

Characterisation of the livestock production system and potential for enhancing productivity through improved feeding at Namayumba, Wakiso district of Uganda.

By Ben Lukuyu¹, Jane Kugonza², Ronald Wabwire² and Isabelle Baltenweck¹

¹ – East African Dairy Development Project (EADD), - International Livestock Research Institute (ILRI), Nairobi

² – East African Dairy Development Project (EADD) - World Agroforestry Centre (ICRAF), Uganda

The Feed Assessment Tool (FEAST) is a systematic method to assess local feed resource availability and use. It helps in the design of intervention strategies aiming to optimize feed utilization and animal production. More information and the manual can be obtained at www.ilri.org/feast

FEAST is a tool in constant development and improvement. Feedback is welcome and should be directed feast@cgiar.org. The International Livestock Research Institute (ILRI) is not responsible for the quality and validity of results obtained using the FEAST methodology.

The Feed Assessment Tool (FEAST) was used to characterize the feed-related aspects of the livestock production system in Namayumba sub district, Wakiso district of Uganda. The assessment was carried out through focused group discussions and completion of short questionnaires by three key farmer representatives owning small, medium and large scale farms on the 24th of March 2011¹. The following are the findings of the assessment and conclusions for further action.

Farming system

The farming system is primarily a subsistence based, mixed crop/livestock system. Farm sizes in the area are around 1.5 acres (0.6 ha) on average with most of the land being used for cropping. A typical household size is 6 people who live permanently on farm on average per year. Households in the area commonly grow a variety of food crops including; maize (*Zea mays*), beans (*Phaseolus vulgaris*), bananas (*Musa acuminata*), cassava (*Manihot esculenta*), and groundnuts (*Arachis hypogaea*). Many farmers also grow forage crops such as Napier grass (*Pennisetum purpureum*), Rhodes grass (*Chloris gayana*), and Nandi setaria (*Setaria sphacelata*). A few farmers grow fodder legumes such as *Lablab purpureus* and *Mucuna pruriens* as well as fodder trees and shrubs such as *Calliandra calothyrsus*. The average area of land used for production of food crops is shown in Figure 1 and fodder crops in Figure 2.

Each household also raises a variety of livestock species including cattle, sheep, goats and pigs for various purposes. Cattle are kept mainly for milk, cash income from animal sales and manure. On average most households have two or three milking cows. In addition, many households have 3-4 sheep and/or goats. Indigenous chickens are kept by households to meet household meat, egg and

¹ The very small number of respondents for questionnaires means that the figures in this report are only indicative and should not be considered an accurate reflection of quantitative aspects of the farming system. However, they are adequate to give a crude overall impression for the purposes of guiding thinking about constraints and interventions.

cash needs. Nganda type cattle are kept by more than 80% of households but they are not popular with farmers due to their low milk production capabilities. Improved cross bred cattle are kept by about 30% of the households. Cross breeds comprise mainly of Friesian, Jersey breeds and the local Nganda cattle. Sheep and goats are also raised by 20-50% of the households for quick sale when funds are required. Labour is generally available all the time at approximately 60,000 Uganda shillings per month. In addition to this price workers are given meals, milk and some health care cover. This total price package is considered very expensive. Livestock oriented labour is mainly needed during the dry season while the crop oriented labour is required mainly required in the wet season. Herding labour is more costly in the dry season because herds are moved over longer distances in search of pastures and water. This high cost of labour is considered to be due to many rural people migrating to town to look for better paying jobs. Rainfall levels are generally adequate to support cropping activities; however, rainfall unreliability is increasingly becoming common (Table 1). Water is not a major constraint in the area and no large scale irrigation is carried out.

