

Full Length Research Paper**Utilization synergistic effect of plant food consumption
in meeting vegetable consumption in South-East (SE)
Nigeria****Ndie Elkenah Chubike**

Department of Nursing Science, Ebonyi State University, Abakiliki, Nigeria.

Received 9 February, 2015; Accepted 19 August, 2015

Survey research design was used in the study of 900 adults from 9 senatorial zones of South Eastern Nigeria that aimed at using the correlation coefficient matrix to evaluate the synergic effect of various plant food diet of South Eastern Nigeria to meet the vegetable consumption requirement of the people. Twenty four hour food recall was conducted using questionnaire while the quantity of vegetable consumed by the individuals were estimated. The correlation coefficient matrix of the diet with vegetables were calculated, the result show that garri, pounded yam and cassava fufu co-relate high with vegetables like bitter leave, ugu and ora (0.82 to 0.86), while food items like yam and rice co-relate poorly with these vegetables (0.24 to 0.12), though yam and rice co-relate high with other vegetables like green amalant and nchuonwu (0.72 to 0.63). Vegetable is incorporated in many plant food items of South Eastern Nigeria diet, yet there is still more room for improvement. It was then recommended that proper planning of meals considering synergistic effect from this incorporation will help in meeting the vegetable needs of the people. The correlation matrix can be of great help to meal planner.

Key words: Synergic effect, diet, vegetable consumption, plant food.

Introduction

Vegetable consumption protect against cardiovascular diseases. World cancer Research Fund and the American Institute for cancer research (2007) stated that some types of vegetables and fruits protect against certain types of cancer. Food and Agricultural Organization/ World Health Organization (FAO/WHO)

(2004) recommended 400 g of fruits and vegetables per day. Consumption of raw vegetables seems to show stronger association with mortality than cooked vegetables, including cancer mortality (Bucher, 2010). The indigenous diet of any population is largely governed by available food with potential role of the diet

E-mail: chubike05@yahoo.com.Author(s) agree that this article remain permanently open access under the terms of the [Creative Commons Attribution License 4.0 International License](http://creativecommons.org/licenses/by/4.0/)

in the pathogenesis of diseases. There is considerable evidence that dietary indiscretion either through ignorance, poverty or socio – cultural practices are of importance in the epidemiology of diseases including malnutrition (Williams, 1981). Ndie et al. (2013) reported that availability and cost do not significantly affect the consumption of vegetable in South Eastern Nigeria. They also reported that vegetable is available and affordable round the year in the area but the quantity needed to add into a particular diet is predetermined by the number of servings being prepared and taste attached to the diet by cultural food habit.

Leender et al. (2013) in their work on fruit and vegetable consumption and mortality in Europe reported that consumption of fruits and vegetables was inversely associated with all-cause mortality with a rate advancement period of 1 to 12 years and with a preventable proportion of 2.95%. These results supports the evidence that fruits and vegetable consumption is associated with lower risk of death driven largely cardiovascular disease mortality (WHO, 2003).

Bucher (2010) reported that eating five portions of fruits and vegetables per day is one of the means to reduce the risk for lung cancer by up to 23%. They stated that in report from the amount consumed, it is also important to take into account the variety. A varied vegetable diet reduces the risk of developing lung cancer. They stated that eating more than eight sub-groups of vegetables cuts the risk of lung cancer by 23% when compared with eating less than four sub-groups. Vegetables are edible part of plant commonly consumed raw or with the food as a recipe. They are fresh green, pulses, sprouts, botanical fruits used as vegetables such as tomatoes, peppers, cucumbers, eggplants, as well as mushrooms and seaweed (Agudo, 2004). Common to all vegetables is low glycermic index.

According to Agudo (2004), the intake of vegetable should be expressed in numerical terms, so that the potential public health benefit can be evaluated and to assess what change to be made if the recommend actions are to be made. There is a synergistic relationship existing basically among daily food consumption. A person who eats a variety of diet with vegetable is likely to consume large quantity of vegetable than one who is on restricted diet (Toyokowa, 1981).

Literature on dietary combination to improve vegetable consumption in Nigeria is rear. This study aimed at investigating the synergic effect of consumption of varied diet with vegetable consumption in South Eastern Nigeria.

