AGRISOCIONOMICS
Jurnal Sosial Ekonomi dan Kebijakan Pertanian
ISSN 2580-0566; E-ISSN 2621-9778
http://ejournal2.undip.ac.id/index.php/agrisocionomics
6 (2): 246-252, November 2022

ANALYSIS OF SOYBEAN INVENTORY CONTROL AS RAW MATERIAL FOR KIZZ CRUNCHY TEMPE CHIPS

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Submitted 17 March 2022; Approved 19 May 2022

ABSTRACT

Inventory control of raw materials is very important at Zanada Tempe House so that soybeans can always be available without the need for additional inventory costs due to excess orders with an irregular schedule. Soybean raw materials that will be processed by Zanada Tempe House are only ordered based on estimated production needs, but have not implemented a certain inventory control model to maintain production success so that it remains economical. This study aims to determine the performance of the production process and control of soybean inventory as raw material for economical "Kizz Crunchy" chips at Zanada Tempe House. This research uses a qualitative design and case study method. All data were analyzed using descriptive analysis and the Economic Order Quantity (EOQ) method. The results showed that the total cost of inventory based on company policies was almost two times greater than the calculation using the Economic Order Quantity (EOQ) method. If the EOQ method can be applied, it is able to provide benefits because it can spend costs accurately and to a minimum, cost savings can be made up to 63%.

Keywords: *control, EOQ, inventory, raw material*

BACKGROUND

Tempe chips are one of the processed soybean products, namely thinly sliced tempeh and then fried using seasoned flour. These tempeh chips have a crisp and crunchy texture with a taste that tends to be salty and savory. So these tempeh chips are very suitable for consumption as a snack to accompany your spare time. Processing tempeh into tempeh chips provides added value for the perpetrators which of course can generate profit so that it can be used as a business opportunity. According to the Central Statistics Agency, small-scale businesses are productive economic enterprises that stand alone, are carried out by individuals, which only employ 5-19 people consisting of paid unskilled workers, owner workers, and unpaid family workers. In West Java, Bandung Regency is the Regency with the largest number of small-scale business owners after Bogor Regency.

Table 1. Number of Businesses by District and Business Scale in West Java

No.	Regency	UMK (units)	UMB (units)	Number of units)
1.	Bogor	368,740	6,308	375,048
2.	Sukabumi	266,945	2057	269,002
3.	Cianjur	249,221	1,587	250,808
4.	**Bandung**	**348,858**	**4,419**	**353,277**
5.	arrowroot	257,858	1,283	259,141
6.	Tasikmalaya	187,458	610	188,068
7.	Nice	138,877	842	139,719

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8.	Brass	94,090	795	94,885
9.	Cirebon	250,162	2,442	252,604
10.	Majalengka	155,419	1,422	156,841
11.	Sumedang	115,039	1,164	116.203
12.	Indramayu	189,325	1,721	191,064
13.	Subang	168,486	1,292	169,778
14.	Purwakarta	85,745	1,501	87. 246
15.	Karawang	230,654	2,952	233,606
16.	Bekasi	225,844	5.198	231,042
17.	West Bandung	155,041	1,246	156,287
18.	Pangandaran	59,990	303	60,293

Source: Central Bureau of Statistics, 2018

Table 1 shows that Bandung Regency has considerable potential for the development of small-scale enterprises. One of the small-scale businesses in Bandung Regency is Rumah Tempe Zanada. Rumah Tempe Zanada is a place that sells tempeh chips as well as a production site for making "Kizz Crunchy" tempeh chips. Tempe Zanada's house is located on Jl. Lawang Wood No. 7, Cibiru Hilir, Cileunyi District, Bandung Regency, West Java. This Tempe Zanada House was just established in 2017 until now it has only been running for 4 years. The Tempe Zanada House was inaugurated byDeputy Regent of Bandung Regency namelyH. Gun Gun Gunawan, S.SI., MSI.He appreciated the existence of Rumah Tempe Zanada whose products are produced by implementing SNI providing hygienic and healthy food ingredients which include HACCP or Hazard Analysis and Critical Control Points which ensure the quality of the production.

