Robustness of dairy cattle farming industry against Covid-19 pandemic in business group (KUB) Tirtasari Kresna Gemilang, Malang

H B Setyawan, D C Widianingrum, R Yulianto and H Khasanah*

Department of Animal Science Faculty of Agriculture, University of Jember
*Corresponding author: himma@unej.ac.id

Abstract. The impact of Covid-19 pandemic disrupts the supply chain for livestock breeds, feed, medicines, and others interfere sustainability of livestock businesses. This study aimed to determine the dairy cattle business's changes during the pandemic at Business Group (KUB) Tirtasari Kresna Gemilang, Malang Regency, Indonesia. The data were obtained using the purposive sampling method. Respondents consisted of 17 dairy farmers (10%) of the total KUB members. The results showed that the farmer had been farming for 10-30 years with a population of three to eight cows. The average milk production of a cow can be maintained at 20 liters/head/day. Cows were given forage and concentrate (made by KUB) two to four times a day. The total cost of feed per month has not changed, which is around IDR 500,000 to IDR 3,000,000. The selling price of milk is IDR 5,400 before and during the pandemic. Health management methods include routine sanitation, injection vitamins, pre-dipping with warm water, and post-dipping with iodine. From this study can be concluded that the farmer of KUB Tirtasari Kresna Gemilang can survive with their management and farming experience, so they were able to sustain and have no problems with their business during the pandemic.

1. Introduction
Covid-19 affects all sectors including livestock [1,2]. Disruption from the supply of seeds, feed, medicines, and other chains affected livestock business. Other factors include reduction workers, consumer purchasing power, increase in the sterilization mechanism process, and others [3]. The livestock sector in Ethiopia, China, India, Pakistan, and other countries has crises from moderate to severe levels [4,5,6]. In Indonesia, the reduction of business activity in early 2020 compared to 2019 indicates a poor economy [7].

The ability to survive in this situation is supported in terms of good management as well as the alternatives in solving management problems. The use of alternative feeds is one of the methods for farmers to survive. Local feed in each area can be used as an alternative feed with the advantages of being easy to obtain and more efficient [8]. Sprouts and dried kale waste can be used as an alternative feed substitute [9]. Farmer training in the field of breeding and feed improvement technology can also be applied to increase farmer independence [10,11].

In East Java, especially Malang, there is one area that has a group business on dairy farming (called KUB Tirtasari Kresna Gemilang) which can survive during this pandemic. This study aimed to
provide information on the strength of this group so the other farmers can also survive in the pandemic.

2. Material and Methods
This study conducted at KUB Tirtasari Gemilang, Malang Regency on October until December 2020. This business group focus on dairy milk production such as fresh milk, pasteurized milk and yogurt. The data collected by interview with the member of KUB. A total of 17 KUB members were interviewed about their dairy farming business before and after the pandemic. The questions include farming experience, cattle population according to each KUB member, total income and outcome, milk productivity, management system, and problems and solutions. All data in this study were collected using the purposive sampling method. Robustness was measured by analyzing that they are not losing, stable, or able to increase profits during a pandemic. All data were reported descriptively.

3. Results and Discussion

3.1 The livestock business before and after the pandemic
The data regarding the livestock business of KUB members before and during the pandemic were presented in Table 1.

| No | Farmer Name   | Experience (year) | Total of Cow* | Total Cost / month (IDR)* | Total income / month (IDR)* |
|----|---------------|-------------------|---------------|---------------------------|-----------------------------|
| 1  | Sisworo       | 25                | 6             | 3,000,000                 | 1,500,000                   |
| 2  | Bapak Nuril   | 17                | 4             | 2,000,000                 | 1,000,000                   |
| 3  | Miswanto      | 12                | 3             | 1,500,000                 | 500,000                     |
| 4  | Lififatus Sholikin | 10            | 3             | 1,500,000                 | 1,000,000                   |
| 5  | Karim         | 30                | 5             | 2,500,000                 | 2,000,000                   |
| 6  | Bapak Purnomo | 20                | 5             | 2,500,000                 | 500,000                     |
| 7  | Rokim         | 20                | 8             | 4,000,000                 | 2,000,000                   |
| 8  | Purwanto      | 20                | 3             | 1,500,000                 | 1,000,000                   |
| 9  | Bu sutiyah    | 10                | 3             | 500,000                   | 1,000,000                   |
| 10 | Pak rudi      | 10                | 4             | 1,500,000                 | 1,500,000                   |
| 11 | Pak dikan     | 20                | 3             | 1,500,000                 | 1,500,000                   |
| 12 | Pak kusnadi   | 20                | 4             | 1,700,000                 | 2,000,000                   |
| 13 | Pak giar      | 20                | 5             | 2,000,000                 | 2,000,000                   |
| 14 | Maimunah      | 10                | 8             | 1,500,000                 | 1,500,000                   |
| 15 | Ketoya        | 30                | 4             | 1,500,000                 | 1,500,000                   |
| 16 | Suntono       | 30                | 4             | 1,700,000                 | 1,500,000                   |
| 17 | Sumadiono     | 25                | 3             | 1,500,000                 | 1,000,000                   |

