

## **The Problems of Quality Control in the Manufacturing Sector A Study of Nigeria Breweries Plc, Enugu**

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**Abstract:** This research work was undertaken to examine the problems of quality control in manufacturing firms, the various techniques of quality control used and to assess the effectiveness and efficiency of their applications. This study also set to find out what manufacturing firms seek to achieve through quality control practice. To achieve these objectives, a study of Nigeria Breweries Plc, Enugu, south east Nigeria was carried out. A review of related literature was also undertaken. Data were collected through distribution of questionnaires and the use of textbooks, newspapers, magazines, and journals. The method of statistical analysis used includes table and percentage while chi-square was used to test hypotheses formulated. From the study, it was discovered that quality control practice in manufacturing firms encountered problems as a result of the following; non-awareness of quality control techniques, inability to understand the need of customers, cost of application and management attitude. It was also discovered that manufacturing firm have some quality objectives they want to achieve through quality control practice. These include; creating a good corporate image, to meet consumer needs and create consumers satisfaction, to achieve lower cost in production etc. Based on the findings, it was recommended that training and seminars should be organized for the entire workers always, strict compliance to the established standard must be ensured and that job description should be properly done to help every staff know his or her role towards the achievement of the firm's quality goals.

**Keywords:** quality assurance, brewery, Nigeria, manufacturing sector, south east nigeria

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### **I. Introduction**

The Nigerian market is being flooded with a lot of sub-standard products. Despite efforts made by the Nigerian government in establishing an enabling Act number 56 of December 1971 known as Standard Organization of Nigeria (SON) of which one of its objectives is to make sure that manufacturing firms produce standard products, measurement, materials process and service among others, Nigerian market is still experiencing sub-standard products. According to the Director General of Standard Organization of Nigeria (SON) Mr. Joseph Odumodu in his interview on Monday, 18th March, 2013, to the Daily Sun Newspapers, he said that in the year 2011, the average level of sub-standard product in the country was about 80% but now in 2013, it has been reduced to 40% but they believed, it will be shifted to 30%. The problem of quality control has become a blow to manufacturing firms and regulatory bodies in Nigeria. The SON went ahead to establish certain activities in order to control quality of products such activities are:

- Electronic Product Registration Scheme (EPRS)
- Product liability insurance

In order to assess product standards to ensure that sub-standard products are detected, SON introduced the use of Electronic Product Registration Scheme (EPRS). Also in a situation where consumers are harmed as a result of using any of such sub-standard products, compensations will be given. Also in 2005, SON introduced a scheme known as Standard Organization of Nigeria Offshore Conformity Assessment Program which is related to pre-shipment verification of quality. Yet there is still an ongoing problem of quality control in Nigeria especially in the manufacturing sector.

Quality is a term that carries important meaning to both producers and consumers. In the global market place today, many organizations realized that their survival in the business world depend highly on producing high quality products and services. Indeed, a lot of organizations have emphasized that quality must be put in place, integrated within the management system, especially in terms of bringing the end products or services to the consumers, especially with intense competition arriving from the rival (International Business Research, 2009). According to Gbadeyan and Adeoti, (2005) quality is the conformance to requirement and those requirement must be defined in measurable and clearly stated term. Quality is one of the goals and objectives organizations seek to achieve. But often times, this goal is not achieved due to some challenges in the firms. The

quality of any company's product or service determines its position in the market. This is because customers desire to get the best value for their money. The quality of product or service can only be defined by the customer (Deming, 2000). This means that for a firm to be satisfied with the quality of its goods or services, its customers must be satisfied with it. Quality is a complex concept that has become one of the most appealing in management theories. This is to say that every business today wants to produce quality products or services that are acceptable to consumers, which are also affordable.

Quality control is a functional management discipline, which is responsible for defining quality purpose. The prerequisites for effective quality control are freedom from deficiency and minimization or reduction of the following costs; waste, re-work replacement and inspection costs. All these are manufacturing problems that should not only be detected and corrected at the earliest time but prevented if possible. (June, 2000). Quality control can therefore be achieved by establishing a standard for effective and efficient quality in the following areas:

- In the factory building, machinery and equipment design and installation, manufacturing system and process as well as product identification system.
- In product design.
- In the market by way of intensive consumer response program which gives the needed feedback.

