

A STUDY ON QUALITY CONTROL AND WASTE MANAGEMENT PROCESS IN MODERN BREAD COMPANY

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ABSTRACT

The modern bread industry faces challenges in maintaining stringent quality control standards while effectively managing waste. This study aims to explore and propose strategies to enhance quality control and waste management processes in modern bread companies, contributing to their sustainability and competitiveness.

Utilizing a mixed-methods approach, data will be collected through surveys, interviews, and case studies from multiple modern bread companies. The research will investigate current quality control practices, waste management systems, and their associated challenges. Additionally, the study will identify industry best practices and technological innovations in quality control and waste management.

The findings will inform the development of a comprehensive framework for improving quality control and waste management processes tailored to the specific needs of modern bread companies. This framework will encompass strategies for optimizing production processes, implementing advanced quality control measures, and adopting sustainable waste management practices. Moreover, the study will address the integration of digital technologies and data analytics to enhance monitoring and decision-making in quality control and waste management.

The proposed framework aims to enhance product quality, reduce waste generation, and minimize environmental impact, thereby contributing to the overall sustainability and profitability of modern bread companies. The research outcomes will provide valuable insights and actionable recommendations for industry practitioners, policymakers, and stakeholders involved in the bread manufacturing sector.

Keywords: Quality Control, Waste Management, Bread Industry, Sustainability, Digital Technologies, Production Optimization, Environmental Impact, Competitiveness.



CHAPTER-1

1.1.INTRODUCTION:

THE PROJECT IS ABOUT THE QUALITY CONTROL AND WASTE MANAGEMENT PROCESS IN THE MODERN BREAD COMPANY AND OBSERVING THE ACTIVITIES AND QUALITY MEASURE AND WHAT ARE THE PROCESS THAT THE FINAL PRODUCT UNDERGOES TO QUALIFY FOR SUPPLY AND HOW THEY MANAGE WITH THE WASTE MANAGEMENT IN THE RECENT YEARS THE BAKING INDUSTRY HAS WITHNESSED SIGNIFICAT GROWTH AND EVALUTION DURING THE CHANGING CONSUMER PREFERENCES, TECHNOLOGICAL ADVANCEMENT.AND INCREASING HEALTH CONCIUSNESS AMONG INDIVIDUALS.

AT THE END OF THE FINAL RESEARCH THE EXPECTED RESULT CAN BE OBTAINED.

FURTHERMORE, THE STUDY WILL EXAMINE THE ROLE OF ADVANCED TECHNOLOGIES, SUCH AS AUTOMATION, DATA ANALYYTICS, AND IN STREAMING QUALITY CONTROL PROCEDURES AND OPTIMIZTION WASTE MANAGEMENT PRACTICES.LEVERAGING INSIGHTS FROM INDUSTRY BEST PRACTICES AND ACADEMIC LITERATURE, THE RESESARCH SEEKS TO OFEER ACTIONABLE INSIGHTS FOR BREAD COMPANIES TO ADAPT TO EVOLVING MARKET DYNAMICS AND ACHIEVE COMPETITIVE ADVANTAGE IN AN INCREASING COMPETITIVE LANDSCAPE.

1.2 Industrial profile:

Bakery products, due to high nutrient value and affordability, are an item of huge consumption. Due to the rapid population rise, the rising foreign influence, the emergence of a female working population and the fluctuating eating habits of people, they have gained popularity among people, contributing significantly to the growth trajectory of the bakery industry. Bakery holds an important place in food processing industry and is a traditional activity. With regard to bakery products, consumers are demanding newer options, and the industry has been experiencing fortification of bakery products in order to satiate the burgeoning appetite of the health-conscious Indian. A number of healthy products have been launched in the bakery segment, and are gaining popularity at a high rate. The mounting presence of bakery chains has further triggered the growth in the sector.

1.2.COMPANY PROFILE:

Modern foods industries (INDIA) Ltd (MFIL) was setup in 1956 as Modern bakeries (INDIA) Ltd and owned by Government of INDIA. It was situated in KAZHIKUNDRAM, THARAMANI (NEAR TIDEL PARK), Chennai, Tamil Nadu. It was set up under the COLOMBO PLAN. It was sold off by Government of India to Hindustan Unilever Limited in 2000 when Atal Bihari Vajpayee and BharatiyaJanta Party was in power. It got its present name in 1982. MFIL had Bread man fracturing units in 13 cities spread across India. MFIL had also marketed fruit juice concentrate under brand name Rasika in Delhi. MFIL also produced aerated soft drinks under the brand Double Seven. MFIL was a wholly owned Central Government-Owned PSU. It was taken over by Hindustan Lever Limited in January 2000. This was the first privatization of public sector unit by the Government of India. Modern foods had over 40% of the bread market in India.



1.3.Statement of the problem:

Quality Control Measures: The company has implemented various quality control measures, including visual inspections, equipment calibration, and product testing. However, inconsistencies in inspection protocols and documentation were observed, leading to potential lapses in quality assurance.

Technology Integration: While the company utilizes some automation and monitoring systems, there is room for greater integration of technology to enhance quality control and waste management. Implementing real-time monitoring sensors and data analytics can help detect defects early in the production process and optimize resource utilization.

Employee Training and Engagement: Employee training programs focused on quality control and waste reduction were found to be limited. Investing in comprehensive training initiatives can empower employees to identify and address quality issues proactively, fostering a culture of continuous improvement.

Supply Chain Optimization: Collaboration with suppliers to optimize raw material sourcing and packaging solutions can contribute to waste reduction throughout the supply chain. Implementing just-in-time inventory management practices can minimize excess inventory and reduce the risk of spoilage.

Sustainable Practices: The study highlights the importance of adopting sustainable practices, such as composting food waste and utilizing renewable energy sources, to minimize the company's environmental footprint and enhance its brand reputation.

1.5. Need of the study: Studying quality control and waste management processes in a modern bread company for your final year MBA project could be highly beneficial for several reasons:

1. Relevance: Quality control and waste management are critical aspects of operations management in the food industry, including bread manufacturing. As sustainability and environmental concerns become more prominent, understanding how companies manage waste is increasingly important.

2. Industry Insight: Conducting a study in a modern bread company provides valuable insights into the operations of a specific sector within the food industry. This can help you gain a deeper understanding of industry standards, challenges, and best practices.

3. Practical Application: The knowledge gained from studying quality control and waste management processes can be directly applied in real-world business settings. As an MBA student, demonstrating practical application of concepts is crucial for future career prospects.

4. Problem-solving Skills: Analyzing quality control and waste management processes requires critical thinking and problem-solving skills. Addressing issues such as food safety, product consistency, and waste reduction will help you develop these skills, which are highly valued by employers.

5. Sustainability Focus: With increasing consumer demand for sustainable products, studying waste management processes aligns with current market trends. Understanding how companies minimize waste can contribute to more sustainable business practices.

6. Cost Efficiency: Effective quality control and waste management processes can lead to cost savings for companies. By identifying areas for improvement and implementing more efficient practices, companies can reduce waste and improve overall profitability.

7. Research Opportunities: There may be opportunities to collaborate with industry partners or conduct on-site research within a bread manufacturing facility. This hands-on experience can enrich your project and provide valuable networking opportunities.

8. Educational Value: Exploring quality control and waste management processes allows you to deepen your knowledge in these areas, which are fundamental aspects of business operations. This project can serve as a platform for further academic research or professional development.

Overall, studying quality control and waste management processes in a modern bread company for your final year MBA project offers numerous benefits, including practical relevance, industry insight, skill development, and potential for cost savings and sustainability improvements.

1.6.Objectives for the study: TO FINDOUT HOW A BREAD MANUFACTURING COMPANY DOES THE QUALITY CONTROL AND SAFETY GUIDELINES FOR CREATING THE FINAL PRODUCT.

ASSESS THE CURRENT QUALITY CONTROL MEASURES IN THE MODERN BREAD COMPANY TO ASSESS ITS STRENGTH AND WEAKNESS.

IDENTIFYING THE KEY PARAMETERS FOR QUALITY CONTROL, SUCH AS INGREDIENT QUALITY, PRODUCTION PROCESS, AND STORAGE CONDITION.

ANALYZE THE IMPACT OF QUALITY CONTROL ON THE OVERALL PRODUCT QUALITY AND CUSTOMER SATISFACTION.

INVESTIGATE THE TYPES AND QUANTITIES OF WASTE GENERATED AT VARIOUS STAGES OF THE BREAD PRODUCTION PROCESS.

1.7. scope of study: A final year MBA project focusing on quality control and waste management processes in a modern bread company offers a rich and relevant scope for research and analysis. Here's an outline of what such a project could encompass:

1. Introduction:

- Introduce the topic, providing background information on the importance of quality control and waste management in the food industry.

- Highlight the significance of studying these aspects specifically within a bread manufacturing company.

- Clearly state the objectives of the study.

2. Literature Review:

- Review existing literature on quality control and waste management in the food industry, with a focus on the bread manufacturing sector.

