CLASS COPY

One "Phat" Fat Lab

In this activity, you will test a selection of ground meats to determine if the labels accurately reflect the fat content. The meats tested are:

- 1% fat ground turkey
- 7% fat ground turkey
- 7% fat ground chicken
- 7% fat ground beef
- 10% fat ground beef
- 20% fat ground beef

The purposes of this activity are for you to:

1. Realize that the foods we eat contain the molecules we are learning about in class
2. Practice making IB quality data tables
3. Learn how to calculate the percent difference between the observed and expected values.

Preparation:

Each meat sample was prepared in the following manner:

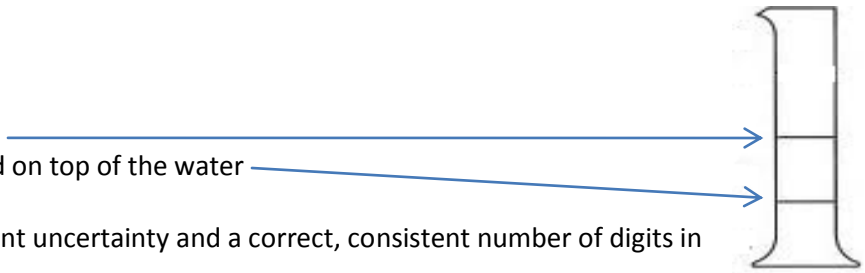
1. 20 grams of ground meat was weighed out onto a piece of foil on a gram scale.
2. Each 20g meat sample was placed in a cooking pot with 10 ml of water. A spoon was used to break up and stir the ground meat.
3. Each meat sample was carefully heated until cooked, stirring occasionally.
4. When cooking, some water evaporated from the pan. Lipids and proteins did not evaporate.
5. When finished cooking, the meat solutions were cooled until it could be handled without causing a burn.
6. The liquid content was poured into a 10-ml graduated cylinder, using a funnel and cheese cloth to filter out the meat so only the liquid was collected.

Raw Data Collection and Presentation:

Raw data is data that you measure directly from a measurement tool. No calculations are done to determine the raw data values. *See page 16 in your student guide for directions on how to make an IB quality data table.*

Create an IB quality data table to record:

- The name of the meat source
- The total mL of the liquid content
- The mL at which the fat has settled on top of the water



Be sure to include titles, units, measurement uncertainty and a correct, consistent number of digits in your measurement.

Data Processing:

Processed data includes any values that you must perform a calculation in order to determine.

1. Calculate the mL of fat present in the each meat sample (simply the difference between the two previous measurements). Show your working.
2. Determine how many grams of fat were collected for each sample. Fat has a density of 0.94 g/mL. Show your working for one example calulation. Your working should not be part of a data table.

FOR EXAMPLE

If 1.20 mL of fat were present in the cylinder, set up the equation like this:

$$\frac{X\ g}{1.20\ mL} = \frac{0.94\ g}{1.00\ mL}$$

Solving for X should give you and answer of 1.128 g of fat in 1.20 mL of fat. Now you need to round. You can only be as precise as your least precise number. So, since the mL measurement was to the hundredths place, the grams calculation must also be rounded to the hundredths place.

1.128 g → **1.13 g** of fat.

3. For each type of meat, determine how many grams of fat would be expected in a 20g sample based on the labeled fat content. Show your working for one example calculation. Your working should not be part of a data table.

FOR EXAMPLE

If the label says 10% fat, set up the equation like this:

(0.10) (20g) = X

Solving for X should give you an answer of 2 g of fat expected fat in the sample. Remember, you can only be as precise as your least precise number. So, all calculations should be presented as whole numbers.

4. Calculate the percent difference between the observed (x_1) and expected (x_2) amounts for each fat sample. Show your working for one example calculation. Your working should not be part of a data table.

$$\% \text{ Diff} = \left| \frac{x_1 - x_2}{(x_1 + x_2)/2} \right| \times 100$$

FOR EXAMPLE

If you observed 1.13 g of fat in your measured sample, and the expected amount from the percent provided on the label was 2 g, set up the equation like this:

$x_1 - x_2 = 1.13g - 2g = -3.13g$

$(x_1 + x_2) / 2 = (1.13g + 2g) / 2 = 1.565$ g

$$\frac{x_1 - x_2}{(x_1 + x_2)/2} = \frac{-3.13g}{1.565g} = -2$$

Absolute value of -2 = 2

Multiple by 100 to convert to a % difference = 2 X 100 = 200%

Remember, you can only be as precise as your least precise number (which in this case is 2 g). So, all calculations should be presented as whole numbers.

Presenting Processed Data

See page 16 in your student guide for directions on how to make an IB quality data table.

Create an IB quality data table to record your processed data:

- The name of the meat source
- The actual grams of fat in the meat sample
- The expected grams of fat in the meat sample
- The percent difference between the observed amount of fat and the amount expected given the label.

Be sure to include titles, units, and a correct, consistent number of digits in your measurement. Processed data does NOT need to include the measurement uncertainty.