

Research

Factors Influencing Consumption of Zobo Drink among Nigerian Private University Undergraduates

*Adeoye, B. K., Agbato, S.O., Ngozi, E.O., Ayelaagbe M. B.

Department of Nutrition and Dietetics, Babcock University Ilishan- Remo Ogun State, Nigeria.

*Correspondence author <evangadeoye2002@gmail.com>

Abstract

This research was conducted so as to obtain information about factors determining consumption of zobo drink among undergraduates of a Nigerian Private University. Structured questionnaires were distributed to 300 respondents drawn randomly from different faculties of the University. Information on their socio-demographic data, reasons for consuming or for not consuming zobo drink and frequency of consumption was obtained. The results obtained were expressed in percentages. Female respondents (63%) were more than male respondents (37%). More than 50% of the respondents were Yoruba, 29% were Ibo while 12% were Hausa. 70% were Christian while the Muslim were 28%. 71% of the respondents consume zobo drink for various reasons: 42.25% consume zobo drink due to its functional and nutritive value, 30.96% consume zobo as result of its low price, 21.12% consume due to its availability while 5.63% consume zobo because of its organoleptic properties. From frequency of consumption, 52.11% consume zobo drink once a week. 39.28% of those not consuming zobo drink, dislike its taste while 28.57% were not aware of the functional and nutritional value. More than 50% of the respondents were not aware of the functional and nutritive value of zobo drink. There is a need for more awareness on benefits of zobo drink especially above carbonated drinks.

Introduction

Zobo drink is a non-alcoholic local beverage made from different varieties of dried, acid-succulent calyces of the flower *Hibiscus sabdariffa* by boiling and filtration (Ogiebor *et al.*, 2008; Kolawole and Okeniyi, 2007). *Hibiscus sabdariffa* (a member of the Malvaceae family) is known by different names in different parts of the world and the red succulent calyx is boiled with sugar to produce the local nutritious drink which is a house hold name in Nigeria (Morton, 1987). The calyces have been found to be rich in vitamins, natural carbohydrate, protein, vitamin C and other antioxidants (Wong *et al.*, 2002). Various medicinal uses of infusions of leaves or

calyces have been reported such as being a diuretic, choleric, febrifugal, hypertensive, anti-helminthic, and antimicrobial, decreasing viscosity of the blood and stimulating intestinal peristalsis (Sharaf, 1962; Kerharo, 1972; Morton, 1987; Delgado-Vargas & Paredes-López, 2003).

Demand for zobo drink is largely based on its nutritive value, flavour, aroma and colour (Adenipekun, 1988). More importantly, its consumption will take an active role in bone and teeth formation as it is a rich source of vitamin C, calcium, magnesium and zinc (Babalola *et al.*, 2001). (Oboh *et al.*, 2011) found the glycemic index of zobo drink to be 33 ± 3 which

consequently made it possibly suitable for maintenance of normal blood sugar, weight reduction and athletes due to its low glycemic index. It is believed that zobo may displace other carbonated beverages in the market due to benefits derived from it which is lacking in other beverages taken for their thirst quenching properties and stimulating effect (Ihekoronye *et al.*, 1985).

Carbonated beverages contain high amounts of sugar, calories and caffeine, and provide no valuable nutrition (Damle1, *et al.*, 2011). There is an increase in the consumption of carbonated soft drinks during adolescence (Forshee *et al.*, 2004) and older teens tend to drink more carbonated beverages, fruit drinks, and citrus juices (Moore *et al.*, 2006) which consequently leads to an increase in the prevalence of overweight and obesity worldwide, (Cavadini *et al.*, 2000; French *et al.*, 2003; Nielsen & Popkin, 2004; Berkey *et al.*, 2004).

