



Stabilizing access to fodder for dairy farmers in Kenya

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Key messages

- Limited access to quality feeds limits the productivity and competitiveness of Kenya's livestock sector. For many smallholder producers, who produce 80% of the marketed milk, this poses a livelihood challenge.
- Institutional innovations, such as fodder purchase contracts, can ensure year-round availability of high-quality feed, which is crucial for optimal feeding and the profitability of smallholder dairy enterprises.
- Although many studies have highlighted the benefits and design of institutional innovations involving contracts with farmers (Abebe et al. 2013; Ochieng et al. 2017; Saenger et al. 2014), much of this has focused on output markets.
- Less is known about the design of input purchase contracts for the dairy sector and the critical role dairy cooperatives could play in such arrangements.

Background

Livestock plays a critical role in supporting income, food security, and nutrition for many individuals in the Global South (Parlasca and Qaim 2022). However, the productivity of current livestock systems is hindered by limited access to high-quality feeds (Balehegn et al. 2020).

Smallholder dairy farmers are particularly affected, as they have limited land available for year-round fodder production and insufficient financial resources to supplement livestock feeding using purchased fodder. Enhanced institutional mechanisms—such as structured fodder purchase agreements—can address these challenges. Nevertheless, such solutions have yet to be implemented in many developing countries, including Kenya, primarily due to limited insights into stakeholder preferences and prevailing institutional barriers.

The International Livestock Research Institute (ILRI) assessed farmers' preferences for different fodder purchase contract designs using a choice experiment with 820 dairy farmers from the Western, North Rift, and

Mt Kenya West regions of Kenya. The results provide some insights into the design of adoptable contracts that can enhance fodder access while strengthening the viability of fodder/feed businesses for smallholders.

The CGIAR's Science Program on Sustainable Animal and Aquatic Foods Program (SAAF), building on the work of the Sustainable Animal Productivity for Livelihood, Nutrition and Gender (SAPLING) Initiative, is working with Kenyan dairy stakeholders to implement a strategy on bundling advisory services with the delivery of livestock technologies, including appropriate feeds.

Choice experiment design

We designed a choice experiment with hypothetical scenarios of fodder purchase contracts. Four key attributes with varying levels were selected. This included price, contract quantity, payment options, and seller type. For quantity, three levels were considered: one reflecting the status quo of ordering fixed quantities, and two representing flexibility in ordering. Payment options included three levels: full payment upfront, a 50% advance payment, and payment upon delivery. The nature of the seller had three levels: first, the status quo (a freelance seller of fodder); second, the seller introduced by the cooperative; and third, the cooperative as the supplier. The design yielded 18 choice sets, each containing three alternatives. To reduce response bias, the choice sets were divided into three blocks of six, each presented graphically on pictorial cards (Figure 1).

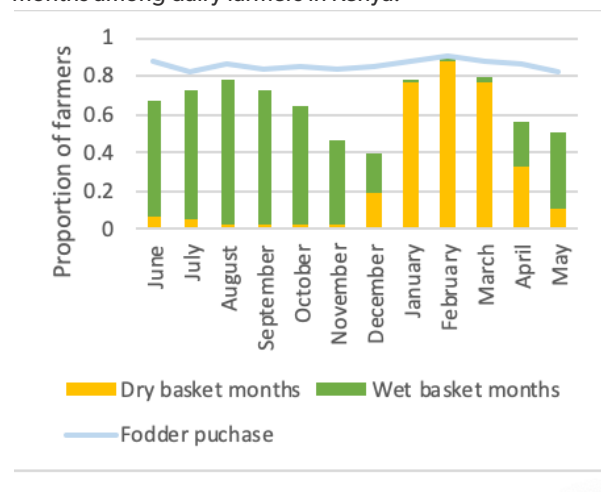
Figure 1: Sample of choice cards



The Feeding practices among dairy farmers

Descriptively, the study showed that 81% of farmers cultivate various fodder species, including improved varieties. Nonetheless, onfarm feed conservation remains low (39%). Farmers mainly conserve fodder as hay (or drying) and/or silage. During wet fodder basket months (May to November), when fodder is presumed to be available in plenty, a large proportion of farmers consistently made fodder purchases (Figure 2). This suggests that onfarm fodder production is insufficient to meet demand. Taken together, these descriptive results underscore the need to stabilize farmers' access to quality fodder by implementing institutional innovations, such as fodder purchase contracts.

Figure 2: Fodder purchase patterns by wet and dry fodder basket months among dairy farmers in Kenya.



