

Dairy production systems in the emerging and communal sectors of South Africa: Results from a structured survey

S.M. Grobler^{1#}, M.M. Scholtz^{2,3}, J. Bester², J.M. Mamabolo⁴ and K.A. Ramsay⁴

¹ARC – Animal Production Institute, Private Bag X05, Lynn East 0039, Pretoria

²ARC – Animal Production Institute, Private Bag X2, Irene 0062, South Africa

³Post Graduate School in Animal Breeding, University of the Free State, P.O. Box 339, Bloemfontein 9301, South Africa

⁴Department of Agriculture, Private Bag X138, Pretoria 0001, South Africa

Abstract

A South African national livestock survey was conducted in 2003 as part of an FAO initiative. The design of the survey sample framework was based on the input variables of the different biomes and urban/rural and deep rural enumerator areas. This article presents the results of the survey in respect of the communal and emerging dairy sector. The keeping of cattle for milk accounted for only 10.2% of the total use of cattle in the communal sector. The most common grazing system was free grazing in both the communal and emerging sector. The head of the household was mainly male (77%) and more than 60% were older than 50 years. The most common dairy and dual-purpose breed types that were used for milking in the communal sector included the Nguni (23%) and Brahman (22%), with an average herd size of 6 dairy cattle or 11 dual purpose cattle. In the emerging sector milk cows consisted mainly of Drakensbergers (19%) with the most common dairy breeds lacking behind with 6% Friesians and 3% Jerseys. The average herd size for dairy cattle was 39, and for dual-purpose cattle, 42. The distance to water for dairy cattle varied from 1 to 5 km in 49% of the communal sector whereas the emerging farmers indicated that in most cases (43%) drinking water was available at the household.

Keywords: Dairy cattle survey, emerging sector, communal sector

Corresponding author. E-mail: mgrobler@arc.agric.za

Introduction

Since 1997 the number of milk producers in South Africa has decreased by more than 41% to the current estimate of only 3 665 commercial producers. The total milk to market for 2007 is currently estimated at 2,37 billion litres - down 2% on 2006. On a milk equivalent basis, lower production in South Africa as well as a sharp increase in demand, has resulted in net imports over the last three years (Coetzee & Maree, 2008). Demand for milk in developing countries is expected to increase by 25% by 2025 (Delgado *et al.*, 1999), partly due to population growth but also because disposable income is being spent on a greater diversity of food products to meet nutritional needs (Bennett *et al.*, 2006). Therefore it is important, especially in rural areas for the emerging and communal dairy farmer to play a role in dairy production as milk can be a reliable intermediate product of extensive cattle farming in the resource poor sector. Although goats are important elsewhere in Africa, they are not a significant source of milk in South Africa. Milk can provide the needed protein in many households as well as a small but sustainable monthly income if market outlets are available.

However, the dilemma facing the small dairy producer is nothing new. Basic economic theory dictates that the minimum size of the economic farm unit will always be increasing, all other factors staying the same. As the marginal cost of inputs rises, or competition in the market place forces the marginal returns to fall, the net margin per unit produced decreases. Thus the producer must increase efficiency or increase in size to compensate (Alien, 1997).

Although dairy ranching is currently receiving little attention, it has the potential to form an integral part of resource poor cattle production systems. Such a system can contribute towards household food security in the form of milk consumption by the family from the cows as well as the cash obtained from the sale of milk.

Traditional milking systems dominate milk production in eastern Africa. Fairly high lactation yields are common in market-orientated smallholder dairy systems in the region. Kenya dominates dairy production and marketing in eastern Africa, with over 85% of the dairy cattle population, most kept by small holders in areas of high and medium cropping potential. In the high potential areas feeding is mainly cut-and-carry with Napier grass, and crop residues, supplemented by forage gathered from common properties around the farm. It is only in South Africa that it appears that emerging and communal dairy farming are not thriving. The reasons for this are not known and information on the dairy production systems in these sectors is scanty. The results of this survey may contribute to a better understanding of the South African situation.

The erosion of indigenous livestock breeds in southern Africa is cause for concern as the animals represent a valuable contribution to the rich biodiversity of the region. In addition, they have potential as well-adapted, alternative breeds for the farmers of the future, especially in the face of global warming. At the end of the last century it became necessary to assess their status in order to conserve them and to develop their economic potential. To this end the FAO/UNDP/SADC Project RAF/97/032 was initiated in the SADC region. The aim of the project was to identify, characterize, conserve and improve farm animal resources of the area in order to maintain biological diversity. In addition, socio-cultural information, population demographics and animal health data were collected to create a holistic approach to the design of sustainable livestock systems with the potential to improve food security, rural livelihoods and incomes. For more detail Scholtz *et al.* (2008) should be consulted.

The information from this survey was used in an attempt to characterize the dairy production systems in the emerging and communal sectors of South Africa.

