



## Honey Production, Processing, Quality, and Marketing in the Mountains of Northern Kenya

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*Improving risk management for rangeland inhabitants can involve income diversification. Honey production is one possibility, as some locals already do it using traditional means. To what extent can honey production be increased, the quality improved, and markets expanded? We report here on a pilot study of honey production and marketing in the mountainous regions of Marsabit and Samburu Districts. We used social science methods and technical assessments in an inter-disciplinary approach. We conclude from case studies of traders that honey production and processing can already be profitable in the area. Expansion of beeswax processing may further increase profitability. The Nyiru Mountains appear to be a key honey production zone, with peak production occurring during June to July and October. Local marketing systems should be strengthened by assisting the organization of traders and bee-keepers. To enhance the market competitiveness of local honey for urban consumers in Kenya, local honey requires improved processing and quality assurances. To reduce costs, processed honey should be packaged in bulk using plastic jerry cans. To improve honey quality and price for market, traders should take care to blend crude (and uniformly ripe) honey from sources having similar viscosities, colors, and nectar source-plants.*

### Background

The mountainous and riverine areas of northern Kenya offer suitable habitats for honeybees. Local beekeepers already produce honey using low-cost, traditional methods. Honey is a natural product highly valued by consumers for food, health, and cultural aspects. Consumer demand for honey is increasing locally and globally (Nyariki et al., 2005). Honey production therefore appears to be a viable option for economic development and income diversification among some residents of northern Kenya, who otherwise engage in livestock herding and petty trade. One of the main challenges facing bee-keeping in the region is the limited market outlets and problems related to poor infrastructure, remote producer locations, and market-chain inefficiencies. Marketing challenges are further compounded by the harvest and mixing of unripe and mashed honey containing many impurities (Lengarite et al., 2005). In the Ndoto Mountains of northern Kenya, local honey traders have expressed concern on the low quality of crude honey supplied by traditional bee-keepers (Lengarite and Keya, 2004). The low-quality honey is largely a processing problem, has a reduced shelf life, and commands low market prices (Lengarite et al., 2005).

Honey production is expanding in Kenya, but data on production trends, processing, and marketing is fragmented. Annual honey production in Kenya is estimated at 700 metric tonnes (Mohamed, 2006). The

arid and semi-arid lands of Kenya typically yield only crudely processed honey for Kenya's urban markets.

We therefore decided to undertake some pilot studies of honey production in the Ndoto and Nyiru Mountains and Mount Kulal in the Marsabit and Samburu Districts. We wanted to characterize the level of honey production, better understand how honey was processed, reveal the constraints on the quality of marketed honey, and explore the extent to which market opportunities could be expanded. Local honey markets studied were at South Horr, Ngurunit, Tuum, and Arsim.

We collected 17 crude and processed honey samples and samples of plants that bees commonly utilize for nectar. The honey quality analyses were conducted using standard methods at laboratories in Nairobi. Experienced beekeepers in Ngurunit assisted with physical assessments of texture, taste, smell, and colour identification of honey. This helped us identify the native plants that honey bees were using as nectar sources. Semi-structured questionnaires, group discussions, and participant observation were used to collect data on the processing and marketing of honey. Participatory tools were used to sensitize communities during our surveys. Survey subjects and interviewees (78 in total) included local honey processors and traders, consumers, and bee-keepers. In each market one major honey trading entity (four in

total) was selected for a case study on the profitability of honey processing. Annual honey sales and costs were collected, and gross margins were analyzed. Further research details may be obtained from the authors. A full report is forthcoming.

## Findings

**Honey Production.** Honey is a highly seasonal product. The areas studied contain montane and *Acacia* riverine vegetation that support honey production in wet and dry seasons, respectively (Lengarite et al., 2005). The total volume of processed honey traded per year in the four producer markets was estimated at a total of about 4.91 metric tonnes, with 74% marketed externally, and with a total market value of KSh 1.6 million. Trading centers with the highest annual volumes of processed honey were Tuum (2.1 metric tonnes) and South Horr (1.19 metric tonnes). These occur at the foothills of the Ngiri and Oldonyo Mara Mountains, with a local population of about 1,500 traditional bee-keepers. Trading centers along the foothills of the Ndoto Mountains had the lowest annual volumes of processed honey, namely Ngurunit (0.93 metric tonnes), and Arsim (0.69 metric tonnes) attributed to low honey production from about 300 traditional bee-keepers. The processing volume tends to be lower during the long rainy season of April to May and the short rainy season of October to November. Production peaks in a lagged fashion at the end of the long rains (June to July) and during the onset of the short rains (October). The volumes of processed honey in Tuum were generally higher, and this was attributed to well-establish market outlets and better-organized local honey collection.

