

# **[MAN 2] AN ANALYSIS OF PRODUCTION CAPACITY TO MEET CUSTOMER DEMAND IN KOPERASI PETERNAKAN BANDUNG SELATAN (KPBS) PANGALENGAN WITH GREEN TECHNOLOGY CONCEPT**

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## **ABSTRACT**

*The aim of this research is to analyse the production of milk in KPBS with green technology. Nowadays, the market of milk production in the world is very exciting because of the price and demand for dairy products the world are on the rise. New Zealand and Australia are two countries in the world dairy producers that will restructure the dairy industry. Meanwhile, Indonesia has a level of struggle that is left behind as Indonesia is still struggling with the problems of technology and cultivation. However, there are some constraints faced by dairy plants in the implementation and management to produce milks, especially in terms of technology and production. This research will be obtained qualitatively is to get information through an interview with the workers at farms and factory of milk, particularly in the field of production. This research focuses on the production in dairy plants to meet customer demand and how green technology can be implemented to mitigate the problem. Thus, this research can identify the potential dairy production closely and identify the problems that would be faced by the factory before they make consideration to initiate start production activities.*

**Keywords:** *milk production, customer demand, green technology*

## **INTRODUCTION**

Milk is one source of animal protein that is essential for the human body because it has a complete nutritional content and balanced. Therefore, the habit of drinking milk on a regular basis will have a positive impact on health, especially the health of the bones because the milk contains a source of calcium (Ca), which is very beneficial for bone growth and may prevent bone weakening diseases or osteoporosis. Milk is a food that is highly beneficial to humans, which is useful to support growth, boost immunity, prevent osteoporosis and various other benefits so that the milk consumed throughout the ages (Mulijanti & Sugandi, 2010). According to Paterson & Belzen (2014) stated that world milk production amounted to 782 million tons in 2013, an increase of 1.3% compared to 2012. Production in 2014 is estimated at around 805 million tons, an increase of 3% compared with 2013. This is driven by increasing population, income level, and urbanization.

Today, the market of the world is very exciting because of the price and demand for dairy products the world are on the rise. New Zealand and Australia are two countries

in the world dairy producers that will restructure the industry, especially the development of investment to respond to the increase in demand for milk, especially in Asia. Meanwhile, the two countries are constantly fighting so that all countries eliminate all trade barriers in the world dairy products such as subsidies and quotas because they have great importance for the marketing of milk to the whole world. Especially that 95 percent of New Zealand milk products dependent on export markets and the dairy trade accounted for 20 percent of total trade. The information in above shows that developed countries are busy fighting for a world free market so it got access to export markets are huge. Meanwhile, Indonesia has a level of struggle that is still far away as Indonesia is still struggling with the problems of technology and cultivation (Nugroho, 2010).

*“The position of Indonesia in dairy industry of the world is Indonesia as the country's consumer dairy products. Indonesia must face the reality seems to be prepared into a country like Japan importers of livestock products, especially if Indonesia does not immediately fix the agribusiness system” (Nugroho, 2010).*

In addition, national milk needs from year to year increase due to an increase in the population of Indonesia. Central Statistics Agency showed that Indonesia would milk import dependence is very high. National milk requirement that 1.5 billion liters per year, as many as 67% still to be imported (Setiawan, Susilawati, & Isnaini, 2008). According to Farid & Sukei (2011) stated that the problem of low population of dairy cows with low productivity level (11 liters / day), low business scale farmers (average 2-3 head or breeder), green land increasingly limited, the cost of imported dairy cows and seeds are expensive, good farming practices not yet done well, less capital, and mentoring is not optimal. The productivity of dairy cows is also influenced by several factors, including genetic quality of livestock, feed, lactation, milking frequency, dry period, health, sanitation, the environment and reproductive factors (Setiawan et al., 2008).

