



## QUALITY CONTROL OF REFINED SUGAR IN THE CARBONATATION PROCESS IN SUGAR COMPANIES

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**Abstract** - Quality control in companies, both service companies and manufacturing companies, is very necessary. With the quality of the services or goods produced, the company hopes to attract consumers and fulfill consumer needs and desires. Quality control that is implemented well will have an impact on the quality of the products produced by the company. The quality of the products produced by a company is determined based on certain measurements and characteristics. Even though the production processes have been carried out well, in reality errors are still found where the quality of the product produced does not comply with standards or in other words the product produced is damaged or has defects in the product. Good product quality results from good quality control. So many companies use certain methods to produce a product with good quality. For this reason, quality control is needed to ensure that the products produced comply with applicable quality standards. The quality standards in question are raw materials, production processes and finished products (Eric A. Hanushek & Wößmann, 2014). Therefore, quality control activities can be carried out starting from raw materials, during the production process until the final product and adjusted to the established standards. There are many methods that regulate or discuss quality with their respective characteristics. Broadly speaking, the meaning of food quality control is that it covers the environment from the company level to the national level which covers all aspects including policy, standardization, control, quality assurance, quality development, and legislation. This quality control covers all types of food products as well as all processing methods and production levels. Supervision of food quality cannot be separated from quality control. This quality control is intended for industrial companies whose production systems can be controlled. For example, control over the type, quantity and quality of products. This quality control also aims to prevent food fraud from circulating in the community. The existence of food adulteration stems from limited production land and an increase in market demand due to an increase in consumer purchasing power. This increase in market needs will lead to innovation and production of new products to address increasing consumer needs

**Keywords:** *Quality Control, Rafinasi and Carbonatation*

### I. INTRODUCTION

Increasingly tight competition in the era of globalization means that every company is required to compete with other companies in the same industry. It is not only enough to provide the best quality service, but the quality of the goods or services offered must also be able to provide quality assurance in order to be able to meet consumer demands. Because it cannot be denied that on the other hand, consumers are increasingly selective in choosing a product or service that they are interested in. Quality products will provide profits for producers and also provide satisfaction for consumers. By paying attention to quality it will have a positive impact on the producer or company. Where good quality can increase demand so that sales results increase and can increase the income of producers or companies. However, consumer dissatisfaction often occurs with a product because the quality produced is lower than the set standards, even though the production process has been carried out well, errors in the production process result in the product not being in accordance with the set

standards. This is one of the factors reducing the quality of a product. So it is necessary to implement an appropriate quality control system that has clear objectives and stages, as well as providing innovation in preventing and resolving problems faced by the company, thus company leaders must keep up with the times and changes that occur in all aspects of the environment so that they are able to maintain survival.

Pengendalian kualitas pada perusahaan baik perusahaan jasa maupun perusahaan manufaktur sangatlah diperlukan. With the quality of the services or goods produced, the company hopes to attract consumers and fulfill consumer needs and desires. Quality control that is implemented well will have an impact on the quality of the products produced by the company. The quality of the products produced by a company is determined based on certain measurements and characteristics. Even though the production processes have been carried out well, in reality errors are still found where the quality of the product produced does not comply with standards or in other words the product resulting in damage or defects in the product. (Sc, 2014) Good product quality results from good quality control. So many companies use certain methods to produce a product with good quality. The quality standards in question are raw materials, production processes and finished products (Eric A. Hanushek & Wößmann, 2014) . Therefore, quality control activities can be carried out starting from raw materials, during the production process until the final product and adjusted to the established standards. To measure the level of product damage that can be accepted by a company by determining the tolerance limit for product defects produced, it can use a quality control method using statistical tools, namely a quality control method that in its activities uses statistical tools contained in the Statistical Process Control (SPC) where the quality of the production process is controlled starting from the beginning of production, during the production process until the finished product. Before being put on the market, products that have been produced are first inspected, where good products are separated from defective products so that the number of products produced is reduced. Therefore, to be able to compete and obtain quality products we must pay attention to all stages of the production process. The production process is the process of changing input into output or a series of processes in creating goods and services or activities that change form by creating or adding to the stated benefits of a good or service. to meet human needs. Many types of goods or services are produced in large quantities so that the number of existing processes is also large. Having good quality raw materials will also provide good quality output. The success of a company in processing these raw materials depends on the company's efforts to search for and carefully select the raw materials that will be used in the production process. The better quality of raw materials will reduce the occurrence of production errors and re-production processes. To obtain good quality raw materials, it is necessary to test or test the raw materials, so it can be seen whether or not the raw materials comply with the criteria set by the company. If the quality of the raw materials meets the established standards, it is hoped that the output product will be of good quality. The availability of raw materials is the most important part of the production process and must be there when needed, apart from that, the stages of the production process must also be considered. The stages of the production process must be carried out correctly, sequentially according to procedures. All of this requires supervision and control in its use and operation so that the company can produce according to the plans that have been set. Quality is a relative measure of goodness. (Irawan, Nasiatin et al., 2020) Thus, the quality of raw materials is the properties of the raw materials, whether the raw materials are of high, medium or even low quality.