**Processing.** Local honey processors are typically the traders. Traders buy crude (raw) honey from the bee-keepers. The processing uses low-cost materials to strain the crude honey and package it in local containers. Honey processing is done by letting the crude honey drain through a cotton cloth into a container. The straining process is intended to remove wax and other impurities. The major constraints in honey processing reported by the traders were lack of processing skills (47%) and lack of suitable materials to process and package honey (47%). The poor-quality materials lower the quality of processed honey and consumer appeal and thus reduce market prices. The costs of packaging of processed honey can be high, as a majority of the respondents (80%) noted a lack of suitable, locally available packaging materials. The main materials used in packaging are mineral-water bottles (40%), plastic jerry cans (28%), and small plastic jars (28%). The water bottles and plastic jerry cans are relatively cheap and available at the trading centers; most local consumers (84%) are satisfied with these types of packaging. Small plastic jars, however, are not readily available and can be more expensive. When combined with a need to affix labels on the jars, cost of packaging with jars and

labels increases significantly. Perceived challenges of honey marketing varied among traders and bee-keepers in different localities. As noted elsewhere, most locally processed honey is sold externally. The major marketing problems noted by respondents include inaccessible markets (32%), lack of marketing skills (28%), high costs of transport (20%), and lack of well-organized marketing chains (20%). Most honey traders (92%) travel long distances themselves (200 to 1,000 kilometers) to sell their honey. The bee-keepers expressed the problem of unreliable local markets in terms of matching the seasonality of honey production with demand and a scarcity of local honey traders.

**Honey Quality.** Samples of locally processed honey from Tuum were analysed by the Kenya Bureau of Standards in Nairobi, and results indicated that it was of “fair to good” quality. The processed honey met the standard quality requirements for consumers in Kenya. Moisture content, however, was at the maximum allowable level (20%), and this was attributed to processing mixed unripe honey with ripe honey. The group at Tuum collects honey from different bee-keepers in different localities, and crude honeys are blended during processing. The blending of crude honey from different bee-keepers contributes to the increased moisture content of the processed honey and lowers quality. There are also problems associated with mixing honeys of varied thicknesses, colors, and nectar sources.

**Honey Marketing.** Local marketing networks consist of bee-keepers (individuals and groups), traders, and consumers. The main marketing channel for crude (unprocessed) honey is directly from bee-keepers to local traders (the processors) and then to external consumers. Other secondary channels are direct from bee-keepers to local consumers. There are about 15 external market outlets for processed honey from the study area. Regional destinations include Nairobi, Nanyuki, Maralal, Nakuru, Isiolo, Marsabit, Naivasha, and Limuru. Local destinations include Korr, Loiyangalani, Merille, Kargi, and Wajir. Tuum (11) and South Horr (10) have the highest established number of external market outlets, while Ngurunit and Arsim have the lowest. The destinations for Tuum honey are mainly supermarkets (72%) while shops, colleges, and tourist camps comprise the remainder. The Tuum group has a honey-quality certification from the Kenya Bureau of Standards, and the local honey handlers have undergone some scrutiny to meet requirements of the competitive outlets. The Tuum processing group has diverse market outlets allowing for the expansion of honey-processing.

**Profitability.** Annual costs and revenues from processed honey sales significantly varied among the honey-trading entities profiled in four case studies (Table 1). Income above variable costs ranged from 11% (Tuum) and 33% (Ngurunit) to 58% (Arsim) and 71% (South Horr). The high costs for packaging, labor, and transport incurred at

Table 1. Summary of annual total revenues, variable costs, and income above variable costs for four honey-trading/processing entities in northern Kenya.<sup>1</sup>

CATEGORY	DETAIL	TRADER LOCATION			
		Tuum	Ngurunit	South Horr	Arsim
Total Revenue	Processed Honey	514,134.00	51,385.00	260,000.00	175,000.00
Variable Costs	Crude Honey	211,640.00	23,495.00	52,000.00	37,800.00
	Labor	67,200.00	6,000.00	7,200.00	6,000.00
	Packaging	103,448.00	3,246.00	4,080.00	5,800.00
	Transport	54,200.00	1,272.00	12,500.00	22,800.00
	Honey Processing Materials	11,370.00	600.00	500.00	500.00
	KBS Quality Assurance	10,000.00	NA	NA	NA
<i>Total Variable Costs</i>	<i>All Cost Detail Above</i>	<i>457,858.00</i>	<i>34,613.00</i>	<i>76,280.00</i>	<i>72,900.00</i>
<b>Income Above Variable Costs</b>	<b>Total Revenue – Variable Costs</b>	<b>56,276.00</b>	<b>16,772.00</b>	<b>183,720.00</b>	<b>102,100.00</b>