Currently, there are several dairy industries in Indonesia who have tried to petrify in increasing milk production in Indonesia. On March 22, 1969, was established cooperative named Koperasi Peternakan Bandung Selatan (KPBS) Pangalengan. On April 1, 1969, KPBS Pangalengan officially been incorporated, and on 1 April 1969, is the day commemorating KPBS. In the development of KPBS, they facing various problems and challenges, for instance, in 1969-1979 got tough challenges caused by acceptance of milk by IPS only on weekdays, so the production of milk on holidays untreated, acceptance of milk by IPS should have been processed refrigeration and pasteurization, marketing of milk directly to consumers is quite difficult because it does not guarantee the quality or because of fraud by the reseller and the high level of damage in the milk cooperatives and farmers.

However, the production activities in each industry will face a problem, also with the problems faced by Koperasi Peternakan Bandung Selatan (KPBS) Pangalengan. Following the high demand for consumer milk, the quantity of the services provided by the dairy industry needs to be improved. There is a tendency in which society as consumers would be counter to the product produced if some mistake or damage the case of the consumer. Although the number of requests from consumers cannot be ascertained in the exact figures, but the number of production need to be in balance with the number of requests from consumers. There is a shortage of national milk production

is a major challenge faced by the national dairy farm. Production is insufficient national milk will be met through import policy milk. There are some disadvantages is the depletion of national funds, the loss of the best chance (opportunity loss) derived from unemployed or not exploited the potential of the resources available for the development of agribusiness dairy, and the loss of potential revenue (revenue) that have accrued to the government from taxes if agribusiness dairy well developed in the country (Asmara, Purnamadewi, & Lubis, 2016). A technology also needs to be implemented at this case. We have to implement a green technology that can help solve the problems faced by KPBS Pangalengan, especially in the field of production capacity to meet the demand of consumers. This may have the possibility to KPBS to make another mistake in the process or the results of the milk production. However, this issue may be discussed in the above paper.

By doing this research, the Koperasi Peternakan Bandung Selatan (KPBS) Pangalengan can analyse the benefit of the company by implementing green technology method by comparing the process of current production with the process of production before implementing with green technology method. Besides that, this research is to enhance the workers understanding in Koperasi Peternakan Bandung Selatan (KPBS) about green technology method implementation in the production of milk and can provide a solution to overcome the problem of production capacity with green technology method. On the other hand, this research give contribution to the society, especially in Pangalengan, Indonesia about production milk in Koperasi Peternakan Bandung Selatan, and give contribution to government to improve their quality and quantity of production milk in Indonesia, and work with effective and efficient.

## **LITERATURE REVIEW**

Livestock is one of the sub-sectors that play a role in the growth of the agricultural sector as a whole. The dairy farm is one of the business activities in the livestock sector that has the potential to be developed. Farm development is a shared responsibility between government, public and private. Government organized setting, guidance, control and supervision of the availability of sufficient livestock products, both in quantity and quality, safe, nutritious, varied and uneven. Being private and the public has the opportunity to play a role in realizing the widest sufficiency in livestock products, can be carried out the production, trafficking, and distribution of livestock products (Chalid Talib, 2010).

The potential development of the dairy farm is supported by a relatively natural condition suitable for the development of aquaculture. Potential or business development opportunities dairy cows are also supported by an increase in milk consumption of a country and support the government in achieving food self-sufficiency of the country. Development of agribusiness dairy farm, from providing advice for the production-cultivation until processing and marketing, in the direction of the business more efficient and competitive into one urgent thing to do as increased competition between countries (Asmara et al., 2016). Nugroho (2010) stated that the United States is a large country next world as the largest producer of milk. Expanding markets, especially dairy herds results, will encourage trade accelerated free milk because of expected free trade will not affect the price of milk in the country, while increasing access to export markets. However, some milk-producing countries of the

world like Eastern Europe will not be easy to quickly enter the market freely as they apply import quotas to protect domestic milk prices. It is estimated that the price of milk in the countries of Eastern Europe will drop when lifted import quotas. In contrast to Australia and New Zealand, free trade will bring great prosperity to farmers, because the price of milk is exported is expected to increase by about 22 to 32 percentage.

