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## Financial Performance of Dairy Cooperatives in West Java-Indonesia During the Covid-19 Pandemic and Foot-and-Mouth Disease Outbreak

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### ABSTRACT

Dairy cooperatives play an important role to collect milk production from dairy farmers, distribution of milk to the milk processing industry, concentrate supply services, credit guarantees, artificial insemination and animal health services, savings and loan services, and various other services carried out by cooperatives. This condition causes the dependence of dairy farmers on cooperatives to be quite high. External factors can influence cooperative resilience, such as the Covid-19 pandemic and Foot-and-Mouth Disease (FMD). Therefore, the purpose of this study was to analyze the performance of cooperative milk production, and to the financial performance of cooperatives in the post-pandem Covid-19 period and during FMD. The method used in this study was a survey method to South Bandung Cattle Breeders Cooperative (KPBS) Pangalengan which represents large cooperatives, Multipurpose Cooperative (KSU) Tandangsari which represents medium-sized cooperatives, and Cattle Breeders Cooperative (KPS) Bogor which represents small cooperatives. The analysis method used standard cooperative performance methods through regulations of the Deputy for Supervision of the Ministry of Cooperatives and Small and Medium Enterprises (KUKM) of the Republic of Indonesia Number 06/Per/Dep.6/IV/2016 and key performance index to assess the financial performance of cooperatives. The results of the study showed that the performance of cooperative milk production decreased by 19.45% during the Covid-19 pandemic to the FMD as a result of the dairy cow mortality rate of 20.14%. The financial performance of dairy cow cooperatives was in the adequate category, both during the Covid-19 pandemic and FMD, but there was a decline in the ratio in all aspects of financial performance during the FMD. Thus, the performance of milk production and the financial performance of dairy cooperatives was better during the Covid-19 pandemic than during the FMD period. Therefore, strengthening milk production by providing new dairy cows and strengthening finances is very important.

Keywords: Performance, Finance, Cooperatives, Dairy cattle, Farmers

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### Introduction

The dairy cattle business has become a source of livelihood for some agricultural communities in Java, especially West Java. The existence of the dairy cattle business in West Java began in the 1880s which was introduced by the colonial government at that time. The dairy business continues to experience development from the golden period (1980 – 1997), degradation (1997 – 1999), and stagnation (1999 – 2010) (Firman *et al.*, 2010). There may even be significant changes in the 2010 – 2022 period due to the Covid-19 pandemic (2020 – 2023) and cases of Foot-and-Mouth Disease (May 2022). These two events could trigger changes in the dairy business in Indonesia, especially West Java (Harly and Mulyani, 2022; Rohma *et al.*, 2022).

The business actors who play a role in the dairy cattle business are dairy farmers, dairy

cooperatives, and the milk processing industry. Actors who play an important role in the dairy business, especially those dealing with dairy farmers are cooperatives. Dairy cooperatives play an important role in the dairy business in Indonesia. The role of cooperatives in the dairy business is to involve farmers as members of the cooperative, milk collection and distribution services, concentrate supply, providing credit guarantees, artificial insemination and animal health services, savings and loan services, payment services for milk deposits sent to the cooperative, and other services (Malau *et al.*, 2021; Nuraina *et al.*, 2021). The role of cooperatives is important so that problems that occur within cooperatives will impact their members, such as artificial insemination services and animal health being hampered, milk production not being distributed and so on, or in other words management and financial errors. As a result, many dairy farmers are no longer

enthusiastic about running their dairy cattle business and have switched to non-dairy cattle businesses, such as agriculture, farm laborers, and craftsmen.

Based on the Indonesian dairy cooperative association (GKSI) West Java report, the number of dairy cooperatives in West Java reached 44 cooperatives before 2000, but in 2007 it was reduced to 24 cooperatives that were still active. In 2023, there will be 16 dairy cooperatives in West Java, as reported on the West Java GKSI website. During 16 years (2007 – 2003), the number of cooperatives decreased by 8 cooperatives. One of the causes of the bankruptcy of dairy cattle cooperatives, apart from the cooperative's internal problems, was the repeal of the proof of absorption (BUSEP) regulations in 1998 as one of the terms of the Indonesian government's agreement with the International Monetary Fund (IMF) (Bramantyo and Wijayadne, 2022). With this regulation, the industry can freely import milk from abroad without having to absorb domestic fresh milk (SSDN), so dairy cooperatives must look for alternatives to sell their milk or accept the milk price set by the industry. The price of SSDN can be absorbed by the industry if the price of imported milk is higher than the price of domestic milk. The price of imported milk is highly dependent on the exchange rate of the Rupiah against the US Dollar.

Apart from that, two pandemics hit Indonesia from the period 2020 – 2022, namely the Covid-19 pandemic and Foot-and-Mouth Disease (FMD). The Covid-19 pandemic tends to limit the movement of goods and people in order to eliminate the spread of the Covid-19 virus. This condition really disrupts the distribution of basic and other commodities, which can cause shortages of goods. Even though the Covid-19 pandemic does not attack livestock, this disease attacks humans, including dairy farmers (Wang *et al.*, 2020). There were 12 cases dairy farmers of Covid-19 in Pangalengan and all of them recovered, however there were no Covid-19 cases dairy farmers in KSU Tandangsari dan KPS Bogor. The FMD is a virus that attacks cloven-hoofed cattle (Rushton and Knight-Jones, 2015). This FMD virus causes many deaths, especially in dairy cows, so it has the potential to cause milk production to decrease between 25%-30% (Rushton and Knight-Jones, 2015). Because both diseases cause losses to dairy cattle businesses, it is hypothesized that these two pandemics could be the cause of the collapse of several dairy cooperatives in West Java through the performance of milk production and cooperative finances (Pamungkas *et al.*, 2023).

The internal problems of cooperatives that often occur are financial management. Cooperative financial management is still carried out simply or manually, whether reporting or other financial records (Handajani *et al.*, 2019). In addition, several cooperatives do not yet have accounting staff who are reliable in handling cooperative finances. However, there are also cooperatives that have made changes in their management

using the latest technology and information. Cooperative financial problems must be handled well because a good financial system reflects the accountability of cooperative institutions to their members. If financial management problems are not managed well, it will result in cooperative members' distrust of the management or management of the cooperative. In addition, all members of the dairy cooperative are highly dependent on the cooperative because the financial flows of the farmers are managed by the cooperative.

Therefore, the existence of dairy cooperatives is very important for the sustainability of the dairy business, if the performance of the cooperative business decreases it can have an impact on dairy farmers. The aims of this study were to analyze the performance of cooperative milk production and to analyze the financial performance of cooperatives during the Covid-19 pandemic and FMD outbreak.

