

## Review Article

# The Nigeria Beer Story

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### ABSTRACT

#### Keywords

Nigeria Beer,  
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Beers are obtained by the yeast fermentation of malted cereal grains, to which hops and water have been added. Brewing has evolved from a cottage craft into a modern industry where large breweries export their beers worldwide. On a per capita basis, Germans consume the most beer at about 40 gallons (151 liters) per person per year. Beer drinkers in the U.S. rank fourteenth in the world, with American breweries producing approximately 156,900 million barrels of beer a year. Each barrel is the equivalent of 117 liters or approximately 31 gallons. The true origin of beer can only be conjectured. Early attempts at brewing occurred around 7000 B.C. in Mesopotamia. The Egyptians and Greeks also brewed alcoholic beverages by various methods, but the term "beer" did not appear in these early languages.

## Introduction

The family of beverages generally referred to as "beer" has been brewed for centuries. Beers are obtained by the yeast fermentation of malted cereal grains, to which hops and water have been added. Brewing has evolved from a cottage craft into a modern industry where large breweries export their beers worldwide. On a per capita basis, Germans consume the most beer at about 40 gallons (151 liters) per person per year. Beer drinkers in the U.S. rank fourteenth in the world, with American breweries producing approximately 156,900 million barrels of

beer a year. Each barrel is the equivalent of 117 liters or approximately 31 gallons.

The true origin of beer can only be conjectured. Early attempts at brewing occurred around 7000 B.C. in Mesopotamia. The Egyptians and Greeks also brewed alcoholic beverages by various methods, but the term "beer" did not appear in these early languages. The Babylonians offered brewing recipes, and there are various references to beer in the Bible. The English word "beer" seems to stem from the Celtic word "beor," which referred to a malt brew made by

monks at a North Gaul monastery. In the middle ages, monasteries were the leading producers of beer, and monks are credited with many early brewing techniques, such as the addition of hops to improve the aroma and help preserve the beer. The distinction between ales, lagers, and darker bock beers began to appear in French and Irish writings in the 13th century. It is generally accepted that the modern beers as we know them today date to the 1600s.

History has it that the Reinheitsgebot (literally “purity order” sometimes called the “German Beer Purity Law” or the “Bavarian Purity Law” in English, is a regulation concerning the production of beer in the Holy Roman Empire and its successor state, Germany. In the original text, the only ingredients that could be used in the production of beer were barley and hops.

The law originated on 30 November 1487, when Albert IV, duke of Bavaria promulgated it, specifying three ingredients- water, malt and hops- for the brewing of beer. Later in the city of Ingolstadt in the duchy of Bavaria on 23 April 1516, two other dukes endorsed the law as one to be followed in their duchies, adding standards for sale of beer.

The earliest documented mention of beer by a German nobleman is the granting of a brewing license by Emperor Otto II to the church at Liege (now Belgium) awarded in 974 AD. In the original text, the only ingredients that could be used in the production of beer were water, barley and hops. The law also set the price of beer at 1-2 Pfennig per MaB. The Reinheitsgebot is no longer part of German Law: it was replaced by the Provisional German Law in 1993, which allows constituent components prohibited in Reinheitsgebot, such as yeast, wheat malt and cane sugar, but which no longer allows unmalted barley.

No yeast was mentioned in the original text. It was not until the 19th century, Louis Pasteur discovered the role of microorganisms in fermentation; therefore, yeast was not known to be an ingredient of beer. Brewers generally took some sediment from the previous fermentation and added it to the next, the sediment generally containing the necessary organisms to perform fermentation. If none were available, they would set up several vats, relying on natural airborne yeast to inoculate the brew.

Hops are added to beer to impart flavors but also act as a preservative, and their mention in Reinheitsgebot was meant to prevent alternative methods of preserving beer that had been used before the introduction of hops. Medieval brewers had used many problematic ingredients to preserve beers, including soot and fly agaric mushrooms. More commonly other ‘gruit’ herbs had been used, such as stinging nettle and henbane. The German name of the latter, Bilsenkraut, may originally mean “Pilsen herb”, including that this region was a major center of beer brewing long before the intervention of (Reinheitsgebot-complaint) Pilsener.

The penalty for making impure beer was also set in the Reinheitsgebot: a brewer using other ingredients for his beer could have questionable barrels confiscated with no compensation.

German breweries are very proud of the Reinheitsgebot, and many claim still to abide by it. Some breweries in areas with a historical connection to Germany, such as Namibia Breweries Limited, also claim to be compliant to the Reinheitsgebot.

The Reinheitsgebot was introduced in part to prevent price competition with bakers for

wheat and rye. The restriction of grains to barley was meant to ensure the availability of affordable bread, as the more valuable wheat and rye were reserved for use by bakers. Today many Bavarian beers are again brewed using wheat and are thus no longer compliant with the Reinheitsgebot.

The Reinheitsgebot formed the basis of legislation that spread slowly throughout Bavaria and Germany. Bavaria insisted on its application throughout Germany as a precondition of German unification in 1871, to prevent competition from beers brewed elsewhere with a wider range of ingredients. The move encountered strong resistance from brewers outside Bavaria. By restricting the allowable ingredients, it led to the extinction of many brewing traditions and local beer specialties, such as North German spiced beer and cherry beer, and led to the domination of the German beer market by pilsener style beers. Only a few regional beer varieties, such as Kölner Kölsch or Düsseldorfer Altbier, survived its implementation.

