the estimated daily milk sales to Addis Ababa in 1986. Of the total of 47 000 litres of liquid milk supplied daily on average, 21% were informal inter-household sales and 79% were sales through DDE. DDE's clients were approved licensed agents, *kebele* shops and government institutions which, in 1986, accounted for 30, 37 and 33% of the total DDE deliveries, respectively.[4]

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1 The highlands are areas above 1500 m altitude, which receive more than 700 mm of rainfall per year and have temperatures below 20°C during the growing season.

2 The lowlands are areas below 1500 m altitude, which receive less than 700 mm of rainfall per year and have temperatures above 20°C during the growing season.

3 There are two types of dairy cooperative. Producer cooperatives are run by groups of individuals within peasant associations. Each peasant association comprises farmers from about 200 households and has access to about 800 ha of land. Service cooperatives tend to be larger and are operated by groups of peasant associations. There are about 98 producer and service dairy cooperatives in Ethiopia. There are also 14 dairy state farms operating under the control of the Dairy Development Enterprise.

4 Licensed agents are DDE-appointed individuals who sell DDE's milk for commission. *Kebele* shops are public shops belonging to urban dwellers' associations (*kebeles*). Government institutions include the armed forces, police, schools, hospitals and factories.

Table 1. *Estimated daily liquid milk supplies to Addis Ababa, 1986*

Source of supply	Quantity (litres/day)
Dairy Development Enterprise	
Domestic supply	
State farms	16 000
Milk collection centres[a]	8 000
Private farms	3 000
Imports (World Food Programme)[b]	10 000
Direct inter-household sales by intra- and peri-urban producers	10 000
Total daily supply	**47 000**

a Served by about 2700 small private producers within 120 km of Addis Ababa

b Milk reconstituted from imported dried skim milk and butter oil

Source: Dairy Development Enterprise, Addis Ababa, Ethiopia (personal communication)

In 1986, DDE bought raw milk from producers at EB 0.50/litre (EB 2.07 = US$ 1). Processed milk was retailed at EB 0.70/litre: this price includes commissions of EB 0.02/litre to government institutions and *kebele* shops, and EB 0.03/litre to private agents (DDE, Addis Ababa, Ethiopia, personal communication).

Production and distribution of other dairy products

Sour milk or yoghurt (*ergo* in Amharic) is produced in the traditional system by leaving fresh milk to sour for a few days. Soured milk keeps longer than raw milk, so this process is useful for storing milk during those days (Wednesdays and Fridays) when Coptic Christians are forbidden to consume animal products. Sour milk not consumed at home is usually sold to neighbours.

Sour milk can also be churned to make butter. The byproduct, buttermilk, is rarely sold; it is usually fed to calves, consumed at home or further processed by heating to about 40°C to precipitate the curd. The curd is a white, grainy-textured cottage cheese (called *ayib* in Amharic) with an acid taste. Both *ayib* and whey are consumed by the household or sold; whey is also fed to calves.

Two types of butter are manufactured and marketed through different sales outlets. Cooking butter is made on the farm by women and sold mainly to itinerant traders or in local town markets, although some may be transported to urban centres and sold to individual consumers, butter merchants or wholesalers. Table butter is manufactured by DDE and sold in grocery stores and supermarkets.

In the rural markets, butter prices fluctuate according to season, ranging from EB 5/kg in the wet season to about EB 12/kg in the dry season. In Addis Ababa, the butter trade is handled mostly by butter merchants. Retail prices vary between EB 10 and 23/kg, depending on quality and market demand, which is high at Easter and during other feasts and low during the fasting periods prescribed by the Coptic Church (O'Mahony and Ephraim Bekele, 1985).

Ayib is produced in the rural areas and sold in rural markets or nearby towns, but some is also transported with butter to Addis Ababa and sold to individual consumers and itinerant traders.

Hard cheese is manufactured by DDE and sold to supermarkets and government institutions.

MARKETS, MARKETING AND MARKET PERFORMANCE: SOME CONCEPTS AND DETERMINANTS

Markets and marketing

In the African context, markets for agricultural products would normally refer to market-places (open spaces where commodities are bought and sold). Conceptually, however, a market can be visualised as a process in which ownership of goods is transferred from sellers to buyers who may be final consumers or intermediaries. Therefore, markets involve sales locations, sellers, buyers and transactions.

Marketing of agricultural products consists primarily of moving products from production sites to points of final consumption. In this regard, the market performs exchange functions as well as physical and facilitating functions. The exchange function involves buying, selling and pricing. Transportation, product transformation and storage are physical functions, while financing, risk-bearing and marketing information facilitate marketing.

Market performance evaluation

In agricultural economics, the most frequently used model for evaluating market performance is based on the industrial organisation model (Scherer, 1970; Shepherd, 1979). The model examines the causal relationships between market structure, conduct and performance, and is usually referred to as the S-C-P (structure, conduct, performance) model.

An alternative to the S-C-P model, and a more appropriate model for the less developed countries, was proposed by Kriesberg (1986). Kriesberg first differentiated between marketing efficiency and marketing effectiveness. Marketing efficiency is related to the amount or cost of inputs required to obtain a given level of output, and is measured by input:output or cost:benefit ratios. For instance, a change which reduces input costs without reducing consumer services or satisfaction would be considered as raising efficiency. Marketing effectiveness is viewed in terms of the objectives set for the marketing system (for example, higher net prices to producers or movements of larger quantities of goods at reasonable cost to urban producers). It is thus measured in terms of objectives and depends on comparisons between alternative marketing channels, enterprises, or even countries with similar developmental conditions. Marketing efficiency and effectiveness have essentially the same meaning if the objectives sought are the same.

Market performance is then evaluated by how well the process of marketing is carried out and how successfully its aims are accomplished. Even though there are many indicators of market performance, the quantitative evidence used in this study was the absolute size of the producers' net margins across their alternative markets of first sale.

RESEARCH OUTLINE

The study reported here is part of a larger study of dairy marketing in Ethiopia conducted by ILCA. The consumers' end of the marketing chain was studied in 1985 (ILCA, Addis Ababa, Ethiopia, unpublished data) to find out which marketing channels were patronised by the different categories of consumers in Addis Ababa, and why. Based on this information, the efficiency of alternative marketing channels was then evaluated using selected criteria likely to appeal to consumers or to government.

The producers' end of the chain (that is, the market conditions and options available to Ethiopian dairy producers) is examined in this study. The relative efficiencies of the alternative marketing channels patronised by different classes of producers were evaluated by:

- identifying and quantifying product flows through different outlets or points of first sale for fresh milk, cooking butter and cottage cheese
- investigating producers' knowledge of different outlets for their products
- determining factors that explain producers' patronage of selected outlets
- comparing performance of different marketing outlets in terms of producers' net profits.

2. MATERIALS AND METHODS

THE STUDY AREA

The study was carried out in Shewa in central Ethiopia (Figure 1). Shewa covers 77 000 km^2 (7% of Ethiopia's land area) and has 5.8 million people (16% of the total population), making it the most densely populated area in the country at 75 persons/km^2 compared with 32 persons/km^2 in Ethiopia as a whole. It also has the highest livestock population in Ethiopia—about 5.6 million cattle (21% of the total) and some 19% of the total sheep and goat population (MAS, 1977). The region has two rainy seasons a year: a long one from June to September when 70% of the annual rainfall occurs and a short one between February and April.