## Materials and Methods

### Subject and object of research

The research subjects consisted of three cooperative administrators, one financial staff and 2 production staff. Meanwhile, the object of this research was internal cooperative data which has previously been summarized by the dairy cattle cooperative.

### Location study

The number of dairy cattle cooperatives under the auspices of GKSI West Java is 17 cooperatives. The selection of cooperatives as samples was carried out purposively with the following considerations: the trustworthiness of large-scale, medium-scale, and small-scale cooperatives. The criteria for cooperatives are determined by the amount of milk production, namely large cooperatives > 20 million kg, 10 – 20 million kg, and < 10 million kg. Each business scale is represented by 1 cooperative, namely: (1) Large-Scale Cooperatives are represented by KPBS Pangalengan, Bandung Regency, (2) Medium-Scale Cooperatives are represented by KSU Tandangsari, Sumedang Regency, and (3) Small-Scale Cooperatives are represented by KPS Bogor, Bogor Regency. For the study, the informants who indept-interview for the study was representatives of dairy cooperatives.

### Data collection

The data collected are primary and secondary data. Primary data was obtained from interviews with informants, either through focus group discussions or visits to the homes of group administrators. Secondary data is data obtained from cooperatives regarding milk production reports and the number of dairy cow populations, and financial reports that have been legalized through the Annual Member Meeting from 2019 - 2022.

### Analysis method

The analysis used to assess these indicators is key performance indicators (KPI). Key performance indicators are financial and non-financial indicators used by institutions/organizations/governments to prove how successful they are in achieving long-term goals (Firman *et al.*, 2022; Rohma *et al.*, 2022; Harly and Mulyani, 2022). Key performance indicators are static and stable indicators that are more meaningful when comparing information, especially when comparing targets and actual indicators (Firman *et al.*, 2022; Wulandari, 2022; Lake, 2020). In addition, KPIs help focus on work and business objects, and gain profits (Firman *et al.*, 2022; Lake, 2020). The KPI analysis from the production and financial side calculated from 2019 – 2022 is as follows:

Production analysis with the following formulation:

$$Y_1 = \frac{X_1}{SP}$$

$$Y_2 = \frac{X_1}{X_t} \times 100\%$$

Where  $Y_1$  is the productivity of dairy cows (tons/head/year), with target (%). SP is the number of productive dairy cows for one year (heads),  $Y_2$  is the achievement of milk production for one year

compared to the target (%),  $X_t$  is the annual milk production target.

Financial analysis is calculated based on the regulation of the Deputy for Supervision of the Ministry of Cooperatives and Small and Medium Enterprises (KUKM) of the Republic of Indonesia Number 06/Per/Dep.6/IV/2016 regarding Guidelines for Health Assessment of Savings and Loans Cooperatives and Cooperative Savings and Loans Units as shown in Table 1. The aspects of cooperative financial evaluation are as follows: (1) capital aspect, (2) productive asset quality aspect, (3) efficiency aspect, (4) liquidity aspect, and (5) independence and growth aspect. In Table 2 can be shown that the indicators and operational variable including the KPI indicators for cooperative financial performance.

## Results and Discussion

### Overview of the impact of Covid-19 pandemic and foot-and-mouth disease outbreak

The Government of the Republic of Indonesia announced that the Covid-19 pandemic

Table 1. Aspects of cooperative financial assessment

Aspects assessed	Components	Ratio value (%)	Indicator value (%)		
<b>Capital aspect</b>					
a.	Ratio of cooperative equity to total assets $\frac{\text{Equity of cooperative}}{\text{Total Assets}} \times 100\%$	0	0		
		1 – 20	25		
		21 – 40	50		
		41 – 60	100		
		61 – 80	50		
		81 – 100	25		
		b.	Ratio of cooperative equity to risky loan $\frac{\text{Equity of cooperative}}{\text{Risky loan}} \times 100\%$	0	0
				1 – 10	10
				11 – 20	20
				21 – 30	30
31 – 40	40				
41 – 50	50				
51 – 60	60				
61 – 70	70				
71 – 80	80				
81 – 90	90				
91 – 100	100				
c.	Ratio of cooperative equity adequacy $\frac{\text{Weighted cooperative equity}}{\text{Risk Weighted Assets}} \times 100\%$	< 4	0		
		4 ≤ Y < 6	25		
		6 ≤ Y < 8	50		
		≥ 8	75		
<b>Productive assets quality aspect</b>					
a.	Ratio of loan volume $\frac{\text{volume of loans to members}}{\text{Total Volume of loans provided}} \times 100\%$	≤ 25	0		
		26 – 50	50		
		51 – 75	75		
		> 75	100		
b.	Non-performing loan risk ratio $\frac{\text{Non-performing loans}}{\text{Loans provided}} \times 100\%$	≥ 45	0		
		40 < Y < 45	20		
		30 < Y ≤ 40	40		
		20 < Y ≤ 30	60		
		10 < Y ≤ 20	80		
		0 < Y ≤ 10	100		
c.	Risk reserve ratio $\frac{\text{Risk reserve}}{\text{PNon-performing loans}} \times 100\%$	0	0		
		1 – 10	10		
		11 – 20	20		
		21 – 30	30		
		31 – 40	40		
		41 – 50	50		
		51 – 60	60		
		61 – 70	70		
		71 – 80	80		
		81 – 90	90		
91 – 100	100				

Continued Table 1

Aspects assessed	Components	Ratio value (%)	Indicator value (%)
<b>Efficiency aspect</b>			
a. Cooperative member operating expense ratio	$\frac{\text{Member operating expenses}}{\text{Gross participation}} \times 100\%$	$\geq 100$	0
		$95 \leq Y < 100$	50
		$90 \leq Y < 95$	75
		$< 90$	100
b. Cooperative operating expense ratio	$\frac{\text{Operating expenses}}{\text{Gross of rest of business (Gross SHU)}} \times 100\%$	$> 80$	
		$60 < Y \leq 80$	
		$40 < Y \leq 60$	
		$\leq 40$	
c. Service efficiency ratio	$\frac{\text{Employee costs}}{\text{Loan volume}} \times 100\%$	$< 5$	100
		$5 < Y \leq 10$	75
		$10 \leq Y < 15$	50
		$> 15$	0
<b>Liquidity aspect</b>			
a. Cash ratio	$\frac{\text{Cash + Bank}}{\text{Current liabilities}} \times 100\%$	$\leq 10$	25
		$10 < Y \leq 15$	100
		$15 < Y \leq 20$	50
		$> 20$	25
b. Loan to debt ratio	$\frac{\text{Loans provided}}{\text{Funds received}} \times 100\%$	$< 60$	25
		$60 \leq Y < 70$	50
		$70 \leq Y < 80$	75
		$80 \leq Y < 90$	100
<b>Independence and growth aspect</b>			
a. Asset rentability	$\frac{\text{SHU before tax}}{\text{Total assets}} \times 100\%$	$< 5$	25
		$5 \leq Y < 7,5$	50
		$7,5 \leq Y < 10$	75
		$\geq 10$	100
b. Cooperative equity rentability	$\frac{\text{SHU member section}}{\text{Cooperative equity}} \times 100\%$	$< 3$	25
		$3 \leq Y < 4$	50
		$4 \leq Y < 5$	75
		$\geq 5$	100
c. Operational independence	$\frac{\text{Netto participation}}{\text{Operating expenses and cooperatives}} \times 100\%$	$\leq 100$	0
		$> 100$	100

