FACTOR ANALYSIS OF PRODUCTION AND ITS EFFICIENCY OF PASTEURIZED MILK PRODUCTION AT CV CITA NASIONAL, SEMARANG REGENCY

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ABSTRAK

Proses pengolahan susu pasteurisasi di CV Cita Nasional membutuhkan bahan baku susu segar, gula pasir, dan perisa dengan formulasi optimum, serta penempatan tenaga kerja yang efisien dan efektif. Bagaimana memperoleh formulasi optimum dan efisiensi alokatif dari penggunaan faktor-faktor produksi susu segar, gula pasir, perisa, dan tenaga kerja terhadap jumlah produksi susu pasteurisasi? Tujuan penelitian adalah menganalisis pengaruh faktor-faktor produksi susu segar, gula pasir, perisa, dan tenaga kerja terhadap jumlah produksi susu pasteurisasi dan menganalisis efisiensi alokatif penggunaan faktor-faktor produksi. Metode penelitian menggunakan analisis data sekunder dari catatan produksi susu pasteurisasi berupa data *time series* harian selama sembilan puluh satu hari. Analisis data menggunakan regresi linier berganda dan perhitungan efisiensi produksi secara alokatif. Hasil penelitian menunjukkan susu segar sebagai bahan baku berpengaruh signifikan sedangkan gula pasir dan perisa tidak berpengaruh signifikan, akan tetapi secara bersama berpengaruh terhadap produksi susu pasteurisasi. Efisiensi alokatif faktor produksi susu segar besarnya 4,10, gula pasir -0,10 dan perisa -1,53. Hal ini menunjukkan bahwa faktor produksi susu segar dan perisa belum efisien secara alokatif sedangkan faktor produksi gula pasir tidak efisien secara alokatif. Perubahan jumlah produksi yang dinamis menuntut pengelolaan faktor tenaga kerja, yang jumlahnya tetap, agar dapat memperoleh distribusi beban kerja yang efektif dan efisien.
Kata kunci: efisiensi alokatif, gula, perisa, produksi, susu pasteurisasi

ABSTRACT

The milk pasteurization process at CV Cita Nasional requires raw milk, sugar, and flavors with an optimum formulation, as well as efficient and effective human resources. How to obtain the formulation optimum and allocative efficiency from the use of production factors of fresh milk, sugar, flavor, and human resources on the amount of pasteurized milk production? The research objectives were to analyze the influence of production factors of raw milk, sugar, flavor, and human resources toward the amount of pasteurized milk production and to analyze the allocative efficiency of the use of production factors. The research method used was secondary data analysis of pasteurized milk production records using daily time series data for ninety-one days. Data analysis was performed using multiple linear regression and calculation of the level of production allocative efficiency. The results showed that raw milk had a significant influence, while sugar and flavor did not have a significant influence. However, all independent variables had an influence on pasteurized milk production. The allocative efficiency of the raw milk production factor was 4.10, sugar was -0.10, and food flavor was -1.53. This result shows that the raw milk and flavor production factors did not meet the allocative

efficiency, while the sugar was not allocative efficient. Dynamic production requires the management of human resources to obtain an effective and efficient job distribution.
Keywords: *allocative efficiency, flavor, pasteurized milk, production, sugar*

INTRODUCTION

Indonesia's population is growing at a fairly rapid pace. According to BPS data (2020), the average annual population growth rate from 2010 to 2019 based on geometric calculations was 1.31. As an instance, Indonesia's population in 2018 and 2019 was 265.02 and 268.07 million people, respectively, while in 2020 it is projected to be 269.60 million people. As Indonesia's population increases every year, the demand for cow's milk to meet the needs of the community increases as well. Cow milk consumption reached 1.01 million tons in 2019, increased to 1.05 million tons in 2020, and is expected to rise 3.33 percent to 1.08 million tons in 2020 (Kementerian Pertanian, 2019).

The milk processing industry of CV Cita Nasional is a pasteurized milk processing company located in Semarang Regency with a milk processing area and a 4-hectare dairy farm. CV Cita Nasional is Capita Farm that produces fresh milk as a raw material provider.