About three-quarters of the Shewa region are highlands (altitude 1500–3500 m above sea level). The highlands are more suitable for crop growing and livestock husbandry than the lowlands, and so mixed crop–livestock smallholder farming is the predominant agricultural activity there. The main crops are teff (*Eragrostis tef*), wheat, barley, sorghum, chickpea, faba bean (*Vicia faba*) and some vegetables; livestock are kept for milk, meat and draught. The rest of the region (lowland areas, altitude below 1500 m) is populated mostly by semi-nomadic, livestock-owning households who derive their livelihood mainly from selling livestock and livestock products.

The specific areas selected for the study were the Menagesha and Selale administrative divisions (*awrajas*) in Shewa. The Menagesha *awraja* covers an area within about 20 km of the Ethiopian capital city of Addis Ababa. The Selale *awraja* is about 85 km from Addis Ababa. These two *awrajas* have different farming systems. In Menagesha there is a high livestock concentration and dairying is the main agricultural activity. Selale is principally a crop-farming area with dairying as a secondary activity.

ALTERNATIVE DAIRY-PRODUCT SALES OUTLETS

Addis Ababa and smaller towns such as Sululta and Sebeta in the Menagesha *awraja* provide ready markets for dairy products produced in the area. In Addis Ababa, producers may sell fresh milk directly to individuals, to the Dairy Development Enterprise (DDE) milk plant, to government institutions (the armed forces, police, schools, hospitals, factories), or to catering institutions (hotels, restaurants and coffee shops). In the smaller towns, producers may sell to restaurants and coffee shops, to individuals, to itinerant dairy traders or at DDE milk collection centres.

Producers in the Selale *awraja* may sell their dairy products to neighbours or itinerant dairy traders, or take them to nearby towns for sale. They may also sell fresh milk at the DDE milk collection centres located along the Addis Ababa–Gojam road.

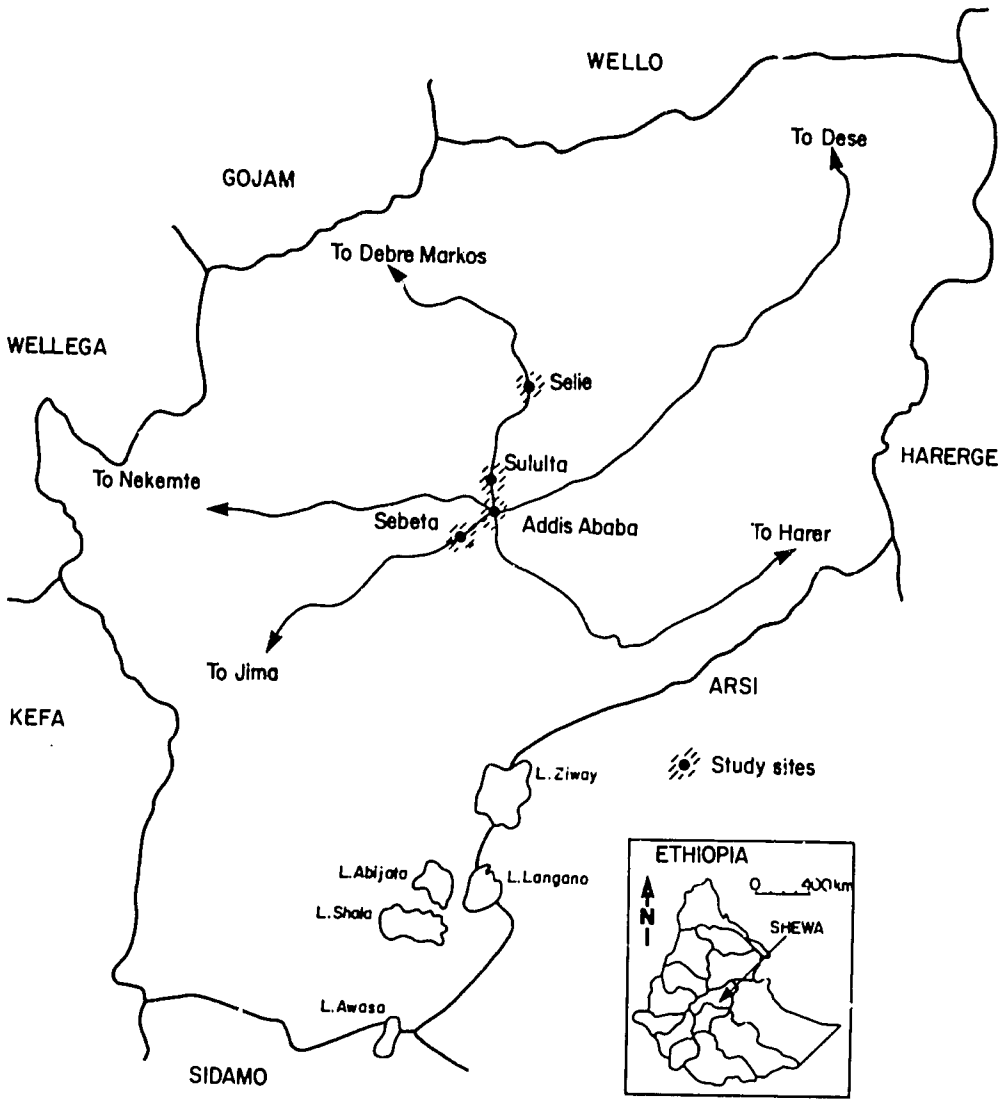
STUDY HYPOTHESES

The study was designed to test two hypotheses relating to the farming systems and producer types within the farming systems:

1. That there are no differences in the types of dairy products produced and sold by producers in the Menagesha *awraja*, representing the livestock system, and in the Selale *awraja*, representing the cropping system.

2. That, irrespective of the farming system, there are no differences among the various categories of producers in the choice of market outlets for their dairy products (that is, they all select the outlets from which they obtain the highest net prices, defined as the producer price less transport costs).

Figure 1. *The Shewa region and study sites*



DESIGN AND METHODOLOGY

Sample selection procedure

Three categories of dairy producers were investigated:

- producers operating in Addis Ababa ("intra-urban producers")
- large-scale producers operating within 20 km of Addis Ababa on the Addis Ababa–Jima road ("peri-urban producers")
- small-scale producers located up to 85 km north of Addis Ababa along the Addis Ababa–Gojam road ("peasant producers").

The intra-urban producers in Addis Ababa and the peri-urban producers located along the Addis Ababa–Jima road represented the Mengesha *awraja*; the peasant producers on the Addis Ababa–Gojam road represented the Selale *awraja*.

In order to examine the sales patterns and marketing behaviour of the different categories of producers more closely, the sample was subclassified by additional criteria. Intra-urban producers were divided into two groups according to the sizes of their herds: producers owning up to three cows were assigned to the 'small-producer' category, and those with four or more cows to the 'large-producer' category. Peasant producers were first classified ac-

cording to their distance from Addis Ababa, the first group being those within 20 km of Addis Ababa, and the second those between 20 and 85 km from the city. Each group was then further subdivided into producers who were near to (0–3 km) or far from (3–10 km) a DDE milk collection centre.

The sampling frame used for the selection of intra-urban dairy producers was a list of about 2000 households registered for feed-purchasing purposes. The list (obtained from the Central Statistical Office in Addis Ababa) groups households within the different zones of the city and gives information on numbers and breed types of dairy animals per household.

Since the study concerned marketing by dairy producers, the target population from which to sample was defined as all households in Addis Ababa who were currently producing and selling milk or other dairy products. Three city zones were selected on the basis of their share of the total dairy herd in Addis Ababa (the three zones account for 60% of the total dairy herd), and 500 households were identified within these zones as currently producing and selling dairy products; of these, 200 were large producers and 300 were small producers. Random samples of 20 large and 30 small intra-urban producers were then drawn using a table of random numbers.

