Basic Scientific Food Preparation Lab Manual

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Introduction

Recipe Use

Recipes were chosen for this laboratory manual to illustrate principles of food preparation. While most of the recipes produce a standard product, some are not designed for general use. For example, while all the recipes in the food preservation section will result in food that is safe, some variations will not be of standard quality. Other recipes are formulated for a specific purpose, such as the recipes for cream pie fillings that are designed to set within a three-hour laboratory period and may be too stiff if allowed to stand longer. In some cases, the ingredient proportions are dependent upon the size of the recipe and results will not be satisfactory if the recipe is increased.

Ingredients

Margarine may be substituted for butter in all recipes unless the recipe specifies otherwise.

Bottled lemon juice may be used in all recipes unless a recipe specifies fresh or frozen juice.

Temperatures and Measurements

Most recipes in this manual are designed for common household utensils and appliances. Because of that, most measurements are common household measurements. The Celsius scale is used for all temperatures except oven temperatures, which are in Fahrenheit.

In order to convert temperature from one scale to another, use the following:

ºC = (ºF−32) / 1.8

ºF = (ºC x 1.8) + 32

Equivalents

Equivalents with abbreviations used in the laboratory manual:

There are 4 quarts in a gallon, two pints in a quart, and 2 cups in a pint. 1 gallon = 4 quarts (qt.)

1 quart = 2 pints (pt.)

1 pint = 2 cups

1 cup = 8 fluid ounces (oz.) or 16 tablespoons (tbsp.)

1 tablespoon = 3 teaspoons (tsp.)

1 pound (lb.) = 454 grams (g.) or 16 ounces

1 large egg = ~¼ cup = 4 tbsp.

dash – few grains, less than 1/16 tsp.

Some products must be packed or weighed to attain the correct measurement.

1 cup grated cheese = 4 oz. = 114 g.

How to use: 3 teaspoons equal a tablespoon, 6 teaspoons equal one ounce, 48 teaspoons equals a cup, ect.

1 Laboratory Equipment and Procedures

1.1 Introduction and Measurement Techniques

Objectives

Observe and demonstrate ability to use standard measurement techniques, which are necessary to obtain accurate proportions of ingredients and consistent formulation of food products.

Laboratory Problems

Observe laboratory procedures; locate and use laboratory equipment.

Observe measurement techniques for various ingredients.

Divide a recipe and determine appropriate measurements.

Measurement techniques

Calculate the amount of each ingredient needed to make one-third the amount of the original recipe.

List the appropriate utensils for measuring these ingredients, using the minimum number of measurements.

COFFEE CAKE

Ingredients 1/3 Recipe Measuring Utensils

Topping:

2 tbsp. brown sugar

¾ tsp. cinnamon

1½ tsp. flour

1½ tsp. butter

Batter:

1⅛ cups sifted flour

1½ tsp. baking powder

⅜ tsp. salt

½ cup sugar

1 egg, beaten

½ cup milk

2 tbsp. vegetable oil

Heat oven to 350ºF. Blend topping ingredients together until they crumble. Set topping aside. Sift flour, baking powder, salt, and sugar into mixing bowl. Make a well in the center. Combine egg, milk and oil. Add liquid to dry ingredients, stirring only to blend. Spoon into greased 7 ¾ X 3 ⅝-inch loaf pan and sprinkle with topping. Bake at 375ºF. for about 25 minutes or until cake springs back when pressed lightly with a finger.

Lab Scavenger Hunt

In your lab unit – find items 1–12 listed below and place them on your counter.

When you have located all of the items, let the instructor or TA know.

1. Vegetable Peeler

2. Pastry Blender

3. Broiler Pan

4. 1 Pint Baking Dish

5. Water Bath

6. Cutting Board

7. Custard Cup

8. Double Boiler

9. Mesh Strainer

10. Saucepan

11. Sauté pan

12. Loaf pan (5½”x2¾”)

Bonus Items (not in your lab station) Location in Lab Location in lab

13. Towel drying rack

14. Scales

15. Extra mixing bowls

16. Plates and cups for sampling prepared food

1.1 Concept Review Introduction and Measurement Techniques

Why is flour sifted before measuring for volume measurement?

Why should the fewest measurements be used?

Why should liquid and dry ingredients be measured in different types of cups?

How is brown sugar measured? Why?

Know the following equivalents:

Cups in a pint

Pints in a quart

Quarts in a gallon

Cups in a gallon

Teaspoons in a tablespoon

Tablespoons in a cup

Grams in a pound

1.2 Water – Temperature and Dispersions

Objectives

Relate descriptive temperature terms to the observable changes in water at various temperatures.

Demonstrate correct operation of various range-top cooking utensils using water as a medium of heat transfer.

Differentiate among true solutions, colloidal dispersions, and suspensions according to their various behavior characteristics determined by the size of the dispersed particles.

Laboratory Problems

Observe water appearance at temperatures used in food preparation.

Change state of dispersion by common food preparation techniques.

Determine effect of dispersed phase on boiling point of dispersion.

Observe commonly used water temperatures in an open saucepan:

Calibrate the thermometer with boiling water.

Heat a saucepan of tap water; observe the water at the following temperatures:

Temperature Conversion:

$°C=(°F-32)/1.8$

$°F=(°C x 1.8)+32$

Lukewarm temperature (30–37ºC; ºF)

Does lukewarm water feel warm or cool to the touch?

What is normal body temperature? ºC; ºF.

Simmering temperature (85–99ºC; ºF)

Describe the surface appearance of simmering water:

Boiling temperature (100ºC; ºF)

Describe the surface appearance of water at:

a slow boil (= actual recorded temperature)

a rapid (rolling or fast) boil (= actual recorded temperature)

What are the advantages of cooking foods at a slow boil rather than at a fast boil?

When might a fast boil be advantageous?

Determine maximum water temperatures of other range-top utensils:

Double boiler

Heat 3 cups of water in upper part of a double boiler over 3 cups boiling water in the lower part. (Water in the lower pan should not touch the upper pan.)

Record the highest temperature reached: ºC; 190–198 ºF.

Will the water in the upper part boil if boiling water in the lower part touches the top part of the double boiler?

List appropriate uses for a double boiler:

Steamer

Put 3 cups water in the bottom part of a steamer, and a maximum temperature thermometer in a custard cup filled with water in the top part.

Record highest temperature reached: 91 ºC; ºF.

How would the rate at which foods cook in a steamer compare to the rate in a saucepan? Explain.

List appropriate uses for a steamer:

Pressure saucepan

Put 1 cup water in a pressure saucepan and place maximum thermometer in custard cup filled with water on rack. Following directions for the saucepan, hold at 10 lbs. pressure for 5 minutes.

Record highest temperature reached at 10 lbs. pressure: ºC; 240 ºF.

At what temperature does water boil under

5 lbs. pressure 109 ºC; ºF.

10 lbs. pressure ºC; 240 ºF.

15 lbs. pressure 121 ºC; ºF.

Temperature decreases 1°C for each 960 foot increase in altitude.

At what temperature would water boil in Denver, Colorado (altitude approximately 5,000 feet above sea level) under 10 lb. pressure?

ºC; ºF.

How would the rate at which foods cook in a pressure saucepan compare to the rate at which they cook in a regular saucepan? Explain.

List appropriate uses for a pressure saucepan.

Measure effect of dispersed phase on boiling point using sugar, salt, gelatin, or bran:

Pour 2 cups of water into a saucepan. Throughout the exercise, add boiling water as needed to maintain this level.

Bring water to a boil. Record boiling temperature in the table; then add 2 tbsp. assigned ingredient (sugar, salt, hydrated gelatin∗, or bran) and stir.

∗ Hydrate gelatin by sprinkling 3 tbsp. dry gelatin over ¾ cup cold water. Use 2 tbsp. of the hydrated gelatin for each addition.

Bring water to a boil again and measure the boiling point.

(Record results on the basis of a 100°C boiling point of water.)

Repeat steps 2 and 3 until four additions of 2 tbsp. each have been made.

Boiling temperature for

Number of additions Sugar

state of dispersion

Salt

state of dispersion

Gelatin

state of dispersion

Bran

state of dispersion

0

1

2

3

4

1.2 Concept Review Water – Temperature and Dispersions

In what state of dispersion is each of the added substances? How does each substance affect the boiling point? Why?

Why can two substances, both in the same state of dispersion, have different effects on the boiling point?

What inferences can you make for each additive’s effect on the freezing point?

1.3 Sensory Attributes Activity

How to Describe the Sensory Attributes of Foods

As a part of this lab activity you will be asked to describe the attributes of a food product accurately and completely. The task is to describe the food, not your reaction to the food. For

example, a chocolate pudding might be medium brown, smooth and shiny, thick but not gelled and have a flavor that includes sweet, chocolate and vanilla components. To make these kinds of descriptions, you will

need to learn to go past your first reaction (I like it! Or I don't like it!) and notice specific details about the food itself.

We usually notice the attributes of foods in the following order:

Appearance

Odor/Aroma

Consistency and Texture

Flavor

When we eat food, we often do not try to separate these sensations, we naturally just form an overall opinion about how much we like or dislike the product based on all of its attributes. With practice, however, we can learn to be more analytical about identifying and describing the sensory attributes of foods. To best describe the sensory attributes of foods, try the following approach:

1. Appearance: Look at the food and describe all of the following that apply (not all of the

attributes listed will apply to every food, and for some foods, you will need to come up with

additional terms).

Color description:

Is it red, orange, brown, yellow-green, etc.?

The intensity of color: Is it light, medium, or dark?

Brightness: Is it bright or dull?

Evenness of color: Is the color even or is it uneven or blotchy?

Size and shape of the pieces or particles:

Are the pieces or particles relatively small, medium, or large? Square, round, flat, etc?

Evenness of distribution: Are the particles within the food uniformly or non- uniformly distributed?

Surface texture:

Is it dull or shiny; smooth or rough, grainy, curdled or bumpy; plump or shriveled:

Does it look wet or dry, soft or hard; if made up of particles, are they loose or

clumped?

Clarity:

Is it clear or hazy or cloudy, transparent, translucent or opaque? Are particles or

bubbles evident?

2. Odor or Aroma: Sniff the food a few times to detect the odor or aroma. The odor is caused by volatiles that reaches the olfactory receptors high up in the nasal cavity. There are thousands of possible descriptors for food aromas. Sometimes we call the specific aromas "notes." For example, a cookie might have a toasted wheat note or a caramelized note, a buttery note, and a vanilla note.

3. Consistency and Texture: When we manipulate food with our hands or with utensils and when we bite and chew it, we can judge how the food reacts to stress. As you sample your product, see if the following apply (you may need other terms as well).

Is the product thin or thick?

Is it soft, firm, or hard?

Is it airy or is it dense or heavy?

Is the product springy or rubbery?

Is the product slippery or slimy?

Is the product sticky?

Is the product brittle? crumbly?

When we eat food, we can also perceive the size and shape of particles in food through our sense of touch. And we can also note aspects that relate to the release of fat and moisture. Does your product have some of the following attributes?

Smoothness (absence of particles)

Grittiness (has small, hard particles)

Graininess (has small particles)

Chalkiness (imparts a film of fine particles or is powdery)

Flakiness (breaks into flat overlapping layers)

Fibrousness (has long, stringy particles)

Lumpiness (has large, even particles)

Juiciness (releases moisture as you chew; feels wet in your mouth)

Oiliness (leaves an oily residue in your mouth)

Greasiness (leaves a more solid greasy residue in your mouth)

4. Flavor: Flavor is the impression that we get from the chemicals in the food that are released when we are eating. Flavor consists of 1) tastes, 2) aromatics and 3) other sensations due to the stimulation of nerves in our mouth and nasal cavity.

Tastes are caused by water soluble materials that reach the taste receptors on our tongue and on other surfaces in the mouth. Tastes are limited in number and include

Sweet

Sour

Salty

Bitter

Aromatics include notes like lemon, butter, rancid, burnt, cheesy, cinnamon, meaty and thousands more such sensations. When we chew a product it seems like these flavor

notes are coming from our mouth, but the volatile molecules being released from the food actually travel to the olfactory receptors when air is forced up and over these receptors as

we chew. The aromatics are responsible for much of the flavor impact for most foods.

Chemical Feeling Factors: Some chemicals in foods cause sensations that are not taste or smell but are important to flavor in some foods. These include:

Astringency (a sensation of dryness or puckering in the mouth)

Heat (from spices)

Cooling (from menthol)

Biting (for example from highly carbonated beverages)

Pungency (for example from horseradish)

Try to name all of the tastes, flavor aromatics and chemical feeling factors that you can identify

in your product.

5. Noise: Some foods make noise when we eat them. These noises contribute to perceptions such as

Crispiness

Crunchiness

Squeakiness

Did your product have any of these attributes?

Sensory Evaluation

Food:

Appearance (sight):

Odor/Aroma (smell)

Texture/Consistency (touch):

Flavor (taste):

Noise (sounds you hear while chewing):

Other observations/comments:

Food:

Appearance (sight):

Odor/Aroma (smell)

Texture/Consistency (touch):

Flavor (taste):

Noise (sounds you hear while chewing):

Other observations/comments:

2 Fruits and Vegetables

2.1 Introduction

This section includes definitions and directions to be used throughout the Fruits and Vegetables unit.