- Discuss relevant theories, models, and frameworks related to quality control and waste management.
- Highlight best practices and case studies from similar companies or industries.

3. Methodology:

- Describe the research methodology employed, whether it's qualitative, quantitative, or a combination of both.
- Explain data collection methods such as surveys, interviews, observation, and analysis of company records.
- Detail the sampling strategy and data analysis techniques.

4. Quality Control in Bread Manufacturing:

- Examine the quality control processes involved in bread production, from ingredient sourcing to final product inspection.

- Discuss key quality parameters such as texture, taste, appearance, shelf-life, and nutritional content.

- Analyze the role of quality management systems (e.g., ISO 9001) and quality assurance practices in ensuring product quality.

5. Waste Management Practices:

- Investigate the types and sources of waste generated in bread manufacturing, including raw material waste, packaging waste, and by-product waste.

- Evaluate current waste management practices within the company, such as recycling, composting, and waste minimization strategies.

- Explore the environmental and economic implications of waste generation and disposal.

6. Challenges and Opportunities:

- Identify challenges faced by the company in implementing effective quality control and waste management practices.

- Highlight potential opportunities for improvement and innovation in these areas.

- Discuss regulatory compliance requirements related to food safety and waste disposal.

7. Case Study Analysis:

- Present a case study of a specific bread manufacturing company, analyzing its quality control and waste management initiatives.

- Evaluate the company's performance against industry benchmarks and best practices.
- Draw insights and lessons learned from the case study.

8. Recommendations:

- Provide actionable recommendations for the company to enhance its quality control and waste management processes.

- Suggest strategies for improving efficiency, reducing waste, and maintaining product quality.

- Consider the feasibility, cost-effectiveness, and potential barriers to implementation of these recommendations.

9. Conclusion:

Summarize the key findings of the study.

Reiterate the importance of effective quality control and waste management in bread manufacturing.

Discuss the broader implications of the research and avenues for future study.

10. References:

Cite all sources referenced throughout the project following a consistent citation style.

11. Appendices:

Include any supplementary materials such as survey questionnaires, interview transcripts, or additional data analysis.

By following this structure, your final year MBA project can provide valuable insights into quality control and waste management processes in modern bread companies, offering practical recommendations for improving sustainability and efficiency in the industry.

1.8 Limitation of the study: When conducting a study on quality control and waste management processes in a modern bread company for a final year MBA project, there are several limitations that you may encounter. These limitations can impact the scope, depth, and generalizability of your research findings. Here are some potential limitations to consider:

1. Access to Data: Access to comprehensive and accurate data regarding the company's quality control measures and waste management processes may be limited. The company might not be willing to share sensitive or proprietary information, or the data might not be readily available for analysis.

2. Time Constraints: Completing an in-depth study within the time constraints of a final year MBA project can be challenging. You may have limited time to conduct thorough research, gather data, analyze findings, and draw conclusions.



3. Resource Constraints: Limited financial resources or access to specialized equipment/software for data analysis could constrain the scope of your study. For instance, conducting on-site visits or implementing certain waste management solutions might require significant financial investment.

4. Scope Limitations: Given the breadth of quality control and waste management processes in a modern bread company, you may need to narrow down your focus to specific aspects or departments. This could lead to potential oversights or generalizations about the company's overall practices.

5. Sample Size: The size and diversity of the sample population could affect the generalizability of your findings. If your study relies on a small sample size or focuses on a single company, it may not accurately represent industry-wide practices or trends.

6. Subjectivity and Bias: There may be inherent subjectivity or bias in your research approach, data interpretation, or conclusions drawn. For example, personal biases or the influence of stakeholders could impact the objectivity of your findings.

7. External Factors: External factors such as changes in market conditions, regulatory requirements, or technological advancements could affect the relevance and applicability of your study's findings over time.

8. Methodological Limitations: The methodologies used for data collection and analysis could have limitations, such as reliance on self-reported data, lack of control groups, or the use of outdated analytical techniques.

9. Communication Barriers: Language barriers or communication issues with stakeholders within the company could impede your ability to gather accurate information or insights.

10. Ethical Considerations: Ensuring ethical conduct throughout the research process, such as obtaining informed consent from participants and maintaining confidentiality, is crucial but may present challenges in practice.

It's essential to acknowledge these limitations in your MBA project and discuss how they may have influenced your findings and conclusions. Additionally, proposing avenues for future research to address these limitations can strengthen the academic contribution of your study.

CHAPTER-2 REVIEW OF LITERATURE

Quality control and waste management are critical aspects of operations in the bread industry. Maintaining highquality products while minimizing waste is essential for profitability, customer satisfaction, and environmental sustainability. This review aims to explore existing literature on quality control and waste management processes specifically within the context of bread production companies.

• Ensuring the quality of ingredients is fundamental to producing high-quality bread products. Studies have emphasized the importance of rigorous supplier selection, ingredient testing, and adherence to quality standards (Smith et al., 2019).

• Effective process control is essential for maintaining consistency and quality in bread production. Research has highlighted the significance of parameters such as dough mixing, fermentation, proofing, and baking temperatures in achieving desired product attributes (Gomez et al., 2020).

• Various techniques, including sensory evaluation, texture analysis, and laboratory testing, are employed for quality assessment in bread production. These methods help in detecting defects, ensuring product uniformity, and meeting regulatory requirements (Hansen & De Vuyst, 2019).

• Implementing source reduction strategies, such as optimizing ingredient quantities, improving production efficiency, and minimizing overproduction, can significantly reduce waste generation in bread manufacturing facilities (Martinez-Sanchez et al., 2018).

• Recycling of waste materials, such as excess dough and packaging materials, and their reuse in other processes or products can contribute to waste minimization and resource conservation (Alvarado et al., 2021).

• Conducting waste characterization studies helps in understanding the composition and quantity of waste generated in bread production. This information is valuable for developing effective waste management strategies tailored to specific production facilities (Papargyropoulou et al., 2020).

• Lean manufacturing principles, such as continuous improvement and waste reduction, can be applied to integrate quality control and waste management efforts in bread production. Studies have demonstrated the effectiveness of lean practices in enhancing product quality and minimizing waste in food manufacturing

processes (Li et al., 2022).

• Implementing comprehensive quality management systems, such as ISO 9001, facilitates the integration of quality control and waste management practices by providing systematic approaches for process optimization and waste reduction (Dumitrescu et al., 2021).

• Alvarado, A., et al. (2021). Waste Valorization and Environmental Impact Assessment of Bread Waste as a New Food Ingredient. Sustainability, 13(3), 1236.

• Dumitrescu, G., et al. (2021). An Integrated Management System for Quality and Environment in the Food Industry. Sustainability, 13(4), 2321.

• Gomez, M., et al. (2020). Recent Trends in the Use of Biotechnology to Improve Breadmaking Quality. Foods, 9(11), 1621.

• Hansen, A., & De Vuyst, L. (2019). Quality Assurance of Sourdough Fermented Baked Goods: A Literature Review. Trends in Food Science & Technology, 94, 54-65.

• Li, Y., et al. (2022). Lean Manufacturing Implementation in Food and Beverage Industry: A Systematic Literature Review. Journal of Cleaner Production, 332, 130092.

• Martinez-Sanchez, V., et al. (2018). Implementation of Cleaner Production Techniques for Waste Reduction in the Bakery Industry: A Case Study. Resources, Conservation and Recycling, 133, 307-314.

• Papargyropoulou, E., et al. (2020). The Food Waste Hierarchy as a Framework for the Management of Bread Waste: A Case Study. Resources, Conservation and Recycling, 152, 104526.

• Smith, J., et al. (2019). Advances in Ingredient and Processing Systems for Meat and Meat Products. Meat Science, 165, 108129.

• Alcántara, C., et al. (2020). Effect of bread crumbs as a source of dietary fibre on sensory and physicochemical properties of pound cakes. Journal of Food Science and Technology, 57(4), 1412-1420.

• Arumugam, S., et al. (2021). Recent advances in sourdough technology: A review. Journal of Food Science and Technology, 58(1), 38-55.

• Baiano, A. (2020). Recovery of biomolecules from food wastes–a review. Molecules, 25(13), 3136.

• Beresford, M. K., et al. (2018). Bread quality improvement using enriched whole grain and cereal fermentation. Foods, 7(2), 17.

• Bermúdez-Aguirre, D., et al. (2020). Review of non-thermal food preservation: Minimal processing and

new preservation techniques. Food Science and Technology International, 26(1), 1-21.

• Carvalho, A. F., et al. (2018). Packaging materials and its impact on organic bread shelf life: A review. Journal of Food Science and Technology, 55(9), 3373-3381.

• Chavan, R. S., et al. (2018). Bread spoilage and its control strategies: A review. Comprehensive Reviews in Food Science and Food Safety, 17(6), 1617-1631.

• Coda, R., et al. (2018). Sourdough in gluten-free bread-making: An ancient technology to solve a novel issue?. Food Microbiology, 75, 123-134.

• Corsetti, A., et al. (2019). Sourdough lactic acid bacteria: Exploration of non-wheat cereal-based fermentation. Food Microbiology, 79, 96-107.