In addition to the established standards, tolerance limits are set for every important quality. These tolerance limits are limits of variations beyond which the variations will not be accepted. The firms must determine what quality is needed by their customers and must try as much as possible to satisfy these needs. Meeting these quality needed by consumers should be a collective responsibility of everybody in the organization. The market research division will find out what these needs are; products development division will create a design to equate with the needs; planning division will devise a process for executing the product desired and the production units will regulate the process to achieve the desired product quality. Also quality control in manufacturing firms will seek to ensure efficiency in terms of purchasing quality raw materials, the machine or conversion equipment and quality of labor or human effort because the quality of these factors mentioned above determine the quality of the end product. (Orga, 2011).

Furthermore, Nigerian business environment changes with ever changing work processes, practice and employee habits. As a result of these changes, firms that are resistant to change or that cannot respond quickly and adequately to change are prone to have problem, which will in long run affect their productivity and profit margin adversely. Although the success of every manufacturing firm depends mainly on the degree of its reputation for supplying quality products to its consumers. Yet, the realization of quality standard has been a problem to manufacturing firm. For manufacturing firms to be successful, they must place great emphasis on the establishment and maintenance of quality control policies of their firm and that of government. The personnel responsible for effective quality control must be familiar with required activities in all quality control systems. It is required that quality procedure for each section must be strictly adhered to in order to achieve success.

As a result of these problems of quality control especially in the manufacturing sector of Nigeria this study took a cursory look at the problems of quality control in a manufacturing firm, Nigerian Breweries Plc, Enugu.

Nigeria Breweries plc was incorporated on 16<sup>th</sup> November 1946 as Nigeria Breweries limited. It started production on June 1949, when the first bottle of star lager beer rolled off the line in Lagos. This was followed by Aba Breweries in 1957, Kaduna Breweries in 1963. Nigerian breweries Plc is one of the largest capitalization firm in the Nigeria stock Exchange. It is also one of the nationally well known concerns in Nigeria. The corporate mission of the organization is to remain the leading beverage company in Nigeria producing high quality brands to meet the needs of identified viable sectors in the market. In the bid to achieve its corporate mission which is to remain the largest beverage company in Nigeria and also to produce high quality brands, the management of the company has plans to continue, to dominate the premium sector of larger market where its products are currently positioned towards this ends, the company has identified that there is need to strength the existing brands by communicating to its customers in clear terms, those qualities which the company claims for its products. In 1982, Ibadan Breweries was established. In September, 1993, the company acquired its fifth Brewery in Enugu State. Ama breweries is the largest brewery as well as the sixth brewery in Nigeria and one of the most modern brewery world wide operation in the old Enugu Breweries were discontinued in 2004, while that breweries sited in Ama Eke Along Nite Miles in Enugu state was christened Ama Breweries while the company acquired a malting plant in Aba in 2008.

In October 2011, Nigeria Breweries acquired majority equity interest in Sona system Associations Business Management Limited (Sona Systems) and Life Breweries Limited from Heineken N. V., This followed Heineken's acquisition of controlling interest in five breweries in Nigeria from Sona Group in January 2011. Sona Systems two breweries in Ota and Kaduna and Life Breweries in Onitsha have now become part of Nigeria breweries in Onitsha have now become part of Nigerian Breweries plc together with the three brands, Goldberg larger, Malta Gold and Life Continental Larger, Thus, from the humble beginning in 1946, Nigerian

Breweries from which it high quality product are distributed to all Nigeria in addition to the ultra modern malting plant in Aba and Kaduna. The company has a portfolio of high quality brands, including:

- Star lager (launched in 1949), pale lager
- Gulder lager (1970) pale lager
- Legend Extra Stout (1992), 7.5% ABV extra stout
- Heineken Lager (June 1998), premium Lager
- Goldberg Lager (Become part of NB family in October, 2011).
- Life continental lager (become part of the NB family in October, 2011).
- Maltina (1976), in three varieties namely, maltina classic, maltina strawberry and Maltina Pineapple
- Maltina Sip-it(2005) in Tetrapak.
- Amstel Malta(1994).
- Fayrouz in pear and pineapple (2006).
- Malta Gold (became part of the NB on october 2011) etc.