Definitions

Cube – Cut food into uniform cubes approximately ½ inch each dimension, unless the directions specify another size.

Dice – Cut into uniform cubes, approximately ¼ inch.

Chop – Cut into small irregular-shaped pieces.

Mince – Divide food into very small (1/16 inch or less) irregular-shaped pieces with a knife or garlic press.

Julienne – Cut into thin strips. (match-stick size, about ⅛ x ⅛ x 2 inches)

Raw vegetable preparation:

Cabbage (red or green): Remove outer leaves, and wash remaining head. It is not necessary to remove the entire core. Shred cabbage into bite-size pieces with a chefs' knife.

Cauliflower: Break small flowerets from the head. Wash.

Carrots: Peel, wash and slice into ¼-inch slices. If the carrot is large, quarter lengthwise before slicing crosswise.

Broccoli: Cut thin spears about 2 inches long. Wash.

Onions: Remove outer skin by peeling or by blanching. Cut off root end. For small onions, leave whole but make an x shaped cut in the bottom, about ½ inch deep. For large onions, cut into bite size pieces. Cook until the flavor is mild.

∗To remove skin by blanching: Place onions in boiling water for about 10 seconds. Drain, cool, and slip off skins.

Directions for cooking vegetables for each flavor category:

Do not add salt to a recipe unless the instructor assigns it.

Boiling in a small amount of water

Mild flavored vegetables

Use only enough water to prevent scorching the vegetables during cooking, approximately ¼ cup water for a one-quart saucepan. Add more if needed to prevent scorching.

Add vegetable to boiling water, cover pan, and bring back to a boil. Begin timing.

Boil gently until vegetable is crisp-tender. Add more water if needed.

Record cooking time.

Boiling in a large amount of water

Brassica Sp. and Allium Sp.

Boil enough water to cover vegetable.

Add vegetable to boiling water and bring water back to a boil. Do not cover pan. Begin timing.

Boil gently until vegetable is done. Crisp-tender for Brassica sp. and until tender for mild flavored and Allium sp.

Drain vegetable.

Record cooking time.

Steaming

Use enough water in the bottom part of a steamer so pan will not boil dry during the cooking period.

When water in bottom part of steamer is boiling, place vegetable in top of steamer.

Assemble steamer and cover. Begin timing.

Cook vegetable in steam over rapidly boiling water until done.

Record cooking time.

Microwave cooking

Use a 1-pint baking dish with a tight-fitting lid or plastic wrap appropriate for microwave. Add 2-4 tablespoons water.

Cook on full power according to microwave oven manufacturer’s

directions until done; stir once.

Record power level in watts and cooking time.

2.2 Methods of Preparation of Raw Fruits and Vegetables

Objectives

To recognize and use proper utensils for various methods of preparation.

To develop techniques for preparation of certain fruits and vegetables.

Laboratory Problems

Define certain terms common in fruit and vegetable preparation.

Observe each of the listed techniques for fruit and vegetable preparation.

Terms

Vegetable Pigments: Chlorophyll, Carotenoids, Anthocyanin, & Anthoxanthin

Flavor Categories: Mild, Brassica, Allium

Texture: Cellulose, Pectin, & Hemicellulose

Enzymatic Browning

Osmosis

Use Proper Utensils:

Utensils Preparation Comments on use of preparation

Chef’s Knife Cube

Dice

Chop

Mince

Julienne

Slice – uniform pieces, ⅛ – ¼ inch thick

Garlic Press Preparing garlic cloves and mincing cloves.

Vegetable parer/peeler

Coarse grater

Fine grater/microplane

Corer

Zester

Prepare Raw Fruits and Vegetables:

Technique Purpose

Soaking in salt water

Cleaning mushrooms

Preparing broccoli stems

Preparing waxed vegetables

Sectioning grapefruit

Clean and dice a mango

Halving avocados

Coring lettuce

Clean and slice cantaloupe

Blanching tomatoes or peaches

WHITE STOCK

2 cups chicken broth Sachet – tie the following in a cheesecloth "sack"

Mirepoix: ⅛ tsp. dried thyme

½ cup onion 1 bay leaf

¼ cup carrots ⅛ tsp. black pepper

¼ cup celery ⅛ tsp. dried parsley

Wash and coarsely chop vegetables. Bring broth to a boil. Add mirepoix

and sachet and simmer for 20–30 minutes.

2.2 Concept Review Methods of Preparation of Raw Fruits and Vegetables

Culinary Terms

Blanch Dice Stir-Fry Chop Fold

Julienne Sauté Zest Cube Baste

Mince Slice Peel/Pare Boil Brown

Simmer Cut-in Knead

Term Definition

Small pieces of the skin on a lemon, lime, orange that are used for flavor (usually using a zester).

To remove the skin from fruits or vegetables.

To fry something quickly over high heat, stirring constantly.

Use pastry blender or two knives to incorporate fat into flour mixture (course crumb).

To cut food into very small fine pieces.

Submerge in boiling water for short time, remove and submerge in ice water.

To cut into small uniform cubes (1/2-inch).

Frying a food in a small amount of fat.

To cut into small irregular pieces.

A flat, usually thin, piece of food cut from a larger piece.

Brush or spoon melted fat or cooking juices over food during cooking (prevent drying).

Cook food in skillet, broiler, or oven to develop flavor and color.

To slice into thin strips about the size of match sticks.

To cut food into small squares or cubes, about the same size, with four equal sides (1/8- to ¼-inch).

Heating liquid so that smaller bubbles more gently rise to the top.

Combine a light mixture (egg whites) with a heavier mixture (white sauce) using spatula, cut down through middle of mixtures across the bottom and up the side.

Heating liquid so that bubbles rapidly rise to the top (212 degrees F, 100 degrees C).

To work dough into a smooth, elastic mass. Press-fold-turn action.

2.3 Effect of pH and Heat on Color and Other Attributes of Fruits and Vegetables; Osmosis; Enzymatic Browning

Objectives

To identify the major categories of pigments found in fruits, vegetables, and other plant foods.

To observe the effects of heat and pH of cooking medium on plant pigments.

To observe the effects of acid or basic cooking medium on the texture of vegetables.

To observe enzymatic browning.

To identify some methods of controlling enzymatic browning.

Laboratory Problems

Identify the major categories of plant pigments.

Boil vegetables representing each of the pigment categories in water, in acidic solution, and in basic solution.

Prepare raw fruits in a variety of ways designed to control enzymatic browning.

Terms

Vegetable Pigments: Chlorophyll, Carotenoids, Anthocyanin, & Anthoxanthin

Flavor Categories: Mild, Brassica, Allium

Texture: Cellulose, Pectin, & Hemicellulose

Enzymatic Browning

Osmosis

Identify the pigments in each of the vegetables listed below:

Pigment categories: carotenoids, chlorophyll, anthoxanthin, anthocyanin

Vegetable Major Pigment Other Pigment Present

Red Cabbage

Cauliflower

Carrot

Broccoli

Prepare assigned vegetable according to specific directions for added ingredients and for covering pan.

Raw vegetable preparation:

Cabbage (red or green): Remove outer leaves and wash remaining head. It is not necessary to remove the entire core. Shred cabbage into bite-size pieces with a chefs' knife.

Cauliflower: Break small flowerets from the head. Wash.

Carrots: Peel, wash and slice into ¼-inch slices. If the carrot is large, quarter lengthwise before slicing crosswise.

Broccoli: Cut thin spears about 2 inches long. Wash.

Onions: Remove outer skin by peeling or by blanching. Cut off root end. Cut onions into bite size pieces. Cook until the flavor is mild.

Lid On and Lid Off Directions:

Prepare ¼ cup assigned vegetable for each part.

Boil 1 cup of distilled water for each vegetable. Add vegetable to boiling water; begin timing after water returns to boil.

Boil until crisp-tender when tested with fork. Record cooking time.

Reserve a small amount of cooking water for display in custard cup.

Display vegetable in a custard cup with the sample of cooking water in separate custard cup.

Record color and texture observations. Do not taste.

Acid/Base Directions:

Prepare ¼ cup assigned vegetable for each part.

Boil 1 cup of tap water for each vegetable. Add vegetable to boiling water; begin timing after water returns to boil. Add 1 tsp. vinegar (acid) or ½ tsp. baking soda (base).

Boil until crisp-tender when tested with fork. Record cooking time.

Reserve a small amount of cooking water for display in custard cup.

Display vegetable in a custard cup with the sample of cooking water in separate custard cup.

Record color and texture observations. Do not taste.

Evaluation

Major Pigment Vegetable Lid on Lid off Acid Add 1 tsp vinegar to cooking water

Base Add ½ tsp baking soda to cooking water

Anthocyanin

min min min min

Anthoxanthin

min min min min

Carotenoid

min min min min

Chlorophyll

min min min min

Observe Osmosis

Objective

To observe the effect of osmosis on the characteristics of raw fruits and vegetables in storage and in preparation.

Laboratory Problem

Store fresh raw vegetables in a variety of osmotic conditions.

Water will move from areas of high concentration (greater amount of free water) to areas of low concentration (areas where there is more water bound to solutes.) Observe the effect of salt on the appearance and texture of cucumbers:

Cut a small cucumber into 1/8″ slices, divide into three bowls, and treat each sample as directed below. Observe after one hour.

Method Appearance Texture

Soak in 1 cup cold water only

Soak in salt/water solution (2 tbsp salt to 1 cup cold water)

Sprinkle with 2 tbsp salt only

Explanation:

Demonstrate enzymatic browning and methods of control:

With a stainless steel knife, slice an apple or banana onto separate dishes.

Apply assigned treatment.

Allow to stand uncovered for one hour.

Record observations.

Treatment Appearance Flavor

None

Diluted lemon juice (1 part to 3 parts water)

Commercial anti-darkening agent

2.3 Concept Review Effect of pH and Heat on Color and Other Attributes of Fruits and Vegetables; Osmosis; Enzymatic Browning

What accounts for the differences in amount of pigment in the cooking water of each of the vegetables?

What factors affect the color of cooked vegetables?

What treatments can control enzymatic browning? Give an example of a product that would control enzymatic browning.

Explain how enzymatic browning negatively impacts food quality.

2.4 Effect of Cooking Time on Structure and Flavor of Vegetables

Objective

To observe the effect of the length of cooking time on the structure, color and flavor of vegetables.

Laboratory Problem

Determine the relationship between length of cooking time and changes in appearance, texture, and flavor of various vegetables.

Terms

Vegetable Pigments: Chlorophyll, Carotenoids, Anthocyanin, & Anthoxanthin

Flavor Categories: Mild, Brassica, Allium

Texture: Cellulose, Pectin, & Hemicellulose

Enzymatic Browning

Osmosis

Vegetable Preparation of Vegetable before Cooking Pigment Flavor Category Cooking Method

Carrots

Broccoli

Onions

Effect of cooking time:

Determine the relationship between the length of cooking time and changes in appearance, texture, and flavor of various vegetables.

Prepare approximately $1\frac{1}{2}$ – 2 cups of assigned vegetable, cut into pieces of uniform size.

Carrots: Peel, wash and slice into $\frac{1}{4}$–inch slices.

Broccoli: Cut thin spears about 2 inches long. Wash.

Onions: Remove outer skin by peeling or by blanching. Cut into bite size pieces.

Cook according to method appropriate for the vegetables (see page 20). Begin timing as water returns to boil.

After 3 minutes, remove ⅓ of vegetable and serve in a custard cup.

Continue to boil remaining vegetable until done to a crisp-tender stage. Record cooking time.

Remove second ⅓ of vegetable and serve in a custard cup.

Continue to boil remaining ⅓ of vegetable an additional 5 minutes. Remove vegetable and serve in a in custard cup.

Record observations in chart on next page.

Record observations

Vegetable Cooking Time (Minutes) Appearance Texture Flavor

Carrots Pigment:

Flavor category:

3 minutes ___minutes

(optimum)

___ minutes

(optimum +5)

Broccoli Pigment:

Flavor category:

3 minutes ___ minutes

(optimum)

___ minutes

(optimum +5)

Onions Pigment:

Flavor category:

3 minutes ___ minutes

(optimum)

___ minutes

(optimum +5)

2.4 Concept Review Effect of Cooking Time on Structure and Flavor of Vegetables

Explain any color change in each vegetable.

How did the texture change with longer cooking? Did all parts of the vegetable respond the same? Why?

What accounts for any flavor change with longer cooking?

List the advantages of a short cooking period for vegetables:

2.5 Effect of Cooking Method on Flavor and Other Attributes of Vegetables

Objectives

To identify the effect of cooking methods on flavor of vegetables.

To recognize the characteristics of the various flavor categories of vegetables.

To determine the influences of a cover and of the amount of water during cooking on the flavor of vegetables.

Laboratory Problems

Determine the influence of the presence or absence of a lid and the amount of water on the flavor of vegetables.

Compare boiled, steamed and microwave-cooked vegetables.

