

## Production and Marketing of Beekeeping Products and By-products

Mohd. Mansor Ismail and Alias Radam

Faculty Of Agriculture  
Universiti Putra Malaysia  
43400 UPM, Serdang, Selangor  
Malaysia

E-mail of Corresponding Author: [mimi@agri.upm.edu.my](mailto:mimi@agri.upm.edu.my)

**Key words:** food competitiveness, productivity, technical efficiency and consumer perceptions.

### Introduction

The Rio Summit was aimed at reducing the dependent of poor countries on non-renewable natural resources like the tropical forest. Following this, there were growing awareness and preferences for carrying out projects that have a minimum adverse impact on the environment. This has led to the introduction of beekeeping as an environmental friendly project. Beekeeping is a relatively new enterprise in Malaysia that was introduced to farmers in 1981. Studies have shown that beekeeping activity is a viable enterprise. Thus, it is not surprising that beekeeping industry had generated widespread interest among Malaysian farmers. Honey consumption in Malaysia is increasing over the years especially when people concern about using natural products for a healthier life. Local demand for honey was largely met by imports from China, Australia, New Zealand, USA and Switzerland. Malaysia has imported 667,229.53 kg of honey for RM3,085,193.00 in 1990. In 1993, the amount has increased to 1,384,303.16 kg worth RM6,473,185 (MEXPO). This shows that the imported amount has doubled throughout the years. Malaysia has also exported honey to other countries, especially to Singapore and Brunei. The total exports of honey to these countries are on the rise. In order to sustain market share for bee products and by-products, beekeeping industry is in need for better marketing strategy. Honey consumption for personal and industrial use has increased over the years. Even though the number of beekeepers has increased, local production was far below the local demand. This indicates that the demand for honey is still higher than the supply. This means that the local honey production is unable to meet the overwhelming demand locally. If local

producers can produce bee products capable of competing with imported products, the country could save a substantial amount of foreign exchange. At the same time if more products are exported, Malaysia could earn additional foreign exchange. By substituting imports and promoting exports, it is possible for the country to reduce its current account deficit. Hence, this study investigated the production and marketing of beekeeping products and by-products.

### Materials and Methods

The production and marketing studies used data from primary and secondary sources. The survey was done on farmers and consumers selected from various states. The production survey was done in Johor, Selangor, Perak and Melaka while the marketing survey was done in Johor. The secondary data were mainly trade data and beekeeping population data, which were gathered from the Department of Agriculture and MEXPO, Kuala Lumpur. Many literatures, which differ in methodologies, have estimated technical efficiency ratios with differing results. Typical approach of technical efficiency analysis would normally be either parametric or non-parametric. In either case, the technical efficiency measurement is normally composed of two parts of regression estimates. First, is the production function estimation and second, is the technical efficiency estimation. A production function of any agricultural enterprise can be in many forms. In this study we chose a three inputs Cobb-Douglas production function. Others have used Translog Production function (another form of a production function) that has its own advantage and disadvantage. Two main methods were employed namely non-parametric and parametric. On the marketing side, questionnaires were

distributed in Johor Bahru. The questions were in the form of multiple choices, dichotomous and Likert scale. The questionnaire was divided into three sections. First, the respondent background. Second, usage and consumption of honey and third, the most preferred packaging characteristics and consumers' perception towards packaging of daily used product mixed with honey. Factor analysis was used to explore the underlying characteristics associated with packaging in the daily used products containing honey as added ingredients. This method was chosen because of its ability to identify the underlying dimensions. The purpose was to identify a set of dimensions that are not easily observed in a large set of variables. These dimensions, that were called factors, summarised a majority of information in the data. The identification of these factors can assist in exploring new business measures, identify appropriate variables for inclusion in subsequent analytical procedures or partially or totally replace the original variables in a subsequent analysis.

### Results and Discussion

In the production analysis, we estimated two Cobb Douglas Production Models. First, a three input production function and second, a two input production function. One with land as additional independent variable and the other without land. This is to reflect even the landless farmers can take up beekeeping. Both models explained the data well. Thus, we chose the three input production function for further efficiency analysis. Upon completion of the analysis, we found that the Malaysian Beekeepers are 89% efficient with a standard deviation of about 0.05 or 5%. This indicates that beekeepers operated at high rate of efficiency. However, there were still 19% rooms

