Agribusiness development strategy farms dairy cattle in efforts to improve milk productivity in Central Java

Mukson¹, Miggie Handayani, Heri Setiyawan, and Agus Subhan Prasetyo

¹Faculty of Animal and Agricultural Sciences, Diponegoro University, Semarang, Central Java, Indonesia.

Email : mukson.fapatundip@gmail.com

Abstract The productivity of dairy cattle farming has been low and it has an impact on the supply of domestic milk. Milk imports continue to increase reaching 75% and the remaining 25% was met from domestic production. The study's aim was to analyze local resource development strategies of dairy cattle farming in Central Java. The study was conducted by survey and observational methods. The determination of location was taken by purposive sampling in Semarang and Boyolali District. Samples of farmers were taken by simple random sampling from 10 dairy farmers groups. There were 120 respondents. In addition, this study had 15 key Informants to add validity to the data. Data collection was done by interview and focus group discussion (FGD). Meanwhile, the data analysis methods used were descriptive quantitative and qualitative. Analytical Hierarchy Process (AHP) was used to formulate strategies for developing dairy cattle farming. The results showed development strategy needs to be considered were human resources, local resources and capital of priority scale. Furthermore, the main actors who need attention were the Village Unit Cooperation (KUD), Government, and The Indonesian Association of Milk Processors (IPS).

1. Introduction
The current state of dairy cattle farming is developing slowly. This condition is caused by various factors, both internal and external, resulting in low productivity and farmers' income. At present, the average level of milk production for dairy cattle is only 7-10 liters/head/cattle/day. In general, the management of smallholder dairy cattle farming does not pay attention to technical aspects and proper management farming system the level of milk production and milk quality is still low, resulting in low farming productivity. This dairy cattle farming situation has an impact on low productivity, efficiency and in turn, has an effect on the low income of farmers [1].

Indonesia has a comparative and competitive advantage of natural and human resources to develop the dairy industry based on the smallholder dairy cattle farming system. However, these potential have not succeeded in strengthening the competitiveness of the dairy industry, hence Indonesia is in the position of a large milk importing country. Milk imports currently reach 75% of the national milk demand and the remaining 25% is met by domestic production [2]. A large number of milk imports carried out by The Indonesian Association of Milk Processors (IPS). It has consequences, such as: 1) dairy farmers can lose the domestic consumer market, and in turn, reduce their income, and 2) milk prices tend to be cheaper, hence can affect marketing milk and cause narrow down Business opportunities.
The low domestic milk production was due to the feeding of poor quality feed, cleanliness of cage, post-harvest handling, which results in the products are being unable to compete in the market. [3]. This condition has an impact on low investment, productivity, efficiency and income as well as business competitiveness. On the other hand, the potential of local resources such as natural resources, human resources, institutions, and technology if managed properly is very promising for the development of dairy cattle farming.

In order to increase the productivity and efficiency of dairy cattle business and its competitiveness, need to pay attention to technology. In order to increase the productivity and efficiency of dairy cattle farming and its competitiveness, need to pay attention to technology, the sustainability of breeding programs and the preservation of genetic resources, and business management for dairy cattle farming [4]. Based on the background and problems above mention, it is necessary to conduct research with the aim of analyzing the development factors of smallholder dairy cattle agribusiness based on local resource potential using AHP (analytical hierarchy process) techniques in Central Java. These results were expected to identify various priority resource factors as the basis for the development of dairy cattle agribusiness in Central Java.

2. Material and Methods
Research on local resource-based dairy cattle agribusiness development strategies to increase milk productivity was carried out using a survey method. The research location took two regencies, namely Semarang Regency and Boyolali Regency which were determined using purposive sampling. The location were chosen due to their promising potential and number of dairy cattle out of all the regencies in Central Java. Each district was taken based on consideration of the largest population of dairy cattle. Each sub-district selected 3 farmer groups purposively based on farmer population and the largest milk production. The respondent was taken by simple random of 10 dairy farmers for each farmer group. There were 120 farmers in total. Primary data collection was carried out by interviewing dairy farmers based on structured questionnaires and focus group discussions (FGD) with various stakeholders related to the dairy business. Meanwhile, secondary data were taken from government institutions and other agencies related to research problems. The measurement of local resource variables used a Likert scale with 5 levels, namely: very good (5), good (4), moderate (3), not good (2) and very poor (1) [5].

