Faculty of Natural and Applied Sciences Journal of Applied Chemical Science Research
Print ISSN: 3027-0359
www.fnasjournals.com
Volume 2; Issue 2; March 2025; Page No. 39-46.

Salt Content of Selected Legume-Based Foods Sold in Different Restaurants in Nsukka, Enugu State

***[1]Godson-Ahuaza, C.V., [2]Nwachukwu, C.U., [3]Onwukwe, E.O., [1]Okolo, B.O., & [4]Abikoye, O.B.**

[1] Department of Biochemistry, University of Nigeria Nsukka, Enugu State, Nigeria
[2] Department of Biology, Alvan Ikoku Federal University of Education, Owerri, Imo State, Nigeria
[3] Department of Integrated Science, Alvan Ikoku Federal University of Education, Owerri, Imo State, Nigeria
[4] Department of Chemistry, University of Lagos, Nigeria

***Corresponding author email**: chika.godson-ahuaza.239441@unn.edu.ng

Abstract
Salt is an important food condiment that serves as a flavor enhancer, preservative, seasoning agent, enzyme inhibitor, and tenderizer. According to the World Health Organization, the recommended daily salt intake for an individual is less than 5 grams. In this study, samples of some legume-based foods namely *akara*, *achicha*, and *akidi* with *abacha* were collected from three different restaurants in Nsukka, Enugu State and the salt content of each food sample was analysed. During analysis, one gram of each sample was weighed out and digested with aqua regia, a mixture of nitric acid and hydrochloric acid in the ratio of 1:3. After digestion, the sodium content of the food samples was determined using an atomic absorption spectrophotometer. The results of the investigation and analyses showed that the salt concentrations of the samples of the legume-based foods were between 7.8 grams and 8.4 grams. The mean values of the salt content in every 100 grams of these food samples were higher than the recommended daily intake and this could be very detrimental to human health. Hence, this study recommends an urgent need for the reduction of dietary salt intake in the preparation of these legume-based foods to curtail the health challenges associated with excess salt intake.

Keywords: Salt Content, Legume-Based Foods, Food Analysis, Restaurant Foods, Nutrition

Introduction

Salt is an ionic compound with the chemical formula NaCl, representing a 1:1 ratio of sodium and chloride ions (Elias et al., 2020). It is also important to note that not all salts contain sodium chloride (NaCl). There are other salts, including potassium chloride (KCl) and calcium chloride (CaCl) but on a general note, NaCl is one of the most common salts added to food. Sodium occurs naturally and as an additive in food products. It is estimated that up to 75% of our dietary intake of sodium comes from the food we buy in restaurants, supermarkets, and malls. Sodium is commonly added to food in the form of NaCl. It is an important nutrient which is necessary for various physiological functions like fluid balance, nerve impulse transmission, and muscle contraction (Elias et al., 2020). On the same note, salt is an important commodity that is commonly used as a condiment and food preservative. It is added to food to enhance flavour, inhibit microbial growth, or extend the shelf life of the food. However, the immense increase in salt intake is one of the greatest challenges that accompany the human diet, and this is a major risk factor associated with various diseases (Yuyun et al., 2020). Legume-based dishes are known for their affordability and nutritional value but the sodium content in these meals, especially those prepared in commercial settings, is rarely monitored (Didinger & Thompson, 2022; Ojo et al., 2024). This study investigates the salt content in legume-based foods sold in restaurants in Nsukka, Enugu State, Nigeria and it assesses the potential contribution of these meals to excessive sodium intake. By highlighting the salt levels in these widely

Cite this article as:
Godson-Ahuaza, C. V., Nwachukwu, C. U., Onwukwe, E. O., Okolo, B. O., & Abikoye, O. B. (2025). Salt content of selected legume-based foods sold in different restaurants in Nsukka, Enugu State. *FNAS Journal of Applied Chemical Science Research*, *2*(2), 39-46.

consumed foods, this research emphasizes the importance of targeted public health interventions aimed at regulating salt use in food preparation to reduce the risk of sodium-related health issues.

