

UNIVERSITY OF HOHENHEIM

**Institute of
Animal Production in the Tropics and Subtropics
Prof. Dr. Anne Valle Zárate**

Master Thesis

Urban Dairying in Awassa, Ethiopia

**by
Anthony Ike**

**Stuttgart-Hohenheim, Germany
September 2002**

This study was sponsored by the Eiselen-Foundation Ulm

7 Summary

This study was carried out in four different locations, comprising one urban area (Awassa) and three peri-urban areas (Loke, Leku and Yirg'Alem). 124 dairy farms, 60 in the urban area and 64 in the peri-urban areas were studied in order to compare the production systems of the two areas. The study was carried out from March to May 2002. The farming families were interviewed using a standardized questionnaire and information gathered from other concerned institutions. Information obtained from the dairy farmers were on socio-economic condition of the farming family, housing of cattle and waste management, feeds and feeding system, water resources, breeding and calf rearing practices, dairy animal performances, milk production and utilization and animal diseases and zoonoses. In addition milk from 80 cows, 50 from 26 farms in Awassa and 30 of 15 each from 23 farms in Leku and Yirgalem, were examined for mastitis using CMT, pH meter and indicator paper and SCC. Also 177 cattle of 75 from Awassa and 102 from 3 Peasant Associations (PA) in Loke were sampled for brucella antibodies. The farms were stratified into small (1-3), medium (4-9) and large (≥ 10) farms based on the number of cattle.

The survey results show that the average family size for the urban dairy farmers is 7.55 (± 2.92), while the average family size for the peri-urban dairy farmers is 8.64 (± 2.70). The average herd size in the urban area is 6.85 (± 5.83) cattle with the large farms having an average of 16.8, the medium farms 5.9 and the small farms 2.6 cattle. In the peri-urban area, the average herd size is 6.23 (± 4.39) cattle with the large farms having 14.3, the medium farms 6.6, and the small farms 2.7 cattle. The individual locations in the peri-urban area have average herd sizes of 6.00 (± 3.19) for Loke, 6.95 (± 6.37) for Leku and 5.80 (± 3.17) for Yirg'Alem. Milking cows form 37.2 % of the total cattle in the urban area with milking cow to dry cow ratio of 24:76. In the peri-urban area milking cow is 23.1 of the total herd and the milking cow to dry cow ratio is 37:63. While most dairy farmers (80.0 %) in the urban area purchased their initial crossbred cow, 78.1 % of the peri-urban farmers got theirs as a loan from SDDP through the MOA.

The urban farms have a total of 1.88 ha used for cropping and cultivation of fodder giving an average of 0.031, while the peri-urban farms have a total of 137.83, averaged 2.15 ha for cropping and growing fodder. Out of these, the urban farmers use 1.25 (66.5 %) ha of the total land for fodder, while the peri-urban farmers 31.28 (22.7 %) of the total land for growing fodder. Therefore most of the farms (95 %) in the urban area use zero grazing system while most of the peri-urban farms (92.1 %) use semi-grazing system. Housing of the animals follow a similar pattern with 76.7 % of the farms in the urban area keeping the cattle in the barn all the time, except when cleaning the barn and 78.1 % of the farms in the peri-urban area housing the cattle at night and during the hot period of the day as well. 31.7 % of the farms in the urban area do not use the cow dung, 65 % use it as a fuel and 3.3 % use it as manure. In the peri-urban area on the other hand, 96.9 % of the farms use the dung as manure while 3.1 % use it as a source of fuel. Moreover, most of the urban farms that use the dung, can only use a small quantity of the dung produced.

Since the urban dairy producers have to buy both fodder and supplements (concentrates), they spend more money on feed than the peri-urban producers who buy only supplements. The urban producers spend on average EB 689.59 per month, while the peri-urban producers spend on the average EB 97.06 per month (1US \$ = EB 8.56). For the urban farms that comes to EB 100.67 per cow and for the peri-urban farms EB 15.57 per cow. In the peri-urban area, Loke farms spend an average of EB 91.33 per month giving an average per cow

of EB 15.22, Leku spend an average of EB 45.80 per month, an average of EB 6.59 per cow, while Yirg'Alem spend EB 115.18 per month, an average of EB 26.75 per cow. Generally the average amount of money spent per month increased from the small to the large farms in all the locations but when considered in terms of per animal does not depend on farm size. For instance, in the urban area, the large farms spend EB 102.81 per cow per month, the medium farms spend EB 101.39 and the small farms EB 127.88 per cow per month.

Both AI and natural mating with bull are used in both areas, with higher percentage of the urban farms using AI. 68.3 % of farms in the urban area prefer AI, to natural mating while only 26.6 % of the peri-urban farms prefer AI. The cost for a bull service is between EB 25 - 30 in the urban area and between EB 15-20 in the peri-urban area. The average weaning age for local calves is 10.5 months in the urban area and 8.9 months in the peri-urban areas. For the crossbred calves, the values are 4.4 months in the urban area and 6.9 months in the peri-urban area. 50 % of the farms in the urban area use bucket feeding for the crossbred calves and another 46.7 % use partial suckling. In the peri-urban farms 14.1 % use bucket feeding and 70.3 % use partial suckling. The remaining percentages of farms in both areas use the two methods in combination.

