

Characterization of the livestock production system and the potential for enhancing productivity through improved feeding in Kidoma village, Hoima District, Uganda

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Methodology

Description of the study area

Data collection was conducted in February 2015 in Kidoma village, located in Kiziranfumbi sub-county, Buhaguzi county, Hoima district, Uganda. The village is located approximately 40 kilometers from Hoima town.

Data collection and analysis

A feed assessment survey was carried out through a focus group discussion (FGD) with community members and completion of individual questionnaires by pig farmers. These farmers represented three landholding categories (small, medium and large) as commonly perceived by the community. All data were analyzed using the Feed Assessment Tool (FEAST) developed by the International Livestock Research Institute. The following are the findings of the assessment and conclusions for further action.

Results and discussion

Farming system

The farming system is primarily a subsistence mixed crop/livestock system. A typical household has an average of seven members who live permanently on the farm throughout the year. The FGD participants recognized three categories of landholdings: small farms (<0.4 ha/household), medium farms (0.4-0.8 ha/household) and large farms (>0.8 ha/household). About 80% of the farmers in Kidoma village own less than 0.4 ha land (Figure 1). It should be noted that most of the respondents' land is used for cropping.

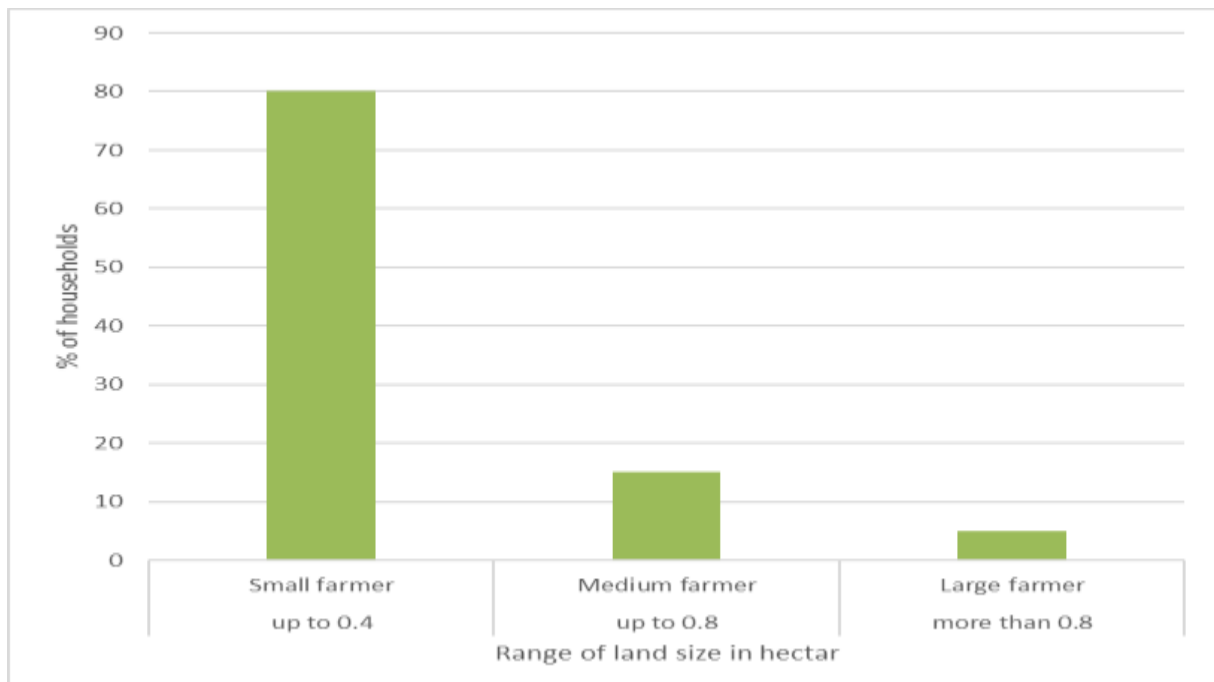


Figure 1: Landholding categories in Kidoma village

Major income sources

Agriculture is the major contributor (63%) to household income. Livestock makes an important contribution of approximately 23% of overall household income. Business and off-farm labour contribute about 10% and 3%, respectively (Figure 2).