Livestock development is an integral part of agriculture development in Indonesia. The livestock sector as part of the agriculture in the broad sense is one of the important components to be developed. Most livestock are a source of food and protein is very important for the community. One of the livestock sectors which has a lot of benefits and potential for development in Indonesia is the dairy agribusiness. Geography, ecology and the fertility of the land in some parts of Indonesia have characteristics suitable for the development of the dairy agribusiness. Milk is one farm commodity that has been widely recognized by society. Milk contains the nutritional value of food is quite high due to many needs of the body contained therein. Milk has the privilege to compensate for the lack of other food nutrients. Additionally, milk is easily digested and absorbed by the body (Wardhani, 2010).

The position of the dairy industry in the eyes of the world is Indonesia as the country's consumer dairy products. Indonesia must face the reality seems to be prepared into a country like Japan importers of livestock products, especially if Indonesia does not immediately fix the agribusiness system (Nugroho, 2010). The number of Indonesian population will have an impact on lifestyle changes, as well as growing public knowledge about the importance of consuming food that is not only filling but also beneficial to health, making Indonesia a huge market and potential for different types of commodities that includes benefits for the body and health such as milk. According to Wardhani (2010), the demand for farm products including milk have a normal or luxury properties that will increase fast or even faster than the rate of increase in consumer income. On the other hand, national dairy development is intended to intensify efforts in the field of dairy agribusiness to meet the needs of the domestic milk. In an international trade of dairy products, today Indonesia is in a position as a net consumer. Currently, the supply of milk in the country in 2012 is only able to meet 20 percentages of the stock of milk or about 700,000 tons of needs. If these conditions are not addressed by building a system based agribusiness farms, Indonesia will continue to be a net importer of livestock products, especially dairy cows (Kementrian Pertanian Republik Indonesia, 2012).

Geography, ecology and soil fertility in Indonesia is suitable for the development of the dairy agribusiness. In addition, domestic milk production was still not sufficient to meet the needs of domestic consumption, whereas the pattern of milk consumption nationwide increased 1.6% annually in line with the increase in the level of social welfare. Currently, the product in the country could only fulfil no more than 30% of national demand and the remaining 70% comes from imports. Of course, milk import policy is very draining foreign exchange, reducing business opportunities breeders, even threatening the food security of the nation of Indonesia. Various efforts have been made by the government to increase national milk production, but it is still at a management level raising, institutional, as well as cattle import policy. The market opportunity is so great for the dairy agribusiness so far there has not been optimally utilized by dairy farmers in Indonesia. It can be seen from the imbalance between national consumption and national milk production. Most of the milk available in the

market are imported. Contributions national dairy products is still very small, it must be through the "struggle" of the Indonesian Association of Dairy Cooperatives to increase the quota and the purchase price of fresh milk production in the country. Currently, new domestic milk production could supply no more than 30 percent of national demand, the remaining 70 percent comes from imports (Suprayogi, Latif, Yudi, & Ruhyana, 2013).

Indonesia produces fresh milk is relatively very small at around 635,000 tons per year when compared to the production of fresh milk in Australia and New Zealand, each about 10 million tons per year. Fresh milk production in Indonesia is currently only able to meet the domestic demand of about 35% and the rest (65%) to be imported from abroad. Australia is a major supplier of dairy products to Indonesia, with a value of about 126 million US dollars in 2005, followed by New Zealand (107 million US dollars), then the people of Europe (102 million US dollars). The main products imported from Australia to Indonesia in the form of skim and whole milk powder, followed by cheese, whey, and butter. Basing on the level of consumption of fresh milk is currently in Indonesia, which is about 6 KG per capita per year, this figure is the lowest among ASEAN member countries, even when compared to the consumption of fresh milk in developed countries, such as in Western Europe, USA and Japan which reached about 200 KG per capita per year, the prospect of an increase in fresh milk consumption in Indonesia is still very optimistic (Nugroho, 2010).