Regulations similar to the Reinheitsgebot were incorporated into various guild regulations and local laws all over Germany, and in 1952, they were incorporated into the West German Biersteuergesetz (Beer Taxation Law). Many brewers objected to the law at the time, disagreeing more with the amount of the tax than the ingredient requirements. The law initially applied only to bottom-fermented ("lager") beers, but brewers of other types of beer soon accepted the law as well.

In May 1988, a European Court of Justice ruling led to the Reinheitsgebot being lifted, allowing ingredients beyond what was listed in the Biersteuergesetz; this meant that anything allowed in other foods was also allowed in beer. The lifting of the Biergesetz

only concerns imported beer. Beer brewed in Germany still must follow the law.

After German reunification in 1990 the Neuzeller Kloster Brewery, a former monastery brewery in the East German town of Neuzelle, Brandenburg, was warned to stop selling its black beer as it contained sugar. After some negotiations the brewery was allowed to sell it under the name Schwarzer Abt ("Black Abbot") but could not label it "bier". This decision was repealed by the Federal Administrative Court of Germany through a special permit, and after legal disputes lasting ten years (known as the "Brandenburg Beer War") Neuzeller Kloster Brewery gained the right to call "Schwarzer Abt" "bier" again.

The revised Vorläufiges Biergesetz of 1993 is a slightly expanded version of the Reinheitsgebot, stipulating that only, water, malted barley, hops and yeast be used for any bottom-fermented beer. Top fermented beer is subject to the same rule with the addition that a wider variety of malt can be used as well as technically pure sucrose and beet sugars.[5] All ingredients and the process itself are subject to additional regulations.

Thus, German breweries continue to comply with the Biergesetz, and often claim compliance with the Reinheitsgebot even when it is patently incorrect (for example, for Wheat beer which were prohibited by the Reinheitsgebot). Thus the Reinheitsgebot has become a valuable marketing tool.

Until superseded by a change in EU law, the Reinheitsgebot was also enforced in Greece from the early 19th century due to a law by the first Greek king, Otto (originally a Bavarian prince) that had remained in effect for over a hundred years. The law drew criticism from foreign brewers as a form of

protectionism that allowed Germany to prohibit beers from Belgium and England which contained sugars, grains such as Corn and Rice, and clarification and fining agents.

Beer brewing was already a thriving industry in Europe when the United States declared its independence in 1776. European immigrants brought their brewing skills to America and founded a thriving beer industry. Some technological advancements—the yeast separator, for example—made mass production of beer possible. Bottled beer was introduced in 1875 by the Joseph Schlitz Brewing Company in Milwaukee, Wisconsin, a city famed for its breweries. Canned beer first came on the market in the 1930s. The American beer market today is dominated by several large companies such as Miller and Anheuser Busch, though microbreweries and brew pubs that produce their own brands are becoming increasingly popular.

The beer story in Nigeria is the story of Nigeria Breweries Plc, which is a decade and half older than Nigeria as a nation. Beer was introduced into Nigeria in commercial quantity apart from the few brought into the country by the colonial master during celebrations in 1946 by Nigeria Breweries Plc when it was first listed as a company. The first brand of beer rolled off the bottling line of its brewery in June 1949.

### **Raw materials**

Beer requires these ingredients for brewing: properly prepared cereal grain (usually barley, sorghum, maize or rice), hops (scientific name *Humulus lupulus*), pure water, and brewer's yeast. Each ingredient can affect flavor, color, carbonation, alcohol content, and other subtle changes in the beer. Grains are carefully stored and handled

to promote highest quality. Hops are cultivated perennially and the useful portions of the vine, the sticky cones, are developed from the bloom. About 16 kg of barley malt and 7 kg of grain are used to make each 1.4-1.5 hectoliters of beer. Large quantities of pure water are extremely important not only as an ingredient, but for maintaining the cleanliness of the brewing equipment. In beer, water high in lime or iron can interfere with the fermentation process and discolor the final product. Yeasts are fungi, which are microorganisms that reduce sugars to alcohol by fermentation. Some types of brewer's yeast are closely guarded trade secrets. This gives one brewery a competitive edge over the other.

Outside of the beer itself, the process also requires various cleaning agents to maintain and sterilize the brewing equipment. The finished product also requires packaging, which includes cardboard products for boxes, aluminum for cans, glass for bottles, and stainless steel for kegs and other commercial dispensing equipment. The majority of the brewing equipment is stainless steel, with the exception of the brew kettles, which are copper.

### **The brewing process**

#### **Malting**

Fully ripened barley grains are "steeped," or soaked in cold water until they are fully saturated. The water is changed once a day, and after 45-72 hours the grains are placed in shallow tanks. The grain is aerated and stirred, which causes it to germinate, releasing enzymes such as malt diastase. Malt diastase converts the starches contained in the grain to sugar for fermentation. As soon as the germination is adequately complete, usually six days, the

grain is roasted to stop the germination process. The exact point at which the roasting starts and ends affects the flavor and color of the beer. The product at this point is referred to as malt.

While amateur brewers swap recipes at will, the commercial recipes for beer are held tightly as any state secret. Until recent decades, the production of beer, like wine, was a wonderful combination of art, science, and luck. At the heart of the process has been the brewmaster, a traditional craftsman wrapped in the lab coat of a scientist and carrying the clipboard of a production engineer. In the 20th century, corporate breweries have evolved into an intriguing combination of flow production in the brewing process and automated canning, bottling, and warehousing.

