

## EFFECT OF SUBSTITUTIONAL SOUP INGREDIENT ON THE PROXIMATE COMPOSITION OF MILLED SOUP

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### ABSTRACT

The study evaluated the proximate composition on selected substitutional soup ingredients using standard techniques. The research work is predicated on the effort to investigate the role of each commonly used soup ingredients in Nigeria. The ash content of soup ranged from 0.25 % to 4.20 %. Sample TROT (tomato, scotch bonnet pepper "rodo", onion and red bell pepper "tatase" blend) has the highest ash content value of 4.20 %. The protein content of sample OTBR (onion, tomato, cayenne pepper, "bawa" and scotch bonnet pepper blends) is 4.84 % which was significantly higher compare to other samples. The fat content of OTBR (onion, tomatoes, cayenne pepper and scotch bonnet pepper blend) 13.59 % was significantly higher than the other samples. Crude fibre range from 0.20 % to 1.51 %, The crude fibre of TRBO (tomato, scotch bonnet pepper, scotch bonnet pepper and onion blend) with value of 1.51% was significantly lower than the other samples ( $p < 0.01$ ). The carbohydrate content of TOTB (tomato, onion, red bell pepper and scotch bonnet pepper blends) is 11.46 % which is the highest among all the samples analysed. Therefore TROT (a blend of tomato, scotch bonnet pepper, onion and red bell pepper blend) is a good source of ash and protein. These research work revealed that complete soup ingredient do not generally contain higher nutrient content as compared to others which are deficient in one ingredient or the other.

**Keywords:** Ingredient, soup, substitution, nutrition, proximate

### INTRODUCTION

Soup is probably as old as the history of cooking. The act of combining various ingredients in a large pot to create a nutritious filling, easily digested, simple to serve food was inevitable. It is a primarily liquid food generally served warm or hot that is made by combining ingredient such as pepper, onion, tomatoes. Traditionally, soups are classified into two main groups, clear soup and thick soups (Ried *et al*; 2011). Thick soups are classified depending upon the type of thickening agent used. Purees are vegetable soup thickened with starch (Jason and abdallah, 2014). Bisques are made from pureed shell fish or vegetables thickened with cream, cream soup may be thickened with béchamel sauce and cream. other ingredients commonly used to thicken soup and broths include egg, rice, lentils, flour and grains., there may not be a clear distinction between the two however soups generally have more liquid than stews.

Myth or legends associated with how various soup ingredients are mixed are numerous. The distinctive characteristics of the stew come from the use of palm oil and open flame cooking. It is traditionally prepared with numerous part of cow which is deep fried before being

added to the stew. Two large red bell pepper 'Tatase', two large green bell pepper 'Green tatase', one large onion, three large tomatoes, two scotch bonnets pepper 'Ata rodo' and two large cayenne pepper 'bawa'. There is no authentic recipe because it's more of an art than a science (Nicastro *et al*; 2015). Most soups are made with chopped tomatoes, onions and pepper (Hurley, 2013).

The aim of this work is to evaluate the nutritional contributions of different commonly used soup ingredient in the overall soup nutritional value.

### MATERIALS AND METHOD

The major raw materials (tomato, onion, scotch bonnet pepper 'ata rodo', cayenne pepper 'bawa' and red bell pepper 'tatase' for the project work were purchased from local market at Oja-Oba Ado-Ekiti, Ekiti State, Nigeria.

### Sample Preparation

Tomato, rodo, onion and cayenne pepper were collected into a plastic bowl of different sizes. Manual hand picking and trimming method was used to pick and select the healthy ones, the materials were washed and drained before being sub-divided by weighing into six different packaging materials based on common mixing

ratios among the local community substituting different ingredients for each sample division. Each sample was then coded as follows: TRBTO, TRBT, TRBO, TROT, TOTB, OTBR and blended in a Kenwood blender and kept in a refrigerated condition for subsequent analysis. The samples were mixed according to the following proportions below:

**Proximate composition**

The proximate composition was determined as described by (AOAC, 2005). One hundred millilitre of

each blend mix were weighed inside a clean plastic bottle and labelled for each sample for proximate analysis as previously coded.

**Determination of carbohydrate content (by difference)**

The total carbohydrate content was estimated as the difference between 100 and the total sum of moisture, fat, protein, crude fiber and ash as described by AOAC (2006).

**RESULT AND DISCUSSION**

The result of the proximate composition of the ground soup materials is as presented in the table below