*No changes before and after Covid 19 pandemic

The results showed that the breeders had been farming for 10-30 years with three to eight cows in total per member. The total cost of feed per month is around 500,000 IDR to 3,000,000 IDR. From this business, they get a profit of around 500,000 IDR to 2,000,000 IDR/ month. There were no changes in the number of cattle, outcome, and income before or during the pandemic. It was an interesting case that we found in this study. In other areas, most farmers can not survive during this outbreak. The reduction of livestock numbers and the economy of breeders were generally caused by the problem of feed, paying employees, and selling [3]. In this KUB, feed is not an obstacle, because they use local feed alternatives that were available and cheap. There is a relationship between feed costs and milk income. Feed affected 62% of dairy cow's milk income while 38% was caused by milk production, prices, maintenance procedures, and medicines [12].
3.2. Milk Productivity and Management.
The average milk production can be maintained at 20 liters/head/day with standard farm management. Cows are given forage and their own concentrate two to four times a day using local alternative feeds such as waste, by-products, and vegetables. The problem with the shipment of agricultural products causes the price of vegetable collapse. Therefore, breeders who are also farmers in this group prefer to provide unsold vegetables as animal feed. In ruminants, fiber is the most important part of the feed to produce milk. Agricultural and market waste can be used as feed. Waste bean sprouts and dried kale can be used as an alternative source of fiber [13]. In Indonesia, rice straw and corn straw commonly used to feeding ruminants [14, 15]. Cabbage waste has a high protein and degradable sugar. Brussels sprouts can be used up to 24% on the concentrate of dairy sheep substitution of the protein source [16]. The quality of this alternative feed can be further improved by a fermentation process using local microorganisms or bio starter [17].

Another maintenance was the management of livestock health. In this group, steps that were routinely applied include sanitation, vitamin injection, pre-dipping with warm water, and post-dipping with iodine. The application of biosecurity can reduce diseases, hinder the spread of infection, and prevent cross-contamination from livestock to humans [18]. For medicine, they usually use natural ingredients such as betel leaf stew for the treatment of mastitis cases. Betel leaf can inhibit the growth of several harmful bacteria such as Escherichia coli and Streptococcus agalactiae [19]. Antibiotics only given in severe cases and were always available at KUB. Using antibiotics causes various dangerous problems like resistance. New breakthroughs in finding antibiotics alternatives are very important [20]. Usage of herbal source that has antimicrobial and immunomodulatory activity was the right way to treat cases of infection [21,22].

Actually, public awareness of drinking milk in this region has also maintained demand during the pandemic. Therefore the farmer's income relatively stable. Producers were more resilient with these impacts than other sectors, so they were generally more stable in finances and have a market [2]. In contrast with product processing businesses such as frozen food requires special treatment in maintaining quality [23].

The buyer (Nestlé, a private multi-national company) takes the milk with 5,400 IDR. This price is very low compared to farmers who sell their milk directly on market for 10,000 to 13,000 IDR. However, the partnership and the benefits of doing joint business were the reasons for breeders to remain united in KUB. This group is one of the dairy farmer institutions that already have a legal license with number 0010084-AH.01.07 [24].

4. Conclusion
Farmer of KUB Tirtasari Kresna Gemilang can survive with their management and farming experience, so they were able to sustain and have no problems with their business during the Covid 19 pandemic.

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