In the 19th century, the brewing industry flourished as numerous brewmasters drew on their European heritages and functioned as chemists, biologists, engineers, inventors, and salesmen. The combination of local ingredients, water quality, and the brewmaster's traditions and skill meant that many regions, even locales, could have their own brands. Before mechanical refrigeration, pasteurization, and rapid transportation facilities, national distribution was, of course, impossible. One result of this was that the United States has always enjoyed a wide variety of regional beers. In 1867 there were breweries in every state and territory, an astonishing total of 3,700; in 1934 there were still over 800 in operation; in 1994 there were about 500. After Prohibition and with the development of steel cans for beer in 1935, breweries shifted their focus away from primary interest in bars and toward home consumption.

Despite the seeming pervasiveness of national brands from the mega-breweries

supported by their huge advertising budgets, this tradition of hundreds of local brands continues. In recent years it has even been augmented by the proliferation of so-called "microbreweries" which often display the brewing equipment as part of the decor of a drinking establishment and distribute their products primarily on-site.

### **Preparing the mash**

The malt is crushed using iron rollers and transferred to the mash tank (or "tun"). This tank is a large copper or stainless steel vessel that mixes the malt with warm water until it is of porridge-like consistency. This mixture is called mash. After mixing with similarly prepared cereal grains, the temperature of the mash is raised incrementally from 100-170°F (38-77°C) so that the enzymes react. The enzymes break down the starch in the grain and convert it to simple sugars. Later, the yeast will convert the sugars into alcohol. Once complete, the mash is allowed to sit undisturbed so the solids can descend to the bottom of the tank.

Beer requires these ingredients for proper brewing: prepared cereal grain (usually barley and corn or rice), hops, pure water, and brewer's yeast. Each ingredient can affect flavor, color, carbonation, alcohol content, and other subtle changes in the beer.

### **Brewing the wort**

The liquid contained in the mash is transferred into another tank called a lauter tun. This is accomplished by drawing the liquid out through the bottom layer of mash solids, which acts as a filter. Hot water is added to the top of the mash tank to rinse the remaining liquid, now called wort, from the mash. The solid remains of the grain are dried and sold by the brewery as animal

feed. The wort travels on to the brew kettles, where it is boiled to sterilize it, and where the carefully prepared hops are added. The addition of the hops is important because they contribute to the bitterness of the beer. The brew kettles are the most impressive equipment in the process. Gleaming copper, they can be 7-12 feet (2-3.6 m) in diameter and two stories high. Steam usually provides the heating energy to the brew kettles. After brewing is complete, the finished wort is filtered again and pumped to the fermentation tanks.

### **Fermenting**

In the fermentation tanks, the atmosphere must be carefully controlled to prevent any "rouge" bacteria from interfering with the yeast. Carefully maintained yeast (approximately 2kg per hectoliters of wort) is added to the wort, and the temperature of the mixture is slowly reduced over a period of days to between 50°F and 60°F (10-15°C). In this temperature range, the yeast grows, consuming the sugar in the wort, and bubbles of carbon dioxide form. The wort has now become beer. The new beer referred to as green beer is filtered and transferred once more into the aging casks or tanks, where the temperature is controlled at 32°F (°C) for 2-24 weeks. The shorter storage time produces a pale lager beer while the European lagers (called Pilsner) are aged longer to increase the alcohol content, where the residual sugar is further metabolized to produce alcohol.

### **Modern fermenting tanks**

Fermentation, as a step in the brewing process, starts as soon as yeast is added to the cooled wort. This is also the point at which the product is first called beer. It is during this stage that sugars won from the malt are metabolized into alcohol and

carbon dioxide. Fermentation tanks come in all sorts of forms, from enormous tanks which can look like storage silos, to 22.5liters glass carboys in a homebrewer's closet.

Most breweries today use cylindroconical tanks, or CCTs, have a conical bottom and a cylindrical top. The cone's aperture is typically 60°, an angle that will allow the yeast to flow toward the cones apex, but is not so steep as to take up too much vertical space. CCTs can handle both fermenting and conditioning in the same tank. At the end of fermentation, the yeast and other solids which have fallen to the cones apex can be simply flushed out a port at the apex.

Open fermentation vessels are also used, often for show in brewpubs, and in Europe in wheat beer fermentation. These vessels have no tops, which makes harvesting top fermenting yeasts easy but the open tops of the vessels make the risk of infection a lot greater.

Fermentation tanks are typically made of stainless steel. If they are simple cylindrical tanks with beveled ends, they are arranged vertically, as opposed to conditioning tanks which are usually laid out horizontally.

A very few breweries still use wooden vats for fermentation as wood is difficult to keep clean and infection-free and must be repitched more or less yearly.

After high krausen a bung device (German: Spundapparat) is often put on the tanks to allow the CO<sub>2</sub> produced by the yeast to naturally carbonate the beer. This bung device can be set to a given pressure to match the type of beer being produced. The more pressure the bung holds back, the more carbonated the beer becomes.

## **Conditioning**

When the sugars in the fermenting beer have been almost completely digested, the fermentation slows down and the yeast starts to settle to the bottom of the tank. At this stage, the beer is cooled to around freezing, which encourages settling of the yeast, and causes proteins to coagulate and settle out with the yeast.

Unpleasant flavors such as phenolic compounds become insoluble in the cold beer, and the beer's flavor becomes smoother. During this time pressure is maintained on the tanks to prevent the beer from going flat.

If the fermentation tanks have cooling jackets on them, as opposed to the whole fermentation cellar being cooled, conditioning can take place in the same tank as fermentation. Otherwise separate tanks (in a separate cellar) must be employed.