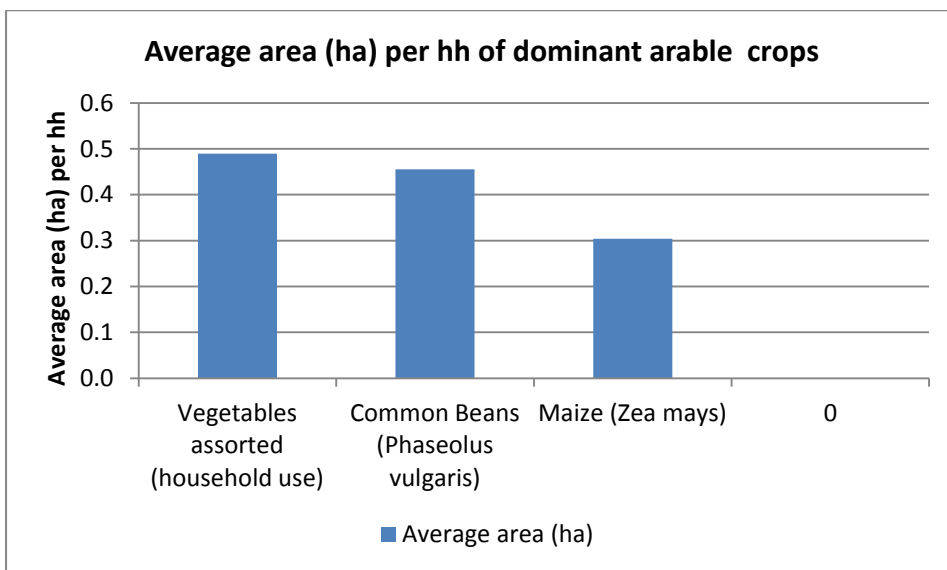


Figure 1: The average area of land utilised for the various food crops grown in Namayumba, Wakiso district

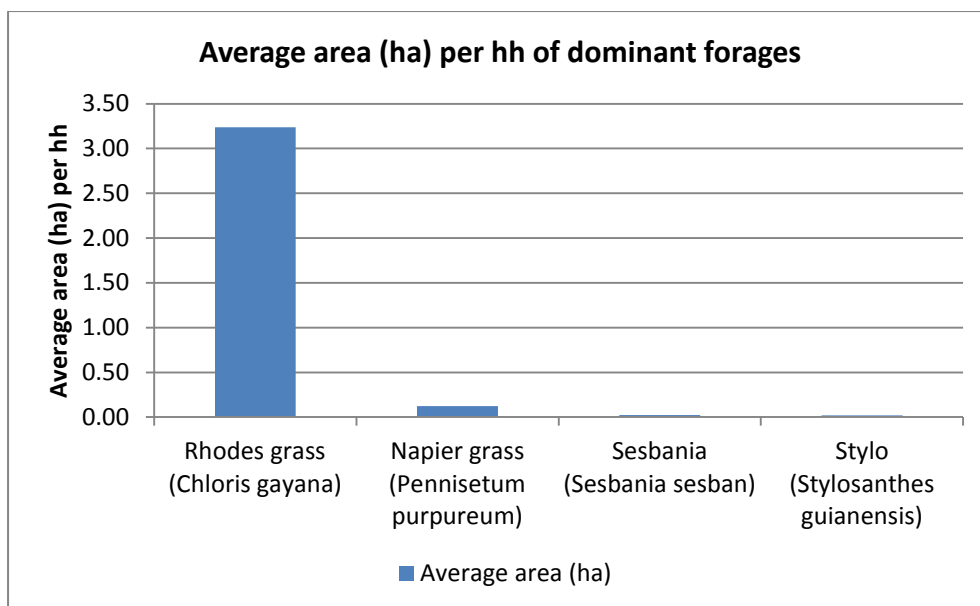


Figure 2: The average area of land utilised for the various fodder crops grown in Namayumba, Wakiso district

Table 1: Cropping seasons that occur in the area

Name of season	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Long wet season (Togo)												
Short wet season (Dumbi)												
Dry season months												

Major income sources

Milk sales are the primary contributor to household income. An average of 52% of all household income comes from the sale of milk. Crops, mainly maize, beans, bananas, groundnuts and cassava make an important contribution of approximately 38% to household income. The contribution from sales of indigenous birds and eggs is considered relatively minor at 10% collectively for some households (Figure 3). The contribution of these sales varies substantially throughout the year based on climatic conditions. Income received from the regular sale of livestock is uncommon in the area as indicated by a proportional off take rate of 0.33%. Sale of animals generally occurs in an ad-hoc manner when funds are required quickly or undesirable animals such as bull calves and unproductive old cows need to be culled.