Table 2. The indicators and operational variables

Indicators	Operational variables
<b>Capital aspect</b>	
- Ratio of cooperative equity to total assets	comparison of cooperative equity with total assets in percent
- Ratio of cooperative equity to risky loan	comparison of cooperative equity with risky loan in percent
- Ratio of cooperative equity adequacy	ratio that shows the cooperative's ability to maintain existing capital to cover possible losses in credit, investment, securities and claims from other banks in percent
<b>Earning asset quality aspect</b>	
- Ratio of loan volume	comparison of loan volume to members with total loan volume in percent
- Non-performing loan risk ratio	comparison between problem loans and loans provided in percent
- Risk reserve ratio	comparison between risk reserves and non-performing loans in percent
<b>Efficiency aspect</b>	
- Cooperative member operating expense ratio	comparison of member operating expenses with gross participation in percent
- Cooperative operating expense ratio	comparison between operating expenses and remaining gross operating results (SHU) in percent
- Service efficiency ratio	comparison between employee costs and total loan volume in percent
<b>Liquidity aspect</b>	
- Cash ratio	comparison between the amount of funds in cash and in the bank with current liabilities in percent
- Loan to debt ratio	comparison between loans provided and funds received in percent
<b>Independence and growth aspect</b>	
- Asset rentability	comparison between SHU before tax and total assets in percent
- Cooperative equity rentability	comparison between members' share of SHU and total cooperative equity in percent
- Operational independence	comparison between net participation and business and cooperative expenses in percent
<b>Key performance indicators</b>	
$Y \geq 100\%$	Very good
$75\% \leq Y < 100\%$	Good
$50\% \leq Y < 75\%$	Enough
$25\% \leq Y < 50\%$	Less
$Y < 25\%$	Very less

in Indonesia began on March 3, 2020 and was declared pandemic free on December 31, 2022. On May 5 2022, the Indonesian Government through the Ministry of Agriculture announced an outbreak of FMD in Indonesia (Firman *et al.*, 2022; Rohma *et al.*, 2022; Wulandari, 2022). These two incidents became two disease disasters that worsened the

livestock sector, especially dairy cattle. Some of the results of research related to the impact of Covid-19 on the dairy cattle industry are obstacles to the sale of production bulls, a shortage of venture capital in China and the United States (Lake, 2020); and has an effect on the costs of a dairy farming business that impact producers, labor and livestock

in the United States (Harly and Mulyani, 2022; Wang *et al.*, 2020). In addition, there have been declines in milk prices at the farm level, barriers to milk distribution, layoffs, and increased costs in Armenia due to the Covid-19 pandemic (Duan *et al.*, 2022; Hambardzumyan and Gevorgyan, 2022). However, research regarding the impact of Covid-19 on dairy cattle businesses in Indonesia is very limited.

The impact of FMD that attacks cloven-hoofed livestock such as beef cattle, dairy cattle, buffalo, sheep, goats, pigs and others with clinical characteristics, such as lethargy/weakness, body temperature reaching 41°C, hypersalivation, decreased appetite, reluctance to stand, lameness, reduced live weight, decreased milk production for milk-producing livestock, and morbidity rate of up to 100 (Adjid, 2020). Therefore, the incidence of FMD causes direct and indirect impacts (Rushton and Knight-Jones, 2015). The direct impact of FMD is decreased milk production (25%), decreased growth rates, reduced fertility, livestock mortality (20%-40%), and livestock destruction (Rushton and Knight-Jones, 2015). The indirect impact occurred in economic losses, such as in England amounting to £ 2.7 billion pounds, in Taiwan amounting to USD 6.617 billion and Japan amounting to USD 0.55 billion (Rushton and Knight-Jones, 2015). Based on these two disease disasters, both have an impact on the economic side of a country.

#### Cooperative milk production performance during the Covid-19 pandemic and foot-and-mouth disease outbreak in West Java

Dairy farming has become the main livelihood in West Java province because dairy farmers spend a lot of their work time taking care of their dairy cows (Firman *et al.*, 2019). Generally, dairy farmers are members of a dairy farming cooperative. The number of dairy cooperatives is 16 cooperatives spread throughout West Java Province. Based on GKSI West Java, the number of cooperatives, number of dairy farmers, dairy cow population and milk production during the Covid-19 period and during FMD can be seen in Table 3. Milk production is a key indicator for dairy farmers and cooperatives (Nurtini *et al.*, 2017).

Based on Table 3, the number of cooperatives has not decreased, both during the Covid-19 and FMD times. The number of dairy farmers has decreased by 223 dairy farmers. The decline in the number of farmers was caused by various factors, such as the death of dairy cows and loss of milk production due to FMD outbreak.

The table also provides an illustration of the decline in the number of dairy cows by 20.14% which was caused by death or forced slaughter or this is in line with research (Rushton and Knight-Jones, 2015). The loss of milk between before FMD (April 2022) and during FMD (May 2023) was 19.45%. In fact, milk production in May 2023 has experienced a recovery compared to the 4 months of FMD, namely in May – August 2022. The average decrease in milk production was 40%. This indicates that milk production has not been able to match the initial production before FMD (Figure 1). This means that FMD disease has an impact on the productivity of dairy cows even though the dairy cows have recovered from the FMD disease. The milk production during the Covid-19 period (January – April 2022) and during the FMD period (May 2022 – May 2023) is shown in Figure 1.

Figure 1 shows that fresh production continued to decline in May 2022. The decline in milk production continued until November 2022 which was the lowest point in milk production in West Java. The Indonesian government will inject the FMD vaccine in bulk at the end of August 2022 in stages. These efforts have shown results with many dairy cows recovering from FMD and milk production starting to rise again. However, the increase in milk production has not been able to reach the condition before FMD.

