



## Evaluation of Bakery Product Defect at PT. ABC Lampung

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### ARTICLE INFO

#### Article history

Received 02/09/22  
Revised 01/10/22  
Accepted 10/10/22

#### Keywords

Control chart;  
Defect;  
Fishbone;  
LCL;  
UCL

 10.12928/jafost.v3i2.6452

### ABSTRACT

*The purpose of bread quality control is to determine the number of defects in bread during production so that causes and solutions can be found to solve the problem. The control chart method and the Pareto diagram were used to determine the product defect. The Control Chart method aims to determine the control of defective products, whether the production process is still within the control limits or outside the control limits and to find out how to control defective products. This study contributes to investigating the quality control of bakery products at PT. ABC in Lampung. The results obtained after the analysis using the P-Chart control showed that the defect bread data was still within the limits of LCL and UCL. By using the Control Chart method, it shows that the product is still within the control limits. The fishbone diagram method contains several factors that cause defects on the bakery products. These factors include materials, people, machines, and processes. The main factor that is very influential in causing defects in bread is the human factor due to the lack of manpower which causes employees to become tired and lack focus in doing work.*

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## 1. INTRODUCTION

Bread made from the mixture of wheat flour and yeast (Preedy et al., 2011). The development of bread in Indonesia has started since the Dutch occupied Indonesian territory and has been growing until now (Weichart, 2006). In Indonesia, bread is a food that has existed for a long time due to the influence of the colonizers who used to eat bread. Along with the times, bread has undergone many changes and variations made with various flavors and shapes. Now, many modifications of bread from various countries enter Indonesia with

varying tastes and textures. As well as the diversity of flour used and different and modern manufacturing techniques (Nigam, 2015; Živančev et al., 2019).

Quality products can only be produced if there is a good unified process within the company (Rózyło & Laskowski, 2011; Zhou et al., 2007). Every company is required to provide not only high quality of product, but also a good service for customers. That means the industry must provide good product and service or services produced. So, the best processing bakery production is essential for the industry. In other side, the best quality production can compete with product competitors.

PT ABC is a company engaged in the food industry, aware of the intense competition and market demands that must be responded to quickly. Therefore, the company strives to provide maximum service to customers by producing high-quality products to achieve customer satisfaction. From the description above, this study contribute to evaluate the bakery product defect during production.

## **2. MATERIALS AND METHODS**

### **2.1. Materials**

The bread from PT ABC that produced during 25 October to 13 November 2021.

### **2.2. Research Methods**

The study was conducted from 25 October 2021 to 13 November 2021. This study was carried out at PT ABC which is at Jl. Raya Metro-Wates Km. 03 Purwodadi 13B Trimurjo, Central Lampung.

The method used in data collection is observation and active participation from the initial stage to the end of production. Apart from that, the author also made direct observations and interviews with employees of PT. ABC to complete the required data.

## **3. RESULT AND DISCUSSION**

### **3.1. P-control chart**

Control chart used in data analysis defects bread at PT ABC, namely P-Charts. The p control chart is a map showing fractional defects (P) or part control that is rejected for one or more various sample sizes (Savic, 2006). The P-control charts describe the total data defects bakery products. P-control Charts can be seen in Figure 1. In the image of the P-Chart control chart, it can be seen that the blue line shows the proportion of samples that move up and down, the red line shows a straight or stable central line, the green line shows the upper central line which means it has a maximum limit for samples, the purple or lower central line which means minimum limit.

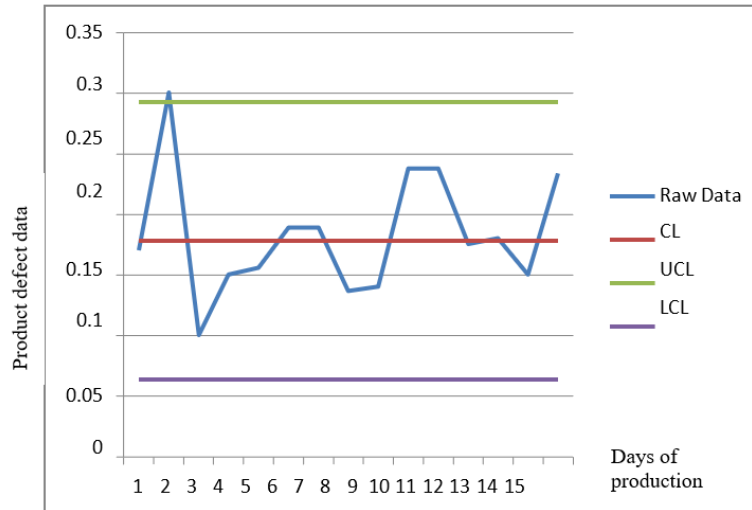


Figure 1. P-control Charts of bakery product defect

### 3.2. Pareto Chart Analysis

The quality of bread can be improved by grouping the defective bread and identifying the problem ranging from the biggest to the smallest. It aims to identify defects in the most significant number so they can be prioritized for immediate improvement (Leavengood & Reeb, 2002). Based on data on the number of types of bread, the defect percentage can be seen on a Pareto Chart (Figure 2).