Roosganda Elizabeth (2009) stated that some disadvantages or constraints that often appear in the milk production business is the inability to utilize the resource efficiency of livestock, utilizing non-optimal allocation of time and labor involved families resulting in relatively little revenue. To that end, the level of livestock ownership capable of efficient use of time, labor and benefits is a phenomenon that must be applied by farmers. National dairy condition closely related to milk production, either in the form of fresh and processing industries that produce. Domestic milk production is not currently able to cover the needs of the raw material milk processing in the country because most of the national fresh milk production comes from farms.

According to Nugroho (2010), in 2009, the national fresh milk production reached about 1.3 million liters per day, equivalent to 56,000 tons. The amount is only able to meet about 25% of domestic milk needs. In 2010 the national fresh milk production is predicted to reach about 1.41 million liters per day, equivalent to 62,000 tons. On one side of price incentives will encourage improved management of dairy cattle business people which in turn will improve the quality of fresh milk. On the other hand, there are fundamental problems that hamper the productivity improvement of dairy cows in Indonesia. The fundamental problems, among other things, limited human resources breeders main mindset, the scarcity of forage, the high price of concentrate, of many small, limited land, poor management of businesses, limited access to funding agencies, weak handlers milking, and post-harvest, as well as the scarcity of seeds quality. In contrast to the condition of farmers, large-scale industries contribute significantly to the national dairy agribusiness sector. Various investors are interested in investing in the dairy sector because the level of sales of dairy products is expected to grow about 5% in 2010 in line with national economic growth. In 2009 the national dairy cattle population of about 320,000 tails are scattered in 68 different areas of fresh milk centers in East Java, Central Java, and West Java. The cultivation of dairy cows and the majority of small-scale farmers are members of cooperatives fresh milk. Cooperative

accommodate the production of fresh milk and will be marketed to the Milk Processing Industry.

## **RESEARCH METHODOLOGY**

The research methodology is a systematic way to solve the problem well as examine how science research to be carried out. Several parts of the methodology will be described in this chapter, including design of the research, data collection, and research analysis. Those aspects will be explained systematically in this chapter because the methodology of the research is important and it will also define the success of the research. Research methodology can be divided into two methods such as the qualitative and quantitative method.

### **Research design**

Type of research that is used by the author in this research is descriptive qualitative using methods that are categorized in comparative studies. Qualitative methods include the primer data and secondary data to get the right data. The research aimed to compare between one object with the object of another research to look at the differences and similarities types, process the results and so on. The comparative results are expected to be born a new kind of model or better. In qualitative research, to get data that is considered legitimate, valid and reliability is very difficult. Many qualitative research results are doubtful because of a few things, namely the subjectivity of the research is the dominant in qualitative research, data collection techniques that rely on observation and interviews contain many weaknesses when done openly what else is not controlled, and the source of qualitative data is less credible will affect the validity of research results. Researchers conduct research directly to Koperasi Peternakan Bandung Selatan (KPBS) Pangalengan to obtain data from the observation in the form of a list of potential and interviewed stakeholders in Koperasi Peternakan Bandung Selatan (KPBS) Pangalengan. After obtaining the necessary data is then analysed based on the theories and concepts that support and drawn conclusions so that we can know the outcome of this research. After getting the results of the authors will describe the results of a research to be recommended.

### **Data collection**

Primary data is the key data which first known by the researcher itself. Primary itself means that the research is based on these facts, usually comes from the interview from expertize, group discussion from current issues, facts that happened in a specific area. In this research, primary data will be achieving from interviewing an expertise and the person in charge for production in the area where the research conducted. The interview is a way of collecting data used to find out information directly from the source. This interview is used to determine the matters in depth. In the interview, which is becoming respondents are stakeholders Koperasi Peternakan Bandung Selatan (KPBS) Pangalengan. In this research, researchers used tools such as interview guides, stationery, and recorder to facilitate researchers when interviewing subjects of research.