### **Theoretical Framework**

Quality is difficult to define, since it means different thing to different people. On general definition is ‘degree of excellence’ in order to clearly understand what quality is all about, it is necessary to put the view of some authors concerning the meaning of quality. Ognyan (2011) defined quality as fulfilling specification or customer requirement without and defect. A product is said to be high in quality if it is function as expected and reliable. According to Anyanwu (2013), quality is seen as all of the features and characteristic of a product or service that contributes to the satisfaction of a customer needs. These needs involved price, safety, available, maintainability, reliability and usability. Quality cannot be inspected into a product; it must be build into it. Also reliability cannot be built into a product; it must be designed into it. So it could be understand that reliability is a consequence of quality which is concerned with satisfaction during use and also the extent to which the product satisfies the purpose.

Gbadedyan and Adeoti (2005), defined quality as the degree to which a specific product conforms to a design or specification. Quality is often the major issue because poor quality can be very expensive for both the producing firm and the customer. It is therefore imperative for every organization’s operation manager to ensure that this or her firm deliver a quality product at the right place, at the right time, and at the right price. Ojinnaka (2011), quality is defined as any of the features that make something what it is or the degree of excellence or superiority. To be able to achieve product of consistent and high quality, the use of good and sound raw materials is of optimum importance. Juran (2000), quality means freedom from deficiencies, freedom from errors that require doing work over again or that result is field failures, customer dissatisfaction, customer claims. Ile (2011), quality of a product is defined by a set of specification governing functional performance, composition strength, shape, dimensions, workmanship, color and finish. Quality is meaningful only in relation to the purpose and end use of the product. Good quality is attained when a product or a service fully satisfied the purpose for which it is designed. Orga (2006), he stated that the image of any company depends on the quality of goods and services offered. It is therefore behoves on the production manager to ensure high quality of product. The quality of the final product depends on the quality of the raw materials, the conversion process (equipment) and the skill of the operation (labor). At anytime one of these is defective; the quality of the product will be defected. The quality of any product is the physical appeal, the packaging, the shape, size, color and other eye catching dimension of the product.

### **Quality Control**

Anyanwu (2013), quality control is the use of techniques and activities to achieve, sustain and improve the quality of a product or service. It involves the inspection of products to ensure that product is in line with quality standards set and also that work is being performed correctly.

Juran (2000), quality control is a universal managerial process for conducting operations so as to provide stability to prevent adverse change and to maintain the status quo” he said that to maintain stability, the quality control process evaluate actual performance, compared performance to goal and take action on difference. Quality control takes place by the use of feedback loop. The feedback loop is universal and fundamental to any problem in quality control. It applies to all types of operations, whether in service or product. The feedback loop describes the quality control process.

#### **a. Choose the control subject**

In choosing a control subject, each feature of the product (good or services) or process becomes a control subject which are derived from sources which include

- State customer needs for product features
- Technological analysis to translate customer needs into product and process features.

- Process features which directly impacts the product features.
- Industry and government standard
- Needs to protect human safety and environment.

**b. Establish Measurement**

Since the control subject has been chosen, the next step is to establish the means, the quality of the goods or service can be measured. In the establishment of measurement, there is need to clearly specify the means of measurement, the frequency of measurement, the way to convert the data to usable information and how does the measurement.

**c. Establish Standard of Performance**

For each control process, it is necessary to establish standard for performance, a quality goal, target or objective. A standard of performance is guide for achievement toward which effort is expended.

**d. Measure Actual Performance**

The critical step in quality control is to measure the performance of the product or process. To make this measurement, a ‘sensor’ is needed. A sensor is specialized detecting devices designed to recognized performance and converts the resulting data into information then became the basis of decision making.

**e. Compare to standard**

The act of comparing actual performance to standard is seen as the role of umpire. The umpire may be human being or technological devices. This umpire is expected to carryout the following activities in comparing to standard.

- Compare the actual performance to the quality goal
- Interpret the observed difference
- Decide on the action to take
- Stimulate corrective action

**f. Take Action or Difference**

When the above steps have taken place the next step is to act on the difference between the desired standard of performance and the actual performance and the actual performance. To do this, an “actor” is needed. An actor is a devices used in stimulating action to restore conformance. At the worker level, an actor may be a keyboard for giving order to an office computer or a calibrated knob for adjusting a machine tool. At managerial level, it may be a memorandum to subordinate.

