

# Empty calories of junk food lab essay sample

[Food & Diet](#)



**ASSIGN  
BUSTER**

Background: The food that we eat throughout the day has energy for our bodies to use. The food content of food is given in kilocalories, which is 1000 calories, and is often known in Calories. A calorie is the amount of heat, energy, needed to raise the temperature of one gram of water by one degree Celsius. You can measure the calorie content of food by lighting a snack on fire and putting a sample of water above the flame, while allowing the water sample to gain the heat from the fire. The heat absorbed by the water from the flame will raise the temperature of the water. Whatever heat gained by the water was lost by the burning food. This allows us to find energy content of common snack foods in our everyday lives. Purpose: To determine the energy content in various snack foods, and compare results to the manufacturer's data. Materials:

Balance

Assorted snack foods: (pecans, Cheetos, Fritos, Cheez-it, marshmallow, potato chip, Popcorn.) Weigh boats

Cork stoppers

Wire paper clips

Empty soda can

Tap water

Graduated cylinder

Ring stand with ring clamp

Thermometer

Aluminum foil

Tongs

Safety: Observe and know all the safety rules. Wear goggles. Tie long hair back and take off the loose clothes. Practice caution when working with open flame. Heated items will be hot... handle carefully. Don't eat any food in the lab.

Prediction: I predict that the marshmallow will contain the highest amount of calories because it contains the most sugar and it is different from all the others in composition.

Hypothesis: If we use a calorimeter to determine the calories in various foods, then the marshmallow will have the highest caloric content because it contains the highest amount of sugar.

Procedure:

1. Before you begin, make sure the ring stand base and your lab benches are covered in aluminum foil and put a glass stir rod between the sodas can to rest on the ring stand base.
2. Place 100 mL of water in the graduated cylinder and put it into the empty soda can.
3. Assume the density of the water is 1g/mL and record the mass of the water in the data table.
4. Take the temperature of the water and put it in the data table.
5. Find the mass of an empty weigh boat and put it in the data table.
6. Get the first mass of the first snack item to be tested and put in the data table.
7. Slowly and peacefully put the snack item on the cork and paper clip stand you constructed, and place it under the can.
8. Place the can with water in it on the ring stand base, so it is exactly 2cm over the snack item.
9. Light the snack item under the can and make sure the flame is all around the can.
10. As soon as the flame dies down, stir the water gently and get the

temperature of the water and put it in the data table. 11. Find the temperature change and put it in the data table. 12. Using the tongs and caution, pour the hot water down the sink. 13. To remove the carbon black from the water of the can, wipe it with a wet paper towel. 14. Using the original weigh boat find the new mass of the burnt snack food item. 15. Find the change in mass of the snack food item.

16. Repeat steps 2-14 for the rest of the snack food items. 17. Lastly, clean the carbon black off the can with a moist paper towel.

Data Table:

Food	Mass	Water T1	Water T2	Final Mass	Temp Change	Cheez-it
------	------	----------	----------	------------	-------------	----------

1.	0.22g	20°C	28°C	0.054g	8°C	
----	-------	------	------	--------	-----	--

Potato Chip	1.89g	20°C	29°C	0.331g	9°C	
-------------	-------	------	------	--------	-----	--

Cheetos	2.056g	20°C	41°C	0.281g	21°C	
---------	--------	------	------	--------	------	--

Marshmallow	7.323g	22°C	29.5°C	6.056g	7.5°C	Frito
	.923g	22°C	30°C	0.278g	8°C	

Popcorn	2.001g	20°C	30°C	0.177g	10°C	
---------	--------	------	------	--------	------	--

Calculations: Calories absorbed by water

1.  $100\text{g} \times 1\text{cal/gram} \times \text{C}^{\circ} (28-20) = 800$  calories

2.  $100\text{g} \times 1\text{cal/gram} \times \text{C}^{\circ} (29-20) = 900$  calories

3.  $100\text{g} \times 1\text{cal/gram} \times \text{C}^{\circ} (41-20) = 2100$  calories

4.  $100\text{g} \times 1\text{cal/gram} \times \text{C}^{\circ} (29.5-22) = 750$  calories

5.  $100\text{g} \times 1\text{cal/gram} \times \text{C}^{\circ} (30-22) = 800$  calories

6.  $100\text{g} \times 1\text{cal/gram} \times \text{C}^{\circ} (30-20) = 1000$  calories

## Caloric Content:

1.  $800\text{cal}/.054\text{g} = 14814.81$  calories/gram
2.  $900\text{cal}/.331\text{g} = 2719.03$  calories/gram
3.  $2100\text{cal}/.281\text{g} = 7473.31$  calories/gram
4.  $750\text{cal}/6.506\text{g} = 115.27$  calories/gram
5.  $800\text{cal}/.278\text{g} = 2877$  calories/gram
6.  $1000\text{cal}/.177\text{g} = 5649.72$  calories/gram

