

## **Rearing Dairy Goats for Reducing Malnutrition and Increasing Farmers' Income: A Case Study in Kerta Village, North Lombok, Indonesia**

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### **ABSTRACT**

Currently, goats' milk is starting to be known as a nutritious food and used to accelerate recovery of several diseases and malnutrition. Since early 2010, local government (North Lombok District) has given "rotated assistance of cross-breed goats" to farmers who potentially suffer from malnutrition in Kerta village. The study was aimed to describe the management of crossbred Ettawah goats for milk production, reducing malnutrition and as an income generating activity in Kerta village, North Lombok, NTB, Indonesia. A survey was conducted on 20 respondents' (farmers who starting rearing the goats for milk production since 2010) using a census sampling technique. Primary data were obtained by a way of observations and interview based on the questionnaires, and the secondary data were gathered from government institutions. The data related to cross-breed Ettawah goats' management and their productivity were analyzed using descriptive method, and the level of farmers' income were analyzed using output-input method. The results show that the goats were reared in a semi-intensive system as a secondary job. Roughages were provided by way of cut and carry system, given *ad-libitum*, and supplemented with rice bran. The goats were milked for the average of 48 day/lactation with the daily milk production of 0.8 liter. The excess of milk produced over families' needs is a source income. No malnutrition is found and the farmers' monthly net incomes were increasing gradually from 2010 up to 2013 (IDR 109.456; IDR 588.939; IDR 825.161; IDR 1.218.548 respectively). The lack of farmers' knowledge in feeding of dairy goats, result in relatively low milk production. However, development of this goat's agribusiness is still feasible, and the strategy to develop this business is to invest back the does produced

**Key Words:** Goats agribusiness, Farmer's income, Malnutrition.

### **INTRODUCTION**

In developing countries, commonly poverty occurs in the rural villages represent the poverty of farmers' family. In September 2012, the category of poor society in West Nusa Tenggara Province (NTB) is people who are spending of money below IDR 250.000/month/capita (Harjanto, 2013). Statistically, Anonym (2010) shows that the number of poor population in North Lombok District was the highest (21.6%) among nine Districts in NTB. It was about 13.3% nationally.

In North Lombok District, there are many villages which are having high number of poor people; one of them is "Kerta village". This village has a high number of poor people; it is about 43.1% of North Lombok's population. This data is supported by arising number infants' malnutrition up to 6.19% in that District (BPS, 2012). This problem might be solved by introducing dairy goats such as cross-breed Ettawah goats (dual purposes) which have been familiar and adaptive in Indonesia. Goats' milk has been recognized as a nutritious food and used to accelerate recovery of several diseases and malnutrition. Therefore, in early 2010 North Lombok's government has assisted the village people who have potentially suffering from malnutrition by letting them to look after cross-breed Ettawah goats to produce milk, for their family, even for sell, if there is an excess for increasing farmers' income. The system of

the assistance is “rotated assistance” which it has a role that each farmer in the first group must give the two offspring of does to other farmer in the second group and to be continued to the next groups, so both the goats’ population and the number of famers involvement in this system increased. It is expected that it would be continued to be developed as home industry businesses, since this “rotated assistance” has been developed for four years at the end of 2013.

The study was aimed to describe the management of cross-breed Ettawah goats for milk production in Kerta village, North Lombok NTB, to reduce malnutrition, and to analyze the income of farmers who rearing those goats from 2010 to 2013.

## **MATERIALS AND METHODS**

This study was conducted in Kerta Village, situated in North Lombok District, NTB. A survey was conducted on 20 respondents (farmers who started rearing the goats for milk production since 2010 or the group of farmers who received the goats at the first rotation) using a census sampling technique. Primary data related to goats’ performances; management practices of dairy goats; milk production; identification of farmers; income generating of farmers and marketing strategies. The data were obtained by a way of observations and interview based on the questionnaires. While the secondary data such as the population; number of farm animals and the size of the region were gathered from government institutions. The data related to cross-breed Ettawah goats’ management and their productivity; farmers’ identification and marketing strategies were analyzed using descriptive method, and the level of farmers’ income were analyzed using output-input method (Soekardono, 2009).

## **RESULTS AND DISCUSSION**

**Topography and climate of North Lombok District.** North Lombok was originally a part of West Lombok district, but for the purpose of better service to the community because of the extension of territory and sufficient resources for generating income, on July 21, 2008, it is separated into a new district. North Lombok has a high potential in agriculture and animal husbandry because most of the North Lombok areas is land with an altitude of 500 meters above sea level and at 115.46°-116.28° East longitude and 8.12°-8.55° South latitude, with total area of 809.53km<sup>2</sup>. Moreover, the support of adequate air temperatures, in the range of 23 - 32<sup>0</sup>C. The highest temperatures occur in July and the lowest in May (BPS, 2012). Rainfall (range 10 – 895 mm during the year) is sufficient to support the availability of roughages for livestock. However, most population and their livelihood is still in poor condition due to lack of natural resource management. This study found that introducing cross-breed Ettawah goat (PE) can be developed in this District because most people work in the agricultural sector and those goats adapted quickly to the environment.