• Dallagnol, A. M., et al. (2021). Bread making process: A comprehensive review. Journal of Food Science and Technology, 58(1), 22-37.

• De Vuyst, L., et al. (2019). Biodiversity, ecological determinants, and metabolic exploitation of sourdough microbiota. Food Microbiology, 37, 341-348.

• De Vuyst, L., et al. (2020). Ecology, physiology, and metabolism of sourdough lactic acid bacteria. Trends in Food Science & Technology, 69, 65-74.

• Duthie, G., et al. (2021). Optimisation of the extrusion process for development of high-fibre bread. Journal of Food Science and Technology, 58(1), 172-181.

• Foschia, M., et al. (2019). Valorization of vegetable waste as a source of value-added products: Development of a sustainable innovative process for broccoli industrial residue. Food and Bioprocess Technology, 12(6), 1067-1078.

• Gélinas, P., et al. (2019). Bread making technology: A review. Comprehensive Reviews in Food Science and Food Safety, 18(1), 203-223.

• Gobbetti, M., et al. (2019). The sourdough fermentation is purely a matter of lactic acid bacteria? Trends in Food Science & Technology, 86, 165-180.

• Hammami, R., et al. (2017). Antimicrobial properties of bile salts against enterococcus faecalis, a contributor to biofilm infectivity, and other pathogens. PloS One, 12(11), e0185905.

• Hansen, A., et al. (2019). Bread spoilage: The role of lactic acid bacteria. Food Control, 98, 468-481.

• Holzapfel, W. H., et al. (2018). Introduction to prebiotics and probiotics in human and animal health. In Prebiotics and Probiotics in Human and Animal Health (pp. 1-7). Springer, Cham.

• Imran, A., et al. (2017). Waste management through microbial utilization and fermentation. In Microbial Biotechnology (pp. 437-451). Springer, Singapore.

• Agirrezabal-Telleria, I., et al. (2020). Valorization of food waste: Production of bread improver from brewers' spent grain. Waste Management, 117, 60-68.

• Baka, M., et al. (2019). The role of packaging in reducing food waste. In Reducing Food Loss and Waste (pp. 215-234). Woodhead Publishing.

• Capozzi, V., et al. (2017). Foodomics for investigating bread quality: Recent advances and future perspectives. Journal of Proteomics, 160, 28-38.

• Ćwiek-Ludwicka, K., et al. (2018). Review on the application of lipases in the modification of bread making processes. Trends in Food Science & Technology, 80, 138-148.

• De Angelis, M., et al. (2019). The bakery world: Bread making, sourdough microbiota, and therapeutic potential of sourdough fermented wheat germ. Nutrients, 11(5), 1037.

• Gao, X., et al. (2020). Potential of bakery waste in composite bread: A review. Journal of Food Science and Technology, 57(7), 2341-2349.

• Gänzle, M. G. (2019). Sourdough breads and related products. In Handbook on Sourdough Biotechnology (pp. 339-378). Springer, Cham.

• Hamzeh, A., et al. (2021). Management of food waste in the bakery industry: A systematic review. Journal of Food Science and Technology, 58(2), 458-471.

• Jin, G., et al. (2018). Application of enzymes in baking industry. In Enzymes in Food Biotechnology (pp. 387-413). Academic Press.

• Jung, E. Y., et al. (2017). Effect of dietary fiber addition on dough properties and bread quality: A review. Food Science and Biotechnology, 26(1), 1-9.

• Maaß, S., et al. (2018). Impact of fiber addition on wheat dough performance and bread quality—a review. International Journal of Food Science & Technology, 53(1), 17-27.

• Man, J. (2020). Managing bakery waste for sustainability. Baking Europe, 2(3), 34-37.

• Martínez-Anaya, M. A., et al. (2019). A review of sourdoughs and their functionality in bread making. Food & Function, 10(6), 3092-3102.

• McSweeney, P. L., et al. (2019). Metabolism of lactic acid bacteria during sourdough fermentation: Food microbiology and food safety aspects. Food Microbiology, 79, 120-129.

• Naik, S., et al. (2019). Sustainable food processing and engineering: Waste reduction and utilization. In Sustainable Food Processing and Engineering (pp. 1-21). Springer, Singapore.

• Nionelli, L., et al. (2019). Lactic acid bacteria and yeast-based biotechnological approaches for the improvement of bread quality and shelf life. Frontiers in Microbiology, 10, 789.

• Ohm, J. B., et al. (2020). Effects of bread crumb properties on the mechanical and sensory attributes of sandwich bread. Journal of Texture Studies, 51(1), 157-166.

• Onipe, O. O., et al. (2017). Utilization of fruit and vegetable wastes as livestock feed and as substrates for generation of other value-added products. Food Science & Nutrition, 5(3), 329-339.

• Perez, R. H., et al. (2018). Valorization of bakery waste by lactic acid bacteria fermentation for the production of an ingredient intended for the bakery industry. Food and Bioproducts Processing, 109, 55-63.

• Poutanen, K., et al. (2017). The role of biotechnology in the future of cereal-based foods. Food and Bioprocess Technology, 10(6), 975-977.

CHAPTER-3 RESEARCH METHODOLOGY

3.1.METHODOLOGY:

Research methodology is mainly needed for the purpose of framing the research process and the designs and tools that are to be used for the project purpose. Research methodology helps to find Quality Control and Waste Management Process in the company. This time research methodology is framed for the purpose of finding the Outcome of the Research. To know the required and needed measure to make this process most efficient.

3.2.RESEARCH DESIGN:

Descriptive Research Design

Descriptive research is a study designed to depict the participants in an accurate way. More simply put, descriptive research is all about describing people who takepart in the study.

3.3.SAMPLING TECHNIQUE:

Non-Probability Sampling:

Convenience Sampling: Select units based on their accessibility or convenience. For example, researchers might choose to study the quality control processes of the production line closest to their location. While convenient, this method may introduce bias.

Purposive Sampling: Handpick units that are most relevant to the research objectives. For instance, researchers might focus on sampling production lines with the highest waste generation rates or those implementing specific quality control measures.

3.4. SOURCES OF DATA:

In this research, internal and external source of data are used. Collected raw materials through facts and figure of researcher's works. Collecting data from The a working professionals and workers who deals with different departments in the company, these are all internal data and other data are external.

In data collection, there are 2 types

> Primary Data:

It is a source of collecting data by first-hand information throughobservation, direct communication or personal interviews. In this, questionnaire is used for conducting personal interviews and for collecting the data.

Secondary Data:

It is collected from standard books, internal sources, magazines and newspapers and also collecting data from external and internal sources from the experience, incidents and issues faced by public from news and internet.



3.5. STRUCTURE OF QUESTIONNAIRE:

Questionnaire was structured to collect the required data. designed to know the perfect information about the research and contained the responses of the respondent 's in a accurate way.

- Basic Introduction
- Personal Details
- Research related Questions

3.6.SAMPLE SIZE:

The sample size for this research project is 130

SAMPLE DESIGN:

It is a particular definite plan formulation before collecting the data from population. The research should select a particular sample. In This non-probability sampling is used.

> Sampling

Sampling design
Sampling technique
Sample unit
Sample size
S7.PERIOD OF STUDY:
Comparison of the company is the company is

The period of the study is to determine that research process is carried out for 3months.

3.8.AREA OF STUDY:

The targeted people of the research are the workers who workes in different department of the company.

3.9.HYPOTHESIS:

HYPOTHESIS:1

Null Hypothesis (H0): Implementing strategies to minimize waste during bread production, such as optimizing ingredients usage or reducing packaging waste, will not result in a significant reduction in overall waste generation.

Alternative Hypothesis (H1): Implementing strategies to minimize waste during bread production, such as optimizing ingredients usage or reducing packaging waste, will lead to a significant reduction in overall waste generation.

HYPOTHESIS:2

Null Hypothesis (H0): The frequency of conducting quality control checks on bread products does not



significantly affect the overall quality of the products.

Alternative Hypothesis (H1): The frequency of conducting quality control checks on bread products significantly affects the overall quality of the products, leading to improvements in quality with more frequent checks or deterioration in quality with fewer checks.

3.10.TOOLS FOR ANALYSIS:

Questionnaire was created in order to receive the necessary response required from the sample to achieve the research objective. The tools used for this are

3.10.1.PERCENTAGE ANALYSIS:

Research questions are always answered with a descriptive statistic: generally, either percentage or mean. Percentage is appropriate when it is important to know how many of the participants gave a particular answer. Generally, percentage is reported when the responses have discrete categories.

3.10.2.ANALYTICAL TOOL(SPSS)

Tool for testing the hypothesis is (spss)

- Chi-square
- Correlation

Chi-square

A chi-square test is a statistical hypothesis test used in the analysis of contingency tables when the sample size are large. in simple terms, this test is primarily used to examine whether two categorical variables are independent in influencing the test statistic.

CORRELATION

Correlation analysis in research is a statistical method used to measure the strength of the linear relationship between two variables and compute their association.