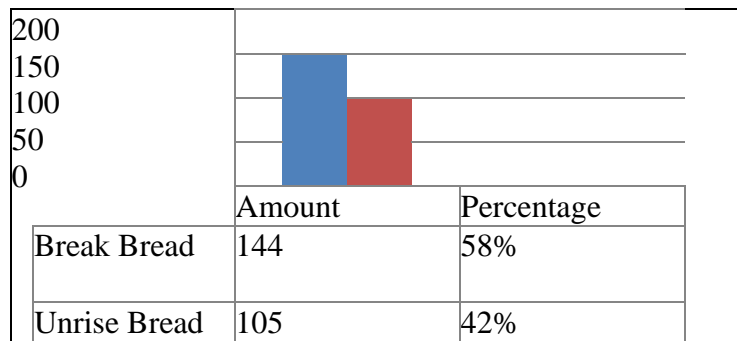


Figure 2. Pareto chart defects bread production

### 3.3. Fishbone Diagram Analysis

Cause and effect diagrams are a technique that is schematically used to see the possible location of a quality problem. Causal diagrams show the causal factors (causes) and characteristics (effects) caused by those factors. Cause and effect diagrams are often called fishbone diagrams because they look like fish skeletons. According to (Heizer et al., 2022; Heizer & Render, 2011). This diagram will show an impact or result of a problem with various causes (George et al., 2018; Neyestani, 2017). The effect or result is written as the muzzle of the head. Meanwhile, fishbones are filled with causes according to the problem. The fishbone diagram can be seen in Figure 3.

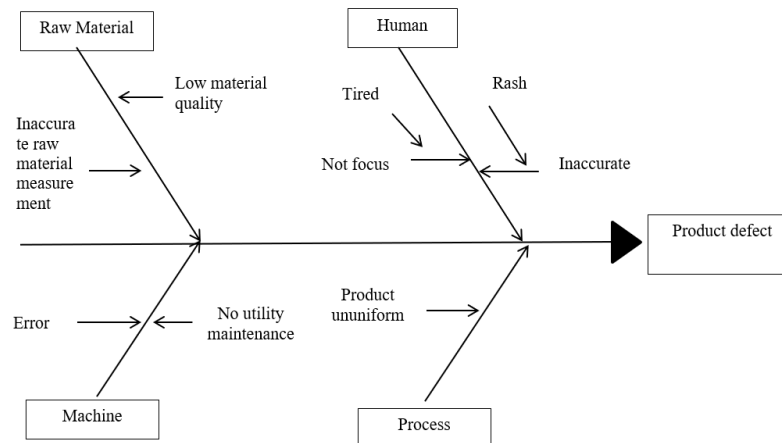


Figure 3. Fishbone Diagrams

Based on fishbone diagrams, an analysis of the factors that cause the number of loaves can be carried out defects. As for the diagram analysis, the fishbone is as follows.

a. Raw material

The first causative factor is raw materials. The poor quality of raw materials can affect the quality of the bread dough, so the quality of raw materials must be checked to produce a final product that is under company standards. The inaccurate dosage of raw materials also causes poor quality of final products and is not following company standards.

b. Man

Factors causing the bread to experience defects the second is human. Unfocused and inaccurate employees in the production process can cause bread to suffer defects. It could be due to fatigue or rush.

c. Machine

During the bread production process, the machine sometimes suffers errors not under the program initially, resulting in defective products on bread. Lack of maintenance and old machine life results in bakery product defects and not following the standards set by the factory.

d. Process

During the bread production process (mixing dough and packaging), the employee made a mistake starting from mixing the dough, which resulted in the bread becoming soggy. When inserting the bread product into the bread packaging machine, it was cut off by the engine because the employee did not properly put the bread into the packaging machine.

Results of chart analysis fish bone above it can be concluded that of the four factors, namely raw materials, humans, machines, and processes, the main factor causing the bread to experience defects is the human factor, where the human element has many causes

#### 4. CONCLUSIONS

Based on the control chart analysis P-Chart it can be concluded that the number of buns defects crossed the UCL boundary in the second observation. Based on the pareto diagram analysis results, it is known that the percentage of damage to sliced bread is 58% and 42% to toasted bread. It can be concluded that the number of loaves defects which is more dominant, namely bread cut by 58%.

Results of the diagram analysis fishbone show that four factors affect the quality control of bread. First, raw materials in terms of quality and dosage of raw materials are not suitable. Then, human employees are not focused and not thorough when the bread production process occurs, so the bread becomes defects. Furthermore, because the machine is old, it does not comply with the standards set by the factory. The process of making dough that does not meet factory standards also has an impact on these bakery products.

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