HOW TO WRITE A FOOD SCIENCE LAB REPORT

You should write a food science lab report so that someone who is not in the class could read it and understand exactly what you did as well as interpret your results. These reports will prepare you to read and write research articles. The writing should be clear and logical so that your experiment is outlined from beginning to end. The general outline of a lab report should be:

- **Introduction**
  - Objectives

- **Method**
  - Food Service Principles
  - Your variation

- **Results**
  - Yours and those of the other groups in the class

- **Discussion**
  - What you learned
  - How your objectives were met

**Introduction**
The introduction, as its name implies, should introduce the food and its properties that were explored in lab. For example, “This lab explored the property of crystallization as it applies to the creation of fudge and ice cream.” Or “Several of the characteristics which make vegetables appetizing can be manipulated during the cooking process. Variables which affect texture, flavor, and color were analyzed and evaluated in this lab in order to determine the best ways to prepare vegetables maintaining their nutrients as well as their gustatory integrity.”

*The introduction can be brief and is just a hint of what will be discussed in the rest of the report.*

**Objectives**
The objectives should briefly and specifically state the purpose of the lab experiment, or what you plan to accomplish. When you are writing the objectives, first refer to those which are listed in your lab manual. Read each of the objectives and determine which ones were actually done during the lab (not all of those in the book will be done in class). Tailor these objectives to fit exactly what you did in your experiment. Here is an example taken from a starch experiment lab report:

- The purpose of this lab is to:
  - Understand the process of gelatinization
  - Compare the behavior and appearance of various gelatinized starches
  - Understand the factors that influence starch paste viscosity

**Food Science Principles**
In this section, you will explain the principles which you explored during the lab, specifically, what happens and why. You should outline the general process being studied, such as gelatinization. Then explain the changes that occur because of manipulations, such as the effects of added sugar and/or acid on gel viscosity. It is helpful to review your class notes as well as your text when you are writing this portion of the lab report. For example, when writing about starches, you should explain what starches are, the general process of gelatinization and elation, and then (changes in temperature, addition of ingredients, etc.) You should write something like this:
Gelatinization is the swelling of starch granules and the migration of some amylose into the cooking water when starch is heated in water. The process of gelatinization includes the hydration of the granules, the disruption of the granules’ tight organization, and the swelling and increasing physical size of the granules. The result of gelatinization is a sol, which when cooled will often form a gel; this process is called gelation.

Sugar reduces paste viscosity and gel strength because it competes with the starch for water. Starch needs the water for gelatinization. Sugar increases the final temperature required to achieve gelatinization and increases translucence.

This section is very important to show that you understand the concepts that are being analyzed during the lab experiment. When you take information directly from your text book, do not forget to reference it.

**Method: Your Variation**

Now you want to explain which variations were carried out in your group. Since each group carried out the same basic procedure, you do not need to copy the entire method from your lab manual. You should report any variations done in your experiment from the basic instructions given in the book. For example: “Our group followed the recipe for creating an egg white foam given on page 97 of our lab text using a frozen egg white.” You should also mention any differences in amounts, times, or techniques.

**Results**

In the results section, you should present all the data collected during lab (from all groups including your own) and present it in a clear way. The best way to do this is with a chart (refer to the charts given in the appendix of the lab manual for each experiment). You should report all data, whether or not it is accurate. It is more important to be able to explain the results and provide possible explanations for what went wrong, than to have perfect results every time.

In order to explain the results you found, you should apply the food science principles that you explained previously in the lab report. It is easier and clearer to explain trends in the data than to focus on each number. For example:

As the amount of sugar added to the starch increased, the percent sag increased as well. Percent sag provides an objective measure of the strength of a gel. This trend is consistent with the known principle that sugar reduces paste viscosity and gel strength because it competes with the starch for water.

When the results found in lab do not turn out as they should, you should try to explain the discrepancy and suggest areas where error could have occurred.

Be sure to include both subjective and objective evaluation when they are applicable. Subjective evaluation includes taste, color, consistency, and other characteristics that are judged individually and are not measured. Objective evaluation includes specific measurements, such as weight, percent sag, line spread, temperature, etc. Subjective evaluations can vary from person to person, but objective measurements should be the same in each person’s lab report.

**Discussion**

Some students may classify the above mentioned evaluation of data as “discussion;” this is fine too, as long as all the essential information is included in the lab report in a clear and logical manner. When the evaluation is included with the results, the discussion section includes a summary of what you learned and how you met your objectives. You should refer back to the objectives and make sure each of them were met during the lab experiment and write-up. Here is a sample:

Through the creation of various starch pastes, the processes of gelatinization and gelation were examined. The tools of line spread and percent sag were utilized in order to objectively compare the pastes and gels produced, while the factors which affect their production, such as acid, sugar and amylose content were also evaluated. It was determined that acid and sugar will decrease the product’s viscosity, and a starch low in amylose content, like tapioca, will not gel. The effect of gelatinization was further demonstrated by the dramatic volume increases seen when rice was hydrated.

*Dr. Lawrence keeps samples of lab reports from previous semesters as well as on file in the ARC*