Secondary data is the data that gain from someone other than users or researcher. The common source of secondary data has come from previous research, previews thesis, journal, article or other information that have been published. The most common source for secondary data comes from online literature or online sources which are data

collection techniques of literature sourced from books, media, experts, or from the work of others who aim to draw up a basic theory that we use in conducting research mainly on the development of agro farms. This research collected data from previous research, online sources, journal, and articles. Gaining more knowledge of information based on the scope of research can be applied to help the analysis of the research more effective and get a view from many angles.

### **Analysis data**

Data analysis involves the use of means to complete data. The analysis is done according to the scope of this project. The qualitative data obtained from the interviews with the stakeholders of Koperasi Peternakan Bandung Selatan (KPBS) Pangalengan. Researcher collecting the data from respondent to find the research result. Collecting the data analysis is to identify the problem that occurs on production capacity to meet customer demand in Koperasi Peternakan Bandung Selatan (KPBS) Pangalengan. The data analysis is done when refer to the scope of the research. Researcher collecting the data from the methodology research to gain more information to further the finding of the research.

## **FINDING**

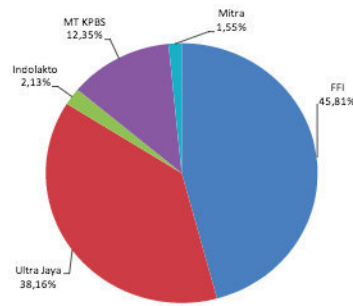
In data analysis, research is presenting the findings from the interviews with the Officer, Mrs. Ina Tafta Uzayna, in Koperasi Peternakan Bandung Selatan (KPBS) Pangalengan. The information is gathered is based on the semi structured interviews. The objective for making the data analysis are to know what the problems that occurred in production of milk in Koperasi Peternakan Bandung Selatan (KPBS) Pangalengan to meet customer demand with implementation of green technology concept.

### **Finding question**

Firstly, what are the problems that occurred among production of milk in Koperasi Peternakan Bandung Selatan (KPBS) Pangalengan to meet customer demand?

According to interviews conducted by respondent, Mrs. Ina, she said there is problem in capacity demand in Koperasi Peternakan Bandung Selatan (KPBS) Pangalengan to fulfil demand from the customer. Based on report, every year KPBS Pangalengan never meet the demand of customers caused by several factors, such as the decrease in the number of stem lactation, decrease in cattle population, the decline in productivity of cows, feeding forage, Wheat pellets and Wheat pollard level member is reduced, and the lack of production capacity in KPBS Pangalengan.

Based on interviews with the officer of KPBS Pangalengan, respondent said that the production capacity of KPBS Pangalengan is around 80 tons per day. In this case, KPBS Pangalengan has the possibility to increase their production capacity by using technology such as milking machine to operates in the milk production process in order to meet the demand with large numbers of the customer. No data conveniently indicate the number of requests from customers that are not fulfilled, because the purchase orders done verbally by the customer and purchase order tailored to the capacity possessed by KPBS Pangalengan.



**Figure 1**  
Marketing of milk KPBS Pangalengan

The percentage of milk marketing place as follows, PT.FFI amounted to 45.81%, PT. Ultra Jaya amounted to 38.16%, PT. Indolacto by 2.13%, MT amounted to 12.35%, and 1.55% Partner. The decline in milk prices worldwide began in early 2015 greatly affect the absorption of national milk significantly, where IPS enforces quality standards higher milk, it has been very difficult for cooperatives are still struggling to improve the quality of milk received from members, so milk marketed obtain optimal pricing. Obstacles still faced by the global and national economic conditions are less supportive of the dairy industry marketing and so the prices received from the IPS is not maximized.

