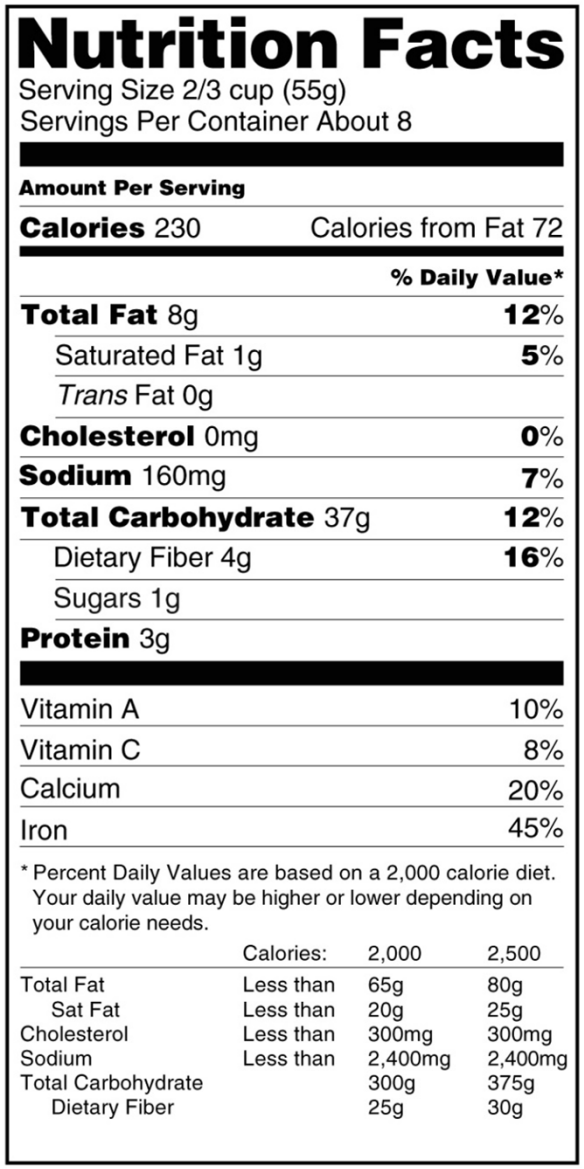


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SCIENCE BUDDIES

Nutrition Facts Label



Nutrition Facts

Serving Size 2/3 cup (55g)
Servings Per Container About 8

Amount Per Serving

Calories 230	Calories from Fat 72
	% Daily Value*
Total Fat 8g	**12**%
Saturated Fat 1g	**5**%
Trans Fat 0g	
Cholesterol 0mg	**0**%
Sodium 160mg	**7**%
Total Carbohydrate 37g	**12**%
Dietary Fiber 4g	**16**%
Sugars 1g	
Protein 3g	
Vitamin A	10%
Vitamin C	8%
Calcium	20%
Iron	45%

* Percent Daily Values are based on a 2,000 calorie diet. Your daily value may be higher or lower depending on your calorie needs.

