Evaluation of Implementation Good Dairy Farming Practices (GDFP) at Ambopi Smallholder Dairy Farm, Southeast Sulawesi

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Abstract. Generally, Dairy cows maintenance traditionally by the farmer on a small scale and did not use Standard Operating Procedures (SOP). This study was done to evaluate the application of Good Dairy Farming Practice (GDFP) at a smallholder dairy farm in Ambopi village. The methods used were a survey and distribution of questionnaires, observations and direct measurements. Data were analyzed descriptively and presented in tabulated frequencies form to illustrate the characteristics of each aspect of raising dairy cows. Assessment of technical aspects of maintenance include: 1) Genetic and Reproduction; 2) Feeding; 3) Management; 4) Enclosures and equipment; 5) Animal health and 6) Animal welfare. The results showed the value of GDFP in unfavorable categories (C) i.e 1.67. Feeding, enclosure and equipment and also animal welfare are in a bad category (D) i.e 0.85; 0.75 and 0.60 respectively while the other technical aspects are in the quite good category (B). D value indicates the poor management of dairy cattle maintenance in Ambopi Village so it needs special attention to optimized milk production and dairy cows productivity.

1. Introduction
Holstein crossbred cows are dairy cows that have adapted to the tropical environment and are widely developed in Indonesia. Generally, dairy cows are raised in high altitude areas because the temperature and humidity are optimal for daily productivity. However, at present, many smallholder dairy farms have developed in the lowlands even though they have to deal with temperature and humidity pressures. According to [1], the pressure of temperature and humidity can be overcome with proper management. [2] states that livestock management is the key to the success of smallholder dairy farming.

Dairy cows in Indonesia are mostly traditionally raised and small-scale family business, farmers have fewer than ten cows. The maintenance system was far from the standard of Good Dairy Farming Practice (GDFP) [3]. According to [1], a good GDFP application will be able to increase the productivity of dairy cows and farmers' income. However, the dairy farming business was done improperly and tends to ignore disease control and good governance and also feeding did not in accordance with the nutritional needs of dairy cows. Therefore, it is necessary to evaluate the
technical aspects of dairy farming based on GDFP at smallholder dairy farms in Ambopi Village, North Tongauna sub-District, Konawe District.

2. Research Methods
This research was conducted at a small dairy farm in Ambopi Village, North Tongauna District, Konawe Regency with 12 ownership of dairy cows. Data were collected by survey method using a questionnaire and field observations. Questionnaires and interviews were carried out with stakeholders. Data collected includes technical aspects of managing dairy farm business including breeding and reproduction, feeding and drinking water, management, enclosure and equipment and also animal health and welfare. Evaluation of the technical aspects based on the implementation of the guideline of GDFP (Good Dairy Farming Practice) which are modified according to [4]. Classification of farmer performance against the application of technical aspects can be seen from the respondents' performance scores. The research data obtained were then analyzed descriptively with frequency tabulation to describe the technical aspects of raising dairy cows qualitatively and quantitatively. Application Achievement of technical aspects based on GDFP is assessed by giving points 4, 3, 2, 1, and 0 on each alternative answer (Table 1).

| Table 1. The conversion value of farmer performance |
|---------------------------------------------------|
| Average Value of GDFP | Quality Value of GDFP | Information |
|-----------------------|-----------------------|-------------|
| 0.00-0.50             | E                     | Very Bad    |
| 0.51-1.00             | D                     | Bad         |
| 1.01-2.00             | C                     | Not Good    |
| 2.01-3.00             | B                     | Quite God   |
| 3.01-4.00             | A                     | Good        |

3. Results and discussion
3.1. Dairy Cattle Management
The success of a dairy farming business is largely determined by the level of knowledge and skills as well as the application of the technical aspects of breeding by farmers. According to [3], there were assessment standards for technical aspects to determine the success of the dairy farming business, including aspects of breeding and reproduction, feed and drinking water, management, enclosure and equipment, health and animal welfare. This standard was also used to assess the application of Good Farm Farming Practices (GDFP) for dairy farming. The results of the evaluation of the application of GDFP on smallholder dairy farms in Ambopi Village can be seen in Table 2.

The value of technical aspects in raising dairy cows in Ambopi Village is based on GDFP standards i.e. 1.67. This value was in a bad category (Table 2). This shows that dairy farmers in Ambopi Village tend to ignore the implementation of technical aspects of maintenance, especially in the supply of feed and drinking water, enclosure and equipment as well as animal welfare. A good application of technical aspects of maintenance will affect livestock productivity and livestock income. Genetic enhancement, feeding, reproduction, management, and environmental modification will affect livestock productivity [5] and the success of the dairy farming business [6].

| Table 2. Value of Good Dairy Farming Practices (GDFP) of smallholder dairy farms in Ambopi Village, North Tongauna Sub District, Konawe District |
|-------------------------------------------------------------------------------------------------------------------------------------|
| Aspects                                    | % Application of GDFP | Value of GDFP | Quality Value of GDFP |
| Breeding and reproduction                  | 67,75                | 2.43          | B                     |
| Feeding and water consumption              | 21,25                | 0.85          | D                     |
| Management                                 | 52,75                | 2.11          | B                     |
| Enclosure and Equipment                    | 18,75                | 0.75          | D                     |
| Animal Health                              | 75,00                | 3.00          | B                     |
| Animal Welfare                            | 15,00                | 0.60          | D                     |
3.2. Breeding and Reproduction

The results of GDFP evaluation on breeding and reproduction aspects show 2.43 values or in good category (Table 2). The lowest GDFP value (0.00) as shown in the method of dairy cattle selection. Farmers did not make a selection of dairy cows because they only receive dairy cattle assistance from the local government and the procurement did not through the right selection so that the performance of dairy cows and milk production was low. selection of dairy cows must be based on the level of milk production. According to [7], a selection method to improve the genetic quality of livestock can be done by recording animal identity, milk production, reproductive data, and animal health.