#### Milk production performance during Covid-19 pandemic and foot-and-mouth disease (FMD) outbreak

Dairy cattle cooperatives are a forum for dairy farmers to distribute the fresh milk they produce to be collected at the cooperative. Apart from that, the function of cooperatives is to develop dairy farmers, distribute production inputs, such as concentrate, artificial insemination and animal health services, financial savings and loan services, and so on. Therefore, the aim of a dairy cooperative is to improve the welfare of its members because all the results of the cooperative's business will be distributed to member farmers. One of the performances measured in this research was the performance of fresh milk production during the Covid-19 pandemic and FMD.

Table 4 shows cooperative productivity measured from milk production in both periods. Fresh milk production is highly dependent on the number of lactating dairy cows owned by each cooperative. The KPBS Pangalengan Cooperative has more lactating dairy cattle resources than the other two cooperatives, namely 7,325 head,

Table 3. Condition of dairy cows during Covid-19 and FMD outbreak in West Java

Variables	Covid-19 (April 2022)	FMD (May 2023)	Loss
Number of dairy cooperatives (Unit)	16	16	-
Farmers (people)	13,570	13,347	223
Dairy cattle (head)	74,934	59,842	15,092
Milk production (kg/month)	11,550,604	9,303,178	2,247,426
Loss of dairy cattle in Rupiah (@ average 20 million/head)			30,184,000,000
Loss of milk production in Rupiah (Average price of fresh milk IDR 6,000/kg)			13,484,556,000

Source: West Java GKSI, 2023.

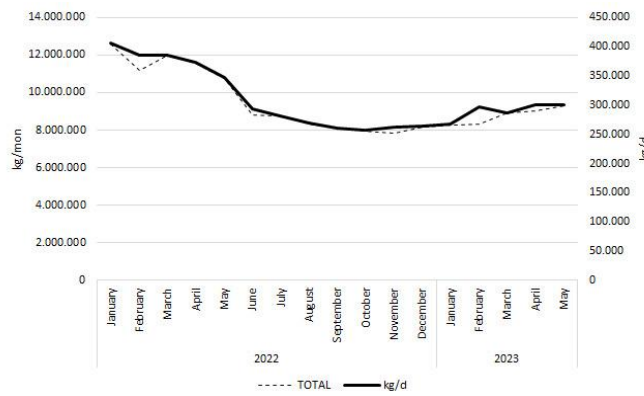


Figure 1. Fresh Milk Production in West Java Province During the Covid-19 Pandemic and foot-and-mouth disease.

Table 4. Cooperative milk production performance during Covid-19 and foot-and-mouth disease

Cooperatives	Dairy cattle productivity					
	Covid-19 (2021)			FMD (2022)		
	Milk production (liter/year)	Total population of lactating dairy cows (heads)	Productivity (liters/head/year)	Milk production (liter/year)	Total population of lactating dairy cows (heads)	Productivity (liters/head/year)
KPBS Pangalengan	27,155,887,40	7,325	3,707.29	21,412,659.88	5,870	3,647.81
KSU Tandangsari	6,387,251,50	1,806	3,536.68	4,806,44.00	1,464	3,283.09
KPS Bogor	3,713,427,00	1,200	3,094.52	2,705,456.00	936	2,890.44

Source: Annual Member Meeting (RAT) Report for 2021 and 2022.

respectively followed by KSU Tandangsari and KPS Bogor during the Covid-19 period. The number of productive dairy cows will have implications for the amount of milk production. KPBS Pangalengan's milk production in 2021 was 27 million liters more than the others and dairy cow productivity reached 3,707.29 liters/year. This means that during the Covid-19 pandemic, dairy cow business activities were not affected by the Covid-19 pandemic. Even during the Covid-19 pandemic, fresh milk was the prima donna during the Covid-19 pandemic, especially its role for the immunity of the human body. The Covid-19 pandemic cases in America and China did not affect milk production, but did influence price reductions and barriers to milk distribution (Wang *et al.*, 2020).

Different conditions were shown when Indonesia was hit by the FMD outbreak in May 2022. The milk production performance of all cooperatives in the sample experienced a decline in production from 20% - 28%. Other research results also show that the effects of FMD can cause a decrease in milk production by 25% (Rushton and Knight-Jones, 2015). Likewise, there is a loss of productive dairy cows due to FMD, either because they die or are forcibly slaughtered with the permission of a veterinarian. The loss of population from the Covid-19 pandemic to FMD was 18% -

22%. Previous research has shown that livestock mortality due to FMD is 20% - 40%. Therefore, the performance of cooperatives in terms of milk production was better during the Covid-19 pandemic compared to FMD because the spread of the FMD virus was faster in livestock with cloven hooves.

The achievements of the cooperative's milk production target can be seen in Table 5. During the Covid-19 pandemic, milk production achievements were able to reach more than 90% of the production target. The target productivity of dairy cows for each cooperative is 13 liters/cow/day. During the FMD period, the milk production target was reduced to 11 liters/cow/day. In this table, milk production achievements can still be achieved at more than 90%, except for KPS Bogor. This reflects that FMD disease has a massive impact on dairy farms which rely on raising dairy cows for their business.

**Financial performance of cooperatives post Covid-19 pandemic and foot-and-mouth disease (FMD) outbreak**

Institutional performance appraisal is an integral part of any planning for an institution. This assessment needs to be done to see how far the target of an institution can be achieved or not.

Table 5. Achievement of fresh milk production for each cooperative

Cooperatives	Covid-19 (2021)			FMD (2022)		
	Target (liters)	Realization (liters)	Achievements (%)	Target (liters)	Realization (liters)	Achievements (%)
KPBS Pangalengan	29,043,625	27,155,887,40	93,50	21,484,200	21,412,659,88	99,67
KSU Tandangsari	6,885,375	6,387,251,50	92,77	5,134,980	4,806,441,00	93,60
KPS Bogor	4,026,000	3,713,427,00	92,24	3,140,280	2,705,456,00	86,15

Performance appraisal is a key factor for evaluating an organization from an effective and efficient perspective (Fachrudin, 2013). This performance appraisal system has a very important role in an organization to ensure that every activity within the institution runs as it should. Institutional performance is the result of the performance of individuals who work in these institutions, so this reflects the performance of human resources in these institutions (Listiani, 2011).

In this research, the financial performance of cooperatives is the target of this research because the financial performance of cooperatives is one of the variables in measuring the soundness of cooperatives. The government through the Ministry of Cooperatives and Small and Medium Enterprises has set financial standards for assessing the financial performance of cooperatives through the Regulation of the Deputy for Supervision of the Ministry of Cooperatives and Small and Medium Enterprises (KUKM) of the Republic of Indonesia Number 06/Per/Dep.6/IV/2016 concerning Assessment Guidelines Health of Savings and Loans Cooperatives and Cooperative Savings and Loans Units.