The dairy animal performance assessment shows that the local cows in the urban area has an average lactation period of 9.8 months and average calving interval of 19.4 months in urban area, while in peri-urban area the values are 8.6 and 22.1 for average lactation period and calving interval respectively. Also the local cows in urban area produced an average daily milk yield of 5.0 litres per lactation giving a lactation yield of 1489.6 litres. The local cows in the peri-urban area produce an average daily yield of 1.7 per lactation and a lactation yield of 444.4 litres. For the crossbred cows, average lactation period is 11.2 months and average calving interval 14.1 months in urban area, while in the peri-urban area the average lactation period and calving interval are 12.2 and 17.3 months respectively. The crossbred cows produce an average daily milk yield of 11.6 litres in the urban area and 7.0 litres in the peri-urban area. This gives a lactation yield of 3949.6 litres in the urban area and 2596.2 litres in the peri-urban area.

The 60 farms in the urban area produce an average of 1504 litres of milk per day, out of which 119 (79.6 %) litres are sold, 124 (8.2 %) litres are used for calf feeding, 149 (9.9 %) litres are consumed at home, while 37 (2.5 %) are processed. In the peri-urban areas the total average daily milk production for all the farms is 528 litres, out of which 186 (35.2 %) litres are sold, 26 (4.9 %) litres are used for calf feeding, 218 (41.3 %) litres are consumed at home and 98 (18.7 %) litres are processed. Both the average milk produced and sold in the urban area increases from the small farms to the large farms but in the peri-urban area, only the average milk produced depended on the farm size there being no given pattern for the volume of milk sold. Also, in the peri-urban area, the average of milk sold is highest in Leku and lowest in Yirg'Alem.

Sales outlets in both areas for milk and milk products are individuals, hotels and café, institutions, schools in urban area and hospitals and churches in the peri-urban area, the farmers retailing the milk themselves and open market. In addition the urban producers also sell through the dairy association. The average prices for fresh milk in the urban area through the various outlets are 2.43 for individuals, 2.23 for hotels and cafés, 3.25 for producers that retail themselves, 2.42 for institutions and 2.17 for the dairy association. In the peri-urban area the average prices are 1.85 for individuals, 1.84 for hotels and cafés, 5 for self-retail and 1.33 for institutions (all prices given in EB). While the most important outlet for the urban producers is 'individuals', the most important for peri-urban producers is 'hotels and cafés'.

For the mastitis tests, the average pH values from the pH meter for all the locations are within the normal range of 6.6-6-9. However, on individual quarters, it was seen that 13.2 % were outside the range with 5.5 % being below the lower range and 7.7 % being higher than the upper range in both areas. In urban area and peri-urban areas 10.8 % and 17.1 % were outside the range respectively. Although the average pH values from the indicator paper lie outside this range, the results were consistent and showed a good relation with the results of the pH meter. The CMT result showed that of 50 cows in the urban area 1 (2 %) had CM, 3 (6) had blocked quarters and 28 (56 %) had SCM. In the peri-urban area the values are 2 (6.7 %) for blocked quarters and 19 (63 %) for SCM, 30 cows were tested. On the individual quarter bases, of the 200 quarters in urban area 3 (1.5 %) had CM and blocked quarters each and 55 (27.5 %) had SCM. In the peri-urban area, out of 120 quarters, 3 (2.5 %) were blocked and 44 (36.7 %) had SCM. With SCC it was found that in the urban area 18 % of the quarter show a count of >500,000 cell per ml showing they have been fully infected, while in the peri-urban area, 26.7 % of the quarters had a count > 500,000 cells per ml of milk. When the SCC is related to CMT it was shown that the quarters with negative CMT result had an average cell count of 152,000 (± 2.01), those with trace reaction had 275,000 (± 4.04) cells, those with + reaction 405,000 (± 4.78) cells, those with ++ reaction 1,136,000 (± 18.71) cells and those with +++ reaction 2,176,000 (± 32.75) cells per ml of milk. Similarly, relating the pH with CMT gives the following values: CMT - reaction average pH 6.62 (± 0.15), CMT 0 6.66 (± 0.16), CMT + 6.73 (± 0.15), CMT++ 6.76 (± 0.19) and CMT +++ 6.94 (± 0.23).

Brucella antibodies were found in no cattle out of 75 tested in the urban area and from 4 of 117 cattle tested in the peri-urban area giving a general prevalence rate of 3.4 % in the study area and a prevalence rate of 3.9 % in the peri-urban area. No case of zoonoses was reported in both areas. The mortality rate of cattle in the urban area is 8.0 % and for the various cattle types it was 15.7 % for calves, 3.3 % for heifers and 6.5 % for cows. In the peri-urban area, the total mortality was 7.4 %, with 20.6 % for calves, 7.1 % for heifers and 1.8 % for cows. No bull or ox was reported died in the last year.

This study has shown that potential for dairy production exists in Awassa and surrounding towns, it has also shown that dairying makes an important contribution to the producers' income. Lack of outlets for milk, diseases, scarcity of feed, inefficient and insufficient AI and veterinary services were found to be the greatest challenges to the realisation of the potentials. Concerted effort is needed from all concerned authorities and NGOs to make dairying in Awassa a sustainable and profitable enterprise.