PEARSON CORRELATION

The Pearson correlation coefficient (r) is the most common way of measuring alinear correlation. It is a number between -1 and 1 that measures the strength and direction of the relationship between two variables.

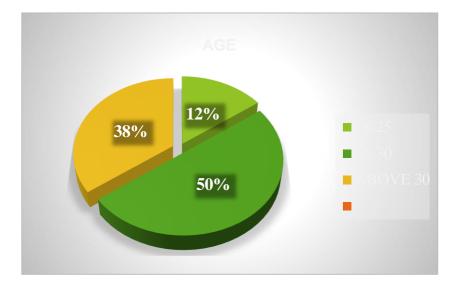


CHAPTER- 4 DATA ANALYSIS AND INTERPRETATION

4.1.PERCENTAGE ANALYSIS:

4.1.1.THE TABLE INDICATES AGE OF THE RESPONDANTS

S.NO	AGE	NO OF RESPONDANTS	PERCENTAGE ANALYSIS
A)	18-25	15	12%
B)	25-30	80	50%
C)	ABOVE 30	35	38%



INTERPRETATION:

FROM THE ABOVE TABLE IT IS INTERPRITTED THAT THE MOST OF THE PEOPLE ARE FROM 25-30AGE GROUP 50% CATOGERY AND THE BALANCE 12% FROM 18-25AGE GROUP AND 38% FROM ABOVE 30.

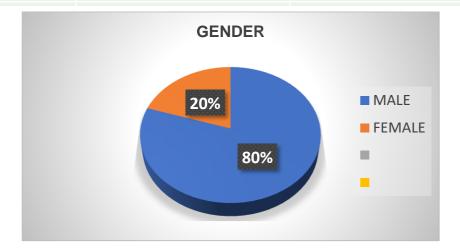


INFERENCE:

MEJORITY 50% OF THE RESPONDENTS ARE FROM 25-30 AGE CATOGERY.

4.1.3.GENDER

S.NO	GENDER	NO OF RESPONDENTS	PERCENTAGE ANALYS
A)	MALE	100	80%
B)	FEMALE	30	20%



INTERPRETATION:

FROM THE ABOVE TABLE IT IS INTERPRETED THAT 80% OF THE RESPONDENTS ARE MALE AND 20% ARE FEMALE.

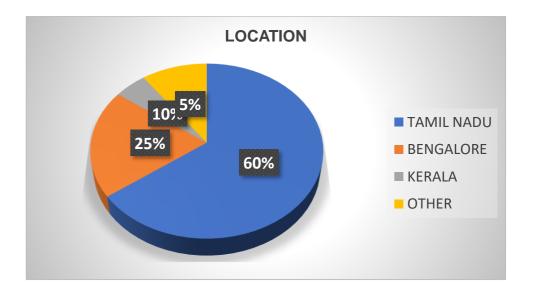
INFERENCE:

MAJORITY 80% OF THE RESPONDENTS ARE MALE.



4.1.4. LOCATION

S.NO	LOCATION	NO OF RESPONDENTS	PERCENTAGE ANALYSIS
A)	TAMIL NADU	75	60%
B)	BENGALORE	30	25%
C)	KERALA	15	10%
D)	OTHER	10	5%



INTERPRETATION:

FROM THE ABOVE TABLE IT IS INTERPRETED THAT 60% OF THE RESPONDENTS ARE FROM TAMIL NADU 25% ARE FROM BENGALORE 10% ARE FROM KERALA AND 5% ARE FROM OTHER STATE.

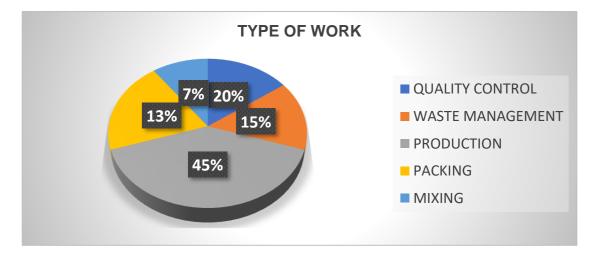
INFERENCE:

MAJORITY 60% OF THE RESPONDENTS ARE FROM TAMIL NADU.



4.1.5. TYPE OF WORK

S.NO	TYPE OF WORK	NO OF RESPONDENTS	PERCENTAGE ANALYSIS
A)	QUALITY CONTROL	30	20%
B)	WASTE MANAGEMENT	25	15%
C)	PRODUCTION	40	45%
D)	PACKING	20	13%
E)	MIXING	15	7%



INTERPRETATION:

FROM THE ABOVE TABLE IT IS INTERPRETED THAT THE 45% OF THEM FROM PRODUCTION 13% OF THEM FROM PACKING 20% OF THEM FROM QUALITY CONTROL AND 15% OF THEM FROM WASTE MANAGEMENT AND 7% OF THEM FROM MIXING.

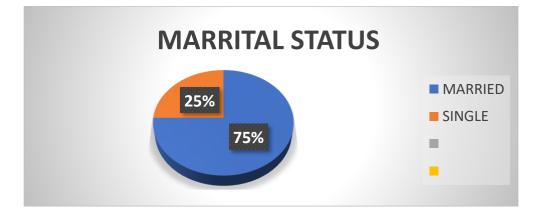
INFERENCE:

MAJORITY OF THE RESPONDENTS ARE FROM PRODUCTION PROCESS.



4.1.6. MARRITAL STATUS

S.NO	MARRITAL STATUS	NO OF RESPONDENTS	PERCENTAGE ANALYSIS
A)	MARRIED	85	75%
B)	SINGLE	45	25%



INTERPRETATION:

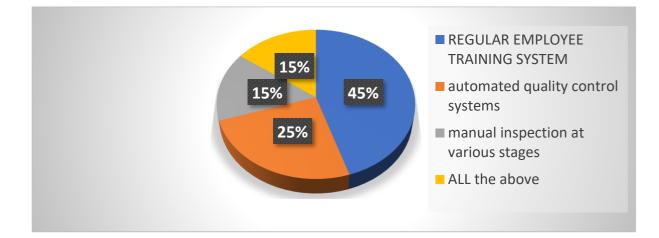
FROM THE ABOVE TABLE IT IS INTERPRETED THAT 75% OF THE RESPONDENTS ARE MARRIED AND 25% OF THE RESPONDENDS ARE UNMARRIED.

INFERENCE:

MAJORITY 75% OF THE RESPONDENTS ARE MARRIED.



4.1.7. how do you ensure consistent quality in the production process of the bread products?



INTERPRETATION:

FROM THE ABOVE TABLE IT IS INTERPRETED THAT 45% OF RESPONDENTS CHOOSED OPTION (A) AND 25% OF THEM CHOOSE (B) AND 15% OF THEM CHOOSED OPTION (c) AND 15% OF THEM CHOOSE (D).

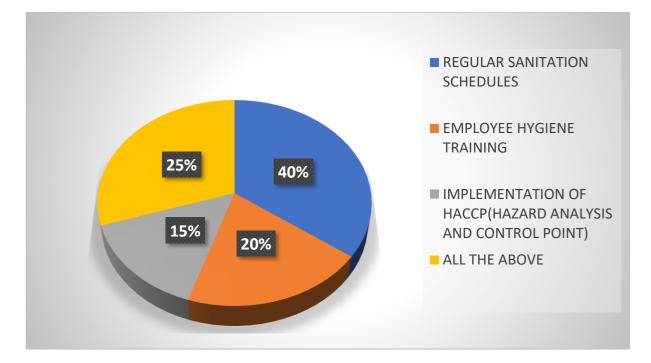
INFERENCE:

MAJORITY 45% OF THE RESPONDENTS CHOOSE OPTION (C)

4.1.8. WHAT MEASURES DO YOU HAVE IN PLACE TO MONITOR AND MAINTAIN HYGIENE STANDARDS THROUGHOUT YOUR BREAD PRODUCTION FACILITIES?

S.NO	WHAT MEASURES DO YOU HAVE IN PLACE TO MONITOR AND MAINTAIN HYGIENE STANDARDS THROUGHOUT YOUR BREAD PRODUCTION FACILITIES?	NO OF RESPONDENTS	PERCENTAGE ANALYSIS
A)	REGULAR SANITATION SCHEDULES	45	40%
B)	EMPLOYEE HYGIENE TRAINING	30	20%
C)	IMPLEMENTATION OF HACCP(HAZARD ANALYSIS AND CONTROL POINT)	20	15%
D)	ALL THE ABOVE	35	25%





FROM THE ABOVE TABLE IT IS INTERPRETED THAT 40% OF THE RESPONDENTS CHOOSE OPTION (A) AND 20% OF THEM CHOOSE (B) AND 15% OF THEM CHOOSE (C) AND 25% CHOOSE OPTION (D).

INFERENCE:

MAJORITY 40% OF THE RESPONDENTS CHOOSE OPTION (A).

4.1.9. CAN YOU DESCRIBE YOUR PROCESS FOR INSPECTING RAW MATERIALS TO ENSURE THEY MEET QUALITY STANDARDS BEFORE USE IN BREAD PRODUCTION?

