Characterisation of the livestock production system and potential for enhancing productivity through improved feeding in Kinyogoga Dairy Farmers Association in Nakaseke district, Uganda

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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 livestock production system and in particular feed-related aspects in Kinyoggoga dairy farmers association (DFBA) of Kinyoggoga, Nakaseke district, Uganda. The assessment was carried out through structured group discussions and completion of short questionnaires by key farmers’ representatives in April 2011. The following are the findings of the assessment and conclusions for further action.

Farming system
Kinyoggoga is located in Nakaseke district. Households in this area are composed of approximately 7 (range 6-11) members and utilise on average 30 acres of pastoral land. Table 1 shows farmers perceptions about average land sizes for different categories of farmers.

<table>
<thead>
<tr>
<th>Category of farmer</th>
<th>Range of land size</th>
<th>% of households that fall into the category</th>
</tr>
</thead>
<tbody>
<tr>
<td>landless</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Small farmer</td>
<td>1 to 5</td>
<td>40</td>
</tr>
<tr>
<td>Medium farmer</td>
<td>5.1 to 15</td>
<td>24</td>
</tr>
<tr>
<td>Large farmer</td>
<td>16 to 100</td>
<td>36</td>
</tr>
</tbody>
</table>

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.
Figure 1: Average land sizes owned by different categories of farmers in Kinyoggoga, Nakaseke, Uganda.

The production system is primarily pastoralist focused on livestock keeping with very few farmers growing food crops, mainly cassava (*Manihot esculenta*), and vegetables. Sweet potato (*Solanum tuberosum*) is another crop grown by some farmers in varying quantities as seen in Figure 2. All crops are grown during the wet season; however, rainfall patterns are becoming unpredictable and unreliable (Table 2). Crops are mainly grown for subsistence and only sell the excess produced.

Table 2: Cropping season that occur in the area

<table>
<thead>
<tr>
<th>Name of season</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>April</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long wet (Itumba)</td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Short wet (Ekyanda)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dry (Akanda)</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

Milk production is an important means of regular income generation with most farmers possessing the Ankole type of indigenous cattle. These are also sold for meat to provide substantial income when the need arises and to pay dowries. Some farmers keep improved cross bred animals for increased milk production. Goats are also kept by some farmers for sale when funds are needed quickly. Very few indigenous chickens are also kept by some farmers. Due to the large size of land holdings and herds, labour is generally required to herd cattle especially in the dry season when herds migrate to look for pasture. Herding labour costs between 140,000 – 150,000 UGS (61-65 US$) per month in addition to provision of food and 2-3 litres of milk daily. Manual labour to open an acre of land is relatively costly at 40,000 – 50,000 UGX (17-22 US$). Factoring in daily provisions overall labour costs become very costly.
Figure 2: Crop varieties grown in Kinyogoga, Nakaseke, Uganda.

**Major income sources**
The main contributor to income is milk sales (65%). Milk is important because most households in this area own cattle. Crop and livestock sales contribute approximately 25% to household income.

**Livestock production system**
Cattle are the most important livestock species in this system as they provide milk, meat and cash income to the households (Figure 4). Local indigenous breed are the most important in this area kept by approximately 90% of all households. However, the area is experiencing a transitional period with many farmers attempting to improve milk production per cow as their lands continue to be encroached upon by bush making grazing difficult. At present, approximately 30% of the farmers keep improved cattle. All cows (predominately indigenous breeds) are milked regularly during lactation. The average milk production per cow per day is 2 litres. The resultant milk is then sold to Kinyoggoga Dairy Farmer Association (DFBA) for an average of 450 UGX (0.22 US$) per litre throughout the year (range 300-600 UGX/litre (0.13-0.26 US$)).
Management of livestock species

Management practices of the cattle are broadly similar between households in the area. However, they differ based on the season and quality of the animal. Crossbred and improved cows are kept and managed separately. Both classes of cattle are grazed throughout the day and confined in cattle sheds overnight. However, improved cattle are often grazed on improved pastures while local cattle are allowed to search for pasture in the thickets of trees and shrubs. Cattle tend to move longer distances during the dry season than the wet season.

Private and government veterinarians are the most important animal health providers available to farmers in the area. Most farmers access animal health services through check off at the DFBA through the use of contracted Community Animal Health Providers (CAHPs). This is so because the services of both private and government health providers are costly to most farmers. For example, treating East Coast Fever (ECF) in calves’ costs farmers 30,000-40,000 per dose. In most cases farmers buy drugs and administer to the animals by themselves. However, this has great risks as these farmers are not trained and therefore they may end up either over dosing or under dosing animals which is risky.

