

PROCEEDINGS



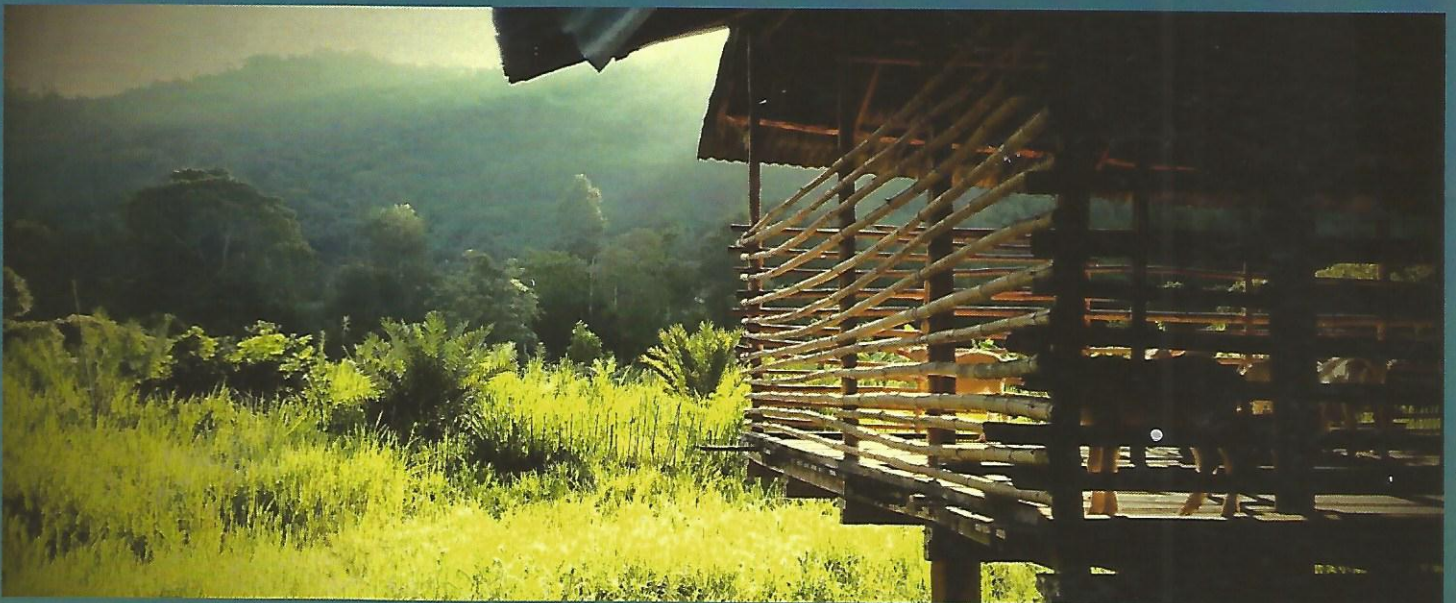
5th

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**“CLIMATE SMART SUSTAINABLE ANIMAL AGRICULTURE FOR FOOD SECURITY
AND LIVELIHOOD IMPROVEMENT IN THE DEVELOPING COUNTRIES”**

October 27-30, 2015, Dusit Thani Pattaya Hotel, THAILAND



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Assessment of goat milk quality to support dairy goat development

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Abstract

The present study was to evaluate factors that affect goat milk quality, goat milk consumer' satisfaction, and technical responses associated with goat milk quality. Three farms having more than 100 dairy goats were purposively selected for the study. Thirty samples were determined using judgment sampling techniques to assess goat milk consumer' satisfaction. Data were analyzed using House of Quality matrix. The study revealed that dairy goat farms development in Bogor Regency is feasible with the support of dairy goat farms that have been there all along. The goat milk produced on farms studied already met the standards of goat milk quality, and could be classified into the premium category. Consumers are satisfied with the important attributes of goat' milk. Goat milk attribute that has been able to achieve customer' satisfaction targets are nutritional content, packaging size and goat milk color. However, to further ensure the fulfillment of the expectations of consumers about the quality of goat milk farmers still need to make improvements in the quality of the livestock' health conditions.

Keywords: dairy goat, milk quality, consumer' satisfaction, technical response, house of quality

Introduction

Milk is one of the protein sources for humans. People consider that milk especially goat milk provide health benefit for them, and it is greatly improves the diet of many rural families. Yet market demand for goat milk began to increase in the last few years, but they have not been met as the goat milk production is still limited. It is attributed to the low productivity of the existed dairy goats, and the lower population as well. One of the biggest problems facing someone getting into the dairy goat business is recognizing that it is not a quick easy business to get into and operate. Benefits of goat milk are more potent and better when compared to other milks on the market. Goat's milk benefits are superior to cow' milk, as it is richer than cow' milk in some important nutrients: vitamin A, niacin, choline, and inositol; it is poorer in folic acid (Park, 2009). Therefore, the selling price of fresh goat milk is still quite high, namely between IDR 25000-60000/l. Goat milk farmers are aware that maintaining the good quality of goat milk is important in order to maintain the consumer's confidence and the sustainability of their businesses. How farmers maintaining their products to meet standardized milk quality is still questionable. Therefore, it is deemed necessary to implement research program related to the topic needs to reponds the questions.

