

AGRIBUSINESS RISK OF DAIRY FARMER COOPERATIVE (CASE STUDY: BOGOR DAIRY PRODUCTION AND LIVESTOCK BUSINESS COOPERATIVE)

Risiko Agribisnis Koperasi Peternak Susu (Studi Kasus Koperasi Produksi Susu, Bogor)

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ABSTRACT

KPS-Bogor is one of the largest dairy cooperatives in Indonesia. The cooperative consists of 127 active farmers, produces an average of 78.8 liters of milk/person/day. However, the quantity and quality of milk produced is very volatile which causes fluctuations in the income of dairy farmers. Considering the role of cooperative to agricultural development, and its unique nature, risk analysis research is an interesting yet rarely conducted. Therefore, the objectives of this study are to analyze the agribusiness risks faced by the KPS-Bogor, and to analyze risk priorities faced by the KPS-Bogor. This research is a qualitative research, using Failure Mode Effect Analysis (FMEA) and Fishbone Diagram. The study results show that the cooperative faces 6 sources of risk that have the potential to cause losses, namely production risk (bacteria and the absence of SOPs for farming method), market risk (Dairy Processing Industry's (DPI) market structure), financial risk (delayed payment of its member's debt), legal risk (GMP standardization is not yet implemented), and human resource risk (low commitment of the workers). FMEA and Fishbone Diagram show that the low commitment of the workers, the absence of farming SOP, and the DPI market structure are the most risky sources which have highest level of severity, occurrence and detection that can cause losses to KPS-Bogor. Unusually, this research found human resource risk valued higher than the production risk factor, which mainly become the main risk source in agricultural business.

Keyword: *fishbone diagram, FMEA, milk, source of risk*

ABSTRAK

Koperasi Produksi Susu dan Usaha Peternakan Bogor (KPS-Bogor), merupakan salah satu koperasi susu terbesar di Indonesia. Beranggotakan 127 peternak aktif, KPS Bogor menghasilkan rata-rata 78.8 liter susu/orang/hari. Namun demikian, kuantitas dan kualitas susu yang dihasilkan sangat fluktuatif yang menyebabkan fluktuasi pendapatan peternak sapi perah. Mengingat peran koperasi untuk pembangunan pertanian, dan sifatnya yang unik, penelitian analisis risiko menarik namun jarang dilakukan. Oleh karena itu, tujuan dari penelitian ini adalah menganalisa sumber risiko yang dihadapi oleh KPS Bogor, dan menganalisa prioritas risiko yang dihadapi KPS Bogor. Penelitian ini merupakan penelitian kualitatif, dengan menggunakan Failure Mode Effect Analysis (FMEA) dan Fishbone Diagram. Hasil dari studi ini menemukan bahwa KPS Bogor menghadapi 6 sumber risiko yang berpotensi menimbulkan kerugian, yakni risiko produksi (bakteri dan tidak adanya SOP pola budidaya), risiko pasar (struktur pasar IPS), risiko keuangan (ketidaklancaran pembayaran hutang anggota), risiko hukum (belum diterapkannya standarisasi GMP), serta risiko sumberdaya manusia (rendahnya komitmen pekerja). FMEA dan Diagram Fishbone menunjukkan bahwa tidak adanya rendahnya komitmen pekerja, tidak adanya SOP budidaya, serta struktur pasar IPS merupakan 3 sumber risiko dengan tingkat keseriusan, peluang kejadian serta kesulitan deteksi tertinggi yang dapat menimbulkan kerugian bagi KPS Bogor. Menariknya, penelitian ini menemukan bahwa risiko sumber daya manusia dinilai lebih tinggi daripada faktor risiko produksi, yang terutama menjadi sumber risiko utama dalam bisnis pertanian.