The township of Sebeta, about 20 km from Addis Ababa, was selected as the site in which to study the large-scale private producers. The Sebeta area is not the only place near Addis Ababa where such producers exist, but it is a place where they are geographically concentrated and, therefore, easier to study. Eighteen large-scale, private producers were registered by the Ministry of Agriculture in Sebeta, and all these were included in the study as the peri-urban producer group.

To select the sample of peasant producers, meetings were held with members of peasant associations operating at selected distances from Addis Ababa along the Gojam road, to explain the study. Following the meetings, lists of households whose cows were lactating at that time, and who were potentially sellers of fresh milk and milk products, were provided by the chairmen of the peasant associations, and from these lists a sample of 105 households was selected at random.

The sizes of the samples used and the distribution of the sampled producers by distance from Addis Ababa and from DDE milk collection centres are shown in Figure 2.

Survey methodology

Information on marketing behaviour and alternative outlets for milk, butter and cheese was collected by personal interviews using structured questionnaires. The emphasis was on marketing, and so few production data (for example, production costs) were collected. Both cross-sectional and longitudinal survey designs (termed 'initial' and 'daily', respectively) were used.

The aim of the initial survey was to collect information on dairy marketing practices in the year preceding the interview. Each sample household was interviewed once, and the normal patterns of marketing in the dry, wet and fasting[5] seasons were deduced from the household's experience in the recall year. In the absence of long-time-series data which are appropriate for analysing normal patterns of marketing behaviour, this technique was found to be useful.

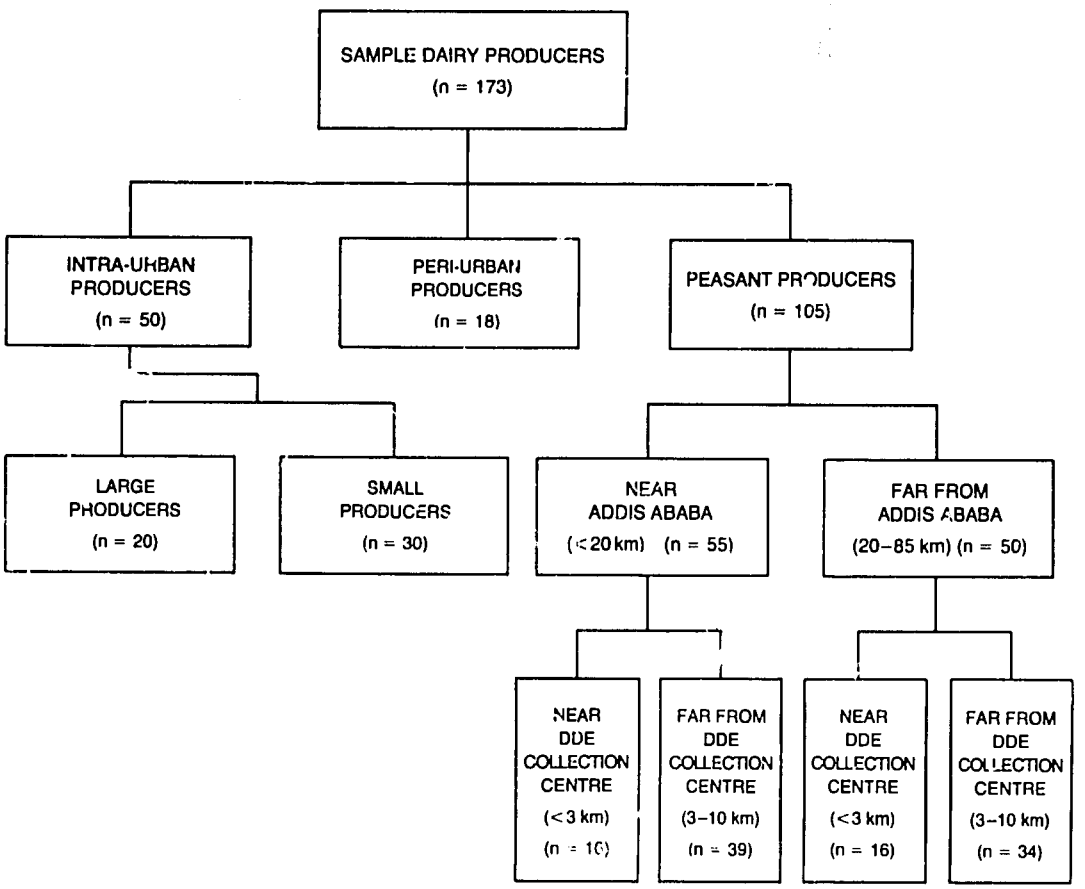
In the daily survey (of the same households used in the initial survey), marketing behaviour was monitored in each household over a seven-day period. The daily survey was useful in determining whether variations existed in marketing behaviour between different market and fasting days during the week. The survey was also intended to provide information on any deviations in marketing behaviour from what respondents reported as normal (in the initial survey) and what they currently did (as reported in the daily survey).

The surveys were carried out on the following dates:

- Intra-urban producers: February 1986 (to obtain historical data for the period February 1985 to February 1986) and March 1986 (to obtain daily data for a week in March 1986)
- Peri-urban producers: May 1986 (to obtain historical data for the period May 1985 to May 1986, and daily data for a week in May 1986)
- Peasant producers: July 1986 (to obtain historical data for the period July 1985 to July 1986, and daily data for a week in July 1986).

5 Each year, Ethiopian Orthodox Christians observe 55 days of fasting between February and April and 15 days in August, during which they are forbidden to eat animal protein. In addition, Wednesdays and Fridays are observed as fasting days during any week.

Figure 2. *Distribution of sample households, Shewa region, Ethiopia, 1986*



Figures in parentheses show the number of households in the sample (n) and approximate distances from Addis Ababa or from Dairy Development Enterprise (DDE) collection centres

Data were collected by 12 high-school graduates who were trained in interviewing techniques. During training sessions, the questionnaires were tested on the enumerators themselves and on some selected dairy producers. Questionnaires were also tested for clarity on a few farmers with long dairy-farming experience. Because of language and other communication problems, many of the questions had to be restructured or rephrased. Depending on the preference of the respondents, the survey questions were posed in either Amharic, the official language of Ethiopia, or *Oromigna*, another widely spoken language.

In both the initial and daily surveys, detailed information was collected on production, use and marketing of milk, butter and cheese. If measurements were doubtful, the interviewers measured containers in which the products were offered.

Respondents provided information on sales locations, types of purchasers and prices received from each class of purchaser at each location. The reasons why producers preferred to sell to selected customers and at selected locations were determined as well. Wherever possible, information was obtained from the household head or the person directly responsible for making marketing decisions.

3. RESULTS

INTRA-URBAN PRODUCERS

Fresh-milk offtake, sales and other disposals

The 49 intra-urban producers on whom complete data were collected kept an average of 5.3 lactating cows (cows giving milk during the survey period) per household (range 1 to 43). On average, the large producers kept about 10 milking cows per household, the small producers about 2.

The intra-urban producers stated that they produced milk both for sale and for home consumption. The small producers recalled having regularly sold two-thirds of their total milk offtake between February 1985 and February 1986, leaving one-third for home consumption. Only five out of the 20 large producers reportedly sold all their offtake during that period while the other 15 estimated that they sold 80% of their total offtake, leaving the other 20% for home consumption.

The quantities of fresh milk sold in Addis Ababa varied by producer and season. Reported daily milk sales and estimated offtakes for the intra-urban producers are shown in Table 2.