S.NO	CAN YOU DESCRIBE YOUR PROCESS FOR INSPECTING RAW MATERIALS TO ENSURE THEY MEET QUALITY STANDARDS BEFORE USE IN BREAD PRODUCTION?	NO OF RESPONDENTS	PERCENTAGE ANALYSIS
A)	TESTING FOR FRESHNESS	45	40%
B)	VISUAL INSPECTION	35	25%
C)	SUPPLIER AUDITS	20	15%
D)	ALL THE ABOVE	30	20%



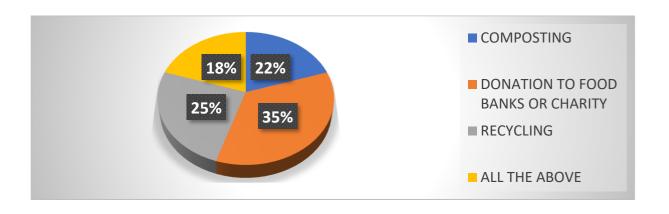
S.NO	HOW DO YOU HANDLE AND DISPOSE OF ANY WASTE GENERATED DURING THE BREAD PRODUCTION PROCESS?	NO OF RESPONDENTS	PERCENTAGE ANALYSIS
A)	COMPOSTING	27	22%
B)	DONATION TO FOOD BANKS OR CHARITY	45	35%
C)	RECYCLING	33	25%
D)	ALL THE ABOVE	25	18%
	20% 40% 25%	VISUAI	IG FOR FRESHNESS INSPECTION IER AUDITS E ABOVE

FROM THE ABOVE TABLE IT IS INTERPRETED THAT 40% OF THE RESPONDENTS CHOOSE OPTION (A) AND 25% OF THEM CHOOSE (B) AND 15% OF THEM CHOOSE (C) AND 20% OF THEM CHOOSE (D).

INFERENCE:

MAJORITY 40% OF THE RESPONDENTS CHOOSE OPTION (A)

4.1.10. HOW DO YOU HANDLE AND DISPOSE OF ANY WASTE GENERATED DURING THE BREAD PRODUCTION PROCESS?



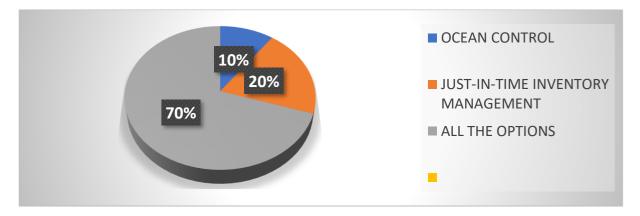
 S.NO	WHAT STEPS DO YOU TAKE TO MINIMIZE WASTE DURING BREAD PRODUCTION,SUCH AS OPTIMIZING INGREDIENT USAGE OR REDUCING PACKAGING WASTE?	NO OF RESPONCES	PERCENTAGE ANALYSIS
A)	OCEAN CONTROL	17	10%
B)	JUST IN TIME INVENTORY MANAGEMENT	28	20%
C)	ALL THE ABOVE	85	70%

FROM THE ABOVE TABLE IT IS INTERPRETED THAT 22% OF THE RESPONDENDE CHOOSE OPTION (A) AND 35% OF THEM CHOOSE (B) AND 25% OF THEM CHOOSE (C) AND 18% OF THE RESPONDENTS CHOOSE OPTION (D).

INFERENCE:

MAJORITY 35% OF THE RESPONDENT CHOOSE OPTION (B).

4.1.11. WHAT STEPS DO YOU TAKE TO MINIMIZE WASTE DURING BREAD PRODUCTION, SUCH AS OPTIMIZING INGREDIENT USAGE OR REDUCING PACKAGING WASTE?



INTERPRETATION:

FROM THE ABOVE TABLE IT IS INTERPRETED THAT 10% OF THE RESPONDENTS CHOOSE OPTION (A) AND 20% OF THEM CHOOSE (B) AND 70% OF THE RESPONDENTS CHOOSE OPTION (C).

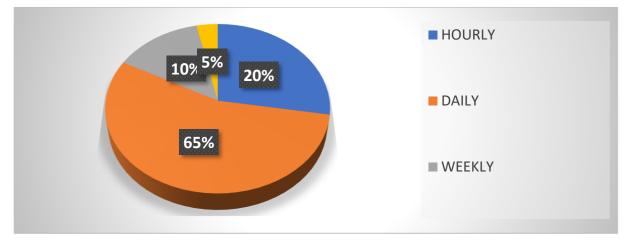
INFERENCE:

MAJORITY 70% OF THE RESPONDENTS CHOOSE OPTION (C).

4.1.12. HOW OFTEN DO YOU CONDUCT QUALITY CONTROL CHECKS ON YOUR BREAD PRODUCTS, AND WHAT CRITERIA DO YOU USE TO EVALUATE THEIR QUALITY?



S.NO	HOWOFTENDOYOUCONDUCTQUALITYCONTROLCHECKSONYOURBREADPRODUCTS,ANDWHATCRITERIA DO YOU USE TOEVALUATETHEIRQUALITY?	NO OF RESPONDENTS	PERCENTAGE ANALYSIS
A)	HOURLY	20	10%
B)	DAILY	30	20%
C)	WEEKLY	10	5%
D)	ALL THE ABOVE DEPENDING ON THE AGE OF THE PRODUCTION	70	65%



FROM THE ABOVE TABLE IT IS INTERPRETED THAT 10% OF THE RESPONDENDENTS CHOOSED OPTION (A) AND 20% OF THEM CHOOSE (B) AND 5% OF THEM CHOOSE (C) AND 65% OF THE RESPONDENTS CHOOSE OPTION (D).

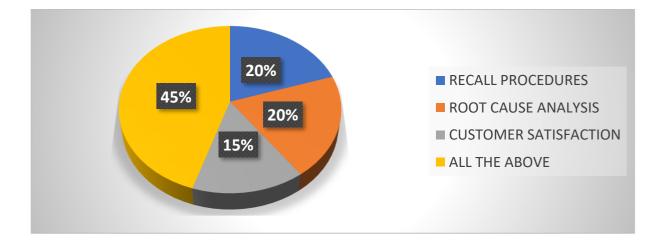
INFERENCE:

MAJORITY 65% OF THE RESPONDENTS CHOOSE THE OPTION (D).



4.1.13. HOW DO YOU ADRESS ANY QUALITY ISSUES OR CUSTOMER COMPLAINTS REGARDING YOUR BREAD PRODUCTS?

S.NO	HOW DO YOU ADRESS ANY QUALITY ISSUES OR CUSTOMER COMPLAINTS REGARDING YOUR BREAD PRODUCTS?	NO OF RESAPONCES	PERCENTAGE ANALYSIS
A)	RECALL PROCEDURES	30	20%
B)	ROOT CAUSE ANALYSIS	30	20%
C)	CUSTOMER SATISFACTION	20	15%
D)	ALL THE ABOVE	50	45%



INTERPRETATION:

FROM THE ABOVE TABLE IT IS INTERPRETED THAT THE 20% OF THE RESPONDENTS CHOOSE OPTION (A) AND 20% OF THEM CHOOSE (B) AND 15% OF THEM CHOOSE (C) AND 45% OF RESPONDENTS CHOOSE OPTION (D).

INFERENCE:

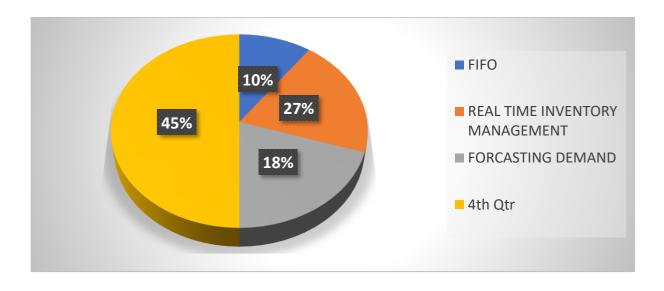
MAJORITY 45% OF THE RESPONDENTS CHOOSE OPTION (D).

4.1.14. CAN YOU EXPLAIN YOUR APPROACH TO MANAGING INVENTORY TO MINIMIZE WASTE AND ENSURE FRESHNESS OF YOUR BREAD PRODUCT?

Т



S.NO	CAN YOU EXPLAIN YOUR APPROACH TO MANAGING INVENTORY TO MINIMIZE WASTE AND ENSURE FRESHNESS OF YOUR BREAD PRODUCT?	NO OF RESPONCES	PERECENTAGE ANALYSIS
A)	FIFO	15	10%
B)	REAL TIME INVENTORY TRACKING PROCESS	25	27%
C)	FORCASTING DEMAND	20	18%
D)	ALL THE ABOVE	70	45%



FROM THE ABOVE TABLE IT IS INTERPRETED THAT 10% OF THE RESPONDENDENS CHOOSE OPTION (A) AND 27% OF THEM CHOOSE (B) AND 18% OF THEM CHOOSE OPTION © AND 45% OF THEM CHOOSE OPTION (D).