Kata kunci: *diagram tulang ikan, FMEA, sumber risiko, susu*

INTRODUCTION

The Indonesian livestock sub-sector contributes to the provision of food sources for the community, especially in the form of fat, animal protein and calcium. The sub-sector is also a large source of employment, amounting to 13.56 million households (BPS, 2020c). Domestic demand for livestock products such as meat, eggs and milk continues to increase. However, this increase was not followed by sufficient availability, so that Indonesia still imports the products from other countries. Milk is a livestock product with the highest import value of 727,038.78 USD (BPS, 2020c). It is two percent higher than the value of beef imports, which is the livestock product with the largest import volume (BPS, 2020c). The high value and volume of Indonesian milk imports are caused by the low level of national milk production. Indonesia's milk production in 2020 was amounted to 997,350 tons, while the level of milk consumption reached 4,406,940 tons (BPS, 2020c). This gap causes Indonesia to import as much as 77.3 percent of the total national milk needs.

Dairy farming in Indonesia is managed by private companies, smallholder farmers and cooperatives. Large livestock farming of for example beef cattle, buffalo, horses are mostly managed by business entities in the form of PT/CV/Firma (93.94 percent), and only a small part of these farms are managed by cooperatives or foundations (BPS, 2020b). This is different from dairy farming, where the livestock management through cooperative institutions has actually reached a fairly large number of 29.41 percent (BPS, 2020a). The data shows that in contrast to other large livestock farming, in the dairy farming, the dairy farmer cooperatives have a strategic role in the development of dairy agribusiness in Indonesia.

The design of Indonesia dairy agribusiness through cooperatives has been arranged since the issuance of the Decree of the three Ministers (Minister of Trade and Cooperatives, Minister of Industry and Minister of Agriculture) in 1977, where the development of dairy agribusiness is directed through cooperatives/village unit cooperatives (known as KUD) and its marketing is regulated by cooperatives and the Milk Processing Industry (MPI) (Yusdja, 2017). The dairy farmer cooperative is one that has contributed to the history of cooperatives in Indonesia. One of the dairy farmer cooperatives that is active until now is the Bogor Dairy Production and Livestock Business Cooperative (KPS-Bogor).

KPS-Bogor was established in 1970 with the aim of becoming an institution that manages the production and marketing of cow's milk by dairy farmers in Bogor area. At that time, the farmers was able to obtain a better market access and milk price through the existence of the cooperative. At the beginning of its establishment, the KPS-Bogor only consisted of 20 dairy farmers. Today, there are 127 active farmers joined KPS Bogor (KPS-Bogor, 2020). In 2020, the production of milk produced by the KPS-Bogor reached 310,128 kg with an average milk production of 78.8 kg/person/day (KPS-Bogor, 2020). The KPS-Bogor markets its fresh milk to several milk processing companies such as PT Indolakto, PT Nutrifood, and PT United Family Food (Unifarm) (Gandhy & Kurniawati, 2018). Its production, marketing and development activities are managed by 3 cooperative administrators and 34 employees.

The KPS-Bogor has several business units consisting of a fresh milk business unit, an animal feed business unit, a livestock technical service business unit and a livestock production facilities (known as *sapronak*) drug store, as well as a loan/financing business unit. The fresh milk business unit is the main business unit that generates the largest income for the KPS-Bogor. However, based on its production data, it was noted that there was a decline in the dairy cow population and a decrease in annual average milk production. The population of dairy cows in 2020 reached 1438 cows, which was lower than the population of dairy cows in 2019 which reached 1494 brood cows. The KPS-

Bogor milk revenue has decreased by an average of 873 liters per year since 2016 (KPS-Bogor, 2020).

Furthermore, the KPS-Bogor also experienced daily fluctuations in milk production and quality (Figure 1). The quality of dairy farmers' milk is measured based on the content Total Plate Count (TPC), Fat and Protein. The better the quality of the dairy cow's milk, the higher the income received by farmers. If the content does not meet the standards demanded by the buyer, the price received by the farmer will be affected. If there is no anticipation obtained, the fluctuations in the volume and quality of milk produced will harm the KPS-Bogor and directly affect the income of its members. Variations on production and prices are significant sources of risk to dairy farmers (Bosch & Johnson, 1992; Neyhard et al., 2013; Wolf & Widmar, 2014)