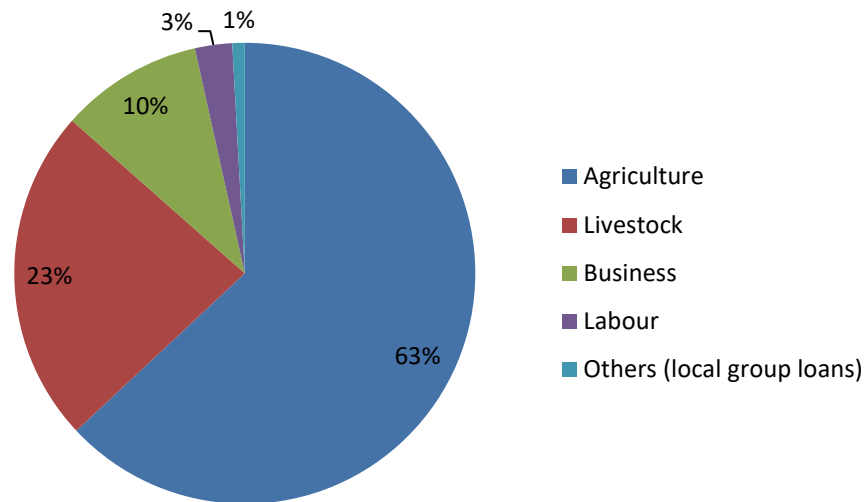


Figure 2: Contribution of different activities to household income in Kidoma village

Labour is generally a constraint for farming and is most required in January when gardens are being prepared for planting and the average rate is UGX 5,000 per day. The labour costs are considered not affordable by most households of this village. There is no gender difference in wages paid to women and men. Very few people (5%) are leaving the village for better livelihood opportunities.

Cropping seasons and crops grown

Seasons are generally bimodal, with two wet and two dry seasons but enough to support cropping activities and provide pasture for livestock. As indicated in Table 1 below, Kidoma village usually experiences two cropping seasons each year. The first rainy season begins in March and ends in June (*Eitoigo*). The second rainy season starts in August and continues up to November (*Ekyanda*). The longest dry season is from December to February and another short dry season is experienced in July. There is limited access to potable water (10% of households) and water for irrigation (10%). Irrigated crops include tomato, cabbage and amaranthus (bitter *Nakati*).

Table 1. Seasons as perceived by FGD participants in Kidoma village

Name of the season	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1st rain season (Eitoigo)												
2nd rainy season (Ekyanda)												
Dry spell (Akasambura)												

Crops grown in the village include groundnut, common bean, rice, cassava, banana, sweet potato, Irish potato, maize, tomato and eggplant. Cash crops include coffee, sorghum, tea tree, sugarcane and tobacco. Rice and groundnuts are sometimes grown for sale. The largest farmland size allocated for cultivating cassava is about 0.16 ha/household and most farmers grow other food crops on less than 0.12 ha land (Figure 3).