### Capital aspects

Capital structure is a comparison between capital outside the company (in the form of long-term debt) and its own capital (Gunarwati *et al.*, 2020; Yuwana, 2021). Optimal capital structure is a capital structure that optimizes the balance between risk and return (Gunarwati *et al.*, 2020). The capital structure is very crucial for cooperatives because the impact of this capital structure will have a direct effect on the financial position of the cooperative (Yuwana, 2021). The equity of cooperative consists of principal savings, mandatory savings, reserve funds, and grants. The analysis of capital aspects consists of 3 things, namely the ratio of cooperative equity to total assets, the ratio of cooperative equity to risky loans, and the ratio of cooperative equity adequacy. The capital calculation is based on the 2021 and 2022 Cooperative Member Annual Meeting Report documents.

The Ratio of Cooperative Equity to Total Assets can be seen in Table 6. Based on this table, the three cooperatives have a ratio of between 30%

- 54%, both during the Covid-19 pandemic and FMD. This means that almost half of the total assets are the cooperative equity collected from principal savings, mandatory savings, reserve funds and grants. Compared to the Covid-19 period, the cooperative equity and total assets of each cooperative have decreased in value. This ratio shows the importance of the source of loan capital and the level of security owned by creditors (Rialdy and Isnaini, 2022). The higher this ratio means the smaller the amount of loan capital used to finance cooperative assets.

The ratio of cooperative equity to risky loans can be seen in Table 7. Based on this table, it is shown that KPBS Pangalengan, and KPS Bogor have a ratio of above 90% in Covid-19 periode, except KSU Tandangsari. This means that all cooperatives still have quite a large amount of capital to cover risky loans (Astuti and Aviandi, 2020). During the FMD era, The ratio value has decreased, especially KPS Bogor, while KPBS still had a ratio above 90%. This means that the FMD epidemic has had a major impact on returning farmers' debts to cooperatives, especially delays in installments of dairy cattle credit to cooperatives through the Cooperative Revolving Fund Management Institution (LPDB) program from the Ministry of Cooperatives and Small and Medium Enterprises, concentrate loans and other loans.

Based on the Regulation of the Deputy for Supervision of the Ministry of Cooperatives and Small and Medium Enterprises (KUKM) of the Republic of Indonesia Number 06/Per/Dep.6/IV/2016, the cooperative equity adequacy ratio is the result of comparing Weighted Own Capital with Risk Weighted Assets (ATMR) multiplied by with 100%. Weighted capital is the sum of the multiplication of each component of cooperative capital contained in the balance sheet with the risk recognition weight. The results of the analysis related to the cooperative equity adequacy ratio can be seen in Table 7. The results of the analysis show that the cooperative equity adequacy ratio is more than 8% (according to regulatory standards). That is, all cooperatives have a fairly good ratio of cooperative equity adequacy. If the capital aspect is assessed as being in a bad condition then the cooperative's capital is in an unhealthy condition or is in below standard (Sudiyanto, 2019).

Table 6. Cooperative equity ratio to total assets

Cooperatives	Covid-19 (2021)			FMD (2022)		
	Cooperative equity (IDR)	Total assets (IDR)	Ratio (%)	Cooperative equity (IDR)	Total Assets (IDR)	Ratio (%)
KPBS Pangalengan	57,152,193,906	175,070,851,439	32,65	56,946,693,390	174,390,342,914	32,65
KSU Tandangsari	8,555,416,626	21,559,454,062	39,68	8,828,219,195	18,989,981,644	46,49
KPS Bogor	7,264,591,672	13,513,739,555	53,76	5,085,214,170	12,432,640,391	40,90

Table 7. Cooperative equity ratio to risky loans

Cooperatives	Covid-19 (2021)			FMD (2022)		
	Cooperative equity (IDR)	Loans given at risk (IDR)	Ratio (%)	Cooperative equity (IDR)	Loans given at risk (IDR)	Ratio (%)
KPBS Pangalengan	57,152,193,905.83	58,913,459,438	97.01	56,946,693,390	63,220,788,657	90.08
KSU Tandangsari	8,555,416,625.54	15,352,990,224	55.72	8,828,219,195	14,914,477,859	59.19
KPS Bogor	7,264,591,672.00	8,010,365,350	90.69	6,538,132,505	8,971,609,192	53.13

### Productive assets quality aspect

The productive assets quality is the wealth that cooperatives bring income for the cooperative concerned (Pramono and Budiayati, 2015). The research results show that if there is an increase in Productive Assets Quality assuming other variables remain constant will provide the impact of the increase on return of assets (ROA) (Sahara, 2022). The aspects of productive asset quality that are used as measurements are the loan volume ratio, the non-performing loan risk ratio, and the risk reserve ratio. The loan volume ratio can be seen in Table 8. Based on this table, it shows that member loans during the Covid-19 period varied, from 11% to 78%. KPBS Pangalengan is a cooperative whose members' loan volume is only 11.25% or does not dominate the total loans provided by the cooperative. This means that cooperative loans are more likely to be extended to sectors other than members. In contrast to KSU Tandangsari and KPS Bogor where the volume of member loans is more than half of the total loans. The tendency for loans from these two cooperatives to increase even more during the FMD period. According to the cooperative management, the loans made by members to the cooperative are to support household life because many farmers' money factories, namely dairy cows, have died or been forcibly slaughtered due to FMD (Maulana *et al.*, 2022).

The risk ratio for problematic loans can be seen in Table 9. The larger the loan given, the greater the risk of problematic loans. The results of the financial performance analysis show that KPBS Pangalengan's problem loans are lower compared to the other two cooperatives, both during the Covid-19 pandemic and during the FMD period. During the FMD period, non-performing loans increase as the ability to repay loans decreases because many dairy cows die or are forced to

slaughter, or if dairy cows recover from FMD but their productivity levels are low.

The risk reserve ratio is the reserve fund owned by the cooperative in order to cover problem debts. Table 10 shows that KPBS Pangalengan and KPS Bogor have higher reserves compared to problem debts compared to KSU Tandangsari whose cooperative reserves are lower compared to problem loans during the Covid-19 pandemic. Likewise during the FMD period, the reserves of the KPBS Pangalengan and KPS Bogor cooperatives decreased in reserves compared to the Covid-19 period. As for the Tandangsari KSU, there was an increase in non-performing loans which resulted in a lower reserve ratio. The emphasis on the aspect of productive asset quality is the cooperative's level of caution in providing loans, so that loans do not exceed the cooperative's assets (Kalefi, 2018).

