

Written Lab Report #2 – Groundnut Soup

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I. About Your Recipe

The recipe I chose to make this week is called groundnut soup (also known as peanut soup, groundnut stew, or peanut stew). Groundnut soup originated in West Africa and its name varies depending on what West African country it is made in. For example, groundnut soup is known as Maafe in Cameroon, nkatenkwan in Ghana, or sauce d'arachide in Côte d'Ivoire.^{1,2,3}

Groundnut soup is a cultural staple in West Africa. Though the name and recipe may vary, the traditional ingredients commonly used are groundnuts (peanuts), tomatoes, onions, meat of choice (most common goat, chicken, or lamb), hot peppers (bonnet pepper or habañero) and spices of choice.¹ Though ingredients and recipes may vary, one ingredient is consistent in all recipes – groundnut paste (peanut butter)!

Groundnut soup is a cherished traditional dish in Ghana.⁴ The recipe I chose is a traditional Ghanaian peanut soup recipe created by Ellen Kyei Baffour of the popular Ghanaian cooking YouTube channel *Akosuah's Tasty Recipe*.² Though this is a traditional Ghanaian groundnut soup recipe, there is a modern modification – store-bought peanut butter and concentrated chicken bouillon! Traditionally, the groundnuts (peanuts) would have been ground down into a paste. Additionally, two tablespoons of condensed chicken bouillon was used – this was certainly not available as an ingredient when groundnut soup originated! All other main ingredients – tomato, onion (known as the “European shallot”), scotch bonnet or habañeros, chicken (a traditional meat ingredient in Ghanaian groundnut soup), and seasonally available spices were all included in traditional groundnut soup recipes. Therefore, the Ghanaian recipe I chose was *extremely* traditional, with the exception of store-bought peanut butter and chicken bouillon – which is a modern recipe adaptation.

The recipe ingredients provided by *Akosuah's Tasty Recipe* is:²

- 1.1 lb goat meat
- 1.75 lb chicken
- ¾ cup peanut butter
- 1/3 cup tomato paste
- 3 medium onions, chopped
- 2 large tomatoes, chopped
- 4-5 fresh chilies (adjust to taste)
- 2 tablespoons seasoning powder or cubes (eg, Maggi or bouillon)
- 1 tablespoon salt
- 1 teaspoon dried rosemary
- 2 garlic cloves, minced
- 2 teaspoons fresh ginger, grated

Directions:²

1. Boil meat, tomatoes, onions, and chilies. Cover with 1 cup of water and let boil for 10-minutes.
2. Add peanut butter and tomato paste in a blender, add water, and blend until smooth.
3. Once done blending, pour in a saucepan, put on stove and stir often to prevent the mixture from becoming lumpy.
4. Once it's thick and starts forming oil, it's done. Turn off heat and set aside.
5. Remove boiled tomatoes, onions, and chiles from chicken pot, put all ingredients in a blender and then add garlic, ginger, rosemary and blend until smooth.
6. Boil chicken and add blended ingredients.
7. Add salt and seasoning.

8. Mix and allow to cook on medium heat for about 10-minutes.
9. Then add peanut butter and tomato paste that was cooked earlier. Mix everything together and add water because when cooked it becomes thicker.
10. Cook on medium heat for 20-25 minutes.
11. Soup is ready after 25-minutes

I modified the original ingredients by substituting the suggested 1.1 lb of goat meat for 1 lb of chicken breast as goat meat is not easily accessible in my local area. Additionally, I rounded the 1.75 lb of chicken suggested in the original recipe to 2 lbs in the recipe I made.

The creator of this recipe, Ellen Kyei Baffour is a Ghanaian who learned most of her cooking skills from her big sister and mother.² Her recipe is authentic as she is native Ghanaian and her recipes were passed down to her through her big sister and mother.² This groundnut soup recipe is an example of a recipe being passed down from generation to generation. Additionally, Ellen Kyei Baffour's Ghanaian recipe videos on her YouTube channel *Akosuah's Tasty Recipe* are very popular and contain many traditional Ghanaian recipes.