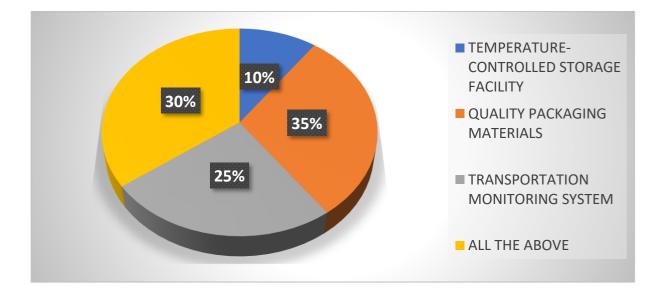
INFERENCE:

MAJORITY 45% OF THE RESPONDENTS CHOOSE OPTION (D).



4.1.15. DO YOU HAVE ANY SPECIFIC STRATEGIES IN PLACE TO PREVENT CONTAMINATION OR SPOILAGE OF BREAD PRODUCTS DURING STORAGE AND TRANSPORTATION?

S.NO	DO YOU HAVE ANY SPECIFIC STRATEGIES IN PLACE TO PREVENT CONTAMINATION OR SPOILAGE OF BREAD PRODUCTS DURING STORAGE AND TRANSPORTATION?	NO OF RESPONDENTS	PERCENTAGE ANALYSIS
A)	TEMPERATURE- CONTROLLED STORAGE FACILITY	20	10%
B)	QUALITY PACKAGING MATERIALS	45	35%
C)	TRANSPORTATION MONITORING SYSTEM	30	25%
D)	ALL THE ABOVE	35	30%





FROM THE ABOVE TABLE IT IS INTERPRETED THAT THE 10% OF THE RESPONDENTS CHOOSE OPTION (A) AND 35% OF THEM CHOOSE (B) AND 25% OF THEM CHOOSE (C) AND 30% OF THE RESPONDENTS CHOOSE OPTION (D).

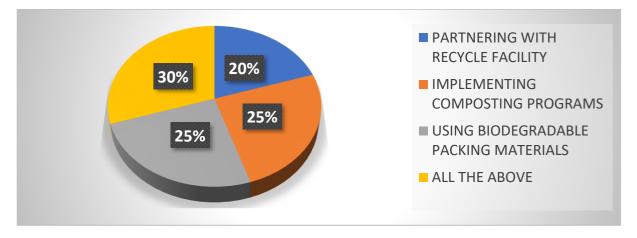
INFERENCE:

MAJORITY 35% OF THE RESPONDENTS CHOOSE OPTION (C).

4.1.16. HOW DO YOU INCORPORATE SUSTAINABILITY PRACTICES INTO YOUR WASTE MANAGEMENT EFFORTS, SUCH AS RECYCLING OR COMPOSTING LEFTOVER BREAD OR PACKAGING MATERIALS?

S.NO	HOWDOYOUINCORPORATESUSTAINABILITYPRACTICESINTOYOURWASTEMANAGEMENTEFFORTS,SUCHASRECYCLINGORCOMPOSTINGLEFTOVER BREAD ORPACKAGINGMATERIALS?	NO OF RESPONCES	PERECENTAGE ANALYSIS
A)	PARTNERING WITH RECYCLE FACILITY	20	20%
B)	IMPLEMENTING COMPOSTING PROGRAMS	25	25%
C)	USING BIODEGRADABLE PACKING MATERIALS	25	25%
D)	ALL THE ABOVE	30	30%





FROM THE ABOVE TABLE IT IS INTERPRETED THAT 20% OF THE RESPONDENTS CHOOSE OPTION (A) AND 25% OF THEM CHOOSE OPTION (B) AND 25% OF THEM CHOOSE © AND 30% OF THE RESPONDENDENTS CHOOSE (D).

INFERENCE:

MAJORITY 30% OF THE RESPONDENDS CHOOSE OPTION (D)

4.1.17. WHAT METHOD DO YOU EMPLOY TO EDUCATE AND INVOLVE YOUR EMPLOYEES IN WASTE REDUCTION AND QUALITY CONTROL INITIATIVES?

S.NO	WHAT METHOD DO YOU EMPLOY TO EDUCATE AND INVOLVE YOUR EMPLOYEES IN WASTE REDUCTION AND QUALITY CONTROL INITIATIVES?	NO OF RESPONCES	PERCENTAGE ANALYSIS
A)	TRAINING SESSIONS ON WASTE MANAGEMENT PRACTICES	10	10%
B)	EMPLOYEE SUGESTION PROGRAMS	10	10%
C)	INCENTIVE PROGRAMS FOR WASTE MANAGEMENT IDEAS	20	20%



ALL THE ABOVE

INTERPRETATION:

FROM THE ABOVE TABLE IT IS INTERPRETED THAT THE 10% OF THE RESPONDENDS CHOOSE OPTION (A) AND 10% OF THEM CHOOSE (B) AND 20% OF THEM CHOOSE (C) AND 60% OF THE RESPONDENDS CHOOSE OPTION (D).

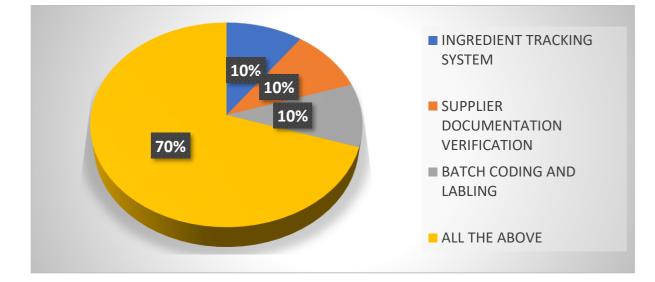
INFERENCE:

MAJORITY 60% OF THE RESPONDENTS CHOOSE OPTION (D).



4.1.18.WHAT MEASURE DO YOU HAVE IN PLACE TO ENSURE THE TRACEBILITY OF INGREDIENTS USED IN YOUR BREAD PRODUCTS, PARTICULARLY IN CASES OF QUALITY ISSUES OR RECALLS?

S.NO	WHAT MEASURE DO YOU HAVE IN PLACE TO ENSURE THE TRACEBILITY OF INGREDIENTS USED IN YOUR BREAD PRODUCTS,PARTICULARLY IN CASES OF QUALITY ISSUES OR RECALLS?	NO OF RESPONCES	PERCENTAGE ANALYSIS
A)	INGREDIENT TRACKING SYSTEM	10	10%
B)	SUPPLIER DOCUMENTATION VERIFICATION	10	10%
C)	BATCH CODING AND LABLING	10	10%
D)	ALL THE ABOVE	70	70%





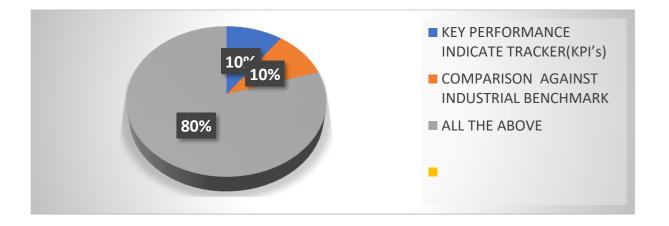
FROM THE ABOVE TABLE IT IS INTERPRETED THAT THE 10% OF THEM CHOOSE (A) AND 10% OF THE CHOOSE (B) AND 10% OF THEM CHOOSE (C) AND 70% OF THE RESPONDENTS CHOOSE OPTION (**D**).

INFERENCE:

MAJORITY 70% OF THE RESPONDENTS CHOOSE OPTION (D).

4.1.19. HOW DO YOU MEASURE THE SUCCESS OF YOUR QUALITY AND WASTE MANAGEMENT EFFORTS OVER TIME?

S,NO	HOW DO YOU MEASURE THE SUCCESS OF YOUR QUALITY AND WASTE MANAGEMENT EFFORTS OVER TIME?	NO OF RESPONCES	PERCENTAGE ANALYSIS
A)		10	10%
B)		10	10%
C)		80	80%



INTERPRETSTION:

FROM THE ABOVE TABLE IT IS INTERPRETED THAT 10% OF THEM CHOOSE (A) AND 10% OF THEM CHOOSE (B) AND 80% OF THE RESPONDENTS.

Т



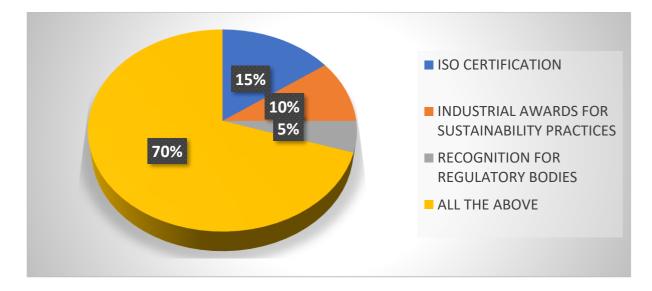
INFERENCE:

THE MAJORITY 80% OF THEM CHOOSE OPTION (D)

4.1.20. CAN YOU PROVIDE EXAMPLES OF ANY AWARDS OR CERTIFICATIONS YOURCOMPANY HAS RECEIVED RELATED TO QUALITY CONTROL AND WASTE MANAGEMENT?