## Kilo Calories per gram:

1.  $14814.81/1000 = 14.81$  Calories/gram
2.  $2719.03/1000 = 2.72$  Calories/gram
3.  $7473.31/1000 = 7.47$  Calories/gram
4.  $115.27/1000 = .11527$  Calories/gram
5.  $2877/1000 = 2.877$  Calories/gram
6.  $5649.72/1000 = 5.65$  Calories/gram

Food| Calories absorbed by water| Caloric Content| Kilocalories per gram|  
 Manufacturers label claim| Manufacturers data| Cheez-it| 800 calories|  
 14814.81 calories/gram| 14.81 Calories/gram| 150 Cal/ 30.0g serving| 5  
 Cal/g| Potato Chip| 900 calories| 2719.03 calories/gram|  
 2.72 Calories/gram| 150Cal/28.0g serving| 5.35Cal/g| Cheetos| 2100  
 calories| 7473.31 calories/gram| 7.47 Calories/gram| 150Cal/28.0g serving|  
 5.35Cal/g| Marshmallow| 750 calories| 115.27 calories/gram| .11527  
 Calories/gram| 90Cal/28.0g serving| 3.21Cal/g| Frito| 800 calories| 2877  
 calories/gram| 2.877 Calories/gram| 160Cal/28g serving| 5.71Cal/g|  
 Popcorn| 1000 calories| 5649.72 calories/gram| 5.65 Calories/gram|  
 150Cal/28.0g serving| 5.35Cal/g| Pecan| | | 213Cal/30g serving| 7.1Cal/g|  
<https://assignbuster.com/empty-calories-of-junk-food-lab-essay-sample/>

### Analysis Questions:

1. Pecans had the highest Calorie per gram or caloric content when burned. This does not support my prediction because I predicted the marshmallow to have the highest caloric content.
2. No it does not because some of the heat was released into the air from the flame because it was not directly under the sample of water.
3. The main source of energy for all the snack food samples is the sun from where the environments these foods came from.
4. My results for the kilocalories per grams were very different from the results of those of the manufacturer's data. Only the result of the popcorn and Cheetos were similar in comparison to the manufacture's data results.
5. Some of the sources of error were the stand with the snack food on it tipping over and the flame not being completely under the can with water in it. Also, after the snack food was burned, it might have fell over and pieces of the ash broke off and the scientists were unable to measure the correct end mass.
6. The improvements we could have made would have been to create a stronger and more sturdy base for the snack food to rest on to keep it from tipping over, also placing the burning snack food completely under the can to heat it to the max and lastly, not tip the base stand of the snack food sample.
7. It was suggested to wipe off the carbon black to keep your hands from getting dirty and that would lead to contaminating the snack food samples and producing incorrect data.
8. Industries determine calorie content of food by using various methods of heat calorimetry and burning to determine the calorie content of food. The look at certain qualities like how long it takes for the sample to burn, the color of the flame and the

temperature change of the water or the object itself. Also burning the object in a gas and recording the temperature change with very advanced and accurate technology to determine the caloric content. 9. Our group did not use nuts.

10. Yes, nuts could be used as a fuel source because they produced the most kilocalories and had the highest amount of energy given off which would be an eco-friendly way of driving from place to place. They are not a fuel source because we would run out of this source too quickly and it is not a reliable source.

Summary:

For this caloric lab we found the caloric content, temperature change, masses, and calories per gram and kilocalories per gram of seven everyday snack foods. We took the temperature and mass of the water and the same for the snacks and then burned the deliciously looking snack foods. We placed the burning object under a can with 100mL of water in it to record the amount of heat given off from the food and gained by the water. This then allowed us to find the number of calories and the caloric content of each item and compare it with the results of the professionals. Overall the data results I received were a bit far off from what that real thing was. Our results were higher and lower than that of the real industry workers.

For Fritos we received results of (2. 877 Calories/gram), while the actual result should have been closer to (5. 71Cal/g). Also the results of the cheez-it were a whopping (14. 81 Calories/gram), while the real thing was (5 Cal/g). The sources of error played a big part in the results of our data. We didn't

<https://assignbuster.com/empty-calories-of-junk-food-lab-essay-sample/>

have the snack food completely under the can for the first two snacks and after the cheez-it was finished burning it broke and we may not have collected all the ashes of the experiment. The results of the data showed that it rejected my hypothesis as I thought the marshmallow would have the highest caloric content because of its high concentration in sugar. We found out that the healthiest snack on our list had the highest caloric content going way beyond the others (213Cal/30g serving). This lab showed us how to find the caloric content of certain objects in everyday life and that just because it looks healthy doesn't mean it is.