Urban and Periurban Dairy Cattle Farming in the Maseru District/Lesotho

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1 Introduction

The economy of Lesotho has the task of covering a steadily growing demand for milk. High population increase and a steady increase in the urban population, especially the capital Maseru, increase the demand for food, especially milk and milk products. Against this background in the survey region, intensive farming has increased, especially poultry and milk production. The demand for milk and milk products is higher than the national supply offers. Deficits are covered by imports from South Africa. Especially in periurban and urban areas, milk producers are able to produce in a market oriented way and to gain a larger income.

This research work aims at giving a larger number of readers an insight into urban milk production of the capital city of Maseru and thereby information for the future development of milk production in urban centres in Lesotho.

A further aim of the research is, taking Maseru as an example, to test how far intensive land-unlinked dairy cow keeping in small scale systems is profitable with high performance dairy cows. A representative overview on conditions of production of dairy cow farming and milk capacity in the area of research is described. The research will show whether improved dairy cows are able to reach their production potential under given circumstances and whether the farms are able to produce milk in an economical way.

The aim results from the following hypotheses:

1) The structures of dairy cow farming play a main role in the specification of the farming methods
2) Dairy farming in Lesotho is in dependence/interaction to the dairy farming in South Africa allowing a limited independent development
3) In urban and periurban dairy farming, subsistence farming is less important than in the remaining animal keeping or in farming.

As a theoretic framework the „Farming Systems Research (FSR)“ approach has been chosen. FSR has been very important in research and economic policy practice in the last few decades (Doppler, 1991).

Doppler (1991) classifies farming systems according to the decision making of the farming family and household. The most important criteria of his

classification are the market orientation (proportion of the market supply to the total value of the farming produce), scarcity of the farming area (farm size in hectares) and the fixed domicile. In the research Doppler's (1991) scheme has been chosen.

2 Methods

2.1 Target group and choice of farms where research is to take place

Target group of the survey are dairy farms in the lowland districts of Maseru. In the survey area there are an estimated 600 farms and 1,500 high performance animals (on average 2.5 dairy cows per farm).

Two phases were planned to obtain the socio-economic basic data of the dairy farms and to examine the work hypotheses (Phase 1 and Phase 2). Basic data was collected by interviews and informal talks.

2.2 Approach

Phase 1 was carried out from April 1997 to April 1998 and Phase 2 from April 1998 to April 1999. Extension officers from the local District Agricultural Office (MAO) and the Department of Livestock Services (DLS) assisted in data collection by visiting the farms and carrying out interviews using questionnaires. The head of the family (farm manager) or other members of the family were interviewed. On most of the farms there were no useful details (dairy invoices, milk production lists). If such were available, these were used.

Interviews of key persons were carried out additionally in the period of research with regard to the sphere of dairy economy and information.

2.3 Research phase I

To acquire the first impression of dairy farms in the Maseru District, as many dairy farms as possible were recorded. Farms was chosen at random. Starting from the town core of the capital Maseru, there were as many farms as possible visited. 173 dairy farms in 39 parts of the city (18 parts in the urban[1] region and 21 in periurban[2] area) and farm data by means of basic questionnaire were recorded.

Before the interview there was a walk round each farm. First impressions were made and data, e.g. the condition of the animals, feedstuffs and the housing for the animals were recorded.

The time taken to visit each farm varied from farm to farm. As a rule the visit in the first phase was up to two hours. The time for the interview itself was relatively short, about 30 minutes. The questionnaire recorded data from the following fields:

[1] urban research area = main part of town up to 10 km away from town core
[2] periurban research area = 10 km from town core up to 30 km from town core

⇒ socio-economic background information (age, size of family, year of the initiation of the farm)
⇒ number of stock of dairy cows
⇒ composition of breeds of individual farms
⇒ stocks of animals on dairy cow farms (sheep, cattle, goats, chickens, horses, donkeys)
⇒ area of land in hectares
⇒ area of crop growing land in hectares
⇒ milk production, use and marketing
⇒ basic fodder supply for dairy cows
⇒ problems, which arise with dairy farming

Together with the Ministry of Agriculture, Co-operation, Marketing and Youth Affairs, the Department of Livestock Services and the Department of International Animal Husbandry of the University of Kassel the questionnaire was developed and tested during this first phase. A choice of farms was decided on for Phase II.