Legumes

Legumes are plants from the Leguminosae family that grow seeds inside pods (Hughes et al., 2022). This plant family is quite large, with over 18,000 species, including climbers, herbs, shrubs, and trees. However, only a small number of these are commonly eaten by humans. Some of the most popular edible legumes include peas, broad beans, lentils, soybeans, lupins, lotus, sprouts, mung beans, green beans, and peanuts. They are often called food legumes or green legumes (Yorgancilar & Bilgiçli, 2014). Food legumes are grouped into two categories: oil seeds and pulses. Oil seeds, such as soybeans and peanuts, have a high oil content, while pulses refer to the dry seeds of cultivated legumes traditionally used as food (Hughes et al., 2022). Pulses are highly nutritious, packed with protein, fiber, and essential micronutrients and bioactive compounds (Siddiq & Uebersax, 2022). Examples of pulses include chickpeas, cowpeas, dry beans, dry peas, and lentils. Peas and beans generally contain 17-20% protein, while lupins and soybeans have a higher protein content, ranging from 38-45% (Mlyneková et al., 2016). Legumes are also a good source of B vitamins like folate, which is important for preventing neural tube defects such as spina bifida in newborns (Becerra-Tomás et al., 2019). Additionally, oil-rich legumes like soybeans have been linked to a lower risk of certain cancers, including prostate and breast cancer (Applegate et al., 2018)

Effects of sodium on health

Sodium is an important nutrient that helps maintain cellular balance and plays a role in regulating blood pressure, fluid levels, and electrolytes in the body (Bernal et al., 2023). It supports osmotic processes and is essential for muscle and nerve function. Sodium also helps to transport nutrients and other substances across cell membranes. The body only needs a small amount of sodium to send nerve signals properly. As an electrolyte, sodium contributes to the maintenance of electrical charge differences across cell membranes. The difference in sodium and potassium levels across these membranes creates an electrochemical gradient called the membrane potential. This balance is controlled by ion pumps, especially Na^+/K^+ ATPase pumps, which help to regulate nerve signaling, muscle movement, and heart function (Larsen et al., 2016). However, there are conditions associated with the consumption of large quantities of sodium or very little amount of sodium. When the average amount of sodium intake is very high compared to the amount required to maintain homeostasis in adults, it affects the blood pressure. Normal blood pressure is measured as a systolic reading of less than 120 mm Hg and a diastolic reading below 80 mm Hg, commonly written as 120/80 mm Hg. When sodium levels in the blood rise, they cause an increase in blood volume, which in turn raises blood pressure. High blood pressure is a major health risk and is responsible for nearly 13% of deaths worldwide (Muntner et al., 2019).

Effects of chloride on health

Chloride is an electrolyte that moves in and out of cells as charged ions. Since chloride ions carry a negative charge, they must be balanced by positively charged ions when entering or leaving cells (Darragh-Hickey et al., 2022). In the body, chloride is a key part of hydrochloric acid (HCl), which is found in gastric juice and helps with digestion and nutrient absorption (Martinsen et al., 2019). Excess chloride or deficiency can disrupt electrolyte balance, leading to symptoms such as irregular heartbeat, confusion, muscle spasm, numbness, fatigue, and nerve or bone problems. The kidneys help to regulate chloride levels by maintaining the body's acid-base balance. A condition called hypochloremia occurs when chloride levels drop too low, often due to excessive fluid loss from vomiting, diarrhea, or sweating. It can lead to metabolic alkalosis, a condition characterized by an increase in blood pH due to excessive retention of bicarbonate ions (Darragh-Hickey et al., 2022). On the other hand, hyperchloremia is a condition characterized by an elevated level of chloride ions (Cl^-) in the blood. It disrupts the body's acid-base balance, leading to a decrease in bicarbonate (HCO_3^-) levels, which is linked to adverse outcomes in severely ill patients (De Vasconcellos & Skinner, 2018).