Terms

Vegetable Pigments: Chlorophyll, Carotenoids, Anthocyanin, & Anthoxanthin

Flavor Categories: Mild, Brassica, Allium

Texture: Cellulose, Pectin, & Hemicellulose

Enzymatic Browning

Osmosis

Effect of cooking method on palatability of vegetables:

Prepare 1 cup fresh vegetables for each part of the assignment, you will need a total of 4 cups of vegetables. Keep vegetable pieces the same size for uniform cooking. See raw vegetable preparation. Cook, following specific assignment directions, to the appropriate degree of doneness for the assigned vegetable. Record cooking time.

Carrots and cabbage: Cook until crisp-tender.

Onions: Cook until the flavor is mild.

Boiling In A Small Amount Of Water:

Use only enough water to prevent scorching the vegetables during cooking, approximately ¼ cup water for a one-quart saucepan. Add more if needed to prevent scorching.

Add vegetable to boiling water, cover pan, and bring back to a boil.

Boiling In A Large Amount Of Water:

Boil enough water to cover vegetable.

Add vegetable to boiling water and bring water back to a boil. Do not cover pan.

Microwave directions:

Use a 1-pint baking dish with a tight-fitting lid or plastic wrap appropriate for microwave. Add 2-4 tablespoons water. Cook on full power according to microwave oven manufacturer’s directions until done; stir once.

Steamer directions:

Use enough water in the bottom part of a steamer so pan will not boil dry during the cooking period. When water in bottom part of steamer is boiling, place vegetable in top of steamer. Assemble steamer and cover. Cook vegetable in steam over rapidly boiling water until done.

Record cooking times and observations on flavor, texture, and appearance:

Vegetable Lid on, small amount of water Lid off, large amount of water Steamer Microwave

Mild flavor: Carrots

minutes minutes minutes minutes

Brassica sp.: Cabbage

minutes minutes minutes minutes

Allium sp.: Onions

minutes minutes minutes minutes

2.5 Concept Review Effect of Cooking Method on Flavor and Other Attributes of Vegetables

Were results of various cooking methods the same for all the vegetable flavor groups? If there was a difference in the quality of products, explain.

Are the best methods for flavor, nutrient retention and appearance consistent? If not, what conflicts exist? What compromise do you suggest?

Discuss the feasibility of using a pressure saucepan to cook fresh vegetables.

What factors make it difficult to specify the exact cooking time for a vegetable?

What factors make it difficult to specify the exact amount of water needed to cook vegetables in a small amount of water?

What are the advantages to cooking vegetables in a small amount of water?

What disadvantages are there?

How do microwave-cooked vegetables compare in flavor and texture to conventionally cooked counterparts?

How do appropriate cooking methods for frozen vegetables differ from those for fresh?

2.6 Varietal Differences

Objectives

To determine the varieties of fruits and vegetables suited to specific uses.

To identify the characteristic differences in several varieties of fresh potatoes, apples, and oranges.

To prepare some varieties of potatoes and apples by different methods to illustrate uses for which each variety is best suited.

Laboratory Problems

Determine differences in texture and flavor of potato products due to varietal differences.

Determine differences in appearance, texture, and flavor of apple products due to varietal differences.

Determine varietal differences in oranges.

Terms

Potato Cultivars: Waxy-type: Red Pontiac

All-Purpose-type Potato: White Chippewa, Yukon Gold, Klondike Gold

Mealy-type: Russet Burbank

Apple Cultivars: Red Delicious, Golden Delicious, Jonathan, Gala, Braeburn, Pink Lady, Envy, Cosmic Crisp, Honey Crisp, Granny Smith, Fuji

Characteristics of potato varieties:

Type Variety Characteristics

White potatoes Waxy

All-purpose

Mealy

Sweet Potatoes Dry-meated

Moist-meated

Prepare assigned variety of potato according to the following directions.

Boiled Potatoes

Wash, peel, and quarter 2-3 medium potatoes. In medium saucepan, gently boil with ½ tsp. salt in enough water to cover until tender, 20-25 minutes; drain.

Mashed Potatoes

2 medium potatoes 1 tbsp butter

3–4 tbsp hot milk* dash salt

*Or 3–4 tbsp reserved cooked liquid and 1 tbsp nonfat dry milk

Wash, peel, and quarter potatoes. Boil with ½ tsp. salt until tender. Drain and mash until smooth. Add butter, and salt to taste. Gradually beat in milk with a potato masher until light and fluffy.

Instant Mashed Potatoes

Prepare two servings of potatoes according to package directions for stovetop.

Baked Potato

Heat oven to 425°F. Scrub potato. Bake on oven rack. After 20 minutes of baking, pierce each potato with a fork. Bake until potatoes feel soft when pressed with fingers, approximately 45 minutes total. Roll potato gently with hands; then cut cross in top with a knife and push in ends and sides of potato to fluff before serving.

Microwave Baked Potato

Scrub medium-sized potato and dry; pierce with fork in several places. Microwave-bake 3 to 5 minutes until potato feels soft when pressed with fingers, following specific microwave oven directions for power and time. Let potato stand for 5 minutes, then cut cross in top with a knife and push in ends and sides of potato to fluff before serving.

Potatoes

(Three general categories)

Mealy – glistening appearance; granular dry feeling on tongue; best choice for baked, mashed or French fries. (Russet Burbank)

All Purpose – intermediate between waxy and mealy. (White Chippewa, Yukon Gold)

Waxy – translucent appearance; feels pasty and wet on tongue; best choice for boiled potatoes and potato salad. (Red Pontiac)

Mealiness of potatoes is dependent on:

Variety (Russet varieties are mealy; red-skinned varieties are waxy)

Growing conditions (soil, climate, fertilizer)

Storage time (new potatoes tend to be waxy)

Storage temperature (above 50°F, sugar → starch; below 50°F, starch → sugar)

Sweet Potatoes

Dry-meated – mealy, yellow-to-tan flesh.

Moist-meated – soft, tan-to-brownish red flesh. (Often called yams; however the true yams are of a different genus.)

Characteristics of standard products and best uses for potatoes:

Boiled Potatoes

Variety: Red Pontiac–waxy.

Appearance Texture Flavor

White; slightly translucent Firm, holds shape well Little or no evidence of sloughing (peeling off in layers)

Mild; slightly sweet

Mashed Potatoes

Variety: Russet Burbank–mealy.

Appearance Texture Flavor

White

Glistening

Light, fluffy, and mealy

Neither pasty nor lumpy

Mild

Properly seasoned

Baked Potatoes

Variety: Russet Burbanks–mealy.

Appearance Texture Flavor

White

Separate, glistening particles

Mealy

Dry feel on the tongue

Mild

Evaluation

Variety of White Potato

Method Waxy All-Purpose Mealy Instant

Boiled

Mashed

Baked

Microwave Baked .

Variety of Sweet Potato

Dry-meated

Moist-meated

Baked

Characteristics of apple varieties:

Raw apple characteristics. Wash, slice and core samples of raw apple. Record observations.

Variety Flavor Texture Uses

Red Delicious

Golden Delicious

Granny Smith

Prepare assigned variety of apple according to the following directions.

Baked Apple

1 medium apple 1 tsp butter

1 tbsp sugar 2 tbsp water

Wash and core apple. Slit the skin around the center of apple. Place in a 1-pint glass baking dish and fill center of the apple with mixture of sugar and butter. Add water, cover with foil and bake covered at 350°F until tender, approximately 45 minutes. Add more water if necessary. Baste (pour accumulated juices over the apple) approximately every 8-10 minutes.

Boiled Apple Slices

2 medium apples 2 tbsp sugar

2 cups water

Wash, peel, quarter, and core apple. Slice into ¼-inch slices. Boil gently in water in covered saucepan until tender, approximately 8 minutes. Add sugar and continue to cook until apple slices are translucent, approximately 4 minutes more. Add more water if necessary.

Characteristics of standard products:

Baked Apples

Varieties: Golden Delicious or Gala

Appearance Texture Flavor

Apple intact

Skin color appropriate to apple variety

Tender, but not mushy

Distinct apple flavor

Boiled Apple Slices

Varieties: Golden Delicious or Granny Green Smith

Appearance Texture Flavor

Slices intact, plump (not shriveled), translucent

Yellow color, shade of yellow dependent upon variety of apple used

Tender, but not mushy

Distinct apple flavor

Evaluation of Cooked Apple:

Method Variety Appearance Texture Flavor

Baked Apple Red Delicious

Golden Delicious

Granny Smith

Boiled Apple Slices Red Delicious

Golden Delicious

Granny Smith

Apples

(Varieties selected for laboratory)

Red Delicious – best eaten raw; loses mild delicate flavor and remains firm when cooked.

Uses: Fruit baskets

Jonathan – all-purpose apple; has distinct flavor when eaten raw; retains tart flavor when cooked; has tendency to mush, making it excellent for sauce.

Uses: Applesauce

Golden Delicious – all-purpose apple; has distinct fresh flavor; retains flavor and shape when cooked.

Uses: Pie, baked, escalloped apples

Granny Smith – tart, crisp all purpose apple.

Uses: Baked, pie, escalloped apples

Fuji –

Uses:

Braeburn – complex, sweet and tart flavor; crisp and juicy; keeps well; retains sweetness when cooked; all purpose apple.

Uses: Applesauce

Gala – crisp, very sweet, juicy; best fresh, loses flavor when cooked.

Uses: Fruit salads, raw

Honey Crisp –

Uses:

Pink Lady –

Uses:

Characteristics of Fruit Varieties:

Variety Characteristics Uses

Oranges – Navel

Oranges – Valencia

Clementine

Varietal Differences in Selected Fruits and Vegetables

Oranges

(Two principal market varieties)

Navel – marketed November to late May; no seeds; less juice than Valencias have; pebbled skin; separates into sections easily.

Valencia – marketed late March to early October; has seeds; more juice than navels have; skin may have greenish tinge.

Squash

Summer – soft rind; short storage life; high water content and low starch content.

Varieties: Zucchini, yellow squash.

Winter – hard shell; longer storage life; lower water, and higher starch content than summer squash have; yellow or orange flesh.

Varieties: spaghetti squash, acorn squash.

2.6 Concept Review Varietal Differences

What characteristic distinguishes an excellent sauce apple from an excellent pie or baking apple?

What are appropriate uses for

Navel oranges?

Valencia oranges?

In view of the color of summer vs. winter squash, what conclusion can you draw regarding the vitamin A value of the two types of squash?

What factors, other than variety, account for the differences in the mealiness of potatoes?

What are the best uses for the following types of potatoes? Waxy

All-purpose

Mealy

2.7 Methods of Preparation

Objectives

To practice various cooking methods for fresh and frozen vegetables – boiling, broiling, baking, steaming, panning, sautéing, etc.

To prepare less-familiar vegetables in order to appreciate the wide variety of characteristics of vegetables.

Laboratory Problems

Prepare vegetables according to the following recipes.

Buttered crumbs: Blend ¼ cup fine dry bread crumbs with 1 tbsp. melted butter.

Culinary Techniques

Blanch or parboil – Partially cook in a large amount of boiling water to inactivate enzymes or to facilitate peeling.

Pan (verb) – Cook very thin slices of vegetables at high heat in enough oil to keep them from sticking. Vegetables may be covered and a very small amount of water (1–2 tbsp.) added to create steam. When covered, the pan should be shaken to prevent sticking.

Sauté – Cook in a small amount of fat over fairly high heat in an open, shallow pan until just done; vegetables should look translucent,

not brown.

Stir-fry – Heat a small amount of oil. Add very thin slices of vegetables and cook over medium-high heat. Stir constantly. A wok is the preferred utensil, but a large, deep skillet may be used. Cook only a few vegetables at a time.

Terms

Vegetable Pigments: Chlorophyll, Carotenoids, Anthocyanin, & Anthoxanthin

Flavor Categories: Mild, Brassica, Allium

Texture: Cellulose, Pectin, & Hemicellulose

Enzymatic Browning

Osmosis

Prepare vegetables according to the following recipes:

Artichokes with Butter Sauce

1 whole artichoke 1½ tsp. fresh or frozen lemon juice

2 tbsp. butter 1½ tsp. chopped parsley

Hold artichoke by the stem and dash up and down in a bowl of water. Cut off stem, 1 inch from top, and ¼ of the top of each leaf. Discard the bottom row of leaves.

Boil gently in salted water to cover until end of stem is tender and leaves pull easily from base, approximately 20-30 minutes. Carefully remove from water and drain upside down.

Prepare butter sauce: melt butter, add lemon juice and parsley. Heat 1-2 minutes to blend flavors.

Place artichoke stem end down on a plate and serve with the hot butter sauce. To eat, dip each leaf into sauce, pull leaf through teeth drawing off tender part, and discard the remainder of the leaf.

Stir-Fried Asparagus

⅓ lb. fresh asparagus spears 1/8 tsp. salt

1 tbsp. vegetable oil dash pepper

Wash and snap off lower woody stems of asparagus, cut tips into bias-

cut (diagonal) pieces, 1½ inches long. In a skillet, stir-fry asparagus and seasonings in oil for 1 minute. Cover skillet and shake while cooking, about 2-3 minutes, until asparagus is crisp-tender.