## **Secondary fermentation**

Secondary fermentation is an additional fermentation after the first or primary fermentation. Some beers may have three fermentations.

## **Bottle fermentation**

Some beers undergo a fermentation in the bottle, giving natural carbonation. This may be a second or third fermentation. They are bottled with a viable yeast population in suspension. If there is no residual fermentable sugar left, sugar may be added. The resulting fermentation generates CO<sub>2</sub> which is trapped in the bottle, remaining in solution and providing natural carbonation.

## **Cask conditioning**

Beer in casks are managed carefully to allow some of the carbonation to escape.

## **Filtering**

A mixture of diatomaceous earth and yeast after filtering.

Filtering the beer stabilizes the flavor, and gives beer its polished shine and brilliance. Not all beer is filtered.

Filters come in many types. Many use pre-made filtration media such as sheets or candles, while others use a fine powder made of, for example, diatomaceous earth, also called kieselguhr, which is introduced into the beer and recirculated past screens to form a filtration bed.

Filters range from rough filters that remove much of the yeast and any solids (e.g. hops, grain particles) left in the beer, to filters tight enough to strain color and body from the beer. Normally used filtration ratings are divided into rough, fine and sterile. Rough filtration leaves some cloudiness in the beer, but it is noticeably clearer than unfiltered beer. Fine filtration gives a glass of beer that you could read a newspaper through, with no noticeable cloudiness. Finally, as its name implies, sterile filtration is fine enough that almost all microorganisms in the beer are removed during the filtration process.

## **Sheet (pad) filters**

These filters use pre-made media and are relatively straightforward. The sheets are manufactured to allow only particles smaller than a given size through, and the brewer is free to choose how finely to filter the beer. The sheets are placed into the filtering frame, sterilized (with hot water, for example) and then used to filter the beer. The sheets can be flushed if the filter becomes blocked, and usually the sheets are disposable and are replaced between filtration sessions. Often the sheets contain powdered filtration media to aid in filtration.

Sheets are sold in nominal ratings, and typically 90% of particles larger than the nominal rating are caught by the sheet.

### **Kieselguhr filters**

Filters that use a powder medium are considerably more complicated to operate, but can filter much more beer before needing to be regenerated. Common media include diatomaceous earth, or kieselguhr, and perlite.

### **Pasteurizing**

After aging, the beer can be pasteurized to kill the remaining yeast and prevent further alcohol production. This is accomplished by heating the beer above 135°F (57°C). This process, named after Louis Pasteur, is widely known for preserving milk. Interestingly, Pasteur originally developed this process to preserve beer in the 1860s. Pasteurization, however, is not used in the production of genuine draft beers. These beers are also known as "ice" beers, since they must be kept refrigerated to preserve their flavor and slow the remaining yeast activity. Many consider the draft beers best in aroma as well as taste.

### **Packaging**

Whether packaged into cans, bottles, or kegs, the beer is always moved gently through the maze of piping in the bottling area. This is to preserve the natural carbonation. During bottling, additional carbon dioxide gas from the fermentation kettles is used to improve the aroma of the beer. High-speed packaging lines can process thousands of cases of beer per day, and with modern computerized control, the inventory can be tracked throughout the distribution network. Most beer is delivered from local distributors who have purchasing contracts with the major breweries.

Most beer is available in the following package sizes: "pony" cans and bottles of about 8 fluid ounces, standard 12-ounce cans and bottles, 16- and 32-ounce jumbo cans, 40-ounce "picnic" bottles, 8-gallon "pony" kegs, and the standard 16-gallon beer keg. Other novelty and party packages are also available. Cans and bottles are packed in 6, 8, 12, or 24 each to a box or case. Most states require a deposit at point of sale to encourage the return of the bottles and cans.

When beer is dispensed from the keg, a pressure apparatus called a "tapper" is used to apply a light pressure of carbon dioxide (usually 2-6 PSI) to the tapper head for dispensing.

### **Byproducts/Waste**

Beer brewing produces several byproducts that can be used by other industries. During the malting of the barley, rootlets form on the grain and drip off. These can be collected and used for animal feed.

The hops that is filtered out from the finished wort can also be collected and used again as fertilizer. The residual yeast from the brewing process is a rich source of B vitamins. It can be put to use by pharmaceutical companies to make vitamins or drugs, or used as a food additive. Used beer cans and beer bottles are routinely recycled.

### **Brewing industry in Nigeria**

Since the reintroduction of democracy in Nigeria in 1999, the beverage industry has shown considerable growth as government policies (allied with increasing oil prices) channel more cash to consumers and a freer atmosphere to socialize emerged. The advent of a democratic government has led to a more business friendly environment and

privatization policies have led to an increase in the size of the beverage industry.

### **Consumption pattern**

Recent survey had shown that the population is on the side of the beverage industry in Nigeria. Initial findings indicate consumption of beer is influenced in many ways. Nevertheless, the most striking of these influences are found to be convenience of purchase, along with availability, price, health concerns, and socio-cultural reasons. Ayantunji et.al.,(2009). The beer industry faces many challenges caused by the environment in Nigeria such as poor infrastructure, poor standards of education, high level of corruption, and dearth of the knowledge of the beneficial effect of beer to health when consumed moderately.

In the recent years, these companies have been totally overtaken by multi national who have increased their investment in physical plants, information technology and staff training with a view to improving their operational performance.

