

QUALITY CONTROL PRACTICES FOR SUSTAINABLE BUSINESS ADOPTED BY SMALL SCALE BREAD MAKING ENTERPRISES IN DELTA STATE

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Abstract

The study investigated quality control practices adopted by small scale bread making enterprises in Delta State. Three research questions were formulated for the study. The study adopted descriptive survey design. The population of the study was 346 staff made up of 64 managers and 282 factory workers who work in small scale bread making enterprises in Delta State. The sample of the study was 152 out of the entire population of 346 staff. 35-item on four-point likert scale questionnaire was used as the instrument for the study. The instrument was validated by two experts. The reliability of the instrument was established using Cronbach Alpha method and the reliability coefficient was 0.92. Out of one hundred and fifty two copies of the instrument administered, 124 was retrieved. The data were analyzed using mean and standard deviation. The findings revealed that small scale bread making enterprises in Delta State adopted to a low extent 4 items in raw material, 4 items in processing and 2 items in packaging quality control practices and adopted to a high extent 5 items in raw material, 9 items in processing and 10 items in packaging quality control practices. Based on the findings, it was recommended among others that the production managers and factory workers should ensure high adoption of quality control practices to ensure that quality bread is baked for sustainability of the business and customers/ consumers of bread.

Keywords: *Quality control, quality control practices, small scale enterprises, small scale bread making enterprises.*

Introduction

Small scale enterprises in Nigeria assist in promoting economic development of the nation. Yusuf (2023) stated that small scale enterprises have served as vehicle for rapid industrialization, sustainable development and poverty alleviation on many countries.

The youths, retired workers and out-of-school graduates can be gainfully employed by small scale enterprises thereby reducing the unemployment rate and its attendants like social vices, armed robbery, etc. (Oliver, 2024). Apart from employment, small scale enterprises help to bring about new goods and services, and supply of raw materials in form of semi processed goods for use by large industries, who rely on the small scale industries for business success. Small scale industries promote the development of indigenous manpower as well as increasing local participation in the business sector; reduction of rural-urban migration; enlarging supply of trained personnel; development and acquisition of appropriate technological skills and improvement of standard of living of average Nigerian (Obi, 2015).

Sarokin (2023) defined small scale enterprise as one marked by a limited number of employees and a limited flow of finance and materials. Similarly, Verma (2023) Stated that small scale enterprises consist of a business establishment employing less than ten people or whose capital investment is over N1.5million but not more than fifty million naira and or workforce ranging from 11-100. Liberto (2024) stated that examples of small scale enterprises include photography, carving, hair dressing, retailing, confectionaries, printing, business center service, paint making, fabric making, soap making, cream making, ice cream making and bread making among others. From the above list of small scale enterprises, bread making enterprise as a typical small scale enterprise is one owned , managed and controlled by a sole proprietor, or partners of about two persons and has total assets of less than ten million naira, and a relatively small share of the market and does not have more than fifty employees. Bread is produced in many towns and cities in Nigeria. According to Matthias (2024) bread is the loaf that results from the baking of dough which is obtained from a mixture of flour, salt, sugar, yeast and water. However, other ingredients like fat, milk, solids, sugar, egg and antioxidant may be added. Ayo-Aderele (2013) stated that bread is a

common feature on family menu any day. Ayo-Aderele also stated that housewives say once they have a standard loaf of bread at home, they can have peace of mind. This is because whether eaten alone or accompanied with other meals like beans, butter or tea, bread is one food that takes the pride of place at the table. Better still, it could be eaten at any time of the day- as breakfast, lunch or dinner. And whether it is brown, wheat or white, bread has fans all over the world. Moreover Udi (2024) noted that bread is one of the foods in Nigeria that is consumed by people in every socio economic class and is acceptable to both children and adults. Bread is consumed by both the rich and the poor. Bread is a good source of carbohydrates and micro nutrients such as vitamins and minerals which nourishes the body. As a result, it is consumed by virtually everybody.

