Production Cost of Friesian Holstein (FH) Frozen Semen Produced by BBIB Singosari

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Abstract— *Productivity and low-quality genetics are the most common problems in dairy industry in Indonesia. Artificial Insemination (AI) using frozen semen will play important roles to increase the quantity and genetic quality of dairy cows in Indonesia. Singosari National AI Centre is a public service agency which has main target to produce, distribute, market and monitor the quality and develop artificial insemination. The mission of Singosari National AI Centre is increasing the production of frozen semen and diversification of high-quality genetics, improve the quality and quantity of frozen semen, and also develop service for local and export market. A good quality of Frozen Semen depends on factors including livestock management, feeding, recording, semen collection and marketing. This set of procedure affecting the production cost of frozen semen produced by Singosari AI Centre. The aim of this research is analysing production cost of FH Frozen semen Produced by Singosari AI Centre. Production cost analysis includes variable cost, fixed cost, total cost and other factors affecting the production cost. Result of the study informed that the total production cost of FH frozen semen produced by Singosari AI centre is Rp. 4. 635.818.057,- with fizxed cost up to Rp. 4.324.047.000 and variable cost up to Rp. 311.771.073,-. The production cost of the frozen semen is Rp. 7.989,- per straw. On the other hand, the price of FH Frozen Semen produced by Singosari AI Centre is Rp. 7.000.,- in conclusion the selling price of FH Frozen Semen produced by Singosari AI is below the production cost. Moreover, the production cost calculated in this research has not include the genetic value of the bull. Therefore, based on the production cost and with the appreciate of the genetic value, FH Frozen Semen produced by Singosari AI could be sold in higher price.*

Keywords— Production cost, Frozen Semen, Friesian Holstein.

I. INTRODUCTION

Dairy industry in Indonesia plays important roles to meet the requirement of milk in Indonesia. On the other hand, there are serious challenges faced by dairy farmers and industry in Indonesia due to the low productivity and genetic quality of dairy cows in Indonesia. Genetically, dairy cows could produce 15-20 litre per day, however the production of dairy cows in household farmers in Indonesia could only produce milk up to 10 litres per day (Yusdja, 2005). Anggraeni (2012) stated that genetics of dairy cows affecting the milk quality, therefore selecting high quality genetics of dairy cows is important. In Indonesia, the government, farmers, industry and dairy community used Artificial Insemination to increase the population on dairy cows (Polakitan, et all, 2021; Adnyana, et al. 202; Setyorini, 2022).

Artificial Insemination (AI) is a technology can be used to improve genetic quality and productivity (Yekti, 2018). The use of AI increase the possibility of cross breed by using frozen semen with specific genetic quality for better quality calves which have better quality of milk production, adaptation to local feed and condition. Moreover, the use of frozen semen is more economically efficient compare to using bull and protect dairy farming from the spread of infectious disease (Lukman, at all. 2022). The implementation of AI with high genetic quality will provide better quality and quantity of calves.

There are two National AI centres in Indonesia that produce the most frozen semen usen though out Indonesia, especially Java Island, Singosari and Lembang National AI Center (Rosyada, et al, 2020). Singosari National AI Centre is a public service agency which has main target to produce, distribute, market and monitor the quality and develop artificial insemination. As a public service agency, the Singosari National AI Centre aims to serve the community including farmers, inseminator, industry and private sectors to have access to good quality of frozen semen. In Indonesia, frozen semen produced by AI center should fulfill the minimum requirement or standard stated in National Stadard of Frozen semen SNI 4869-1:2021. With the minimum standard, frozen semen produced by the Singosari AI center could increase the production, quantity, quality and service to dairy farming community in Indonesia and also targeting the export market.

Producing Frozen semen of good quality genetic bulls that fulfill the minimum requirement of National Standard require a set of procedures including livestock management, feeding, recording, semen collection and marketing. This set of procedure affecting the production cost of frozen semen produced by Singosari AI Centre. Therefore, this research analyses the production cost of FH Frozen semen Produced by Singosari AI Centre and other factors affecting the production cost of FH Frozen Semen.

II. METHODS

The study was conducted using primary and secondary data. Primary data were collected through interview to Singosari National AI Center, including the head of AI centre, the coordinator of marketing and information, and the coordinator of marketing and relationship. Secondary data were collected from Singosari National AI Center related to production costs and other sources. Data were obtained in quantitative and descriptive analysis using BEP analysis which includes: variable costs, fixed costs, total costs, and factors that affect production costs. The material used is the cost of producing FH (Friesien Holstein) cow semen at BBIB Singosari.