The increasing level of soft drink consumption by children and teens is one of many barriers to their achieving an adequate diet and a healthy lifestyle (SNAC, 2002) and changes in beverage consumption patterns over the past several decades may be related to the high prevalence of obesity

related diseases (Harnack *et al.*, 1999; Ludwig *et al.*, 2001; French *et al.*, 2003; Forshee & Storey, 2003). Also, the continuing increase in soft drink consumption among adolescents raised a national concern about the health effects of soft drinks as sugar-containing soft drinks can be cariogenic (Ismail, Burt & Eklund, 1984). Consequently, it became imperative to determine the level of awareness of benefit of zobo among the youth especially university undergraduates and the frequency of consumption of the drink.

Material and methods

A questionnaire was structured and administered to 300 respondents among Babcock University Undergraduate Students, Ilishan-Remo, in order to obtain their response on the consumption pattern of zobo drink and their awareness of nutritional and other benefits of zobo drink. Respondents were randomly selected from the four existing faculties at the time the research was been conducted and information about their social characteristics such as gender, course of study, ethnicity and religion were also gathered. Descriptive test was used to analyze frequency of consumption.

Results

Table I: Socio- Demographic characteristic of the respondents

Percentage	Frequency	Percentage	Cumulative
Sex			
Male	111	37.0	37.0
Female	189	63.0	100.0
Total	300	100.0	
Faculty			
Science & Tech.	72	24.0	24.0
Educ. & Humanity	24	8.0	32.0
Business School	66	22.0	54.0
Law & security studies	138	46.0	100.0
Total	300	100.0	
Religion			
Christianity	210	70.0	70.0
Islam	84	28.0	98.0
Others	6	2.0	100.0
Total	300	100.0	
Ethnicity			
Yoruba	162	54.0	54.0
Ibo	87	29.0	83.0
Hausa	36	12.0	95.0
Others	15	5.0	100.0
Total	300	100.0	

Table II : Distribution of respondents for consumption of zobo drink

	Frequency	Percentage	Cumulative percentage
Consume zobo drink	213	71.0	71.0
Do not consume zobo	84	28.0	99.0
Undecided	31.0	100.0	
Total	300	100.0	

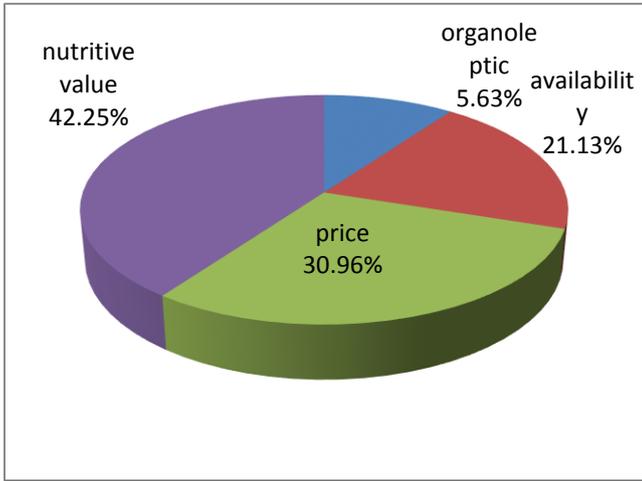


Figure 1: Reasons for consuming zobo drink

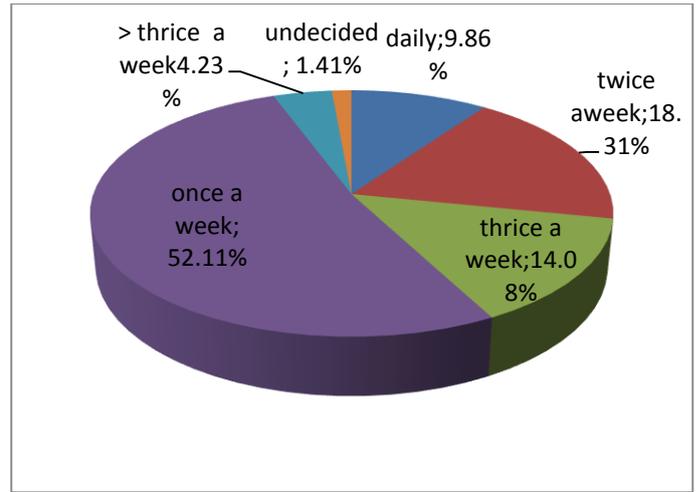


Figure II: Frequency of consumption.