To satisfy the need for raw materials for fresh milk, the company acquires fresh milk supplies from dairy farmers through collaboration with the Village Unit Cooperative (KUD) and the Association of Farmer Groups (GAPOKTAN). The raw material supply will cover some of the raw material demands with a manufacturing capacity of 45,000 liters/day. Comparison of the amount of fresh milk supplied by CV Cita Nasional with fresh milk supply from KUD and GAPOKTAN in 2019 was 5.62% and 94.38%, respectively. This circumstance demonstrates that CV Cita Nasional is extremely reliant on the supply of fresh milk from outside sources, hence the utilization of fresh milk as a raw material for pasteurized milk products must be as efficient as feasible. If the supply of raw materials for fresh milk

from KUD and GAPOKTAN is still insufficient, the company uses imported milk powder (whey). A previous study (Aziz, 2017) supported this condition, showing that the upstream supply chain of CV Cita Nasional as a supplier of raw materials for fresh milk is the Village Unit Cooperative around the factory while the internal supply chain as a raw material processor is the company. The downstream supply chain in the industrial supply chain system is a distributor that distributes products to consumers.

The manufacturing process of pasteurized cow's milk at CV Cita Nasional also necessitates the use of supporting raw materials such as granulated sugar, and food flavors, which in processing require human resources, both as machine operators and other activities. In this case, fresh milk, sugar, food flavors, and human resources are included in the production factors. The results of the manufacturing process of pasteurized milk are marketed by industry in the region surrounding the factory and Semarang City. The industry has grown to the point that it now sells pasteurized milk products throughout Java Island.

Pasteurized milk processing industry of CV Cita Nasional has markets all over Java Island and is classified into four marketing areas, including the Jakarta area (70% total share), Surabaya area (15% total share), Yogyakarta area (8% total share), and Semarang area (7% total share).

Considering that the market coverage of this company is quite vast, it is impossible to deny that business competition with similar industries and pasteurized milk substitute products such as powdered milk and UHT milk is intense.

Competition in obtaining the supply of fresh milk raw materials and product marketing requires the industry to produce products with a high level of allocative

efficiency. The industry aims for optimal manufacturing costs relative to product pricing so that these conditions can be accomplished. In accordance with this, a study conducted by Meisya (2011) revealed that in encountering competition in the pasteurized milk processing business, it is necessary to consider product and price variables. Product variables are crucial aspects of good product quality and well-known product brands. The price variable is linked to the price-setting by the company whose role is significant in competitive competition. In this case, the determination of product prices needs to consider the factors that influence it directly, including production costs and marketing costs (Kotler, 2000).

In addition to the human resource as a production factor, raw materials are a significant component in estimating production costs, both in terms of the amount and price. Pasteurized milk monthly production from CV Cita Nasional demonstrates changes according to consumer orders through its distributors (Parida *et al.*, 2017). This condition has a significant influence on the amount of production. Factors of production, in contrast, have an impact on the amount of production, necessitating the calculation of allocative efficiency.

Because production in the pasteurized milk industry must be kept at an allocatively efficient level for as long as this industry is established, allocative production efficiency must be estimated under a variety of conditions, including changes in the availability of raw materials and the amount of production. Research on the influence of production factors on the amount of production and efficiency in the agricultural sectors remains relatively limited, particularly in the milk processing industry. Research in the dairy processing industry focuses on product quality and production processes. Therefore, this study aims to analyze the influence of production factors on the amount of pasteurized milk production and to analyze the allocative level of production efficiency at CV Cita Nasional.

RESEARCH METHOD

The research framework of this study starts with the understanding that the pasteurized milk processing process at CV Cita Nasional uses raw materials of fresh milk, sugar, flavor, and human resources as production factors. In the initial conditions, the utilization of these production factors leads to pasteurized milk products that are allocatively inefficient in terms of processing. To increase allocative efficiency, it is important to increase or decrease the utilization of fresh milk, sugar, food flavors, and human resources. It is expected that in the final condition, the pasteurized milk production process can be allocatively efficient by increasing the amount of fresh milk and flavor and reducing the amount of sugar.