Farmers' preference for fodder purchase contracts

Analysis of the choice experiment results showed overall acceptance of formal fodder purchase contracts over traditional approaches to fodder procurement, as indicated by the statistical significance of the alternative-specific constant (Table 1). The price coefficient was also negative and statistically significant, implying that farmers prefer lower input prices, as in the case of feeds, as one would expect. This is consistent with other findings in similar settings, where farmers, being rational, prefer lower input prices for vaccines and index insurance (Linhoff et al. 2023; Maina et al. 2024).

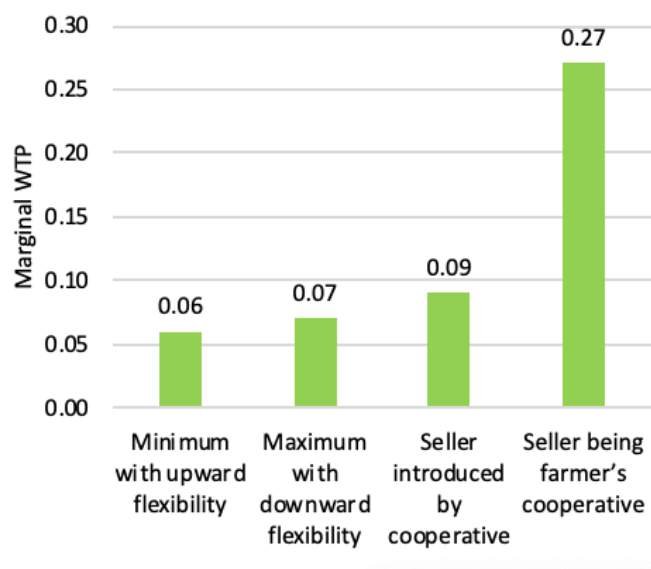
In terms of other fodder contract attributes, farmers prefer flexibility in the order quantities as opposed to fixed quantities contracts, as shown by the positive and statistically significant coefficient for both minimum, with upward flexibility, and maximum, with downward flexibility. In terms of the nature of the seller or supplier, farmers prefer sellers introduced by the cooperative society or supplied directly by the cooperative itself.

To better understand the trade-offs between different contract attributes, the willingness to pay (WTP) was estimated as shown in Figure 3. The estimates are interpreted as incremental values over the unit price of fodder. Farmers are willing to pay 6% more to meet minimum order quantities, with the option to increase quantities. They are also willing to pay 7% more for maximum order quantities, with the option to reduce them. In terms of the nature of the seller, farmers would be willing to pay 9% more if the cooperative were to introduce the seller. More importantly, farmers would be willing to pay 27% more if the cooperative supplies the fodder. Given the magnitude of the coefficient estimates and WTP, the strongest preference is for situations where the cooperative supplies fodder directly.

Table 1: Simulated maximum likelihood estimates from the mixed logit model.

Fodder contract attribute	Mean coefficient	Derived SD coefficient
Non-random parameters in the utility function		
ASC	-5.26*** (0.26)	
Price	-4.30*** (0.06)	0.46*** (0.03)
Random parameters in the utility function		
Minimum with upward flexibility	0.24*** (0.07)	0.88*** (0.11)
Maximum with downward flexibility	0.29*** (0.06)	0.60*** (0.13)
50% pre-payment	-0.00 (0.06)	0.44*** (0.13)
100% payment on delivery	-0.06 (0.07)	0.56*** (0.12)
Seller introduced by cooperative	0.39*** (0.07)	0.61*** (0.12)
Seller being farmer's cooperative	1.15*** (0.08)	1.15*** (0.10)

Figure 3: Marginal willingness to pay (WTP) estimates for fodder purchase contract attributes.



Conclusion

The increasing demand for livestock-derived foods (LDFs) offers considerable potential for smallholder producers to enhance their incomes and broaden market opportunities. Addressing feed availability through institutional innovations can reinforce existing fodder

markets and optimize input delivery systems. This study indicates that although most small-holder dairy farmers in Kenya cultivate various forage species, fodder constraints persist, which negatively impact on-farm productivity and the overall competitiveness of dairy enterprises. Furthermore, farmers generally prefer fodder purchase contracts that allow flexibility in order quantities, with a notable inclination toward direct supply arrangements from dairy cooperatives.

Enhancing fodder purchase contracts requires developing a robust, diverse financing ecosystem, such as implementing an innovative check off system. The scalability of these institutional innovations can be further enhanced by integrating digital tools that facilitate accurate record keeping for farmers. Such measures promote greater transparency in farm operations, enable effective tracking of feed stocks and productivity metrics, and ultimately contribute to more informed farm management decisions.

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