2.4 Research Phase II

In the second phase of the 173 research farms, 60 were chosen with suitable farming systems for detailed survey of the production process of dairy farming. The farms which were taken in the survey phase II had to have a certain reliability and be prepared to co-operate well during the detailed analysis. Of these 60 farms, 30 were in urban and 30 in periurban regions of survey.

The second phase of the project began in April 1998 with the quantitative data ascertainment of the individual farms with dairy cows in the survey group. The 60 surveyed farms were visited twice as a rule and by means of a standardised questionnaire interviewed to record conditions of production. The first part of the questionnaire entails general farm data, in the second part specialised data (feeding, milk capacity, marketing) are recorded, the third part records information on organisations which support dairy farming, e.g. Department of Livestock Services (DLS), Dairy Technical Officer of the Ministry of Agriculture, Co-operation, Marketing and Youth (MAO) and Lesotho Dairy Products (LDP). For all parts of the questionnaire the following parameters are requested or recorded.

Part 1: general farm data
⇒ financing of dairy cows
⇒ farm equipment

Part 2: Special farm data

⇒ feeding of the dairy cows
⇒ milk production
⇒ milk marketing
⇒ accounting
⇒ animal breeding
⇒ running costs
⇒ upbringing of the calves
⇒ structure of the herd (size and composition of the stocks according to age)
⇒ marketing of the animals
⇒ transport of milk and fodder

Part 3: Supporting organisations

⇒ veterinary service (DLS)
⇒ Ministry of Agriculture, Co-operation, Marketing and Youth (MAO)
⇒ Dairy and Milk Collecting Centres (LDP and Mccs).

3 Results

3.1Results of the first research phase

In the first research phase 173 farms were visited of which 89 were in the periurban research area and 74 in the urban research area

3.1.1 Animal husbandry in general

Table 1 shows that animal husbandry in general in the Maseru District shows great potential, whereby sheep, cattle and laying hens farming are in the foreground.

Table 1: Animal keeping in general in the surveyed farms in the Maseru District

Animal	Total				Urban				Peri-urban			
	N	n total	No. house holds	means	N	n total	No. house holds	means	N	n total	No. house holds	means
Meat cattle	173	209	57	3.7	74	129	30	4.3	99	80	27	2,9
laying hens	173	9515	54	176.0	74	7897	13	607.5	99	1618	41	39.5
broilers	173	1850	20	92.5	74	1150	9	127.8	99	700	11	63.6
sheep	173	538	73	7.4	74	129	17	7.6	99	409	56	7.3
goats	173	80	11	7.3	74	8	1	8.0	99	72	10	7.2
horses	173	21	13	1.6	74	8	2	4.0	99	13	9	1.4
donkeys	173	26	10	2.6	74	0	0	0.0	99	26	10	2.6
pigs	173	27	8	3.4	74	21	6	3.5	99	6	2	3.0
ducks	173	34	4	8.5	74	26	2	13.0	99	8	2	4.0
geese	173	38	2	19.0	74	38	2	19.0	99	0	0	0.0
rabbits	173	40	1	40.0	74	40	1	40.0	99	0	0	0.0

N = number of farms
n = total number of animals

42.2% of the interviewed households (73) kept a total of 538 Merino sheep (periurban 409, urban 129 animals). In periurban areas the number of sheep per household increased to 56.6% (56 households) against 23% of the urban households (17 households). The average farm kept seven sheep whereby there were fluctuations from at least one sheep up to a max. of 30 animals were to be found (periurban min1/ max. 30, urban min 3 / max. 19).

32.9% of the 57 households in the research kept 209 fattening cattle, i.e. 80 animals on 27 farms on periurban farms and 129 animals on 30 urban farms. Next to pure-bred Basotho cattle there were crossbreeds with South African fattening breeds, like. Afrikander and Drakensberger. In the urban research region the average herd size was four animals, in the periurban districts three. The stock per farm were from one animal up to 20 animals (periurban min 1 / max 18, urban 1/ max 15.

There are 9,515 laying hens in mostly medium sized (300-1000 laying hens) and larger farms (over 1000 laying hens). 7,897 laying hens are kept on only 13 farms in the urban research area, in contrast 1,618 on 41 periurban farms. The average number of laying hens per household is 176. Large differences between periurban and urban areas can be seen as far as the farm size is concerned. In the periurban area the average brood size is 39 laying hens, whilst it is 607 in the urban survey area.