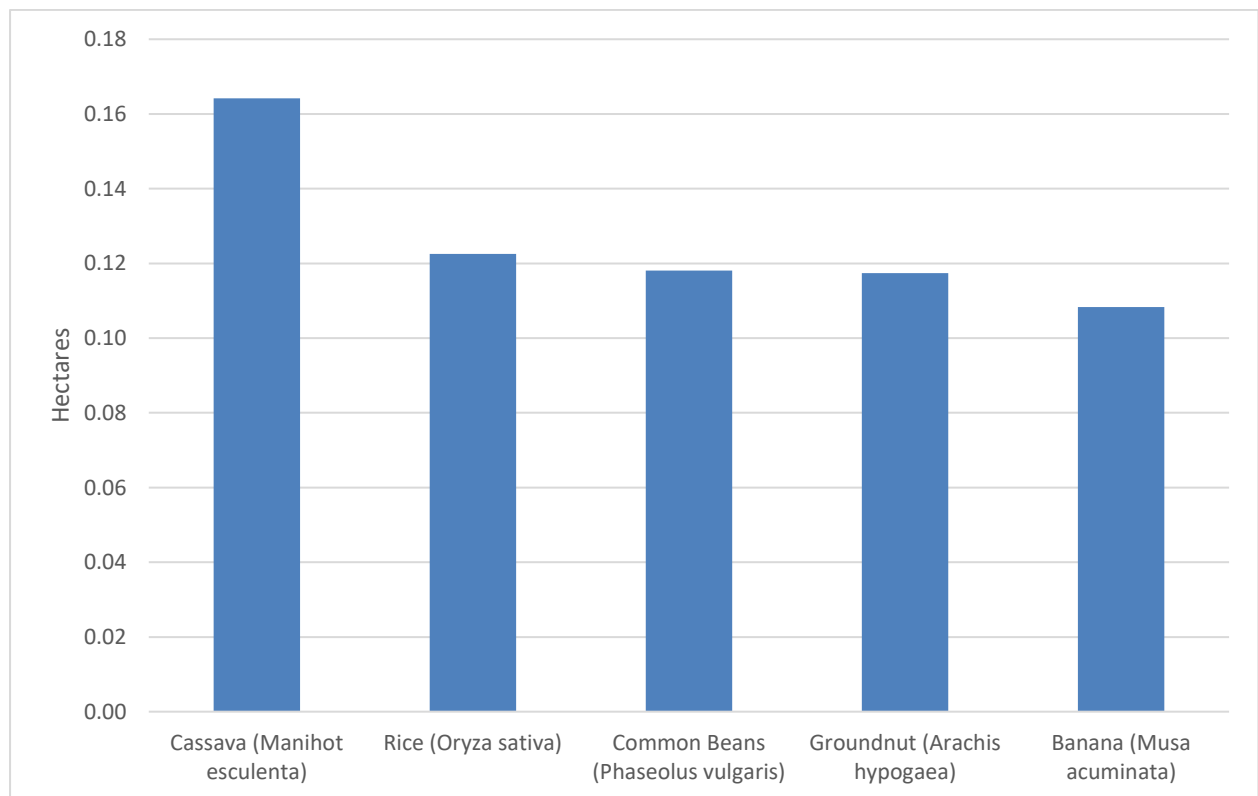


Figure 3: Major crops that are grown in Kidoma village

Livestock holdings

Households in Kidoma village raise a variety of livestock species including pigs (0.34 TLU/household), cattle (0.33 TLU/household), goats (0.15 TLU/household), sheep (0.04 TLU/household) and poultry (Figure 4).