## II. METHOD

Research techniques are the methods used to collect data from respondents. According to (Kadarova & Demecko, 2016) data collection is a systematic and standard procedure for obtaining the required data. The success of research is largely determined by the instruments that will be used. Data instruments as data collection tools must be truly designed and made in such a way that they can produce data as they are. To facilitate data collection in this research, data collection techniques in the form of observation, interviews and documentation studies will be used. Observation techniques are tools used to collect data by making direct observations of research objects. Observation is an activity seen from a field that occurs to be used as material for research by researchers, so that researchers get research sources that they see from the field. According to (Baskar & Pragadeeswaran, 2013) Observation is a way to conduct research by means of observation, including the activity of focusing attention on an object using all the five senses.

The interview technique is a data collection technique by conducting questions and answers with respondents to obtain data directly orally. According to (Baskar & Pragadeeswaran, 2013) Interview is a dialogue conducted by the interviewer to obtain information from the interviewee. This technique is carried out with the aim of obtaining information by asking questions directly, both to respondents and to other sources that are related to this research problem. Documentation studies are carried out to collect data sourced from archives and documents related to the research. Guba and Lincoln (Muhassanah & Khozinati, 2021) stated that documentation studies are any written materials or films. In principle, the activities in this research can be grouped into three stages. As stated by Lexy J. Meleong (Juran & Godfrey, 1998) that qualitative research should be carried out in certain stages, This stage is used in research aimed at obtaining a complete and clear picture of the problem being studied. The activities carried out at this stage include: Finding the basis for preparing research data collection tools, Determine the source of research data, Prepare references, Choose the analysis method and approach to be used.

Data analysis is defined as an effort to process data into information, so that the characteristics or properties of the data can be easily understood and are useful for answering problems related to research activities. According to Patton, in Lexy J. Moleong explains that data analysis is the process of arranging the sequence of data, organizing it into patterns, categories and basic units of description. Thus, data analysis techniques can be interpreted as a way of carrying out analysis of data, with the aim of processing the data into information, so that the characteristics or properties of the data can be easily understood and are useful for answering problems related to research activities, both related to description of data or to make inductions, or draw conclusions about population characteristics (parameters) based on data obtained from samples (statistics).

## III. RESULT AND DISCUSSION

According to Earl P. Strong, Control is the process of regulating various factors in a company, so that they comply with the provisions in the plan. Meanwhile, according to Harol Koonnttz, control is the measurement and improvement of subordinates' work implementation, so that plans that have been made to achieve company goals can be implemented. Based on the results of interviews conducted with employees of PT Sentra Usahatama Jaya in the Process Department, namely Ahmad as an Engineer and Jenal and Epi as employees in the Process Department, it is known that the quality of refined sugar produced at PT Sentra Usahatama Jaya is very good. This is in accordance with government

regulations which refer to refined sugar having to be of SNI standard. And if you look at the output produced, refined sugar already has good quality in terms of cleanliness, taste, color and crystal shape. In this research, the control process so that the quality of refined sugar is high quality must pay attention to the following steps:

- a. Raw material inspection
  - b. Always monitor the process of making sugar. This applies to semi-finished sugar and ready-made sugar. The inspection aims to determine whether the quality control process is running as specified
  - c. Machinery, labor and facilities also greatly influence the quality of sugar.
  - d. And what is no less important is maintaining the cleanliness of the factory environment.
- Control/control is carried out through the following stages:
- a. Setting standards and benchmarks. This step includes standards and measures for everything from work targets that must be achieved, to work implementation. These benchmarks can be in the form of regulations, standards, instructions, etc. For this step to be effective, these standards need to be detailed in operational terms, understood and accepted by each individual employee.
  - b. Measuring implementation results (performance). This step is a continuous process, repetitive (repetitive) with the actual frequency according to the type of activity being measured. In this step we check, measure, see the actual results or can also check the implementation.
  - c. Compare implementation and standards. This step is in many ways the easiest to take in the control process, its complex nature may have been overcome in the previous step. So in this step all you have to do is compare the results that have been achieved and those that have been determined previously. If the results comply with the standards, then it can be said that things are proceeding in a controlled manner. But there may also be discrepancies or deviations, this is feedback that needs to be corrected.
  - d. Take corrective action. If results have not been achieved or are decreasing, and analysis shows the need to take action. This action can take the form of multiplying changes to one or more outcomes.

According to the Engineer at PT Sentra Usahatama Jaya Process Department, the supervision carried out to control the quality of refined sugar is as follows:

- a. Hazard Analysis & Critical Control Point (Determining Critical Control Points)  
HACCP is a food safety management system that has been proven and is based on preventive measures. Identify the location of a hazard that may arise in the process, the necessary control measures can be placed accordingly. This is to ensure that food safety is managed effectively and to reduce reliance on traditional methods such as inspection and testing.  
HACCP is a food quality assurance system or a point, stage, or procedure where food-related hazards can be prevented, eliminated, or reduced to an acceptable point (allowable or safe point).  
HACCP (Hazard Analysis and Critical Control Point) can also be linked to food quality tests that must be carried out, because it is based on public awareness of foods that can harm our bodies. Apart from that, it is also based on an appreciation of the many losses caused by processed dangerous foods.
- b. Good Manufacturing Practices is a management concept in the form of appropriate procedures and process mechanisms to produce output that meets standards with a small level of non-conformity. Aims to produce high quality and safe products.  
Good Manufacturing Practices are also procedures for controlling the quality of food

produced by a company. A company that produces food/processed products generally must meet Good Manufacturing Practices (GMP) standards if it wants its products to grow and be trusted by the public and distributors.

c. Food Safety (Food Safety / Food Quality Supervision)

Food safety or food quality control is an activity carried out in the food industry, catering services and food service systems in hospitals which includes the production, processing and marketing of products. This food quality control covers food products, both fresh products, raw materials and processed products. In general, the meaning of food quality control is that it covers the environment from the company level to the national level, covering all aspects including policy, standardization, control, quality assurance, quality development and legislation. (Stamatis, 2015) This quality control covers all types of food products as well as all processing methods and production levels.

Supervision of food quality cannot be separated from quality control. This quality control is intended for industrial companies whose production systems can be controlled. For example, control over the type, quantity and quality of products. This quality control also aims to prevent food fraud from circulating in the community. The existence of food adulteration stems from limited production land and an increase in market demand due to an increase in consumer purchasing power. This increase in market needs will lead to innovation and production of new products to address increasing consumer needs. One of the supervisors who monitors food quality is the Food and Drug Supervisory Agency or commonly known as BPOM. The POM Agency is an institution in Indonesia which is tasked with supervising the distribution of medicines and food in Indonesia. When controlling the quality of refined sugar, the people involved are all production employees, including those from the engineering department who carry out activities in the production process area (Myerson, 2012). Apart from that, the process of controlling the quality of refined sugar also involves Quality Control to control the temperature parameters of refined sugar and determine whether the sugar is standard or not.

The objectives of controlling the quality of refined sugar are as follows:

- a. So that the sugar produced is of quality according to SNI
- b. Fulfill consumer satisfaction
- c. Making high quality sugar

The objectives of implementing quality control (Eric A. Hanushek & Wößmann, 2014) are:

- a. Efficient achievement of company policies and targets.
- b. Improved human relations.
- c. Increased employee morale.
- d. Developing workforce capabilities. By aiming at achieving the above goals, there will be an increase in business productivity and profitability.