During the survey period there were 1,850 broilers, which were fattened in 20 households. Of these broilers 1,150 were on 9 urban farms and 700 on 11 farms in the periurban area. The farms were mainly small to medium sized farms. The average stock of broilers per household was 93 animals (periurban 64 / urban 128) with fluctuations from 30 to 200 animals per farm (periurban min 30 / max 200, urban 50 / max 200).

Twenty one horses (Basotho ponies) are kept in 13 households (8 horses with 4 urban households) and 80 goats (Angora goats) on 11 farms (8 goats on one urban household). 26 donkeys were kept on 10 periurban farms only. Geese, ducks and rabbits only played a very small role in the survey area.

3.1.2 Structure of the dairy herds

On the 173 surveyed farms a total of 526 high performance dairy cows were kept. On average the farms kept 3.04 dairy cows. In the urban region of Maseru the average number of dairy cows kept was 3.25 and in the periurban region 2.88 animals per farm.

428 or 81.4% dairy cows are Friesians, followed by Brown Swiss (38 animals, 7.2%) and Jersey (28 animals, 5.3%). 32 animals (6.2%) of the surveyed cattle population are from crosses between high performance breeds and crosses of high performance animals with local cattle. The exact regional distribution of the various breeds can be seen in Table 2.

Of the 526 dairy cows kept 473 (89.92%) are lactating. The percentage of lactating cows in periurban regions is 93.68% (267 animals) on urban farms 85.47% (206 animals).

3.1.3 Milk production, use and marketing

The average capacity per dairy cow and day is 12.77 l. In the urban survey areas of Maseru the average milk capacity is 14.7 l per day, in the periurban region at 11.3 l per day.

Table 2: Surveyed dairy stocks according to breed, subdivided according to periurban and urban region of survey

	Frequency total		***urban frequency***		***periurban frequency***	
Breed	**n**	**%**	**n**	**%**	**n**	**%**
Friesian	428	81.4	192	79.7	236	86.8
Brown Swiss	38	7.2	11	4.6	27	9.5
Jersey	28	5.3	18	7.5	10	3.5
Friesland x Brown Swiss	21	4.0	14	5.8	7	2.5
Friesland local	5	1.0	0	0	5	1.8
Jersey x Ayrshire	2	0.4	2	0.8	0	0.0
Jersey x Friesian	1	0.2	1	0.4	0	0.0
Jersey x local	1	0.2	1	1	0	0.0
Ayrshire	1	0.2	1	0.4	0	0.0
Drakensberger	1	0.2	1	0.4	0	0.0
Total	526	100.0	241	100.0	285	100.0

n = number of animals

Consumption of milk in households

Milk traditionally plays an important part in daily nutrition of the Sothos. In 156 households (90.17%) of the survey group milk is consumed daily (Table 3). In the periurban survey group 66 household consumed 153 l per day and in 90 urban households 187 l were consumed per day. The average daily consumption per family is 2.18 l (periurban 2.08 l and urban 2.32 litres per day).

Use of milk as feedstuff

At the time of the interviews 206 l (3.4% of the milk production) were used a animal feedstuff on 98 farms. As calves suckle after milking, on many farms the use of milk as feedstuff is far higher. Exact details however could not be made.

Marketing

5,498 l (91% of the total production) are marketed from 167 farms via the informal and formal market. This corresponds to a daily marketing of 33 l (periurban 29 l, urban 38 l) per farm and day. In the urban region 73 milk producers sell 2,775 l milk per day and in the periurban region 94 farms sell 2,723 l per day. Six farms in the survey area did not market any milk at the time of the interviewing. These farms as a rule keep one cow only which the time of survey were at the end of the lactation period and only produced 3 l milk per day which was used directly by the household itself.

Formal marketing

106 surveyed farms sold 57% (3,468 l) of the total milk production to the formal market. 67 farms in the survey area do not sell any milk to the dairy or the one of the milk collection centres. On an average 32.7 l are sold daily per farm which sells its milk to the formal market. Periurban farms supply daily on an average 21 l (1,396 l on 66 farms) to the milk processing industry, urban on an average 51.8 l (2,072 l to 40 farms).

Informal marketing

2,030 l (33.58%) per day are sold directly via the informal market to the end consumer or to local milk purchasers without further processing. The percentage of the directly marketed milk in the periurban region is 43.89% (1,327 l on 53 farms) whilst the percentage in the urban region is 23.27% (703 l on 48 farms).