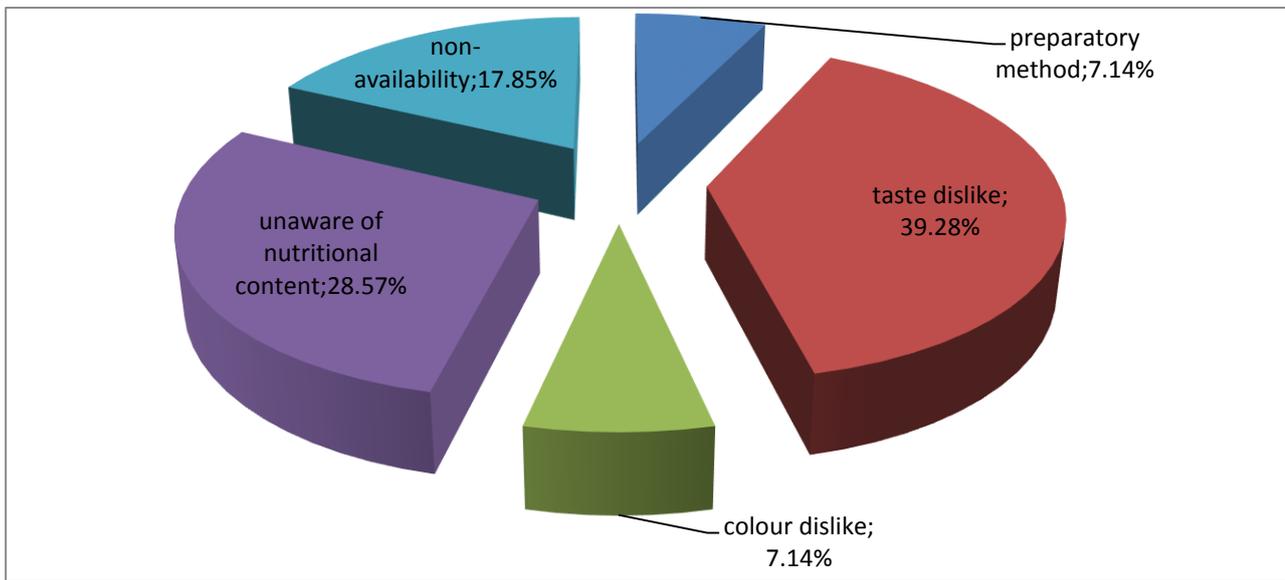


Figure III: Reasons for not drinking zobo

Discussion

Table I show the socio-demographic data of the respondents. There were more female respondents (63%) than male respondents (37%). Many of the respondents were not studying science- related courses as only 24% were from Faculty of Science and Technology and 76% were from other faculties. The respondents were mostly Christians (70%) while Muslims were 28%. The respondents were from the three major

tribes in Nigeria; Hausa, Ibo, and Yoruba with the majority being Yorubas (54%).

Table II show that 71% of the respondents drink zobo, those who do not drink were 28% and 1% were undecided. The large percentage of those consuming zobo and 76% of the respondents studying non-science related courses confirm that zobo drink is a house hold drink in Nigeria (Morton, 1987).

Figure I show the reasons for drinking zobo and this reflect that only 42.25% out of those drinking zobo are aware of its nutritive and functional properties. 30.96% drink zobo due to its low price, 21.13% drink zobo for its availability while 5.63% found the organoleptic properties of zobo desirable. The high percentage of zobo drinkers as a result of its nutritional content and price and the 5.63% of drinkers as a result of the organoleptic properties is in agreement with the earlier reports. (Bolade *et al.*, 2009) reported that zobo serves as a cheaper alternative to the industrially produced carbonated soft drinks that is available in all parts of the country. Furthermore, (Adenipekun, 1988), (Oboh & Elusiyan, 2004) and (Osueke & Ehirin, 2004) reported that demand for zobo drink due to its low prices, organoleptic properties, nutritional and medicinal properties is on the high side (Oboh & Elusiyan, 2004; Osueke & Ehirin, 2004).