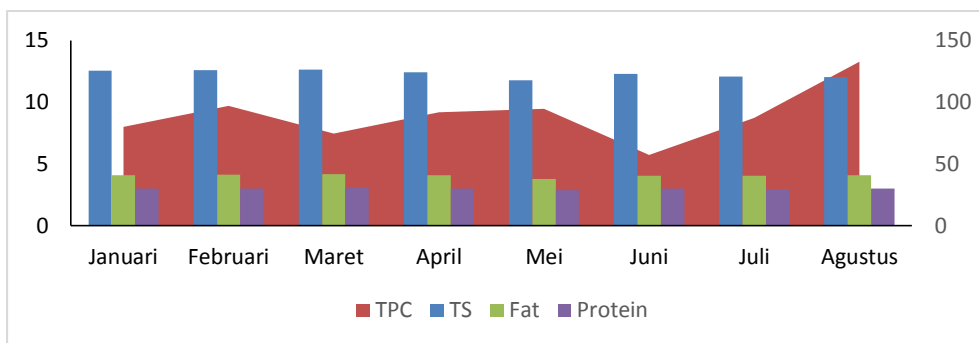


Figure 1.

The Development of Cow's Milk Quality in The KPS-Bogor Based on The Value Of TPC, TS, Fat, and Protein.

Source: (KPS-Bogor, 2020)

(Harwood et al., 1999) mentioned that there are several sources of risk that interfere the agribusiness and cause losses to farmers. Those consist of production, market, financial, human resource and legal risks. Often farmers or agribusiness actors do not anticipate the emergence of risks that cause losses to their business. Neither the administrators nor the employees of the KPS-Bogor, as the dairy business unit organizers, have conducted an analysis of risk that may be experienced. In fact, by tracing the sources of risk faced institutionally, the KPS-Bogor is able to anticipate losses and even support the development of its business units. As stated by (Amam & Harsita, 2019) and (Amam & Soetriono, 2019) institutions, in this case cooperatives, do not only play a role in risk minimization efforts but also in business development that supports the welfare of their members. Studies over countries also find that cooperative plays important role in agricultural development acceleration (Dong et al., 2019; Shokoohi et al., 2019; Wolf & Widmar, 2014; Yang et al., 2014). Considered the role of cooperative to agricultural development, and its unique nature, risk analysis research is an interesting yet rarely conducted. Cooperative as a social-

economic institutions might face unique source of risk differ to other type of institutions. Thus, the objective of this research are to analyze: (a) the agribusiness risks faced by the KPS-Bogor; and (b) the risk priorities faced by the KPS-Bogor.

RESEARCH METHOD

This research employs the qualitative descriptive method design. Data were obtained through in-depth interviews and Focus Group Discussion (FGD). Respondents involved were the KPS-Bogor administrators, employees and dairy farmers. This research activity was carried out from June to November 2021. The location selection was performed purposively with consideration of the production scale and the history of the KPS-Bogor development as one of the largest dairy cooperatives in West Java. The data used in this study are primary and secondary data. The primary data were obtained through observation, in-depth interviews and FGDs. Meanwhile, the secondary data used were in the form of statistical data, books, journals, and other related literatures. Data processing and analysis was carried out by using the agribusiness risk categories by (Harwood et al., 1999), Failure Mode and Effect Analysis (FMEA) (Stamatis, 2003) and Fishbone Diagram methods.

Risk is a predictable probability of failure (Robison & Barry, 1987). (Harwood et al., 1999) described several risks that often occur in agricultural sector and can reduce farmers' income levels, including production Risk, Price or Market Risk, Price risk, Institutional/Legal Risk, Human Resource Risk, and Financial Risk. FMEA is a technique used to find, identify and eliminate potential failures that occur in the systems, designs, and processes before reaching consumers (Stamatis, 2003). FMEA is employed to evaluate failures that occur by determining risk ranking using the Risk Priority Number (RPN) value. The RPN value can be obtained from the multiplication of three indicators, namely severity (S), occurrence (O), and detection (D). Table 1 show information in assessing the S, O, D value.

Fishbone Diagram is a causal analysis concept developed by Dr. Kaoru Ishikawa to describe a problem and its causes in a fishbone framework. This diagram can also show more detailed factors that affect the main factors illustrated by the fishbone shape arrows. The Fishbone Diagram can be used to identify and organize the possible causes of a specific impact and then separate them from their roots, which made Fishbone Diagram become very useful tool to identify source of risks (Ilie & Ciocoiu, 2010). The diagram provides many advantages for the business world in solving various important problems in the company such as quality problems.