Scalloped Broccoli

⅓ to ½ lb. broccoli ¼ cup fine dry bread crumbs

¾ cup thin white sauce 1 tbsp. melted butter

1 oz. grated sharp cheddar cheese dash paprika

White Sauce:

2 ¼ tsp butter or margarine 2 ¼ tsp flour

¾ cup milk 1/16 tsp – salt to taste

Melt fat in saucepan, blend in flour and salt; remove from heat.

Add milk, stirring to blend, return to heat and stir gently while heat to a full boil.

Wash and trim broccoli. Cut into 2-3 inch spears. Boil broccoli in a large amount of water until nearly crisp-tender.

Prepare white sauce. In a 1-pint glass baking dish, alternate layers of broccoli, white sauce, and cheese. Repeat until all broccoli is used. Blend bread crumbs with melted butter, spread on top of casserole and bake uncovered at 375°F for 20 minutes. Sprinkle with paprika.

Stir-fried Celery

1½ cups celery (1-2 ribs) ½ cup sliced fresh mushrooms

1 tbsp. vegetable oil 1-2 tsp. soy sauce

Wash and trim celery. Cut diagonally into ¼-inch slices. In a skillet, stir-fry celery in oil until almost crisp-tender. Remove celery and stir-fry mushrooms in same oil. Return celery to pan, and soy sauce. Continue cooking one minute more.

Brussels Sprouts Au Gratin

⅓-½ lb. Brussels sprouts ⅓ cup sliced water chestnuts

¾ cup thin white sauce ¼ cup fine dry bread crumbs

1½ oz. grated sharp Cheddar cheese 1 tbsp. melted butter

⅛ tsp. dry mustard

White Sauce

2 ¼ tsp butter or margarine 2 ¼ tsp flour

¾ cup milk 1/16 tsp – salt to taste

Melt fat in saucepan, blend in flour and salt; remove from heat.

Add milk, stirring to blend, return to heat and stir gently while heat to a full boil.

Preheat oven to 350°F. Trim stems and wilted leaves from Brussels sprouts; wash sprouts. Boil in large amount of water until almost done. Slice sprouts in half.

Prepare white sauce, cool slightly, and stir in cheese and mustard. In a 1 pint baking dish, alternate layers of halved Brussels sprouts, water chestnuts, and cheese sauce. Blend bread crumbs with melted butter, spread on top of casserole and bake uncovered at 350°F for 15 minutes.

Cabbage with Cheese Sauce

¼ head green cabbage ¾ cup thin white sauce

2 bacon slices 1 oz. grated sharp Cheddar cheese

White Sauce

2 ¼ tsp butter or margarine 2 ¼ tsp flour

¾ cup milk 1/16 tsp – salt to taste

Melt fat in saucepan, blend in flour and salt; remove from heat. Add milk, stirring to blend, return to heat and stir gently while heat to a full boil.

Wash cabbage; trim off wilted leaves and cut into small wedges, leaving a portion of the core in each wedge to hold the shape. Fry bacon in skillet over moderately low heat until crisp. Reserving drippings, remove bacon from pan and crumble. Boil cabbage wedges in large amount of water.

Prepare white sauce, cool slightly, stir in cheese. Arrange hot drained cabbage on platter, pour cheese sauce over, and sprinkle with bacon bits.

Carrots with Dill and Sour Cream

½ lb. carrots ½ tsp. chicken bouillon

1 tbsp. vegetable oil ½ tsp. sugar

1 tsp. chopped fresh dill ⅓ cup water

½ teaspoon dried dill-weed 1 tbsp. sour cream

Wash and peel carrots; cut into julienne strips (about ⅛ x ⅛ x 2 inches). Sauté carrots and dill in oil for approximately 5 minutes without browning. Stir in chicken bouillon granules, sugar and water, and cook until carrots are crisp-tender. With a slotted spoon, remove carrots to a warm dish. Reduce cooking liquid to approximately two tablespoons; blend in sour cream and add carrots. Heat to serving temperature if necessary.

Deviled Cauliflower

¼ head cauliflower ¼ tsp. Worcestershire sauce

1 tbsp. butter, melted ⅛ tsp. salt

¼ tsp. prepared mustard dash cayenne pepper

Wash cauliflower and cut into flowerets; boil in a large amount of water until crisp-tender. Combine remaining ingredients, heat, and pour over hot, drained cauliflower.

Sautéed Leaks

3 medium leeks 1 tsp. lemon zest

2 tbsp. butter salt and pepper

¼ cup chicken broth

Discard tough outer leaves of leeks. Trim off green tops and roots; slice remaining leek lengthwise twice, so that it has been cut into quarters. Then slice the quarters crosswise into 2-inch strips. Wash the strips by lifting them up and down in water. Lift leeks out of water. Repeat until no more sand or dirt settles to bottom of the container. Melt butter over moderate heat in sauté pan. Add leeks with water still clinging to them. Cook for five minutes, stirring occasionally. Add broth and zest, cover pan and cook until leeks are tender, about five minutes. Season with salt and pepper.

Peanut Creamed Onions

½ lb. (8 oz.) small boiling onions 2 tbsp. chopped salted peanuts

½ cup medium white sauce dash mace

White Sauce

1 Tbsp butter or margarine 1 Tbsp flour

½ cup milk 1/16 tsp – salt to taste

Melt fat in saucepan, blend in flour and salt; remove from heat.

Add milk, stirring to blend, return to heat and stir gently while heat to a full boil.

Blanch onions in boiling water for about 10 seconds. Drain, chill, trim and slip off skins. Cook in fresh boiling water to cover until almost done (boiling in large amount of water).

Prepare white sauce. Halve onions, combine with white sauce, half the peanuts, and mace in a 1–pint baking dish. Top with remaining nuts and bake uncovered at 375°F for 20 minutes.

Peas with Broccoli Medallions

1 tbsp. vegetable oil ¼ cup water

2 green onions, sliced ⅛ tsp. salt

1 cup shelled peas, fresh or frozen dash pepper

½ cup peeled broccoli ½ tsp. lemon zest

stems cut into 1/8 inch disks 2 tsp. minced fresh parsley

Sauté green onions in oil; add peas, broccoli stems, water, salt and pepper. Boil uncovered for one minute (fresh peas only); cover and cook until peas are crisp–tender, about 5 minutes. Stir in lemon zest and parsley.

Parsnips Caramel

½ lb. (8 oz.) parsnips (3 medium) 1 tbsp. butter

2 tbsp. brown sugar

Wash and peel parsnips, cut into ½–inch round slices, and steam until nearly tender. Drain any remaining water; put parsnips into one–pint baking dish, sprinkle with brown sugar, and dot with butter. Bake uncovered at 400°F for 10 minutes.

Rutabagas and Turnips

½ cup cubed turnips 1 tsp. butter

½ cup cubed rutabagas dash pepper

Peel and cube vegetables. In separate saucepans, boil vegetable in salted water to cover until tender. Combine vegetables, add butter, and season with pepper.

Panned Spinach

½ lb. (8 oz.) spinach 1 hard-cooked egg, chopped

⅛ tsp. salt 2 tsp. fresh or frozen lemon juice

Sort leaves and remove stems. Wash spinach thoroughly by lifting spinach up and down in water. Remove spinach from water. Repeat until no more sand settles to bottom of container. Drain. Cook salt and spinach in a skillet with tight-fitting lid, about 3 minutes, using only the water clinging to the leaves from the last rinsing. Drain, sprinkle with lemon juice, and garnish with chopped hard-cooked egg.

Hard-Cooked Egg: Add egg to enough cold water to come at least 1” above egg. Bring to boil. Cover pan; remove from heat. Let egg stand in water 15-20 minutes. Cool immediately in ice water. When egg is cold, remove from shell.

Baked Acorn Squash

½ medium acorn squash 1 tbsp. brown sugar

½ cooking apple, diced ¼ tsp. cinnamon

½ tsp. butter

Remove seeds from squash; place squash cut-side down in a baking dish large enough to allow contact between the cut surface of the squash and the bottom of the dish. Pour boiling water to ¼ inch depth around squash. Bake uncovered at 400°F for 35 minutes. Invert squash and fill center with mixture of apple, brown sugar, cinnamon, and butter. Continue baking, uncovered, until apple and squash are tender, about 40 additional minutes.

Spaghetti Squash Parmesan

½ medium spaghetti squash 2 tbsp. grated Parmesan cheese

1 tbsp. butter, melted Salt & pepper to taste

Heat oven to 350°F. Halve squash lengthwise; scoop out seeds. Place squash, cut side down, in a baking dish large enough to allow contact between the cut surface and the bottom of the pan. Pour boiling water to ¼-inch depth around squash. Bake in a 350°F oven for 45-60 minutes until tender. With a fork, shred and separate the squash pulp into strands. Remove the squash from the shell, and toss with salt, pepper, melted butter and Parmesan cheese.

Four Cheese Broiled Tomatoes

¼ cup grated Parmesan and Romano cheese blend ¼ cup shredded part-skim mozzarella cheese

¼ cup ricotta cheese ¼ cup mayonnaise

¼ teaspoon salt ½ tablespoon dried oregano

½ teaspoon minced garlic 2 large tomatoes

In a small bowl, combine the first seven ingredients. Cut each tomato in half. Spread each with 3 tablespoon cheese mixture. Place on an un-greased baking sheet. Broil 3 in. from the heat for 3-5 minutes or until cheese mixture is golden brown and tomatoes are heated through.

Oven Roasted Vegetables

½ sweet potato, peeled 1 garlic clove

1 red potato 1 tbsp. olive oil

1 carrot, peeled 2 tsp. balsamic vinegar

½ fennel bulb, top and root removed ⅛ tsp salt

¼ green pepper ¼ tsp. lemon pepper

½ red onion, peeled

Wash and trim vegetables; cut into 2-inch pieces. Use a large spoon to combine vegetables and remaining ingredients and stir until vegetables are well coated. Bake in a shallow roasting pan at 425°F for 45 minutes or until vegetables are tender and lightly browned.

Panned Zucchini Parmesan

½ lb. (8 oz.) zucchini squash 1/8 tsp. salt

2 tbsp. coarsely chopped onion dash pepper

1 tbsp. butter 2 tbsp. grated Parmesan cheese

1 tbsp. water

Wash and trim ends of zucchini (do not peel); cut into ⅛" round slices. In a skillet, sauté onion in butter 1 to 2 minutes. Add all other ingredients except cheese. Cover, bring to a boil, and cook one minute. Uncover and cook, turning with spatula, until tender. Cool slightly (1–2 minutes), sprinkle with cheese, toss and serve.

Evaluation

Write observations of these vegetables and methods of preparation below the recipes. Include appearance, flavor, degree of doneness, compatibility of ingredients, and quality of fresh ingredients, if applicable.

Recipe Method of Preparation Flavor Category Pigment Category Sensory Attributes

Artichokes with Butter Sauce

Stir-Fried Asparagus

Scalloped Broccoli

Stir-Fried Celery

Brussel Sprouts Au Gratin

Cabbage with Cheese Sauce

Carrots with Dill and Sour Cream

Deviled Cauliflower

Sautéed Leaks

Peanut Creamed Onions

Peas with Broccoli Medallions

Parsnips Caramel

Rutabagas and Turnips

Panned Spinach

Baked Acorn Squash

Spaghetti Squash Parmesan

Broiled Tomatoes

Oven Roasted Vegetables

Panned Zucchini

2.7 Concept Review Methods of Preparation

What cooking methods are appropriate for each of the flavor groups of vegetables? Brassica

Allium

Mild

List Vegetables for each flavor group. Brassica

Allium

Mild

2.8 Salad Greens and Dressing

Objectives

To identify a variety of salad greens by appearance and flavor.

To discuss the principles of emulsion formation.

To identify various emulsifying agents and determine their effect on viscosity and permanency of the emulsion.

Laboratory Problems

Observe the characteristics of various salad greens.

Prepare a salad dressing as an example of an emulsion.

Calculate percent oil for each recipe.

Terms

Emulsion: Colloidal dispersion of one liquid in another, in which liquids are immiscible with each other Temporary – large droplets of oil, separates out quickly, ex. True French Dressing

Semi-Permanent – medium-size droplets of oil with a thickening agent, ex. Modified French Dressing and Fruit Salad Dressing

Permanent – small-size droplets of oil with a strong emulsifier, ex. Mayonnaise and Cooked Salad Dressing

Oil in Water Emulsion: oil droplets are suspended in the water phase, ex. salad dressing, milk

Emulsifier: Ingredient with a polar and non-polar end that allows oil and water to mix Give examples from the lab: egg yolk (lecithin), whole egg, paprika, dry mustard

Lecithin: Emulsifier present in egg yolk

Thickening Agents: Gums, Starch, & Gelatins

Observe various salad greens

Salad Greens Appearance Texture Flavor

Iceberg Lettuce

Leaf Lettuce

Boston Lettuce/Bibb

Spinach

Romaine

Kale

Swiss Chard

Prepare salad dressing according to the recipes below.

True French Dressing (temporary emulsion)

¼ tsp. dry mustard ¼ tsp. salt

¼ tsp. paprika dash black pepper

¼ tsp. sugar ¼ cup vegetable oil

2 tbsp. apple cider vinegar

Place all ingredients in jar and shake well just before serving.