Approximately 75% of intra-urban milk producers usually sold all milk intended for sale, regardless of the season. Reasons for failure to sell all milk were late milking, late delivery and refusal by regular customers to buy milk when fasting. Sample producers did not see failure to sell milk as a problem as the unsold portion could be processed into butter or cheese, or consumed as fresh milk at home.

Fresh-milk markets of first sale

Intra-urban producers sold neither butter nor cheese during the survey period. The analysis was therefore done on fresh milk only. The initial survey indicated that intra-urban dairy producers sold milk:

Table 2. *Average daily milk sales and estimated daily offtake per household by intra-urban producers, February 1985 to February 1986*

Producer group	Number of households	Average number of cows	Daily milk sales (litres/household)				Estimated daily offake (litres/household)[b]
			Wet season[a]	Dry season[a]	Lent[a]	Mean	
Large producers	20	10.4 (10.3)	32.9 (44.6)	22.9 (26.6)	17.0 (22.7)	24.2 (37.0)	30.3
Small producers	29	1.8 (0.6)	3.7 (3.0)	2.2 (1.3)	3.0 (2.1)	3.0 (1.6)	4.5
Whole sample[c]	49	5.3 (7.8)	15.6 (20.0)	10.7 (11.6)	8.8 (10.5)	11.7 (16.1)	16.0

Figures in parentheses are standard deviations. The large standard deviations relative to the means imply that the distribution of sales is highly skewed to the right, especially for the large producers

[a] The wet season is between June and September. The dry season is between October and January. Lent during the survey period was 17 February to 13 April 1985

[b] Estimated on the assumption that sales represented 80, 66 and 73% of total milk offtake for large, small and all sampled producers, respectively

[c] Figures are weighted averages. The weights applied are 0.41 for large producers and 0.59 for small producers

- direct to the consumer, either at the producer's home or at the farm gate or at the customer's home or business premises; 73% of the producers used this outlet
- to catering institutions, either at the farm gate or by direct delivery; 18% of the sample sold milk to catering institutions
- to government institutions, either by direct delivery or through itinerant traders; 9% of the sample patronised this outlet.

Selling directly to individual consumers was by far the most popular outlet for both the large and small producers. Almost all the small producers (96%) sold through this outlet, while 45% of the large producers did so. Of the large producers, 40% sold fresh milk to catering institutions and 15% sold to government institutions.

Relative importance of alternative sales outlets

The shares of fresh milk sold by intra-urban producers through alternative outlets by season are shown in Table 3. Wet- and dry-season sales patterns were not markedly different, but they differed significantly ($P<0.05$) from the pattern in Lent.

The proportions of total volume marketed by different categories of producer suggest that small producers preferred to sell direct to individuals, while large producers found it more convenient to sell to customers with large daily milk requirements—catering and government institutions.

Producer prices in markets of first sale

Average prices in Ethiopian birr (EB; EB 2.07 = US$ 1) received by producers at various sales outlets during the period February 1985 to February 1986 (initial survey) were:

- Individual consumers: EB 0.84/litre (SD=0.09; CV=11%)
- Catering institutions: EB 0.79/litre (SD=0.03; CV=3.2%)
- Government institutions: EB 0.79/litre (SD=0.03; CV=3.2%).

There were no variations in milk prices across seasons; these prices are thus average annual prices.

Although producers could receive EB 0.05/litre more from individual consumers than from catering or government institutions, the bulk of the large producers' sales was made to institutions in Addis Ababa (see Table 3). Because they sold relatively large quantities of fresh milk compared with small producers, perhaps the cost, in terms of labour time, of delivering fresh milk directly to individuals is higher than the extra money they would get by doing so. Selling in bulk directly to institutions may not involve as much labour time as selling to individuals. Besides considerations of the opportunity cost of the large producers' time, it appears that the risk of not being able to sell all the fresh milk offered for sale is less through institutional outlets than through direct sales to individuals.

Table 3. *Percentage market shares of fresh milk sold by intra-urban producers through alternative sales outlets by season, February 1985 to February 1986*

Sales outlet	Market share (%)		
	Large producers	Small producers	Whole sample
Lent (17 February to 13 April)			
Individual consumers	35	87	43
Catering institutions	31	0	26
Government institutions	34	13	31
Total daily sales by all households (litres)	*340*	*87*	*427*
Wet season (June to September)			
Individual consumers	26	91	35
Catering institutions	39	0	34
Government institutions	35	9	32
Total daily sales by all households (litres)	*658*	*107*	*765*
Dry season (October to January)			
Individual consumers	9	93	18
Catering institutions	51	0	46
Government institutions	40	7	36
Total daily sales by all households (litres)	*458*	*64*	*522*

Variation in producer prices

An analysis of variance was used to determine the significance of variation in prices obtained for fresh milk at the different sales outlets during the daily survey in March 1986. The results indicated signifi-

cant ($P<0.05$) differences between the producer prices received for fresh milk delivered direct to individuals and sold to catering or government institutions. There were no differences between prices received at catering and government institutions.

Producers' knowledge of alternative sales outlets and of prices they offer will, generally, enhance their bargaining position and improve their chances of getting the highest price for their products. Producers will also have the flexibility to shift between outlets to obtain the best prices. When asked about alternative outlets during the daily survey, half of the intra-urban producers said they knew of at least one other outlet, but none changed outlets during the survey, even though the prices paid by individual consumers at the time were higher than those paid by catering or government institutions. So it seems that other factors (such as outlet reliability) were more important to producers than high prices.

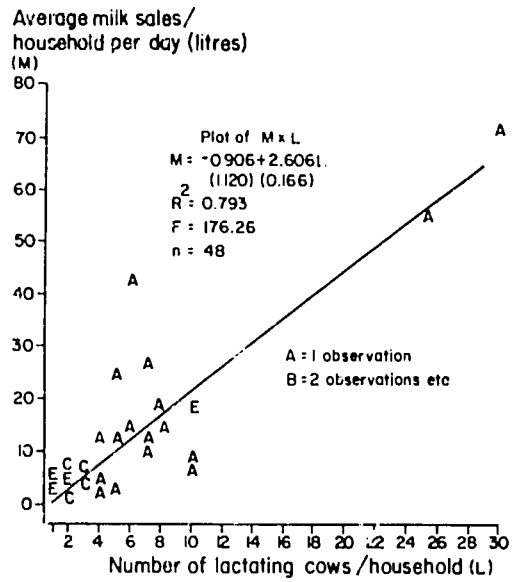
Factors affecting households' marketable supply of fresh milk

A household's marketable supply of fresh milk is a function of total production, variations in household consumption, the amount of milk suckled by calves and the ratio between the prices of fresh milk and concentrate feed. Total production in turn depends on the breed type, the number of lactating cows in the herd and the amounts and quality of feed fed.

During the course of the initial survey, some key independent variables that explain a household's marketable supply of milk, such as breed of cows, share of total production retained for household consumption and milk consumed by calves, did not vary much. However, there was a wide variation in the number of lactating cows held by the intra-urban producers and a linear regression was fitted to quantify the relationship between a household's total supply of marketable milk, represented by the household's sales, and the number of lactating cows held. The relationship is shown in Figure 3.

The regression excluded one producer whose milk sales per cow were significantly above the sample average and who had the largest number of cows. The slope of the regression line was estimated at 2.206, indicating that an additional lactating cow results in the increase of a household's marketable supply of 2.2 litres. The number of lactating cows alone explained 79% of the total variation in the marketable supply of fresh milk for the intra-urban sample, leaving other variables (for example, breed, calf intake, milk:feed price ratio, etc) explaining 21% of the variation in marketable supply.