Table 1. Scoring Scale for Severity, Occurrence, and Detection

Score	Rank	S	O	D
1	<i>Minor</i>	No effect	Almost never	Almost certain
2	<i>Minor</i>	Very small/minor	Very rare	Very easy
3	<i>Low</i>	Small / minor	Quite rare	Easy
4	<i>Low</i>	Very low	A bit rare	Quite easy
5	<i>Moderate</i>	Low	Rare	Ordinary
6	<i>Moderate</i>	Moderate	A bit often	A bit difficult
7	<i>High</i>	High	Quite often	Quite difficult
8	<i>High</i>	Very high	Often	Difficult
9	<i>Very High</i>	Hazardous with warning	Very often	Very difficult
10	<i>Very High</i>	Hazardous without warning	Almost always	Almost impossible

Source: (Sellappan et al., 2015)

RESULT AND DISCUSSION

KPS-Bogor Overview

KPS Bogor as a supporting system/institution in the agribusiness system has an important role to minimize risk and to implement the business development. KPS-Bogor currently received 3,535,049 kg milk, or equivalent to 9,696 kg of milk per day (KPS-Bogor, 2020). About 80 percent of the milk produced by farmers is sold to the MPI, namely PT Indolakto, while the rest is sold to other retail consumers. The 2020 average selling price of milk at the farmer level was 5,867 IDR/liter. This price is determined by the quality of the milk produced at that time.

KPS-Bogor has two livestock areas with different characteristics, namely the *Kawasan Usaha Peternakan Sapi Perah* (known as *Kunak*) and the livestock area outside the *Kunak*. KPS-Bogor performance is supported by its administrators and employees in carrying out its activities. The dairy farmers in *Kunak* are located in plots containing forage land, cowsheds, houses of the cowsheds keeper, animal health facilities, and milk collection facilities belonging to KPS-Bogor. The integrated condition of the area makes it easier for farmers to obtain various needs from production to marketing process. In contrast to it, the location of farmers outside *Kunak* area tend to spread out, and far away from the feed facilities and other production facilities. Such conditions will affect the farmers performance and benefits received by farmers in each non-*Kunak* area. Kurniawati (2017) found that farmers received higher social and economic benefits by being in the area of *Kunak*.

Sources of Agribusiness Risk

Each business potentially faces risk of loss. However, the opportunity for a business actor to lose can be minimized with good risk management. In the agricultural sector, the risk from production side is often found. However, (Harwood et al., 1999) stated that risks in the agricultural sector are generally divided into production, market, human resource, financial and legal risks. Based on this five sources of risk, this study shows that KPS-Bogor faces several sources of risk that can cause losses in the future.

Production risk faced by KPS-Bogor is indicated by fluctuations in both milk production quantity and quality. As Kahan (2013) mentioned that the cause of the production risk is the fluctuation of quantity, quality and continuity. Bacteria and farming method are two sources of production risk that can cause losses. In this case both can affect cow's milk production, in terms of quantity and quality. Mastitis or inflammation of the udder is a disease that is often experienced by the brood cows in KPS-Bogor. Mastitis can be caused by several types of bacteria which can reduce about 15% of the milk production per cow per lactation; therefore, mastitis becomes a big problem for the dairy industry (Zulfikar, 2014). (Farizqie et al., 2020) found that 6 out of 9 sources of production risk that contribute to the greatest potential loss, are related to the absence of SOPs in cow rearing, including incorrect milking technique, haste in caring for cows, improper concentrate feeding (amount and quality), lack of cow hygiene, lack of cowshed sanitation, and farmers low discipline. Further, mastitis caused multifactorial trait is categorized as risk factor (Ivemeyer et al., 2011).

Market risk faced by KPS-Bogor is the condition of the MPI structure, which is currently controlled by several large companies. Currently, KPS-Bogor sells 80% of the milk produced to PT Indolakto. The price of milk received by KPS-Bogor is determined by the quality of milk produced, however, KPS-Bogor does not have a bargaining position to determine the milk base price. Higher bargaining power imply higher profit for MPI, and disadvantages for dairy farmers (Shokoohi et al., 2019). The condition of the MPI structure in Indonesia tends to be concentrated (consisting of several large companies), so that dairy companies have a high bargaining position to set a lower purchase price for local milk, compared to the purchase price for imported milk (Simarmata et al., 2015).