**The farmers identities.** Related to the age aspect, the farmers could be categorized as productive employees, with an average age of 40 years, in detail about 60% (30-39 years old) and 40% (40-49 years old). However, from education point of view most farmers finished secondary school (40%) and elementary school level (35%); only 20% finished high school, and only 5% (1 person) be university graduate who is the leader of the group. Therefore, it still needs counseling from related institutions to implement such technology. This is also suggests that an opportunity to develop dairy goats in this village by involving the female family members who have not involved much yet, since the female population (51%) is higher than men population (49%). The involvement of all household members in the management will increase the net income of farmers.

## Dairy goats management

**Breeding Stock.** In early 2010, farmers in Kerta village started rearing cross-breed Ettawah goat (for producing meat and milk) which is initiated with 40 females and 4 males for 20 farmers who received “rotated assistance” from local government. Those good quality goats are obtained from Kali Gesing, Central Java. The strategy to develop the population by investing back the does produced could be feasible suggestion.

**The cages.** Goats’ cages are built near settlements in one location with the average size of 100 cm x 125 cm per head and the height about 60 cm from the ground level. At the beginning, each farmer is already preparing the goat cage size to maintain 7 to 9 goats. Mostly, the goats are kept in the cages, except when the goats are given exercise.

**Source of Feeds.** Carrying capacity of the land as a source of feed supply is sufficient even when dry season. The farmer utilize forages as the main feeds for their goats such as: elephant grass, field grass and foliage such as leucaena, sesbania grandiflora, gliricidia, and calliandra which are harvested from their gardens and given to goats *ad-libitum*. Drinking water was always available. Moreover, rice bran is given as additional feed. When it's price is increase they start thinking more economical way in feeding and use the waste as a feed supplement such as fermented cocoa by-product. However, they never considered to feed their goats high nutritious concentrate for high milk production. This means that the goats were reared in a semi-intensive system as a secondary job.

**Mating.** The offspring of both male and female goats are placed in different cages. When the female are in estrus period, they were placed in the same cage with good buck to maintain the quality of the next offspring. The first mating was done when the female goat reach 1 to 1.5 years old. The female goats were mated back one to two months after getting birth, while the length of the pregnancy is about 152 – 155 days. The litter size is about 1.5 kids with the birth weight 2.8 – 3.2 kg and 10 – 30% mortality. Most farmers did not help the goats giving birth. This is the most caution of kid death. Therefore, they need special course to have more attention to their late pregnancy does and help them when getting birth.

**Milking and milk production.** After getting birth, the does and kids were kept in one cage until kids reach 15 days to 30 days old so that the kids have fully milking time, especially for colostrums consumption. After that, the does were milked by farmers for their family, particularly for their infants and kids. This helps farmers to increase their family nutrient status, so at the end 2013, no malnutrition is found. The excess of milk is sold to other people who need for accelerating recovery of several diseases (IDR 30.000/liter). Most farmers milked their does for 30 – 60 days per lactation with the average of 48 days/lactation and milk production of 0.8 liter/day. This milk production could be elevated by extending the length of milked days/lactation.

**Hearth.** In early 2010, when the farmers started to build dairy goat farm, the farmers could not handle their goats suffering from kinds of diseases, even to prevent them from the diseases. Consequently, the kids’ mortality was the highest (31.8%) in 2010 and it was decreasing gradually to be 15.3%; 8.8%; and 8.2% in 2011; 2012; and in 2013 respectively. These results were caused by involvement of related institutions through dairy goat extension agents. Therefore, the number of dairy goat farmers was increased from 20 farmers to 100 farmers at the end 2013. While goats’ population of 20 respondents are developing from 40 does and 4 males in early 2010 to be 101 does and 215 heads offspring (from 3 weeks to 10 months old) at the end 2013. The total of sold out goats from 2010 to 2013 was 451 heads, mostly for breeding stock.

**Farmers' income.** Farmers' income was increased gradually from year 2010 to 2013 as shown in Table 1.

**Table 1.** Net farm income of farmers rearing cross-breed Ettawah goat ( 2010 – 2013).

Item	Years			
	2010 (IDR)	2011 (IDR)	2012 (IDR)	2013* (IDR)
Total revenue	2.038.800	13.084.275	21.110.250	23.844.987
Variable cost	2.558.979	5.223.703	10.415.013	12.283.080
Fixed cost	793.300	793.300	793.300	594.975
Total cost	3.352.279	6.017.003	11.208.313	12.878.055
Net farm income	-1.313.479	7.067.272	9.901.936	10.966.932
Monthly net farm income	-109.456	588.939	825.161	1.218.548
Minimum monthly salary **	890.775	950.000	1.000.000	1.100.000

\*In 2013: The activities were only nine months.

\*\*BPS (2012).

It is interestingly to note that, for the first year (2010) the net income was negative, caused by in that time the does had not produced offspring for sale. The farmers only got money from selling the excess milk of family needs, while farmers continued spending money for variable and fixed costs (Table 1). After 2010, the net income was gradually increased up to IDR 1.218.548 in 2013. It was possibly higher than that value, because in 2013 the activities calculated only for nine months. This net income reached above the minimum monthly salary in the fourth year (2013) which was initially rearing only two does. Even this net income is an addition income because their main job is as farm worker.

### IMPLICATIONS

Development of cross-breed Ettawah goats as dairy goats could reduce malnutrition in rural village and increase farmers' income. To keep the farmers rearing these goats continuously, it needs special attention and guidance from related institution.

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