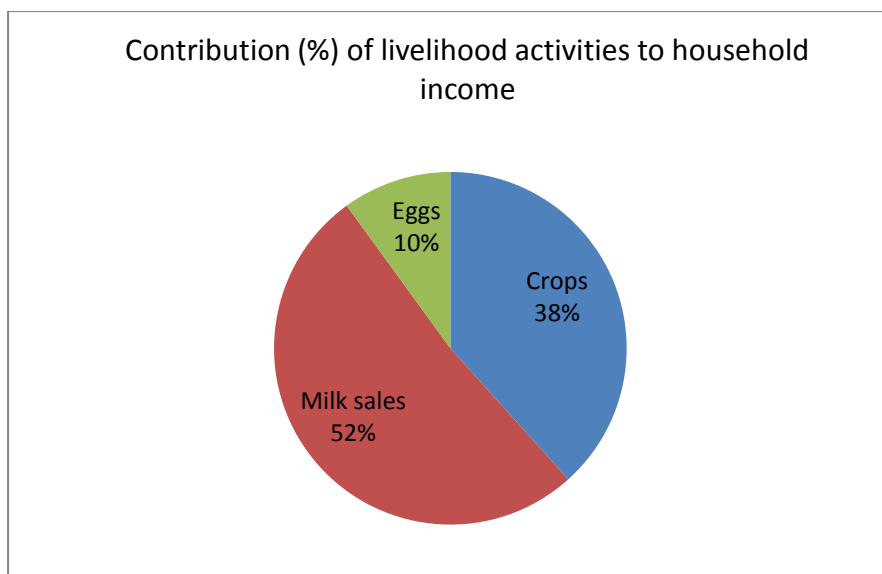


Figure 3: The primary contributors to household income in the area

Livestock production system

The livestock production system is focused on milk production. Improved dairy breeds, namely Friesians and a few Jerseys dominate livestock holdings as shown in Figure 4. Milk produced on the farm is sold to Bubusi dairy co-operative society at an average price of 620 Ugandan shilling (UGS), (0.26 USD; ranging from 500-800; 0.21-0.33 USD) per litre. The average milk production per cow per day in the area is 7.8 kg. Management of the cows varies with type of cattle. Indigenous local breeds are normally grazed while improved cows are confined and fed in cattle sheds throughout day and night. Generally households with larger land holdings tend to graze cows while those with smaller land holdings confine their cows in a small fenced area (sometimes with a cattle shed). Sheep and goats are normally tethered in homesteads and along the road side for grazing. The common feeding strategies in the area include grazing, feeding chopped green fodder and or crop residues especially maize stover. Hay and silage is fed by a few farmers.

Artificial Insemination (AI) services are readily accessible for all farmers in the area from Bubusi dairy farmer business association (DFBA) and it is the preferred method of reproduction. Improved bull services are also available from large farms and the National Agricultural Advisory Department (NAAD) bull scheme at a cost of UGS 20,000 (8 USD) per successful service. The price of semen varies significantly and AI services cost UGS 30,000 – 40,000 (13-17 USD per service) per service. Farmers pay UGS 30,000 for any repeats. Farmers consider this price expensive. Farmers would like to be trained on heat detection to improve conception rates. Service providers use bull catalogues to decide which semen to give. The type and quality of semen is given to farmers depending on the provider's perception of the farmer's management capabilities.

Veterinary services are not easily accessed. The price of veterinary treatments depends largely on the nature of the problem. For example east coast fever (ECF) vaccination costs UGS 90,000 (38 USD) which is considered unaffordable to most farmers. Farmers vaccinate animals against common diseases such as trypanosomosis, caprine bovine pleural pneumonia (CBPP), foot and mouth disease (FMD) tuberculosis, and lumpy skin disease (LSD). Veterinary services are provided by private health

technicians and government animal health workers. Farmers individually buy acaricide and spray animals themselves to control ticks.