It has been observed that bread produced in Nigeria does not have uniform weight and volume. The differences in weight and volume is seen with bread produced within the same bakery and those produced in other bakeries. In the same vein, Ayo-Aderele (2013) stated that bread produced in Nigeria must have uniform weight and volume, preferably in multiples of 100g as stipulated in the World Health Organization (WHO) or health standard for bread making. Moreover, the bread produced in Nigeria varies in terms of quality within the same bakery and when compared with other bakeries. It is believed that the production of low quality bread by small scale bread making enterprises in Nigeria could be as a result of not conforming to the standard of bread making and continuous use of prohibited material like potassium Bromate. Quality control in bread making will ensure the production of quality bread for the consumers. The continuous consumption of sub-standard bread by Nigerians will make them to be vulnerable to sicknesses and diseases. It is imperative that bread makers should make high quality bread that contains the food nutrients for nourishing the body and guarantee success and continuous existence in business. According to Tech Quality Pedia (2020) quality drives productivity;

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improved productivity is a source of greater revenue. It is obvious that any business organization that produce quality product enjoy a lot of advantages which include productivity, increased profit, business expansion and continuous existence of the business. Osland (2019) defined quality as the ability of a product to meet or exceed customers' need or expectations. The quality of a product or service refers to the degree to which the product or service meets the customer's expectation. A quality item has the ability to perform satisfactorily in service and it is suitable for its purpose. A quality bread is the one baked according to standard and is capable of satisfying the consumers. Evidently, quality product assures high level of customer satisfaction, profitability and growth of a business. If product should always meet the customers' expectation, it is important to maintain the quality of such product through quality control.

Quality control is a process through which a business seeks to ensure that product quality is maintained or improved and manufacturing errors are reduced or eliminated. According to Tony (2013) quality control is a process within an organization designed to ensure a set level of quality for the product or service offered by a company. Rouse (2015) stated that quality control is the set of measures and procedures to follow in order to ensure that the quality of a product is maintained and improved against a set of benchmarks and that any errors encountered are either eliminated or reduced. Quality control in a small scale bread making enterprise is a process designed within the organization to ensure that bread produced in the bakery maintains the same level of quality. The overall goal includes meeting customers' requirement, product satisfaction, and dependable output. Implementing a quality control strategy allows an organization to find faults or problem with products or services before they reach the customers. Quality control monitors the overall quality by comparing the products or service with the requirement. Making sure that products or services meet or exceed the requirements set up allows a business to be more successful and

improve the organization. In line with quality control, practice involves carrying out or performing a particular activity or custom habitually or regularly (Russel, 2024). Quality control practice is the carrying out or performing quality control activities regularly. Performing the activities involved in quality control regularly will help to maintain the quality of the product of small scale businesses. Harwick (2023) enumerated the following areas of quality control practices for small scale businesses: raw material quality control practice, processing quality control practice, packaging quality control practice, staff personnel quality control practice among others.

Raw material quality control practice ensures the regular use of right quantity and quality raw materials in production. Bakery and Confectionery Materials (2015) pointed out that the correct choice and specification of raw materials for baked product is essential to ensure good quality products. The raw materials for bread according to Baking Industry Research Trust (2021) include flour, salt, sugar, yeast, water, fat, milk, egg, butter, fruits, nut, and antioxidant. The quality of raw material is controlled by ensuring the use of flour made from hard wheat which contains 11–18% protein. Other ingredients should be carefully selected.

Similarly, processing quality control practice ensures that the right measurement of materials with a proper scale, mixing, timing, molding, panning, avoidance of unwanted substances, baking at the right temperature and proper storage are maintained. The baker can determine the type and quality of finished product by paying careful attention to the main process control points which involves accurate weighing, temperature and humidity control, timing and handling procedures (Bread Basics, 2023).

Furthermore, packaging quality control practice involve ensuring clean packaging, storage and distribution process to avoid contamination of the product. Adeloye (2012) stated that bread must have proper packaging and labelling with expiration date to enable it meet the requirements of Mandatory Conformity Assessment Programme (MANCAP)/ Nigerian Standard (NIS) certification. It is compulsory to

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state the material used in baking bread on the label or nylon that contains the bread. Bread making consist of processes where quality control measures should be applied. These processes includes raw material; processing; packaging; staff personnel management among others. Smith (2023) stated that standard quality control measures must be in place throughout the processes involved in making bread to ensure the making of high quality bread and track variability and determine conformity to acceptable standard sizes. On this background , there is need to carry out a study on quality control practices for sustainable business adopted by small scale bread making enterprises in Delta state. The consideration and practice of the above quality control practices by small scale bread making enterprises will ensure regular production of quality bread for the numerous consumers in the state. Moreover, it will lead to profit maximization and continuous existence of small scale bread making enterprises.

Statement of the Problem

It has been observed that in many small scale bread making enterprises in Delta State, there is low quality of bread produced. Variation in terms of quality and weight among bread produced within the same bakery and other bakeries and generally low conformity to acceptable standards for bread. Also, there is no uniform weight and volume of bread produced within the same bakery and other bakeries (Adeloye, 2012).