The highest GDFP value (4.00) as shown in the way of mating dairy cows. Breeders breed dairy cows by artificial insemination (IB) using the services of an inseminator from the Animal Husbandry Department. The IB technique was chosen to make it easier for breeders to choose quality cement from superior males.

The value of GDFP in breeding and reproduction aspects tends to be lower than [5] who evaluated GDFP on smallholder dairy farms in Pondok Ranggon i.e. 3.14 (good category). However, the value of GDFP in this study did not differ from the value of GDFP in Cibungbulang smallholder dairy Farms i.e. 2.69-2.79 [8]. This shows that farmers in the smallholder dairy in Ambopi village pay less attention to the technical aspects of breeding and reproduction.

3.3. Feeding and drinking water

The GDFP value In the management aspect of feeding and drinking water i.e. 0.85 or in the poor category (Table 2), the lowest value in this aspect because farmers did not provide concentrate so that the milk production produced tends to be lower. According to [9], giving concentrates to dairy cows can increase milk production by 18%.

On the other hand, the amount of forage was limited so that feed intake of nutrients results in the lowest milk production. [10] stated that the dry matter intake, crude protein, and TDN of dairy cows in Ambopi Village were 2.79-3.79; 0.19-0.26 and 1.38-2.03 kg/head/day respectively. The low dry matter intake causes the production of milk produced was only between 1.16-3.27 kg/head/day. [11] [12] states that feeding which did not sufficient for dairy cows’ needs in the dry and rainy seasons causes a decrease in milk production. The provision of feed will determine the amount of dry matter intake and the availability of nutrients for basic life and production [13]. Variations in the amount of feed provision [14], adequacy of feed [15] and availability of water will affect milk production.

GDFP values in this study tend to be lower (0.85) than [5] and [8] i.e. 2.43 at smallholder dairy farms in Pondok Ranggon and 2.77-2.98 in Cibungbulang.

3.4. Management

The GDFP value in the management aspect i.e. 2.11 or in the quite good categories (Table 2). The lowest GDFP value (0.00) or very bad category was shown in the recording dairy cows business and waste management (environmental). Farmers in the Ambopi village did not have a livestock business recording system so information about the development and production of livestock cannot be known. The business recording will affect milk production [7]. The recording includes the identity of livestock production, milk production, reproduction, and animal health. Recording can be used to estimate the value of heritability and breeding of dairy cows. Dairy cows that have high heritability and breeding values can be used as broodstock to improve the next generation.

The highest GDFP value (3.00) or in the quite good category were shown in how to clean dairy cows, milking methods and how to dry lactation cows. Farmers generally clean dairy cows and enclosure once a day before milking by watered and cleaned all dairy cows. Cleanliness of enclosure and cows will affect the quality of milk which will have an impact on determining the sale price of milk. [16] stated that the cleanliness of enclosure, dairy cows, equipment and breeders will affect
milk quality and the number of bacteria in milk. The number of bacteria, milk fat and dry matter determines the price of milk [17].

GDFP values in this study tend to be lower than [5] and [8] i.e. 2.67 at smallholder dairy farms in Pondok Ranggon and 3.14-3.22 in Cibungbulang.

3.5. Enclosure and Equipment
The GDFP value on the enclosure and equipment aspect was 0.75 or in the bad category (Table 2). The lowest GDFP values were seen in dung cow shelters and enclosure equipment. At Ambopi's dairy farms, there is no shelter for dairy cow dung, so there was a high possibility of environmental pollution. Equipment enclosure is also inadequate so that the cleanliness of the cage did not guarantee. The process of milking was done using equipment as is so that the resulting milk is less hygienic. The water conditions in the farm were murky but clean of impurities so that cleanliness of water did not guarantee, has no smell and has limited availability.

The value of GDFP in this study tends to be higher than [5] and [8] i.e. 2.00 at smallholder dairy farms in Pondok Ranggon and 2.44-2.50 in Cibungbulang.

3.6. Animal Health and welfare
The GDFP value in animal health aspects were 3.00 or in the quite good category. The lowest GDFP value was seen in worming medication. Dairy farmers in Ambopi generally did not regularly provide worm medicine for dairy cows. The provision of worm medicine can prevent decreased endurance and productivity of dairy cows due to worm infections. According to [18] dairy cows infected with worms can reduce milk production and inhibit the growth of dairy cows. The development of worms in the digestive tract can be caused by diet, environmental factors (temperature, humidity, and rainfall), as well as poor enclosure sanitation [19]. Worms can cause intestinal mucosal damage thereby reducing the efficiency of feed absorption and decreased milk production in dairy cows [20]. Animal health is very important for the success of the dairy farming business because dairy cows can produce optimally if in a healthy condition [21].

The GDFP value on animal welfare aspects were 0.60 or in the bad category. The lowest GDFP values were shown in a dairy cow which frees from discomfort, sickness, accidents and disease and fear.

The GDFP values of animal health in this study tend to be higher than [5] and [8] i.e. 1.17 in Pondok Ranggon and 1.33 in Cibungbulang. The GDFP value of animal welfare in this study tends to be lower than [8] i.e. 3.48-3.73.

4. Conclusions
The technical aspects implementation of dairy farming based on GDFP in Ambopi smallholder dairy farms were 41.75% with a GDFP value i.e. 1.67 or in C category (not good). The aspects of feeding and drinking water, enclosure and equipment as well as the animal health and welfare need special attention and the categories must be upgraded from D (bad) to B (quite good) or A (good).

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