Table 2. Production of Chips *"Kizz Crunchy" Zanada Tempe House in 2021*

Month	Total Production of "Kizz Crunchy" (kg)
July	640
August	470
September	405
October	320

Source: Zanada Tempe House "Kizz Crunchy" Production Data for 2021

According to data from Rumah Tempe Zanada, it can be seen that the amount of production of "Kizz Crunchy" chips is not stable, it is feared that if the supply of soybeans is not suitable it will cause losses and eliminate the opportunity to make a profit. If the supply of soybeans is not controlled, it will affect the costs that must be incurred by the Zanada Tempe House. Providing raw materials efficiently is the main factor to achieve the right inventory. Judging from this situation, management of soybean inventory control is needed as one of the main raw materials for making tempeh to be used as a follow-up product into "Kizz Crunchy" tempe chips. According to Assauri (2008), inventory control is an activity designed to ensure that existing inventory or supplies are not short of inventory and are maintained at optimal levels to minimize inventory costs.

This is done so that soybeans can always be available without the need for additional inventory costs due to overordering on an irregular schedule. Therefore, it is very important to anticipate this situation by planning a regular supply management of soybean raw materials so that Rumah Tempe Zanada can continue to survive in the long term. The purpose of this research isto know the performance of the tempeh chips production process *"Kizz Crunchy"* implemented at Zanada Tempe

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House and to determine the control of soybean supplies as raw material for tempe chips *"Kizz Crunchy"* the economical one at Zanada Tempe House.

RESEARCH METHODS

The research was conducted in November-December 2021 at the Tempe Zanada House which is located at Jalan Kayu Lawang no. 7, Cibiru Hilir, Cileunyi District, Bandung Regency, West Java. The selection of research sites was done intentionally or purposively. The design used to support this research is a qualitative design with a case study technique. The analytical tool used is descriptive analysis and analysis using the Economic Order Quantity (EOQ) method. This descriptive analysis is used to answer the identification of the first problem, namely to find out how the production performance of "Kizz Crunchy" tempeh chips is performed by using the data in the table. Identification of the second problem, namely regarding how much quantity of good inventory and when should Rumah Tempe Zanada re-order soybeans from suppliers, will be analyzed using the Economic Order Quantity (EOQ) model.

RESULT AND DISCUSSION

Demonstration of "Kizz Crunchy" Tempeh Chip Production Process

The thing that makes "Kizz Crunchy" tempeh chips one of the typical souvenirs from Bandung is their savory taste and crunchy texture. This is also obtained from the use of tools and the selection of good raw materials. As a food product that prioritizes taste, "Kizz Crunchy" tempeh chips require a good composition of ingredients. In addition to soybeans and yeast as the main raw materials, supporting materials are also needed to support the taste of the tempeh chips themselves, namely cassava starch, water, garlic and salt.

Tools are needed to process the ingredients into "Kizz Crunchy" tempeh chips. Each step in the process of making tempeh chips requires a variety of tools. The tools used include the latest tools such as Automatic Soya Bean Peeler, Slicer, Spinner, and Membrane Alufoil Sealer machines. Other tools that support the production process include digital scales, mixing tables, soaking and washing tanks, boiling pans, stoves, fans, fermentation racks, trays, heaters, cassava starch containers, funnels, blenders, spice containers, pans, tongs, strainers, jars, and packing racks.

Tempeh Chips Production Process "Kizz Crunchy"

The "Kizz Crunchy" chips owned by Rumah Tempe Zanada are characterized by their crisp, crunchy and delicious texture. This is due to the selection of good quality soybeans and good water quality in the manufacturing process. Soybeans need to go through several stages in the manufacturing process, including sorting, washing, soaking, boiling, and good serving techniques, so that they become delicious "Kizz Crunchy" tempe chips. The stages of the process of making "Kizz Crunchy" tempeh chips are sorting, peeling, washing and draining I, soaking, washing and draining II, boiling, draining, inoculation I, packaging, fermentation I, inoculation II, packaging I, fermentation II, cutting, crushing seasoning, seasoning dipping, frying, draining, packaging II.

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Soybean Inventory Management Applied by Zanada Tempe House

Soybean orders are made when there are 20 kg of soybeans left in the warehousethat isneeded for production until the next day. This is done to maintain the quality of the soybeans and prevent them from accumulating in the storage room. Usually, 500 kg of soybeans are ordered by telephone from a supplier in Bandung within one month, so Rumah Tempe Zanada orders 12 times in one year. Soybean storage at Rumah Tempe Zanada is very easy because access to the warehouse is always controlled. The warehouse is located inside the Tempe Zanada House with an area of 20 square meters, with only the air duct from the entrance and lighting. The soybean utilization system that applies is the First In First Out method, the first soybean that enters the warehouse is used first.

