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On Farm Participatory Evaluation and Demonstration of Processing Crude Honey and Beeswax at Gelana District West Guji Zone Southern Oromia, Ethiopia

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Abstract

The study was conducted at Galena district of West Guji zone, Southern Oromia to demonstrate improved honey bee product handling and processing techniques, and increasing the income generated from beekeeping sector by improving the quality of produced products. One (Beekeeping Research Group) BRG which contains 10 individual beekeepers was established at the District. On both crude honey and bees wax processing necessary training & information was given to the Agro-pastoral and pastoral demonstration group members. For the demonstration purpose crude honey collected from their farm gates (agro-pastoral/pastorals) by beekeeper and this crude honey was used for the demonstration on the honey extraction and processing.

Keywords: crude honey, BRG, Agro-pastoral and pastoral.

Introduction

Ethiopia is one of few countries in Africa with a big honey and bees wax production potential. Owing to its varied ecological and climatic conditions, the country is considered as a home to the most diverse flora and fauna (Girma, 1998). Even though, the country has such potential resource but beekeeping is practiced as tradition, which means that most of the farmers in rural areas have traditional hives. As a result, about 4,688,278 beehives are estimated to be found in the rural sedentary areas of Ethiopia, of which, 4,580,303 (97.7%) are traditional hives, 29,421 (0.63%) transitional hive and 78,554 (1.68%) modern beehives (CSA 2007). These affect both of quality and quantity honey. The harvesting and product handling process of beekeepers largely contributed for the low quality of honey and reduce the market values of the product Amsalu (2004). As a result of this most beekeepers brining the honey to the market with impurities partly associated with the mix of beeswax with honey during harvesting.

In Ethiopia about 10% of the honey produced is consumed by beekeeping households. The remaining 90% is sold for income generation; of this amount, it is estimated that 70% is used for brewing “Tej” and the balance is consumed as table honey. Large proportion of civil servants and middle classes are seeking for quality table honey, which generate an amplified demand for it. Regardless of producing large volume of crude honey locally and existence of high requirement for quality table honey, consequently skill shortage to process and absence of market information, traditional beekeepers are not intended on processing and value addition of crude honey. For this

reason, beekeepers are remained unable to maximize the outputs of beekeeping. Therefore, demonstration and scaling up/out of the product handling and processing was enable the traditional beekeepers to maximize the efficiency of resource utilization.

Objectives

- To demonstrate some improved honey bee product handling and processing techniques
- To increase the income generated from beekeeping sector by improving the quality of produced products

Materials and Methods

The participatory evaluation and demonstration was conducted in Gelana District of Borana zone. One (Beekeeping Research Group) BRG which contains 10 individual beekeepers was established at the District. The selection criteria of individual beekeepers is number of bee colonies, efficiency of beekeepers based on the previous colony management and yield obtained, and accessibility of the area for demonstration and willingness of the beekeeper to be included in the group. On both crude honey and bees wax processing necessary training & information was given to the Agro-pastoral and pastoral demonstration group members. The demonstration was conducted on farmer's field in partnership with BRG, (Development Agent) DAs and Researchers. For the demonstration purpose crude honey collected from their farm gates (agro-pastoral/pastorals) by beekeeper and this crude honey was used for the demonstration on the honey extraction and processing. Equipment used for honey extraction and processing was: cooking pan, plastic pails, staining cloths and honey presser. Similarly crude beeswax collected from the traditional hives and local brewery houses was used. Equipments like (cooking pan, big bowls, sisal sacks, plastic and pails) were applied for the wax extraction process. Accordingly, the evaluation was undertaken periodically by all groups of participants and researchers.

Data collection

- Amount of crude honey/beeswax used for the extraction purpose
- Amount of purified honey/beeswax
- Costs incurred for the processing
- Comparison of pure wax obtained from crude wax collected from the traditional hive versus local brewery houses
- Perception of the participants
- Profitability

Net profitability was calculated using the formula

Net profit = (Price of purified honey + Price of purified Wax) – (Original crude wax cost + Cost incurred for processing of honey and wax)

Data management and statistical analysis

The collected data during the extraction process and other additional market information (linkage, quality and price) were collected and descriptive statistics tools were employed to analyze the collected data.