The groundnut soup recipe I chose is representative of West African culture for several reasons. Groundnuts were brought to West Africa around 1560 by Portuguese explorers and merchants and became very popular amongst the West African population.^{1,5,6} The groundnut crop has been very important for the economic development of West Africa and is considered a "major cash crop" that has been cultivated in Africa for hundreds of years.^{1,6} Groundnut soup recipes have been passed down through generations of West African families (the recipe I chose is an example of this).¹

Not only is groundnut soup a West African cultural staple, but it is often prepared during celebrations, communal gatherings, family gatherings, and special occasions.⁷ Lastly, Ghanaian groundnut soup is often served with another West African staple food – fufu!⁸ Fufu is typically

made using either plantain, mashed yam, or cassava.⁸ Traditionally, starchy root vegetables are boiled, then mashed in a mortar and pestle into a dough-like consistency, molded, and then served.⁸ However, in modern times, a food processor is used in place of a mortar and pestle.⁸

II. Health Context

The traditional Ghanaian groundnut soup recipe I chose can be enjoyed by most people, provided they do *not* have a peanut allergy. The staple ingredient of groundnut soup is peanut butter (groundnut paste), so if an individual suffers from a peanut allergy, the recipe must be modified prior to consumption. Though the groundnut soup recipe I chose did not have fish or shellfish listed as an ingredient, other groundnut soup recipes do have fish and/or shellfish listed as ingredients. In addition to peanuts, fish and shellfish are also part of the “Top 9 Allergens.” If an individual does have a fish and/or shellfish allergy, they must ensure the recipe they are consuming does not contain either of these ingredients. Additionally, individuals with cardiovascular disease and hypertension should first check the sodium amounts in the groundnut soup they are consuming as one serving of the recipe I made contains 1,024 mg of sodium.⁹

Nutrient Analysis

Nutrient analysis was conducted via happyforks.com.⁹ The nutrient analysis is attached as *Appendix I* at the end of this written report. The traditional Ghanaian groundnut soup recipe makes 8 servings (Serving Size = 390 g). One serving provides 438 kcal, 13.63 g carbohydrate, 17.8 g fat, and 56.18 g protein.⁸ Groundnut soup contains multiple B vitamins, including thiamin, riboflavin, niacin, pantothenic acid, vitamin B-6, and folate.⁹ Notably, one serving contains 131% of the daily value for niacin.⁹ Additionally, this groundnut soup recipe contains multiple minerals, including calcium, magnesium, phosphorus, iron, potassium, zinc, copper, selenium,

and manganese.⁹ It is important to note that one serving contains 1,024 mg of sodium, making this a high-sodium soup.

The nutritional strengths of this recipe include being a deliciously satiating soup that is high in protein, as one serving contains 56.18 g of protein. Additionally, one serving of this recipe contains 13.62 g of carbohydrate, making it great meal for individuals who suffer from type 2 diabetes. Weaknesses include that one serving of this recipe contains 1,024 mg of sodium – which is very high. Additionally, one serving of this soup contains 17.8 g of fat – which is 35% of overall calories. Therefore, this soup is considered high fat. However, as long as one does not exceed the AMDR for fat of 20-35% of total caloric intake, this soup can be enjoyed and incorporated into a balanced dietary pattern.

III. Modification

If an individual has a peanut allergy, the Peanut butter in this recipe can be substituted with sunflower seed butter, or a nut butter of choice (such as cashew butter, almond butter, etc.) provided the individual that is allergic to peanuts is also not allergic to the substituted nut butter. My groundnut soup recipe did not contain fish and/or shellfish. However, if an individual does have a fish and/or shellfish allergy, and the groundnut soup recipe *does* contain fish and/or shellfish as an ingredient, this can easily be modified by omitting these ingredients altogether. Additionally, this groundnut soup recipe can be made vegan or vegetarian by omitting meat and using vegetable stock, tofu, and vegetables of choice.

If an individual is spice sensitive, the bonnet peppers or habañeros can be omitted or modified with sweet peppers such as orange or red bell peppers.

One serving of this recipe is 56 g of protein, 17.8 g of fat, and 13.63 CHO. The carbohydrate amount of 13.63 g in one serving is less than one carbohydrate exchange (15 g),

making groundnut soup a great lunch or dinner option for an individual with type 2 diabetes. However, hypothetically, even if one serving contained over 15 g of carbohydrate, this soup would still fit into a balanced dietary pattern for an individual with type 2 diabetes.