METHODOLOGY

A survey research design was used to elicit information on plant

food consumption using food intake study. A simple random sampling method was used to select Anambra State, Enugu State and Ebonyi State from five SE states of Nigeria. The population of Anambra, Enugu and Ebonyi States are 4,019,471, 4,533,899 and 3,480,622, respectively (National Population Commission, 2005). Convenient sampling method was used to select 100 adults age of 20 to 60 years from each of the 9 senatorial zones of the 3 states (each state has 3 senatorial zones), these 900 adults representatives samples were living in private households, not pregnant or breastfeeding at the time of the doorstep sift. A 24 h food recall method was conducted using questionnaire and interview schedule to collect data on plant food eating within 24 h. The questionnaire was constructed based on Nnanyelugo (1982), Action Against Hunger (2002), United States National Health and Nutrition Examination Survey (US NHANES) (2005) and National Diet and Nutrition survey (UK NDNS) (2000) and Labradorios et al. (2000). The questionnaire was use for pilot study at Abia State and split half method was used to find the co-relational coefficient which is 0.79. Students of Department of food Science and Technology of Enugu state University of Science and Technology, Enugu, and Department of Nursing Science, Ebonyi State University Abakaliki, were trained on how to administer the questionnaire and the interview schedule. The questionnaire were administered to literate subjects who filled it while the interview schedule were used for the illiterates. Each participant was assured that the information collected will only be used for statistical analysis and informed consent were obtained from each of the subject. Statistical Package for Social Sciences (SPSS) was used to determine the co-relation coefficient of the diet consumption.

RESULTS

The food items/vegetable consumption correlation matrix of South Eastern Nigeria is shown in Table 1. The results show that vegetables are incorporated into varieties of SE Nigeria diet. The results show that yam, rice and beans have co-relational coefficient of 0.712 to 0.736 which is high and these three food items are consumed highly in the area. The common vegetable spices in the area like nchuwu, curry leave and uziza also co-relate well positively with yam, rice and beans with co-relation coefficient ranging from 0.612 to 0.909, this is also high. The results also show that garri, pounded yam and cassava fufu co-relate well with ugu leave, bitter leave, okra, ora and okazi, with co-relation coefficient ranging from 0.626 to 0.851. Those whose correlation coefficient are significantly positive form a synergistic combination in the daily vegetable consumption while those that are negatively correlated significantly are mutually exclusively and may not be consumed together in the same diet. A close study of the correlation matrix, show that vegetable food items are incorporated mainly into the following diet soup, boiled yam, rice, beans and tapioca. There are some diet of the zone that do not have vegetable incorporated into them, not because they are not tasty with vegetable but because they were not traditionally prepared with vegetable, such food include okpa and beans.

is room to incorporate more vegetables in the diet of the people since it is available as well as affordable. Home makers (mothers) should be educated on how to utilize the synergic effect of foods/vegetables in order to improve vegetable consumption in the area.

LIMITATION OF THE STUDY

This study focused on consumption of vegetable without considering the actual weight consumed per meal.

Conflict of interest

Author has none to declare.

REFERENCES

- Agudo A (2004). Measuring intake of fruit and vegetables (Electronic Resource), Background paper for the joint FAO/WHO workshop on fruit and vegetables for Health 1 – 3 sept. 2004 Kobe, Japan p 40.
- Bucher FL (2010). Eating a variety of fruits and vegetables cut lung cancer. *Cancer Epidemiol Bioworkers Prev* 19(19).
- FAO/WHO (2004) Fruits and vegetable for Health. Report of Joint FAO/WHO workshop 1-3 September 2004 Kobe, Japan. Available at: <http://www.fao.org/ag/magazine/fao-who-fv.pdf>
- Leender M, Sluijs I, Ros MM (2013). Fruits and vegetable consumption and mortality: European Prospective Investigation into Cancer Nutrition. *Am. J. Nutr. Epidemiol.* 178(4):590-62
- Ndie EC, Okatah JC, Okoli EC (2013). Evaluation of vegetable consumption in South Eastern Nigeria. *Int. J. Nutr. Metabol.* 5(4):57-60.
- Toyokowa H (1981). A study of the relationship between diet and cancer mortality in Japan: In R. Schoental and T. A. Cancer (Eds.). *Dietary influence on Cancer: Tradition and Modern* CRC Press Boca Rota, Florida pp 37-48.
- WHO (2003). Diet, Nutrition and the prevention of chronic diseases. Report of a Joint FAO/WHO Expert consultation, Geneva, WHO Technical Report Series, No 916.
- Williams AO (1982). Diet and Cancer in Tropical Africa: In *Dietary Influence on Cancer: Tradition and Modern* (Ed. R. Schoental and T. A. Connors) CRC Press Boca Rota, Florida pp 37-48.