Financial risk that is able to cause losses for KPS-Bogor is the delayed payment of its member's debt. One of the business units developed by KPS-Bogor is the loan/financing business unit. In 2019, KPS served loans of 476,698,384 IDR, while in 2020, KPS Bogor provided loans of 128,240,000 IDR (KPS-Bogor, 2020). In 2020, the total KPS-Bogor revenue from its members' contribution as principal installment was 255,728,049 IDR. The business profit of financing loans in 2020 was 42,893,535 IDR, or decreasing of about 63 percent compared to the amount in 2019. If the KPS-Bogor does not evaluate and restrict loans, this could affect the cooperative liquidity.

Legal risk that can potentially harm the business can be caused by the incompleteness of the owned business license. KPS-Bogor has fulfilled all the requirements for the required business license. However, KPS-Bogor currently does not meet the operating standards according to Good Manufacturing Practices (GMP), so that its operations will be limited to fresh milk collection. KPS-Bogor can not conduct further milk processing activities, thus the income opportunities from the activities cannot be obtained.

The human resource risk which is able to cause losses is the low commitment of the cowshed workers. They, as human resources of the dairy farming business, are the key factor in milk production and quality (Amam & Harsita, 2019). Dairy farming activities conducted by dairy farmers at KPS-Bogor are generally assisted by cowshed workers. Cowshed workers are responsible to prepare the cows needs such as feed and medicine, as well as caring for and monitoring the condition of the cows. Some of the farmers in KPS-Bogor do not directly supervise their livestock. Moreover, some of them completely leave the livestock policy to the workers. This is then reported to often cause problems such as loss of feed and medicine, poor maintenance of cows (causing illness), decreasing in production and others.

Table 2. Agribusiness Risk Source Result in KPS-Bogor

No	Type of Risk	Source of Risk	Result
1	Production	Bacteria	Causing disease in cows, one of which is mastitis
2	Production	There is no SOP in the farming method	Not optimal production and quality of milk produced
3	Market	Market structure of the MPI	Farmers have no bargaining power in determining prices
4	Finance	Delayed payment of its member's debt	Disruption in cooperative cashflow
5	Law/Legal	Production standardization has not been applied according to GMP	The milk produced cannot be marketed widely
6	Human Resource	Low commitment of the workers	Emergence of fraudulent practices; working activities are not optimal

Source: Primary Data

Failure Mode and Effect Analysis (FMEA)

Further analysis is to conduct a risk priority by using the FMEA. FGD is conducted with KPS-Bogor administrators and employees to identify the value of S, O, D factors in each sources of risk. Table 3 describes the risks faced by KPS-

Bogor and their urgency according to the values of S, O and D. Results show that the highest risky sources are human resource risk (the low commitment of workers) (280), the absence of farming SOPs (210) and the market structure of the MPI (196). Those source of risks have very high severity level between 7-10, occurrence level of 7, and detection between 3-5. These three factors have the greatest chance of causing losses for KPS-Bogor.

Table 3. Source of Agribusiness Risk based on FMEA

No	Source of Risk	FMEA			SxOxD
		S	O	D	
1	Bacteria	5	5	4	100
2	There is no SOP in the farming method	10	7	3	210
3	MPI market structure	7	7	4	196
4	Delayed payment of its member's debt	2	2	2	8
5	GMP has not been implemented	4	3	4	48
6	Low employee commitment	8	7	5	280

Source: Primary Data

Fishbone Diagram Analysis

Furthermore, the three sources of risk with the highest level of urgency were analyzed using the Fishbone Diagram (Figure 2). Fishbone diagram is a tool used to elaborate each factor, so that the technical issues causes each of the source of risk can be identified.