**Table 1**  
Production milk of KPBS Pangalengan

Year	Total Milk (litre)	Milk per day (litre)	Price (per litre)
2011	131,667.90	139,238	Rp3,327.65
2012	44,118,384.36	120,872.29	Rp3,314.68
2013	32,118.305.08	87,995.36	Rp3,647.67
2014	27,869,978.58	76,607.20	Rp4,129.09
2015	27,500,473.21	75,343.76	Rp4,412.33

As we can see in Table 1, the milk production KPBS Pangalengan is always decreasing from year to year. Inversely proportional to the price of milk, which always go up from year to year. This is a problem in the system of milk production in KPBS, while demand from the customer is always rising every year. In 2014 a decline in milk production due to a decrease in the number of stem lactation number, but by mid-year despite a decline in the number of lactating cows after the efforts made by related units began to show results with the increase in production capacity, especially cattle per cow improvements in health and quality of feed. In 2015 production of milk decreased compared to 2014 by 0.04%, this decrease is caused by the provision of alternative feed both raw and finished feed with good quality, so farmers have several options for livestock feed to boost milk production, and increasing awareness of members in the delivery of concentrate adapted to the needs of cattle (projection feeding) and calculation of economical feeding.

Secondly, what is the best way to solve the problem of implementation of green technology method in Koperasi Peternakan Bandung Selatan (KPBS) Pangalengan?

The presence of pathogenic bacteria also caused the unwanted damage so that the milk becomes unfit for consumption. Prevention of damage and the presence of pathogenic

bacteria in milk can be done by handling through a heating process. The main process that is widely used in the processing of milk is the thermal method. The thermal method is a conventional food processing, which is by using heating between 600C-1000C include the pasteurization process. This process is used to extend the shelf life to inactivate the enzyme and reduce the number of microorganisms in milk. Along with the development of technology, the process is deemed to have been ineffective because they have such a negative impact, dissolution of minerals, calcium, and phosphorus, damage whey protein, low-power strained curd, reduced CO<sub>2</sub> levels, a changes in hydrogen ion balance and reduced the formation of cream. Food processing using thermal methods has many negative effects, it would require an alternative to conventional treatment with a non-thermal processing method. One of the non-thermal methods that are being developed is the use of high-voltage electric shock, such as Pulsed Electric Field / PEF. PEF is the processing of foodstuffs is based on the application of short pulses of high voltage (20-80 kV / cm) to foodstuffs at room temperature or below for a few seconds to minimize damage caused by heating. This method is very effective because it can inactivate microorganisms up to 95% without changing the colour, smell, and nutritional value in a very short time (Veri Andriawan, 2015).

## CONCLUSION AND RECOMMENDATION

As a conclusion, this research proves that there is a problem in production capacity at Koperasi Peternakan Bandung Selatan (KPBS) Pangalengan to meet customer demand. High demand for consumer milk, the quantity of the services provided by the dairy industry needs to be improved. There is a tendency in which society as consumers would be counter to the product produced if some mistake or damage the case of the consumer. Although the number of requests from consumers cannot be ascertained in the exact figures, but the number of production need to be in balance with the number of requests from consumers. To overcome the problems faced by dairy industries in Indonesia, especially KPBS Pangalengan, green technology is one way to help overcome these problems, one of which is the PEF (Pulsed Electric Field).

As a recommendation, the use of manure as a source of organic fertilizer to support farming and vegetable crops can be used as a good use of the rest of the milk production process is carried out in KPBS Pangalengan. Hence, it shall overcome to reduce the problems occurred in production capacity at KPBS Pangalengan to meet customer demand without any obstacles. Besides the dairy industry in Indonesia, including KPBS Pangalengan, the other party shall also be responsible for ensuring that problems in production capacity could be reduce to ensure that the dairy industry in Indonesia can be carried out properly.

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