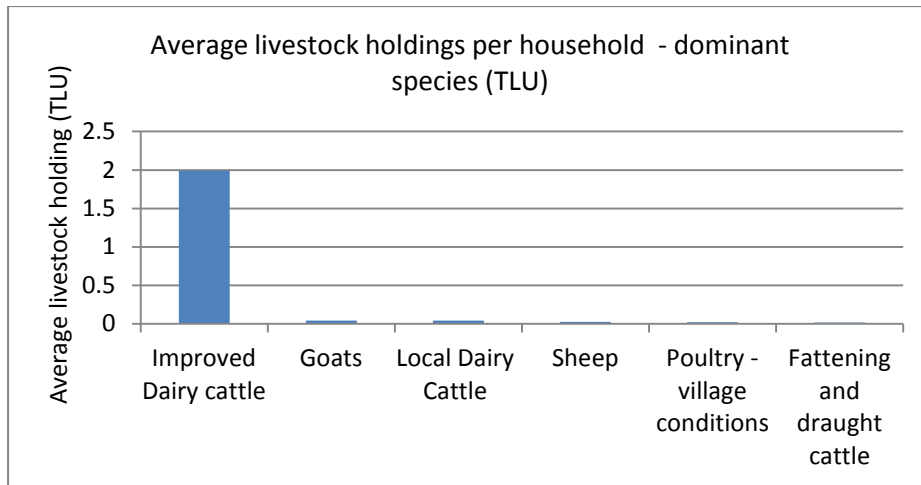


Figure 4: Average livestock holdings per household in Namayumba in Tropical Livestock Units (TLUs)

Major feed sources through the year

The diet is primarily composed of green forages, concentrates, crop residues, legumes and grazing as shown in Figure 5. The contribution made by these feed sources to the diet varies throughout the year. During the main part of the wet season (April-June) and (September -November), green forages, legumes and grazing compose the largest part of the diet. During the dry season (January – March and July- August) crop residues are found in the diet in larger quantities. Surprisingly, larger quantities of concentrate feeds are fed during periods when there is plenty of forage. Grazing, purchased feeds, naturally occurring and collected feeds, cultivated fodder and crop residues contribute 48, 32, 8, 6, and 6% of the total diet on farms (Figure 6). Concentrates and maize bran contribute 99% of the total purchased feed. The contributions of total ME (MJ/kg) and crude protein (CP; %) are shown in Figure 7 and 8 respectively. Supplements such as maize bran and dairy meal can be purchased for 200 UGS (0.1 USD) per kg and 40,000 UGS shillings (17 USD) per 70 kg bag respectively.

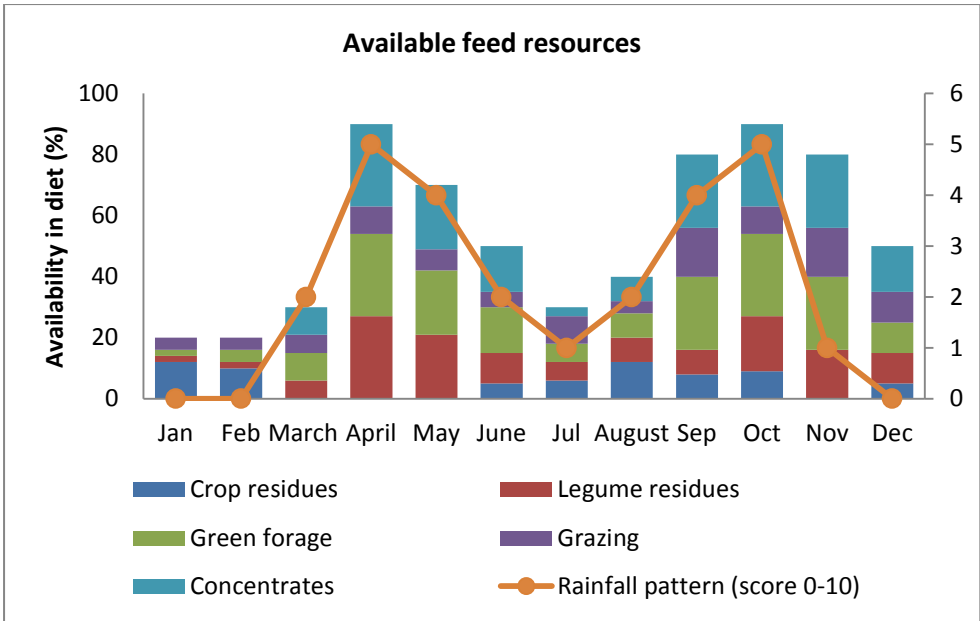


Figure 5: The dietary composition of cattle in Wakiso, Uganda throughout the year in relation to rainfall pattern.