Sample	Moisture (%)	Ash (%)	Protein (%)	Crude Fibre (%)	Fat (%)	Carbohydrate (%)
TRBO	85.29 ± 0.02 <sup>a</sup>	0.50± 0.01 <sup>c</sup>	2.44 ± 0.01 <sup>b</sup>	1.51 ± 0.01 <sup>a</sup>	8.80 ± 0.01 <sup>b</sup>	1.46 ±0.05 <sup>d</sup>
TROT	87.71 ± 0.02 <sup>a</sup>	4.20± 0.02 <sup>a</sup>	3.34± 0.02 <sup>b</sup>	0.60± 0.01 <sup>d</sup>	1.40± 0.02 <sup>c</sup>	2.66±0.05 <sup>d</sup>
TRBTO	86.96 ± 0.02 <sup>a</sup>	0.25± 0.01 <sup>f</sup>	1.76± 0.01 <sup>d</sup>	0.20± 0.01 <sup>e</sup>	1.28± 0.02 <sup>d</sup>	9.47±0.04 <sup>b</sup>
TOTB	74.72 ± 1790 <sup>a</sup>	0.30± 0.01 <sup>e</sup>	1.62± 0.02 <sup>d</sup>	0.89± 0.02 <sup>b</sup>	0.02± 0.01 <sup>f</sup>	11.46±0.78 <sup>a</sup>
OTBR	78.27 ± 0.24 <sup>a</sup>	0.40± 0.01 <sup>d</sup>	4.84± 0.06 <sup>a</sup>	0.68± 0.03 <sup>c</sup>	13.59± 0.06 <sup>a</sup>	1.96±0.05 <sup>e</sup>
TRBT	85.58± 0.06 <sup>a</sup>	0.75± 0.01 <sup>b</sup>	3.38± 0.03 <sup>b</sup>	0.86± 0.04 <sup>b</sup>	0.07± 4.42 <sup>c</sup>	0.87±5.86 <sup>f</sup>

**Table 1. Result for Proximate Composition**

**Key**

- TRBTO: 500g Tomato, 100g scotch bonnet pepper “Rodo”, 100g , cayenne pepper “ Bawa”,100g red bell pepper “Tatase”, 100g Onion
- TRBT: 500g Tomato, 100g scotch bonnet pepper “Rodo”, 100g, cayenne pepper “ Bawa”, 100g red bell pepper “Tatase”
- TRBO: 500g Tomato, 100g scotch bonnet pepper “Rodo”, 100g cayenne pepper “Bawa”, 100g Onion
- TROT: 500g Tomato, 100g scotch bonnet pepper “Rodo”, 100g Onion, 100g red bell pepper “Tatase”
- TOTB: 500g Tomato, 100g Onion, 100g red bell pepper “Tatase,” 100g cayenne pepper “Bawa”
- OTBR: 100g Onion, 100g red bell pepper “Tatase,” 100g , cayenne pepper “ Bawa”, 100g scotch bonnet pepper “Rodo”

Table 1, shows the proximate composition of the sample analysed. It was observed that there was significant difference in all the nutrient parameter analysed except for the moisture content value which ranged between 74.72 to 87.7%. There was no significant difference in all the samples analysed in term of moisture. High moisture content in food leads to easy contamination by micro-organism due to increase water activity (aw) which gives room for enzymatic reaction which leads to easy spoilage of soup. The ash content of TROT is the highest with value of 4.20%, TROT is free of cayenne pepper “bawa”, and sample TRBTO which is the control sample (sample with all the ingredients used) has the lowest value of 0.25% ash content. Ash content helps determine the amount and type of mineral in food and it helps to stop bleeding. (Alliance, 2005). It was observed that the protein value ranged between 1.62% to 4.84% which shows that soup irrespective of their blend mix is generally low in protein content. OTBR which is free of tomato has the highest protein (4.84%), probably due to the rodo replacing tomatoes because TOTB which is free of rodo has the lowest value of protein(1.62%).Proteins helps to build and repair tissue

and it is important in building block of bones, muscles, cartilage, skin and blood in the body (Nelson and Hotchkiss, 2010). The crude fibre ranged from 0.20% to 1.51%, the crude fibre of TRBO which is free of red bell pepper “tatase” has the highest value (1.51%) while TRBTO has the lowest value (0.20%). Crude fibre in help reduces the risk of chronic disease such as diabetes, obesity (Kik, 2006). It was observed that the fat content of the samples ranged from 0.02% to 13.59%. TOTB which is free of scotch bonnet pepper “rodo” is the lowest (0.20%) while OTBR free of tomatoes has the highest (13.59%) which means scotch bonnet pepper has significant contribution to the fat content of the ingredient blends. Fat in soup is essential to keep the brain and body strong and gives energy (Oguntona, 2012) it's observed that the presence of tomato and absence of scotch bonnet pepper reduce the fat content in soup blend. The carbohydrate ranged from 0.87% to 11.46%. TRBT which is free of onion has the lowest value (0.87%) while TOTB free of scotch bonnet pepper has the highest value (11.46%). carbohydrate is known to helps fuel brain, kidneys, health muscle (Igwemma, 2014). TRBTO which is the experimental control

sample with all the ingredients in the blends and the common conventional ingredient formulation in soup making was found to have lower nutritional value in most of the parameters analysed except for carbohydrate where it has the highest after TOTB. its ash content and crude fibre are the lowest while its protein content is also lower than all the other samples except TOTB which is deficient in scotch bonnet pepper . Its fat content is only significantly higher for samples TOTB and TRBT. Therefore, it can be deduced from this research work that complete conventional soup ingredient formulation do not generally contain higher nutritional benefits or necessarily superior when compared with other soup formulations which are deficient in one ingredient or the other.

## CONCLUSION

It can be concluded that TROT which is a blend of Tomato, scotch bonnet pepper “Rodo”, Onion and red bell pepper “Tatase”, contain a more appreciable quantity of the major nutrients analysed. This research work has shown that complete soup ingredient do not generally contain higher nutrition content when compared with others which are deficient in one ingredient or other and in fact some samples which are deficient in one form of the ingredients were found to be nutritionally better.

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