Research Time and Site

The study was conducted at the company of CV Cita Nasional, Getasan District, Semarang Regency. This research site was selected considering that CV Cita Nasional is one of the companies producing pasteurized milk on a large scale and the supply of raw materials is highly dependent on outside the company. This company also has a broadly wide marketing reach throughout Java Island. The study was conducted from July to September 2020.

Research Methods and Types of Data

The research method employed in this study was secondary data analysis based on production records and information on the amount of utilization of fresh milk, granulated sugar, food flavors, and human resources. This study also utilized a record of the unit price of each production factor and the unit price of pasteurized milk production. Data collection was performed utilizing the time series method with a span of ninety-one days every day.

Data analysis method

The data were tested for normality using the Kolmogorov-Smirnov test employing SPSS before being analyzed.

Then, the data that has been tested for normality was analyzed using multiple linear regression analysis utilizing the Cobb-Douglas production function analysis model with the following formulation (Soekartawi, 2003) :

$\ln Y = \ln a + b_1 \ln X_1 + b_2 \ln X_2 + b_3 \ln X_3 + b_4 \ln X_4 + \mu$

Notes:
Y : Amount of pasteurized Milk Production (liter/day)
X_1 : Amount of Fresh Milk (liter/day)
X_2 : Granulated sugar (kg/day)
X_3 : Perisa Makanan (kg/day)
X_4 : Human resources (HOK)
a : Constant
b : Regression Coefficient
μ : Error

The equations that have been obtained were then tested using the classical assumption test consisting of error normality, multicollinearity, autocorrelation, and heteroscedasticity tests. Analysis of the influence of production factors on the amount of pasteurized milk production was performed utilizing the coefficient of determination test, F test, and t-test.

The measurement of allocative efficiency was performed using the allocative efficiency equation. This efficiency equation is a continuation of the linear regression equation. In this case, the regression coefficient is utilized as the product elasticity for each input. Allocative efficiency is accomplished as the value of the marginal product is equal to the price of the factors of production used. Therefore, the formula can be written as follows (Soekartawi, 2003) :

$$EH = \frac{NPMxi}{Pxi} \frac{NPMx}{Px} = \frac{\frac{dy}{dxi} . Y.Py}{Xi.Pxi} = \frac{bi. Y. Py}{Xi.Pxi} = 1$$

Notes:
EH : Allocative Efficiency Level
NPMxi: Marginal Product Value of Factors of Production of x (Rupiah)
Pxi : Unit Price of Factors of Production of i (Rupiah/ unit factor of production)
Xi : Factors of Production of i
bi : Production Elasticity
dy : Total Product Change/Output
dxi : Changes in the Number of Inputs of Factors of Production
Y : Production (liter)
Py : Pasteurized Milk Price (Rupiah/liter)

EH = 1 indicates that the use of the input of x is efficient. EH > 1 indicates that the use of the input of x is not efficient. To accomplish efficiency, it is necessary to add the input of x. EH < 1 indicates that the use of the input of x is not efficient. To achieve efficiency, the use of the input of x needs to be decreased. To prove that the value of EH is equal to one or not equal to one (different), the One-Sample t-test is employed.

RESULT AND DISCUSSION

Overview of CV Cita Nasional

The processing of pasteurized cow's milk at CV Cita Nasional is by pouring fresh milk as the main raw material into a stirring tank and heating it to 55ºC-60ºC, depending on the desired final product. Sugar, flavor, Cellulose Gum (CMC), cocoa powder for chocolate-flavored pasteurized milk and food coloring for strawberry flavored pasteurized milk are added to the main raw material. In the mixing tank, the fresh milk and other ingredients are stirred for around 10 minutes to mix thoroughly. This mixed fresh milk is then pumped through a pasteurizer that has been set at a temperature of 85ºC.

In order to achieve high product quality, CV Cita Nasional employs the quality control principle during the manufacturing process. The stages of quality control include controlling the quality of the raw materials supplies before and throughout processing.

In the pre-processing stage, the main raw material for fresh milk that does not satisfy the quality criteria stipulated will be discarded. The next stage of quality control is carried out after mixing the main and supporting raw materials in the mixing and intermediate tanks. If the mixing results do not match the quality criteria, they will be reprocessed using a different formula. Pasteurized milk product packaging is sold in 75 mL mini packs, 150 mL cups, and 500 mL pure packs, all with the trademark "Susu Segar Nasional" and varying selling prices depending on the size of the packaging.

