

Characterisation of the livestock production system and potential for enhancing productivity through improved feeding in Ude peasant associate Ada'a, Ethiopia, April 2010

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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 to 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 aspect in Ude peasant association of Ada'a, Ethiopia. The assessment was carried out through structured group discussions and completion of short questionnaires by six key farmers/stakeholders on 21st of April 2010. The following are the findings of the assessment and conclusions for further action.

Farming system

The farming system is an integrated subsistence based crop/livestock system. Households are comprised of an average of 5 members who utilise approximately 1.5 hectares of arable, rain-fed land. Cropping operations are cereal crop focused with tef (*Eragrostis tef*) being the primary crop of importance as displayed in Figure 1. Other cereal crops such as wheat (*Triticum spp.*), barley (*Hordeum vulgare*) and maize (*Zea mays*) are also grown by many farmers, however, the importance of these crops is less than that of tef. Leguminous crops such as chickpeas (*Cicer arietinum*), rough peas (*Lathyrus spp.*), field peas (*Pisum sativum*) and other varieties of beans and peas are also grown. The significance of these crops to household income is minimal. Cattle are the most important livestock species kept by farmers, as they support the production of crops through the provision of draught power. Many of the wealthier farmers also have dairy cows (either local indigenous breeds or cross-bred animals) which provide regular income through the sale of small quantities of milk. Other livestock species such as, horses, donkeys, chickens, sheep and goats are also kept by most farmers in varying numbers. The importance of these animals to farmers is very minimal. The focus on tef production places significant strain on the production system in terms of labour as periods of peak labour requirement all occur simultaneously across the area. As a result, additional labour outside the family unit, is often difficult to find for land preparation, planting and harvesting. In the event that labour can be found, the rate is generally 250-300Birr/month (including meals)

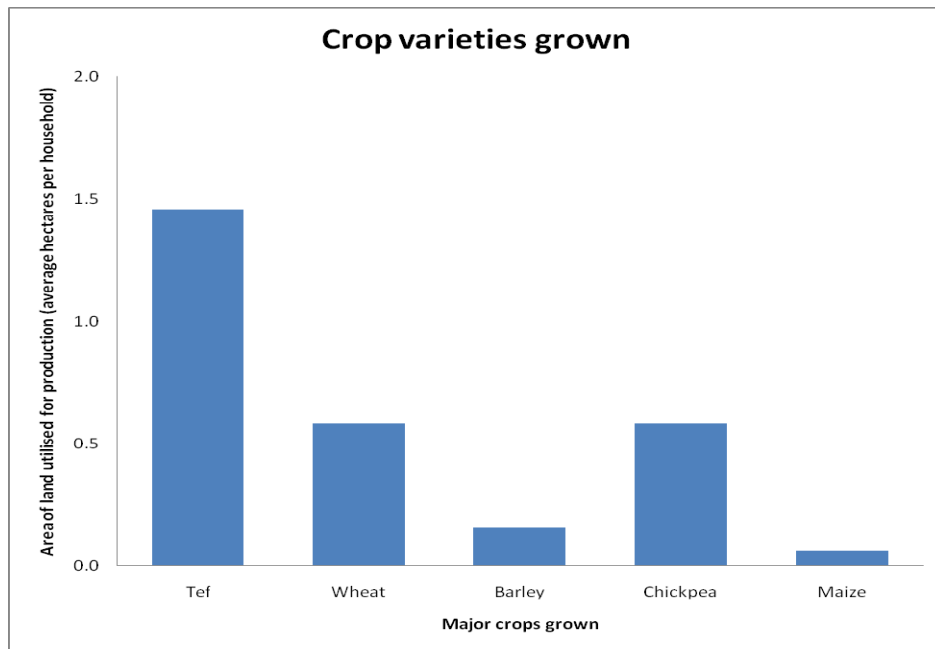


Figure 1: The average area sown to the various crops utilised by farmers in Ude Peasant Association

Major income sources

Tef is overwhelmingly the most important source of income. Tef contributes an average of 50% of all household income for farmers in the area. Wheat and chickpeas are of equal importance, collectively contributing 30% to household income. Income earned from the sale of livestock products is very minimal. The sale of old draught cattle that are no longer capable of pulling a plough contribute approximately 7% to household income according to farmers. The average price received for fattened ex-draught cattle can range from 3500 Birr/head during periods of religious fasting, up to 5000birr/head during important holidays and festivals. The monetary benefits obtained from these sales are generally only experienced by wealthier farmers who are able to breed replacement animals. Less wealthy farmers are forced to use the funds generated to purchase replacement animals. Poultry also contribute approximately 7% to household income through the sale of individual birds and eggs. Interestingly, income earned from the sale of milk is very minimal at approximately 5% and restricted to the more wealthy farmers in the area. The price received for milk sales varies from 4.8Birr/litre to 5.3Birr/Litre depending on religious fasting and holiday periods. Poorer farmers tend not to earn any income from the sale of milk as their low producing indigenous cattle breeds are incapable of producing milk quantities beyond those required for consumption within the household. The sale of cow dung for fuel also contributes a very small amount (approximately 1%) to household income.