Implications of excessive salt intake

Consuming too much salt can raise the risk of heart failure and stroke. It causes blood vessels to narrow, which reduces blood and oxygen flow to vital organs. As a result, the heart works harder to pump blood throughout the body, leading to increased blood pressure (Archer et al., 2022). High blood pressure can enlarge the heart's pumping chamber and weaken the heart muscle, eventually causing heart failure. Excess salt intake also makes it harder for the kidneys to remove extra fluids from the body. This fluid buildup can cause bloating, weight gain, and other health problems. Hypertension puts added strain on the kidneys' filtering units, which can lead to scarring and reduce their ability to regulate fluid properly. Also, this can lead to kidney failure and kidney disease (Grant, 2017). In relation to diabetes, excessive salt intake does not cause diabetes directly. However, high salt intake elevates blood pressure, which results in fluid retention that can further lead to swelling in the feet and other health challenges that are very harmful to individuals living with diabetes. Thus, the occurrence of diseases

Cite this article as:
Godson-Ahuaza, C. V., Nwachukwu, C. U., Onwukwe, E. O., Okolo, B. O., & Abikoye, O. B. (2025). Salt content of selected legume-based foods sold in different restaurants in Nsukka, Enugu State. *FNAS Journal of Applied Chemical Science Research*, *2*(2), 39-46.

linked to lifestyle choices rises as salt consumption increases (Itoh et al., 2022). In relation to osteoporosis, increased dietary salt or sodium increases the risk of osteoporosis.

Deficiency of salt in the body

Hyponatremia occurs when the sodium level in the blood drops below 135 mEq/L, and most commonly, it results from water retention (Adrogué et al., 2022). This condition is more common in adults who take certain medications or have underlying health issues that lower sodium levels. It is also frequently observed in hospitalized patients. Symptoms include nausea, vomiting, headaches, confusion, drowsiness, seizures, and even coma (Adrogué et al., 2022). When sodium levels drop too low, excess water shifts from the bloodstream into body cells, including those in the brain, causing swelling that can be fatal. Moreover, consuming very low quantities of salt can raise heart rate, which may counteract any potential benefits of lower blood pressure (Graudal et al., 2017). It has also been linked to higher insulin resistance and an increased risk of heart-related deaths (DiNicolantonio & O'Keefe, 2023). Given that at least 23 studies suggest that low-salt diets can worsen insulin resistance and affect glucose metabolism, sodium restriction should be approached with caution.

Materials and methods

Materials

Atomic Absorption Spectrometer (model AA-7000 Shimadzu, Japan, ROM version 1.01, S/N A30664700709) was used for the analysis. Other apparatus include weighing balance, crucible, fume cupboard, funnel, filter paper, and 100 ml standard flask. Note that all glass wares used were soaked into 3 moles of nitric acid (HNO_3) overnight and washed with deionized water to minimize the chances of interferences.

Chemicals and reagents

The chemicals and reagents employed during this research work include 30 cm³ of aqua regia (a mixture of HNO_3 and HCl in the ratio of 1:3), deionized water, double distilled water, concentrated hydrochloric acid (HCl), and 3 moles of nitric acid (HNO_3).

Sample collection

In this research, several samples of three legume-based foods were collected from different restaurants in Nsukka, Enugu State: namely Chitis Restaurant, Terrace Restaurant and Old Carolina Restaurant. In this study, they will be called Restaurant 1, 2 and 3 respectively. These legume-based foods include: *akara* (fried bean cake), *achicha* (consisting mainly of a legume called pigeon pea and a small quantity of dried cocoyam), *abacha* (African salad with a legume called black beans). In total, nine food samples were collected. A weighing balance with sensitivity in grams was used to measure one gram of each sample collected for digestion.

Samples of *akara*. *achicha* and *abacha* with *akidi*.