**Quality Control Techniques**

There are different techniques of quality control namely; statistical method of quality control and non-statistical method of quality control. According to Ryan (2000) the use of statistical method can often make controlling products and services easier, less expensive and more effective. Some knowledge of qualified employees or outside consultant must be made available. The statistical method of quality control includes;

- Acceptance sampling
- Statistical process control

**Control Chart**

**Acceptance Sampling**

This involves taking random samples products and measuring them against predetermined standards. The size of sampling affects the discriminating power of sample plan. The smaller the sample size, the greater, the risk of either accepting a defective lot or rejecting a good lot due to sampling errors. A larger sample reduces the risk but increase the cost of inspection.

**Statistical Process Control**

is a statistical approach for assisting operator, supervisors and managers to manage quality and to eliminate special causes of variability in a process. (ognyan,2011). Items produced in a manufacturing process are not totally identical. Although, the variation are sometimes very small and the products may seem to be exactly alike. Careful measurement however, can detect the differences. The use of statistical process makes it possible to establish tolerance limit that allows for inherent variations due to chance. When measurements fall outside these tolerance limits, the quality controller knows that there is a problem and may be caused due to variations in raw materials, machine wear or changes in employee’s work practice.

### **Control chart**

This is a statistical method which has to do with graphical records of the quality of particular characteristics. It shows whether or not the process is in a stable state by adding statistically determined control limit to run chart added (Orga,2006:305). Control chart graphically shows the limit for the process being controlled. Under the control chart, there is control limit which conforms whether or not a process is under or out control. Gbadeyan and Adeoti (2005). Non-statistical method of quality control includes employee involvement and quality circle. Employee involvement means including the employee in every step of the process from product design to final packaging. Quality circle on the other hand is a situation in which a group of between six and twelve employees volunteer to meet regularly to solve work related problems. The members all from the same work area receive training in group planning, problem solving and statistical quality control. Quality circle's problem-solving emphasizes brainstorming, group discussions and tools such as process capacity studies, inspection, and cost analysis in order to identify aspect of their jobs that create problems. The group makes recommendations to management by identifying expected benefits, cost and implementation of the idea.

### **Problems of Quality Control**

There are problems militating against control practice in manufacturing firm. They include:

**Non-awareness of techniques:** A firm could encounter problems in the quality control practice if, it is not aware or ignorant of quality control techniques.

**Inability to understand the needs of customers:** where a firm is unable to know what its customers need or their taste, it fails to produce quality products that will satisfy its customers taste.

**Cost of application:** Sometime, a firm may know what its customers need and available techniques of quality control, the cost of applying the quality control techniques become a problem. This is because, applying quality control techniques could be very expensive and where a firm cannot afford the cost, it becomes a problem.

**Non-availability of equipment:** This could constitute a problem to quality control practice in a firm where the needed equipment for effective quality control is not available due to cost and other reasons.

**Management attitude:** The attitude of firm's management can go a long way in affecting the quality control practice in the firm. Where management attitude is negative, may be the management does not care about the quality of products its firm produce or where management is not interested in providing all necessary equipment, finance and other supports needed then, it becomes a problem.

This study is being carried out in order to achieve the following objectives: To find out the problems facing quality control, their causes and possible solutions. To identify the different technique of quality control in the manufacturing firm. To determine if efficient quality control can increase profitability in manufacturing firms. In order to achieve the objective mentioned above, the researchers drafted the following research questions: What are the problems facing quality control their causes and possible solution? What are the different techniques of quality control in the manufacturing firms? Can efficient quality control increase profitability in manufacturing firms?

### **Hypotheses**

The following are the research hypotheses of this study.

There are problems facing quality control in the manufacturing firms.

There are techniques of quality control in the manufacturing firms.

There is relationship between quality control and increase in profitability of manufacturing firms.

## **II. Research Methods**

### **Design**

This chapter focuses on the various methods, the researcher employed in collecting data and tools for analysis in this study.

### **Sources Of Data**

The researchers obtained information needed for this study through two major sources of data namely:

**Primary Source** These are data collected in its original state and it is being collected for a specific purpose. It was collected through distribution of questionnaires to the employees of Nigerian Breweries, Enugu.

### **Secondary Source**

These are data which have already been collected and used by other persons and organizations. They are usually collected for other purpose in which they are used. The internal secondary sources of data which

helped the work are the information collected from the records of the company while the external secondary sources include; Enugu State Library and Abia state library in Aba where relevant materials were collected and used such as text-books, newspapers, journals and Magazines.

