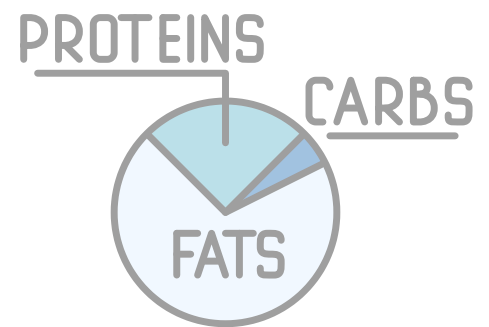
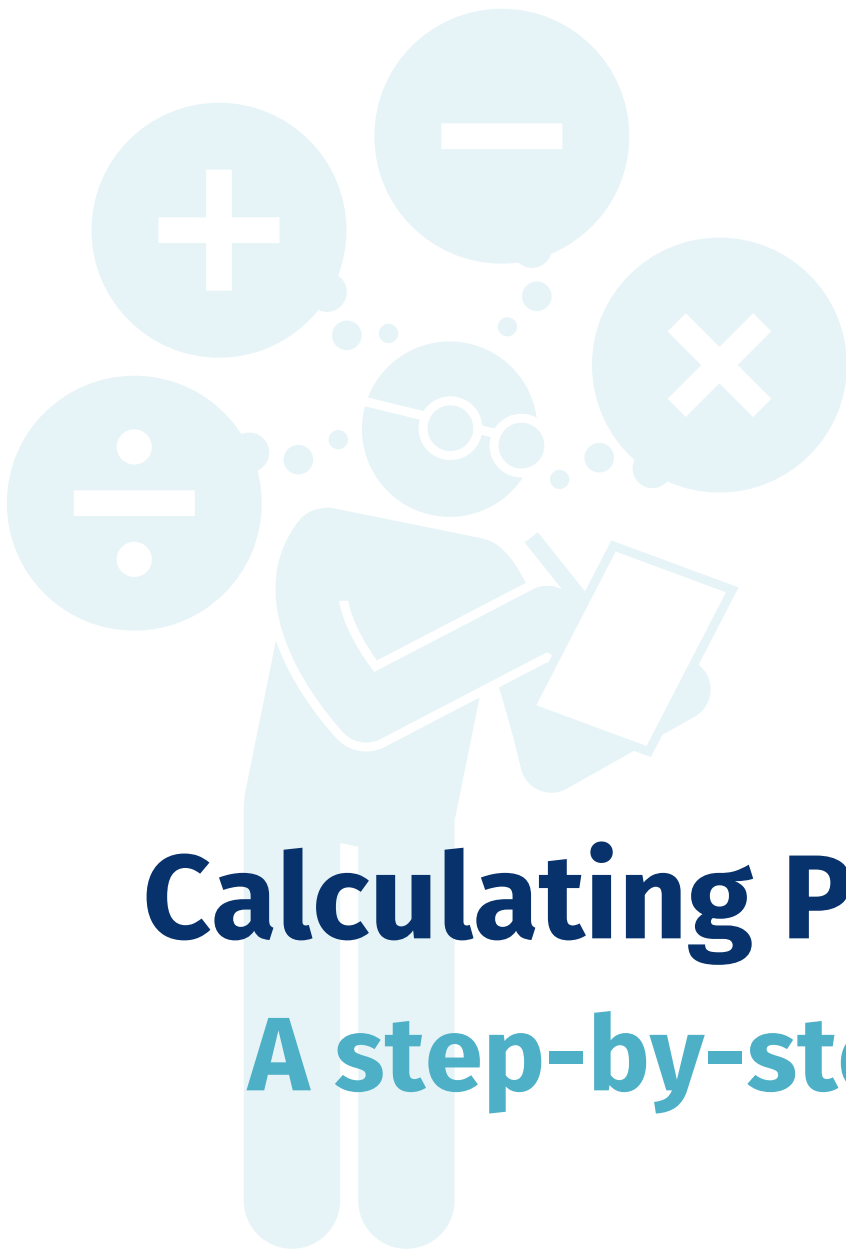




Citrus Foundation



Calculating PFC Ratios

A step-by-step guide

The ideal PFC ratio may vary based on individual needs and the stage of life. Based on the **2019 Citrin Deficiency Guidelines** published by the Japan Society of Inherited Metabolic Disorders, the recommended PFC ratio for citrin deficiency patients is **Protein: 15% – 25%, Fat: 40% – 50%, Carbohydrate: 30% – 40%**.