### Efficiency aspect

The efficiency aspect is one aspect of the assessment to see the financial performance of cooperatives. The efficiency aspect aims to measure the level of cooperative capabilities in providing services to its members with cooperative assets (Apriyati *et al.*, 2019). There are three indicators in determining financial efficiency in cooperatives, namely operating expense ratio, operating expense ratio, and service efficiency ratio. In Table 11 the operating expense ratio is shown. The results of the analysis show that the operating expense ratio was above 80% during the Covid-19 pandemic. This condition depends on the activities of each cooperative. KPBS Pangalengan has a milk treatment business, a goods and feed service unit, and PT SKP so that the operating expenses will be greater. The activities carried out by KSU Tandangsari and KPS Bogor consist of a dairy cattle service unit and a savings and loan service unit. As for the FMD period, the operating

Table 8. Equity adequacy ratio

Cooperatives	Covid-19 (2021)			FMD (2022)		
	Weighted cooperative equity (IDR)	Risk Weighted Assets (IDR)	Ratio (%)	Weighted cooperative equity (IDR)	Risk weighted assets (IDR)	Ratio (%)
KBPS Pangalengan	57,384,993,452	174,089,375,510	32.96	56,377,226,456	172,646,439,485	32.65
KSU Tandangsari	8,469,862,459	21,128,264,981	40.09	8,633,998,372	18,610,182,011	46.39
KPS Bogor	7,191,945,755	13,243,464,764	54.31	6,408,023,668	12,062,147,707	53.13

Table 9. Loan volume ratio

Cooperatives	Covid-19 (2021)			FMD (2022)		
	Number of volumes loan on member (IDR)	Total Volume of the loan given (IDR)	Ratio (%)	Number of volumes loan on member (IDR)	Total volume of the loan given (IDR)	Ratio (%)
KBPS Pangalengan	7,468,394,015	66,381,853,454	11.25	6,670,948,427	63,220,788,657	10.55
KSU Tandangsari	11,837,685,050	15,352,990,224	77.10	14,173,914,478	14,914,477,859	95.03
KPS Bogor	6,783,911,762	12,673,000,542	53.53	8,140,694,114	9,664,029,133	84.24

Table 10. Risk ratio for non-performing loans

Cooperatives	Covid-19 (2021)			FMD (2022)		
	Non-performing loans (IDR)	Total volumes loans given (IDR)	Ratio (%)	Non-performing loans (IDR)	Total volumes loans given (IDR)	Ratio (%)
KBPS Pangalengan	5,068,865,746	66,381,853,453	7.64	6,270,552,820	63,220,788,657	9.92
KSU Tandangsari	6,602,491,061	15,352,990,224	46.00	7,606,383,708	14,914,477,859	51.00
KPS Bogor	4,662,635,192	12,673,000,542	36.79	3,865,611,653	9,664,029,133	40.00



Table 11. Risk reserve ratio

Cooperatives	Covid-19 (2021)			FMD (2022)		
	Risk reserve (IDR)	Non-performing loans (IDR)	Ratio (%)	Risk reserve (IDR)	Non-performing loans (IDR)	Ratio (%)
KBPS Pangalengan	17,816,407,471	5,068,865,746	351.49	16,904,274,909	6,270,552,820	269.58
KSU Tandangsari	2,066,126,972	6,602,491,061	31.29	2,030,631,656	7,606,383,708	26.70
KPS Bogor	4,717,945,476	4,662,635,192	101.19	4,623,586,566,48	3,865,611,653	119.61

Table 12. Operating expense ratio for cooperative members

Cooperatives	Covid-19 (2021)			FMD (2022)		
	Operating expenses for members (IDR)	Gross participation (IDR)	Ratio (%)	Operating expenses for members (IDR)	Gross participation (IDR)	Ratio (%)
KBPS Pangalengan	28,203,313,202	29,449,938,865	95.77	25,349,833,884	25,576,083,629	99.12
KSU Tandangsari	9,258,342,833	10,185,974,391	90.89	10,698,175,891	12,026,104,203	88.96
KPS Bogor	3,448,550,262	4,116,324,070	83.78	3,862,376,293	4,033,997,589	95.75

Table 13. Cooperative operating expense ratio

Cooperatives	Covid-19 (2021)			FMD (2022)		
	Cooperative operating expenses (IDR)	Gross SHU (IDR)	Ratio (%)	Cooperative operating expenses (IDR)	Gross SHU (IDR)	Ratio (%)
KBPS Pangalengan	28,203,313,202	1,019,863,672	2765.40	25,349,833,884	1,733,622,196	1462.25
KSU Tandangsari	9,258,342,833	495,674,085	1867.83	10,698,175,891	316,563,775	3379.47
KPS Bogor	3,448,550,262	667,773,808	516.42	3,000,238,728	467,441,666	641.84

expense ratio increased by more than 4% from 2022 at KPBS Pangalengan. This happens because the level of service to farmers has become more intensive because it is in the context of preventing and healing dairy cows due to FMD. As for the KSU Tandangsari and KPS Bogor cooperatives, they reduced their business expenses during the FMD period because all dairy business actors were affected by FMD.

The results of the analysis of the operating expense ratio can be seen in Table 12. Based on this table, all cooperatives have an operating expense ratio value of above 500%, both during the Covid-19 pandemic and FMD. The size of the operating expense ratio depends on the value of operating expenses and the gross remaining operating results. KPBS Pangalengan had a higher operating expense ratio during Covid-19 than the others. Meanwhile, KSU Tandangsari had a higher ratio than the others during the FMD period. This means that the impact of FMD affects the operating expenses borne by the cooperative so that it has an impact on the gross remaining operating result (SHU).

The measure of the efficiency aspect is the ratio of service efficiency as measured by employee costs compared to loan volume. Loan volume is a dividing factor for this ratio indicator. That is, the higher the loan volume will affect the lower the value of the service efficiency ratio. During the Covid-19 and FMD pandemics, the value of the service efficiency ratio varied. KSU Tandangsari and KPS Bogor had quite high service efficiency ratio values during the Covid-19 pandemic, only these two cooperatives had values that dropped drastically during the FMD period (Table 13). In contrast, KPBS Pangalengan has a ratio value below 10%, but increases when FMD becomes more than 25%. Therefore, cooperatives must pay attention to the operational efficiency aspects of cooperatives so that they can be run well (Kalefi, 2018; Hidayati and Suranta, 2016).