	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

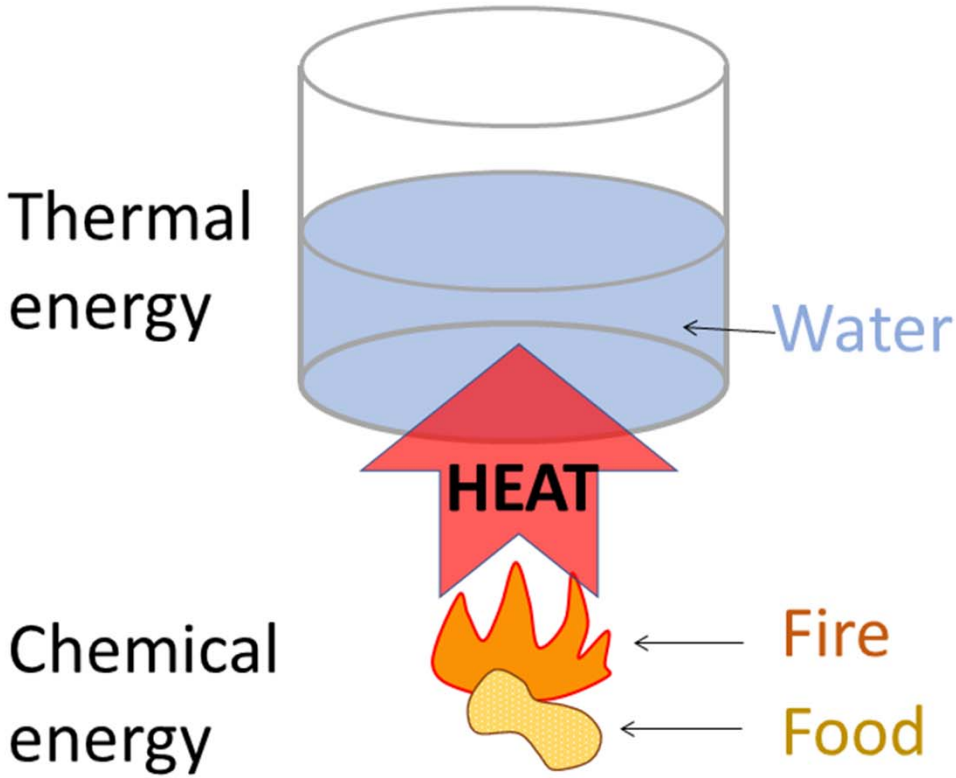
- Is this food item densely packed with energy?
- What is a Calorie?
- What is a serving size?

Laboratory Calorimeter

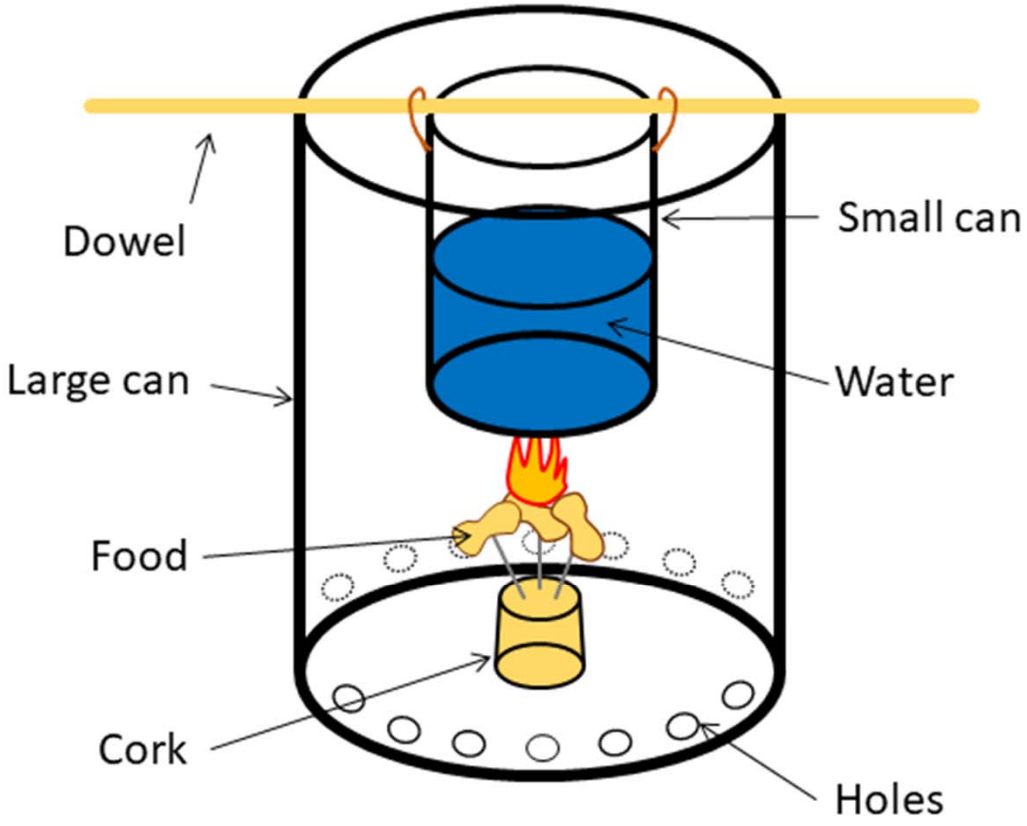


- Burn food inside the calorimeter to release its energy.
- Catch the released energy in a water reservoir.
- Measure the change in temperature of the water reservoir.
- Use the measurement to calculate the energy stored in the food.

