**FOOD STUDIES 9/10**  NAME:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2014-2020 TA\_\_\_\_ CLASS \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# Learning Guide 10

Thickeners: Sauces and Fillings

Making lump free sauces, gravies and fillings takes experience and some knowledge of how food ingredients react with liquids and with heat. This is basic food science! In this guide, you’ll learn how to use flour, cornstarch and egg to thicken milk, how to make a cheesecake crust and how to whip up egg white to make a fluffy meringue!

Learning Outcomes/Big Ideas:

On completion of this learning guide you will be able to:

* Describe three ways to prevent lumps from forming when mixing hot liquids with flour.
* Describe and demonstrate the technique used to add egg into a hot liquid.
* Demonstrate organization and co-operation in partner and group work
* Describe the technique used to make an egg meringue.
* Demonstrate skill s in preparing Banana Cream Pie or Pudding

Resources:

1. Food for Life textbook: Chapter 8 (Milk Products)
2. Handouts attached: How to Thicken With…, Thickening Agents
3. Youtube videos, especially:
   * Macon - Alternative Starches: How to thicken sauces without flour [www.youtube.com/watch?v=wndGXOoqRLs](http://www.youtube.com/watch?v=wndGXOoqRLs)
   * HarvardX – Thickening Agents in Cooking [www.youtube.com/watch?v=21H0eOTp7jw](http://www.youtube.com/watch?v=21H0eOTp7jw)
   * Everyday Food – Make Perfect Custards Every Time [www.youtube.com/watch?v=l03a1aatvWY](http://www.youtube.com/watch?v=l03a1aatvWY)
   * America’s Test Kitchen - Science: The Magic of Meringue [www.youtube.com/watch?v=0fnWf5BvXac](http://www.youtube.com/watch?v=0fnWf5BvXac)

Evaluation:

1. Question Sheet attached.
2. Attend the demonstration and complete in-class activities.
3. Make Banana Cream Pie with a partner. (Bring a container to take away your product)

Assessment:

* Make sure to present all completed work in an interview to Mr. Dmitrieff

**Questions: Thickeners--Sauces and Fillings** LG 10, Foods 9

Answer the following questions in the space provided. References include your textbook, Food for Life, and the two handouts found in this package.

1. What happens to the starch granules when they are heated with a liquid? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_/1
2. What happens if you add flour directly to hot milk? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_/1
3. Equal parts of fat and flour cooked together is called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_/1
4. Liquids can be added to the **roux**; if milk is added then the resulting sauce is called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_/1
5. Eggs act as a thickening agent because the heat of cooking \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the protein /1
6. When thickening with eggs low heat is essential, otherwise you \_\_\_\_\_\_\_\_\_\_\_ the eggs /1
7. When adding egg to a hot liquid sauce, what happens if the cooking temperature is too high or the time cooked is too long? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_/4
8. White sauces is made from four basic ingredients:
   1. \_\_\_\_\_\_\_\_\_\_\_\_\_b.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_c.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_d.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_/4
9. How does gelatin thicken a sauce?

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1. Describe the technique to add flour to hot liquid to avoid lumps.

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1. Cornstarch, as with many starches is mixed with a \_\_\_\_\_\_\_\_ liquid to create a \_\_\_\_\_\_\_\_\_\_\_\_\_\_. /1
2. Tapioca is usually used for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_/2
3. What kind of vegetables can be used to thicken liquids?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_such as\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_/3

1. Egg whites, when whipped hold their shape due to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. When mixed with sugar forms the basis of a\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

## Banana Cream Pie Recipe or Vanilla Pudding

Cookery Principle: thickening with egg, flour and cornstarch.

Ingredients:

75ml dried skim milk powder Crust:

25ml flour 45ml melted butter or margarine

12ml cornstarch 100ml graham wafer crumbs

50ml sugar

50ml cold water or milk

200ml boiling water

12ml butter(optional)

2ml vanilla

1 egg, divided

½ banana (or 25ml coconut)

**Method:**

1. Make crumb crust: melt 45ml butter in a small glass bowl. Add 100ml graham wafer crumbs and stir until crumbly. Press into 2 small foil pie pans. Set aside.
2. Set up double boiler: put 2.5cm cold water in bottom pot and bring to a boil.
3. In the top pot, combine the first four ingredients: 75ml milk powder, 25ml flour, 12 cornstarch and 50ml sugar. Stir to combine.
4. Add 50ml cold water and stir until dry ingredients are moistened.
5. Add boiling water and cook until thick, stirring constantly, about 5 minutes.
6. Taste. If there is raw starch taste, continue cooking.
7. In a large glass measuring cup, beat egg white until thick. Add 5ml sugar and continue to beat until the meringue holds a stiff peak. Set aside.
8. In a small glass cup, mix egg yolk with a fork. Add a large spoonful of the thickened mixture from the top pot TO THE EGG YOLK. Mix well.
9. Pour this egg/sauce mixture BACK into the top pot and stir to blend. Turn heat off, stir 1 minute to cook egg then remove from heat. Add vanilla and 12ml of butter.
10. Slice banana and arrange on crust. Pour sauce mixture on top.
11. Divide meringue and place on pies. Bake at 350’ for 5 minutes until meringue is golden.
12. Cool on wire rack for 1 hour. Cover and place in fridge and chill for 2 hours. Serve cold.

Options:

* Do not make meringue (include egg white with yolk and use in sauce mixture). Decorate with some reserved crumb crust mixture or fresh fruit or whipping cream.
* Do not make pies-place sauce mixture in glasses, chill and serve as vanilla pudding. To prevent a skin on the surface, cover hot pudding with wax paper.