### Liquidity aspect

Liquidity is the company's ability to fulfill short-term liabilities at maturity (Apriyati *et al.*, 2019; Litamahuputy, 2021). The liquidity aspect is an important aspect in assessing the financial performance of cooperatives. There are 3 indicators for measuring liquidity, namely the cash ratio and the loan to fund ratio. The ratio of cash generated by cooperatives during Covid-19 and FMD varies. In these two periods, the KPBS Pangalengan and KPS Bogor cooperatives had a cash ratio of between 48% - 53% (Table 14). This means that the level of cash availability is almost half of current liabilities, while KSU Tandangsari has the lowest cash ratio compared to the other two cooperatives, both during the Covid-19 and FMD periods.

Another indicator is the loan to funds ratio. The loan to deposit ratio is a ratio to measure a financial institution's ability to repay depositors by relying on financing (Ulfa, 2020). The results of the analysis show that the ability of cooperatives to anticipate withdrawing funds by members is quite large, so members are safe enough to withdraw or borrow funds from cooperatives, multiplying during the Covid-19 or FMD period (Table 15). Therefore, the liquidity aspect must be considered because it is related to debt payments with other parties (Kalefi, 2018; Hidayati and Suranta, 2016).

### Aspects of independence and growth

Measurement of financial performance involves aspects of independence and growth. Aspects of independence and growth can be used to measure how big is the independence and growth of cooperatives when seen from its ability to earn profits and its service operations (Apriyati *et al.*, 2019). The indicators assessed are asset profitability, equity profitability, and operational independence. Profitability is the ability of a financial company or cooperative or institution to achieve a certain profit as a result of using a certain

Table 14. Service efficiency ratio

Cooperatives	Covid-19 (2021)			FMD (2022)		
	Employee costs (IDR)	Loans volume (IDR)	Ratio (%)	Employee Costs (IDR)	Loans volume (IDR)	Ratio (%)
KBPS Pangalengan	15,470,962,093	66,381,853,453	7.64	16,053,152,455	63,220,788,657	25.39
KSU Tandangsari	748,232,077	15,352,990,224	46.00	2,650,975,129	14,914,477,859	17.77
KPS Bogor	1,359,166,165	12,673,000,542	36.79	1,134,385,335	9,664,029,133	11.74

Tabel 15. Cash ratio

Cooperatives	Covid-19 (2021)			FMD (2022)		
	Cash + Bank (IDR)	Current liabilities (IDR)	Ratio (%)	Cash + Bank (IDR)	Current liabilities (IDR)	Ratio (%)
KBPS Pangalengan	38,395,055,312	79,000,975,786	48.60	38,177,979,556	79,394,126,436	48.09
KSU Tandangsari	1,166,630,685	4,690,151,156	24.87	613,055,334	3,539,813,695	17.32
KPS Bogor	497,417,513	942,530,260	52.77	397,934,010	801,150,721	49.67

Table 16. Loan to fund ratio

Cooperatives	Covid-19 (2021)			FMD (2022)		
	Loans (IDR)	Funds received (IDR)	Ratio (%)	Loans (IDR)	Funds received (IDR)	Ratio (%)
KBPS Pangalengan	58,733,459,439	69,937,868,195	83.98	63,220,788,656,53	69,732,367,680	90.66
KSU Tandangsari	15,352,990,224	17,160,426,918	89.47	14,914,477,859,00	15,861,071,750,57	94.03
KPS Bogor	12,673,000,542	13,279,292,213	95.43	9,664,029,133,00	10,357,847,926,14	93.30

Tabel 17. Assets rentability

Cooperatives	Covid-19 (2021)			FMD (2022)		
	SHU before tax (IDR)	Total assets (IDR)	Ratio (%)	SHU before tax (IDR)	Total assets (IDR)	Ratio (%)
KBPS Pangalengan	1,604,891,988	175,070,851,439	0.92	1,733,622,196	174,390,342,914	0.99
KSU Tandangsari	340,468,671	21,559,454,062	1.58	316,563,775	32,322,771,360	0.98
KPS Bogor	667,773,808	13,513,739,555	4.94	467,441,666	11,892,090,808	3.93

Table 18. Cooperative equity rentability

Cooperatives	Covid-19 (2021)			FMD (2022)		
	SHU for members (IDR)	Total of cooperative equity (IDR)	Ratio (%)	SHU for members (IDR)	Total of cooperative equity (IDR)	Ratio (%)
KBPS Pangalengan	1,604,891,889	58,767,085,795	2.73	1,733,622,196	56,946,693,390	3.04
KSU Tandangsari	340,468,671	8,555,416,626	3.98	320,960,438	8,828,219,195	3.64
KPS Bogor	667,773,808	7,837,865,480	8.52	534,219,046	6,538,132,505	8.17

amount of company funds or capital (Magnalena and Lestari, 2015). High levels of profitability reflect high effectiveness as well.

Asset profitability is a comparison of the remaining operating results (SHU) compared to total assets. The higher the value of the ratio will reflect the high effectiveness in managing assets. Table 16 shows the results of the assessment of this measure showing the range of ratios between 0% < asset profitability < 5%. This means that the SHU granted is still relatively small compared to total assets, both during the Covid-19 pandemic and FMD. The remaining business results are business income which is distributed to cooperative members (Nugroho and Masud, 2021), or in company terms, dividends. The remaining business results in the cooperative are usually reported at the members' meeting at the end of each year, so that the SHU given is an agreement of the members.

The return on capital alone can be seen in Table 17. Based on this table, the return on capital alone is still below 10%. This means that the cooperative's ability to pay SHU to members is still below 10%, both during the Covid-19 pandemic and FMD. The SHU distributed is an agreement by cooperative members at the Cooperative Member Meeting (RAT).

The next indicator is operational independence. The formula for this indicator is a comparison of net participation or income compared to cooperative business expenses or in other terms, the R/C ratio (Nugroho and Masud, 2021). Based on Table 18, it shows that net participation compared to operating expenses is more than 1. This means that the cooperative is still able to generate profits to cover operational costs.