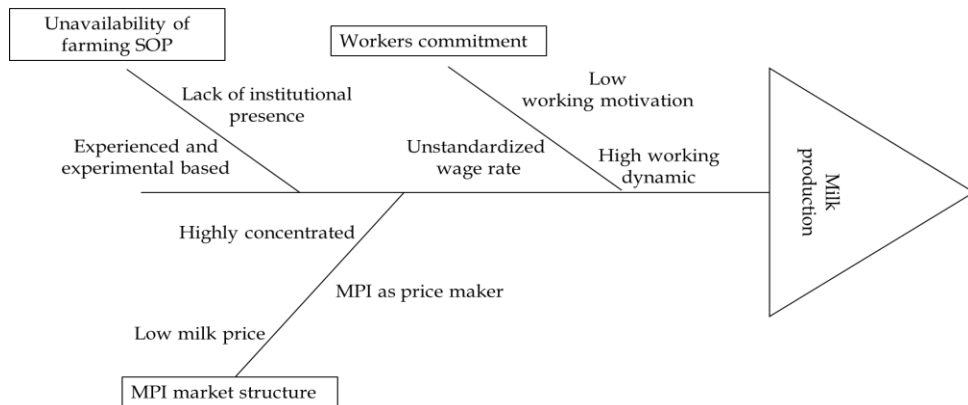


Figure 2. Fishbone Diagram of KPS-Bogor Agribusiness Risk

1. Commitment of stable workers

Human resources are an important factor in an organization. The vision and mission of the organization will not be achieved if it is not supported by committed and competent human resources. The cowshed workers in KPS Bogor

have an important role in the maintenance of livestock and cowsheds. In general, the dairy farming process in KPS Bogor is carried out mostly by cowshed workers. The cowshed workers are tasked with finding, preparing and feeding the cows, performing livestock and cowshed sanitation regularly, milking cows, monitoring the condition of cows and cowsheds, delivering the milk that has been milked daily, and maintaining the safety of the cowsheds.

The research resulting that some farmers, especially in the *Kunak* area, do not perform the process of their livestock farming themselves. Most of them are dairy farm investor, so the farming management is left to the cowshed workers. It is known that the cowshed workers in the *Kunak* area are migrant workers. As a result, there are often clashes and incompatible practices between the owner and the cowshed workers. Furthermore, this discrepancy is also shown by the high changes of workers in the dairy farming business. This was confirmed by KPS-Bogor administrators, field coordinator and the dairy farm owners in the KPS-Bogor.

Furthermore, the factor of their low commitment in KPS-Bogor is also triggered by the wage issue, where farmers at KPS-Bogor, do not have wage standardization. So when there is dissatisfaction with the amount of wages earned, they tend to be demotivated, looking for other alternative jobs and even committing fraudulent practices¹. (Amam & Harsita, 2019) found that institutions have a positive effect on dairy farmers, meaning that the role of farmer groups is very important for the development of dairy farmers. The importance of a comfortable working atmosphere and great farmer group dynamics will affect the achievement of an institution, in this case the KPS-Bogor and the farmer groups that are incorporated in it. Sutarno & Suswadi (2017) find that great group dynamics can move group members to work effectively and efficient in its institutions.

2. There is no SOP in the farming method

The dairy farming practice is still performed simply and traditionally by the dairy farmers in KPS-Bogor. Both farmers and/or cowshed keepers milk the cows every morning and afternoon. During the day, the cowshed keepers go to the fields to look for forage which is used as animal feed. The composition of feed given to the livestock does not have a special standard, both in quantity and composition ratio. Farmers often change the feed composition if one of the feed components such as concentrate or tofu waste is difficult to be found or its current price is high. The disease control is performed based on experience. Even though KPS-Bogor provided animal health facilities, the limited capacity causes nonoptimal animal health services.

¹ Result of the interview with the coordinator of *Kunak* area, and some of the cowshed's owners in *Kunak* area.

KPS-Bogor does not have an SOP in the livestock farming management. Farmer groups, under KPS-Bogor, carry out farming activities based on their respective experiences and beliefs. The cooperative also has not performed monitoring activities routinely, which is aimed at maintaining the quality of cow's milk produced. The variety of farming methods or techniques conducted causes the variety of milk yields obtained, both in terms of productivity and milk quality. Standardization of the farming methods will affect the quality of milk and further affect the income of farmers and KPS- Bogor. Good farming practices and a well treated dairy cow will produce better production efficiency, and milk quality (Hemsworth et al., 2000; Napolitano et al., 2020).

