THE STUDY OF THE AMOUNT OF OIL AND GREASE IN CHIPS
Cindy Li
Cary Academy

ABSTRACT
The purpose of this experiment was to find out how much oil is in the chips after being tested with various experiments. Potato chips start as potatoes and as they get chopped, fried, and salted, the chips get very unhealthy, and can harm a body if eating too much chips, because there is one thing that comes from chips: grease. Potato chips were burned over a fire, and when all the oil has burned out, and the fire has stopped, the potato chips were crushed onto a paper towel. In result, the potato chips have lost a ton of weight in grams, as a lot of oil dropped from the chip. This happened because oil is really flammable and when the chip was set on fire, the oil was burned off of the chip, and after, the chip felt almost weightless.

INTRODUCTION
Everyone knows how tasty potato chips are. There are many different qualifications to make the perfect chip. It is known that the more oil in the chip, the more people think potato chips are tasty. There are many flavors and sizes of chips in a bag of chips, but there is usually only one way to make the chips the best tasting and the most delicious. Basically, potato chips are made by slicing farm grown potatoes into thin strips and fried in oils and lastly salting or flavoring them. The farmed potatoes have to be checked for taste, color and weight. If the potato does not meet expectations, a whole field of potatoes could be rejected. The allowed potatoes are taken to be cut and peeled. Once cut, they are again checked for color. The thin potato slices are then fried in oil. The main oils used for frying are corn oil, cottonseed oils, and sometimes vegetable oil. Today, the oils the potato chips are fried in get purified of any chemicals or bacteria. People who make potato chips add a cleaning agent to do all this. This is done for all chips, until they start to add the flavoring. All the flavorings like sour cream and onion, or barbeque, they are all bought from varieties of other places, and are just powdered flavors put on chips. When they make chips, workers use flake salt instead of crystal salt. Some factories that make potato chips even add chemicals like citric acid and more. This is done just to change the color of the chips to
make it look more satisfying, while also reducing the sugar level in the chips, making chips taste and look delicious.

Something that is almost always in food once its cooked: grease. If grease is seen in food, in this case; chips, it does not look too disgusting. But grease alone, it is nasty. Grease is made from basically what can be called used oil, from cooking. It is mixed and referred as used frying oils, where people can find grease in things like fryers for food like French fries, or chip fryers. Excess grease can be made into detergent or rubber. Over time, grease had become a valuable product. They could use grease on roads, or for animals, as well as a feedstock for biodiesel, as grease is able to change wastes into fuel. Grease comes from chips as well, grease from those chips are unhealthy as the same for chips. Common grease is usually called yellow grease. Even though it is normal for a human to have fats and oils, but too much is not the best for the body.

All the unhealthy foods that contain a tremendous amount of oil and fat can be extremely unhealthy. The oils, fats, and grease, can really affect a body. Oils and grease means calories, calories, if not burned, turns into fat. Unhealthy foods can become greasy and oily when either deep fried or cooked with lots of oil. Some food can be turned unhealthy when another unhealthy ingredient is added to it. It might be something such as a salad. If a lot of ranch and cheese is added, it would become high in calories and especially fat. Soon, that fat will affect whoever did not burn it off. One symptom of being overweight is having problems with the heart and blood pressure. Oily and greasy foods will have high cholesterol which can lead to clogging of the arteries and causing a chance of stroke. Not only will greasy foods and oils harm a person’s cardiovascular system, but also damage his or hers digestive system. Eating foods without a ton of oils and greases is vital to a person’s health. Otherwise, it can really affect the health.

Some other experiments have also been done on potato chips. Before, Nell Levine had conducted an experiment on the amount of oil in a ruffles bag of chips when placed on a Cary Academy brand paper towel. The chips were placed on the towel and crushed to see the weight change of the chips. The chips were crushed and stomped on to get the weight change. That experiment was done to see the weight change to the chips after the oil had been completely wringed out. Another experiment that Nell Levine did was changing the paper product, which is changing the brand of paper towels. The chips were still stomped on, but the paper towel changed, which might have absorbed more or less oil. Some other experiment related was conducted by Jason
Hallman. Jason Hallman did an experiment on burning foods. The experiment conducted was to find out how high the temperature rose on different foods. Jason Hallman calculated this by dividing the temperature by the weight loss. He could tell the reason some foods burned to higher temperatures.

