Lipid Extraction Lab Report
By
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Date of Experiment: 13 November 2015 - 16 November 2015

Data Table:

<table>
<thead>
<tr>
<th>Name of Food Product</th>
<th>Weight of Empty Beaker</th>
<th>Weight of Empty Petri Dish</th>
<th>Weight of Food</th>
<th>Weight of Beaker and Food</th>
<th>Weight of Food in Beaker After 48 Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oreo Chocolate Sandwich Cookies</td>
<td>102.83 g</td>
<td>43.73 g</td>
<td>5.00 g</td>
<td>107.83 g</td>
<td>106.90 g</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Weight Lost From Food Overnight in Beaker</th>
<th>Weight of Lipid and Petri Dish</th>
<th>Weight of Lipid Extracted</th>
<th>Percent Lipid Extraction</th>
<th>Percent Lipid From Nutrition Value</th>
<th>Percent Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.91 g</td>
<td>44.58 g</td>
<td>0.85 g</td>
<td>17%</td>
<td>20.4%</td>
<td>16.67%</td>
</tr>
</tbody>
</table>

Analysis:
1. Describe the appearance of fat in your petri dish as well as two other petri dishes.

   The food I chose for the experiment was the Oreo chocolate sand which cookies. I did use the whole chunk of Oreo with the cream when grinding the Oreo. Thus, the fat that was extracted must be from both the cookies and the cream. According to the experiment, the result obtained from the extraction of the fat from Oreo chocolate sandwich cookies on the petri dish was most solid at the room temperature. Some black spots could be visible on the petri dish. These spots are likely to be the power of Oreo, as long as a little piece of Oreo, that fallen into the petri dish during pouring out the acetone. The fat looked oily with the stain of fat that can possibly be liquid, but was left over and already dried out. However, for the two other petri dishes were honey star cereal and pumpkin seed. The fat extracted from honey star cereal was a combination of a light yellowish power and an oily stain with the transparent texture. The left over fat seemed to be very dry for both the power and the stain. For the other petri dish with the pumpkin seed, the extracted fat has a greenish colour. We can see the power of the pumpkin seed that were not grind completely in the petri dish. Also, the fat looked oily...
but the power looked dry. Some of the fat were liquid at the room temperature either. Overall from the three observation, all the fat was all solid and dry with the power of the food on the petri dish mix with the extracted fat.

2. Determine which of these three foods contained saturated fats, unsaturated fats, or both based on the appearance of fat in the petri dish. How do you know?

From the observation we obtained, all the three foods seem to contain saturated fat. However, the pumpkin seed was likely to be the only food that contains both saturated fatty acid and unsaturated fatty acid. The reason that I think all the three foods contained saturated because the fat that was extracted from the food were solid. Due to the characteristic of a saturated fatty acid that would stay solid in the room temperature can help determine the kind of fat the foods contained. Even there were some pieces of food mix with the fat, but the fat can still be see to be dry and hard. Whereas, for the pumpkin seed, some part of the fat that was extracted from the the food remained liquify and the stain can be seen. This means that the pumpkin seed also has an unsaturated fatty acid contained because the unsaturated fatty acid will stay in the stage of liquid even in the room temperature. Another factor that determined the pumpkin seed contained unsaturated fatty acid is that the food is originally comes from plant. The fat from the plant, except from coconut oil and palm oil, are consider to be an unsaturated fat.

3. For each of the three food items observed:

<table>
<thead>
<tr>
<th></th>
<th>amount of fat</th>
<th>amount of grams in package</th>
<th>X</th>
<th>5 g</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. 1.) Oreo</strong></td>
<td>5 g x 6 g of fat = 30 g</td>
<td>29.4 g</td>
<td>1.02 g</td>
<td></td>
</tr>
<tr>
<td><strong>2.) Honey Star Cereal</strong></td>
<td>5 g x 0.5 g of fat = 2.5 g</td>
<td>20 g</td>
<td>0.125 g</td>
<td></td>
</tr>
<tr>
<td><strong>3.) Pumpkin Seed</strong></td>
<td>5.21 g x 12 g of fat = 2.5 g</td>
<td>25 g</td>
<td>0.101 g</td>
<td></td>
</tr>
</tbody>
</table>
B. How does that number for (A) compare to the grams of fat actually extracted for each of the three products? Use data to support your answer.

1.) Oreo
   1.02 g  →  Extracted fat = 0.85 g

2.) Honey Star Cereal
   0.125 g →  Extracted fat = 0.4 g

3.) Pumpkin Seed
   2.5 g   →  Extracted fat = 0.87 g

All of the extracted from the three products are less than the actual fat each product are supposed to contain in 5 grams.

C. Which of these products should have been highest in fat content? Put the three foods in order by fat content. Based on the experiment, do you have similar results? If not, put the three foods in order by extracted fat content.

The product that should have been highest in fat content is the pumpkin seed. According to the result from the experiment, the highest fat content is still be pumpkin seed. However, other food product fell on the same rank of fat content from the calculation in 3B which are followed by Oreo and Honey Star Cereal, respectively.

4. What do you think contributed to the percent error that was calculated the three food products?

In my opinion, the the factors that contribute the percent error of the experiment were the fallen piece of food into the petri dish, the big piece of Oreo absorbed large amount of acetone, the longer duration of the experiment, incomplete amount of acetone was pours, and other physical errors that cause by our unawareness unintentionally.

For the first factor, it could be clearly seen that there was a power, as long as a tiny piece, of Oreo on the petri dish. Since when pouring the acetone out of the beaker, the piece of Oreo or the power was accidentally fell out with the acetone. This is the reason why there was a black spot on the petri dish as the result. Moreover, this increased the weight of the petri dish which is supposed to be lighter. Secondly, because the piece of Oreo fallen into the petri dish was quite big and we can clearly see the unequal size of Oreo in the beaker, so this bigger piece is probably absorbed more acetone. When a lot of acetone was being absorbed a lot by the big piece of Oreo, there might be less acetone come out when we pour the acetone out onto the petri dish. Thus, this can cause the weight of fat extracted to be less than the actual. Thirdly, the procedure of the experiment stated that we need to leave the fat extracted from the product by acetone for 48 hours, yet, we left it for 3 days because of the weekend took two days. The longer duration of than the actual time could drive a different weight result.
of the fat extracted. The weight could be lighter because we left it too long and some of the fat might go or escape to the environment in some ways. The fourth factor was the incomplete amount of acetone was poured out from the beaker. There might be some acetone left in the beaker, so that some of the fat might still be stored in the Oreo. This implies that not all of the fat in the food will be extracted from the food. The amount of acetone can also affect the weight too. Since we did not use equipment to exactly measure the amount of the acetone to be poured into the beaker, the amount of acetone I use might be too little. This drove the result of amount of extracted fat possibly be less in weight due to this error either. Other physical errors that I probably unintentionally did during the experiment were the stirring time when mixing the acetone with the food. I might did it too long or too short.

Overall, this experiment can be improved by being more careful and aware of the error that might cause any of inaccuracy in the result. The experiment need a lot of concentration, whether when weighing the mass of the food or draining the acetone out of the beaker. Some background knowledge of the experiment is also required.