Source: Chitis Restaurant, Terrace Restaurant and Old Carolina Restaurant

Preparation of the reagent, aqua regia

Aqua regia is a mixture of nitric acid and hydrochloric acid, optimally in a molar ratio of 1:3. It is used for digestion of samples. When concentrated nitric acid (HNO_3) and concentrated hydrochloric acid (HCl) are mixed, a chemical reaction occurs, producing volatile products such as nitrosyl chloride (NOCl) and chlorine gas (Cl_2). These products give aqua regia its characteristic yellow color and fuming nature. As these volatile products evaporate from the solution, aqua regia slowly loses its potency.

Cite this article as:
Godson-Ahuaza, C. V., Nwachukwu, C. U., Onwukwe, E. O., Okolo, B. O., & Abikoye, O. B. (2025). Salt content of selected legume-based foods sold in different restaurants in Nsukka, Enugu State. *FNAS Journal of Applied Chemical Science Research*, *2*(2), 39-46.

The chemical reaction can be represented as follows:

$$HNO_{3\,\{aq\}} + 3\,HCl \longrightarrow NOCl_{\{g\}} + Cl_{2\,\{aq\}} + 2\,H_2O_{\{l\}}$$

Nitrosyl chloride (NOCl) can further decompose into nitric oxide (NO) and chlorine gas (Cl_2). This decomposition is equilibrium limited, meaning that it does not proceed to completion and exists in a dynamic balance. Therefore, in addition to nitrosyl chloride and chlorine, the fumes of aqua regia also contain nitric oxide.

The decomposition reaction is as follows:

$$2NOCl_{(g)} \longrightarrow 2NO_{(g)} + Cl_{2\,(g)}$$

Nitric oxide (NO) reacts readily with atmospheric oxygen (O_2) to form nitrogen dioxide (NO_2), a brown gas. The reaction is:

$$2\,NO_{(g)} + O_{2\,(g)} \longrightarrow 2NO_{2\,(g)}$$

Methods

Samples can be digested using either wet or dry digestion methods. In this case, the wet digestion method is employed. This method breaks down sample matrices chemically by using the oxidizing and dehydrating properties of concentrated mineral acids, converting the components into simple chemical forms suitable for introduction into analytical instruments.

- Sample Preparation: Accurately weigh the sample size, which depends on the sensitivity required for the method of determination.
- Addition of Reagents: Add an appropriate amount of aqua regia (used for its strong oxidizing and dissolving capabilities) to the sample. The amount of reagent is dictated by the sample size.
- Heat Application: Apply heat to the mixture to accelerate the decomposition process. This can be done using a hot plate, microwave, or other suitable heating apparatus.
- Decomposition: The concentrated acids break down the sample matrix, converting it into simple aqueous solutions.

After this, the sample was analyzed in an Atomic Absorption Spectrometer (AAS) to measure the sodium concentration of the samples. A blank sample was prepared to zero the instrument before running other series of samples. Standards (2 ppm, 4 ppm and 6 ppm) were prepared from 1000 ppm stock solution of the metals. Laboratory analyses provided the sodium concentration in the unit – part per million (ppm). From this, the average sodium concentration for 100 grams of legume-based foods sold in different food outlets was calculated. To obtain sodium concentration in gram per 100 grams, the formula below was used.

$$\text{Sodium concentration (g/100g)} = \frac{\text{Dilution factor}}{\textit{Mass of sample (g)}} \times \text{Sodium concentration (ppm)}$$

$$\text{Dilution factor} = \frac{50}{1.2}$$

Cite this article as:
Godson-Ahuaza, C. V., Nwachukwu, C. U., Onwukwe, E. O., Okolo, B. O., & Abikoye, O. B. (2025). Salt content of selected legume-based foods sold in different restaurants in Nsukka, Enugu State. *FNAS Journal of Applied Chemical Science Research*, *2*(2), 39-46.