In the mid to late eighties the then Nigerian Military Government embarked on a string of economic reforms to jump start the economy, some of which included restriction on the importation of barley, so the sought, for local grains, and the sorghum being the most suitable in terms of the similarity in an anatomical physiological structure and also economically viable was the choice grain.

Prior to this time, in the brewing industry, all the ingredients were imported, the only ingredient sorted locally was water! The structural Adjustment Programme (SAP) thus became the birth place of the sorghum supply chain in Nigeria.

The sorghum supply chain in Nigeria is currently put at about US\$200 (Two

hundred) million market, comprising seedling producers, farmers, farming input (pesticides, fertilizer input etc.)

The sorghum malting industry in Nigeria has combined malting capacity of over 160,000 metric tones (MT) of sorghum per annum. This is expected to rise by as much as 25,000 – 30,000 MT as a result of more investment in the industry. Apart from the sorghum supply chain, there are other chains that support the brewing industry, including packaging, warehousing logistics among others. There are also service industries providing engineering design and capacity building. There are also financial institutions that lubricate the entire industry.

### **Over view of the alcoholic beverage industry between 1980 to date**

The brewery industry has been faced by three different economic situations. Within the period 1980 -1981. These could be regarded as “Utopian” period. This was a period of favourable market; buoyant economy, characterized by high exchange rate of the currency, high purchasing power of consumer income, high demand easy accessibility of foreign exchange, availability of loans, the funds to finance capital project coupled with low interest rate.

With the arrival of 1982, the bubble busted, Nigeria started experiencing uncertainty in supply and unfavourable market terrain in the industry. These manifested itself in; difficult access to foreign exchange, absence of easily usable local alternatives to imported materials.

Between 1986 – 1997 was the peak of the unfavorable market for the alcoholic beverage industry. The industry during this period experienced, high cost of production occasioned by low exchange rate of the

currency, rise in general of all commodities which affected all inputs into the operations, including locally sourced materials, high prices of products, low purchasing power of disposable income, high unemployment, accumulation and payment of debts owed contractors among others factors.

### **The state of the brewery industry in Nigeria**

In 1983, there were thirty-six breweries with a combined production level of 19.5 million hectoliters of installed capacity. As at 2010, the number of financing breweries slid down to barely 12, with a combined hectoliters of production of less than 6.0 million hectoliters. It might interest you to know that, Nigeria still falls below the level of 2 liters per capita consumption with South Africa ranking the highest with 61. This decline started with the period of Structural Adjustment Programme (SAP) when the industry was forced to backward integrate. This was desirable; however, the industry was ill prepared for the policy.

One of the emerging factors in the operating environment is the removal of beer from the prohibition list: This is difficult to classify; opportunity or threat? This depends on which side of the divide you are. The government will have to weigh the implications this policy will have on the brewing industry.

Other policies are: abolition of excise duty, the increasing wave of religious fervor and diversification efforts of breweries into the non-alcoholic beverage business, which is healthy for the economy.

Also is the policy of liberation of foreign investment and expansion of informal sector, which led to the proliferation of fake and adulterated products.

It is worthy of note that, despite all these, the Nigerian brewery industry is a major player in the Nigerian economy with annual sales exceeding =N=200billion. However, to date, competition in the Nigerian beer market is getting fiercer as environmental and economic conditions affect the disposable income of the consumer.

Growth in this industry in recent times has been achieved through innovation, market share increase and exploration of new frontiers through exports. With so few option for growth, companies that operates in the industry are under considerable pressure to deliver to their shareholders. Consequently, they must streamline their processes in order to drive real profitable growth, while ensuring that they effectively meet demands of both customers and consumers.

The Nigerian Breweries Plc and Guinness Nigeria Plc, the first and second largest players (by volume) in the brewery industry in Nigeria have experience significant growth in recent years in spite of the harsh terrain. This is attributable to the strategies they adopted in addressing the challenges posed by the environment. Their strategies are to continue to leverage on their existing competitive advantages they enjoy with their various brands, for example “star” and “Gulder” from Nigerian breweries Plc and Guinness “stout” from Guinness Nigeria Plc, however, in the recent times with advent of other stout beers like “legend extra stout” brewed by Nigeria Breweries Plc which is a main rival to Guinness Foreign Extra, has contributed to the downward trend of the fortune of Guinness Nigeria Plc from gains from its stout beer. Nevertheless these two beer brewing giants have a virtual dominance of the market, promoting growth in other brands, while diversifying their

product base to cut across all classes, tastes and geographic regions.

This is manifested in their efforts at;

- Maintaining cost leadership
- Enhancing price stabilisation
- Driving for excellence in product quality and
- Striving to attain exceptional operational efficiencies

The future of the beer market is however more complex. This is as a result of;

- The increasing complexities associated with distribution systems
- Demographic and changing lifestyles and increasingly health conscious population
- Fierce competition in the market
- The increasing powers of the distributors and retailers, who can choose to sell only products that gives them maximum profit.

### **Nigeria's beer industry: clash of the titans**

Industry reports indicate that the beer industry recorded a marked decline in growth as in the third quarter of 2013, as pressure on household incomes and heightened security concerns affected consumption patterns.

The revolution taking place in the Nigerian beer market is however hitting real hard on premium brands and if the trends continues, the brands may have to shrink in size and stature, forcing everybody to play at the low end. To prevent this slide, the brands have embarked on series of innovative marketing activities.

Even as the global consumption of beer has slowed down due to the downturn in economy, Nigeria consumption pattern has followed sooth. Nigeria has the second

largest beer market in Africa, after South Africa. And with the largest population in Africa, a growing middle class and a large number of drinking-age consumers , the brewing multinationals are jockeying for positions in a market that shows plenty of room for expansion.