### Cooperative financial performance during the Covid-19 pandemic and foot-and-mouth disease

Based on the description above, the financial performance of cooperatives is measured by the Key Performance Index (KPI). The performance can be identified by looking at the ratio value compared to the standards set by the Ministry of Cooperatives and SMEs. The results of the performance appraisal can be seen in Tables 19 and 20. Based on Tables 19 and 20 it can be seen that the ratio values of each aspect of capital, productive asset quality, efficiency, liquidity, and independence and growth are converted into indicator values for each of these aspects. The total value of the indicators for each indicator is averaged to become the value of cooperative performance during the Covid-19 and FMD pandemics. The comparison of cooperative

Table 19. Service operational independence

Cooperatives	Covid-19 (2021)			FMD (2022)		
	Netto participation (IDR)	Business and cooperative expenses (IDR)	Ratio (%)	Netto participation (IDR)	Business and cooperative expenses (IDR)	Ratio (%)
KBPS Pangalengan	29,449,938,865	28,203,313,202	104.42	25,576,083,629	25,349,833,884	100.89
KSU Tandangsari	2,800,132,353	2,288,365,129	122.36	12,026,104,203	10,698,175,891	112.41
KPS Bogor	4,116,324,070	3,448,550,262	119.36	3,293,059,256	2,896,782,220	113.68

Table 20. Cooperative financial performance during the Covid-19 pandemic

Aspects of financial performance	KBPS Pangalengan		KSU Tandangsari		KPS Bogor	
	Ratio value (%)	Indicator value (%)	Ratio value (%)	Indicator value (%)	Ratio value (%)	Indicator value (%)
<b>Equity</b>						
Cooperative equity ratio to total assets	32.65	50.00	39.68	50.00	53.76	100.00
Cooperative equity ratio to risky loans	97.01	100.00	55.72	60.00	90.69	100.00
Equity adequacy ratio	32.96	100.00	40.09	100.00	54.31	100.00
<b>Earning asset quality</b>						
Loan volume ratio	11.25	-	77.10	100.00	53.53	75.00
Risk ratio for non-performing loans	7.64	80.00	46.00	-	36.79	20.00
Risk reserve ratio	351.49	100.00	31.29	40.00	101.19	100.00
<b>Efficiency</b>						
Operating expense ratio for cooperative members	95.77	50.00	90.89	75.00	83.78	100.00
Cooperative operating expense ratio	2.765.40	80.00	1.867.83	80.00	516.42	80.00
Service efficiency ratio	7.64	75.00	46.00	-	36.79	-
<b>Liquidity</b>						
Cash ratio	48.60	25.00	24.87	25.00	52.77	25.00
Loan to fund ratio	83.98	199.00	89.47	100.00	95.43	100.00
<b>Independence and growth</b>						
Assets rentability	0.92	25.00	1.58	25.00	4.94	25.00
Cooperative equity rentability	2.73	25.00	3.98	25.00	8.52	100.00
Service operational independence	104.42	100.00	122.36	100.00	119.36	100.00
<b>Average financial performance</b>		<b>72.07</b>		<b>55.71</b>		<b>73.21</b>

financial performance in each of these periods can be seen in Table 21.

Based on Table 22, it can be seen that the financial performance of cooperatives during the Covid-19 pandemic was better than during the FMD period. This proves that the business activities of dairy cows were not disrupted during the Covid-19 pandemic, even though during this period there were restrictions on movement in order to eliminate the spread of the Covid-19 virus between humans. Information from cooperative management, dairy cows must still be given grass and concentrate feed even though there are activity restrictions so that breeders will try to find grass in

areas where there is a lot of forage. In addition, the spread of the Covid-19 virus is not transmitted from humans to dairy cows so that cattle business activities are carried out normally. On the other hand, the spread of the FMD virus occurs between livestock and humans and humans can become carriers for the spread of the FMD virus. The FMD virus does not affect humans, it only affects cloven-hoofed animals. During this period, there was quite a high mortality of dairy cows, especially in West Java. The large number of deaths of dairy cows, especially productive ones, has resulted in a decrease in milk production which has an impact on the income level of farmers and cooperatives.

Table 21. Financial performance of cooperatives in the period of foot-and-mouth disease

Financial aspects	KBPS Pangalengan		KSU Tandangsari		KPS Bogor	
	Ratio value (%)	Indicator value (%)	Ratio value (%)	Indicator value (%)	Ratio value (%)	Indicator value (%)
<b>Equity</b>						
Cooperative equity ratio to total assets	32.65	50.00	46.49	100.00	40.90	100.00
Cooperative equity ratio to risky loans	90.08	100.00	59.19	60.00	56.68	60.00
Equity adequacy ratio	32.65	100.00	46.39	100.00	53.13	100.00
<b>Earning asset quality</b>						
Loan volume ratio	10.55	-	95.03	100.00	84.24	100.00
Risk ratio for non-performing loans	9.92	80.00	51.00	-	40.00	10.00
Risk reserve ratio	269.58	100.00	26.7	30.00	119.61	100.00
<b>Efficiency</b>						
Operating expense ratio for cooperative members	99.12	50.00	88.96	100.00	95.75	50.00
Cooperative operating expense ratio	1462.25	25.00	3379.47	25.00	641.84	25.00
Service efficiency ratio	25.39	0	17.77	0	11.74	50.00
<b>Liquidity</b>						
Cash ratio	48.09	25.00	17.32	50.00	49.67	25.00
Loan to fund ratio	90.66	100.00	94.03	100.00	93.3	100.00
<b>Independence and growth</b>						
Assets rentability	0.99	25.00	0.98	25.00	3.93	25.00
Cooperative equity rentability	3.04	50.00	3.64	50.00	8.17	100.00
Service operational independence	100.89	100.00	112.41	100.00	113.68	100.00
<b>Average financial performance</b>		<b>57.50</b>		<b>60.00</b>		<b>67.50</b>

Table 22. Comparison of cooperative financial performance during the Covid-19 pandemic, and foot-and-mouth disease

Koperasi	Key performance index (KPI)			
	During Covid-19	Performance categories	During FMD outbreak	Performance categories
KBPS Pangalengan	72,07	Enough	57,50	Enough
KSU Tandangsari	55,71	Enough	60,00	Enough
KPS Bogor	73,21	Enough	67,50	Enough

Farmers and cooperatives incur a lot of costs in the context of healing livestock affected by FMD, this has an impact on increasing operational costs while income from milk drops drastically.

### Conclusion

Based on the description above, it can be concluded that the performance of cooperative milk production decreased by 19.45% during the Covid-19 pandemic to the FMD as a result of the dairy cow mortality rate of 20.14%. The financial performance of dairy cow cooperatives was in the adequate category, both during the Covid-19 pandemic and toefoot and mouth disease, but there was a decline in the ratio in all aspects of financial performance during the FMD. Thus, the performance of milk production and the financial performance of dairy cooperatives was better during the Covid-19 pandemic than during the FMD period. Therefore, dairy farming cooperatives must be alert to the decline in dairy cow population and milk production due to the FMD outbreak by strengthening milk production and cooperative finances.

### Conflict of interest

The manuscript was written by the team and there is no conflict of interest with any party related to the materials discussed in the paper.

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### Author's contribution

AF: Conceptualization of ideas, data collection, data analysis, manuscript writing, and comment review improvement; TK: conceptualizing ideas, compiling questionnaires, supervising data collection, and writing manuscripts; MAM: preparation of questionnaires, supervision of data collection, and writing of manuscripts.

### Ethics approval

Therefore this research is not related to the treatment of animals or plants, it does not require the Ethics approval.

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