The low quality bread denies the consumers such micro nutrients as vitamins and minerals which in turn could pose serious health challenges like malaria, cancer, malnutrition sclerosis, tumor and brain disturbance among others. The continuous production of low quality bread may lead to loss of customer, thereby making such small scale bread making enterprise to close up and return all the employees to the labour market.

Research Questions

The following research questions guided the study

1. To what extent are raw materials quality control practices for sustainable business adopted by small scale bread making enterprises in Delta State?

2. To what extent are processing quality control practices for sustainable business adopted by small scale bread making enterprises in Delta State?
3. To what extent are packaging quality control practices for sustainable business adopted by small scale bread making enterprises in Delta State?

Method

The study adopted descriptive survey design. The population of the study is three hundred and forty six (346) staff made up of sixty four (64) managers two hundred and eighty two (282) factory workers who work in small scale bread making enterprises in the three senatorial zones in Delta State. One hundred and fifty two (152) out of the three hundred and forty six staff of small scale bread making enterprises comprised the sample size, which is 44% of the staff of small scale bread making businesses. The sample size was randomly selected from the population. The instrument used for collection was a structured questionnaire titled “Quality Control Practices for Sustainable Business Adopted by Small Scale Bread Making Enterprises Questionnaire.” The instrument contained 35 item on a four point ratio scale of Very High Extent (VHE)-4, High Extent (HE)-3, Low Extent (LE)-2, Very Low Extent (VLE)-1, with cut off point 2.50. The instrument was validated by two experts from the department of accounting education FCE (I) Asaba. The reliability of the instrument was determined using Cronbach Alpha method and a reliability index of 0.92 was realized indicating that the instrument was reliable. Out of one hundred and fifty two copies of the instrument administered, 124 was retrieved. The data collected were analyzed using mean and standard deviation. A criterion mean of 2.50 was determined through the computation of mean based on the weighing of the option. Any item below 2.50 was regarded as low extent while any item from 2.50 was regarded as high extent.

Results

Research questions 1

To what extent are raw materials quality control practices for sustainable business adopted by small scale bread making enterprises?

Table 1: Mean ratings and standard deviations of managers and factory workers on the extent to which raw materials quality control practices for sustainable business are adopted by the small scale bread making enterprise.

S/N	Items	VHE	HE	LE	VLE	Mean	SD	Decision
1	Baking bread with flour that is strong-made from hard wheat and have high protein and water absorption levels (60–65) of flour weight and a good colour.	61	34	20	9	3.19	0.95	High extent
2	Ensuring that incoming flour have a moisture content of not more than 14% to reduce the risk that molds, insect infestation and rancidity do not develop during storage.	20	31	52	21	2.40	0.95	Low extent
3	Ensuring that the level of yeast used is 1% of flour weight for a 2 to 3 hour fermentation process.	72	20	30	2	3.31	0.89	High extent
4	Using clean water to form the dough and wash the equipment.	50	60	12	2	3.27	0.70	High extent
5	Checking the presence of dirt in sugar before use by dissolving a quantity of sugar in hot water and allowing any dirt to settle.	11	28	32	53	1.98	1.00	Low extent
6	Ensuring that the melting temperature of the fat is above the temperature of the dough in order not to produce a sticky dough.	15	80	21	8	2.82	0.72	High extent
7	Use of potassium bromate (KBrO3) as preservative	45	3	40	36	2.46	1.24	Low extent
8	Using flour fortified with vitamin A and C for baking bread	17	24	38	45	2.10	1.04	Low extent
9	Using alum and baking powder for baking	57	38	15	14	3.11	1.01	High extent
Grand mean and SD						2.74	0.94	High extent

Data in table I show that the respondents adopted items 1,3,4,6 and 9 to a high extent. The mean score of the responses ranged from 2.82 – 3.31. The items were adopted to a high extent since the respective mean scores were above the mean cut-off of 2.50. Also, the respondents adopted items 2,5,7, and 8to a low extent . The mean score of the responses ranged from 1.98-2.40. The items were adopted to a low extent since the respective mean scores were below the mean cut-off of 2.50.

Research Questions 2

To what extent are processing quality control practices for sustainable business adopted by small scale bread making enterprises?