Results and Discussion

Financial benefits for demonstration of Processing Crude Honey and Beeswax

Quality yield is an important determinant factor in demonstrating technologies. The quality yield obtained from the introduced technology; obviously increase the price and which is make the task of convincing farmers about a particular technology easier. Accordingly, for this study a total of 53.36 kg of crude honey was applied and after processing it indicated that percentage of pure honey, obtained from crude honey varied from 26.14% to 82.00 % with an average yield of 55.52 % while the percentage of crude beeswax (by-product) obtained from crude honey varied from 15.95% to 38.70% with an average yield of 29.32%. Previous studies by Nuru and Edessa (2004) honey samples taken from different area of Ethiopia indicted that the percentage of pure honey obtained from crude honey varied from 34.4 % to

95.0% with an average yield of 73.15% while the percentage of crude beeswax obtained from crude honey varied from 5% to 65.62% with an average yield of 27.5%. This yield variation come may as result of factors such as bee race, vegetation cover, season of harvest and individual difference among beekeepers.

On the other hand, percentage of pure beeswax obtained from 15.64kg crude beeswax varied from 18.87 % to 39.17 % with mean of 28.40%.Whereas, average pure beeswax obtained from traditional and brewery house, were 28.40 % and 14.24% respectively. According to MoARD (2005) the pure wax yield obtained from traditional hives is estimated to be 8–10% of the crude honey yield. Similarly this study indicates that pure wax obtained from traditional hive 6.29% to 13.05% with mean of 8.33%.

Partial budgeting for purification of crude honey and beeswax

During the study, the average selling (prices) for 1kg of crude honey and purified honey were 51 and 131.95 ETB respectively. From calculation of partial budgeting, average net benefits beekeepers obtained from selling purified honey and wax were 107.51 ETB than selling crude honey (Table .1).

Table 1. Partial budget for purified 5.34 kg crude honey (n = 10)

Product type	Average accessories service cost			Total revenue from 5.34 kg per unit (ETB)* (D)	Net revenue (D-C)
	Material (A)	Lobar (B)	Total (C =A+B)		
Crud Honey	0	0	0	272.34	272.34
Purified Honey	21.00	14.50	35.5	390.60	355.10
Processed Beeswax	9.00	11.25	20.25	45.00	24.75

Incremental net benefit per crude honey processing (Net income from purified honey +Net income from processed) - (Price crude honey) = (355.1+24.75)-272.34= ETB 107.51

Pure wax production from crude honey and byproduct of local brewery

The percentage of bees wax purified from15.64 kg crude wax and 15.64 kg byproduct of local brewery is presented in Table 2. The result showed that the percentage purification from 15.64 kg of crude wax is found greater than similar kg the one purified from the byproduct obtained from local brewery (Table 2). The amount obtained from the two raw materials showed significant difference ($P<0.05$).

Table 2. Percentage of bees wax purified from15.64 kg crude wax and 15.64 kg of local brewery

No	Source of wax	Purified wax in percent (Mean **±SE)**
1	Crude honey	28.40±2.42*
2	Brewery	14.24±1.58

Perception of Beekeeper Research Group

After the termination of this experiment the feedback obtained from the BRG indicated that crude honey processing is advantageous in terms of, increasing the quality of honey which directly increased the selling price of honey. In addition to having good price for purified honey, beekeepers of the study area benefited from selling of beeswax. However they were using only crude honey for income generation before this experiment was held and they started beeswax production.

Role of women in beekeeping

The established BRG included a single woman. Information obtained from District Livestock Agency shows that nearly all the beekeeping activities in the District were traditional which is practiced by hanging hives on a tree which makes it difficult for women to operate (Figure 1). Moreover, in the District traditionally beekeeping is considered as a man's job. Generally, the identified factors seriously affected the participation of women on beekeeping activities in the area.

Figure 1 Traditional apiary site with several hives hanged on a tree in Gelana district

Conclusion and Recommendation

Average net benefits that the beekeepers obtained from processed crude honey were found by far higher than the unprocessed one. Similarly, the wax produced from residue of local brewery is identified lesser in quantity and quality compared to the one produced from crude honey. Even though beekeeping can be an alternative source of income for women's of the area, due to its impracticality their participation is found very limited. Finally, if improvement of beekeeping production in the study area is required the following points need to be considered;

- Introduction of modern beekeeping technology is needed to improve the difficulty of beekeeping tasks to be practical for women and also increase the production and quality of the products
- Establishing BERG (beekeepers extension research group) and providing frequent training for the established group is very crucial
- Moreover, for beekeepers or BERG intensive help will be needed on market linkage

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