3. MPI Market Structure

The dairy processing industry in Indonesia consists of several large companies. These companies manage the production and processing of dairy product and its derivatives. Dairy derivative products produced by the MPI in Indonesia are generally in the form of UHT / pasteurized milk, yogurt, cheese and several other forms. The structure of the MPI in Indonesia is strongly concentrated, so it has strong bargaining power in determining prices. Farmers at KPS-Bogor receive a price given by the industry based on the daily milk quality. Figure 3 shows the development of milk prices obtained at the KPS-Bogor farmer level. Variations of milk prices caused by variations of milk quality. Researches on market risk in agriculture have been increasingly associated with the prices volatility (Wolf & Widmar, 2014), as in this case shown by Figure 3.

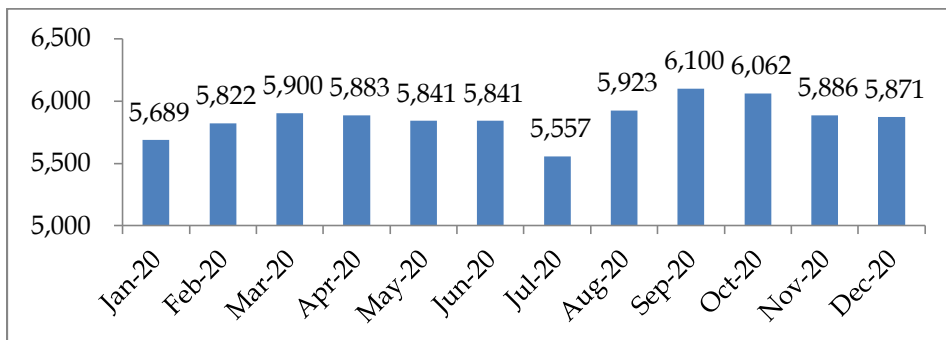


Figure 3.

Selling Price of Fresh Milk in Average from KPS-Bogor to the MPI

Source: (KPS-Bogor, 2020)

The average price of fresh milk at the farmer level sold to MPI in 2020 was 5,867 IDR/liter or increased by 9.8% compared to the price in 2019. Even though there was an increase in price, the fresh milk selling price to the markets outside of the MPI was 8,000 IDR/liter, or 27% higher than the selling price to the MPI.

However, the KPS-Bogor has a constraint in terms of the market certainty, which cannot be obtained from buyers outside of the MPI. Dairy markets outside of the MPI have a limited number of purchases, and cannot provide the certainty in term of period of purchasing, especially during long holidays. Meanwhile, MPI can definitely absorbs 80% of the milk produced by dairy farmers, even though at a low price. This causes KPS-Bogor to face market risk, since the main buyer has higher bargaining power in terms of price determination and market certainty, so this can cause potential losses in the in future. Higher bargaining power of MPI lead to unequal share of profits in the milk market (Shokoohi et al., 2019). Furthermore, market risk in KPS-Bogor also get worse because there is no written contract between the KPS-Bogor and MPI.

CONCLUSION AND SUGGESTION

Conclusion

The results of this study found that KPS-Bogor faces 6 sources of risk that have the potential to cause losses to the cooperative, namely production risk (bacteria and the absence of SOPs for farming method), market risk (MPI market structure), financial risk (delayed payment of its member's debt), risk law (GMP standardization is not yet implemented), and human resource risk (low commitment of workers). The six sources of risk cause the KPS-Bogor to have potential losses in the future. Furthermore, The FMEA approach and Fishbone Diagram was employed to find a result that there are three risks with the highest severity level, the highest probability of occurrence and the most difficult detection rate. Those are the risks of i) the low commitment of workers, , ii) the absence of farming SOPs , and iii) MPI market structure. Unusually, this research found human resource risk valued higher than the production risk factor, which mainly become the main risk source in agricultural business.

Suggestion

Based on the results, it is suggested to have a further research on the magnitude of risk from each identified source of risk. Furthermore, it becomes very important to analyze preventive and mitigation strategies for managing the six sources of risk, in particular the three risks with the greatest chance of loss. KPS-Bogor requires to review its business model as a socio-economic institution.

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