

ANALYSIS OF DIFFERENT TYPES OF BEER PRODUCTION IN NIGERIA

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ABSTRACT

Eight brands of beer were bought from the open market in Nigeria. The samples were pre-treated using prescribed reagents and analyzed based on parameters such as colour, pH, original gravity, alcohol content, dissolved CO₂, foreign gas, diacetyl, foam stability and turbidity. Results obtained were compared with European brewing convention (EBC) and it showed permissible level for both lagers and stout beers are within acceptable limit except for pH, foam stability and bitterness which are within, below or above the standard for some beers. The original gravity of 33 is below standard 11.2 as against 11.6⁺ 2 diacetyl of Guinness stout, legend and Turboking are all within the value of 0.18, 0.32 and 0.15 respectively as against 0.50mg/l. In all of them they tried to conform to EBC standard.

INTRODUCTION

Beer is a beverage of low alcoholic content made by brewing with various raw materials usually hops added to impart more or less bitter taste ⁽¹⁾. Beer could also be taken in a generic form for the malt liquors called ale, stout, Porter and larger ⁽¹⁾. The history and origin of beer brewing is associated distinctively with three parts of the world viz middle East, Europe and North America ^(2,3). Brewing seemed to have originated in Babylon because there is evidence that beer made from malted grain was being brewed in Mesopotamia by 6000BC ^(2,3).

The production of beer is tied to three consecutive biochemical processes: thus the formation of enzyme in germinating grain, the breakdown of starch to sugar and the resulting fermentation of sugar to alcohol and carbon dioxide. Beer has some nutritional value in that it quenches thirst, stimulates appetite, assists digestion, has powerful diuretic effect and soporific effect ⁽⁴⁾. As a result of development of beer bottles, cans and beer glasses instead of the previously prevalent opaque beer mugs, pale beer and usual dark beer and usual dark beer which were prevalent until they began to triumph ^(5,6,7). So this provides for introduction of versatile monitoring and control system on beer production to be

supervised easily. This is necessary because new brands are on the increase and consumption rate is also increasing ⁽⁸⁾. This work is within the limit of analyzing different types of beer using different parameters compared with the standard.

EXPERIMENTAL

The samples were given pre-treatment before the analysis as described by Association of analytical chemistry ^(9,10). The analyses were carried out as described by the Breweries Hand Book ^(11,12,13). The parameters analyzed were pH foreign gas, original gravity, alcohol content, dissolved CO₂, diacetyl, foam stability and turbidity using standard methods.

RESULTS AND DISCUSSION

Table 1 summarized the results for the whole parameters detected in comparison with the European Brewing Convention, EBC, it is seen that the result for colour for both bottom and top bearers are within the EBC standard of 8.00 ⁻⁺ 1.0 and 225 ⁻⁺ 25 for bottom and top fermented beer respectively. In the pH value, only the guinness stout is below standard with a value of 3.70 as against 3.90 ⁻⁺ 1.0 EBC. The original gravity for both are within the standard as depicted in Table 1. This

indicates that the fermentation processes for the conversion of sugar is adequate and the amount of alcohol is good as shown in the result for alcohol content for the desired tanginess in the beer ⁽⁷⁾. The diacetyl result was desirable which is an indication that the beer will have a good shelf life. The foam stability of the beers were suitable except for Guinness stout and legend which had values of 337 and 309 respectively as against >200 - < 300 EBC. These high values are attributed to foam positive substance such as molecular weight, proteins, hops, and alpha acids ⁽¹⁰⁾. The result for bitterness showed that all other good except for Turboking whose value is 31.0 when compared with 55 ^{-+ 5} EBC for top fermented beer. This may be from the

amount of hops added and manner of adding during worts boiling. Turbidity was not carried out for dark coloured beers but for bottom-fermenting beers. The amounts of foreign gas for each of the beers were adequate.

CONCLUSION

This work has shown that most of the beers produced in Nigeria are within the stipulation of the European brewing convention and they should be consumed in little quantity. This is to enable beer perform nutritional and health functions because excess of it result in cancer, high blood pressure, liver disease, diabetes, liver damage and damages to foetuses of pregnant women.

Analysis of Different Types of Beer Production In Nigeria

Table 1: Results of Analysis of Different Types of Beer

Parameters	Bottom Fermented Beer (BFB)					Top Fermented Beer(TFB)			EBC	
	Heineken	Star	Gulder	Harp	33	Legend	G/Stout	Turbidity	BFB	TFB
Colour(TCU)	6.3	7.6	7.8	8.3	7.7	240	175	170	8.0+_0.1	225+_25
Original gravity(° P) °	11.5	11.8	11.6	11.8	11.2	11.7	17.0	16.0	11.6+_0.2	17.5+_0.2
CO ₂ content(% wt)	0.5	0.6	0.5	0.6	0.6	0.5	0.5	0.6	0.45+_0.58	0.52+_0.02
Diacetyl mg/l	0.05	0.09	0.10	0.07	0.08	0.32	0.18	0.15	<0.10	0.50
Foam stability (SECS)	237	234	257	243	235	300	337	286	>200-<300	200min300max
Bitterness (EBC)	17.6	17.45	17.63	16.60	13.45	50.85	51.95	31.00	20.00+_2.0	55+_5
Turbidity	0.56	0.54	0.76	0.65	0.58	-	-	-	<0.8	-
Foreign gas ml/l	0.8	1.30	1.10	1.50	1.20	1.40	1.50	1.60	<2.0	2.0 max
Alcohol content(% V/ V)	5.1	5.3	5.0	5.2	5.2	6.7	7.5	7.4	5.1+_0.2	7.3+_0.2
pH	4.5	4.5	4.1	4.5	4.1	4.2	3.7	4.5	4.0-4.3	3.9+_0.1

Bottom Fermented Beer (BFB)

Top Fermented Beer (TFB)

European Brewery Convention (EBC)

REFERENCES

1. Kunze , w. (2004), "Technology Brewing and Matting" VLB, Berlin. pp. 214-218
2. Gold hammer, T (2008), The Brewer's Handbook, 2nd edition Apex U.S.A. Pp. 102-104.
3. Boderick, H.M. (1975) Practical brewer, 9th edition, xyz publishers, USA. PP. 95-98.
4. The brewer's handbook (<http://www.criteria.com/2008/07/03> largest-us-brewers)
5. Hyfoma on beer brewing ([http://www](http://www.hyfoma.com/en/content/food-branches-processing-manufacturing/beverages/beer/) hyfoma.com/en/content/food branches-processing-manufacturing/beverages/beer/)-hyfoma.
6. All about beer; Home brewing secondary fermentations ([http://www.all](http://www.all-about.com/home-brew/secondary.html) about.com/home brew/secondary.html).
7. Association of Officials Analytical Chemist (1975), Official and Tentative Method of Analysis 12th edition Washington DC, USA. pp. 48-60.
8. Andrew, J and Harrison, G. (1954), Brewing Book, 2nd edition, ABC publisher, U.S.A. pp. 97-103.
9. Encyclopedia of Chemical Technology Vol. 2. 8th edition, Wiley-Int-Science Publication, New York. Pp. 241-246.
10. The New Encyclopedia Britainica (Micropeadia) Vol. 11.Encyclopedia Britainica, Inc., Edeinburgh pp. 545-548.
11. Morrison, R.T. and Boyd, R.N. (2005) Organic Chemistry 5th edition Prentice Hall Publishing, India. Pp. 201-204.