Figure 3. *Relationship between intra-urban producers' milk sales and holdings of lactating cows*



Results of the daily survey

During the daily survey, intra-urban producers sold neither butter nor cheese, and although they could sell fresh milk to the Dairy Development Enterprise (DDE) at the fixed price of EB 0.50/litre, none of them reported doing so. Instead they sold through the same outlets as they did during the initial survey period (direct to consumers and to catering and government institutions). The shares of milk sold through these outlets are shown in Table 4.

It was estimated from the number of producers using a particular outlet and the percentage shares marketed that large producers sold an average of 24 litres/household per day and small producers sold an average of 3 litres/household per day.

Average prices in Ethiopian birr received by producers at the different outlets over the course of the daily survey were:

- Individual consumers: EB 0.86/litre (SD=0.08; CV=8.8%)
- Catering institutions: EB 0.74/litre (SD=0.06; CV=7.4%)
- Government institutions: EB 0.76/litre (SD=0.05; CV=6.3%).

Transport costs

As the emphasis of the study was on marketing, data on production costs were not collected. However, information on costs of transport for those who delivered milk to customers was obtained.

Table 4. *Percentage market shares of fresh milk sold by intra-urban producers through alternative sales outlets, March 1986*

Sales outlet	Market share (%)		
	Large producers	Small producers	Whole sample
Individual consumers	19	90	31
Catering institutions	27	1	23
Government institutions	54	9	46
Total daily sales by all households (litres)	*480*	*75*	*555*

Milk was transported to sales locations on foot or by donkey, own vehicle, bus or taxi. Most intra-urban producers transported milk on foot, covering distances of 15–60 minutes' walk, but no accurate information on the unit cost of this type of transport could be obtained. Similarly, the unit cost of transporting milk by donkey could not be specified.

Approximate costs for various modes of transport were obtained by asking respondents to estimate how much they would be willing to pay to have their milk delivered on foot or by donkey over a distance of about 1 hour's walk. The results are summarised in Table 5. Based on prices received at the corresponding outlets during the daily survey in March 1986 and the weighted average transport costs, it was calculated that transport costs of delivering milk to individual customers and catering and government institutions represented 13, 15 and 13% of the price received by producers.

Table 5. *Costs of alternative means of transporting fresh milk, March 1986*

Destination and transport means	Relative frequency of use (%)	Transport costs (EB/litre)	
		Mean	SD
Direct delivery to consumer's home			
On foot	54	0.10	0.02
Own vehicle	11	0.03	0.02
Bus	2	0.03	0.00
Taxi	33	0.17	0.07
Weighted average cost[a]		0.11	0.04
Catering institutions			
On foot	45	0.10	0.03
Own vehicle	38	0.12	0.10
Bus	12	0.09	0.01
Taxi	5	0.21	0.03
Weighted average cost[a]		0.11	0.05
Government institutions			
On foot	100	0.10	0.03

EB = Ethiopian birr; EB 2.07 = US$ 1
[a] Weighted by frequency of use

Performance evaluation of markets of first sale

In this study it was assumed that the objective of the dairy product marketing system is to provide the highest net prices to dairy producers. The performances of the various dairy marketing outlets were thus evaluated and compared with one another. The data used for this evaluation were:

- unit prices received by producers at the different sales outlets during the daily survey
- unit marketing costs during the daily survey.

The only costs included in the analysis were those for delivering milk (weighted average transport costs).

The equation used to calculate the unit net profit for an outlet was then:

Net profit = Unit price – Unit cost

The efficiency of an outlet was then judged by the size of the net profit.

The efficiency of the fresh-milk sales outlets used by intra-urban producers is shown in Table 6. Selling directly to individual consumers was the most efficient outlet, followed by sales to government institutions. Sales to catering institutions was the least efficient outlet.

PERI-URBAN PRODUCERS

The peri-urban producers surveyed kept an average of 15 milking cows per household. Most of the cows were crossbreds. Eleven (61%) of the producers cited milk production for sale as the principal reason for keeping cows; the rest kept cows for both milk sales and home consumption.

Like their counterparts producing milk in Addis Ababa, the peri-urban producers in Sebeta, 20 km from Addis Ababa, sold only fresh milk during the period covered by the initial survey. Butter and cheese are thus not discussed in this study.

Over the entire year (May 1985 to May 1986), peri-urban producers' fresh-milk sales averaged 80.6 litres/household per day. Sales varied by season, averaging 98 litres/household per day during the wet

Table 6. *The efficiency of alternative sales outlets used by intra-urban dairy producers, March 1986*

Sales outlet	Average producer price (EB/litre)	Weighted average transport cost (EB/litre)	Net profit (EB/litre)
Individual consumers	0.86	0.11	0.75
Catering institutions	0.74	0.11	0.63
Government institutions	0.76	0.10	0.66

EB = Ethiopian birr; EB 2.07 = US$ 1

season, 77 litres/household per day during Lent and 67 litres/household per day during the dry season.

A regression analysis, similar to that done for the intra-urban producers, was done for the peri-urban producers. After excluding from the analysis two producers whose sales and cow numbers were above the average, the slope of the regression line was estimated at 2.59, indicating that an additional lactating cow will increase a household's marketable milk supply by about 2.6 litres. The number of lactating cows explained 75% of the total variation in the marketable supply. The relationship between a household's marketable supply of fresh milk, represented by the household's sales, and the number of lactating cows is shown in Figure 4.

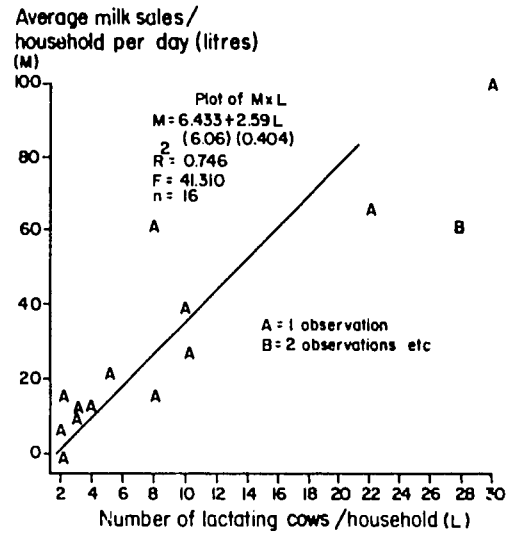
Results of the daily survey

During the seven days of the daily survey, the 18 producers interviewed sold a total of 9157 litres of fresh milk, averaging 72.7 litres/household per day. Most of the milk was sold to catering and government institutions in Addis Ababa: the market shares of the different outlets were:

- catering institutions in Addis Ababa: 53.9%
- government institutions: 42.2%
- itinerant traders: 1.4%
- individual consumers in Addis Ababa or Sebeta: 2.5%.

On 76% of the 126 interview occasions, peri-urban producers sold all the milk intended for sale. The commonest reason for not being able to sell all available milk was that there were too few customers (on 62% of the occasions on which all milk was not sold). Other reasons cited were customers' refusal to buy milk because of lack of money (on 24% of occasions) and late delivery (on 14% of occasions). About one-third of the unsold milk was consumed

Figure 4. *Relationship between peri-urban producers' milk sales and holdings of lactating cows*



at home as fresh milk; the rest was converted into butter and cheese for home consumption.

Peri-urban producers' knowledge of alternative sales outlets was investigated. All the producers claimed they knew of at least one other outlet besides their regular ones. However, only two producers used an alternative outlet during the course of the daily survey; their regular customers were, reportedly, not available at the time of sale.

Average prices received by peri-urban producers for their fresh milk were:

- EB 0.59/litre from individual consumers in Sebeta
- EB 0.69/litre from individual consumers in Addis Ababa
- EB 0.73/litre from catering institutions in Addis Ababa
- EB 0.69/litre from government institutions in Addis Ababa.