Specifically, it can be explained that the objectives of quality control are:

- a. Improve the quality of the products produced.
- b. Reducing quality costs in terms of quality.

The purpose of control/supervision is so that "the implementation process is carried out in accordance with the provisions of the plan and to take corrective action if there are deviations; so that the resulting goals are in accordance with what was planned so that control is not only about looking for errors but trying to prevent deviations from occurring. So control is carried out from the start of the process, until the measurement of the results achieved. With control, it is also hoped that the utilization of all management elements (6M) will be

effective and efficient. Effectiveness (effective) while efficient (effective).

#### IV. CONCLUSION

The way to control the quality of refined sugar is by going through a control process so that the quality of refined sugar is of high quality, so you must pay attention to the following steps, checking raw materials, always monitoring the process of making sugar. This applies to semi-finished sugar and ready-made sugar. The inspection aims to find out whether the quality control process is running as specified. Machinery, labor and facilities also have a big influence on the quality of sugar.

##### 1) Hazard Analysis & Critical Control Point (Determining Critical Control Points)

HACCP is a food safety management system that has been proven and is based on preventive measures. Identify the location of a hazard that may arise in the process, the necessary control measures can be placed accordingly. This is to ensure that food safety is managed effectively and to reduce reliance on traditional methods such as inspection and testing. HACCP is a food quality assurance system or a point, stage, or procedure where food-related hazards can be prevented, eliminated, or reduced to an acceptable point (allowable or safe point). HACCP (Hazard Analysis and Critical Control Point) can also be linked to food quality tests that must be carried out, because it is based on public awareness of foods that can harm our bodies. Apart from that, it is also based on an appreciation of the many losses caused by processed dangerous foods. The aim of HACCP will also tend to reduce the risk of harm from food. (Lestari & Yunita, 2020) So it is possible that HACCP could fail, because there are risks that follow it. However, the risk is very small so HACCP is confirmed to be a very effective food testing system.

##### 2) Good Manufacturing Practices

Good Manufacturing Practices is a management concept in the form of appropriate procedures and process mechanisms to produce output that meets standards with a small level of non-conformity. Aims to produce high quality and safe products. Good Manufacturing Practices are also procedures for controlling the quality of food produced by a company. (Zuniawan et al., 2020) A company that produces food/processed products generally must meet Good Manufacturing Practices (GMP) standards if it wants its products to grow and be trusted by the public and distributors.

##### 3) Food Safety (Food Safety / Food Quality Supervision)

Food safety or food quality control is an activity carried out in the food industry, catering services and food service systems in hospitals which includes the production, processing and marketing of products. This food quality control covers food products, both fresh products, raw materials and processed products. (Surveyandini, 2022) In general, the meaning of food quality control is that it covers the environment from the company level to the national level, covering all aspects including policy, standardization, control, quality assurance, quality development and legislation. This quality control covers all types of food products as well as all processing methods and production levels. Supervision of food quality cannot be separated from quality control. This quality control is intended for industrial companies whose production systems can be controlled (Stamatis, 2015) For example, control over the type, quantity and quality of products. This quality control also aims to prevent food fraud from circulating in the community. (Saputra, 2014) The existence of food adulteration stems from limited production land and an increase in market demand due to an increase in



consumer purchasing power. This increase in market needs will lead to innovation and production of new products to address increasing consumer needs. One of the supervisors who monitors food quality is the Food and Drug Supervisory Agency or commonly known as BPOM. The POM Agency is an institution in Indonesia which is tasked with supervising the distribution of medicines and food in Indonesia. The factors that hinder the refined sugar production process include:

- 1) System
- 2) Human Resources
- 3) Equipment
- 4) Materials
- 5) Management

Meanwhile, according to employees of PT Sentra Usahatama Jaya in the Process Department, several things that are inhibiting factors in the production process are machine damage which is one of the factors inhibiting the production process, and deadlocked material flows often occur, resulting in disruption of the production process. If something happens that becomes an obstacle to the production process which is caused by human resources, warnings and lessons must be given and training must be given, and if it is caused by the equipment then immediately analyze the damage or problem so that it is immediately repaired properly.

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