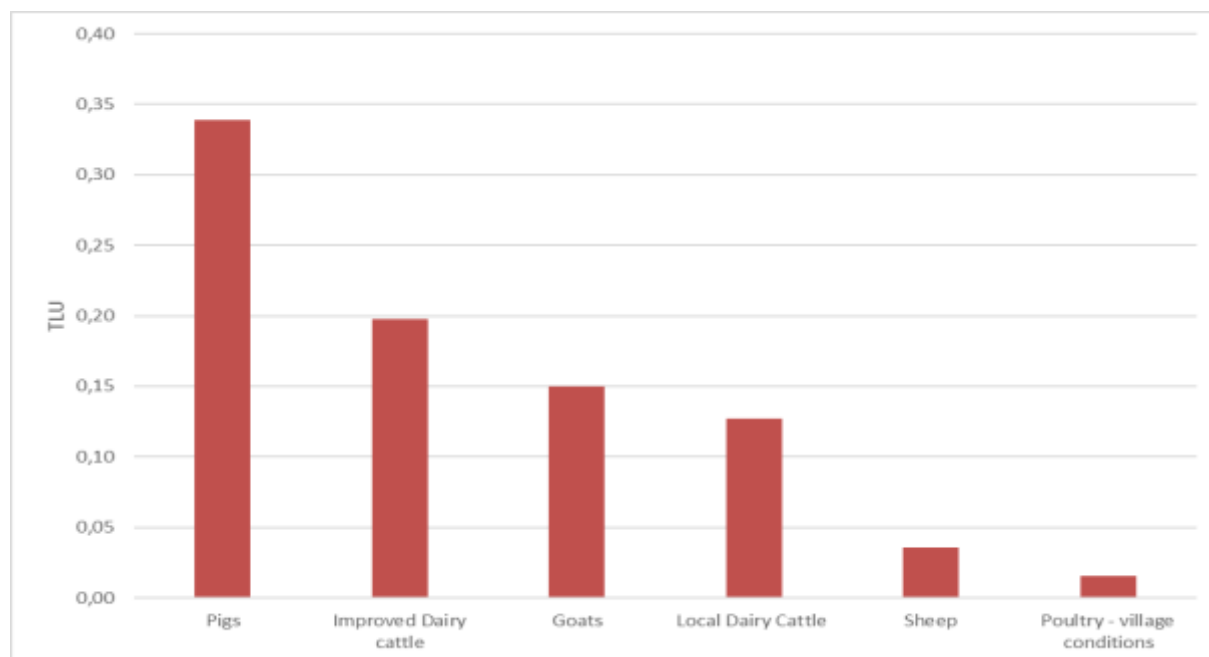


Figure 4: Average livestock holdings in Kidoma village (TLU/household)

Table 2 shows the main functions and ownership pattern of livestock species in the village. About 60 % of the farmers in Kidoma village keep an average of two pigs/household. About 80% of households are engaged in village poultry production with an average flock size of three birds/household. About 10% of the households own an average of five indigenous cattle and only 1% of the farmers own improved dairy cows. Cattle are kept for milk production and generating income from the sale of milk and live animals. Goats are raised by 30% of the households and generate cash for immediate use by the household and slaughtering during important social gatherings.

Table 2: Types, uses and ownership of livestock in Kidoma village

Livestock type	Primary use	% households owning type	Average no. of animals/household
Local dairy cows	Milk for sale, meat	10	5
Improved dairy cows	Milk for sale	1	1
Sheep	Sale	1	2
Goats	Sale/consumption	30	3
Pigs	Sale	60	2
Poultry village	Sale/consumption	80	3

Feed availability

Feed availability through the year

Generally, feeds are primarily comprised of concentrates, legume residues, kitchen waste and green forages. Figure 5 shows the availability of feed resources and rainfall over an average year. Rainfall was estimated by farmers on a scale of 1-10 where 10 is abundant and 1 is very scarce. Similarly feed availability was estimated by farmers on a scale of 10-100 where 100 corresponds to abundant feed available and 10 denotes very little feed. During the dry season between November to early March, concentrates, jack fruits and crop residues are available as feeds for livestock. In the wet seasons between April and June, and August and November, green forages, grazing, legume residues and kitchen wastes are used to meet a large proportion of the feed demands for livestock. Concentrates are readily available low-fibre and high-energy feeds affordable to most of the households throughout the year. However, some concentrates are processed locally as some households keeping pigs also grow rice and maize which then are sold after processing. Such local feed processing is common from November to February with harvesting and processing of grain crops (rice and maize). Surprisingly, concentrates are fed even when green forages are abundantly available in April-June and September-October. Kitchen waste is also available in January and February when more cassava and sweet potatoes are harvested, peeled and dried for sale.