Table 3: Milk production, milk home-consumption and milk marketing of dairy farms in the survey

Survey region	milk production	home consumption		marketed	
		own use	animal feed	informal	formal
	l (N)	l (N)	l (N)	l (N)	l (N)
urban	3021(73)	153(66)	93(39)	703(48)	2072(40)
periurban	3023(94)	187(90)	113(59)	1327(53)	1396(66)
total	6044(167)	340(156)	206(98)	2030(101)	3468(106)

N = number of farms in ( )

3.1.4 Price for milk for formally and informally marketed milk

Informal sector

The average price for locally marketed milk via the informal market was 2.00 Maloti (Table 4) whereby the price varied between M 1.50 and M 2.80. The average price for directly marketed milk was in the urban region M 1.96

somewhat under the price in the periurban region at M 2.05. A Maloti was in 1999 0.31 DM.

Formal sector

Prices of 1.22 Maloti were attained on average by delivery to the dairy. Fluctuations were between M 1.17 (2.8% fat) and M 1.30 (corresponds to a fat content of 3.8%). The milk price on periurban farms at 1.23 Maloti was just a little over the urban farms at 1.22 Maloti.

Table 4: Prices for formal and informal marketed milk in Maloti

	total				periurban				urban			
	N	Min	Max	Med	N	Min	Max	Med	N	Min	Max	Med
dairy	32	1.17	1.30	1.22	15	1.18	1.26	1.23	17	1.17	1.30	1.22
off farm	44	1.50	2.80	2.00	21	1.80	2.50	2.05	21	1.50	2.80	2.00

N = number of farms

Raw milk was as a rule delivered twice a day, mornings and evening to the dairy or one of the milk collection centres. Most of the transport here was done by the farm's own vehicle 67.7%, followed by wheelbarrow at 19.4%, transport rental 9.7% and public transport at 3.8%.

4 Conclusions

Dairy farming has an important function from the farming as well as from the socio-economic point of view. Dairy farming can be an important source of income and self-sufficiency of a family in the survey area. Summarised, it can be seen that dairy farming in the survey area is profitable and dairy cows get the most from their genetic potential under the mainly extensive keeping conditions.

To improve dairy farming in the survey region the following suggestions are to be made: development of research and further flanking regions. Set up of political framework condition and establishment of an extensive coverage of health and insemination services. Possibilities to lower costs are to be considered in future. In this connection, crop farming is to be considered.

In order to promote dairy farming, not only the production side is to be considered but the build up of a sustainable development of milk farming in the survey area and measures on the following fields are necessary:

- Many problems which were seen during the survey were in the field of feeding, breeding and animal hygiene and health. Unfortunately there are still many farm managers who are not sufficiently trained after school education. The employment of herdboys for the dairy cows brings further problems, as they are usually not motivated, are badly trained and paid. Both groups are to be trained further and more intensively to improve motivation.

- Build up and improvement of farm unions so that more farms can be reached with training or technical support. The status of dairy cattle farms could be improved by this.

- The extension services of the Ministry of Agriculture, Market and Youth Affairs (MAO) and the Department of Livestock Services (DLS) are well staffed for dairy cattle farming. Aim should be to train these further and improve motivation.

- Privatisation of animal hygiene services and especially artificial insemination and to make it easier to reach the farms. Especially in the scope of AI it seems to be relatively easy to do this, thus improving breeding.

- Land reform: aims should be made to reform the rights of land use, to give farmers an incentive to us the land and it resources intensively. It should also be made possible through this land reform to protect the areas of crop farming better from illegal grazing theft.

- An increase in crop farming is the main measure to be taken in dairy farming as the additionally buying of feed for the cattle creates the highest costs, decreasing the profits and hindering the extension of dairy farming

- The feeding is, at the present time, not carried out according to production. It is recommended to feed according to animal capacity. This appears relatively easy to accomplish with small groups.

- Research: the research in Lesotho has made no contribution to the development of dairy farming up to now. The Department of Research has, however, an important task with regard to fodder production and improvement of pasture land.

- From the group of dairy farms the over-average farms should be identified and used as demonstration farms for training other farm managers.

- Loans with ‘easy’ conditions for the improvement of diary farming should be given by the State. This will help, especially in the initial stages.

- Animal health, especially in the rearing of calves, should be given special attention in the first 6 months. The loss in calves during the first 6 months is 30% and hinders therefore the increase of the animal stocks form the farm’s own dairy offspring.

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