The peri-urban survey was conducted in May when there was much more rain than in March, when the survey of intra-urban producers was done, and this perhaps explains the lower prices received by the peri-urban producers using the same outlets. The average weighted price received by peri-urban producers was EB 0.71/litre.

The main market for peri-urban producers' fresh milk was in Addis Ababa, about 20 km from the production site. Milk was usually transported to catering and government institutions in large quantities by public bus, own vehicle or contract taxi. Average transport costs per litre of milk ranged from EB 0.06 (by bus) to EB 0.21 (by contract taxi), the weighted average being EB 0.14/litre.

Performance evaluation of fresh-milk markets

The unit net profit criterion was applied to evaluate the efficiency of peri-urban producers' alternative sales outlets. Direct producer–consumer sales were negligible and hence were not considered in the evaluation. Transport costs were not allocated between deliveries to catering and government institutions in Addis Ababa; instead, the weighted average transport cost of EB 0.14/litre was used for deliveries to both outlets.

Net profit from milk sales through each outlet was estimated by subtracting the weighted average unit transport cost from the average unit price received: net profit amounted to EB 0.59/litre for sales to catering institutions and EB 0.55/litre for sales to government institutions.

PEASANT PRODUCERS

Two groups of peasant dairy producers were surveyed, one located within 20 km of Addis Ababa and the other located between 20 and 85 km from the city. The producers are subclassified according to whether they are near to or far from a Dairy Development Enterprise (DDE) milk collection centre. A total of 105 peasant producers were surveyed in July 1986, each producer being interviewed once during the initial survey and seven times during the daily survey.

Peasant producers located within 20 km of Addis Ababa kept an average of 2.7 milking cows per household, while those located between 20 and 85 km kept 2.1 milking cows per household. Some 56% of the producers surveyed said that the main reason they kept cows was to produce butter and cheese, mostly for sale. During the daily survey, peasant producers sold on average 1.0 litre of fresh milk 0.127 kg of cooking butter and 0.258 kg of cottage cheese per household per day.

Table 7 shows average daily sales by peasant producers. Regardless of distance from Addis Ababa, producers near milk collection centres appeared to sell more fresh milk and less butter and cheese than those farther from the centres. Peasant producers near Addis Ababa sold more milk, butter and cheese per household than those farther away.

Table 7. *Average dairy sales per household and per day for peasant producers near and far from a milk collection centre and Addis Ababa, July 1986*

Dairy product	Producers 0–20 km from Addis Ababa	Producers 20–85 km from Addis Abeba
Producers 0–3 km from collection centre		
Number of households	16	16
Cows/household	3.1	1.8
Sales per household per day		
Milk (litres)	2.3	3.2
Butter (kg)	0.172	0.007
Cheese (kg)	0.393	0.0
Total (litres, milk equivalent)[a]	6.4	3.2
Producers 3–10 km from collection centre		
Number of households	39	34
Cows/household	2.6	2.2
Sales per household per day		
Milk (litres)	0.3	0.1
Butter (kg)	0.183	0.097
Cheese (kg)	0.522	0.011
Total (litres, milk equivalent)[a]	4.7	2.4

[a] Computed as the sum of fresh milk and the milk equivalent of butter (1 kg butter = 24 litres fresh milk). Cheese is ignored in the calculation because it is a byproduct of butter manufacture and no additional milk (over and above what is needed for butter) is needed to produce it

Fresh-milk sales and sales outlets

Peasant producers sold their fresh milk mainly at the DDE collection centres located along the main roads. Other sales were made at the farm gate, in the local market and direct to individual consumers in Addis Ababa, particularly by those producers close to the city. Customers at the farm gate or in the local market were either itinerant traders or final consumers. Itinerant traders are believed to have purchased most of the milk marketed through these two outlets.

For the purpose of comparison, the fresh-milk outlets used by peasant producers were grouped into:

- sales to DDE
- local sales (to neighbours, to itinerant traders and at local markets)
- direct deliveries (sales outside the production locality, to individual urban consumers or to catering and government institutions).

The relative importance of the alternative outlets used is shown in Table 8. DDE was by far the most important outlet for milk produced by the producers surveyed. Local sales and direct deliveries were insignificant.

Table 8. *Percentage market shares of fresh milk sold by peasant producers through alternative sales outlets, July 1986*

Sales outlet	Market share (%)				
	Producers near Addis Ababa		Producers far from Addis Ababa		
	Near collection centre	Far from collection centre	Near collection centre	Far from collection centre	Whole sample
Dairy Development Enterprise	92	92	100	100	96
Local sales	3	0	0	0	1
Direct delivery	5	8	0	0	3
Total daily sales by all households (litres)	*36 8*	*11.7*	*51.2*	*3.4*	*103.1*

DDE paid peasant producers EB 0.50/litre of fresh milk, which is the price set by government for all fresh milk sold through this outlet. Producers who sold milk at the farm gate or in the local markets also reported receiving EB 0.50/litre year round. Those who delivered directly to individual consumers or to institutions in Addis Ababa received on average EB 0.71/litre, but the volume of milk sold directly was small.

Butter sales and sales outlets

The peasant producers surveyed sold 93.2 kg of cooking butter during the seven days of the daily survey in July 1986. The average daily sale per household was 127 g.

The main outlet for cooking butter made by peasant producers was the local market where it was sold to merchants or itinerant traders. Cooking butter was also sold at the farm gate or directly to consumers in Addis Ababa.

For the analysis, cooking-butter sales outlets used by peasant producers were grouped into:

- sales to itinerant traders
- sales to urban dwellers (individual customers, merchants and local-food *injera* restaurants)
- local sales (to neighbours and to consumers and restaurants in local towns).

Table 9 shows the percentage shares of alternative outlets by volume of butter going through each outlet and by distance from Addis Ababa and from a collection centre. The main outlet for producers near both Addis Ababa and a collection centre was local sales. In contrast, producers near Addis Ababa but far from a collection centre sold little butter locally; itinerant traders were their main outlet. Producers located far from both Addis Ababa and a collection centre sold their butter mainly to local customers; those near a collection centre sold only to individual consumers living in Addis Ababa.

Producers living far from Addis Ababa sold on average 68 g of cooking butter/household per day, compared with 180 g/household per day sold by producers living near the city. Producers within 3 km of a DDE collection centre sold 90 g of cooking butter/household per day compared with 143 g/household per day by those 3–10 km away.

Table 9. *Percentage market shares of butter sold by peasant producers through alternative sales outlets, July 1986*

Sales outlet	Market share (%)				
	Producers near Addis Ababa		Producers far from Addis Ababa		
	Near collection centre	Far from collection centre	Near collection centre	Far from collection centre	Whole sample
Itinerant traders	17	48	0	15	20
Urban dwellers	22	40	100	31	48
Local sales	61	12	0	54	32
Total daily sales by all households (kg)	*2.75*	*7.14*	*0.11*	*3.30*	*13.3*

On 98% of interview occasions respondents sold all the butter intended for sale through their regular sales outlets. Even though peasant producers claimed they knew at least one other sales outlet besides their regular ones, no producer used a new outlet during the daily survey.

Peasant producers were asked to indicate why they sold butter through their preferred sales outlets. Of those located far from Addis Ababa, 46% said they could obtain higher net prices from itinerant traders than from other buyers. High net prices were also important to peasant producers near Addis Ababa, as 58% of them said sales to individuals and merchants provided higher prices than sales in their localities. Of the producers near Addis Ababa, 11% indicated that they sold to urban dwellers because they were always available to buy.