Energy Flow in a Calorimeter



Homemade Calorimeter

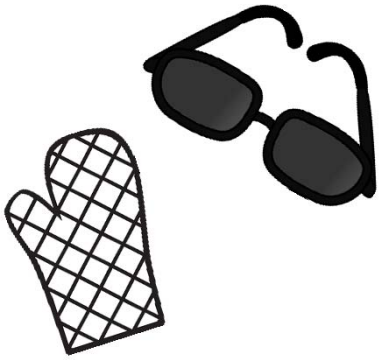


- Make holes in the bottom of the large metal can.
- Make two holes in the small can.
- Attach the dowel to the small can with metal wire.
- Push the blunt ends of three needles into the cork.
- Assemble the calorimeter as shown in the figure.

Taking Measurements

Safety rules:

- Work on a non-flammable surface.
- Tie back hair.
- Wear safety glasses.
- Use oven mitts to handle hot items.



For each trial, measure:

- The temperature change of the water.
- The change in mass of the food.





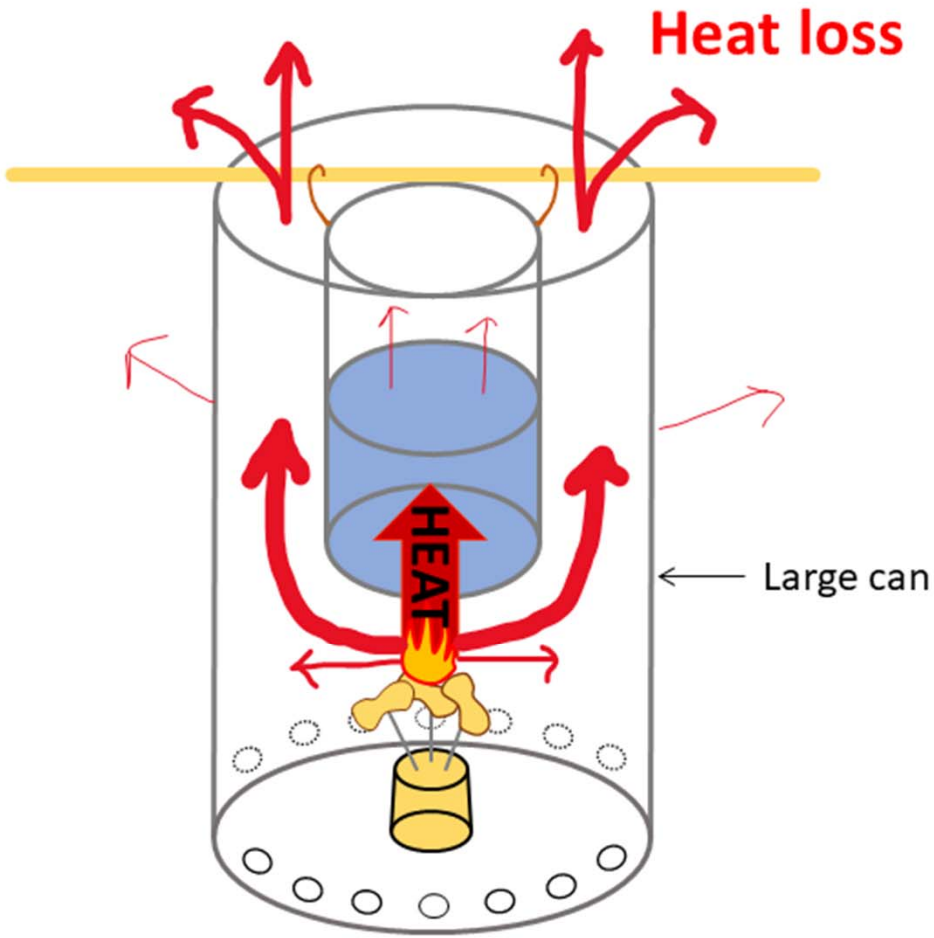
Perform at least 1 trial for each food item.