Patients should try to consume a variety of sources of fat and avoid relying on animal fat by actively using healthier options such as vegetable-oriented fat like olive oil, nuts, seeds, avocado, or fatty fish. This dietary approach helps reduce the burden of carbohydrate metabolism while providing sufficient energy needed for essential bodily functions.

This step-by-step guide can help ensure that citrin deficiency patients and caregivers can easily calculate the PFC ratio for various recipes, supporting their dietary management.

Step 1: Gather the Recipe Ingredients

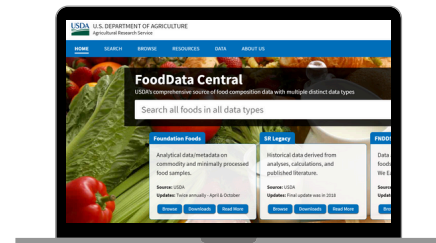
List all the ingredients used in your recipe along with the quantities (e.g., grams, ounces, tablespoons). For example:

- 100g chicken breast
- 1 tablespoon olive oil
- 50g spinach



Step 2: Access USDA's FoodData Central

Go to [USDA FoodData Central](https://www.ams.usda.gov/fdc/), a trusted resource for detailed nutritional information. This database contains macronutrient information for thousands of food items, including both raw and cooked varieties. Bookmark the site for easy future reference.



Step 3: Search for Each Ingredient

- After entering an ingredient (e.g., "chicken breast"), browse the results to find the most accurate match for your recipe. Pay attention to descriptors like "raw," "cooked," "with skin," or "skinless" to ensure you select the correct preparation type.
- Once you click on the food item, scroll down to the "Nutrient Content" section. Look for the default serving size, which may be displayed as 1 ounce, 100 grams, or another unit.
- Double-check the units. You want to make sure you're consistent with your measurements. If the recipe uses grams but the USDA data is in ounces, convert the units before making calculations. For example, if the default serving size is 1 oz but your recipe uses 3 oz, multiply the nutrients by 3.



NOTE: You do not need to include all seasonings in your PFC calculation as their influence on the overall ratio will be minimal.

Step 4: Record the Macronutrient Information and Sum the Macronutrients

For each ingredient, note the macronutrient values in a table and add the total protein, fat, and carbohydrate content for all ingredients. Some ingredients on the website may have more than one value for fat or carbohydrates. Below are the values you should use:

- Protein
- Total Lipid (fat)
- Carbohydrate, by difference

Example:

INGREDIENT	PROTEIN (G)	FAT (G)	CARBS (G)
CHICKEN BREAST (100G)	22.5	1.93	0
OLIVE OIL (1 TBSP)	0	13.5	0
SPINACH (50G)	1.43	0.2	1.8
TOTAL	23.93	15.63	1.8

Step 5: Calculate the calories

After finding the grams of protein, fat, and carbohydrates for each ingredient, you can calculate the total calories from each macronutrient using the 4/9/4 rule (*1). Formula:

MACRONUTRIENT	GRAMS (G)	CALORIES (KCAL)
PROTEIN	23.93	$23.93 \times 4 = 96 \text{ kcal}$
FAT	15.63	$15.63 \times 9 = 141 \text{ kcal}$
CARBS	1.8	$1.8 \times 4 = 7.2 \text{ kcal}$

Step 6: Calculate the PFC Ratio

1. Calculate the total calories of the recipe:

- Total calories: $96+141+7.2 = 244.2 \text{ kcal}$

2. Calculate the percentage of each macronutrient from the total calories calculated above:

% = Calories/Total calories x 100

- Protein: $96/244.2 \times 100 = 39.3\%$
- Fat: $141/244.2 \times 100 = 57.7\%$
- Carbohydrates: $7.2/244.2 \times 100 = 2.9\%$

3. PFC Ratio in terms of calories:

39:58:3

Step 7: Adjust the Recipe (if needed)

If the ratio is not ideal for citrin deficiency patients, adjust the ingredients to create a more balanced recipe. For example, you can substitute pasta with spiralised vegetables or add cheese or avocado to increase the fat content of a dish.

NOTE:

(*1) The 4/9/4 rule is a guideline used to calculate the number of calories provided by the three main macronutrients—protein, fat, and carbohydrates. According to this rule:

- Protein provides 4 calories per gram.
- Fat provides 9 calories per gram.
- Carbohydrates provide 4 calories per gram.

This means that for every gram of protein or carbohydrates consumed, you get 4 calories, and for every gram of fat, you get 9 calories. The rule helps to estimate the caloric content of foods based on their macronutrient composition. It is commonly used in nutrition labelling and dietary planning.



Tip: you may want to use apps such as [MyFitnessPal](#) and [Fastic](#), or keep a food diary to track your eating habits and see what works for you.