Modified French Dressing (semipermanent emulsion)

½ tsp. gelatin 1½ tsp. sugar

2 tsp. cold water ½ tsp. salt

1 tbsp. boiling water dash cayenne pepper

½ tsp. dry mustard ½ cup vegetable oil (chilled)

½ tsp. paprika 2 tbsp. vinegar or lemon juice

Hydrate gelatin in cold water and dissolve in boiling water (if necessary, heat over boiling water). Cool to lukewarm. Mix dry ingredients and add to oil. Add vinegar. Beat 5 minutes with an electric mixer. Add gelatin and beat 5 more minutes. Chill about 10 minutes and beat again.

Fruit Salad Dressing (semipermanent emulsion)

⅓ cup sugar 2 tsp. lemon juice

2 tsp. paprika ⅔ cup vegetable oil

1 tbsp. flour 2 tsp. finely grated onion

2 tsp. dry mustard 2 tsp. celery seed

⅓ cup vinegar

Combine dry ingredients in a saucepan. Add vinegar. Cook until thick. Add lemon juice; cool to room temperature. Add oil in slow stream, beating with electric mixer. Add grated onion and celery seed. Stir before serving.

Mayonnaise Dressing (permanent emulsion)

¼ tsp. sugar 1 tbsp. pasteurized whole egg

¼ tsp. salt 1½ tsp. lemon juice

½ tsp. dry mustard ½ cup vegetable oil

In small mixing bowl, combine dry ingredients, egg yolk, and vinegar; beat until well mixed. Add ½ tsp. oil and beat vigorously with an electric mixer. Continue adding oil, doubling the amount at each addition, and beating vigorously after each addition. If mayonnaise is too thick, it may be thinned by adding more lemon juice or vinegar. If mayonnaise separates, use 2 tsp. of cold water, egg yolk or mayonnaise, and add separated dressing as if it were oil in the above directions.

Cooked Salad Dressing (permanent emulsion)

1 tbsp. + 1 tsp. cornstarch ¼ cup + 2 tbsp. water

2 tbsp. sugar 1 tbsp. vinegar

½ tsp. salt ¼ cup pasteurized whole egg

½ tsp. dry mustard ½ cup vegetable oil

In a saucepan, mix dry ingredients; gradually add water and vinegar. Heat. Boil for one minute. Pour into blender and cool to approximately 55oC so that egg protein will not coagulate. Add egg and blend until smooth. Add oil gradually while blender is running. Continue blending until mixture is thick.

Evaluation

Name of Emulsion Type of Emulsion Emulsifying Agents Size of Fat Globules % Oil Viscosity Stability Flavor

True French Dressing

Modified French Dressing

Fruit Salad

Mayonnaise

Cooked Salad Dressing

2.8 Concept Review Salad Greens and Dressing

Define the following terms and provide examples of food product/ recipes for each:

Dispersions:

Suspension:

Colloid:

Solution:

Emulsion

Emulsions Temporary

Semi-Permanent

Permanent

Oil in Water Emulsion:

Water in Oil Emulsion:

Emulsifier: Give examples from lab:

3 Food Preservation

3.1 Canning

Objectives

To apply the principles of food preservation in the basic methods of home canning.

To properly store canned foods.

To use the canned food in a safe manner.

Laboratory Problems

Prepare jelly and process by the boiling water bath method.

Prepare and process fruit or tomatoes by boiling water bath method.

Prepare a low acid vegetable and process by pressure canning.

Terms

Boiling water bath: We will prepare jelly, fruit, and salsa using the boiling water bath.

Pressure canner: We will prepare carrots using the pressure canner

Headspace

Clostridium Botulinum

ALL PROCESSING TIMES AND TEMPERATURES ARE APPROPRIATE FOR 1001–2000 FEET ABOVE SEA LEVEL. CONSULT A RECENT USDA OR STATE EXTENSION BULLETIN FOR PROCESSING TIMES AND TEMPERATURES APPROPRIATE FOR OTHER ALTITUDES.

General Laboratory Instructions This lesson is divided into two laboratory periods several weeks apart, with some additional activities scheduled for the laboratory period following the first full lab. In the first laboratory, the food is prepared and processed. In the following laboratory, jars are checked for seal and stored. Evaluation takes place in the third period. Be certain to follow

directions for each of the three laboratory periods.

Preparation Day

Follow individual directions for fruit or vegetable processing. Label jars as follows: Food, treatment, and date canned: Student Initial, Course Number, Lab Section

Once individual jars of food have been prepared for the canner, students assigned to use the canner will process all the jars of one kind of food together.

Boiling water bath:

Prepare jelly, fruit or tomato as described below and process according to the general directions.

Container preparation

Prepare containers for foods processed 10 minutes or more:

Be sure all jars and closures are perfect. Discard any with cracks, chips, dents, or rust.

Wash glass jars in hot, soapy water and rinse well. Wash and rinse all lids and bands. Jars need not be sterilized before processing.

Prepare food for processing:

Grape Jelly

1¾ oz. boxed powdered fruit pectin (1 box) 3 cups bottled grape juice

5¼ cups sugar 2 tsp lemon juice

Prepare six half-pint jars, lids and bands. Thoroughly mix pectin, lemon juice and juice in a 6-quart saucepan. Bring mixture to a boil; stir constantly until bubbles form all around the edge of the pan. Immediately add all sugar and stir. Bring to a full rolling boil and boil rapidly, stirring constantly, until mixture reaches 104oC (219oF). Remove from heat. Skim off foam with a slotted metal spoon. Quickly pour the jelly into sterilized jars, leaving ¼-inch headspace, and seal by placing hot lid and screw band on each jar. Process immediately in boiling water bath for 11 minutes. Makes approximately 6 cups jelly.

Apple Jelly

1¾ oz. boxed powdered pectin 4 cups frozen apple juice (do not dilute)

5 cups sugar 2 tbsp. lemon juice

Prepare five half-pint jars, lids and bands. Test pH of apple juice. Thoroughly mix pectin, lemon juice and apple juice. Stir constantly over high heat until mixture boils. Add sugar and stir. Immediately add all sugar and stir. Bring to a full rolling boil and boil rapidly, stirring constantly, until mixture reaches 104oC (219oF). Remove from heat. Skim off foam with a metal spoon. Pour the jelly quickly into sterilized jars, leaving ¼ inch headspace, and seal by placing hot lid and screw band on each jar. Process immediately in boiling water bath for 11 minutes. Makes approximately 4½ cups jelly.

Applesauce

Wash, core, peel and quarter 6 medium apples. Place apple quarters in saucepan and barely cover with water. Cover the pan and boil gently until tender. Drain the apples, reserving liquid, and put the apples through a food mill. Return the apple pulp to the saucepan and add enough reserved liquid for desired thickness; add enough sugar (1/4 to 1/2 cup) to sweeten. Heat, stirring constantly, to dissolve sugar. Fill jars with hot sauce, leaving ½ inch headspace. Process immediately in boiling water bath for 20 minutes.

Tomato and Chili Salsa

2½ lbs. tomatoes ½ cup vinegar (5% acetic acid)

½ lb. green bell peppers 1½ tsp. salt

½ lb. chili peppers ¼ tsp. pepper

½ lb. onions

Caution: Wear plastic or rubber gloves and do not touch your face while handling or cutting hot peppers. If you do not wear gloves, wash hands thoroughly with soap and water before touching your face or eyes.

Prepare 4 half-pint jars, lids and bands. Wash tomatoes and dip in boiling water for 30 to 60 seconds or until skins split. Dip in cold water, slip off skins, and remove cores. Coarsely chop tomatoes and combine chopped peppers, onions, and remaining ingredients in a large saucepan. Heat to boiling, and simmer 10 minutes. Fill jars, leaving ½ -inch headspace. Adjust lids and process in boiling water bath for 20 minutes.

Process in boiling water bath:

Put filled glass jars on rack in canner containing hot water. The jars should not touch the sides or bottom of pan, or each other. Add

boiling water to bring water to 1 or 2 inches over tops of jars. Put cover on canner. When water in canner comes to a rolling boil, start to count processing time. Boil gently and steadily for the processing time recommended for the specific food (at least 11 minutes). Remove jars from the canner immediately when processing is finished.

Cool jars top side up on a rack or on a folded cloth. Give each jar enough room so that all sides are exposed to air. Never set a hot jar on a cold surface. Keep hot jars away from drafts, but don't slow cooling by covering them.

Pressure canning

Prepare one-half pint of vegetable. Process each according to general pressure canning directions.

Prepare containers:

Prepare jars and lids as for water bath canning ten minutes or more (see page 68.)

Prepare food:

Raw Pack Carrots

Prepare one half-pint jar, lid and band. Wash, peel and rewash carrots. Slice or dice. Pack raw carrots tightly into clean jar, to 1 inch from top of jar. Fill jar with boiling water, leaving a 1-inch headspace. Adjust jar lids. Immediately process in pressure canner at 10 pounds pressure (116oC or 240oF) for 25 minutes.

Hot Pack Carrots

Prepare one half-pint jar, lid and band. Wash, peel and rewash carrots. Slice or dice. Cover with boiling water; bring to boil and simmer 5 minutes. Pack hot carrots to 1 inch from top. Cover with boiling hot cooking liquid, leaving 1-inch space at top of jar. Adjust jar lids. Immediately process in pressure canner at 10 pounds pressure (116oC or 240oF) for 25 minutes.

Note: For home canning, ⅛ tsp. salt may be added to the carrots for flavor before the jar is sealed. Salt has no role in preserving the wholesomeness or safety of canned vegetables.

Process in pressure canner:

Put 2 to 3 inches of boiling water in the bottom of canner. Space filled jars on rack in canner so that steam can flow around each jar. Fasten canner cover securely so that no steam can escape except through vent. Heat over high heat until steam pours steadily from

vent; continue heating over high heat for 10 minutes or more to drive air from canner. Close petcock and/or set weight on vent post and allow pressure to rise to 10 pounds. For detailed instructions, follow manufacturer's directions.

Start counting processing time when 10 pounds pressure (116oC or 240oF) is reached. Keep pressure constant by regulating heat under the canner. When processing time is up, remove canner from heat immediately. Let the canner depressurize at room temperature. NEVER cool the canner under cold running water or by opening petcock. When pressure registers zero, wait 1–2 minutes, then slowly open petcock or remove weight with tongs or fork tines. Unfasten cover and tilt the lid up so steam escapes away from you. Take jars from canner. Remove carefully as jars are not yet fully sealed. Place jars top side up on a towel or cooling rack, with air space between them. Never set a hot jar on a cold surface.

If liquid boiled out in processing, do not open jar to add more. Give each jar enough room to allow air to contact all sides. Keep hot jars away from drafts, but don't slow cooling by covering them.

Following Laboratory Period

Remove bands of two-piece lids. Test the seal of lid. If lid has not sealed, reprocess by repeating the entire canning procedure, using a new lid; or refrigerate food and use within one or two days.

Wipe container clean and complete labeling if necessary. Wash bands and store for next use.

Store jars in dark, cool, dry place.

Evaluation Day

Check each jar of canned food before opening to ensure that it is still sealed.

If it is tightly sealed, remove the lid and inspect food for any change in appearance or odor that might be a sign of spoilage. If any spoilage is suspected, skip to step 4.

Vegetables: Do not taste any home- or laboratory-canned vegetables until they have been boiled at least 10 minutes. If any spoilage is suspected during cooking, do not taste the food. Commercially canned products should be safe without boiling. Fruits and Jelly: If no spoilage has been detected at steps 1 and 2, or when the food is removed from the jar, the food should be safe without further cooking.

If spoilage is suspected at any stage, check with your instructor for directions for safe disposal of food and container.

3.1 Concept Review Canning

Consumers have called the Answer Line for help with food preservation techniques. Can you help?

A homemaker from LeMars asks: When I canned tomatoes, some of the jars did not seal. What can I do to make sure all the jars seal when I can again?

A gardener from Story City asks: I have saved all our old mayonnaise jars for canning this summer. Do you know where I can get more?

The liquid in my home-canned green beans is cloudy. Are these safe to eat? How can I tell? Asks a person from Storm Lake.

My grandmother died last year and, when my mom cleaned out her basement, she found lots of canned fruits and vegetables. My mom gave them all to me since I am a poor college student. Can I eat this stuff? asks an ISU student.

Joyce from Minnesota asks if it is ok to can tomatoes (crushed, pint jars) in the boiling water bath canner at 35 minutes if she adds green peppers and onions.

Paul, an avid fisherman, packages the fish he catches in sandwich bags and bread wrappers, then freezes them. The fish are dried out and tough when cooked. Can you tell him why?

A women from Davenport says that her apples and pears have pinkish purple spots in them after they are canned. Why are they so colorful? Is it harmful?

Food in the top of the jar of canned fruit darkens. Why? Asks a man from Waterloo.

I do everything the way my mother taught me when preserving food at home, says a woman from Sioux City. She was the best cook! However, the lids come off the jars a few days after I've canned. I know I didn't do anything wrong. It must be the lids. What do you think?