The average daily production of pasteurized milk according to data obtained from June, July, and August 2020 is 37,176.10, 39,213.87, and 36,427.33 liters/day, respectively. The average pasteurized milk production in July is better than in June and August according to the number of consumer orders.

The company collaborates with CV Cita Karsa Bersama headquartered in Jakarta for marketing pasteurized milk. The collaboration includes marketing the product to public consumers throughout Indonesia. The marketing company is a subsidiary of CV Cita Nasional, making its business management centralized. Distribution of products from the company to public consumers utilizes means of transportation with a refrigerated space, including trucks, boxcars, and bicycles. The product distribution system employs three-level channels of marketing, including distributors, wholesalers, and retailers (Kotler, 2000). Marketing for industrial or corporate consumers is performed by CV Cita Nasional directly based on request.

The daily fluctuation of pasteurized milk production during the three months of the study was quite significant with the largest daily production of pasteurized milk occurring in July of approximately 50,000 liters/day and the lowest of around 30,000 liters/day was in June, July, and August. The relatively large daily output fluctuation represents the dynamics of the high demand for pasteurized milk on a daily basis, both by the general public and industry or companies.

Production flexibility is critical in responding to variable product demand conditions and the condition of pasteurized milk products that are readily destroyed over time, as well as fluctuations in the volume of production every day. The demands of changing production quantities require companies to arrange a set number of personnel in positions with effective and efficient workloads. In this situation, the function of human resource management is critical, particularly in establishing discipline associated with controlling and integrating the interests of the company with the needs of employees. According to Hasibuan (2003), The most challenging aspect in the human resource management function is controlling the discipline and behavior of the employees. Furthermore, the needs of employees also must be considered the order for the company's interests to be fulfilled. The integration of two frequently-opposed interests is difficult, so it is highly necessary to obtain the effectiveness and efficiency of high production factors of human resources. Human resources have crucial roles in the pasteurized milk processing industry. These roles are implemented both in the processing and the management and administration processes. Based on company records, the company employs a total of 115 permanent workers who work according to the company's working hours.

The results revealed that the average daily supply or utilization of fresh milk in June, July, and August was 29,740.88, 31,371.10, and 29,141.87 liters/day in June, July, and August, respectively. The fresh milk is supplied by Capita Farm by 5.62% and KUD surrounding the factory by 94.38 %. The amount of fresh milk supply is in line with the pasteurized milk production plan. As a result, the demand for fresh milk supply from KUD partners needs to consider the percentage of rejected fresh milk supply. A study conducted by Aziz (2017) showed that the percentage of rejected milk from the KUD

is around 0.05%. The rationale for rejecting fresh milk from KUD is the quality of the milk that does not meet the quality requirement of the SNI standard for fresh milk.

The company utilizes granulated sugar from the sugar supply of PT. Sentra Usahatama Jaya, Indonesia as a supporting raw material. The daily average amount of sugar usage in June, July, August was 4,089.37, 4,313.53, and 4,007.01 kg/day in June, July, and August respectively. The highest average daily use of granulated sugar was in July while that of the lowest was in August. This follows the daily average production of pasteurized milk production in June, July, and August 2020.

Fluctuations in the daily usage of raw sugar raw materials were fairly high. The highest daily usage of granulated sugar in July was around 5,000 kg/day, while the lowest daily usage was of around 3,000 kg/day in June, July, and August. The use of granulated sugar as a sweetener followed the requirements of the relevant company on the amount of pasteurized milk production. The quality of granulated sugar determined the sweetness of the production of pasteurized milk. For this reason, the company used granulated sugar that had fulfilled the SNI-3140.3:2010 standard according to government regulation.

The supporting raw materials for flavoring were provided by several companies, one of which PT Givaudan Indonesia, Indonesia. The average daily amount of flavor usage in June, July, and August 2020 was 29.74, 31.37, and 29.14 kg/day respectively.

In July, the highest daily usage of flavor was around 40 kg/day, while the lowest daily usage was around 23 kg/day recorded in June, July, and August. Flavor quality determined the taste and aroma of pasteurized milk production. For this reason, the company used a flavor that had fulfilled the SNI 01-7152– 2006 standard according to government regulation.