Butter prices

Depending on outlet, average butter prices ranged from EB 6.27 to EB 7.11/kg during the daily survey in July 1986 (Table 10). Producers near Addis Ababa received a higher weighted average price than those operating farther away. Peasant producers near Addis Ababa received the highest price when they sold butter to individual customers in Addis Ababa, and the lowest when they sold to neighbours near the production sites. Producers far from Addis Ababa received the highest price when selling butter to itinerant traders.

Butter transport costs and producers' net returns

Peasant producers living within walking distance of Addis Ababa travelled on foot; those further away travelled by public transport (bus) or, in a few cases, in their own vehicles to sell butter in Addis Ababa.

Almost all peasant producers far from Addis Ababa took butter to nearby local-town markets on foot. No reliable estimates of transport costs for butter could be obtained, because butter is usually transported together with cheese, and, as was shown above, mostly on foot. When it was transported in a vehicle, other motives were usually served by the same trip.

Approximate costs of transporting butter to markets of first sale were used to estimate producers' net profits. The direct labour (or opportunity) costs of butter manufacture were considered to be minimal and, therefore, were not included in the calculation. Transporting butter to markets of first sale was estimated to cost the producers near Addis Ababa EB 0.29/kg and those far from Addis Ababa EB 0.27/kg.

Table 10. *Average butter prices received by peasant producers, July 1986*

	Average price (EB/kg)			
	Producers near Addis Ababa		Producers far from Addis Ababa	
Sales outlet	Average price	SD	Average price	SD
Itinerant traders	6.74	0.93	7.11	0.67
Urban dwellers	6.81	0.78	6.41	0.54
Local sales	6.39	0.00	6.27	0.00
Weighted average price[a]	6.63	0.54	6.42	0.40

EB = Ethiopian birr; EB 2.07 = US$ 1

[a] Weighted by the frequency of outlet use (see Table 9)

The net profits accruing to peasant producers by selling butter through alternative outlets are shown in Table 11. In general, producers near Ababa Ababa earned the highest net profit (EB 6.52/kg) when they sold butter to urban dwellers, while those far from Addis Ababa maximised their profit (EB 6.84/kg) by selling to itinerant traders. Overall, producers made the least profit selling butter locally, regardless of distance from Addis Ababa. Butter transportation costs represented about 4% of the price paid by the customer.

Table 11. *Peasant producers' net profits on selling butter through alternative sales outlets, July 1986*

Sales outlet	Average price paid by customer (EB/kg)	Average transport cost (EB/kg)	Producer's net profit (EB/kg)
Producers near Addis Ababa			
Itinerant traders	6.74	0.29	6.45
Urban dwellers	6.81	0.29	6.52
Local sales	6.39	0.29	6.10
Producers far from Addis Ababa			
Itinerant traders	7.11	0.27	6.84
Urban dwellers	6.41	0.27	6.14
Local sales	6.27	0.27	6.00

EB = Ethiopian birr; EB 2.07 = US$ 1

Table 12. *Percentage market shares of cheese sold by peasant producers through alternative sales outlets, July 1986*

Sales outlet	Market share (%)			
	Producers near Addis Ababa		Producers far from Addis Ababa[a]	
	Near collection centre	Far from collection centre	Far from collection centre	Whole sample
Itinerant traders	13	50	0	21
Urban dwellers	23	40	100	54
Local sales	64	10	0	25
Total daily sales by all households (kg)	*6.28*	*20.4*	*0.37*	*27.05*

[a] None of the peasant producers far from Addis Ababa but near a collection centre reported selling cheese in July 1986

Cottage cheese

The sampled peasant producers sold 189.4 kg of cheese during the seven days of the daily survey, the average sale being 257.6 g/household per day. The distribution network for rural cheese is similar to that for rural butter.

The percentage shares of cottage cheese sold by peasant producers through alternative outlets are shown in Table 12. In terms of both volume of cheese sold and the frequency of outlet use, the most popular outlet for cheese made by producers near Addis Ababa and a collection centre was local sales (to neighbours and to customers and restaurants in local towns). Producers far from a collection centre sold cheese mainly to itinerant traders and butter merchants (urban dwellers) who resold it to individual consumers living in Addis Ababa. Of the producers far from Addis Ababa and from a collection centre, only one sold cottage cheese, mainly to butter merchants.

On 92% of interview occasions, respondents reported having sold all the cheese they had for sale. The few failures to sell all the cheese available were due to lack of transport to make the delivery. Although all respondents knew of other outlets, they sold cheese only to their regular customers during the daily survey.

Peasant producers near Addis Ababa received on average EB 1.14/kg of cheese; the only producer selling cheese far from Addis Ababa reported receiving EB 1.11/kg (Table 13).

Performance evaluation of markets

Most (96%) of the milk produced by peasant producers was sold to DDE at a fixed price of EB 0.50/litre. Producers who sold to neighbours and itinerant traders received the same price. Because there were not many alternatives with which to compare the performance of DDE as an outlet, performance of the milk market was not evaluated. But since butter and cheese were sold through several outlets, the performance of these outlets was evaluated. For this evaluation, it was assumed that butter and cheese were sold together.

The unit-profit maximisation criterion was again applied; the results are presented in Table 14. For peasant producers living near Addis Ababa and a collection centre, the most efficient butter and cheese outlet was itinerant traders. For producers living near Addis Ababa but far from a collection centre, the most efficient outlet was local sales. For producers far from Addis Ababa, itinerant traders appeared to be the most efficient sales outlet.

Table 13. *Average cheese prices received by peasant producers, July 1986*

Sales outlet	Average price (EB/kg)			
	Producers near Addis Ababa		Producers far from Addis Ababa[a]	
	Average price	SD	Average price	SD
Itinerant traders	1.18	0.23	-	-
Urban dwellers	1.07	0.16	1.11	-
Local sales	1.18	0.24	-	-
Weighted average price[b]	1.14	0.21	1.11	-

EB = Ethiopian birr; EB 2.07 = US$ 1

[a] Only one producer in this category sold cheese
[b] Weighted by the frequency of outlet use

Table 14. *The efficiency of peasant producers' sales outlets for butter and cheese, July 1986*

Sales outlet	Producers near collection centre			Producers far from collection centre		
	Unit price[a] from butter/ cheese sale (EB/kg)	Unit transport cost (EB/kg)	Net profit (EB/kg)	Unit price[a] from butter/ cheese sale (EB/kg)	Unit transport cost (EB/kg)	Net profit (EB/kg)
Producers near Addis Ababa						
Itinerant traders	3.20	0.29	2.91	2.40	0.27	2.13
Urban dwellers	2.77	0.29	2.48	2.38	0.27	2.11
Local sales	2.71	0.29	2.42	2.53	0.27	2.26
Producers far from Addis Ababa						
Itinerant traders	-	-	-	7.11	0.27	6.84
Urban dwellers	5.85	0.29	5.56	4.96	0.27	4.69
Local sales	-	-	-	6.27	0.27	6.00

EB = Ethiopian birr; EB 2.07 = US$ 1

[a] Unit prices are weighted average prices of butter and cheese at a given outlet

4. DISCUSSION

SUMMARY

The study of dairy producers' markets of first sale and marketing patterns was designed to test two hypotheses:

1. That there are no differences in the types of dairy products produced and sold by producers in the Menagesha *awraja*, representing the livestock system, and in the Selale *awraja*, representing the cropping system.

2. That, irrespective of the farming system, there are no differences among the various categories of dairy producers in the choice of market outlets for their products (that is, they all select the outlets from which they obtain the highest net prices, defined as the producer price less transport costs).