S.NO	CAN YOU PROVIDE EXAMPLES OF ANY AWARDS OR CERTIFICATIONS YOURCOMPANY HAS RECEIVED RELATED TO QUALITY CONTROL AND WASTE MANAGEMENT ?	NO OF RESPONCES	PERCENTAGE ANALYSIS
A)	ISO CERTIFICATION	15	15%
B)	INDUSTRIAL AWARDS FOR SUSTAINABILITY PRACTICES	10	10%
C)	RECOGNITION FOR REGULATORY BODIES	5	5%
D)	ALL THE ABOVE	70	70%





FROM THE ABOVE TABLE IT IS INTERPRETED THAT 15% OF THEM CHOOSE OPTION (A) AND 10% CHOOSE (B) AND 5% CHOOSE (C) AND 70% OF THE RESPONDENTS CHOOSE OPTION (D)

INFERENCE:

MAJORITY 70% OF THE RESPONDENTS CHOOSE OPTION (D).



HYPOTHESIS Chi Square Test

Chi Square Test:

A chi-square test is a statistical test used to compare observed results with expected results. The purpose of this test is to determine if a difference between observed data and expected data is due to chance, or if it is due to a relationship between the variables you are studying.

Hypothesis 1:

Null Hypothesis (H0): Implementing strategies to minimize waste during bread production, such as optimizing ingredients usage or reducing packaging waste, will not result in a significant reduction in overall waste generation.

Alternative Hypothesis (H1): Implementing strategies to minimize waste during bread production, such as optimizing ingredients usage or reducing packaging waste, will lead to a significant reduction in overall waste generation.

Chi-Square Tests				
	Value	df	Asymptotic (2-sided)	Significance
Pearson Chi-Square	1.429 ^a	3	.699	
Likelihood Ratio	1.456	3	.693	
Linear-by-Linear Association	.665	1	.415	
N of Valid Cases	151			
[DataSet1]				

Case Processing Summary

	Cases					
	Valid N Percent		Missing		Total	
			Ν	Percent	Ν	Percent
WHAT STEP DO YOU TAKE TO MINIMIZE WASTE DURING BREAD PRODUCTON, SUCH AS OPTIMIZING INGREDIENT USAGE OR REDUCING PACKAGING WASTE ? * HOW OFTEN DO YOU CONDUCT QUALITY CONTROL CHECKS ON YOUR BREAD PRODUCTS ?	151	100.0%	0	0.0%	151	100.0%

a. 2 cells (25.0%) have expected count less than 5. The minimum expected count is 2.04.



Correlation: Correlation describes the strength of an association between two variables, and is completely symmetrical, the correlation between A and B is the same as the correlation between B and A. However, if the two variables are related it means that when one changes by a certain amount the other changes on an average.

Hypothesis 2:

Correlations

Null Hypothesis (H0): The frequency of conducting quality control checks on bread products does not significantly affect the overall quality of the products.

Alternative Hypothesis (H1): The frequency of conducting quality control checks on bread products significantly affects the overall quality of the products, leading to improvements in quality with more frequent checks or deterioration in quality with fewer checks.

Correlations		
	WHAT STEP DO YOU TAKE TO MINIMIZE WASTE DURING BREAD PRODUCTON, SUCH AS OPTIMIZING INGREDIENT USAGE OR REDUCING PACKAGING WASTE ?	HOW OFTEN DO YOU CONDUCT QUALITY CONTROL CHECKS ON
WHAT STEP DO Pearson Correlation YOU TAKE TO	1	.014
MINIMIZE WASTE DURING BREAD PRODUCTON,		.881
SUCH AS OPTIMIZING INGREDIENT N USAGE OR REDUCING PACKAGING WASTE ?	151	151
HOW OFTEN DO Pearson Correlation YOU CONDUCT	.014	1
QUALITY Sig. (2-tailed)	.881	
CONTROL CHECKS ON YOUR BREAD PRODUCTS N	151	151

Т



CHAPTER -5

FINDINGS

5.1.FINDINGS:

1. **Quality Control Measures:** The company has implemented various quality control measures, including visual inspections, equipment calibration, and product testing. However, inconsistencies in inspection protocols and documentation were observed, leading to potential lapses in quality assurance.

2. **Technology Integration**: While the company utilizes some automation and monitoring systems, there is room for greater integration of technology to enhance quality control and waste management. Implementing real-time monitoring sensors and data analytics can help detect defects early in the production process and optimize resource utilization.

3. **Employee Training and Engagement**: Employee training programs focused on quality control and waste reduction were found to be limited. Investing in comprehensive training initiatives can empower employees to identify and address quality issues proactively, fostering a culture of continuous improvement.

4. **Supply Chain Optimization**: Collaboration with suppliers to optimize raw material sourcing and packaging solutions can contribute to waste reduction throughout the supply chain. Implementing just-in-time inventory management practices can minimize excess inventory and reduce the risk of spoilage.

5. **Sustainable Practices**: The study highlights the importance of adopting sustainable practices, such as composting food waste and utilizing renewable energy sources, to minimize the company's environmental footprint and enhance its brand reputation.

5.1.1. FINDINGS FROM THE PERCENTAGE ANALYSIS:

- MEJORITY 50% OF THE RESPONDENTS ARE FROM 25-30 AGE CATOGERY.
- MAJORITY 80% OF THE RESPONDENTS ARE MALE.
- MAJORITY 60% OF THE RESPONDENTS ARE FROM TAMIL NADU.
- MAJORITY OF THE RESPONDENTS ARE FROM PRODUCTION PROCESS.
- MAJORITY 75% OF THE RESPONDENTS ARE MARRIED.



- MAJORITY 45% OF THE RESPONDENTS CHOOSE OPTION (C)
- MAJORITY 40% OF THE RESPONDENTS CHOOSE OPTION (A).
- MAJORITY 40% OF THE RESPONDENTS CHOOSE OPTION (A)
- •
- MAJORITY 35% OF THE RESPONDENT CHOOSE OPTION (B).
- MAJORITY 70% OF THE RESPONDENTS CHOOSE OPTION (C).
- MAJORITY 65% OF THE RESPONDENTS CHOOSE THE OPTION (D).
- MAJORITY 45% OF THE RESPONDENTS CHOOSE OPTION (D).
- MAJORITY 45% OF THE RESPONDENTS CHOOSE OPTION (D).
- MAJORITY 35% OF THE RESPONDENTS CHOOSE OPTION (C).
- MAJORITY 30% OF THE RESPONDENDS CHOOSE OPTION (D).
- MAJORITY 60% OF THE RESPONDENTS CHOOSE OPTION (D).
- MAJORITY 70% OF THE RESPONDENTS CHOOSE OPTION (D).
- THE MAJORITY 80% OF THEM CHOOSE OPTION (D)
- MAJORITY 70% OF THE RESPONDENTS CHOOSE OPTION (D).
- THE MAJORITY 80% OF THEM CHOOSE OPTION (D)

CHAPTER-6

SUGGESTION

6.1.SUGGESTION:

1. Implementation of real-time monitoring systems for quality parameters to detect and address deviations promptly.

2. Introduction of lean manufacturing techniques such as 5S, Kanban, and Total Productive Maintenance (TPM) to streamline processes and minimize waste.

3. Training programs for employees to enhance skills in QC procedures, waste segregation, and sustainability practices.

4. Integration of sustainability principles into product design, packaging, and supply chain management to minimize environmental impact.

5. Collaboration with suppliers and partners to optimize raw material usage and reduce waste generation throughout the supply chain.

6. Continuous improvement initiatives to foster a culture of innovation and sustainability within the organization.



CONCLUSION

6.1.1.CONCLUSION:

By implementing the recommended strategies, the bread manufacturing company can enhance its QC processes, minimize waste generation, and improve overall operational efficiency. This study contributes to the broader goal of achieving sustainability and competitiveness in the food manufacturing industry while ensuring the delivery of high-quality products to consumers. Further research may explore the long-term impact of these interventions and additional opportunities for improvement.

REFERENCES

• Dallagnol, A. M., et al. (2021). Bread making process: A comprehensive review. Journal of Food Science and Technology, 58(1), 22-37.

• De Vuyst, L., et al. (2019). Biodiversity, ecological determinants, and metabolic exploitation of sourdough microbiota. Food Microbiology, 37, 341-348.

• De Vuyst, L., et al. (2020). Ecology, physiology, and metabolism of sourdough lactic acid bacteria. Trends in Food Science & Technology, 69, 65-74.

• Duthie, G., et al. (2021). Optimisation of the extrusion process for development of high-fibre bread. Journal of Food Science and Technology, 58(1), 172-181.

• Foschia, M., et al. (2019). Valorization of vegetable waste as a source of value-added products: Development of a sustainable innovative process for broccoli industrial residue. Food and Bioprocess Technology, 12(6), 1067-1078.