Data Analysis

The results of the data normality test revealed that the Asymp Sig. (2-tailed) < 0.05 for all variables, indicating that all variables were not normally distributed. If multiple linear regression is performed on these variables, then the residual regression results are not normal. To overcome this issue, the variable data was first transformed in the form of the natural logarithm (ln). Therefore, the test for normality errors will acquire the regression residual data which is normally distributed.

Analysis of the Influence of Factors of Production

Based on more detailed observations of research data, the number of human resources was always fixed for 91 times the production process. Therefore, the production factor of the human resources could not be included in the multiple linear regression model. Based on the results of the regression, the estimation of the regression model is as follows:

$$\ln Y = 0.365 + 0.983 \ln X_1 - 0.007 \ln X_2 - 0.018 \ln X_3$$

Furthermore, the results of this regression are transmitted to the Cobb-Douglas production function as follows:

$$e^{\ln Y} = e^{0,365 + 0,983 \ln X_1 - 0,007 \ln X_2 - 0,018 \ln X_3}$$
$$e^{\ln Y} = e^{0,365} . e^{0,983 \ln X_1} . e^{-0,007 \ln X_2} . e^{-0,018 \ln X_3}$$
$$e^{\ln Y} = e^{0,365} . e^{\ln X_1^{0,983}} . e^{\ln X_2^{-0,007}} . e^{\ln X_3^{-0,018}}$$

Therefore, Cobb-Douglas function is:

$$Y = 1,441\ X_1^{0,983}\ X_2^{-0,007}\ X_3^{-0,018}$$

The F value of the SPSS was is calculated as F = 5369.9, while the magnitude of the F table = 2.71. The comparison of these values indicated that F count > F table so that Ho was rejected while Ha was accepted. It indicated that the variables of fresh milk, sugar, and flavor altogether had a significant effect on the variable of pasteurized milk

production. These results demonstrate research empirical evidence, indicating that one of the factors of production cannot be removed from the production process, even though partially it did not have a significant effect. It also explains that because the pasteurized milk product had a particular taste and aroma so that eliminating one of the factors of production will eliminate the taste or aroma of the pasteurized milk product.

In the fresh milk variable, the value of t count > t table, so that Ho was rejected. It indicates that the fresh milk variable had a partially significant effect on the variable of pasteurized milk production. These results demonstrate that adjustment in the amount of fresh milk will fully affect the amount of pasteurized milk production because fresh milk is the main raw material for pasteurized milk production This is in line with the statement of Waseso *et al*. (2017), that the use of fresh milk to produce pasteurized milk corresponds to the amount of pasteurized milk production.

In the variables of sugar and flavor, the value of t count < t table so that Ho was accepted. It indicates that the variables of granulated sugar and flavor had no partial significant effect on the variable of pasteurized milk production. Flavor and granulated sugar are supporting raw materials that function as taste and aroma enhancers in pasteurized milk production. As a result, both do not significantly affect the amount of pasteurized milk production. This is in line with the statement of Waseso *et al*. (2017) that granulated sugar and flavor are supporting ingredients that give pasteurized milk taste and aroma.

The result of the statistical test shows that the value of Adjusted R Square was 0.994 or 99.4%. It indicates that 99.4% of pasteurized milk was influenced by the variables of the inclusion of fresh milk, granulated sugar, and flavor. Meanwhile, the other 0.6% is influenced by other factors outside the multiple linear regression model.

The Influence of Fresh Milk

The elasticity value of the use of fresh milk as raw material for pasteurized milk production was 0.983, indicating that the addition of fresh milk of 1.00% of the average amount of 30098.75 liters also increase the production of pasteurized milk by 0.98% of the average amount of 37623.44 liters with the assumption that other production factors remain constant. The production factor of fresh milk in this research significantly influenced the amount of pasteurized milk production and had a positive relationship direction. It explains that fresh milk as the main raw material for pasteurized milk production is extremely dominant in determining the amount of pasteurized milk production both in terms of the amount of fresh milk and the taste of the milk.