Analyzing the Data

Calculate the energy released by the food

Formulas	Variables
$Q_{water}=m_{water}\ c\ (T_f - T_i)$	• Q_{water}: heat captured by the water when heated (Cal) • m_{water}: mass of the water that is heated (g) • c: specific heat capacity of water (.001 Cal/(g°C)) • T_i: initial temperature of the water (°C) • T_f: final temperature of the water (°C) • Q_{food}: energy released when burning the food (Cal) • $Q_{food,\ 1g}$: energy released when burning 1 gram of food (Cal/g) • M_i: initial mass of food burned (g) • M_f: final mass of food burned (g)
$Q_{water}= Q_{food}$	
$Q_{food,\ 1\ g} = \frac{Q_{food}}{(M_i - M_f)}$	

Realistic Energy Flow in a Calorimeter



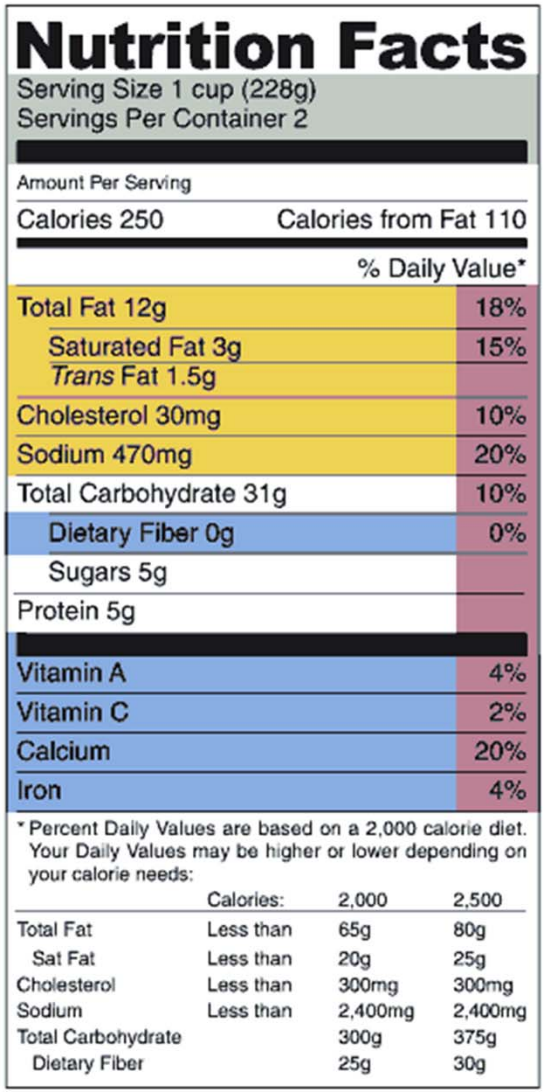
How Healthy is this Food?

Start Here

Limit these Nutrients

Get Enough of these Nutrients

Footnote



Nutrition Facts

Serving Size 1 cup (228g)
Servings Per Container 2

Amount Per Serving

Calories 250	Calories from Fat 110
	% Daily Value*
Total Fat 12g	18%
Saturated Fat 3g	15%
Trans Fat 1.5g	
Cholesterol 30mg	10%
Sodium 470mg	20%
Total Carbohydrate 31g	10%
Dietary Fiber 0g	0%
Sugars 5g	
Protein 5g	
Vitamin A	4%
Vitamin C	2%
Calcium	20%
Iron	4%

* Percent Daily Values are based on a 2,000 calorie diet. Your Daily Values may be higher or lower depending on your calorie needs:

	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

Quick Guide to % DV

5% or less is low
20% or more is high