• Gélinas, P., et al. (2019). Bread making technology: A review. Comprehensive Reviews in Food Science and Food Safety, 18(1), 203-223.

• Gobbetti, M., et al. (2019). The sourdough fermentation is purely a matter of lactic acid bacteria? Trends in Food Science & Technology, 86, 165-180.

• Hammami, R., et al. (2017). Antimicrobial properties of bile salts against enterococcus faecalis, a contributor to biofilm infectivity, and other pathogens. PloS One, 12(11), e0185905.

• Hansen, A., et al. (2019). Bread spoilage: The role of lactic acid bacteria. Food Control, 98, 468-481.

• Holzapfel, W. H., et al. (2018). Introduction to prebiotics and probiotics in human and animal health. In Prebiotics and Probiotics in Human and Animal Health (pp. 1-7). Springer, Cham.

• Imran, A., et al. (2017). Waste management through microbial utilization and fermentation. In Microbial Biotechnology (pp. 437-451). Springer, Singapore.

• Agirrezabal-Telleria, I., et al. (2020). Valorization of food waste: Production of bread improver from brewers' spent grain. Waste Management, 117, 60-68.

• Baka, M., et al. (2019). The role of packaging in reducing food waste. In Reducing Food Loss and Waste (pp. 215-234). Woodhead Publishing.

• Capozzi, V., et al. (2017). Foodomics for investigating bread quality: Recent advances and future perspectives. Journal of Proteomics, 160, 28-38.

• Ćwiek-Ludwicka, K., et al. (2018). Review on the application of lipases in the modification of bread making processes. Trends in Food Science & Technology, 80, 138-148.

• De Angelis, M., et al. (2019). The bakery world: Bread making, sourdough microbiota, and therapeutic potential of sourdough fermented wheat germ. Nutrients, 11(5), 1037.

• Gao, X., et al. (2020). Potential of bakery waste in composite bread: A review. Journal of Food Science and Technology, 57(7), 2341-2349.

• Gänzle, M. G. (2019). Sourdough breads and related products. In Handbook on Sourdough Biotechnology (pp. 339-378). Springer, Cham.

• Hamzeh, A., et al. (2021). Management of food waste in the bakery industry: A systematic review. Journal of Food Science and Technology, 58(2), 458-471.

• Jin, G., et al. (2018). Application of enzymes in baking industry. In Enzymes in Food Biotechnology (pp. 387-413). Academic Press.

• Jung, E. Y., et al. (2017). Effect of dietary fiber addition on dough properties and bread quality: A review. Food Science and Biotechnology, 26(1), 1-9.

• Maaß, S., et al. (2018). Impact of fiber addition on wheat dough performance and bread quality—a review. International Journal of Food Science & Technology, 53(1), 17-27.

• Man, J. (2020). Managing bakery waste for sustainability. Baking Europe, 2(3), 34-37.

Martínez-Anaya, M. A., et al. (2019). A review of sourdoughs and their functionality in bread making.
Food & Function, 10(6), 3092-3102.



ANNEXURE – QUESTIONNAIRE

A STUDY ON QUALITY CONTROL AND WASTE MANAGEMENT PROCESS IN MODERN BREAD COMPANY

1.NAME

2.AGE : A.18-25B.25-30C.ABOVE 30

3.GENDER: A.MALE B.FEMALE

4.LOCATION: A.TAMIL NADU B.BENGALURU C.KERALA D.OTHER

5.TYPE OF WORK: A.QUALITY CONTROL B.WASTE MANAGEMENT C.PRODUCTION

D.PACKING E.MIXING

6.MARRITAL STATUS : A.MARRIED B.SINGLE

7.HOW DO YOU ENSURE CONSISTANCY QUALITY IN PRODUCT PROCESS OF THE BREADPRODUCTION? A. REGULAR EMPLOYEE TRAINING B. AUTOMATED QUALITY CONTROLSYSTEM

C. MANUAL INSPECTION STAGES D. ALL THE ABOVE

8. WHAT MEASURES DO YOU HAVE IN PLACE TO MONITOR AND MAINTAIN HYGIENE

STANDARDS THROUGHOUT YOUR BREAD PRODUCTION FACILITIES?

A.REGULAR SANITATION SCHEDULES B.EMPLOYEE HYGIENE TRAINING

C.IMPLEMENTATION OF HACCP(HAZARD ANALYSIS AND CONTROL POINT)

D.ALL THE ABOVE

9.CAN YOU DESCRIBE YOUR PROCESS FOR INSPECTING RAW MATERIALS TO ENSURE THEY MEET QUALITY STANDARDS BEFORE USE IN BREAD PRODUCTION?

A.TESTING FOR FRESHNESSB. VISUAL INSPECTION C. SUPPLIER AUDITSD. ALL THEABOVE10.HOW DO YOU HANDLE

AND DISPOSE OF ANY WASTE GENERATED DURING THE BREAD PRODUCTION PROCESS?A.COMPOSTINGB. DONATION TO FOODC.RECYCLING D.ALL THE ABOVE

11.WHAT STEPS DO YOU TAKE TO MINIMIZE WASTE DURING BREAD PRODUCTION, SUCH ASOPTIMIZING INGREDIENT USAGE OR REDUCING PACKAGING WASTE?A.OCEAN CONTROL MEASURESB. JUST-IN-TIME INVENTORY MANAGEMENTC.ALL

THE ABOVE

12.HOW OFTEN DO YOU CONDUCT QUALITY CONTROL CHECKS ON YOUR BREAD PRODUCTS,AND WHAT CRITERIA DO YOU USE TO EVALUATE THEIR QUALITY? A.HOURLY B.DAILY



C.WEEKLY D. ALL THE ABOVE DEPENDING ON THE AGE OF PRODUCTION 13.HOW DO YOU ADRESS ANY QUALITY ISSUES OR CUSTOMER COMPLAINTS REGARDING YOUR BREAD **PRODUCTS**? A.RECALL PROCEDURES B. ROOT CAUSE ANALYSIS C.CUSTOMER SATISFACTION SURVEY D. ALL THE ABOVE 14.CAN YOU EXPLAIN YOUR APPROACH TO MANAGING INVENTORY TO MINIMIZE WASTE AND ENSURE FRESHNESS OF YOUR BREAD PRODUCT? A.FIFO(FIRST IN ,FIRST OUT)INVENTORY ROTATION **B.REAL TIME** INVENTORY TRACKING SYSTEM C.FORCASTING DEMAND ACCUEAYELY D.ALL THE ABOVE 15.DO YOU HAVE ANY SPECIFIC STRATEGIES IN PLACE TO PREVENT CONTAMINATION OR SPOILAGE OF BREAD PRODUCTS DURING STORAGE AND TRANSPORTATION? A.TEMPERATURE-CONTROLLED STORAGE FACILITY B. OUALITY PACKAGING MATERIALS C.TRANSPORTATION MONITORING SYSTEM D. ALL THE ABOVE

16.HOW DO YOU INCORPORATE SUSTAINABILITY PRACTICES INTO YOUR WASTEMANAGEMENT EFFORTS,SUCH AS RECYCLING OR COMPOSTING LEFTOVER BREAD ORPACKAGING MATERIALS?A.PARTNERING WITHRECYCLE FACILITY B. IMPLEMENTING COMPOSTING PROGRAMSC.USINGBIODEGRADABLE PACKING MATERIALSD.ALL THE ABOVE

17.WHAT METHOD DO YOU EMPLOY TO EDUCATE AND INVOLVE YOUR EMPLOYEES IN WASTE REDUCTION AND QUALITY CONTROL INITIATIVES?

A.TRAINING SESSIONS ON WASTE MANAGEMENT PRACTICESB.EMPLOYEESUGESTION PROGRAMSC. INCENTIVE PROGRAMS FOR WASTE MANAGEMENT IDEASD.ALL THE ABOVE

18.WHAT MEASURE DO YOU HAVE IN PLACE TO ENSURE THE TRACEBILITY OF INGREDIENTS USED IN YOUR BREAD PRODUCTS, PARTICULARLY IN CASES OF QUALITY ISSUES OR RECALLS?

A. INGREDIENT TRACKING SYSTEMB.SUPPLIER DOCUMENTATIONVERIFICATIONC.BATCH CODING AND LABLINGD. ALL THE ABOVE19.HOW DO YOU MEASURE THE SUCCESS OF YOUR QUALITY AND WASTE MANAGEMENTEFFORTS OVER TIME?



A.KEY PERFORMANCE INDICATE TRACKER(KPI's) B.COMPARISON AGAINST INDUSTRIAL BENCHMARK C. ALL THE ABOVE

20.CAN YOU PROVIDE EXAMPLES OF ANY AWARDS OR CERTIFICATIONS YOURCOMPANY HAS RECEIVED RELATED TO QUALITY CONTROL AND WASTE MANAGEMENT ? A.ISO CERTIFICATION B.INDUSTRIAL AWARDS FOR SUSTAINABILITY PRACTICES C.RECOGNITION FOR REGULATORY BODIES

D. ALL THE ABOVE