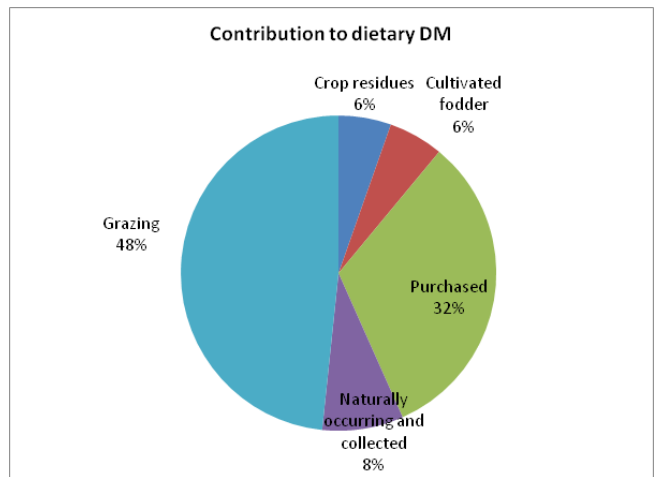


Figure 6: The contribution of dietary dry matter (DM) to the total diet on farm in the area.

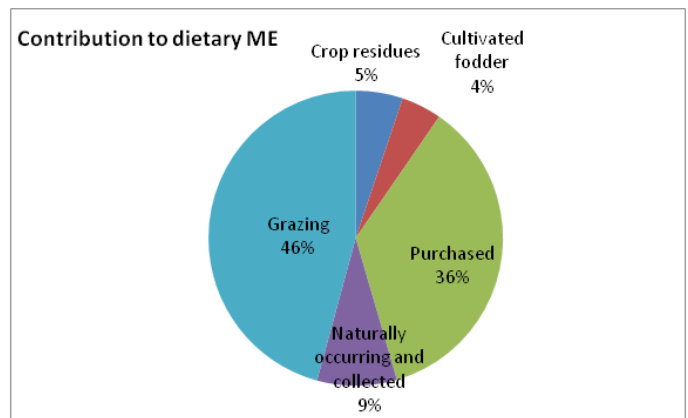


Figure 7: The contribution of dietary metabolizable energy (ME, MJ/kg) to the total diet on farm in the area.

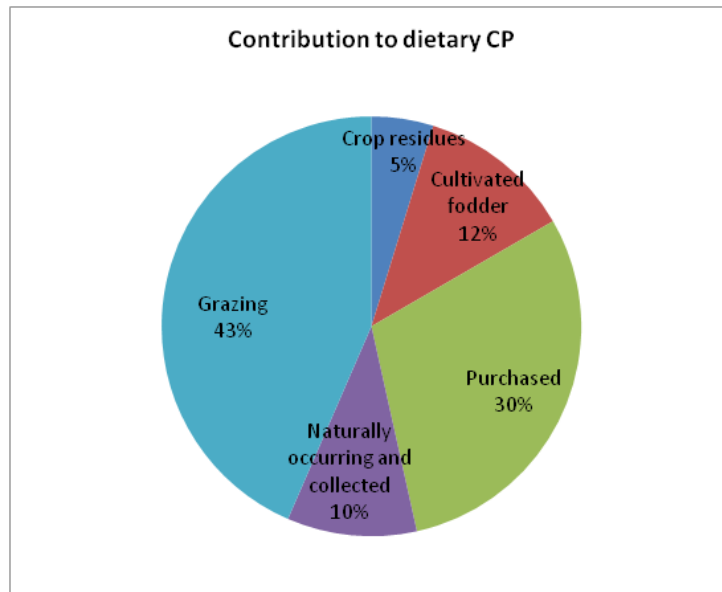


Figure 8: The contribution of crude protein (CP) % to the total diet on farm in the area.

Problems, issues and opportunities

According to farmers, the main constraint to production in this area is insufficient forage seed for establishing high yielding forages. Animal diseases, especially tick borne diseases and lumpy skin disease, is the second most important problem in the area. Water scarcity is the third most important problem especially in the dry season. Other problems include unavailability of animal health providers. Farmers also consider fluctuation of milk prices in the dry and wet season as a major problem to sustainable incomes. Farmers attribute price fluctuation to the monopoly of the milk processor in the area. Although not listed as a major problem concentrate feeds are considered to be very expensive and significantly increase the cost of milk production. A summary of problems and farmer proposed solutions are shown the (Table 2).