Artificial Insemination (A.I.) is available at the Kinyoggoga DFBA and also through government and private practitioners. However, due to the many limitations such low conception rates, high prices and cultural attachments, it has not been popularised. DFBA member farmers access AI on check-off and only have been requested to pay for transport charges. Transport charges are variable depending on distance and type of practitioner. Kinyoggoga DFBA charges UGS 35,000 (15 US$) per service per cow and the same again for repeat services. This includes UGS 10,000, 5,000, and 5,000 for straw, liquid nitrogen and...
disposable items cost respectively plus UGS 10,000 and 5,000 for labour and transport charges respectively. Most farmers use their own local bull service since almost everyone has a bull. AI adoption is still a challenge in this area, due to the fact that this is a pastoral community where animals are grazed communally.

At present cattle prices vary with season increasing during the wet season (800,000 – 1,000,000 UGS (345-435 US$) per head) and dropping drastically in the dry season (400,000 – 500,000 UGS (130-217 US$) per head) during the dry season. Sheep and goat prices tend to remain the same throughout the year ranging 80,000 – 100,000 UGS (35-45 US$) per head.

**Major feed sources through the year**

Grazing on naturally occurring pastures contributes the largest proportion of the feed base on a dry matter (DM) basis in the area and consequently metabolisable energy (ME) and crude protein (CP). However, grazing drastically reduces during the dry season in January – February when a few farmers feed on crop residues as shown in Figure 6. However, after April the quantity of residues are proportionally smaller than grazing but are still present for most of the year.

Purchased feeds and crop residues are of little importance in this farming system. No purchased feed resources are utilized even for the improved breeds of cattle.

![Available feed resources](image)

**Figure 1:** Available feed sources utilised by farmers throughout the year.
Problems, issues and opportunities
The main issues faced by farmers are scarcity of water especially during the prolonged dry season and the bush encroachment problem on grazing pastures. The expansive pastoral system does not have adequate water dams and these are located long distances from most households. The encroachment of bush on grazing pasture has drastically reduced biomass production in grazing lands leading to overgrazing. This is aggravated by presence of termites on grazing lands reducing grazing areas even further. Some farmers have already commenced purchasing concentrate feed to help alleviate this constraint. Lack of improved dairy breeds is also a clear constraint to the further development of milk production within the area. Artificial Insemination (AI) services will help disseminate improved genetics; however, the service is not reliable within the area and is costly to farmers. Other animal health related issues include the prevalence of tick borne diseases.

Potential interventions
The combination of shrinking grazing lands and a low utilization of cereal crop residues put the farmers in this area in a difficult position in terms of increasing their milk productivity as there are very few on-farm options available to them. To alleviate feed constraints it will be necessary for farmers to produce more feed biomass per hectare from grazing. Improved biomass production from grazing can be facilitated through the use of simple pasture improvement technologies such as bush clearing using brush-cutters, motorised power sows and using over sowing strategies e.g. strip and band sowing. Farmers also have the option to utilize the crop residues such as maize stovers. Enhancing pasture quality through collective action is a promising option. However, increased milk production will also be required to offset the increased cost of production. Therefore, it will be imperative that an integrated approach is taken and efforts are also made to upgrade existing cattle breeds through improved access to AI services. Promotion of water harvesting technologies will be required to provide water during the dry season.

Key issues
- Scarcity of water especially during the prolonged dry season
- Bushes and thickets leading to decreased grazing pastures
- Lack of enough feed sources, both in terms of quantity and quality
- Poor milk yields coupled with low prices per litre
- Expensive AI services and lack improved dairy cattle breeds

Ways forward
- Introduce strategies to improve pasture management through over sowing, strip cropping with legumes, and use of labour saving technologies of bush clearing.
- Control of invasive weed species such as Lantana camara using systemic herbicides
- Integrated Termite Control strategies
- Improve AI services
- Implement water harvesting technologies
Conclusion

The production system is predominantly extensive characterised by pastoralism with minimal crop production. At present, milk and livestock sales are the primary agricultural contributors to household income. Cattle are the most important livestock species. The area experiences feed shortages especially during the prolonged dry season and farmers are looking into other strategies such as improved pasture management and utilization of crop residues. Improved milk production is constrained by a lack of feed sources (both in terms of quality and quantity) and poor producing breeds of cattle. To mitigate these constraints farmers (and other stakeholders) will be required to take an integrated approach to improve feed production through pasture improvement strategies and improving accessibility to AI services through check-off to ensure farmers can rapidly upgrade the genetic merit of their cattle holdings.