



# Food Science/ Healthy Living:

## Reflect Questions Answer Key

Below are the general answers to the questions in the lessons. If possible, have the 4-Hers research the answers online or in your local library. When searching online, reliable resources include the FDA website, USDA website, scholarly articles, and college websites such as Purdue. Wikipedia also has a lot of general information that is easy to understand, but the website is user generated meaning anyone can edit the information. However, the articles referenced at the bottom of Wikipedia pages often lead to scholarly works.

### Fruits – Apple variety

1. Which apple variety provides the best flavor for baked apples?  
*Observations/opinion*
2. Which apple variety provides the firmest texture?  
*Observations*
3. Which apple variety would you use to make baked apples?  
*Observation/opinion*

### Vegetables – Emulsions

1. Explain the difference in texture of the control and the variable.  
*Observations*
2. What is the emulsifier in this recipe?  
*Dijon mustard*
3. What are some other food products that use an emulsifier? (products that mix oil and water)
  - > *Egg yolk (contains lecithin)*
  - > *Soy lecithin*
  - > *Sodium phosphates*
  - > *Sodium stearoyl lactylate*
  - > *DATEM (diacetyl tartaric acid ester of mono- and diglycerides)*

### Dairy – Ricotta cheese

1. Explain the differences between the various combinations of milk and acid.  
*Observations*
2. Why do these ricotta cheese samples taste different than cheddar cheese? Bleu cheese?  
*Cheddar cheese is aged between 2-3 months (mild cheddar) and 1 year (sharp cheddar). The volatile flavor compounds in cheese originate from degradation of the major milk constituents; namely lactose, citrate, milk lipids, and milk proteins (collectively called caseins) during ripening.*  
*Bleu cheese is made with cultures of the mold Penicillium. The mold enhances the growth of good bacteria creating the flavor and the streaks of blue-ish color throughout the cheese.*  
*Ricotta cheese is considered a fresh cheese so there are no strong flavors from aging or mold and bacteria.*

3. Why do these ricotta cheese samples have a different texture than hard cheeses like parmesan cheese?  
*Hard cheeses are aged for a few weeks to a year, so a lot of the moisture is depleted making the cheese drier and harder. Soft cheeses like ricotta is fresh and still contains all of the moisture from the milk and cream ingredients.*

## **Grains – Gluten in flour**

1. What type of baked product would each dough be good for (cake, cookies, breads, etc.)? Why do you think this is the case?  
*Observations/opinions*
2. Was the gluten dough elastic and stretchable?  
*Observations*  
*The gluten in doughs is what causes an elastic and chewy texture (see apply section). The gluten doughs should be elastic and stretchable.*
3. Did the gluten free dough fall apart, showing neither elasticity nor stretchiness?  
*Observations*  
*The gluten is what holds all of the ingredients together in a dough. The gluten-free dough should be smaller and falling apart after the experiment.*

## **Protein – Egg foam soufflés**

1. How did the soufflé change after baking?  
*Observations – use table to describe appearance, texture, volume, and tenderness.*
2. What does a clean knife mean when testing if the soufflé is done cooking?  
*Inserting a clean knife into the soufflé will either result in a clean knife or residue on the knife. Residue on the knife means that the egg proteins have not completely coagulated and the soufflé needs more time baking. It is a similar process to testing a cake to see if it is done baking.*
3. At what stage should you beat your egg whites to?  
*Stiff pointed peaks – this is the stage that has the best stability and has incorporated the most amount of air without over-beating and destroying the air pockets.*

## **Snack – Fruit roll-ups**

1. Why does the fruit need to be a smooth puree without chunks before baking?  
*The fruit puree needs to be all the same consistency so the puree dries out at the same speed. With big chunks of fruit, you will either produce a fruit leather with pockets of moisture that will cause the fruit leather to spoil faster or you will produce a fruit leather that is very dry and cracking in the thinner areas.*
2. What role does the lemon juice play?  
*The lemon juice helps with the flavor (brighter and tarter) and the color (keeps the pigments from getting too dark by slowing the natural enzymes reactions and oxidation).*
3. What are other ways to dehydrate the fruit puree without an oven?
  - > *Dehydrator*
  - > *Toaster oven*
  - > *Sun-drying*
  - > *Microwave*
  - > *More?*

## **Dessert – Pavlova with lemon curd**

1. Why is it important that the water in the saucepan beneath the lemon curd not boil while thickening the curd?  
*Boiling the water under the curd would apply too much heat to the ingredients and could curdle the eggs into scrambled eggs. Keeping the water at a simmer allows for a very smooth and creamy texture.*

2. Why should the mixing bowl and whisk attachment be very clean and dry before adding the egg whites?  
*Any residue of fat (oils, egg yolk, etc.) in the bowl or on the whisk will deflate your meringue. The fat molecules disrupt the structure being built by the protein and the air bubbles will not form.*
3. The butter must be incorporated into the curd one piece at a time. Why is this necessary?  
*The step where you add the butter one piece at a time is to cool the curd. Adding the butter slowly while stirring cools the lemon curd evenly.*
4. Why is it important to serve immediately?  
*The dry Pavlova and the lemon curd have different levels of water activity. All food has a measurement of free water available within the ingredient or product: dry foods like crackers and flour have a very low water activity while moist foods like cream cheese and salad dressing have a very high water activity. Putting the moist lemon curd on top of the dry Pavlova will cause the free water in the lemon curd to migrate into the dry environment of the Pavlova. This will make the Pavlova soggy.*

## **Protein – Egg replacer**

1. How did the muffin batter and the finished muffins compare in the egg recipe vs. the egg substitute recipe?  
*Observations*
2. Can you tell a difference in appearance, texture, volume, tenderness, or flavor of the two samples?  
*Observations*
3. Why would somebody or a food company replace egg with an egg substitute in a recipe?  
*Home cooks and food companies replace eggs with egg substitutes for many different reasons. Some are as follows:*
  - › *Health – egg substitutes can be bought as only egg whites reducing the amount of fat and cholesterol*
  - › *Easier than cracking eggs*
  - › *Allergies – some egg substitutes do not contain any egg protein, so those with an egg allergy can use the substitute to make a recipe that they can safely consume*
  - › *Dietary choices – those that do not wish to consume animal products can find egg substitutes that are labeled as “vegan”*
  - › *And more!*