Livestock production system

Due to the importance of cropping and the need for draught power to support cropping operations, the livestock production system is dominated by draught cattle as displayed in Figure 2. Approximately 98% of all households have a pair of castrated male cattle to provide draught power. A large majority of households (92%) also maintain at least one cow for milk production. Indigenous cattle breeds dominate holdings with only the more wealthy farmers owning cross-bred cows. Every household has approximately 10 chickens which are integrated into the system to provide a quick

source of income during times of need and to fulfil household meat and egg requirements. The more wealthy farmers in the area maintain their cattle in specially built cattle sheds and stalls for feeding during periods of non-work. Poorer farmers generally do not have access to a cattle shed and maintain their cattle in a simple circular pen (or corral) made from the branches of *Acacia spp.* in close proximity to the household.

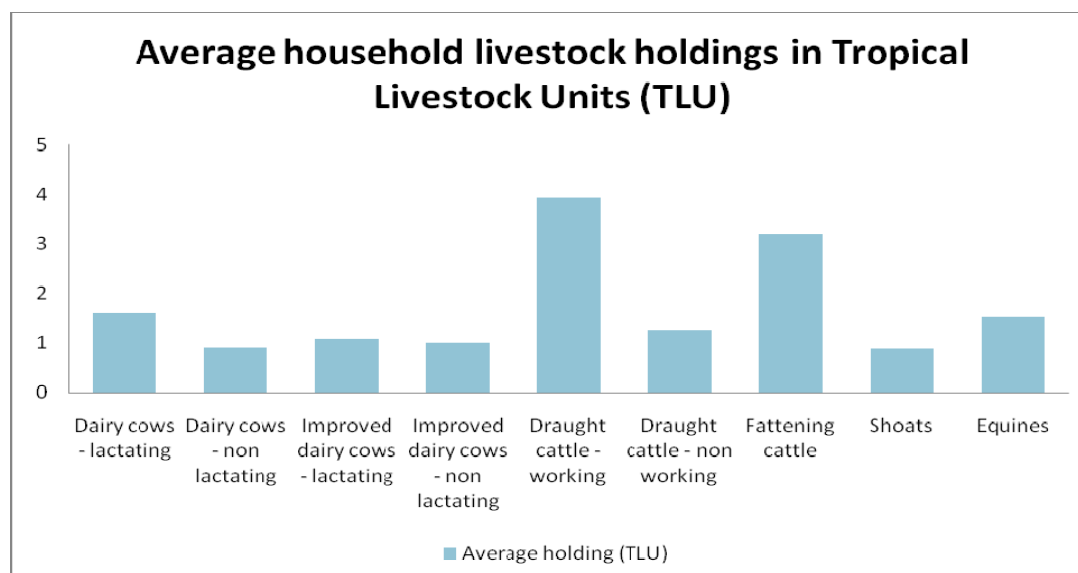


Figure 2: The average livestock holdings of households in Ude Peasant Association in Tropical Livestock Units (TLUs).