Materials and methods

The design of the survey sample framework was based on the input variables of the different biomes and urban/rural/deep rural enumerator areas. Areas chosen were the enumerator areas used in the South African population census of 1996 and were identified by fusing the census information onto the biomes. Weighting was applied towards the communal areas where available information was scanty and unreliable. A total of 2570 households owning livestock were visited by enumerators. From these 2570 households, 2480 were either from the emerging or communal sector. In the case of the emerging sector a total of 31 households indicated that they are producing milk, whereas the number in the communal sector is 247.

The emerging cattle farmers can be categorized in three groups, viz. livestock farmers on private land, livestock farmers on communal land and subsistence farmers. These different groups are characterized as follow (NERPO – Simela, personal communication):

Emerging cattle producers on private land:

- Have about 500 ha of land
- Obtained their farms from the previous homeland government or are leasing state farms
- Beneficiaries of land reform programmes (tend to be in groups)
- Have about 40 – 70 cattle
- Are mostly retired professionals (average ~ 60 years old)
- Livestock farming is a business; other functions are secondary
- Few animals can be sold per year (6 - 12 animals per annum)
- Sell their cattle through auctions and informal markets
- Have ambition to build their herds but are limited by land and access to finance

Commercially oriented livestock producers on communal land

- Minimum herd of 25 cattle and are more commercially-oriented
- Prefer informal markets but will also use auctions and local butchers
- Limited by communal land tenure
- Normally sell oxen and culled cows (a few will sell weaners).

Subsistence livestock farmers on communal land

- Varied numbers of livestock

- Main reasons for keeping livestock are savings and home slaughter
- Will sell 1 – 3 cattle when they do sell
- Sell only when they need cash
- Sell oxen and cull cows
- Will take up other forms of income generation given an opportunity
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In this survey the emerging sector refers to the first group only, viz. emerging cattle producers on private land. The communal sector refers to both groups on communal land, since the survey did not distinguish between these two groups. It is recommended that in future any survey should distinguish between commercially oriented livestock producers on communal land and subsistence livestock farmers on communal land.

Results and Discussion

A comparison of population group numbers against those of Census 1996 showed that the sample was representative. The head of the household is usually male (77%) with 60% falling between the ages of 50 and 70 years. The age and sex of the head of the household are typical of a patriarchal society in which age further confers authority. It also reflects the pattern of rural/urban migration from the former homeland areas. It appears that labour migration strips the rural homelands of young people, particularly men, leaving behind older people, women and children (Cross, 2003).

Dairying is a long-term commitment and demands timeliness and total commitment by the entire family. In the communal milking enterprise, men are mainly responsible for all aspects of dairy farming where purchasing (71%), selling (69%) and breeding (78%) are some of the most common responsibilities expected from the men. In the emerging enterprise, men are also mainly responsible for all aspects of dairy farming although hired labour is commonly used (31%) for herding and feeding of animals and the women are mostly responsible for selling the dairy products (56%) with the girls in the household making the dairy products (47%).

Table 1 summarises the reasons for keeping cattle in the communal sector. Scholtz *et al.* (2008) can be consulted for more information on how the relative importance was calculated. From Table 1 it is clear that the primary reasons for keeping cattle are for cash and meat, which together accounted for 47% of the total usage. The keeping of cattle for milk accounted only for 10.2% of the total use although there is a perceived need for milk production in the rural developing areas of South Africa.

Table 1 Relative importance of the reasons for keeping cattle in the communal sector

Reason	Cash	Meat	Investment	Milk	Ceremony	Cultural	Dowry	Work	Other
Index	2844	2394	1709	1128	907	569	564	455	500
%	25.7	21.6	15.4	10.2	8.2	5.1	5.1	4.1	4.5

This is reason for concern as milk can be a reliable intermediate product to provide high quality protein and minerals, to reduce malnutrition especially for infants and growing children where the variety and quality of the staple diet is restricted. Milk can also contribute a small but sustainable monthly income if market outlets are available.

The low percentage of dairying in the communal areas can be due to constraints unique to this farming enterprise as it involves the agricultural sector, veterinary services and human health. Very few communal and emerging farmers have access to such a broad spectrum of knowledge. Other constraints also include inadequate infrastructure, shortage of potable water, record keeping, selling of milk into an informal market, high mortalities, low milk production, high bacterial cell counts, malnutrition of lactating cows and sub-optimal calving percentage. Sour milk can also be a problem, especially at high daily temperatures, since few of the farmers have cooling tanks or electricity. Other key factors that threaten the survival of the

emerging scale and communal dairy enterprises are the market price of milk, cost to produce milk and labour requirements.

Table 2 shows the dairy and dual-purpose breed types that are used for milk production in the communal and emerging sectors.

Table 2 Common mixed dairy and dual purpose breeds in the communal and emerging sector

	Afrikaner	Angus	Bonsmara	Brahman	Drakensberger	Friesians	Jerseys	Nguni	Other
Communal	20%	2%	10%	22%	1%	2%	1%	34%	8%
Emerging	3%	9%	13%	16%	19%	13%	3%	3%	21%

The most common dairy and dual purpose breed types used for milk in the communal sector include Nguni (34%), Brahman (22%) and Afrikaner (20%) types. Dairy breed types constituted only a small percentage, viz. Friesians (2%) and Jerseys (1%). The average herd size for dairy breeds in the communal sector is six dairy or 11 dual purpose cattle. In the emerging sector milk cows consisted mainly of Drakensberger (19%), Brahman (16%) and Bonsmara (13%). The most common dairy breeds were Friesians (13%) and Jerseys (3%). The average herd size for emerging dairy herds is 39 dairy cattle or 42 dual-purpose cattle.