Inventory Costs

Soybean orders are made by telephone with the supplier. After that the supplier will prepare a number of ordered soybeans and immediately delivered according to the request. The total order fee incurred for one order is Rp. 365,000 consisting of transportation costs, driver fees, communication costs, and administrative costs. The frequency of purchasing raw materials in one year should be 12 times, but because in April the Zanada Tempe House did not purchase raw materials because there was no production that month, and soybean supplies were still there from the previous month, so only 11 times in one year. Then the ordering fee is Rp. 4,015,000. Storage of soybeans in a warehouse aims to maintain the quality of soybeans so they don't deteriorate quickly, namely by providing air circulation, adequate lighting, and a room that is not damp. CostThe only costs incurred due to soybean storage are electricity costs and maintenance costs for warehouse cleanliness. Jthe total cost of storing soybeans in a warehouse per month is Rp. 246,000, so it can be calculated that the total cost of storing soybeans in one year is Rp. 2,952,000. The storage costs incurred are the total storage costs per year divided by the total purchase of raw materials, which is Rp. 881.194 kg/year.

Calculation with the Economic Order Quantity (EOQ) Method

Calculation of soybean inventory using the EOQ method because this method is the oldest and widely known inventory method, is intended to obtain the quantity of soybean orders to meet production needs by minimizing the total cost of inventory and the balance between ordering costs and storage costs.

Table 3. Comparison of Calculation Results

No	Calculation Type	Company Policy (Rp)	EOQ Method (Rp)
1.	Order Fee	3,807,184.9	714,740,826
2.	Storage Fee	134,181,613	714,740,419
3.	Total Inventory Cost	3,941,366.1	1,429,481.24
4.	Order Frequency	12 times	2 times

Source: Primary Data Processed

The comparison of the total cost of inventory between the policies implemented by the company and the calculation of the EOQ method is very different. The total inventory cost based on company policy is Rp. 3,941,366.1 while based on the calculation of the EOQ method it is only Rp. 1,429,481.24. The total cost of inventory based on company policy is almost 2 times greater than the calculation of the EOQ method. If the EOQ method can be applied, it will be able to provide benefits

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because it can issue costs appropriately and as minimally as possible. Rumah Tempe Zanada is able to save expenses.

$$E = \frac{\text{Company Inventory Costn} - \text{Inventory Cost Using EOQ Method}}{\text{Company Inventory Cost}} \text{ x } 100\%$$

$$E = \frac{3.941.366,1 - 1.429.481,24}{3.941.366,1} \; x \; 100\%$$

E = 63 % (Percentage cost efficiency)

Cost savings can be made up to 63%. The efficiency of the total cost of supplying soybeans as a raw material for "Kizz Crunchy" chips obtained according to the EOQ method allows Rumah Tempe Zanada to make savings and the remaining costs can be allocated to other fields, one of which is increased marketing because this product already has a good image, but not widely known by the public. So, it is unfortunate if the costs incurred are only focused on raw materials. The marketing activities carried out are to influence consumer purchasing decisions for this "Kizz Crunchy" tempeh chip product.

CONCLUSION AND SUGGESTION

Based on the results of research that has been done,Rumah Tempe Zanada uses imported soybeans as the main raw material for making "Kizz Crunchy" tempe chips and several other supporting ingredients such as cassava starch, water, garlic, and salt. To produce savory and crunchy tempeh chips, soybeans go through 17 stages of the production process, starting from sorting to packaging. Soybean raw material control system at Zanada Tempe House is not optimal. The EOQ method is used to optimize raw material inventory costs.The total cost of soybean inventory according to the calculation of the Economic Order Quantity method is smaller than the calculation according to the company, which is Rp. 1,429,481.24 or a saving efficiency of 63%. This shows that the Economic Order Quantity method can reduce the costs incurred by the company to supply soybeans as raw material for "Kizz Crunchy" tempeh chips.

Based on the conclusions that have been described, there are several suggestions related to research as follows:

1. Rumah Tempe Zanada should use the EOQ model to determine the amount of soybean inventory. Before using this EOQ model, Rumah Tempe Zanada should also keep regular bookkeeping for inventory management such as ordering soybeans, using soybeans and other supporting materials as well as the quantity of soybeans used in the production of “Kizz Crunchy” tempe chips. This can help the Zanada Tempe House in evaluating soybean needs so as not to incur additional costs.
2. Carry out continuous marketing so that the “Kizz Crunchy” tempe chips produced by the Zanada Tempe House can be better known by the public.

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