<sup>1</sup>Annual quantities of honey processed varied from 2,114 kg valued at KSh 243/kg (for Tuum) to 121 kg valued at KSh 423/kg (Ngurunit), 650 kg valued at KSh 400/kg (South Horr), and 540 kg valued at KSh 325/kg (Arsim). Annual quantities of crude honey purchased for processing varied from 2,963 kg valued at KSh 71/kg (Tuum) to 365 kg valued at KSh 64/kg (Ngurunit), 910 kg valued at KSh 57/kg (South Horr), and 756 kg valued at KSh 50/kg (Arsim). Honey packaging includes purchase of jars, bottles, jerry cans, and plastic wrap. Transport includes costs of transport for traders, processed honey, and packaging materials. Honey processing materials includes sieving cloth and containers. Certification of honey quality by the Kenya Bureau of Standards was done only by Tuum.

At the time of research, the exchange rate was about KSh 80 per 1 USD.

Tuum and Ngurunit were the primary reasons for their lower profitability. The individual honey traders in South Horr and Arsim realized the largest profitability by using cheap locally available packaging and from premium prices of honey earned from selling bulk, processed honey to external traders. Due to the remoteness of honey producers, transport of processed honey to the urban markets carried the highest toll on the expenditure (39%), labor costs were generally high (30%) and packaging was also high at about 28%. Processing honey is a sustainable revenue generation business, and the revenue made covers the cost of processing, packaging and marketing. In the survey area about 60% of the honey traders discard beeswax; only 28% actively process and market beeswax. Processing beeswax for sale may significantly increase income from honey.

### Practical Implications

For traders, our pilot study suggests that honey processing and marketing can be a highly profitable business in some cases. Diversification by processing other products such as beeswax, and linking traders to beeswax industries, may further increase profitability. The Nyiru Mountain area is a key honey-production zone. Our observations suggest that a combination of montane and riverine habitats may be optimal for sustained seasonal productivity of honey bees in the area. The best months for external honey buyers to be linked to local honey processors seem to be during June, July, and October. The Tuum honey-processing group may

offer a model in terms of the volume of higher-quality honey production and a better-organized processing and marketing network. Strengthening local marketing systems by helping bee-keepers and traders build technical capacity and better organize themselves for increased marketing efficiency is important. Facilitating honey certification and quality assurance could also help locals compete more effectively in regional consumer markets. Packaging processed honey in bulk using cheap, plastic jerry cans—without labeling—may help cut costs and boost profits. Local honey traders should improve processing techniques, even at the Tuum location. One avenue is for processors to take more care to blend crude (and uniformly ripe) honey from sources having similar viscosities (thicknesses), colors, and nectar source-plants. This could promote more product uniformity, quality, and improve market prices.

## Further Reading

Nyariki, D., N. Musumba, and C. Ikutwa. 2005. *Capacity building through training of beekeepers in the southern rangelands of Kenya*. Nairobi, Kenya: DMP/KARI Report

Lengarite, M., and G. Keya. 2004. *Feed-back workshop on the honey production and marketing survey in the Ndoto mountains of northern Kenya*. Nairobi, Kenya: DMP/KARI Report.

Lengarite, M., G. Keya, and M. Okoti. 2005. *Survey report on the traditional honey production and marketing in the Ndoto mountains of northern Kenya*. Nairobi, Kenya: DMP/KARI Report.

Mohamed, A.M. 2006. *Launch of the Kenya Bureau of Standards diamond mark of quality for KVDA's pure Acacia honey*. Eldoret, Kenya: Unpublished report, Kenya Bureau of Standards.

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The GL-CRSP Pastoral Risk Management Project (PARIMA) was established in 1997 and conducts research, training, and outreach in an effort to improve the welfare of pastoral and agro-pastoral people with a focus on northern Kenya and southern Ethiopia. The project is led by Dr. D. Layne Coppock, Utah State University. Email: lcoppock@cc.usu.edu



The Global Livestock CRSP is comprised of multidisciplinary, collaborative projects focused on human nutrition, economic growth, environment and policy related to animal agriculture and linked by a global theme of risk in a changing environment. The program is active in East Africa, Central Asia and Latin America.

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