

**Conclusion:** How Cooking Method affects the Fat Content of Hamburger

To determine how various cooking methods affect the fat content of hamburgers, five methods of cooking were tested; frying, boiling, microwaving, broiling and grilling. The results of my experiment supported my hypothesis that grilling would result in the greatest fat loss, leaving only 8.4% fat in the hamburger on average. The results showed that broiling was also effective at removing fat, leaving only 12.7%. Neither frying nor microwaving showed a significant fat loss. Fried hamburgers still had 17.7% fat on average, and microwave had an average of almost 19.8% fat. Unfortunately, I was not able to get good data for boiling hamburgers because that method does not make hamburgers that I could measure with my equipment.

With twelve pieces of data for each method, I showed a significant difference in the amount of fat removed by all of the cooking methods. I reject the null hypothesis that the cooking method had no effect on fat content ( $p < .05$ ).

Unfortunately it can take up to a half an hour to cook a single hamburger, so the amount of data collected was limited by the time that I had to complete the experiment. The standard deviation was relatively small for each of the sets of data: baking, 1.3; Frying, 1.0; Grilling, 1.0; Microwaving, 1.3, with the exception of boiling (7.4). As I learned, it is difficult to boil hamburger without it falling apart, therefore I believe my fat content measurements to be unreliable for that cooking method.

One source of inaccuracy in my project was the fat testing kit that I used. The kit says that it has a 97% accuracy rate, but that is only when it is used perfectly and I know that I may not have measured correctly on all of the hamburgers. I was also limited by the precision of the scale that I use to obtain my weight data. To obtain better data, I would suggest a regular scientific balance rather than a spring-loaded kitchen scale.

Although I attempted to control most of the variables that could affect the outcome of my experiment, there were a few factors that I did not control. Halfway through my experiment my hamburger spoiled and I had to replace it with another package of hamburger. I tried to ensure that the second package I bought was as identical to the first as I could get, but I had to buy it from a different store (the first was from Fred Meyer, the replacement was from Super Bear). I'm not sure how important this source of error is. Also, while I tried to control the thawing of the meat before I cooked it, the temperature of my house varied quite a bit throughout the experiment and I noticed that the meat was not always the same temperature after the prescribed thaw time.

A great deal of my time was spent trying to get data from boiled hamburgers. In the end I had to put the hamburgers in cheese cloth to get them to retain a measurable shape. The cheese cloth may have effected the fat loss.

I am sure that the results of my experiment will change the way that I cook hamburgers for myself. I would also think that anyone who cooks his or her own hamburgers at home would be interested to know this information. Given that heart disease and obesity are two of the biggest health problems facing Americans, I would suggest that people start grilling their hamburgers rather than frying them. Of course there are a lot of foods that have less fat in them than a hamburger cooked by any method.

One future study I would suggest is to compare the fat content of hamburgers that are grilled to different states of color (rare, medium, well-done). Another useful experiment might be to see if the temperature of the fire affects the fat content of the hamburger when I grill them. I also wonder if the thickness of the hamburger might affect its fat content after I grill it.