**Population of the study**

The population of the study is the management and staff of Nigerian Breweries Plc, Ninth Mile, Enugu. They were grouped as shown below:

**Table 1**

Department	Frequency
Quality Control Department	650
Production Department	450
Other Department	200
<b>Total</b>	<b>1300</b>

Source: Field study, 2013

From the above table, the number of employees in quality control department is six hundred and fifty (650), production department is four hundred and fifty(450) and other department are two hundred (200), which makes the total population to be one thousand and three hundred (1300).

**Sample Size and Sampling Techniques**

The population of employees under study is one thousand and three hundred but for some reasons, the researcher was unable to study the whole population as a result of cost involved. Hence the researcher decided to use a selected sample and in determining the sample size, the researcher used “Taro Yamene” formulae which are stated as;

$$n = \frac{N}{1 + N(e)^2}$$

Where

- n = The sample size
- N = The population size
- e = Margin of Error

In this case, the researcher used 5% margin of error

Therefore, n = ? N = 1300, e = 0.05

$$n = \frac{1300}{1 + N(e)^2}$$

**Table 2**

Department	Frequency	Allocation of Questionnaire
Quality control	650	153
Production	450	106
Others	200	47
<b>Total</b>	<b>1300</b>	<b>306</b>

From the table above, the sample size of various departments were shown as; quality control department has the population of 650 and sample size of 153, production department has the population of 450 and its sample size was 106. Also other department that has the population of 200 and its sample size was 47.

**Instrument For Data Collection**

The researchers used personal/oral interview and structured questionnaire as the major sources of data collection. It involves a formal consultation with Nigeria Breweries Plc, Enugu. As the main instrument used was the questionnaire which involved sorting out for the views of those involved. The instrument’s face and content validity was high. In addition, test-retest reliability was also established.

**III. Results**

The data were analyzed using table and percentage. The hypotheses were analyzed using chi-square statistic. General Analysis of Questionnaire Distributed

**Table 3**

Department	Number Distributed	Returned Questionnaire	Percentages
Quality Control	153	153	50
Production	106	106	35
Others	47	47	15
<b>Total</b>	<b>306</b>	<b>306</b>	<b>100</b>

From the above table, a total number of 306 questionnaires were distributed to employees in different departments of Nigerian Breweries plc Enugu. 153 questionnaires were distributed to quality control department and all were returned representing 50% of the total questionnaires. 106 questionnaires were distributed to production department and all were returned, representing the 35% of the total questionnaire and 47 questionnaires were distributed to other department and all were returned representing 15% of the total questionnaire distributed and returned.

**Question 1**

Is there any problem facing quality control in manufacturing firms?

**Table 4**

Opinion	Frequency	Percentage
Yes	222	73
No	84	27
<b>Total</b>	<b>306</b>	<b>100</b>

From the above table, data reveal that 222 respondents representing 73% of the total respondents agreed that there is problem facing quality control in manufacturing firms while 84 respondents representing 27% of the total respondents disagreed.

**Question 2**

Is there different technique of quality control in manufacturing firms?

**Table 5**

Opinion	Frequency	Percentage
Yes	276	90
No	30	10
<b>Total</b>	<b>306</b>	<b>100</b>

In response to analyze, from the above table, 276 respondents representing 90% of the total respondents agreed that there are different techniques of quality control in manufacturing firms while 30 respondents representing 10% of the total respondents disagreed.

**Question 3**

Can efficient quality control increase profitability in manufacturing firms?

**Table 6**

Opinion	Frequency	Percentage
Yes	188	61
No	118	39
<b>Total</b>	<b>306</b>	<b>100</b>

From the above respondents, 188 respondents representing 61% of the total respondent agreed that efficient quality control increase profitability in manufacturing firms while 118 respondents representing 39% of the total respondents opposed it.

**Question 4**

What factor does your firm consider most important in Production?

**Table 7**

Opinion	Frequency	Percentage
Customers satisfaction	263	86
Management satisfaction	15	5
Profit	28	9
<b>Total</b>	<b>306</b>	<b>100</b>

From the above data, it was discovered that Nigerian Breweries plc Enugu consider all the above mentioned factors but much emphasis is laid on customers satisfaction as 263 representing 86% of the total respondents maintained that their firm consider customer satisfaction most important in production while 15 respondents representing 5% of the total respondents said that their firm consider management satisfaction most here as 28 respondents representing 9% of the total respondents maintained for profit.