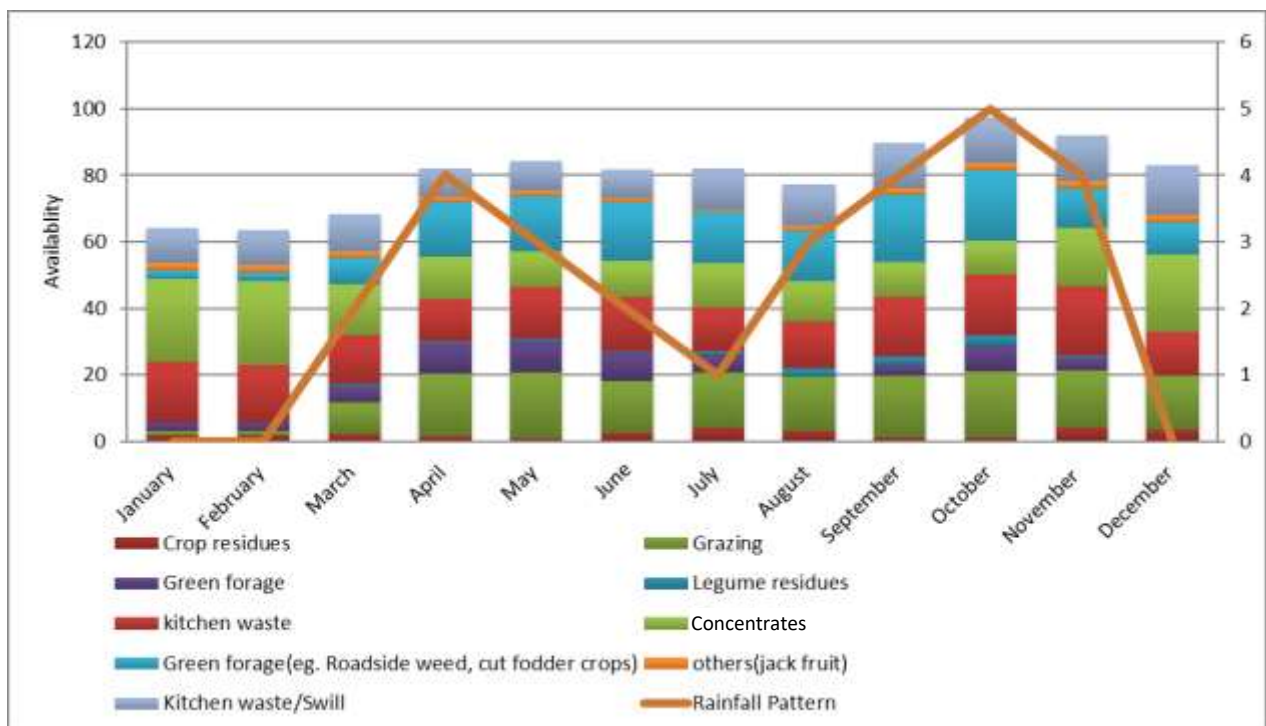


Figure 5: Availability of feed resources and rainfall during the year in Kidoma village

Fodder crops grown

We have not come across specific cultivated fodder crops in Kidoma village, and it appears that farmers entirely depend on natural unimproved pasture for feeding their pigs and other livestock species. On average, each household owns about 0.37 ha pastureland.

Purchased feeds

Purchasing of feeds for pigs is a common practice in Kidoma village. As shown in Figure 6, about 58% of the purchased feed is rice bran (58%) followed by maize bran (41.4%). Fish meal constitutes a very small proportion of all purchased feeds (0.6%).