My neighbor told me about a quick and easy way to freeze sweet com. You just clean the ears of com, wrap them in plastic wrap and foil, and put them in the freezer. I can hardly wait to try this method because it is so hot in the summer to use other methods of preservation. Do you think this will work, asks a farmer from Garwin.

Jenni's grape jelly tastes great, but is rubbery. What's the problem?

12.There was an ice storm and the electricity was off for 2 days in

Nashville, TN. What would you advise all those people with freezers full of food?

Fresh peas in a creamed white sauce is John’s favorite food. He plans to make a big batch and freeze it. What would you recommend?

Mom received a candy thermometer, a meat thermometer, a refrigerator/freezer thermometer and a general food safety (40–140°F) thermometer for a Christmas gift. She has been cooking up a storm. She also checked the temperatures in the refrigerator and freezer which are 45°F and 5°F, respectively. Is this ok?

3.2 Dehydration

Objectives

To apply the principles of dehydration to home methods of drying.

To properly store dehydrated food.

To rehydrate or otherwise prepare dehydrated food for consumption.

Laboratory Problems

Pretreat, dry, store and serve some commonly dehydrated fruits and vegetables.

Observe the characteristics of various dried fruits.

General Laboratory Directions This lesson is divided into two laboratory periods several weeks apart, with short assignments during the week following the first laboratory.

Preparation Day

Pretreat assigned fruit or vegetable according to specific directions below to control enzymatic deterioration.

Carrots or Onions

Wash and trim. Cut into ⅛-inch slices, then pretreat if directed. Steam blanch by spreading vegetable in a thin layer in steamer. Steam until hot in center, approximately 3 to 3 ½ minutes.

no treatment.

steam blanching.

Apples

Wash, peel, core, and cut into ⅛-inch rings. Immediately drop into assigned pretreatment solution and soak for 10 to 15 minutes.

no treatment.

1 tsp. salt in 1 pint water.

2 tsp. ascorbic acid in 1 pint water.

Peas

No treatment.

Drain and dry fruits and vegetables. Spread one layer of cheesecloth on dehydrator racks. Spread food in a single layer on racks. Set temperature of dehydrator at 140o-150oF. Dry until vegetable slices are brittle (3-6 hours) and fruit slices are leathery and pliable (6-8 hours).

Label a Ziploc bag for each dehydrated sample as follows:

Name of Product, treatment used, section number, and student initials

Let food stand in a large loosely covered container for a week, stirring each day, to allow moisture to equilibrate.

Place in small air-tight containers and store in a cool place.

Evaluation Day

Prepare food according to specific directions. Record your observations on the chart.

Carrots

Rehydrate by soaking for 20 minutes or more in enough water to cover. Add more water if necessary to keep carrots covered. Cook carrots as if they were fresh in a small amount of soaking water.

Apples

Dehydrated apple slices may be eaten as they are, or they may be rehydrated and cooked. Add enough water to cover fruit and soak for 1 hour or more. Add more water if necessary to keep fruit covered. Simmer fruit in soaking water until tender.

Observations and Explanations

Type of Treatment Before Drying Appearance Texture Flavor

Carrots, No Pre-treatment

Carrots, Steam-Blanched

Apples, No Pre-treatment

Apples, Salt

Apples, Ascorbic Acid

Observe the characteristics of various dried fruits:

Dried Fruits Appearance Texture Flavor

Apples

Apricots

Currants

Dates

Figs

Peaches

Prunes

Raisins

3.2 Concept Review Dehydration

What will happen to fresh berries sprinkled with sugar? Explain the scientific principle illustrated.

Why is sugar added to cooked fruit near the end of the cooking period?

What may cause sugar to crystallize on the surface of dried fruits?

How are dried fruits treated to retain their natural color and prevent browning?

3.3 Freezing

Objectives:

To demonstrate that freezing is one of the most effective ways of preserving the natural color, texture and flavor of foods.

To illustrate the relative effectiveness of various methods of

preparing fruits and vegetables for freezing.

To illustrate the effect of freezing on a variety of prepared foods.

NOTE: This lab is designed to illustrate the effects of freezing methods on a variety of fresh and prepared foods. Some of the methods outlined below are examples of processes that will not result in a standard product.

General Laboratory Instructions This lesson is divided into two periods several weeks apart.

Preparation day

Once food has been prepared it should be frozen as quickly as possible. Cartons or packages should not be stacked or allowed to touch each other until they are frozen solid. When the food is completely frozen it may be stacked on freezer shelves.

Each frozen product should be labeled with masking tape as follows:

Food, Treatment, and Date Frozen;

Student Initials, Course Number, Lab Section

Evaluation Day

Place all foods in refrigerator 24 hours before class time.

Follow individual directions for reheating frozen food and preparing fresh products for comparison.

Laboratory Problems

Apple slices Dry pack (untreated)

Dry sugar pack

Steamed

35% syrup pack

35% syrup and commercial anti-darkening preparation

35% syrup plus lemon juice

Vegetables: Cauliflower and Carrots

Apple and Cherry Pies

Gelatin

Pudding

Spanish Rice

Macaroni and Cheese

Spice Cake

Egg Salad

Ground Beef Patties

Apple Slices

Preparation Day:

Wash, sort, pare, and slice apples. Use 1 apple for each part of the lab problem.

Treatments A–F pack in individual quart-size, labeled, freezer bags; exhaust air and fasten securely.

Protect these bags during storage by packing them together in 1 gallon-size freezer bag.

Freeze immediately.

Evaluation Day:

Place freezer bags in lukewarm water for 20 minutes to thaw.

Display samples in individual labeled sauce dishes.

Compare effectiveness of freezer treatments and canning.

Record your conclusions for obtaining standard frozen apple slices.

Observations and Explanations

Type of Treatment Before Freezing Appearance Texture Flavor

A Dry pack (untreated)

B Dry sugar pack: ¼ cup sugar for each 4 parts fruit

C Fruits steamed for 3 minutes

D* ¼ cup 35% syrup pack*

E* ¼ cup 35% syrup* and ¾ tsp. commercial anti-darkening preparation

F* ¼ cup 35% syrup*, fruit sprinkled with 1 tsp. lemon juice

*For Treatments D, E, F: To prepare 35% syrup, bring 1 cup sugar and 2 cups water to a rolling boil. Chill before adding other ingredients or apple slices.

Freezing Vegetables – Cauliflower and Carrots

Preparation Day:

Unblanched Vegetables

Wash, peel (carrots), and slice or chop vegetables. Use 1 cup vegetable for each part of the lab problem.

Pack in individual small labeled plastic bags, exhaust air, and fasten securely.

Protect these bags during storage by packing them together in gallon-size freezer bag.

Freeze immediately.

Blanched Vegetables

Wash, peel (carrots), and slice or chop vegetables. Use 1 cup vegetable for each part of the lab problem.

Boil at least 1½ quarts of water for each cup of raw vegetable. Lower vegetable into water and cover. Time from the moment the vegetable is immersed in water. Keep heat at high setting during blanching. Blanch carrots 2–3 minutes and cauliflower 3 minutes, or until center of vegetable is hot. Use slotted spoon to remove vegetables.

Chill immediately in at least two quarts of iced water. When vegetables are cool, drain thoroughly.

Pack in individual small labeled plastic bags, exhaust air, and fasten securely.

Protect these bags during storage by packing them together in gallon-size freezer bag.

Freeze immediately.

Evaluation Day:

Examine, cook, and evaluate blanched, unblanched, and fresh vegetables.

Record observations and explanations of changes occurring during frozen storage, comparing these vegetables whenever possible with similar canned products.

Record your conclusions for obtaining standard frozen vegetable products.

Observations and Explanations

Treatments Appearance Texture Flavor

Carrots

A. Fresh

B. Blanched

C. Unblanched

D. Canned

Cauliflower

A. Fresh

B. Blanched

C. Unblanched

Freezing Prepared Foods – Apple and Cherry Pie

Preparation Day:

Double apple and cherry pie recipes in the Pastry and Fruit Pie section to make 2 small pies. Use refrigerated pie crust and disposable pie tin. Mix ⅛ tsp. ascorbic acid with sugar in recipe when making apple pie.

Bake first pie, cool, wrap in plastic wrap and foil, label and freeze.

Prepare second pie (without cutting vents in crust), wrap in plastic wrap and foil, label and freeze unbaked.

Evaluation Day:

Prepare and bake fresh cherry and apple pies.

Bake unbaked pie after refrigerating overnight. Unwrap and cut vents in upper crust. Bake at 450°F for 15–20 minutes. Lower heat to 375°F to finish baking, approximately 20–30 minutes.

Thaw pre-baked pie in refrigerator overnight. Freshen by heating in a 350°F oven approximately 35–40 minutes. Place aluminum foil loosely over top of pie to prevent excessive browning.

Record your observations.

Observations and Explanations

Characteristics Pie Fresh Baked after Freezing Baked before Freezing

Crust: appearance, crispness, and tenderness Cherry

Apple

Filling: appearance, consistency, and flavor Cherry

Apple

General Eating Quality Cherry

Apple

Freezing Prepared Foods – Gelatin

Preparation Day:

Mix ½ of 3 oz. package (3T plus 1½ t) of flavored gelatin following package directions.

Pour into a plastic freezer container.

Let gel, cover, and freeze.

Evaluation Day:

Unmold frozen sample of gelatin into casserole dish.

Prepare ½ of 3 oz. package (3T plus 1½ t) of flavored gelatin according to package directions and let gel.

Compare the two products and record your observations.

Characteristics of the Standard Product for Gelatin: Appearance Texture Flavor

Clear. Retains the shape of mold.

Firm, yet resilient. Neither rubbery nor watery.

Mild, characteristic fruit flavor.

Freezing Prepared Foods — Chocolate Pudding

Preparation Day:

Prepare chocolate cornstarch pudding, or prepare ½ of 3 oz. package (3T plus 1½ t) pudding. (Do not use instant pudding mix.)

Pour into labeled plastic freezer container.

Let cool, cover, and freeze.

Chocolate Pudding

1 tbsp. cornstarch 1 cup milk

¼ cup sugar ⅓ oz. unsweetened chocolate, cut in small pieces

dash salt ½ tsp. vanilla

Mix cornstarch, sugar and salt. Blend in milk; add chocolate. Cook over medium heat, stirring gently until mixture boils. Continue cooking over direct heat 2 to 3 minutes,* stirring slowly but constantly. Remove from heat, blend in vanilla, and pour into serving dish to cool.

*Or cook, covered, in a double boiler for 10–15 minutes, stirring occasionally.

Evaluation Day:

Thaw pudding.

Prepare a fresh sample of chocolate cornstarch pudding according to directions on page 50 or prepare ½ of 3 oz. package (3T plus 1½ t) pudding.

Compare the two products and record your observations (see page 111) for characteristics of a standard cornstarch pudding.)

Observations and Explanations

Product Appearance Texture Flavor

Gelatin Fresh

Frozen

Cornstarch Pudding Fresh

Frozen

Freezing Prepared Foods – Spanish Rice Casserole

Spanish Rice Casserole

⅓ cup long grain polished rice Dash cayenne

¼ tsp. salt 2 tbsp. chopped green pepper

¾ cups water 1 cup canned tomatoes and juice

3 strips bacon Salt to taste

¼ cup chopped onion

Boil rice, salt and water according to directions:

Put rice, water, and salt in heavy saucepan; cover with tight fitting lid. Bring to a full boil; reduce heat to very low boil and cook until done,* approximately 15–25 minutes depending on variety of rice and temperature. (Add more water if necessary to prevent scorching.)

Fry bacon over low heat in sauté pan until crisp. Remove and crumble bacon. Sauté onion in bacon drippings until tender. Pour off excess fat. Add cooked rice, bacon, and other ingredients. Pour into 1–pint baking dish and follow assignment directions for freezing or baking.

Preparation Day:

Prepare one recipe of Spanish Rice Casserole, slightly undercooking the rice.

Pour into casserole dish but do not bake. Cover and freeze in plastic bag

Evaluation Day:

Unwrap the food and bake covered at 350°F until bubbling around the edges, approximately 1 hour. NOTE: Some casserole dishes do not withstand freezer–to–oven temperature changes. For these do not preheat oven.

Prepare one recipe Spanish Rice Casserole and bake at 350°F for 30 minutes.

Record your observations.

Observations and Explanations

Spanish Rice Long Grain Polished Rice

Characteristics Fresh Frozen

Appearance

Flavor

Texture

Characteristics of Standard Product:

Rice grains: firm, yet tender; not gummy or watery

Green pepper: comparable to fresh cooked

Bacon: fresh smoked flavor; not rancid

Tomatoes: comparable to fresh cooked

Onion: comparable to fresh cooked

Freezing Prepared Foods – Macaroni and Cheese

Preparation Day:

Prepare recipe for macaroni and cheese, slightly undercooking macaroni. Do not bake.

Pour into casserole dish but do not bake. Cover and freeze in plastic bag.

Macaroni and Cheese

⅔ cup uncooked macaroni 84 grams or 3 oz. shredded Cheddar cheese (3/4 cup)

3 cups water 1 cup thin white sauce

2 tbsp. dry bread crumbs 1 tsp. butter

White Sauce:

1 Tbsp butter or margarine

1 Tbsp flour

1/8 tsp salt 1 cup milk

Melt fat in saucepan. Blend in flour and salt; remove from heat. Add milk, stirring to blend; return to heat and stir gently while heating quickly to a full boil, remove from heat.