The objectives of the study were to evaluate the quality of the goat milk produced by dairy goat farms, as well as to evaluate customer requirements to goat milk. It is expected that the study will be beneficial to all parties associated with the development of dairy goat farms, especially in the city and district of Bogor.

Methods

The study was carried out in three dairy goat farms in the city and district of Bogor, West Java. Samples were collected purposively from farmers who own more than 100 goats. Sample of 30 consumers were determined using judgment sampling techniques to assess their satisfaction on goat milk. The data was collected using questionnaire and checklist forms which contains the characteristics of dairy goats, goat farms and its farmers characteristics, consumers attitudes toward goat milk, consumer' assessment for goat milk attributes (Ozawa et al., 2009).

The analytical method was based on House of Quality Matrix (Gaspersz, 2007). The House of Quality (HoQ) is the first matrix that a product development team uses to initiate a Quality Function Deployment process. This matrix is especially powerful because of the amount of information that can be documented and analyzed. This matrix consists of two main parts. The horizontal matrix containing information about customer needs, it is called the *customer table*, whereas the vertical matrix containing information how the organization will meet the challenges of providing products that delight the customer, it is called *technical table*.

Results and Discussion

Goat Milk Quality

Good quality goat milk is indicated by its color, smell, taste, cooking test, a test screening (cleanliness), specific gravity, fat content, total solid-fat and protein content (Park, 2009). Fat is one of the most important components in goat's milk relate to prices, nutrition and physical and sensory characteristics that affect the goat milk products. The higher amounts of shorter-chain fatty acids in goat milk fat significant difference from cow milk. Currently Indonesia has no specific standard for goat milk. The current reference standard applicable for goat milk quality in Indonesia is the Thai *Agricultural Standard for Raw Goat Milk* issued by the *National Bureau of Agricultural Commodity and Food Standards Ministry of Agriculture and Cooperatives of Thailand* (Table 1). Based on the goat milk quality analysis (Table 2) it was revealed that goat milk produced by dairy goat farms have met Indonesia fresh milk standard (SNI 01-3141-1998) and Thai Agricultural Standard of Raw Goat Milk (TAS, 2008) as well, particularly in the basic components, i.e. specific gravity, total solid, fat, protein and total solid non-fat. Moreover, further analysis of its fat and protein content, goat milk from those farms could be classified into the premium category.

Table 1. Fresh milk quality standard

No.	Parameter	Thai Agricultural Standard 6006*		
		Premium	Good	Standard
1	Specific gravity (at 27°C)	-		
2	Fat	>4	>3.5 to 4	3.25 to 3.5
3	Total solid non-fat	-	-	8.25
4	Protein	>3.7	>3.4 to 3.7	3.1 to 3.4

Note: *TAS (2008)

Table 2. Goat milk quality of the analyzed farms

Description	Farm A	Farm B	Farm C
Dairy goat' breed	Saanen	PE & Saanen	Etawah & PE
Population of lactation does (head)	90	22	44
Milk production (liter/day)	110 ± 30	22.2 ± 2.5	40.5 ± 7.5
Average milk production (liter/head/day)	1.2 ± 0.3	0.9 ± 0.25	0.85 ± 0.2
Quality parameter*			
Specific gravity	1.0295 ± 0.0003	1.0300 ± 0.0002	1.0300 ± 0.0002
Total solid (%)	15.88 ± 0.02	14.78 ± 0.01	14.40 ± 10.02
Fat (%)	6.6 ± 0.4	5.6 ± 0.5	5.3 ± 0.5
Protein (%)	3.70 ± 0.06	4.09 ± 0.03	3.70 ± 0.04
Total solid non-fat (%)	9.28 ± 0.04	9.18 ± 0.03	9.11 ± 0.04

Note: *Analyzed in Dairy Production Laboratory, Department of Animal Production and Technology Faculty of Animal Science Bogor Agricultural University (2014)

Customer Satisfaction on Goat Milk

Trend of research results on the level of consumer interests to goat milk show that attributes for nutrient content of goat milk is very important for consumers. Consumers need important information on the nutrient content and expiration dates of the goat milk, they must be printed clearly on its packages. It is very important to ensure the consumers that the products they consume safe and healthy. For consumers relatively expensive price of goat milk if compared to cow milk won't be problem for them as long as they are convinced that consuming goat milk is beneficial for them. Consumers expect that goat milk farmers guarantee the availability of goat milk at any time.