Salt concentration (NaCl) = $\frac{Sodium\ concentration \times Molecular\ weight\ of\ Salt\ (NaCl)}{Atomic\ weight\ of\ Sodium}$

Molecular weight of NaCl = 58.5 g/mol

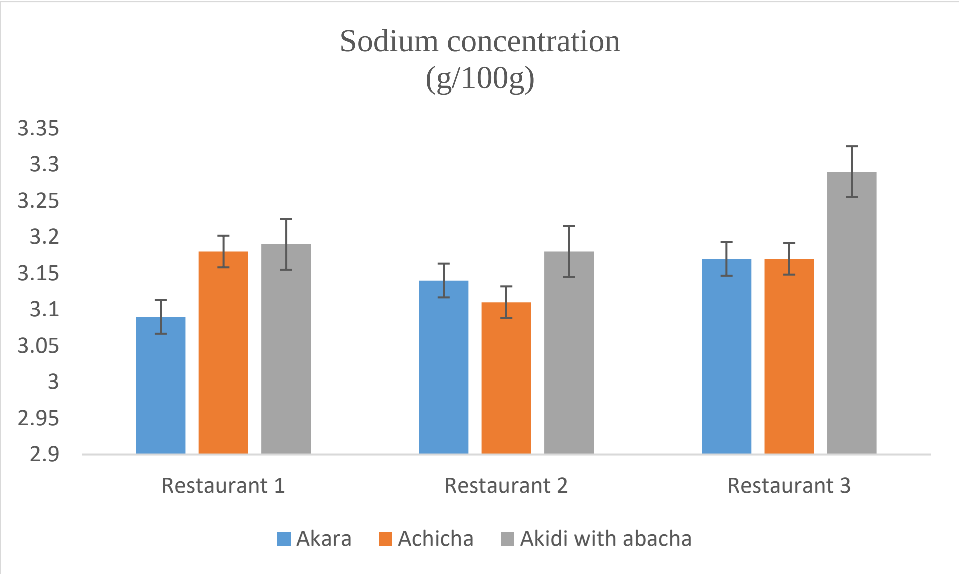
Atomic weight of Salt = 23 g/mol

This formula has been used in calculating the salt concentration of different samples, ranging from bread, cereals, fruits and vegetables to legumes (Al Jawaldeh & Al-Khamaiseh, 2018).

Results

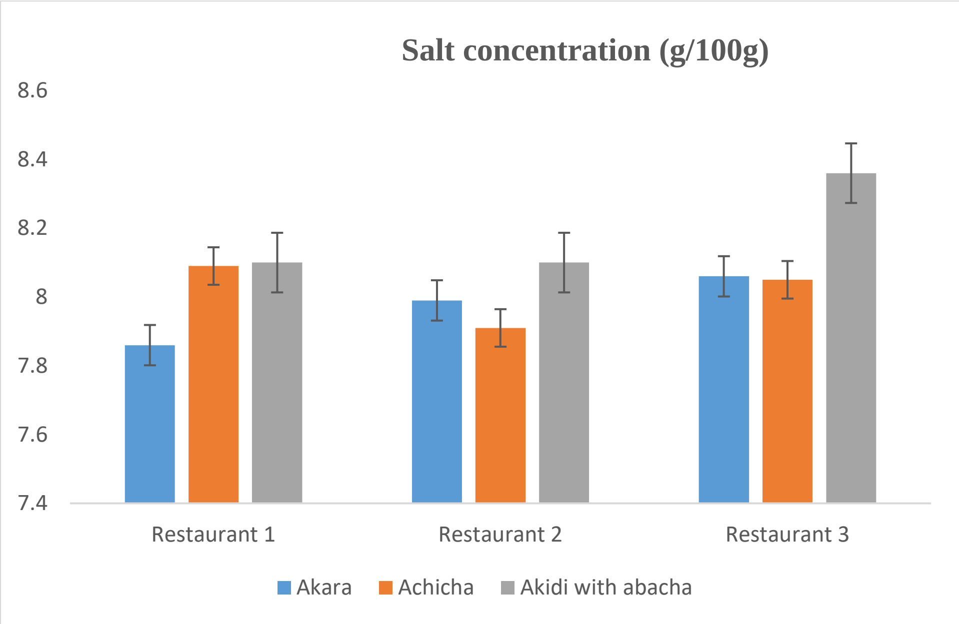
Graph 1 shows the sodium concentration of the legume-based food samples. *Akara*, gotten from the first restaurant, contained the lowest sodium concentration (3.09 grams in 100 grams of the food sample) while *Akidi* with *abacha*, gotten from the third restaurant contained the highest sodium concentration (3.29 grams in 100 grams of the food sample). Similarly, Graph 2 shows the salt concentration of the legume-based food samples. *Akara*, gotten from the first restaurant contained the lowest salt concentration (7.86 grams in 100 grams of the food sample) while *Akidi* with *abacha*, gotten from the third restaurant, contained the highest salt concentration (8.36 grams in 100 grams of the food sample).