or 5%. This indicates that beekeepers operated at high rate of efficiency. However, there were still 19% rooms for improvement in output if the resources were utilised more efficient. One particular thing to note here is that in efficiency calculations, different methods will provide different efficiency ratios. Realising this, we performed another similar analysis but instead of using an econometric analysis we used a linear programming (LP) analysis. The results in the later analysis was quite different from the former analysis. The LP analysis indicates that on average Malaysian beekeepers are not efficient at all, only 43% efficiency ratio and the standard deviation is 25%. Due to vast differences in efficiency results, we suggest that more data should be taken and carefully analysed to determine the rate of efficiency in beekeeping industry. In the marketing study, the results indicate that 75% consumed honey. Most of them who stop consuming honey explained the reasons such as availability and pricing were two main problems. Respondents were asked about consumption of daily used products that contain honey such as breakfast cereals, beverages and cosmetics. The results showed that about 71% of the respondents have used the products regularly. Further, about 32% of the respondents used products with honey for health reasons. More than 65% of the respondents admitted that they look at how a product is packed before buying. Materials for packaging desired by consumers are mostly papers (75%) followed by glass and plastic. When asked about honey packaging, they prefer a small design pail to glass containers. Based on the result of the reliability test, the attitudinal statements were factor analysed using the principal component solution. This analysis resulted to six interpretable factors. The six factors accounted for 66% of the variation in the attitudinal statements. Variables were selected to represent these factors. The six factors were labeled as: Design, Reliability, Recycled, Quality, Appearance, and Informative. The first factor i.e. Packaging design, accounted for 22.6% of the variations in the data set. It can be said that consumers buying behavior were influenced by the attractiveness of packaging itself. In other words, when making decision to buy a product, the attractiveness of packaging is given first priority by consumers.

Usually, consumers evaluate a product through its packaging. Reliability (a second factor) refers to consumers trust that packaging reflects its content. According to consumers, a bright colour indicates deliciousness of its content. They also perceived that difficulty in opening a package assures safety. It is not surprising that a reliable packaging can fetch a higher price for the product. The third factor i.e. recycled reflects consumer sensitivity and awareness to environmental issues. Consumers were more inclined to choose packaging that can be used again. According to the respondents, they can save as well as protecting the environment. Having an attractive package alone is not worth if it brings adverse impact to the environment. All aspects of packaging that is from raw materials assembly to waste disposal, should therefore be environmental friendly. Quality packaging (a fourth factor) is important in ensuring quality products. Torn and dented packages reflect low quality products. Packaging appearances (a fifth factor) reflects the attitude of the company towards its product. It provides initial powerful impression about the company and the product. Regardless of actual product quality, an unattractive and poorly designed package will cause uncertainty about the product. Appearance embraces all visual aspects of packaging. The final factor i.e. informative means that packaging must be able to communicate rapidly and clearly all the important information necessary to convince shoppers to buy the product. In order to accomplish this effectively, the packaging must identify the product's, important features and motivate customers to buy it.

### Conclusions

Beekeeping industry in Malaysia is a new enterprise. If farmers can use available resources efficiently more output could be produced without additional cost. However, the methodology used results in contrasting views. But on the whole both analysis suggests that there are stillrooms for improvements in this industry. The marketing of bee products is normally done through direct selling. This is to ensure quality. But for the future, there should be a proper marketing channel in order to attract high-class consumers. We know that packaging can increase the sales of a particular product and we

found that consumer perception on packaging can be grouped into six factors that should be considered by producers. Thus, it is possible to attract high-class buyers if local producers could pack their bee products based on the suggested factors.

### Benefits from the study

For the producers, the combination of existing inputs efficiently can increase production without cost increase in. Consumer needs are conveyed to producers through questionnaires. The study can assist business community who are interested to join the production or the distribution channel. Lastly, researchers can benefit from discussions with industry players and consumers.

### Literature cited in the text

None.

### Project Publications in Refereed Journals

- A. Radam, I.A. Latiff and M.M. Ismail 1999, Productivity and Technical Efficiency Indicators of Malaysian Food Manufacturing Industries, *The Malaysian Journal of Agricultural Economics*, 12: 33-44.
- A. Radam, Shazali Abu Mansor and Mohd Mansor Ismail. 2001. Technical Inefficiency of Manufacturing Industry in Malaysia, *International Journal of Business and Society*, 2(2): 69-80.
- Muzafar Shah Habibullah and Mohd Mansor Ismail 1995, An Economic Analysis of Technical Efficiency in Beekeeping in Malaysia: Frontier Production Function Approach. *The Indian Journal of Economics*, 75(298): 407-420.

### Project Publications in Conference Proceedings

- Ismail, M.M., R. Alias and H. Zainuddin, 1995, The Impact of Forest Conservation on Honey Hunting in Malaysia, in *Malaysian Natural Resources: Sustainability, Development and Strategies*, (Edited by I.B. Ipor et al.), UNIMAS. Pp. 173-182.
- Mohd Mansor Ismail, Alias Radam and Ismail Latif. 1996. Dimensions of Consumers Perceptions of Honey Packaging in Daily Used Products, paper presented at the *Workshop on Small and Medium Scale Enterprise*, Langkawi Island, 27-29 August, 1996.

Mohd Mansor Ismail, Alias Radam, Ismail Latif and Muzafar Shah Habibullah. 1996. Technical Efficiency of Beekeeping Production in Malaysia: A comparative Analysis of Parametric and Non-parametric Approach" paper presented at the *Fourth Malaysian Econometric*

*Conference*, - Park Royal Hotel, Kuala Lumpur, 9-10 October 1996.  
Muzafar Shah Habibullah and Mohd Mansor Ismail. 1995. Production Frontier and Technical Efficiency: The case for Beekeeping Farms in Malaysia. Paper presented at the *International*

*Conference on Tropical Bees and the Environment*, Pedu Lake Resort, Kedah, March 1995.

### Graduate Research

None.