The beer market in Nigeria grew in value by 21.8% in 2009, making it worth USD2.7 billion. As a result of the per caput intake of of just 10liters of Nigerians, the market has plenty of room for expansion. Analyst had projected an average annual growth of 23.45% between 2011 and 2014. Alcoholic beverage consumption is a social activity in Nigeria, of which 80% of the country sales are on trade. Beer is the most popular alcoholic drink in the country, making up about 96% of all alcohol sales, this is apart from the local alcohol brewers like “buruku” “pito”, wine and spirit drinks, which are also significant in volume

The three big operators in Nigeria's beer sector, which among the biggest global operators in the sector are on their wits end to ensure that they maintain, if not improve on, their market share. Nigerian Breweries Plc, Guinness Nigeria Plc, and SAB Miller are making sure that they supply enough of their various brands.

Beer is a very thriving business in Nigeria, and it is growing all the time. It is said to have been expanding at 10 percent per annum for quite a while. The average per capita beer consumption which is still 2liters but sixth of the rate compared to South Africa, meaning that the potential for growth remains huge, especially given that Nigeria has a population of 170million people. The brand conscious middle class is swelling and it is this demography that the three big global operators are targeting with aspirational drinks such as Heineken,

available in magnum-size bottles in Nigeria, and Guinness, which sells in greater quantities in the West African countries than anywhere else, including Ireland. The less affluent Nigerians, who have limited disposable income, also represent a potentially lucrative market as a result of their numbers, and are the target market for the cheaper brands of beer.

The competition between these three 'titans' is intense and highly exciting especially to market watchers. The over sixty years old Nigerian Breweries Plc, incorporated in 1946, is the pioneer and largest brewing company in Nigeria. Its first bottle of beer, 'Star lager' was rolled off the bottling lines of its Lagos brewery in June 1949. Other breweries were subsequently commissioned by the company, including Aba Brewery in 1957, Kaduna Brewery in 1963 and Ibadan Brewery in 1992. In September 1993, the company acquired its fifth brewery in Enugu State, and in October 2003, its sixth brewery, sited at Ameke in Enugu. Ama Brewery is the largest brewery in Nigeria and one of the most modern worldwide. Operations at Enugu brewery were discontinued in 2004, while the company acquired a malting plant in Aba in 2008.

In October 2011, Nigerian Breweries acquired majority equity interests in Sona Systems Associates Business Management Limited, (Sona Systems) and Life Breweries Limited from Heineken N.V. This followed Heinekens acquisition of controlling interests in five breweries in Nigeria from Sona Group in January 2011.

Sona Systems' two breweries in Ota and Kaduna, Life Breweries in Onitsha have now become part of Nigerian Breweries Plc.

Nigeria Breweries Plc now has eight operational breweries from which its products are distributed to all parts of

Nigeria, in addition to the malting plants in Aba and Kaduna. Nigeria Breweries Plc, parades brands of beer and other drinks namely; star, Gulder, Heineken, Malta Gold, Goldeberg, Maltina, Amstel Malta, Fayroux, Climax, and Life. Last year the company unveiled a new look Star, thereby deepening the market penetration strategy. It also reintroduced Life lager beer to Onitsha as a response to SAB Miller incursion into the South East geopolitical zone market. The company is not leaving any stone unturned in its bid to maintain market leadership.

SAB Miller is reputed to be the second largest lager beer manufacturing in the world. Its brewing and beverage operations in Africa cover 15 countries with a further 21 covered through strategic alliance with the Castel group. It is reported that in most of these countries, SAB Miller is the number one brewer by market share. It bottles soft drinks for Coca-Cola Company in 20 of its African markets (in alliance with Castel in 14 of those markets)

SAB Miller, a South African brewing giant made a grand entry into the Nigerian market, its coming has since rattled the market, giving the hitherto two giants in the brewing industry in Nigeria a run for their money.

SAB miller in 2009, bought Pabod Breweries, Port Harcourt, where it owns 57 percent of and Voltic Nigeria Limited (voltic produces table water), Lagos owning 80 percent of the Company, International Breweries, Ilesa and Standard Breweries, Ibadan, using these companies for soft landing in Nigeria.

The Company explained that in Nigeria, its lager beer volumes grew significantly, due to the additional capacity provided by the commissioning of the green-field in Onitsha in August in 2012, the successful launch of

Hero lager and the continued growth of Trophy lager brand, from the stable of International Breweries plc. SAB miller key 'local' brands include 2M, Chibuku, Chibuku Super, Club Premium lager, Club pilsner, Eagle, Hero, Impala, Kilmajaro, Laurentina, Lion lager, Maluti, Manica, Mosi, Nile Special, Rwenzori, Safari, Sibebe, St. Louis, Voltic, White Bull, and Trophy.

Guinness is certainly not playing a second fiddle. It is equally working very hard to keep the premier brands ahead of competition. The company explains that its global priority brands are its primary growth drivers across its markets and are the main focus for its business. The brands it states, have broad consumer appeal across geographies, and although each of them has a rich heritage, they all continue to innovate and expand to meet new and emerging consumer trends. It states: "We manage and invest in these brands on a global basis, so you will see consistent marketing from country to country. The company's eight global priority brands include ; Smirnoff, Johnnie Walker, Guinness, Baileys, J&B, 'the number three Scotch Whisky in the world (5.2million liter cases)": Captain Morgan and Tanqueray. Guinness Nigeria Plc which belongs to the Diageo family supplies the following other products in Nigeria; Foreign Extra Stout, Harp lager, Satzenbrau Pilsner lager, Gordon's Spark, Malta Guinness, Guinness Extra Smooth and Armstrong lager.