III. RESULT AND DISCUSSION

The maintenance of FH proven Bulls is following a set of procedures feeding, vitamins, physical examination and sexual behavior to produce high-quality of frozen semen. FH Proven bulls that produce frozen semen with good quality standards were selected based on their reproductive qualifications so that the semen can then be accommodated and processed into frozen semen suitable for circulation. Feradis (2010) stated that the reproductive requirements that must be possessed by superior males include high libido, and ability to serve / mating well. Each proven bull in BBIB Singosari in average produce frozen semen 2 times a week, with the number of straws produced as much as 1600 straws/week. Production is carried out through a predetermined procedure starting with preparation to marketing frozen semen.

Income analysis

Production costs include fixed costs and variable costs. Based on the calculation, production costs are the sum of fixed costs and variable costs. The biggest cost in production costs is the average cost of concentrate feed, forage feed, labor and depreciation costs. In accordance with the results of research Sundari and Katamso (2010) showed that the largest cost incurred by the cost of feed amounted to 61.28%. Based on research by Prasetyo et al. (2005) that the total variable costs are 77.94% of the total production costs.

Operational costs are part of the non-fixed costs incurred by the company to pay employee salaries, electricity, water, and transportation. Operational costs function in providing financial needs in one production period, either annually or monthly. In addition, there are fixed costs that are the axis in maintenance or production, because fixed costs will be costs in large quantities but can experience a decrease in quality. High production costs because there are variable costs and fixed costs that have been accumulated in the amount of Rp. 4,635.818,057.

TABLE 1. Fixed cost, variable cost, and Total cost

Bull	Fixed Cost	Variable Cost	Total Cost
FH	Rp. 4. 324. 047. 000,	Rp. 114.863.021	Rp. 4.294.910.021

Source: secondary data, 2022

Production costs can be divided into fixed costs and variable costs. Fixed costs are costs whose size does not depend on the size of production, while variable costs are costs that are directly related to production costs (Soekardono, 2009). Included in the group of fixed costs, namely bank interest, namely the amount of bank interest and repayment of loan principal every month adjusted to the ability of the planned business/project, both the amount of credit, the interest rate and the length of the payback period, insurance costs, depreciation/depreciation is the amount of depreciation fund adjusted with the amount of funds calculated annually based on the method used (Ibrahim, 2003). Revenue is the result of the sale of the business carried out. Total revenue is the cost of production times the amount of semen that can be produced. On the level of dairy farming, revenue is calculated from the sale of milk, calves and rejected cows. Sudono et al. (2003) and Hartono (2006) stated that dairy cattle business revenues consist of sales of milk, sales of unbred calves, sales of unproductive cows and sales of manure.

Productivity Performance

1. Break Even Point (BEP)

Break Even Point (BEP) analysis is one of the economic analysis techniques that is useful in the relationship between total variable costs (TVC) and total fixed costs (TFC) on production output or other measures in business and industrial activities (Gaspersz, 2002). Break even analysis is an analysis that shows the amount of sales volume that can cover operational costs (Emawati, 2007). Break Even Point analysis is an analysis to study the relationship between fixed costs, variable costs, profits and activity volume. If a company has income from the sales volume that is exactly the same as the total cost, so that the company does not suffer a profit or loss, it is called the Break Even point (Soekardono, 2009). Table 2. Shows that the average straw production of frozen FH semen is 537.600/year/cattle. based on the calculation data of semen production, there is a fixed cost and variable cost used during the production process is Rp. 4.294.910.021. The amount of production and the total amount of semen production that can affect the high and low value of BEP. This is in accordance with Retno, A., Sri, M and Achmad, H. (2014) which states that what can affect the Break Even Point (BEP) are changes in variable costs, changes in fixed costs and changes in selling prices. The results of the FH (Friesien Holstein) Frozen Semen BEP at Singosari BBIB are shown in the following table:

TABLE 2. BEP Analysis of FH frozen semen

Bull	Total Cost (Rp/year/head)	Straw production (year/head)	BEP Price (year/head)
FH	4.294.910.021	537.600	Rp. 7.989

Data of the study showed that the BEP price of a single straw FH frozen semen produced by the Singosari National AI Center is Rp 7.989,-. This means that the AI Centre will only get profit if the price of the FH frozen semen is higer that the production cost. However, the price of FH frozen semen at the Singosari National AI Centre is Rp. 7.000,- per straw, which below the production cost. With the current price of FH frozen semen, the Singosari National AI Center make lost up to Rp 989,- per straw to be subsidized by the government.

IV. CONCLUSION

Based on the analysis that has been done, it shows that the production cost of cement per straw obtained is Rp. 7989, with the selling price of frozen cement obtained, namely Rp. 7000. The conclusion shows that the selling price of frozen semen is below the production price, and the frozen semen produced by BBIB Singosari considers the cost of frozen semen production and the genetic quality of FH frozen semen. The researchers suggested that the AI center to take into consideration to adjust the FH frozen semen straw based on the production cost. Therefore, the AI Center will not depend on the government subsidy and be able to produce high quality frozen semen to increase the quality and quantity of dairy cows in Indonesia.

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