If an individual suffers from cardiovascular disease or hypertension, I would recommend omitting the chicken bouillon cube and the one tablespoon of salt. One serving of this groundnut soup recipe is high in sodium, as it contains 1,024 mg of sodium.⁹ Therefore, omitting the salt and chicken bouillon cube altogether would help decrease sodium levels. Alternatively, a sodium-free chicken bouillon cube can be used in place of the sodium-containing chicken bouillon cube and a salt substitute could be used in place of salt provided the individual does not have any potassium restrictions.

One serving of this soup is also high in fat, which may be problematic for individuals with cardiovascular disease. The fat content of this recipe can be modified by decreasing the total amount of peanut butter used in the original recipe.

If an individual has low fruit or vegetable intake, I would recommend they include a variety of Ghanaian vegetables, such as collard greens, spinach, okra, hardy yams, cabbage, sweet potato greens, African eggplant, kale, and mustard greens.¹⁰ These vegetables are grown in Ghana and can be added to the groundnut soup recipe as additional ingredients. If an individual has low fruit intake, I would recommend they make fufu out of plantains so a fruit can be consumed directly with the groundnut soup. Groundnut soup itself traditionally does not have fruit as an ingredient, so because of that, I would recommend that Ghanaian fruits such as pineapple, soursop, mango, orange, alasa, or yooyi be consumed as a snack during the day, as fruits will not be incorporated into the groundnut soup directly.¹¹

For an individual who has very little time to cook or shop, I would first recommend purchasing groundnut soup online from *Egunsi Foods*.¹² *Egunsi Foods* has ready to eat West African groundnut soup that can be microwaved or heated up on the stove in minutes. The soup sold by *Egunsi Foods* is a vegan product, so if an individual would like chicken in their soup, they can purchase pre-cut cooked chicken to place in the soup while the soup is heating up.

This soup requires several steps to maintain West African traditional integrity. However, another possible modification is placing all ingredients in a large pot, heating all ingredients up together, and then using an immersion blender to create a smooth texture. Once a smooth texture is reached, place pre-cooked meat into the soup to heat up.

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Appendix I

Groundnut Soup Recipe Analyzed via happyforks.com.⁹



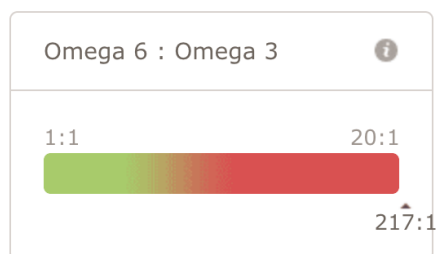
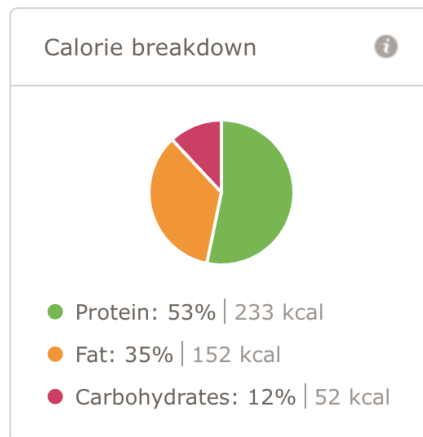
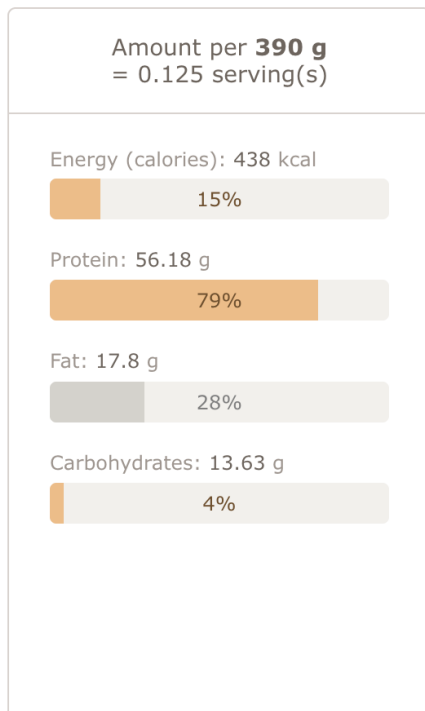
Recipe analyzer