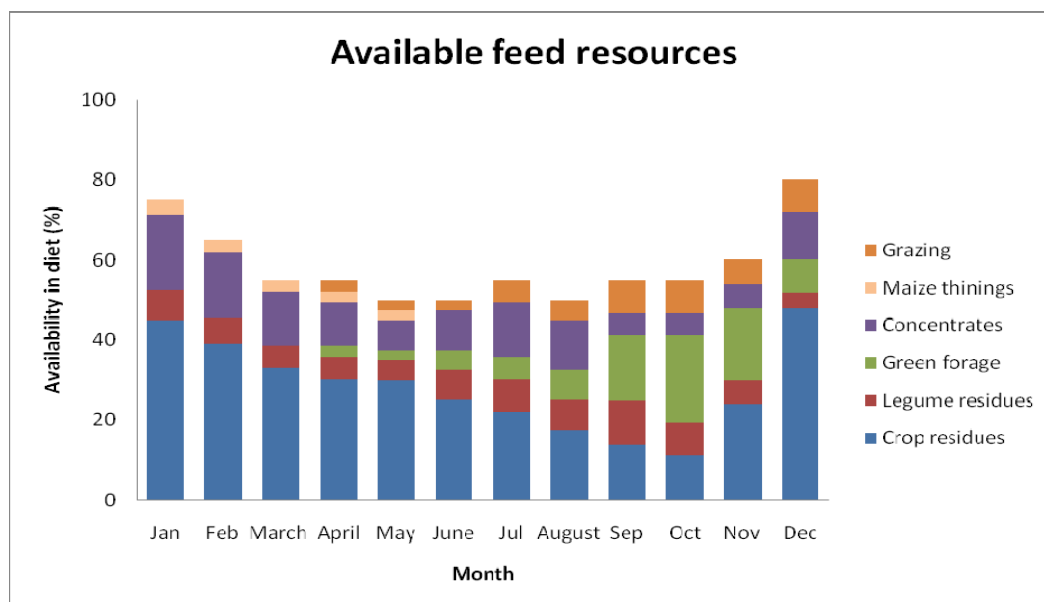
Problems, issues and opportunities

There are several problems currently being experienced by farmers in this area. Lack of feed both in terms of quantity and quality is the primary constraint and is the main concern for many farmers. The more wealthy farmers have begun to purchase concentrate feeds to mitigate this constraint. Wheat bran and oil seed cake are the principle ingredients purchased by farmers for approximately 2 Birr/kg. These ingredients are mixed with a small quantity of crop residue and given to cattle during periods when energy is required; during work for draught animals and during lactation for dairy cows. Health problems and diseases are also constraints for many farmers. Artificial Insemination (AI) services in the area are poorly developed. Farmers are currently utilising natural matings with free ranging bulls. Many farmers believe this mode of reproduction to be the only viable option as selected village bulls are known to carry a number of diseases. However, farmers are unable to identify the primary diseases of concern, indicating a general lack of awareness pertaining to disease issues within the area.

Major feed sources through the year

Crop residues form the primary component of the diet throughout most of the year as displayed in Figure 3. The quantity of crop residue in the diet tends to decrease throughout the growing season (June-October). This is partly due to the decreasing availability of crop residues during this period, and a substitution effect caused by green forage material collected during weeding of crop areas. When given the choice between green forage material and crop residues, cattle are unlikely to consume large quantities of crop residues. As a result, many farmers do not provide their cattle with large quantities of crop residues when green forage is available, preferring to store the crop residues

until the dry season when no green forage is available (December- February). Variable quantities of concentrate feed are also fed to cattle throughout the year. During periods when draught is required for activities such as land preparation (January - July) the proportion of concentrate in the diet tends to increase. Conversely, when draught power is not required, concentrate contributes negligible amounts to the diet. Grazing also contributes negligible amounts to the diet.



Potential interventions

To improve livestock productivity in a sustainable way, it will be necessary to undertake an integrated approach to mitigate the negative effects of constraints simultaneously. To alleviate feed constraints, farmers will be required to produce more feed biomass per hectare, improve the quality of existing feed sources, and potentially purchase more concentrate or green fodder feeds. Increasing feed biomass production on farm, in terms of quantity and quality can be achieved through planting of forage crops. Species such as Napier grass (*Pennisetum purpureum*), Pigeon pea (*Cajanus cajan*) and Fodder beet (*Beta vulgaris L.*) should be considered. For poorer farmers that do not have excess land that could be used to plant fodder crops, or face labour constraints, they should consider fodder trees such as *Leucaena spp.* or *Sesbania spp.* These species represent a high quality, long lived source of fodder material and could be grown in hedges around paddock edges to ensure crop yields are not compromised. As farmers in this area are already familiar with stall feeding and “cut and carry” methodology, it is likely forage crops can be integrated into the system with much success. To improve the quality of existing crop residues the formation of a local feed processing co-operative to chop (or chaff) residues and/or mix residues with more palatable substances such as molasses should be considered. Purchasing of additional concentrate or green fodder will also help to alleviate feed shortages. However, this will increase the cost of production. To offset this increased cost of production it will be necessary to increase the amount of household income generated from livestock products. As the sale of milk is underutilised as an income generating activity within this village, increasing milk yields beyond household requirements is a potential means of offsetting the increased cost of production. Thus, it will be imperative that AI services are also improved to ensure farmers have access to the improved breeds that will be required to improve milk yields. Improved AI facilities will also provide additional disease benefits,

through decreasing the transmission of reproductive diseases which are a concern for farmers. Other disease and health issues that are affecting livestock need to be clearly and accurately identified to gain an understanding of the disease situation. Attempts should then be made to increase awareness of the diseases amongst farmers and the methods required to minimise disease prevalence, incidence and transmission within the village and neighbouring communities.

Key issues

- Lack of feed sources, both in terms of quality and quantity
- Poor milk yields preventing income from the sale of milk products being generated
- Lack of AI facilities and access to improved dairy breeds
- High disease prevalence affecting animal health and productivity

Ways forward

- Introduce fodder crops and forage trees to improve the quantity and quality of feed available
- Develop a co-operative and introduce simple feed processing technologies to improve the quality of existing feed.
- Improve AI services
- Identify diseases currently affecting animal health and undertake the necessary steps to mitigate their effects.

Key metrics

Milk yield: 1006.7 Litres per household per year

Meat offtake: 21.11% per household per year

ME per TLU:

Conclusion

This area is a mixed crop/livestock system that is heavily reliant on cereal crops, particularly Tef to generate the majority of household income. Livestock, namely draught cattle, are used to support the production of crops through the provision of draught power. The sale of milk is not widely practiced as only the more wealthy farmers possess the improved breeds required to produce milk yields beyond household requirements. Thus, opportunities exist for many of the poorer farmers to diversify into milk production as a means of generating additional income. However, this diversification process is being constrained by a lack of feed resources (both in terms of quantity and quality), a lack of AI services, and disease problems. To help alleviate these constraints an integrated approach will be required to produce more forage material on farm through the use of fodder crops and forage trees, improve feed utilisation through the introduction of simple feed processing technologies, improve AI services to increase the availability of improved genetic material, and identify the diseases affecting livestock productivity in an attempt to limit their impact and further spread.