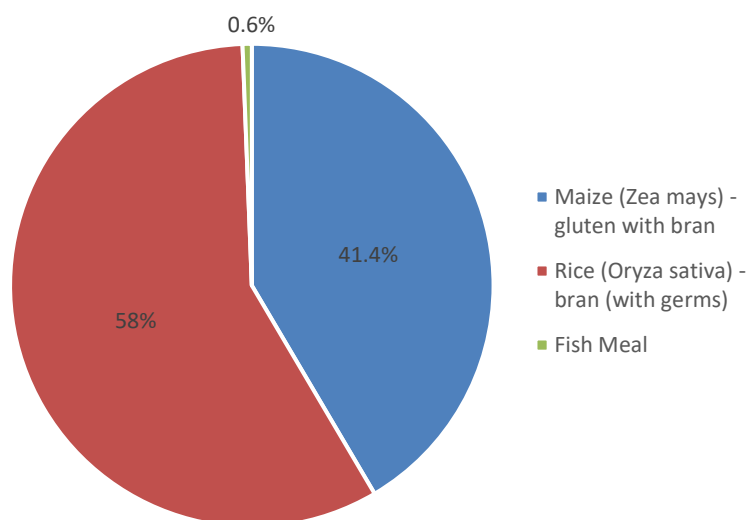


Figure 6: Proportions (Dry matter) of feed purchased over a 12-month period in Kidoma village

Livestock dietary composition

Figure 7 and Figure 8 show the contribution of various feed sources to the total diet of smallholder pigs in terms of dry matter, metabolisable energy (ME) and crude protein (CP).

More than 50% of the total dry matter is contributed from grazing and the contribution of crop residues and purchased feeds is comparable, 22% and 21%, respectively (Figure 7).

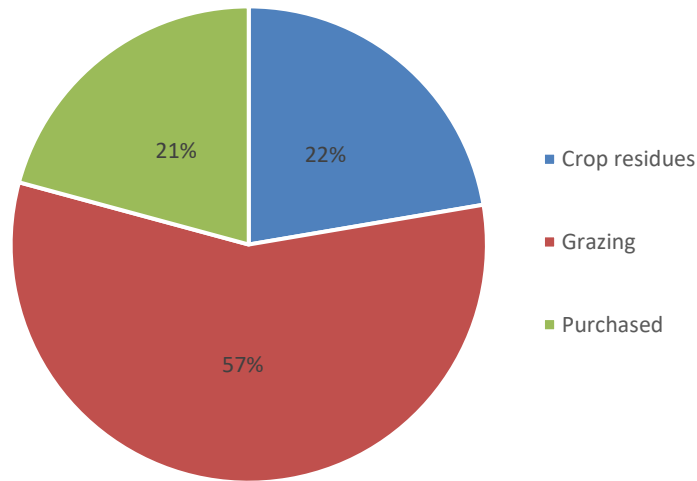


Figure 7: Contribution of various feeds to total dietary dry matter intake in smallholder pigs

When contributions are computed based on ME content of feeds, the contribution from grazing and crop residues is slightly reduced while the contributions from purchased feeds are increased (Fig 8).

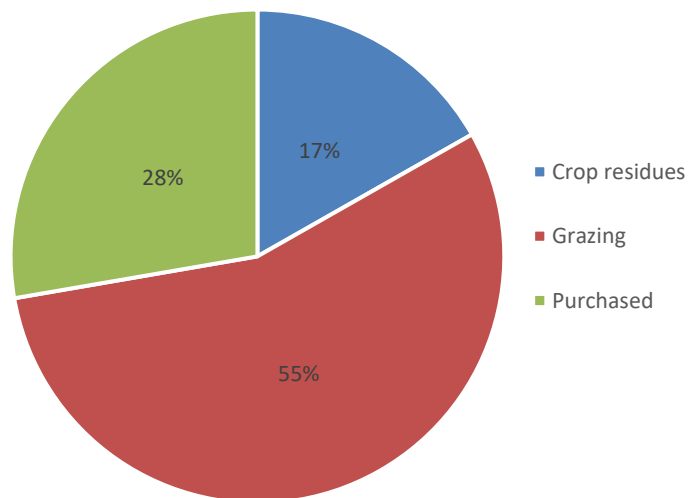


Figure 8: Contribution of various feeds to total metabolisable energy intake in smallholder pigs

Large shifts in contributions are noticed when the crude protein content of the above feeds is considered. Purchased feeds accounted for about 43% of the total CP intake in smallholder pigs (Figure 9). This is more than double the contribution to dry matter intake from the same feed resource. As indicated in Figure 6 above, most of the purchased feeds in the village are rice and maize bran and these feeds are known for their high concentration of CP (>10%).