Cook macaroni in boiling salted water until almost tender. Drain and rinse with hot water. Prepare white sauce. Wait 45 seconds, and blend cheese into sauce. Stir in macaroni; turn into 1-pint baking dish. Melt butter, mix with crumbs, and sprinkle over top. Do not bake until evaluation day. Set baking dish on wire rack in pan of hot water and bake uncovered at 350°F for 30 minutes.

Evaluation Day:

Unwrap frozen macaroni and cheese. Bake uncovered in water bath at 350°F until heated through and bubbling around the edges, approximately 50-60 minutes.

Prepare and bake one recipe macaroni and cheese.

Record your observations, noting especially the effect of freezing on the macaroni texture, the cheese, and the white sauce thickened with flour.

Observations and Explanations

Macaroni and Cheese Fresh Casserole Frozen Casserole

Appearance

Flavor

Texture

Consistency

Freezing Prepared Foods – Spice Cake

Quick Mix Spice Cake

½ cup sifted flour ⅛ tsp. mace

⅓ cup sugar ⅛ tsp. cloves

¼ tsp. salt 2 tbsp. shortening

¾ tsp. baking powder ¼ cup milk

¾ tsp. cinnamon ½ egg

¼ tsp. nutmeg ¼ tsp. vanilla

Grease a 5X5 inch baking pan and line with waxed paper. Sift together flour, sugar, salt, baking powder, and spices three times. Add shortening and approximately half the milk. Beat at medium speed of electric mixer for 2½ minutes. Add egg, remaining milk, and vanilla. Beat at medium speed for 3 minutes more. Pour batter into greased 5X5-inch pan. Follow assignment directions for freezing or baking.

Preparation Day:

Prepare a double recipe of the spice cake recipe. Pour equal weights of batter into each of two prepared pans. Wrap, label, and freeze one pan of batter. Bake remaining pan of batter at 350oF for 20–25 minutes. Cool, wrap in plastic wrap and foil, label, and freeze.

Evaluation Day:

Place frozen batter in refrigerator overnight. Unwrap and bake batter at 350°F for 20–25 minutes.

Prepare one recipe spice cake. Pour into baking pan identical to those for the frozen samples. Bake at 350°F for 20–25 minutes; cool.

Warm frozen baked cake in heat-proof wrapping in a 300°F oven until heated throughout, about 15–25 minutes.

Observations and Explanations

Spice Cake Characteristics Fresh Cake Cake Baked Before Freezing Batter Frozen Before Freezing

Height of Center Slice

Appearance

Grain

Flavor

Mouthfeel

Conclusions

Freezing Prepared Foods – Egg Salad

Egg Salad

2 eggs 2 tbsp. mayonnaise

2 tsp. chopped green pepper salt and pepper

Prepare hard-cooked eggs: Add egg to enough cold water to come at least 1” above egg. Bring to boil. Cover pan; remove from heat. Let egg stand in water 15-20 minutes. Cool immediately in ice water. When egg is cold, remove from shell. Chill. Chop eggs for salad. Combine eggs, green pepper, mayonnaise, and seasonings.

Preparation Day:

Prepare one recipe egg salad.

Pack in a quart-size labeled plastic freezer bag; exhaust air and fasten securely. Freeze immediately.

Evaluation Day:

Thaw frozen sample of egg salad.

Prepare a fresh sample of egg salad.

Compare the two products. Note especially the effect of freezing on the egg white, the mayonnaise, and the green pepper.

Record observations regarding freezing mixtures containing cooked egg whites and/or mayonnaise.

Characteristics of the Standard Product for Egg Salad:

Egg white should be firm yet tender.

Egg should have a mild egg flavor.

Mayonnaise should be a smooth emulsion.

Green pepper should be comparable to fresh sample.

Observations and Explanations

Appearance Texture Flavor

Fresh Egg Salad

Frozen Egg Salad

Freezing Prepared Foods – Ground Meat Patties

Preparation Day:

Raw: Shape two patties using ¼ pound ground beef for each. Wrap tightly in plastic wrap and foil. Label and freeze.

Shape two beef patties using ¼ pound ground beef for each. Panfry to internal temperature of 165°F. Wrap tightly in plastic wrap and foil (recommended method). Label and freeze.

Shape two beef patties using ¼ pound ground beef for each. Panfry to internal temperature of 165°F. Wrap in non-freezer plastic wrap or bag (not recommended method). Label and freeze.

Evaluation Day:

Fresh: Shape two beef patties using ¼ pound ground beef for each. Panfry to an internal temperature of 165°F.

Panfry raw, stored patties to an internal temperature of 165°F.

Reheat cooked, stored patties to an internal temperature of 165°F.
recommended method – 2 patties

non-freezer plastic wrap – 2 patties

Observations and Explanations

Appearance Flavor Texture

Fresh

Cooked after freezing, recommended packaging

Cooked before freezing, recommended package

Cooked before freezing, non-freezer plastic wrap

4 Beverages

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4.1 Tea

Objectives

To prepare various teas using loose tea, a tea ball, or tea bags.

To describe differences in appearance and flavor of various types of tea: black, oolong, green, flower, and spiced.

To identify the factors affecting the optimum extraction and retention of tea constituents in the prepared beverage: tea quality, type and temperature of water, material of teapot, and preparation techniques.

General directions for preparation of teas:

Use a clean teapot. Preheat by filling it with boiling water.

Measure freshly drawn cold water. Heat just to boiling. As soon as measured water reaches boiling, drain the preheated teapot; place tea leaves in pot; add the freshly boiled water.

Cover pot and steep appropriate length of time for the tea used. Remove tea bag or tea ball, or strain out tea leaves.

For evaluation, serve tea in pot in which it was prepared. (If a ceramic pot was used, display a sample of tea in a small clear glass beaker.)

Tea Treatment Directions

Tea ball – Prepare black tea according to the general directions. For each serving, use ½ tsp. tea leaves per 6 oz. water. Place tea leaves in a tea ball large enough to allow water to circulate freely. Steep for three minutes.

Tea bag – Prepare black tea according to the general directions, using 1 tea bag for two servings (12 oz. water). Steep for three minutes.

Loose tea – Prepare black tea according to the general directions. For each serving, use ½ tsp. black tea and 6 oz. water. Place loose tea leaves in teapot. Steep for three minutes, then strain tea into preheated serving pot.

Iced tea – Prepare double-strength black tea according to general directions for hot tea, using 1 tsp. tea or 1 tea bag per tea cup (6 oz.) water. Pour prepared tea into serving pitcher filled with ice.

Instant black iced tea – Prepare according to the directions on the container.

Oolong tea – Prepare oolong tea according to general directions, using 1 tea bag or 1 tsp. tea leaves per 2 teacups (6 oz. each) water. Steep for 3 minutes.

Green tea – Prepare green tea according to the general directions, using 1 tea bag or 1 tsp. tea leaves per 2 teacups (6 oz. each) water. Steep for 3 minutes.

Flower tea – Prepare according to package directions.

Spiced tea – Prepare according to package directions.

Decaffeinated tea – Prepare according to package directions.

Terms

Oolong Tea is made from the Camellia sinensis plant. Its dried leaves and leaf buds are used to make several different teas, including black and green teas.

Green Tea is made from unfermented leaves and reportedly contains the highest concentration of powerful antioxidants called polyphenols.

Brewing Techniques: Percolated, French Press, Drip, Vacuum, & Pour Over

Characteristics of the standard product:

Appearance Flavor

Bright and clear; free from oily film. Color appropriate for type:

Green tea – a pale straw color

Black tea – a deep amber color

Oolong tea – a light golden brown

Subtle aroma Delicate flavor with astringency appropriate for type.

(Green tea is more astringent than black.)

Evaluation

Sample Appearance Flavor

Black, tea bag

Oolong

Green

4.1 Concept Review Tea

Describe differences in sensory qualities among black, oolong and green teas.

What is the effect of excessive steeping temperature on the sensory qualities of tea?

4.2 Coffee

Objectives

To prepare coffee by each of the basic methods (steeped, percolated, drip, and vacuum) using the grind of coffee appropriate for each type of coffeemaker.

To list the factors that determine the quality of the beverage: quality of the ground coffee, temperature of water, design and material of the pot, and preparation technique.

To describe differences in appearance and flavor of coffee beverages made from coffee beans prepared by different methods of commercial processing.

To describe differences in appearance and flavor of coffee made with different types of pots.

To prepare beverages in which coffee is blended with other flavors.

General directions for preparation of coffee: Wash coffee pot in hot soapy water. Rinse thoroughly.

Brew at least ¾ of the capacity of assigned coffeemaker (drip, percolator, or vacuum) for best results from each coffeemaker.

Use 1–2 level tbsp. coffee for each serving (6 oz.) of freshly drawn cold soft water depending on strength preference (weak–strong).

Remove coffee grounds and keep coffee hot until served.

For evaluation, serve coffee in pot in which it was prepared, displaying a sample in a large liquid measuring cup.

Coffee Treatment Directions

Steeped coffee – Prepare according to general directions, using regular grind coffee tied loosely in a square of freshly rinsed cheesecloth large enough to allow water to circulate readily. Bring measured water in the pot just to the boil, reduce heat slightly, and add coffee. Cover pot and let steep at simmering temperature for about 7–10 minutes.

Percolated coffee – Prepare according to general directions, using regular grind coffee. Measure water into pot and coffee into basket. Place basket, stem, and water-spreader assembly into pot. Cover and heat quickly just until percolation begins. Lower heat and percolate gently for about 8–9 minutes.

Electric percolated coffee – Prepare according to directions above. Coffeemaker will stop perking automatically when process is complete.

Drip coffee – Prepare according to general directions, using drip grind coffee measured into coffee basket. Preheat lower section by rinsing with very hot water before assembling pot. Pour measured, freshly boiling water into top section, and set in warm place while water drips through the grounds.

French Press coffee – Prepare according to general directions, using finely ground coffee. Pour freshly boiled water over coffee in carafe. Let stand a few minutes. Press the plunger filter through the water, trapping grounds beneath. After pouring coffee, discard grounds.

Vacuum coffee – Prepare according to general directions using finely ground coffee. Assemble pot with measured cold water in lower section. Put glass rod in stem of upper section and add the measured coffee. Heat quickly until nearly all the water has been forced into the upper part (water below the level of the stem will remain in the lower section). Reduce heat. Turn off heat after one minute. Coffee should remain in contact with grounds for another 2–3 minutes, and then will be drawn back into the lower section as the coffeemaker cools and a vacuum is formed.

Dark roast coffee – Prepare according to general directions, using a method appropriate to the grind of the dark roast coffee.

Decaffeinated coffee – Prepare according to general directions, using a method appropriate to the grind of the coffee.

Freeze-dried coffee – Prepare according to package directions.

Instant coffee – Prepare according to package directions.

Cereal beverage – Prepare according to package directions.

Specialty Coffees

Orange Coffee

6 oz. boiling water 6 oz. coffee (freshly brewed at double-strength)

1 tbsp. sugar zest from ½ orange

¼ cup whipping cream 1 tsp. sugar

Remove zest from orange (colored portion of skin), using a zester, vegetable parer, or fine grater. Pour boiling water over zest and steep for 3 minutes. Add sugar and coffee; stir until sugar is

dissolved. Prepare whipped cream: Chill bowl, beaters, and ¼ cup heavy whipping cream. Beat to a soft peak. Fold in 1 tsp. sugar. Pour coffee into small cup and top with whipped cream.

Spiced Viennese Coffee

4 oz. water 9 oz. coffee (freshly brewed at double-strength)

1 tbsp. sugar 4 cloves

¼ cup whipping cream 1-inch cinnamon stick

1 tsp. sugar ground cinnamon

Combine water, sugar, cloves, and cinnamon stick and bring to boil. Remove from heat; let stand 5 minutes. Remove spices with slotted spoon or strainer; add coffee. Prepare whipped cream: Chill bowl, beaters, and ¼ cup heavy whipping cream. Beat to a soft peak. Fold in 1 tsp. sugar.Pour one demitasse cup; top with whipped cream and ground cinnamon.

Brazilian Coffee

½ oz. unsweetened chocolate, cut into small pieces ¼ cup milk

2 tbsp. sugar ¼ cup half-and-half

4 oz. water 6 oz. coffee (freshly brewed at double-strength)

1-inch cinnamon stick ¼ tsp. vanilla

Combine chocolate, sugar, water, and cinnamon stick; boil for 3 to 5 minutes. Remove cinnamon stick. Add milk and ½ and ½ and heat to serving temperature. Add coffee and vanilla.

Characteristics of the standard product:

Appearance Flavor

Clear, free from both sediment and oily surface film.

Deep amber to rich brown in color, depending upon strength of brew and degree of roast.

Fresh, mellow, very slightly astringent and slightly bitter.