### **Ways forward**

The main challenge is how to pump up volume and margin without increasing price. Some schools of thoughts have postulated that out sourcing, leasing, elimination of agents and intermediaries, retrenchments, monetization of benefits and local servicing of input are effective way to cost reduction

and waste management in the beverage industry. While others believed that review of pricing policy, review of marketing policy and high consideration for product development should be the focus for the way forward. However, one wonders how beer consumers will continue to meet their tastes in areas where sale and consumption of alcohol are prohibited?

In conclusion, the crucial success factors in the beverage industry especially the brewery sector so far is the enhancement of the task environment which is associated with top management values and organizational analysis, to conquer the operating environment. These could be the limits of the opportunities and threats in the beverage industry.

Beyond any factor that threatens growth in the beer industry, it is apparent that the beer market in Nigeria is a vibrant one that offers value and much excitement to consumers.

### **The future**

Recently, concern among citizens' groups over the excessive consumption of alcoholic beverages by some individuals has initiated additional government regulation of beer. New warnings have been added to labels, warning of impaired driving, hazards to pregnant women, and other health ailments associated with alcohol consumption in the developed world. Reduced tolerance for drunk driving, for example, encouraged many brewing companies to advocate responsible consumption. The beer industry will continue to contend with these large social issues.

However, on the positive side, inclusion of gluten free cereals like sorghum, maize, or rice in the brewing of beer as is practiced in Nigeria will help in preventing celiac diseases. It has been scientifically proved

that gluten free diets help in eliminating celiac diseases; diseases that trigger autoimmune enteropathy, affect the intestinal mucosa by rendering it functionally impaired resulting in total atrophy of the intestinal mucosa.

Polyphenols found in beer especially beer brewed with sorghum or rice as adjuncts when consumed, have been established clinically to decrease all cause of mortality and cardiovascular diseases Beer has been shown to be a good source of polyphenols and it is one of the main food contributor to hydroxybenzoic acid intake in the European Prospective Investigation into Cancer and Nutrition cohort study. High intake of hydroxibenzoics had been reported to decrease cardiovascular risk by 53%. (Lamuela, 2014). Although beer is composed of 96% water, it is never an 'empty calories', as erroneously believed, moderate consumption does not cause weight gain or "beer belly". Beer had been discovered to lower calories than other alcoholic beverages. (O'Sullivan, 2014)

Recent research carried out in the USA reported that beer has health benefit; 80,000 cases of US women investigated for 8 years were found to have 14% lower in high blood pressure cases of women who had moderate beer intake than non-drinkers. Similarly, when men who rarely drank beer increase their consumption to moderate levels of 1-2 bottles of beer a day, after a four year period, their risk of type 2 diabetes dropped by 25% (Johnson, 2010) In addition reports had been credited that moderate consumption of beer can protect bone density (O'Sullivan, 2014).

Much research is currently conducted in the area of plant engineering. Brewery researchers are manipulating the genes of barley and other common grains to increase their resistance to disease and to encourage

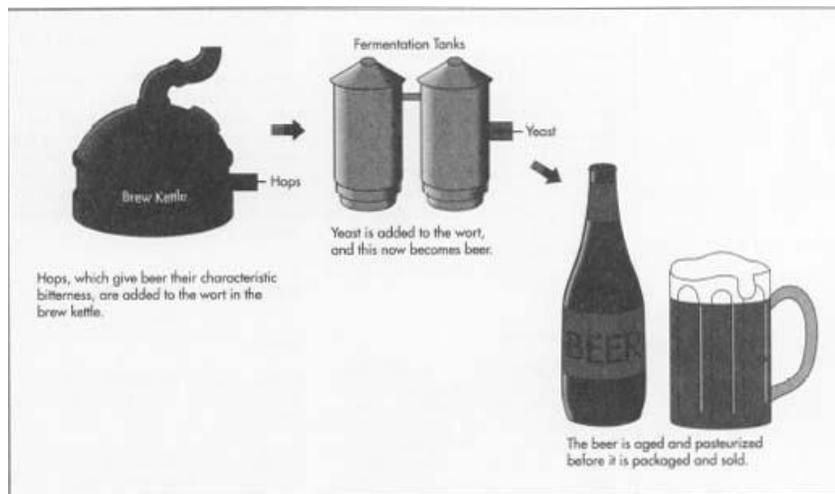
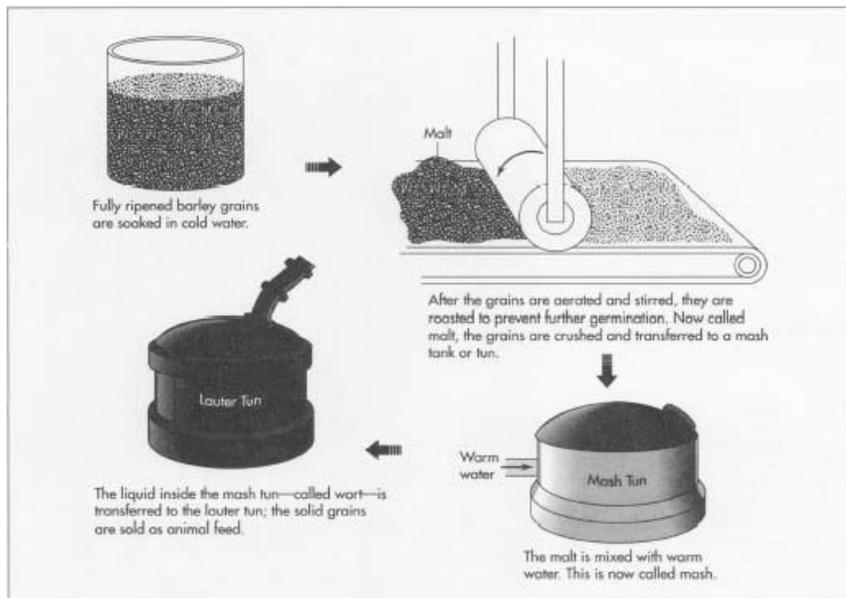
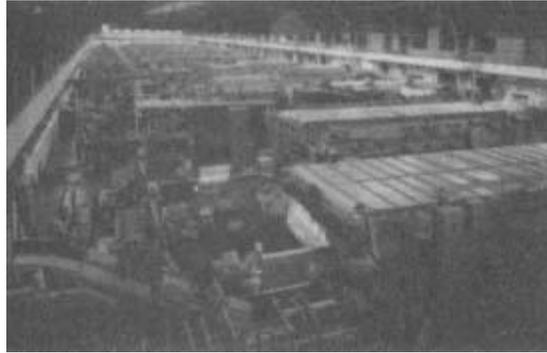
helpful mutations. This genetic research also extends to improving the yeast. Current research is aimed at producing yeast strains that resist contamination and to making new varieties of yeast that can ferment carbohydrates, which common yeasts cannot process.