Table 2: *Mean ratings and standard deviation of managers and factory workers on the extent to which processing quality control practices for sustainable business adopted by the small scale bread making enterprises.*

Items	VHE	HE	LE	VLE	Mean	SD	Decision
1 S/N	19	28	53	24	2.34	0.96	Low Extent
2 Measuring ingredients with proper scale by weight for right measurements.	60	35	20	9	3.34	0.96	High Extent
3 Measuring ingredients by volume (measuring with cups and spoons).	22	23	51	28	2.17	1.02	Low Extent
4 Identifying well developed /kneaded dough by conducting a test to see if the dough can stretch up to 2-3 cm without breaking.	25	20	42	37	2.27	1.23	Low Extent
5 Care and maintenance of weighing scales ,thermometers and timers for consistent and cost effective production.	56	39	13	16	3.09	1.03	High Extent
6 Putting your scaling machine in perfect order before scaling so as to enable the dough of different sizes not to outweigh another	51	44	18	11	3.09	0.95	High Extent
7 During molding, ensuring that the hand machine and table used are clean.	65	38	10	11	3.27	0.94	High Extent
8 Rubbing butter on the molded dough for beauty and to prevent it from gumming the pan before baking.	71	8	20	25	3.00	1.24	High Extent
9 Baking in a hot preheated oven until bread color is golden and baked through.	68	14	28	14	3.10	1.10	High Extent

10	Conducting a test to check if the loaf of bread is baked by tapping it on the base with your knuckle to see if it will sound hollow.	28	7	60	29	2.27	1.06	Low Extent
11	Turning off the loaf immediately after baking onto raised wire rack to cool, instead of leaving it in the pan which makes the loaf to sweat and become soft and soggy.	47	62	11	4	3.24	0.74	High Extent
12	Ensuring internal baking temperature of min 75C to kill bacteria, when you identify bacterial contamination of raw dough as this temperature is sufficient to kill viable bacteria cells.	42	70	6	6	3.19	0.73	High Extent
13	Reduction of moisture during baking which has the potential to delay or stop bacteria growth in the finished product.	72	15	16	21	3.11	1.17	High Extent
14	Covering of loaf during baking to avoid airborne contamination or introduction of a critical control point cooling temperature to control microbiological activity during the cooling process.	81	5	22	16	3.22	1.14	High Extent
Grand Mean and SD						2.91	1.02	High Extent

Data in Table 2 show that the respondents adopted items 2,5,6,7,8,,9,11,12,13 and 14 to a high extent . The mean score of the responses ranged from 3.00 – 3.34. The items were adopted to a high extent since the respective mean scores were above the mean cut-off of 2.50. Also the respondents adopted items 1,3,4 and 10 to a low extent. The mean score of the responses ranged from 2.17 – 2.34. The items were adopted to a low extent since the respective mean scores were below the mean cut-off of 2.50.

Research Questions 3

To what extent are packaging quality control practices for sustainable business adopted by small scale bread making enterprises?

Table 3: *Mean ratings and standard deviations of managers and factory workers on the extent to which packaging quality control practices for sustainable business are adopted by the small scale bread making enterprise.*

S/N	Items	VHE	HE	LE	VLE	Mean	SD	Decision
1	Packaging all baked bread to protect them from contamination before distributing to customers	63	27	18	16	3.10	1.08	High Extent
2	Ensuring that the packaging nylon contains production date and expiration date.	23	15	64	23	2.32	0.98	Low Extent
3	Ensuring that the packaging nylon contains all the materials used in baking the bread	17	22	56	29	2.08	0.96	Low Extent
4	Making sure that the packaging nylon contains NAFDAC number.	54	42	16	12	3.11	0.97	High Extent
5	Storing packaged bread by the use of mobile racks or steel shelving on adjustable supports for easy inspection.	80	3	21	20	3.15	1.20	High Extent
6	Ensuring daily checks on bread stored for distribution.	71	20	6	27	3.09	1.22	High Extent
7	Storing bread at room temperature to maintain proper crumb and crust texture.	34	80	2	8	3.77	0.97	High Extent
8	Wrapping bread during storage to avoid exposure to air.	21	82	12	9	2.93	0.74	High Extent
9	Distributing bread in returnable plastic bread baskets.	42	68	4	10	3.15	0.82	High Extent
10	Proper arrangement of bread on plastic basket during distribution.	63	37	23	1	3.31	0.79	High Extent
11	Ensuring use of clean plastic basket for bread distribution.	74	31	6	13	3.34	0.97	High Extent
12	Proper arrangement of bread in the distribution van for easy removal from the van to the customers.	46	42	15	21	2.91	1.08	High Extent
Grand Mean and SD						3.02	0.98	High Extent

Date in table 3 show that the respondents adopted items 1,4,5,6,7,8,9,10,11 and 12 to a high extent. The mean score of the responses ranged from 2.91-3.77. The items were adopted to a high extent since the respective mean scores were above the mean cut-off of 2.50. Also, the respondents adopted items 2 and 3 to a low extent.