Graph 1: Sodium concentration of legume-based foods



Cite this article as:
Godson-Ahuaza, C. V., Nwachukwu, C. U., Onwukwe, E. O., Okolo, B. O., & Abikoye, O. B. (2025). Salt content of selected legume-based foods sold in different restaurants in Nsukka, Enugu State. *FNAS Journal of Applied Chemical Science Research*, *2*(2), 39-46.

Graph 2: Salt concentration of legume-based foods



Discussion

Adults should consume less than 5 grams of salt and less than 2 grams of sodium daily. For children, the recommended intake is even lower and varies based on their calorie consumption (Elias et al., 2020). However, the results obtained in this study showed that the salt concentrations of the legume-based food samples from the three different restaurants were more than 150% higher than the daily salt recommendation. Also, the sodium concentrations of the food samples were more than 150% higher than the recommended daily sodium intake. The sodium concentrations obtained in 100 grams of all the food samples were above 3 grams and some adults in Nsukka, Enugu State eat more than 100 grams of food as a meal. Hence, just one meal of legume-based food contains more sodium than the daily recommended intake. Consuming too much sodium raises blood pressure by causing the body to retain extra fluid, putting strain on the heart. Regular intake of the sodium levels found in these food samples can increase the risk of stroke, heart failure, osteoporosis, stomach cancer, kidney disease, and cardiovascular diseases (He & MacGregor, 2018). Salt is a silent killer because many people are ignorant of its effects until their health condition becomes critical.

Several institutional and health-related organizations have proposed strategies to reduce salt and sodium concentration in food products without reducing their quality. These institutions recommend using little or no salt when cooking, instead opting for aromatic herbs, spices, lemon juice, wine, marinades, garlic, and vinegar for flavor. Many countries are also working to lower sodium levels in packaged and ready-to-eat foods (Archer et al., 2022). Pairing bland foods with those that have stronger flavors, like onion, garlic, pepper, and tomato, can also reduce salt intake. Additionally, cooking with less water helps concentrate flavors and aromas. When using pre-prepared sausages or canned foods, extra salt should be avoided, and salt shakers should be removed from the table (Elias et al., 2020). The national sodium reduction program in Nigeria also employs a holistic method based on four core strategies. Firstly, it establishes and enforces sodium limits in packaged foods to help decrease sodium consumption across the population. Secondly, it conducts widespread media awareness campaigns to enhance public education and encourage healthier eating habits, with a focus on reducing sodium intake. Thirdly, the program places restrictions on food and beverage advertisements, particularly those targeted at children and teenagers to lessen their influence on food choices. Fourthly, it incorporates health education into school curricula to instill lifelong healthy eating habits by teaching students about the benefits of balanced diets and the dangers of excessive sodium (Ojo et al., 2024). These diverse strategies highlight Nigeria's commitment to addressing high dietary sodium and salt intake.

Conclusion

The current salt levels of legume-based foods sold in different restaurants in Nsukka, Enugu State are more than 150% of the recommended daily salt intake. The continuous consumption of these meals may lead to high blood pressure and other diseases associated with excess consumption of salt. Some individuals may already have high blood pressure without knowing. Hence, there is an urgent need to reduce the level of salt intake to the recommended level to curtail the dangers associated with excess salt consumption.