The brewing industry is also making advances in the area of rapid testing for contaminants. New technology such as DNA probes and protein and chromosome fingerprinting is being developed by brewers to detect microorganisms that can adversely affect the brewing process. Some of this technology is already in use in medical science for drug screening, AIDS testing, and pregnancy testing. Brewers are eager to adapt this cutting edge research to the beer industry.

### **Over all conclusion**

- Beer is as old as one could possibly think dating as far back as 975 AD.
- Beer brewing is scientific
- Beer purity law was the basis of hygienic production of beer and the basis of the Good Manufacturing Practices (GMP) and Good Hygienic Practices (GHP)
- Beer production has contributed to social economic wellbeing of the country.
- The healthy rivalry in the beer sector will enhance Nigeria economy
- Moderate consumption of beer is good for your health;
- Beer consumption as brewed in Nigeria with gluten free cereals and rich in polyphenols will help in preventing celiac diseases
- The populace needs to be well educated that moderate drinking of beer is beneficial to health after all.
- The per capita consumption of beer in Nigeria is still abysmally low, less than one liters compared to even South Africa with 65 liters.

The automatic canning machinery dwarfs the workers in this 1970s brewery canning room.  
(From the collections of Henry Ford Museum & Greenfield Village.)



## References

- Aaron, L. (2010): Beverage plays for a thirsty world: Article posted on the net. 21 July 2010
- Ayantunji, G., Tajudeen, O.Y. and Dallah, H. (2009): Attitudes of Nigerians towards Insurance services: an empirical study; *African Journal of Accounting, Economics, Finance and Banking Research*, Vol. 4, no. 4, 2009.
- Ayantunji, G., Ojo, O.I., Bamber, D., (2010): An exploratory study of student's consumption of non-alcoholic beverages in Nigeria: A qualitative perspective; *Journal of Nutrition and Food Science*, vol. 39, no. 6.
- Egbe, A. (1998): Operating environment of food and beverages sub-sector: A review. Paper presented at the Strategic management Retreat for International Breweries Plc, Ilesa.
- Euromonitor International, (2010): Research- Global Wine: Challenges and opportunities.
- Malomo, O. (1987): Barley to Sorghum-Transition for the Nigerian Brewing Industry. Paper presented at the Quarterly meeting of the Brewers Association of Nigeria (BAN)
- Malomo, O. (1989): Use of sorghum grain/malt in lager beer production. Progress and prospects. Invited paper presented at the International Crops Research Institute (ICRISAT) symposium on current status and potentials of industrial uses of sorghum in Nigeria.
- Siaka, M. (2009): Why brewers are expanding capacity; *Business day newspaper*, Tuesday 20, October, 2009.
- Vanguard, (2010): Consolidated Breweries assured of Increase profitability. Published in the Vanguard Newspaper; 24, May, 2010
- Hough, J.S. *Biotechnology of Brewing*. Cambridge University Press, 1985.
- Altany, David. "Seeds to Suds." *Industry Week*, May 4, 1992, p. 40+.
- Booth, Stephen A. "The Local Beer Returns." *Popular Mechanics*, November 1992, p. 44+.
- Hummel, George. "The Quest for Homebrew." *Mother Earth News*, December-January 1994, p. 54+.
- Polaneczky, Ronnie. "Beer Here! How Home Brewers Are Fomenting a Revolution." *Philadelphia Magazine*, December 1994, p. 57+.
- Dornbusch, Horst D. (1997). *Post: the German Beer*. Boulder, CO: Siris Books. ISBN 0-937381-55-1
- Lamuella, R.M. (2014). Polyphenols in beer: the role of xanthomol and isoxanthohumol. Paper presented at the 7th European Beer and health Symposium, Brussels, 30th September, 2014.
- O'Sullivan, R. (2014). Beer and Calories. Paper presented at the 7th European Beer and health Symposium, Brussels, 30th September, 2014.