Furthermore, based on the observation of the value of elasticity of production (EP} of the production factor of fresh milk of 0.983, the use of fresh milk had reached a rational or efficient production area (0 < EP < 1). It is in accordance with the statement of Tuwongkesong *et al*. (2013) that if the elasticity of production is between 0 and 1, then the production is in a rational or efficient area because the use of factors of production has reached the optimum level.

The Influence of Granulated Sugar

The elasticity value of the use of granulated sugar as raw material for pasteurized milk production was -0.007, indicating that the addition of fresh milk of 1.00% of the average amount of 4138.58 kg, will decrease the production of pasteurized milk by 0.01% of the average amount of 37623.44 liters with the assumption that other production factors remain constant. The production factor of sugar in this study did not significantly influence the amount of pasteurized milk production and had a negative relationship direction, indicating that the addition of granulated sugar causes a decrease in production. Granulated sugar is a supporting raw material and a source of sweetener in pasteurized milk products. The

addition of this material causes excessive sweetness and does not suit consumer tastes so that influencing consumer demand for products and reducing production.

Based on the observation of the value of elasticity of production (EP} of the production factor of sugar of -0.007, the use of granulated sugar was in an irrational or inefficient production area (EP < 0). It is in accordance with the statement of Tuwongkesong *et al*. (2013) that if the elasticity of production is less than 0, the production is in the irrational or inefficient area. It is in line with the need to adjust the amount of granulated sugar usage by considering consumer tastes in order to make the demand for pasteurized milk products remains good.

Influence of Flavor

The elasticity value of the use of flavor as raw material for the pasteurized milk production is -0.018, indicating that the addition of fresh milk of 1.00% of the average amount of 30.10 kg will decrease the production of pasteurized milk will decrease by 0.02% of the average amount of 37623.44 liters with the assumption that other production factors remain constant. The production factor of flavor in this study did not significantly influence the amount of pasteurized milk production and had a negative relationship, indicating that the addition of flavor resulted in a decrease in production. The flavor is a supporting raw material and a source of flavor and aroma in pasteurized milk products. Therefore, the addition of flavor will influence the taste and aroma of pasteurized milk products. These adjustments in taste and aroma influence consumer demand for pasteurized milk associated with taste and reduce production.

Based on the observation of the elasticity of production value (EP} of the production factor of the flavor of -0.018, the use of flavor was in an irrational or inefficient production area (EP < 0). It is in accordance with the statement Tuwongkesong *et al*. (2013) that if the elasticity of production is less than 0, then the production is in the irrational or inefficient area. It is in accordance with the need to adjust the amount of flavor by considering consumer tastes to maintain demand for pasteurized milk products.

Allocative Production Efficiency

The one-sample *t*-test was employed to determine whether that the EH value in the factors of production of fresh milk, sugar, and flavor was equal to one or not equal to one. The test results of the one-sample *t*-test reveal that the value of sig. (2-tailed) on the three factors of production was 0.000 or <0.05, so that Ho was rejected. It indicates that the EH value of the factors of production of fresh milk, sugar, and flavor was not equal to one.

The results of the allocative calculation of production efficiency on the factors of production are shown in Table 1.

The EH value obtained in the factor of fresh milk production was 4.1 or greater than 1, indicating that the use of fresh milk as a production factor was not efficient. This condition means that the company can increase the use of fresh milk as a production factor in the pasteurized milk production process.

Table 1. Allocative Efficiency Calculation Results

Factors of Production	Elasticity of Production	EH Value
Fresh Milk	0.983	4.10
Granulated Sugar	-0.007	-0.10
Flavor	-0.018	-1.53

It is supported by the statement of (Soekartawi, 2003) that if EH > 1, then it is necessary to add inputs to accomplish an allocatively efficient level of production.

More specifically, raising the use of fresh milk in the pasteurized milk production process can help to obtain the maximum profit. It is indicated by the value of the marginal product of fresh milk that is equal to the price of the production factor of fresh milk.