Analytical Hierarchy Process (AHP) analysis was used to formulate the right strategy in the development of a dairy cattle agribusiness. There are 5 levels of criteria in the AHP structure which are started from focus, factors, actors, objectives, and alternative strategies [6]. The use of the Analytical Hierarchy Process (AHP) technique was used to create a functional hierarchy with the main input being the perceptions of the stakeholders. With a hierarchy, a complex problem regarding the development of dairy cattle in Central Java that has not been structured can be broken down into parts in a hierarchy. The stages of preparing AHP were a) compiling the AHP hierarchy diagram, b) making a questionnaire based on the AHP diagram, c) conducting interviews based on a questionnaire, d) processing the interview data hence the weight of each alternative strategy was obtained.

3. Result and Discussion
3.1 Local Resource Profile for Dairy Cattle Agribusiness Development
Based on the aggregate profile of local resources, it was still in a sufficient level. This condition can affect the performance of the dairy cattle business, especially on milk production and milk quality. The average milk production was 9.76 liters/head/day, still below the target for the revitalization of the dairy which is expected to be able to produce as much as 15 liters/head/day [7].

| No. | Local Resource Factors   | Boyolali District | Semarang District | Aggregate   |
|-----|--------------------------|------------------|------------------|-------------|
| 1   | Human Resources          | 12.9 (less)      | 15.16 (sufficient)| 14.03 (sufficient) |
| 2   | Natural resources        | 14.8 (sufficient)| 15.35 (sufficient)| 15.07 (sufficient) |
| 3   | Capital resources        | 13.6 (sufficient)| 14.38 (sufficient)| 13.99 (sufficient) |
Entrepreneurial resources

Technological resources

Institutional resources

Infrastructure Resources

3.2 Dairy Cattle Business Development Strategy in Central Java

The development of smallholder dairy cattle businesses requires better strategy and direction hence the goal of increasing and developing dairy cattle farming system would have an positive impact. Based on existing local resources, a development strategy using process hierarchy analysis (AHP) resulted in the following steps:

a. Analysis of the position of local resource factors for the development of a dairy business:

Analysis of the position and role of local resources for the development of a dairy business shows that the human resource factor ranks with a weight of 0.219, followed by natural resources 0.201, and 0.178 capital resources.

Table 2. Composition of Weighted Value and Priorities among Local Resource Factors for Dairy Cattle Development

| No. | Local Resource Factors          | Weighted Value | Priorities Scale |
|-----|--------------------------------|----------------|-----------------|
| 1.  | Human Resources                | 0.219          | 1               |
| 2.  | Natural resources              | 0.201          | 2               |
| 3.  | Capital resources              | 0.178          | 3               |
| 4.  | Entrepreneurial resources      | 0.080          | 7               |
| 5.  | Technological resources        | 0.099          | 5               |
| 6.  | Institutional resources        | 0.133          | 4               |
| 7.  | Infrastructure Resources       | 0.091          | 6               |
|     | Inconsistency ratio            | 0.04           |                 |

b. Analysis of the position of dairy cattle farming development actor on local resources:

The result of this research showed that obtained that Village Unit Cooperation (KUD) in each village had the biggest role, weighing 0.285, followed by the government 0.198 and the third was the milk processing industry (IPS). Dairy cooperatives were expected to be able to develop various resources for farmers and other resources related to the dairy business. Dairy breeders collaborate with KUDs covering many aspects, starting from the provision of production advice, marketing, capital and technical guidance It should be continuously improved. AHP analysis results can be seen in Table 3.