Figure II present the result of frequency of consumption. 52.11% of the respondents drinking zobo do so once in a week, 18.31% twice a week, 14.08% thrice a week, 4.23% drink it more than thrice a week while 9.86% drink it daily. The high percentage of those drinking zobo once a week is an indication of low level of awareness of benefits of zobo drink among the undergraduate respondents. This report agrees with earlier reports of (Babalola *et al.*, 2001) and (Desnosier, 1970) that traditional vegetable have been relatively neglected by the scientific and developed communities and their consumption and utilization is limited due to lack of information on their nutritive values.

The reasons for not drinking zobo are as presented on figure III. 28.57% of the respondents' not drinking zobo, do not drink zobo based on their ignorance of the nutritional qualities while it was disliked by 39.28% of the respondents due to its taste. 7.14% dislike the colour. These two characteristics are very important as colour and taste are known to play a principal role

in the acceptability of zobo beverage by the consumers (Mounigan & Badrie, 2006). However, these complaints could be rectified by creating varieties of taste and colour which is possible with zobo drink. 7.14% do not drink zobo due to its preparatory method which is crude and may be unhygienic and this is corroborated with the reports of (Okafor, 1983) and (Nwokocha *et al.*, 2012) that the processing methods are crude, manual and unsanitary.

Conclusion

Zobo is a nutritious drink compared to other soft drinks that are consumed for the purpose of quenching thirst. There is a need to create more awareness of its nutritional quality among the university undergraduates. In order to make it more acceptable, there could be modification of its taste and colour which will give varieties. Also, there is a need to intensify effort to commercialize zobo drink so as to overcome the problem of unhygienic condition of preparation.

References

- Adenipekun, I (1998). Extraction and colour stability of Roselle juice, *Hibiscus sabdariffa*, Master's Thesis, Food Microbiology Department. University of Ibadan, Oyo State Nigeria.
- Babalola, S.O., Babalola, A.O & Aworh, O.C. (2001). Compositional attributes of the calyces of roselle (*Hibiscus sabdariffa*L.). *The Journal of Food Technology in Africa*, Vol. 6, No. 4, Oct-Dec, 2001 pp. 133-134.
- Berkey, C.S., Rockett, H.R., Field, A.E., Gillman, M.W. & Colditz, G.A. (2004). Sugar-added beverages and