The EH value obtained in the production factor of sugar was -0.10 or less than 1, indicating that the use of the production factor of granulated sugar was not efficient. This condition indicates that the company should minimize the use of the production factor of sugar in the pasteurized milk production process. This statement is supported by Soekartawi (2003) that if EH < 1, then it is necessary to decrease the number of inputs to accomplish an allocatively efficient level of production. The use of granulated sugar in pasteurized milk processing requires to be considered to suit consumer tastes. In this case, the addition or reduction of the use of granulated sugar in the pasteurized milk production process did not aim to increase or decrease production in quantity, but rather to consider increasing sales as it satisfied consumer tastes. This is in accordance with the statement of Yunita *et al*. (2018) that the factor of taste influences consumer demand for pasteurized milk. More specifically, the decrease of granulated sugar in the pasteurized milk production process aimed to obtain the maximum profit. It is indicated by the value of the marginal product of granulated sugar that is equal to the price of the production factor of granulated sugar.

The EH value obtained for the flavor production factor was -1.53 or more than 1, indicating that the use of the production factor of flavor was not efficient. This condition demonstrates that the company needs to increase the use of the production factor of flavor in the pasteurized milk production process. This is supported by the statement of Soekartawi (2003) that if EH > 1, then it is

necessary to increase the number of inputs to accomplish allocative efficiency. The use of flavor in pasteurized milk processing requires considering consumer tastes. In this case, the addition or reduction of the use of flavor in the pasteurized milk production process did not aim to increase or decrease production in quantity, but rather to consider increasing sales as it satisfies consumer tastes. This is in accordance with the statement of (Yunita *et al*. (2018) that the factor of taste influences consumer demand for pasteurized milk. More specifically, increasing the flavor in the pasteurized milk production process aimed to obtain the maximum profit. It is indicated by the value of the marginal product of flavor that is equal to the price of the production factor of flavor.

CONCLUSION AND SUGGESTION

Conclusion

Based on the results and discussion of this study, the following conclusions can be drawn:

1 The multiple linear regression model demonstrates that the factors of production of fresh milk, sugar, and food flavors altogether influence 99.4% of pasteurized milk production while 0.6% was influenced by other variables outside the regression model. The factors of production of fresh milk, sugar, and flavor altogether had a significant effect on the production of pasteurized milk. The production factor of fresh milk had a significant influence partially with a positive direction on the amount of pasteurized milk production. The production factor of granulated sugar had no significant influence partially with a negative direction on the amount of pasteurized milk production. Granulated sugar served as a supporting ingredient to provide a sweet taste to pasteurized milk products. The production factor of Food did not have a significant effect partially with a negative direction on the amount of pasteurized milk production. Food

flavor served as a supporting ingredient to provide flavor and aroma to pasteurized milk products. Dynamic production adjustments need effective and efficient management of human resources.

2 The use of the production factor of fresh milk had not yet achieved an allocatively efficient level, making it was still possible to add the amount quantitatively. The elasticity of production demonstrates that the production factor was already in the efficient area. The use of the production factor of sugar was not allocatively efficient. However, decreasing the amount of the production factor of sugar to obtain allocative efficiency requires consideration of consumer tastes. The use of the factor of food flavor was not allocatively efficient. However, increasing the production factor of food flavor to achieve allocative efficiency requires considering consumer tastes.

Suggestions

Based on the results of research and discussion, there are some suggestions for companies to obtain better allocative efficiency as follows:

1 In the process of processing pasteurized milk, the company can increase the use of the production factor of fresh milk to obtain an allocatively efficient level.

2 In the process of processing pasteurized milk, the company can reduce the use of the production factor of sugar to obtain an allocative efficient level.

3 In the process of processing pasteurized milk, the company can increase the use of the production factor of food flavor to obtain an allocative efficiency level.

4 In further detail, reducing granulated sugar and increasing food flavor needs consideration of consumer tastes as there is a positive influence of consumer tastes on the demand for pasteurized milk, which also influences the amount of production.

5 In accordance with the suggestions related to the importance of information on the influence of consumer tastes with the production level above, which is expressed in the form of pasteurized milk demand, further studies are required to be conducted to research the influence of pasteurized milk taste on the level of pasteurized milk demand at CV Cita Nasional. Therefore, the company can use the results of the study to complete the reference in making decisions whether to increase or reduce the factors of production of fresh milk, granulated sugar, and food flavor to obtain an allocative efficient production level and an optimal level of demand.

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