Analyze new recipe

Ingredient description	Matched product <small>Check products whether they are correct</small>	Edit	Energy (calories)
3 lbs chicken breast	Chicken · broilers or fryers · breast · meat only · cooked · stewed - 3 lb		2055 kcal
3/4 cup peanut butter	Peanut butter · smooth style · without salt - 0.75 cup		1157 kcal
1/3 cup tomato paste	Tomato products · canned · paste · without salt added - 0.33 cup		71 kcal
3 medium onions	Onions · raw - 3 medium (2-1/2" dia)		132 kcal
2 large tomatoes	Tomatoes · red · ripe · raw · year round average - 2 large whole (3" dia)		66 kcal
2 hot peppers	Peppers · serrano · raw - 2 pepper		4 kcal
2 tablespoons bouillon	Soup · beef broth bouillon and consomme · canned · condensed - 2 tbsp		3 kcal
1 tablespoon salt	Salt · table - 1 tbsp		0 kcal
1 teaspoon dried rosemary	Spices · rosemary · dried - 1 tsp		4 kcal
2 garlic cloves	Garlic · raw - 2 clove		9 kcal
2 teaspoons fresh ginger	Ginger root · raw - 2 tsp		3 kcal
3 cups water	Water · tap · municipal - 3 cup		0 kcal
Add ingredient			

One recipe = 8 servings (390 g / serving)

Nutrient Analysis for one serving:



General

Energy

438 kcal

15%

Water

298.88 g

11%

Carbohydrates

Carbohydrate

13.63 g

4%

Fiber

3 g

12%

Sugars, total

6.88 g

Starch

0.89 g

Lipids

Total lipid (fat)

17.8 g

28%

Total polyunsaturated

4.226 g

Omega 3 (n-3)

0.014 g

1%

Omega 6 (n-6)

3.021 g

19%

Total monounsaturated

8.059 g

Total saturated

3.998 g

as low as possible

Total trans

0.018 g

as low as possible

Cholesterol

131 mg

as low as possible

Vitamins

Vitamin C

12.7 mg

17%

Folate, total

43 µg

Folate, DFE

43 µg DFE

11%

Vitamin B-1 (Thiamin)

0.154 mg

14%

Vitamin B-2 (Riboflavin)

0.289 mg

26%

Vitamin B-3 (Niacin)

18.287 mg

131%

Vitamin B-5 (Pantothenic acid)

1.366 mg

27%

Vitamin B-6

0.799 mg

61%

Vitamin B-12 (Cobalamin)

0.4 µg

17%

Vitamin A

597 IU

26%

Vitamin E

3.4 mg

23%

Vitamin D

9 IU

2%

Vitamin K

5.6 µg

6%

Isoflavones, total

0 mg

Minerals

Calcium, Ca

59 mg

6%

Cholesterol	131 mg	as low as possible
Protein + aminoacids		
Protein	56.18 g	<div></div> 79%
Tryptophan	0.645 g	<div></div> 202%
Threonine	2.246 g	<div></div> 175%
Isoleucine	2.777 g	<div></div> 228%
Leucine	4.111 g	<div></div> 153%
Lysine	4.398 g	<div></div> 181%
Methionine + Cystine	2.133 g	<div></div> 175%
Methionine	1.435 g	
Cystine	0.698 g	
Phenylalanine + Tyrosine	4.169 g	<div></div> 197%
Phenylalanine	2.285 g	
Tyrosine	1.884 g	
Valine	2.662 g	<div></div> 173%

Minerals			
Calcium, Ca	59 mg	<div></div>	6%
Magnesium, Mg	97 mg	<div></div>	31%
Phosphorus, P	397 mg	<div></div>	57%
Iron, Fe	2.55 mg	<div></div>	14%
Potassium, K	749 mg	<div></div>	16%
Sodium, Na	1024 mg	<div></div>	68%
Zinc, Zn	2.49 mg	<div></div>	31%
Copper, Cu	0.273 mg	<div></div>	30%
Selenium, Se	39.9 µg	<div></div>	73%
Manganese, Mn	0.594 mg	<div></div>	33%