References

Adrogué, H. J., Tucker, B. M., & Madias, N. E. (2022). Diagnosis and Management of Hyponatremia: A Review. *JAMA*, *328*(3), 280. https://doi.org/10.1001/jama.2022.11176

Al Jawaldeh, A., & Al-Khamaiseh, M. (2018). Assessment of salt concentration in bread commonly consumed in the Eastern Mediterranean Region. *Eastern Mediterranean Health Journal = La Revue De Sante De La Mediterranee Orientale = Al-Majallah Al-Sihhiyah Li-Sharq Al-Mutawassit*, *24*(1), 18–24.

Applegate, C. C., Rowles, J. L., Ranard, K. M., Jeon, S., & Erdman, J. W. (2018). Soy Consumption and the Risk of Prostate Cancer: An Updated Systematic Review and Meta-Analysis. *Nutrients*, *10*(1), 40. https://doi.org/10.3390/nu10010040

Archer, N. S., Cochet-Broch, M., Mihnea, M., Garrido-Bañuelos, G., Lopez-Sanchez, P., Lundin, L., & Frank, D. (2022). Sodium Reduction in Bouillon: Targeting a Food Staple to Reduce Hypertension in Sub-saharan Africa. *Frontiers in Nutrition*, *9*, 746018. https://doi.org/10.3389/fnut.2022.746018

Becerra-Tomás, N., Papandreou, C., & Salas-Salvadó, J. (2019). Legume Consumption and Cardiometabolic Health. *Advances in Nutrition*, *10*, S437–S450. https://doi.org/10.1093/advances/nmz003

Bernal, A., Zafra, M. A., Simón, M. J., & Mahía, J. (2023). Sodium Homeostasis, a Balance Necessary for Life. *Nutrients*, *15*(2), 395. https://doi.org/10.3390/nu15020395

Darragh-Hickey, C., Flowers, K. C., Shipman, A. R., Allen, G. T., Kaur, S., & Shipman, K. E. (2022). Investigative algorithms for disorders affecting plasma chloride: A narrative review. *Journal of Laboratory and Precision Medicine*, *7*, 22–22. https://doi.org/10.21037/jlpm-22-7

De Vasconcellos, K., & Skinner, D. L. (2018). Hyperchloraemia is associated with acute kidney injury and mortality in the critically ill: A retrospective observational study in a multidisciplinary intensive care unit. *Journal of Critical Care*, *45*, 45–51. https://doi.org/10.1016/j.jcrc.2018.01.019

Didinger, C., & Thompson, H. J. (2022). The role of pulses in improving human health: A review. *Legume Science*, *4*(4), e147. https://doi.org/10.1002/leg3.147

DiNicolantonio, J. J., & O'Keefe, J. H. (2023). Sodium restriction and insulin resistance: A review of 23 clinical trials. *Journal of Metabolic Health*, *6*(1). https://doi.org/10.4102/jir.v6i1.78

Elias, M., Laranjo, M., Cristina Agulheiro-Santos, A., & Eduarda Potes, M. (2020). The Role of Salt on Food and Human Health. In M. Cengiz Çinku & S. Karabulut (Eds.), *Salt in the Earth*. IntechOpen. https://doi.org/10.5772/intechopen.86905

Grant, G. (2017). Hypertension. *Global Journal of Addiction & Rehabilitation Medicine*, *2*(4). https://doi.org/10.19080/GJARM.2017.02.555591

Graudal, N. A., Hubeck-Graudal, T., & Jurgens, G. (2017). Effects of low sodium diet versus high sodium diet on blood pressure, renin, aldosterone, catecholamines, cholesterol, and triglyceride. *Cochrane Database of Systematic Reviews*. https://doi.org/10.1002/14651858.CD004022.pub4

He, F. J., & MacGregor, G. A. (2018). Role of salt intake in prevention of cardiovascular disease: Controversies and challenges. *Nature Reviews. Cardiology*, *15*(6), 371–377. https://doi.org/10.1038/s41569-018-0004-1