The results of the study clearly do not support the first hypothesis. Dairy producers operating in the livestock production system in the Menagesha *awraja* (covering Addis Ababa and other smaller towns within a 20-km radius) produced and sold fresh milk almost exclusively. On the other hand, peasant producers operating in the cropping system in the Selale *awraja* (20 to 85 km from Addis Ababa) produced and sold fresh milk, butter and cheese.

The main factor determining the types of products produced and sold seems to be proximity to market outlets. Intra- and peri-urban producers operating within and close to Addis Ababa, where demand for fresh milk is high year round, can sell milk within a few hours of production, and therefore have little interest in converting it into butter and cheese. Among the peasant producers, those with easy access to a milk collection centre mostly sell fresh milk, while those farther away from these centres must find ways of preserving their milk, and therefore produce and sell butter and cheese.

The study results also suggest that the second hypothesis can be rejected: for some categories of producer, obtaining the highest net profit for their products does not seem to be the most important criterion determining marketing strategy.

Intra-urban small producers and peri-urban producers do appear to select the most profitable outlet for their products: the intra-urban sample sold almost all of their milk to individual consumers in Addis Ababa, who paid higher prices than either catering or government institutions in the city; and the peri-urban producers concentrated on selling milk to catering institutions in Addis Ababa, who paid higher prices than government institutions, the other major outlet patronised by these producers. In contrast, intra-urban large producers sold more than half of their total milk volume to government institutions for net profits that were lower than those obtainable through sales to individual consumers. And peasant producers sold almost all of their milk to the Dairy Development Enterprise (DDE) at a considerably lower price than they could have obtained from individual consumers in Addis Ababa. In the butter and cheese market, peasant producers sold most of their marketable supply through outlets that did not provide the highest net profits.

RECOMMENDATIONS FOR FURTHER RESEARCH

This study was limited to the markets of first sale of dairy producers, and was based only on transport costs to estimate net profits. However, pre-transport or terminal costs, such as assembly, packaging and handling, are equally important in the movement of dairy products from points of production to markets of first sale, and need to be considered in future studies.

The large-scale intra-urban producers sold the bulk of their fresh milk to catering and government institutions which paid lower prices than individual consumers. Perhaps these producers by-pass the most profitable outlet because they consider the opportunity costs in terms of their labour time in selling milk from door to door in Addis Ababa too high, compared to the additional profit they could have obtained. The risk of non-sales, particularly by large-scale producers when selling direct to individual consumers, may also have been an important factor in the choice of the sub-optimal outlets. The aspects of opportunity cost and the risk of non-sales in the marketing strategy of dairy producers need to be investigated.

The study revealed the importance of DDE as an outlet, particularly for fresh milk producers far from Addis Ababa. DDE was the main buyer of milk produced by dairy farmers far from Addis Ababa.

The objectives of the dairy development policy of the Ethiopian Government include increased domestic milk output so as to improve producers' incomes and to reduce government dependence on dairy imports. DDE has the potential to provide a regular and assured market outlet for fresh milk produced not only around Addis Ababa but also by the numerous producers dispersed over a large area beyond the city. First, raising the producer price DDE pays from the current EB 0.50/litre to that received through non-DDE outlets (EB 0.81/litre on average) might attract sales by intra- and peri-urban producers to the DDE.

In order to reach a larger number of peasant producers, it would be necessary to increase the number of collection centres on the all-weather roads. However, since setting up additional centres may be costly, the effects and profitability of additional collection centres need to be determined.

Increased domestic milk supplies to DDE would reduce dependence on imports. Moreover, a higher proportion of the milk sold in Addis Ababa could be secured for low-income consumers, since the DDE is the lowest-price supplier in the market and sells about two-thirds of its milk output through *kebele* shops and other DDE outlets accessible to low-income households (ILCA, Addis Ababa, Ethiopia, unpublished data). A study on how to reduce the costs of processing and distributing milk would be necessary in order to avoid a situation in which DDE is obliged to charge higher prices to consumers as a consequence of paying higher prices to producers.

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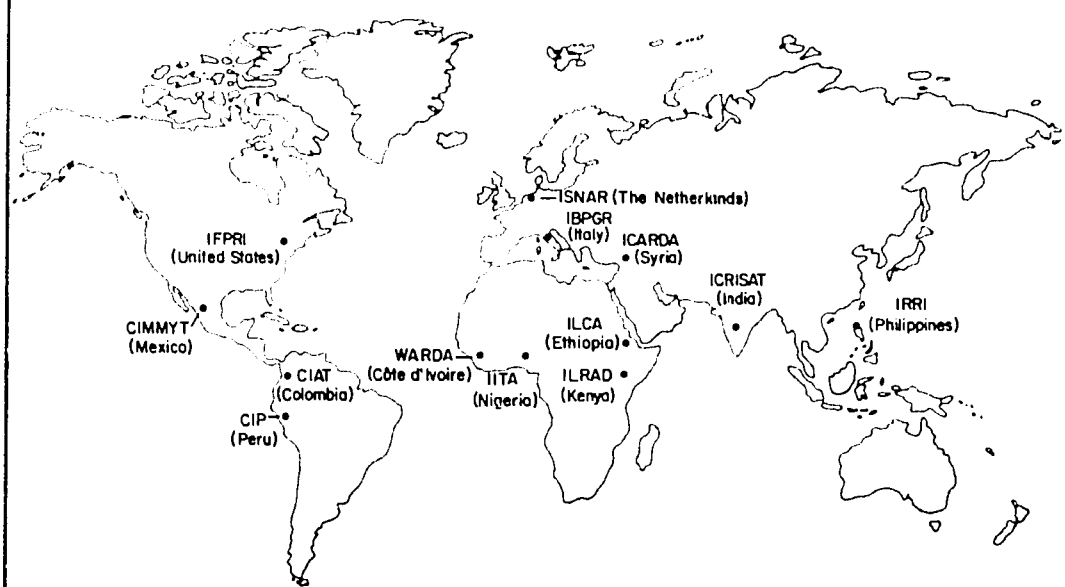
The International Livestock Centre for Africa (ILCA) is one of the 13 international agricultural research centres funded by the Consultative Group on International Agricultural Research (CGIAR). The 13 centres, located mainly within the tropics, have been set up by the CGIAR over the past two decades to provide long-term support for agricultural development in the Third World. Their names, locations and research responsibilities are as follows :



Centro Internacional de Agricultura Tropical (CIAT), Colombia: cassava, field beans, rice and tropical pastures

Centro Internacional de Mejoramiento de Maíz y Trigo (CIMMYT), Mexico: maize, wheat and triticale

Centro Internacional de la Papa (CIP), Peru: potato and sweat potato

International Food Policy Research Institute (IFPRI), USA: analysis of world food problems

International Board for Plant Genetic Resources (IBPGR), Italy

International Service for National Agricultural Research (ISNAR), The Netherlands

West Africa Rice Development Association (WARDA), Côte d'Ivoire: rice

International Institute of Tropical Agriculture (IITA), Nigeria: farming systems, maize, rice, roots and tubers (sweet potatoes, cassava, yams), and food legumes (cowpea, lima bean, soybean)

International Laboratory for Research on Animal Diseases (ILRAD), Kenya: trypanosomiasis and theileriosis of cattle

International Livestock Centre for Africa (ILCA), Ethiopia: African livestock production

International Centre for Agricultural Research in the Dry Areas (ICARDA), Syria: farming systems, cereals, food legumes (faba bean, lentil, chickpea), and forage crops

International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), India: chickpea, pigeon pea, pearl millet, sorghum, groundnut, and farming systems

International Rice Research Institute (IRRI), Philippines: rice