This study reveals that consumers satisfied with the attributes of nutritional content, flavor, aroma, color, packaging design, package size and price of goat milk produced by dairy goat farm A. Similar assessments were also given by consumers for goat milk of farm C. While for goat milk produced by farm B, the study revealed that consumers were satisfied with similar attribute own by farm A and B, except on its practicality consumption.

Goat milk prices at farm B was relatively lower than the other two farms. This was due to that farm B did not put labels in its packaging, whereas the other two farms have implemented this. Goat milk products of farm B are sold in 200 cc size of plastic packs. In addition, farm B does not only perform direct selling for individual consumers but also for retailers or distributors that resell the milk using their own packages. There are opportunities for farm B to sell its milk production at the same price of other two farms or even higher if the farm improve the design of its packages to suit its customer' expectations.

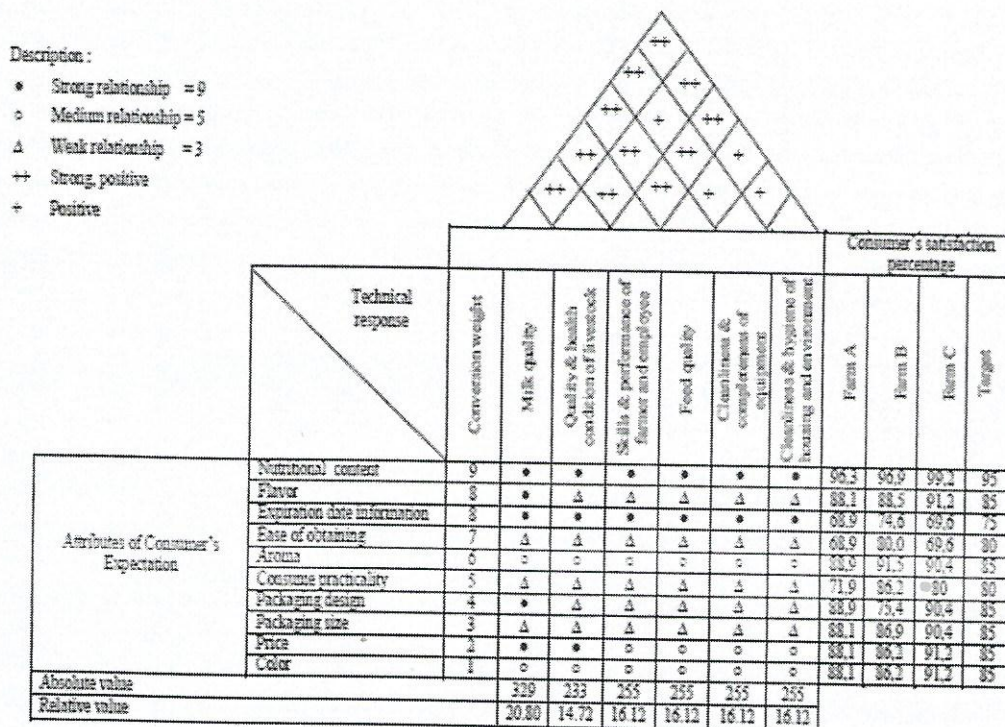


Figure 1. Goat milk house of quality

Goat Milk House of Quality

House of Quality (HoQ) is one of Quality Function Deployment (QFD) Matrix to explain the expectations of consumers and how to meet these expectations (Al-Marsumi, 2009, Gaspersz, 2007; Suyraningrat et al., 2010). The producer's ability to meet consumer expectations will be reflected in the ratio between the company target and level of customer satisfaction. Expectations reflect both past and current product evaluation and use experiences (Midauet al., 2010). Goat

Milk House of Quality (Figure 1) shows the highest customer satisfaction scores for goat milk. The highest scores were given to the nutrient content's attributes, it means that farmers had been able to achieve the targeted expectation for consumer satisfaction (the ratio is greater than one). Other attributes that reached the targets were the packaging size and color of goat milk. Efforts must be made by goat milk farmers to achieve other customer satisfaction attributes by improving their products. The relationship between technical responses to consumer expectations. Based on the data analyzed it was revealed that the technical response for the quality and health condition of goats was the first priority for improvement, as its relative value was rated 14.72 percent, the lowest. Based on their experiences dairy goat farmers are aware of and understand the importance of keeping their goat always in good health to ensure the quality of milk produced to sustain their businesses.

Conclusion

Dairy goat farms development in Bogor Regency is feasible with the support of dairy goat farms that have been there all along. The goat milk produced on farms studied already met the standards of goat milk quality, and could be classified into the premium category. Consumers are satisfied with the important attributes of goat' milk. However, to further ensure the fulfillment of the expectations of consumers about the quality of goat milk farmers still need to make improvements in the quality of the livestock' health conditions.

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