**Question 5**

Does your firm apply control techniques?

**Table 8**

Opinion	Frequency	Percentage
Yes	306	100
No		
<b>Total</b>	<b>306</b>	<b>100</b>

All the three hundred and six (306) respondents agree that Nigeria Breweries plc Enugu applies control techniques.

**Question 6**

If the answer to the question above is yes, what method does your firm use?

**Table 9**

Opinion	Frequency	Percentage
Statistical	52	17
Control chart	12	4
Quality Circle	34	11
Acceptance Sampling	34	11
All of the above	174	57
<b>Total</b>	<b>306</b>	<b>100</b>

According to the data above, 52 respondents representing 17% of the total respondents indicated that the firm use only statistical process, 12 respondents representing 4% of the total respondents indicated that the firm use only control chart, 34 respondents representing 11% of the total respondents indicated that the firm use only quality circle, the same thing is applicable to acceptance sampling while 174 respondents representing 57% of the total respondents shows that Nigerian Breweries Plc Enugu uses all the above mentioned techniques.

**Question 7**

Whose Responsibility it is to established quality standard in a firm?

**Table 10**

Opinion	Frequency	Percentage
Board of directors	50	16
Top managers	135	44
Quality control Managers	82	27
Supervisors	39	13
<b>Total</b>	<b>306</b>	<b>100</b>

From the table above, 50 respondents representing 16% of the total respondents indicated that the firm's quality standard is the responsibility of the Board of Directors, 135 respondents representing 44% of the total respondents indicated that top managers are responsible for the establishment of firm's quality standard, 82 respondents representing 27% of the total respondents indicated that quality control managers are responsible for the establishment of firm's quality standard while the remaining 39 respondents representing 13% of the total respondents indicated that supervisors are responsible for the establishment of firm's quality standard. This shows that some staff in the firm does not know whose responsibility it is to establish quality standard. It also shows that the top management and quality control managers are involved in the establishment of quality standard in the firm.

**Question 8**

Whose responsibility is it, to ensure that product quality conforms to firm's specification?

**Table 11**

Opinion	Frequency	Percentage
Quality Control Manager	107	35
Supervisors	73	24
Workers	34	11
Everybody	92	30
<b>Total</b>	<b>306</b>	<b>100</b>

From the data above, 107 respondents representing 35% of the total respondents agreed that it is the duty of the Quality Control managers to ensure that product quality conform to the firm’s specification, 73 representing 24% of the total respondents said that it is the duty of the supervisor, 34 respondents representing 11% of the total respondents said that it is the workers responsibility while the remaining 92 respondents representing 30% of the total respondents said that it is everybody responsibility to ensure that products quality conform to the firm’s specification.

**Question 9**

Does your firms’ quality of product confirm to firm’s specification?

**Table 12**

Opinion	Frequency	Percentage
Yes	306	100
No	-	-
Total	306	100

From the table above, all 306 respondents agreed that their firm’s product confirm to firm’s specification.

**Question 10**

If yes to the above question, is the current practice enough to ensure high quality products?

**Table 13**

Opinion	Frequency	Percentage
Yes	306	100
No	-	-
Total	306	100

From the response above, 306 respondents representing 100% of the total respondents indicate “yes” that the current quality control practice in the firms ensures the production of high quality product.

**Question 11**

Does individual training in quality control practice affect their commitment to quality control in your firm?

**Table 14**

Opinion	Frequency	Percentage
Yes	306	100
No	-	-
Total	306	100

From the response above, 306 representing 100% of the total respondents indicates “yes” that the training of individual workers in quality control practice make them to be committee in achieving the goals of the firm.

**Test Of Hypotheses**

The chi-square statistics was used in computing the test and stated below”

**Hypothesis 1**

There is problem facing quality control in the manufacturing firm.