Table 3. Composition of weighted value and priorities of actors who play a role in dairy cattle development

| No. | Development Actor               | Weighted Value | Priorities |
|-----|--------------------------------|----------------|------------|
| 1.  | Government                      | 0.198          | 2          |
| 2.  | milk processing industry (IPS)  | 0.195          | 3          |
| 3.  | dairy cooperative (KUD)         | 0.285          | 1          |
| 4.  | Banking                         | 0.180          | 4          |
| 5.  | Association / Group of breeder  | 0.143          | 5          |
|     | Inconsistency ratio             | 0.07           |            |

c. Analysis of the priority position of the development goals for dairy cattle agribusiness:

Analysis of the position and role of the main objectives of the dairy Cattle development obtained that three factors had a balanced value. These factors were increasing the population of dairy cattle milk production and improving the milk quality for dairy cattle. It meant that the development of dairy cattle
agribusiness must continue to increase the livestock population, and also be followed by efforts to increase milk production and quality. Currently, the development of the milk market only relies on marketing through KUD, and there were no alternative markets that are able to buy fresh milk from farmers at a relatively higher price. The fresh milk market was more directed towards the oligopsony market, in which buyers (KUD and IPS) determine the quota and price of milk.

| No. | Development Goals                      | weight | Priorities |
|-----|----------------------------------------|--------|------------|
| 1.  | population increase                    | 0,143  | 2          |
| 2.  | increased milk production              | 0,286  | 1          |
| 3.  | Improved milk quality                  | 0,286  | 1          |
| 4.  | Development of the milk market          | 0,286  | 1          |

Inconsistency ratio 0,01

d. Analysis of the Position of the Agribusiness System for the dairy cattle business development

The analysis of the position and role of the agribusiness system shows that the milk marketing sub-system is important in supporting the dairy cattle business development strategy with a value of 0.330, followed by the development of 0.194 dairy institutions, cultivation and processing of dairy products and the provision of production facilities and infrastructure. AHP analysis results related to the position of the agribusiness system can be seen in Table 5.

| No. | Agribusiness System                      | Weighted Value | Priorities |
|-----|------------------------------------------|----------------|------------|
| 1.  | Production facility sub system           | 0,146          | 4          |
| 2.  | Cultivation sub system                   | 0,165          | 3          |
| 3.  | Dairy product processing sub system       | 0,165          | 3          |
| 4.  | Milk marketing sub system                | 0,330          | 1          |
| 5.  | Institutional sub system                 | 0,194          | 2          |

Inconsistency ratio 0,01

4. Conclusion

The results of the study concluded that the local resource factor still in the sufficient category, hence it has not been able to increase milk production or quality. The development strategy of smallholder dairy cattle farming system that needs to be considered is human resources, local resources and capital to be a priority scale. Moreover, the main actors who get attention are KUD, Government and Social Studies. Efforts should be support in developing a dairy cattle business to increase population, milk production and the milk market must be the main concern because these three factors are still the main problems for farmers. Hence The successful development strategy of dairy cattle farming depends on the agribusiness system, marketing sub-systems, institutional development, milk cultivation and processing.

References

[1] Sudono, A. Rosdiana, R. Fina and B. Setiawan 2003 Intensive Dairy Farming (Jakarta: Agro Media Publisher Pustaka)
[2] Firman, A 2010 Dairy Cattle Business from Upstream to Downstream. (Bandung: Widya Padjadjaran)
[3] Mukson, Isbandi., K. Budiraharjo, M. Handayani and N.W. Listiani 2010 Proceedings of the 2010 Ruminansi National Seminar.
[4] Pradana, M. N 2010 Pengem Dairy Cattle Business Development in Indonesia BIAFS-MIBB
[5] Indriana, N dan B. Supomo 2002 Business Research Methodology (Yogyakarta: BPFE)
[6] Saaty, T.L. 1993 *Analytical Hierarchical Process for Decision Making in Complex Situations* (Jakarta: PT. Pustaka Binaman Pressindo)

[7] Presidential Regulation of the Republic of Indonesia 2008 Per Pres. No. 28