It is of interest to note that in the case of the emerging dairy farmers, 9% of the cattle milked are of the Angus type. At first glance this appears to be a very strange situation. However, it must be remembered that in South Africa, Angus bulls are commonly used to open up first calf Holstein heifers. The bull calves from this cross are normally absorbed by the feedlots, but it appears that a number of the crossbred heifers are used for milk production by the emerging dairy sector. This is an aspect that definitely deserves further attention.

Management interventions such as the common grazing systems used by the communal and emerging dairy farmers (Table 3) and the distance the cattle have to walk to water (Table 4) are summarized in the tables that follow.

In both the dry and wet seasons the most common grazing systems used by communal farmers are herded (28%) and free grazing (70%). The emerging farmers use mostly paddocks (26%) and free grazing (57 – 64%).

The only grazing system that is influenced by season is the yard system used by emerging farmers where 10% uses this during the dry season. Only 3% use this system in the wet season, indicating that farmers let the animals graze when forage is available. Animals are only supplemented in the yard system close to home when forage is scarce. The yard system is not influenced by water availability during different seasons and therefore it can be concluded that the animals are only kept in the yard system for supplementary feeding.

Table 3 Common grazing systems used by communal and emerging dairy farmers of South Africa

	Free grazing	Herded	Paddocks	Yard	Tethered
Communal	70%	28%	0%	0%	2%
Emerging	57% (dry season) 64% (wet season)	7%	26%	10% (dry season) 3% (wet season)	0%

The amount of water a cow drinks depends on her size and milk yield, quantity of dry matter consumed and the temperature and relative humidity. Other factors are quality and availability of the water, amount of moisture in the feed, and the sodium, salt and protein content of the diet.

Placement of water is probably the single most important factor affecting grazing pattern and distribution. Forage utilization decreases rapidly as the distance to water increases, even in level pastures. Animals will overuse sites near water locations rather than walk greater distances to abundant forage. Where forage production is high, cattle have a tendency to remain closer to water, and forage utilization declines substantially at 250 m to 300 m from water. Furthermore, the National Research Council (NRC, 2001) concluded that production could be rapidly and severely depressed if water availability was limited. In an extensive review on water metabolism published by Murphy (1992), the need to provide ample water to maximize milk production is emphasized. However, it is difficult to say whether offering water only in the field is limiting because cows are free to drink at any time during grazing time.

Table 4 Dairy cattle's distance to water in the communal and emerging sector of South Africa

	Household	<1 km	1 - 5 km	6 - 10 km
Communal	4%	41%	49%	6%
Emerging	43%	37%	10%	10%

In the communal sector 49% of dairy farmers indicated that the distance to water for dairy cattle varied between one to five km and 41% indicated that water was available at less than one km, whereas 6% of the dairy cattle had to walk 6 - 10 km per day to the nearest water source. This water availability was not influenced by the rain season and stayed the same throughout the year.

The emerging farmers indicated that in most cases (43%) drinking water is available at the household and in 37% of the cases the animals have water available at a radius of less than one km. At 10% of the farms, the cattle have to walk a distance of between 1 - 5 km per day and another 10% have to walk 6 - 10 km per day to the nearest water source.

Conclusion

It is important, especially in rural areas, for the emerging and communal dairy farmers to play a role in milk production, since milk can be a reliable intermediate product of extensive cattle farming in the resource poor sector. However, from the survey it is clear that small scale dairy farming is not thriving in South Africa as only 10% of communal and emerging farmers stated that they keep cattle for milking despite the fact that there is a perceived need for increased milk production in rural developing areas of South Africa. Although dairy ranching is currently receiving little attention, it has the potential to form an integral part of resource poor cattle production systems.

It is clear that farmers use mainly well-adapted zebu or indigenous breed types, with lower milk production, rather than dairy breed types that are not well-adapted to their management system and with higher nutritional needs. However, most of the current breed types they use have a limited milk production potential. The use of alternative genotypes could therefore be considered as an option. In Brazil for example, crossbred animals (Gir x European) are widely used in pasture based dairy ranching systems, due to their adaptation and are responsible for around 80% of total milk produced in the country. There are more than a million small and medium scale milk producers in Brazil that practice dairy ranching using such adapted genotypes.

Milk production can be rapidly and severely depressed if water is limited. This survey indicated that the distance to water for dairy cattle varied between one and five km in 49% of the cases in the communal sector, whereas the emerging farmers indicated that in most cases (43%) drinking water is available at the household, which means cows can only drink water when they are there and not when they are in the veld. It seems that the importance of the availability of water to dairy cows is underestimated by these sectors. Alternatively the availability of water may be a real problem, and should be addressed through the government infrastructure development programmes.

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