**2x3 contingency Table**

Option	Quality Control	Production	Others	Total
Yes	23(35.5)	34(24.60)	14(10.91)	71
No	130(117.5)	72(81.40)	33(36.09)	235
Total	153	106	47	306

**Test Technique – Chi-square**

Departments Quality Control	Response	0	e	0-e	(0-e) <sup>2</sup>	$\frac{(0-e)^2}{e}$
Quality Control	Yes	23	35.5	-12.5	156.25	4.40
	No	130	117.5	12.5	156.25	1.33
Production	Yes	34	24.60	9.4	88.36	3.60
	No	72	81.40	-9.4	88.36	1.09
Others	Yes	14	10.91	3.09	9.55	0.88
	No	33	36.09	-3.09	9.55	0.27
						11.57

Calculated value = 11.57  
 Df = (r - 1) (c-1)  
 Where  
 DF = Degree of freedom  
 r = Number of Rows  
 c = Numbers of columns  
 DF = (2-1) (3-1)  
 = 1 x 2  
 = 2  
 Critical value = 5.99

**Decision Rule**

Since the calculated value is greater than critical value we accept the hypothesis which states that there are problems facing quality control in the manufacturing firms.

**Hypothesis II**

There is a technique of quality control in the manufacturing firms.

**2x 3 contingency Table**

Option	Quality Control	Production	Others	Total
Yes	36(26.5)	12(18.36)	5(8.14)	53
No	117(126.5)	94(87.64)	42(38.86)	253
<b>Total</b>	<b>153</b>	<b>106</b>	<b>47</b>	<b>306</b>

**Test-Techniques – chi-square**

Departments Quality Control	Response	0	e	0-e	(0-e) <sup>2</sup>	$\frac{(0-e)^2}{e}$
	Yes	36	26.5	9.5	90.25	3.406
	No	117	126.5	-9.5	90.25	0.713
Production	Yes	12	18.36	-6.36	40.45	2.203
	No	94	87.64	6.36	40.45	0.462
Others	Yes	5	8.14	-3.14	9.86	1.211
	No	42	38.86	3.14	9.86	0.254

$\Sigma 8.249$   
 Calculated Value = 8.249  
 DF = (r - 1) (c-1)  
 DF = (2-1) (3-1)  
 = 1 x 2  
 = 2  
 Critical value = 5.99

**Decision Rule**

Since the calculated value is greater than critical value accept we accept the hypothesis which states that there are different techniques of quality control in the manufacturing firms.

**IV. Hypothesis**

There is relationship between quality control and increase in profitability of manufacturing firms.

**2x 3 contingency Table**

Option	Quality Control	Production	Others	Total
Yes	50(38)	14(26.33)	12(11.67)	76
No	103(115)	92(79.67)	35(35.33)	230
<b>Total</b>	<b>153</b>	<b>106</b>	<b>47</b>	<b>306</b>

**Test- techniques – chi-square**

Departments	Response	0	e	0-e	(0-e) <sup>2</sup>	$\frac{(0-e)^2}{e}$
Quality Control	Yes	50	38	12	144	3.789
	No	103	115	-12	144	1.252
Production	Yes	14	26.33	-12.33	152.03	5.774
	No	92	79.67	12.33	152.03	1.908
Others	Yes	12	11.67	0.33	0.109	0.009
	No	35	35.33	-0.33	0.109	0.003

$$\begin{aligned} \sum 12.735 \\ \text{Calculated Value} &= 12.735 \\ \text{DF} &= (r-1)(c-1) \\ \text{DF} &= (2-1)(3-1) \\ &= 1 \times 2 \\ &= 2 \\ \text{Critical value} &= 5.99 \end{aligned}$$

#### **Decision Rule**

Since the calculated value is greater than critical value we accept our hypothesis which state that there is a relationship between quality control and increase in profitability of manufacturing firms.

#### **Summary Of Findings**

Based on the results, we summarize the findings as follows:

The most important factor a firm considers before production is customers' satisfaction or customers' taste

Nigerian Breweries Plc applies quality control techniques ranging from acceptance sampling, control chart, quality circle and statistical process of quality control techniques.

Quality control establishment is mainly the responsibility of top managers as well as quality control manages while the responsibility to ensure conformance lies with everybody in the firm, especially the quality control managers.

Efficient quality control increase profitability of manufacturing firms.

Training and development of employees based on quality control practice affect their commitment of quality control in the manufacturing firms.

Despite, the quality control techniques applied by the manufacturing firms, they still encounter some problems in the quality control practice.