Hughes, J., Pearson, E., & Grafenauer, S. (2022). Legumes—A Comprehensive Exploration of Global Food-Based Dietary Guidelines and Consumption. *Nutrients*, *14*(15), 3080. https://doi.org/10.3390/nu14153080

Itoh, N., Tsuya, A., Togashi, H., Kimura, H., Konta, T., Nemoto, K., Yamashita, H., & Kayama, T. (2022). Increased salt intake is associated with diabetes and characteristic dietary habits: A community-based cross-sectional study in Japan. *Journal of Clinical Biochemistry and Nutrition*, *71*(2), 143–150. https://doi.org/10.3164/jcbn.21-153

Larsen, B. R., Stoica, A., & MacAulay, N. (2016). Managing Brain Extracellular K+ during Neuronal Activity: The Physiological Role of the Na+/K+-ATPase Subunit Isoforms. *Frontiers in Physiology*, *7*. https://doi.org/10.3389/fphys.2016.00141

Martinsen, T. C., Fossmark, R., & Waldum, H. L. (2019). The Phylogeny and Biological Function of Gastric Juice-Microbiological Consequences of Removing Gastric Acid. *International Journal of Molecular Sciences*, *20*(23), 6031. https://doi.org/10.3390/ijms20236031

Mlyneková, Z., Chrenková, M., & Formelová, Z. (2016). Cereals and Legumes in Nutrition of People with Celiac Disease. *International Journal of Celiac Disease*, *2*(3), 105–109. https://doi.org/10.12691/ijcd-2-3-3

Cite this article as:
Godson-Ahuaza, C. V., Nwachukwu, C. U., Onwukwe, E. O., Okolo, B. O., & Abikoye, O. B. (2025). Salt content of selected legume-based foods sold in different restaurants in Nsukka, Enugu State. *FNAS Journal of Applied Chemical Science Research*, *2*(2), 39-46.

Muntner, P., Shimbo, D., Carey, R. M., Charleston, J. B., Gaillard, T., Misra, S., Myers, M. G., Ogedegbe, G., Schwartz, J. E., Townsend, R. R., Urbina, E. M., Viera, A. J., White, W. B., Wright, J. T., & on behalf of the American Heart Association Council on Hypertension; Council on Cardiovascular Disease in the Young; Council on Cardiovascular and Stroke Nursing; Council on Cardiovascular Radiology and Intervention; Council on Clinical Cardiology; and Council on Quality of Care and Outcomes Research. (2019). Measurement of Blood Pressure in Humans: A Scientific Statement from the American Heart Association. *Hypertension*, *73*(5). https://doi.org/10.1161/HYP.0000000000000087

Ojo, A. E., Alfa, V. O., Huffman, M. D., & Ojji, D. B. (2024). Nigeria sodium study 2023 policy meeting on dietary sodium reduction in Nigeria. *BMC Proceedings*, *18*(S16), 18. https://doi.org/10.1186/s12919-024-00303-3

Siddiq, M., & Uebersax, M. A. (Eds.). (2022). *Dry beans and pulses: Production, processing, and nutrition* (Second edition). Wiley Blackwell.

Yorgancilar, M., & Bilgiçli, N. (2014). Chemical and nutritional changes in bitter and sweet lupin seeds (Lupinus albus L.) during bulgur production. *Journal of Food Science and Technology*, *51*(7), 1384–1389. https://doi.org/10.1007/s13197-012-0640-0

Yuyun, M. F., Sliwa, K., Kengne, A. P., Mocumbi, A. O., & Bukhman, G. (2020). Cardiovascular Diseases in Sub-Saharan Africa Compared to High-Income Countries: An Epidemiological Perspective. *Global Heart*, *15*(1), 15. https://doi.org/10.5334/gh.403

Cite this article as:
Godson-Ahuaza, C. V., Nwachukwu, C. U., Onwukwe, E. O., Okolo, B. O., & Abikoye, O. B. (2025). Salt content of selected legume-based foods sold in different restaurants in Nsukka, Enugu State. *FNAS Journal of Applied Chemical Science Research*, *2*(2), 39-46.