**MATERIALS AND METHODS**

In the experiment, the following materials were used: The four flavors in the brand “Lays”: Classic, Sour Cream and Onion, Barbeque, Salt and Vinegar, a rolling pin, sheets of Cary Academy paper towels, a triple beam balance, candles (fire), timer, tongs, and a hard surface.

The first experiment measured how much the grease and oil weighed off the chip by itself. The chips were all measured until they had the same weight. The paper towel was measured to find out how much the towel weighs by itself. The chips were then laid out onto a sheet and rolled until all the grease had been rubbed on the paper towel. The paper towel was then measured on the triple beam balance to find the total weight. The weight of the paper towel was subtracted to find the weight of the oil only. This was done with all four brands. It was done three times each, and then was taken an average.

The second experiment measured how long or how fast it takes one chip from each flavor to burn. A chip from each flavor was held with a fire on a pair of tongs. A timer kept track of how long the chip can be burned for. This was done for all four flavors and done three times each, then taken an average again.

The third experiment measured how much the potato chip weighed after being burned completely. One chip from each flavor was burned until completely burnt, and then was weighed on a triple beam balance for the weight it lost. This was done 3 times with each flavor and taken an average after.

In the fourth experiment, a bunch of chips that weigh the same amount in grams were burned and then weighed again to see how much oil and grease the chips burned off. The chips were weighed to the same weight, and then was all burned, put in a pile, and rolled out as much oil that was left in the burnt chips. This was done for all four flavors of chips, and done three times each. An average was taken once again after.
RESULTS AND DISCUSSION

![Bar chart showing weight of oil on different types of potato chips]

**Figure 1: Weight of oil on chips**

Oils are the majority of a potato chip. If there was no oil, the chip would be almost weightless, not only that, also healthy. The data in the graph show all the oil that had been rolled out onto a sheet of Cary Academy brand toilet paper. This shows the oil by itself without the weight of the chip and the paper towel. The graph shows that classic had the most oil within the chips. This is because classic has no powdered flavor. Classic is just plain oil and salt. While barbeque and sour cream have flavor, classic has to add more oil to create a better flavor. Therefore, when rolled out on a paper towel, classic has the most oil.

![Bar chart showing time it takes a potato chip to burn]

**Figure 2: Time it takes a potato chip to burn**
Oil can be flammable when set on fire, in the second experiment, it was determined that classic burned that fastest. This was because it had the most oil on it. This also relates to the first experiment that was conducted. The first experiment showed that the most oil that came off the chips was classic, and that leads to the reason why classic burned that fastest. Sour cream and onion burned the slowest because there was so much flavoring and seasoning. The powdered flavor may have blocked of some oil.

It is known that vinegar is very flammable, however, salt it not. This would explain why the fire not only did not last long on a salt and vinegar chip, but also did not lose a lot of its oil. The fire started, with the vinegar encouraging it, but the salt blocked the spreading fire. Salt and vinegar chips are just plainly that, it probably has the least amount of oil of all four flavors. Classic, on the other hand, was the fastest burning chip, as well as the chip that lost the most weight. Since classic contains most oil, most of it burned off when the heat was spreading throughout the chip. Barbeque and sour cream and onion were kind of the same, depending on the amount of flavor.
In this experiment, the oil was rolled out, to see how much that did not get burned off. Salt and vinegar still had the most oil, because the salt refused to burn the oil off the chip. The graph shows that classic is at the bottom of the graph. This shows that so much oil was burned off, there was much lighter from the start weight. The oil from the classic chips burned quickly, getting lighter and lighter, while the salt and vinegar, barley burns anything. This is why there is still so much oil left on the salt and vinegar chip. Sour cream comes close behind classic, with less flavoring on one slide of the chip, or maybe less oil.

**CONCLUSION**

The second experiment was to measure how long it took a chip to burn completely. The hypothesis expecting classic to burn the fastest was correct because in the first experiment, classic was found to have the most oil, and because oil burns really fast, classic was expected to burn the quickest. This information is important to the world because it tells people how much oil is in potato chips and proves that there is lots of unhealthy oil in chips because of how fast the chips burn. Some experiments that could be conducted in the future is weighing the number of oil drops that fall from the chips when burning, changing the heat of the flame, there can also be an experiment on crushing the chips first, and then burning to see how much oil is left.
CITATIONS


i.e. Discovery Education, potato chips

Jason Hallman, The Study of Burning Foods, Cary Academy, 2012


Nell Levine, The Study of Grease in Chips, Cary Academy, 2013