The mean score of the responses ranged from 2.80-2.32. The items were adopted to a low extent since the respective mean scores were below the mean cut-off of 2.50.

Discussion of Findings

Research question one revealed that the extent to which raw material quality control practices were adopted by small scale bread making enterprises was low in the following items: ensuring that incoming flour have a moisture content of not more than 14% to reduce the risk that molds, insect infestation and rancidity do not develop during storage; checking the presence of dirt in sugar before use by dissolving a quantity of sugar in hot water and allowing any dirt to settle; use of potassium bromate (KBrO₃) as preservative; using flour fortified with vitamin A and C for baking bread. However, there was high adoption in the following items: baking bread with flour that is strong-made from hard wheat and have high protein and water absorption levels (60 – 65) of flour weight and a good colour; ensuring that the level of yeast used is 1% of flour weight for a 2 to 3 hour fermentation process; using clean water to form the dough and wash the equipment; ensuring that the melting temperature of the fat is above the temperature of the dough in order not to produce a sticky dough; sing alum and baking powder for baking. The findings are in consonance with the submission of Bakery and Confectionery Materials (2015) that the correct choice and specification of the materials for baked product is essential to ensure good quality products. While Ristic (2024) Maintained that the control of required inputs for a given product ensures the control of quality of future products.

Research question two revealed that the extent to which processing quality control practices were adopted by small scale bread making enterprises was low in the following items: sieving flour before measuring to remove small foreign bodies and decanting to remove packaging in order to reduce the intake of microorganisms and foreign bodies; measuring ingredients by

volume (measuring with cups and spoons); identifying well developed /kneaded dough by conducting a test to see if the dough can stretch up to 2-3 cm without breaking; and conducting a test to check if the loaf of bread is baked by tapping it on the base with your knuckle to see if it will sound hollow. However, there was high adoption in the following items: measuring ingredients with proper scale by weight for right measurements; care and maintenance of weighing scales ,thermometers and timers for consistent and cost effective production; putting your scaling machine in perfect order before scaling so as to enable the dough of different sizes not to outweigh another; during molding, ensuring that the hand , machine and table used are clean; rubbing butter on the molded dough for beauty and to prevent it from gumming the pan before baking; baking in a hot preheated oven until bread color is golden and baked through; turning off the loaf immediately after baking onto raised wire rack to cool , instead of leaving it in the pan which makes the loaf to sweat and become soft and soggy; ensuring internal baking temperature of min 75C to kill bacteria , when you identify bacterial contamination of raw dough as this temperature is sufficient to kill viable bacteria cells; reduction of moisture during baking which has the potential to delay or stop bacteria growth in the finished product; and covering of loaf during baking to avoid airborne contamination or introduction of a critical control point cooling temperature to control microbiological activity during the cooling process. The findings are in agreement with the submission of Rouse (2015) that the control of the quality of future products is possible by controlling the conversion process. Research question three revealed that the extent to which packaging quality control practices were adopted by small scale bread making enterprises was low in the following items: ensuring that the packaging nylon contains production date and expiration date; and ensuring that the packaging nylon contains all the materials used in baking the bread; packaging all baked bread to protect them from contamination before distributing to customers ;making sure that the packaging

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nylon contains NAFDAC number; storing packaged bread by the use of mobile racks or steel shelving on adjustable supports for easy inspection; ensuring daily checks on bread stored for distribution; wrapping bread during storage to avoid exposure to air; distributing bread in returnable plastic bread baskets; proper arrangement of bread on plastic basket during distribution; ensuring use of clean plastic basket for bread distribution; proper arrangement of bread in the distribution van for easy removal from the van to the customers. The findings are in agreement with the submission of Adedoye (2012) that bread must have proper packaging and labelling with expiration date to enable it meet the requirements of MANCAP/NIS Certification.

Conclusion

From the findings of the study, the extent of adoption of raw material, processing and packaging quality control practices was low in some of the small scale bread making enterprises and high in most of them. Improving on the adoption of quality control practices would ensure production of quality bread and help in sustaining bread making businesses.

Recommendations

Based on the findings of this study, the following recommendations are made:

1. The production managers and factory workers should ensure high adoption of control practices to ensure that quality bread is baked for sustainability of the business and customers/consumers of bread.
2. The owners and management of small scale bread making enterprises should enforce the recommended standard for bread baking in their bakeries.
3. Factory workers should be adequately monitored to ensure compliance in the adoption of quality control practices in bread making.

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