- adolescent weight change. *Obes. Res.*, 12: 778-788.
- Bolade, M.K., Oluwalana, I.B. & Ojo, O. (2009). Commercial Practice of Roselle (Hibiscuss abdariffa Beverage Production: Optimization of Hot Water Extraction and Sweetness level. *World J. Agricultural Sci.*, 5: 126-131.
- Cavadini, C., Siega-Riz, A.M. & Popkin, B.M. (2000). US adolescent food intake trends from 1965 to 1996. *Arch. Dis. Child*, 83: 18-24.
- Damle, S.G., Bector, A & Saini, S. (2011). The Effect of Consumption of Carbonated Beverages on the Oral Health of Children: A Study in Real Life Situation. *Pesq Bras Odontoped Clin Integr*, João Pessoa, 11(1):35-40.
- Delgado-Vargas, F. & Paredes-López, O. (2003). *Natural Colourants for Food and Nutraceutical Uses*. CRC Press, LLC: Boca Raton, FL.
- Desrosier, N.W. (1970). *The Technology of Food Preservation*. AV Publ. Co Inc., West Port Connecticut 47-50.
- Forshee, R.A. & Storey, M.L. (2003). Total beverage consumption and beverage choices among children and adolescents. *Int. J. Food. Sci. Nutr.*, 54: 297-307.
- Forshee, R.A., Anderson, P.A. & Storey, M.L. (2004). The role of beverage consumption, physical activity, sedentary behavior, and demographics on body mass index of adolescents. *Int. J. Food Sci. Nutr.* 55 :463-478.
- French, S.A., Lin, B.H. & Guthrie, J.F. (2003). National trends in soft drink consumption among children and adolescents age 6 to 17 years: prevalence, amounts, and sources, 1977/1978 to 1994/1998. *J. Am. Diet. Assoc.*, 103: 1326-1331.
- Harnack, L., Stang, J. & Story, M. (1999). Soft drink consumption among US children and adolescents: nutritional consequences. *J. Am. Diet. Assoc.*, 99:436-441.
- Ihekoronye, A.I. & Ngoddy, P.O. (1985). *Intergrated food science and technology for the tropic. 1st ed., McMillian publisher limited.*
- Ismail A.I., Burt B.A., Eklund S.A. The cariogenicity of soft drinks in the United States. *J Am Dent Assoc.* 1984; 109: 241-5.
- Kerharo, J. (1972). Sensegal Bisap (*H. sabdariffa*) or Guinea sorrel or red sorrel. *Plant Medicine Pytotherapy*5: 272-81.
- Kolawole, J. A. & Okeniyi, S.O. (2007). Quantitative mineral ion content of a Nigerian local refreshing drink (water extract of *Hibiscus sabdariffa* calyx). *Res. J. Pharmacol*; 1: 23- 26.
- Ludwig, D.S., Peterson, K.E. & Gortmaker, S.L. (2001). Relation between consumption of sugar-sweetened drinks and childhood obesity: a prospective, observational analysis. *Lancet*, 357: 505-508.
- Moore, R.H., Thompson, D., Affenito, S.G., Franko, D.L., Obarzanek, E. & Barton, B.A. (2006). Correlations of beverages intake in adolescent girls: The national heart, lung, and blood institute and health study. *J. Paediatrics*, 148: 183-7.

- Morton, J.F. (1987). *Roselle in Fruits of Warm Climates* (ed.CF Dowling, Jr), pp. 281–6. Media Incorporated: Greensborough, NC.
- Mounigan, P. and N. Badrie, 2006. Roselle/sorrel (*Hibiscus subdariffa*L.) wines with varying calyxpuree and total soluble solids: Sensory acceptance, quantitative descriptive and physicochemical. *J. Foodservice*, 17: 102- 110.
- Nielsen, S.J & Popkin, B.M. (2004).Changes in beverage intake between 1977 and 2001. *Am. J. Prev. Med.*, 27: 205-210.
- North Carolina School Nutrition Action Committee (2002).Soft drinks and school- age children; Trends, Effects and Solutions. *SNAC@ ncmail.net*
- Nwokocha, J. V., Okoronkwo, N.E., Eze, S. O. & Nwokocha, N. J. (2012). Comparison of the preservative activity of alligator pepper and ginger extracts on zobo liquor during storage at ambient temperature. *Academic Research International* Vol2, No.3.
- Oboh, G. & Elusiyan, C.A. (2004). Nutrient composition and antimicrobial activity of sorrel drinks (soborodo). *J Med Food* 7(3):340-42.
- Oboh, H., Obahiagbon, F., Osagie, A. & Omotosho, A. (2011). Glycemic response of some local Nigerian drinks in healthy subjects. *Journal of Nutritional Sciences* Vol. 32 No. 1.
- Ogiehor I. S., Nwafor O. E. &Owhe-Ureghe U. B. (2008). Changes in the quality of zobo beverages produced from *Hibiscus sabdarifa* (Linn roselle) and the effects of extract of ginger alone or in combination with refrigeration.
- Okafor, N. (1983). Processing of indigenous fermented foods: A chance for innovations. *Nig. Food J.*, 1: 32-37.
- Osueke,J.C. &Ehirin, F.N (2004). Chemical, nutritional and sensory analysis of zobo drink and selected soft drinks. *J. Agric. Food science*, 21-24.
- Sharaf, A. (1962). The pharmacological characteristics of *Hibiscus sabdariffa* L. *Plant Medicine* 10: 48–52.
- Wong P. (2002). Physic-chemical characteristics of Roselle, nutrition and food science www.organicfacts.net/organicoil, organic fact September 2011.