Table 2: Problems, issues and proposed farmer solutions within the production systems

Problem (in order of importance)	Main problem	Proposed farmer solutions
1	Unavailability of forage seeds	<ul style="list-style-type: none"> - Link seed companies to farmers through DFBA - Enhance network between farmers so that those who have e.g. demo farmers share with others - Help farmers to start community seed production
2	Animal diseases	<ul style="list-style-type: none"> - Increase number of local drug shops - Increase number of service providers - Education on control of diseases and vaccinations
3	Unavailability of water – especially in the dry season	<ul style="list-style-type: none"> - Education on water harvesting technologies such as valley dams, underground water tanks etc.
4	Limited animal health services. Farmer consider the causes as: <ul style="list-style-type: none"> - Farmers reluctance to pay for services - Service providers are overloaded with many cases hence slow in responding to cases - They are occupied with other personal tasks such as business. 	<ul style="list-style-type: none"> - Service provider should separate personal and animal health roles - Service provider should specialise in technical roles such as A.I., clinical and animal husbandry services rather than mixing them.

Potential interventions

One way of mitigating the effects of feed constraints is to produce more feed biomass per hectare. Farmers consider that the main reason limiting this is lack of forage seed. As most farmers have not committed large proportions of their holdings to fodder, there is still scope for producing more fodder from available land. To mitigate the effects of lack of forage seed, efforts will have to be made to catalyse community seed production either through groups or interested people as a business. There is also an avenue of linking seed companies to the DFBA to supply seed in small packages that are affordable to farmers.

The variation in price received for milk indicates an oversupply of fresh milk in the area, particularly during the wet season. There is potential to conserve the excess forage that occurs during the wet season through silage making. This will help alleviate dry season feed shortages and enable farmers produce more milk during the dry season when milk prices are high hence to earn more money. Simple on-farm methods of silage production should be considered. The use of polythene bags or small scale silage pits may be viable options. Grazing forms a substantial amount of forage to households. Improving pasture quality can significantly increase DM available for feeding. Simple

methods of improving pasture such as bush clearing, strip and circular sowing are viable options given that farmers own small portions of land.

Currently most of the 32% of purchased feeds are concentrates and feed ingredients. As a result attempts to make delivery chains effective and improve access of concentrates will enhance usage amongst farmers. However, as the price received per litre of milk is relatively low, the extra expense of additional concentrate feeds is unlikely to be off-set by the potential increases in milk yields that may be achieved with higher levels of concentrate feeding. Improvement of animal health services will require a top down approach as it is unlikely the farmers can instigate the necessary changes themselves on-farm. Such changes include creating attractive incentives that should attract more service providers and make them concentrate on providing animal health services. Other changes are that service providers should specialise in technical roles such as A.I., clinical and animal husbandry services rather than mixing them. However, this would require farmers to show the willingness to pay for better services.

To mitigate the high incidences of animal diseases attempts need to be made to increase the number of local drug shops, increase the number of service providers and enhance education on control of diseases and vaccinations. Again some of these are outside the scope of what farmers can change themselves and will need institutional interventions to solve them.

Key issues

- Lack of forage seeds for establishing high yielding forages.
- Limited animal health services providers. The few offering services are overloaded by attending to AI, clinical and animal husbandry services.
- High incidences of animal diseases caused by unavailability and high cost of drugs and vaccines.
- The price received for milk is low and variable throughout the year.

Ways forward

- Initiate community seed production either through groups or interested people as a business.
- Establish linkages between seed companies and DFBA's to ensure micro sized products are supplied to farmers.
- Enhance training on simple silage making techniques on farms.
- Enhance efficient concentrate feed delivery chains to farmers and train them on optimum concentrate usage.
- Improve animal health service delivery amongst farmers.
- Improve farmer training in disease control measures.

Key metrics

Milk yield: 5765 litres per household per year

Meat off take: 0.33% per household per year

Dairy cattle TLU: 2.0

Lactating cattle TLU: 0.45

Conclusion

Milk is the main contributor to household income in this subsistence based mixed/crop livestock system. Farm sizes in the area are an average size of 1.5 acres (0.6 ha) most of which is used for cropping. Every household has at least 2-3 milking cows and 3-4 sheep and/or goats. The primary crops of importance are maize and beans. The main constraint to the further intensification and development of dairying in the area is a lack of feed especially in the dry season. Rhodes and Napier grasses are the main types of fodder. Most farmers keep improved cattle. Milk prices are generally unstable and vary throughout the year due to an oversupply in the wet season. The major constraints are lack of forage seeds for establishing high yielding forages and limited animal health service providers.