#### **V. Conclusion**

From the results of this research work, it has been revealed to readers that quality control techniques are indispensable tools for a successful business since the application of quality control techniques can help to ensure the production of high quality products to consumer satisfaction which in turn result to a successful business. Like every other things, the benefit of quality control and its techniques can only be assured by the effective and efficient application of these techniques. Above all, manufacturing firms encounter a lot of problems while applying quality control practice as a result of the following;

Non –awareness of quality control techniques.

Inability to understand the need of customers

Cost of applying quality control techniques

Non-availability of equipment to be used.

Negative attitude of employees more especially top management in the firm.

#### **Recommendations**

From the research findings, numerous recommendations can be made in order to provide possible solution to the problems encountered by Nigerian Breweries on its control process. The recommendations are:

Training and seminars should be organized once in a while for everybody in the firm. That is from the top management down to operative workers. Effort should be made during these training program and seminar to let them understand the objectives of the firm and the need for effective quality control.

The establishment of quality standard as well as ensuring that product quality conforms to the firm's specification should not only be the responsibility of the top management and quality control managers but also everybody in the firm. This will give everybody a sense of responsibility in achieving the organization quality goals.

Quality is not inspected into products but is designed into them. Therefore, the company should identify errors if any and correct them at the source where the product is produced.

The firm should enforce the employees to strictly comply with the standard established in order to avoid mistake and correct employees' negative attitude toward quality control practice.

There is also need to move with the trend in the area of technology and equipment. This will help in curbing the problem of poor technology or equipment.

Job description is also important. It must be clearly defined to every individual based on his role in the quality control of the firm and ensure that he complies with it.

The company should not undermine the important of quality circles. The technique has to be used more often other techniques because it involves people who carryout research in order to known the current quality trend and the problems of quality control. They also carryout research to find out ways these problem could be solved.

### **Suggestions For Further Research**

Having highlighted the problems of quality control in a manufacturing firm, the researcher thereby gives further suggestion for further research in order to improve the quality of product in manufacturing firm.

The suggestions are;

- 1) The manufacturing firm should make use of run chart in checking the quality of their products.
- 2) By applying Pareto analysis in dealing with the causes of quality control problems in the manufacturing firm.
- 3) By ensuring that employees that will improve the quality of their products are employed. i.e. employing qualified employees in each department.

### **References**

- [1]. Anyanwu, C.I (2013) "Quality Control Concepts in the Manufacture of Masonry Block for Building Project Delivery" Vol. 14(1) Pg 35-40.
- [2]. Deming, W.E. (2000) "Out of Crisis" Revised Edition, Cambridge, Managing Institute of Technology.
- [3]. Gbadeyan, R.A. and Adeoti, J.O (2005) "Total Quality Management". An MBA Seminar presentation to the Department of Business Administration, University of Illorin
- [4]. George, J.M and Jones, G.R (2006) "Understanding and Managing Organizational Behaviour", USA, Addison Wesley Publishing Company Inc.
- [5]. Orga, C. C. (2011) "Production Management", Revised Edition, Veamaks Publisher, Enugu
- [6]. Ile, N.M (2011) "Small Scale Business Management; An Integrated Approach" 2<sup>nd</sup>, Edition, Enugu, Bencelia Venture.
- [7]. Juran J. M. and (2000) "Early Scientific Quality Control; A Historical supplement Quality Process" Vol. 30(9) Pg 73-81
- [8]. Leonard, D.R. and Adam, Mc (2000) "Developing Strategic Quality Management; A Research Agenda, Total Quality Management" Vol. 13 (4) pg 507-522
- [9]. Longenecker, J.G, Moore, C.W and Petty, J.W (2000) "Small Business Management" 11<sup>th</sup> Edition, USA, South Western College Publisher
- [10]. Mesinger, M. and Wagner, S. (2006) "A model of Analytical Quality Assurance Vol.11 (5) pg 54-60
- [11]. Ognyan, I. (2011) *Application and experience of Quality Control*, Vol.2 (5) pg 25-28
- [12]. Ojinnaka, M.C (2011) *Development and Quality Assurance*, Vol. 10 (6) pg 589-593
- [13]. Ryan, T.P (2000). *Statistical Method for Quality Improvement*, 2<sup>nd</sup> edition, New York, Wiley Publisher
- [14]. The Daily Sun Newspaper (2013) Volume 10 No. 2583, Monday March 18th
- [15]. [www.nigerianbreweries.org](http://www.nigerianbreweries.org)