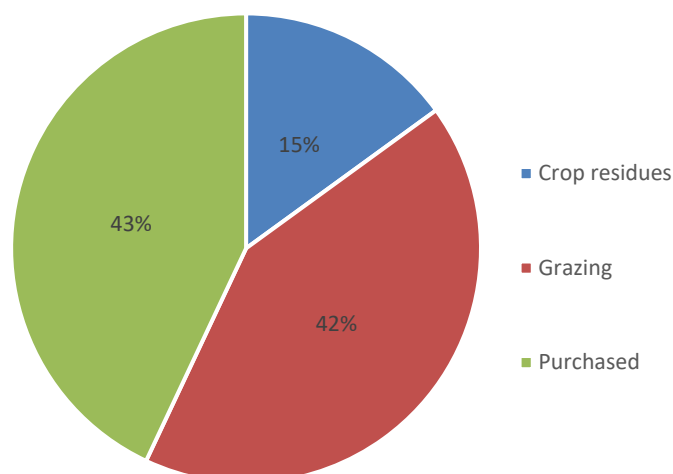


Figure 9: Contribution of various feeds to total crude protein intake in smallholder pigs in Kidoma

Key challenges and suggested interventions

Problem analysis and ranking were done by participants of the FGD and livestock diseases stood out as the major constraints affecting pig production (Table 3). Diseases that have been identified include African swine fever, external parasites and worms. Insufficient supplies, especially of concentrate, feeds, limited resources due to low income generating activities, lack of appropriate advisory service, insufficient knowledge about livestock management and poorly developed market infrastructure were among the constraints affecting smallholder pig productivity and profitability.

Table 3: Problem analysis and ranking by FGD participants in Kidoma village

Rank	Problem	Suggested farmer interventions
1	Diseases	- Animals need to be housed
2	Feeds	- Increasing crop production especially maize and potatoes that can act as feeds for animals
3	Limited resources	- Farmers need credit and saving schemes
4.	Advisory services	- Taking advice from fellow farmers who have more knowledge of livestock rearing in the area - Extension service providers by government
5.	Inadequate market	- Forming marketing associations

Potential interventions

The biggest constraint that has negatively affected livestock production in Kidoma village is disease. Farmers need to understand the signs/symptoms of the different diseases so animals can be treated in time. The second constraint is lack of feeds and farmers need to grow/ plant forages that can be fed to livestock. Crops such as maize and rice that are also used as feeds can be properly preserved and used in case of long dry spells.

Suggested interventions for problems associated with limited financial resources include the formation of farmers' associations and/or groups to access credit from microfinance institutions. This will allow them to develop their enterprises. They further mentioned that there is a lack of veterinary and crop advisory services in their village. Through their association, they can attract private extension workers.

Farmers in Kidoma village indicated that there is a problem of accessibility to the markets for their agricultural products. This can be solved by forming collective actions that enable all farmers to come together and improve their bargaining power in even bigger markets.

Finally, infrastructures like roads that provide access to the village are needed so that livestock and their products can easily be marketed.

Conclusions

A feed assessment was carried out through a focus group discussion with community members and individual interviews in Kidoma village. Agriculture is the main contributor to the livelihoods of Kidoma farmers. Livestock is the second contributor after food crops. Of all livestock species, pigs play a key role in the livelihoods of smallholder farmers. Smallholder pigs use a variety of feeds including concentrates, legume residues, kitchen wastes, and green forages. Based on the FGD on community problem analysis and ranking, pig diseases were considered as the most important development constraint. Other important constraints identified by the participants include inadequate concentrate feeds, limited resources of farmers, and poorly developed market infrastructure. Providing skill trainings for farmers is key to improve and upgrade their capacity in disease identification and prevention. Formation of farmers' associations to access credit is also vital in accessing financial institutions.