Evaluation

Sample Appearance Flavor

Percolated

French Press

Vacuum

Decaffeinated

Instant

Orange

Spiced Viennese

Brazilian

4.3 Chocolate and Cocoa

Objectives

To prepare chocolate beverages using unsweetened chocolate, natural- and Dutch process cocoa, and instant cocoa mixes.

To identify compositional differences between chocolate and cocoa.

To differentiate between natural-process and Dutch-process in treatment, solubility, color, and flavor.

Laboratory Problems

Prepare the following: Hot chocolate

Natural-process cocoa

Dutch-process cocoa

Instant cocoa

Cocoa mix

Adjust pH of cocoa mixtures.

Preparation:

Prepare hot chocolate according to the following recipe:

Hot Chocolate (1 serving)

⅓ ounce unsweetened chocolate* ¼ cup water

1 tbsp. sugar ¾ cup milk

dash salt

∗ In most recipes, three tablespoons (50 ml) of cocoa and one tablespoon (15 ml) of fat may be used in place of one ounce (28 ml) of unsweetened chocolate.

Heat chocolate, sugar, salt and water slowly, stirring constantly until chocolate melts. Boil gently 2 minutes. Add milk and heat to serving temperature. Just before serving beat with a rotary beater until the surface is covered with froth.

Prepare natural- or Dutch-process cocoa according to the recipe below:

Cocoa (1 serving)

1 tbsp. cocoa ¼ cup water

1 tbsp. sugar ¾ cup milk

dash salt

Mix dry ingredients, add water and boil gently for 2 minutes. Add milk and heat to serving temperature. (A double boiler may be used after initial boiling; allow 10-15 minutes for heating beverage.) Just before serving, beat with a rotary beater until the surface is covered with froth.

Prepare instant cocoa beverage according to package directions.

Prepare cocoa mix according to package directions.

Characteristics of the standard product:

Appearance Flavor Consistency

Well-blended, with no surface film or sediment.

Color appropriate to type of processing – natural or Dutch.

Definite chocolate taste appropriate to type of processing – natural or Dutch. Definite body with a smooth consistency resembling that of thin cream.

Evaluation

Record for your observations for hot cocoa and hot chocolate.

Sample Appearance Flavor Consistency

Hot Chocolate

Natural Process Cocoa

Dutch-Process Cocoa

Instant Cocoa

Cocoa Mix

4.3 Concept Review Chocolate and Cocoa

What is the fat content of cocoa? Of chocolate?

How does Dutch-process cocoa differ from natural-process cocoa?

Why should cocoa and chocolate reach the boiling point in beverage preparation?

How should chocolate be stored?

5 Crystallization

5.1 Ice Crystalline Products

Objectives

To participate in making ice crystalline products with an ice cream freezer.

To recognize the effects of varying ingredients and procedures on ice crystal size in a frozen product.

Laboratory problems

Prepare still-frozen desserts.

Prepare churn-frozen ice cream and sherbet.

Compare laboratory prepared frozen desserts with commercially-prepared samples.

Terms

Sublimation= freezer burn. Ice crystals form on the surface of food and lead to tough dry areas.

Apricot Mousse

½ tsp. unflavored gelatin 1 cup whipping cream

1½ tsp. water ¼ cup sugar

⅓ cup apricot puree dash salt

Soften gelatin in water in custard cup. Set cup in hot water until gelatin dissolves. Stir gelatin into puree. Combine cream and salt in chilled bowl. Beat cream until it begins to thicken. Gradually add sugar and beat until it forms soft peaks. Fold into apricot mixture. Pour into 1 pint container, cover, label and freeze.

Mousse: Whipped cream, sweeteners, and flavors rich in fat and air, may contain gelatin.

Fruit Mousse

¾ tsp. gelatin ½ cup powdered sugar

3 tbsp. water 1 tbsp. lemon juice

1 cup crushed fruit 1 cup whipping cream

dash salt

Soak gelatin in 1 tbsp. cold water, then dissolve in 2 tbsp. boiling water. Combine fruit, salt and sugar. Add dissolved gelatin. Chill 30 minutes and add lemon juice. Beat whipping cream until thickened, but not stiff. Fold into fruit and gelatin mixture. Pour into 1 pint container, cover, label and freeze.

Cranberry Ice

3 cups water 2 cups cranberry juice cocktail

1½ cups sugar 1 tbsp. lemon juice

dash salt

Combine water, sugar, and salt; boil until sugar dissolves. Cool; add cranberry and lemon juices. Pour 2 cups into loaf pan, cover with foil, label and freeze. Freeze the remainder using a electric ice cream freezer, directions below.

Prepare ice crystalline products with an ice cream freezer.

Directions for operation of electric ice cream freezer:

Wash and rinse freezer can, dasher, and lid.

Place cooled mixture into freezer can. Fit in dasher and adjust cover.

Place freezer can in outer container and adjust before adding ice and salt.

Using 1 part (volume) coarse rock salt to 6 parts crushed ice, distribute about 3 inches of ice in bottom of freezer; then add salt and ice in layers, packing ice and salt slightly higher than the level of mixture in the freezer can.

Turn on ice cream mixer 20–30 minutes.

Put mixture into 1 pint container, cover, label, freeze.

Vanilla Ice Cream

¾ cup half-and-half 1½ teaspoon vanilla

½ cup sugar 1½ cup whipping cream

Combine half-and-half, sugar and vanilla. Stir until sugar dissolves. Stir in whipping cream. Freeze, using an electric ice cream freezer.

Orange Milk Sherbet

½ tsp. grated orange zest ⅔ cup orange juice

⅔ cup sugar 1 cup very cold milk

1 tbsp. fresh or frozen lemon juice

Stir together orange zest and sugar. Add lemon and orange juices; stir until sugar dissolves. Stir mixture gradually into milk. If the milk curdles slightly, it will not affect the texture of the frozen sherbet. Freeze in ice cream freezer, according to directions above.

U.S. STANDARDS FOR COMMERCIAL FROZEN DAIRY DESSERTS

2022 CODE OF FEDERAL REGULATIONS **

Ice Cream:

contains nutritional sweeteners; must be at least 10% milk fat and 20% total milk solids or, if it contains bulky flavors (e.g. fruits), 8% milk fat and 16% total milk solids. Weighs at least 4.5 pounds per gallon.

Sherbet:

contains nutritional sweeteners; must be between 1 and 2% milk fat and

between 2 and 5% total milk solids. Weighs at least 6 pounds per gallon.

** Some regulations may not apply to products labeled “reduced calorie” or “light”.

Characteristics of the standard product:

Ice crystals in frozen desserts should be small; however, size may vary between products, depending on the identify of the interfering ingredients and the methods of preparation. For example, the crystal size of an ice is expected to be considerably larger than that of a mousse. A frozen desserts should have flavor typical of the product and a spoonable yet firm consistency. It should be smooth rather than grainy, with body appropriate to the product.

Evaluation

Product Interfering Agents Appearance & Flavor Consistency (firmness) Texture (smoothness) Body (mouth feel)

Apricot Mousse

Fruit Mousse

Cranberry Ice, still-frozen

Cranberry Ice, hand cranked

Orange Sherbet

Vanilla Ice Cream

Commercial Vanilla Ice Cream (less expensive)

Frozen Yogurt

Commercial Sherbet

Refrozen Vanilla Ice Cream

Other

5.2 Introduction to Carbohydrates – Sugar

Objectives and Laboratory Problems

To determine the effect of dry heat on sugar.

To describe sensory properties of the sugars and syrups.

Describe the major differences in sensory properties between the following types of sugars and syrups:

Type Characteristics Sensory Properties

Granulated Sugar crystalline sucrose

Commercial Raw Sugar semi-refined granulated sugar

Powdered or Confectioners Sugar finely pulverized white sugar with 3% corn starch added to prevent lumping

Molasses by-product of producing refined white sugar from cane. Contains sucrose, other sugars, organic acids and minerals

Light Molasses syrup produced from first boiling of sugarcane juice

Dark Molasses syrup produced from second boiling of sugarcane juice; less sweet and more flavorful than light molasses

Light Brown Sugar sugar less refined than granulated sugar, coated with molasses

Dark Brown Sugar sugar even less refined than light brown sugar, coated with molasses

Light Corn Syrup clear syrup made from hydrolyzed cornstarch, containing glucose, maltose and dextrin's. May have added high-fructose corn syrup and/or added flavorings: vanilla, salt.

High Fructose Corn Syrup corn syrup in which some of the glucose has been enzymatically converted to fructose, a sweeter sugar than sucrose

Dark Corn Syrup mixture of light corn syrup and refiners' syrup

Honey plant nectar which has been concentrated by bees. The major sugars are fructose and glucose

Sorghum concentrated sap of sorghum cane

Maple Syrup concentrated sap of maple trees

Imitation Maple Syrup or Pancake Syrup blend of syrups, often including imitation or natural maple syrup, intended for use on pancakes.

Effect of dry heat on sugar:

Spread ½ cup sugar evenly in iron skillet.

Heat slowly until sugar is completely melted.

Pour half of melted sugar onto greased, warm plate.

Add ⅛ tsp. soda to remaining sugar, stir rapidly to blend, and pour onto greased, warm plate.

Record observations.

Product Color Texture Flavor

Caramelized Sugar

Caramelized Sugar with Soda Added

5.2 Concept Review Introduction to Carbohydrates – Sugar

Describe the reaction that occurs when soda is added to caramelized sugar.

Which sugars are reducing sugars?

5.3 Amorphous Candies

Objectives:

To observe the proportion of ingredients, heating, and handling of amorphous candy mixtures.

To relate ingredients and endpoint temperature to candy characteristics.

Laboratory Problems:

Prepare amorphous candies.

Evaluate candies, immediately and after storage.

Terms

Amorphous/Non-Crystalline Candies—these candies have many interfering agents and are cooked at very high temperatures to prevent crystallization.

Amorphous/Non-Crystalline Candies: Peanut Brittle, Caramels, Hard Candy, English Toffee, Butterscotch

Crystallization— Ice Crystals vs Sugar Crystals determines the texture smooth or grainy

Interfering Agents–Prevent Crystallization Examples: Butter, Corn Syrup, milk, brown sugar, 1/2 & 1/2

General Directions Calibrate thermometer. Hold thermometer in 2.5 inches of boiling water for 2 minutes. If thermometer does not read 100oC (212oF), make the appropriate adjustment up or down on subsequent readings. Thermometers inaccurate by > 1oC (3oF) should not be used.

Prepare amorphous candies according to the recipes below.

Determine end point temperature with calibrated thermometer and with cold water test. Completely immerse thermometer bulb in syrup to attain accurate measurement.

Reserve a portion of each candy for observation in the following lab period.

Cold Water Test

Pour a small amount of syrup into cold water and observe behavior.

Stage Syrup Description Temperature

Soft Ball Forms a ball – loses its shape when removed 112–115°C (234–240°F)

Firm Ball Forms a ball – maintains its shape when removed 118–120°C (244–248°F)

Soft Crack Separates upon contact with cold water into threads that crack when touched 132–143°C (270–290°F)

Hard Crack Separates upon contact with cold water into fine, brittle threads 149–154°C (300–310°F)

English Toffee

¼ cup blanched slivered almonds 2 tbsp. water

¾ cup sugar ¼ cup semisweet chocolate, melted

½ cup butter (not margarine) double boiler

Butter cookie sheet. Spread almonds on baking sheet and bake at 300oF until light brown (approx. 8 min.); chop. In a small saucepan, cook sugar in butter and water to 137oC (280°F), the soft crack stage. Add the almonds and cook to 152oC (305°F), the hard crack stage. Pour onto a buttered baking sheet. When cold, spread with chocolate that has

been melted in double boiler. When chocolate has set, break into pieces.

Caramels

½ cup half and half ¼ cup butter

½ cup sugar ¼ tsp. vanilla

1/3 cup dark corn syrup

Butter 6×6 pan. Scald half-and-half (heat to 92ºC for 1 min.). Place sugar, corn syrup, butter, and ¼ cup half-and-half in heavy saucepan. Bring to boiling over low heat, stirring constantly. Slowly add remaining ¼ cup half and half. Cook over medium-low heat to firm ball stage (118ºC or 245ºF), stirring near the end of the cooking period to keep mixture from scorching. Remove from heat; stir in vanilla. Pour into buttered 6″x6″ pan. Mark into squares when cool; cut when cold.

Butterscotch

1 cup brown sugar 3 tbsp. butter

2 tbsp. light corn syrup dash salt

½ cup water

Butter 6×6 pan. Combine ingredients in heavy saucepan. Cook and stir until candy reaches soft crack stage (142°C or 288°F). Immediately pour into buttered 6×6 pan and cool. Crack into pieces.

Peanut Brittle

1 cup sugar 1 cup unroasted Spanish Peanuts

½ cup light corn syrup ¼ tsp. salt

½ cup water 1 tbsp. butter

½ tsp. baking soda

Grease cookie sheet with butter. Heat and stir together sugar, corn syrup, and water until sugar dissolves. Cook to soft ball stage (112°C or 234°F). Add peanuts and salt. Cook to hard crack stage (154°C or 309°F), stirring constantly. Stir in butter and soda just enough to mix (mixture will bubble). Pour onto buttered cookie sheet. Lift edges with spatula to partially cool and keep from sticking. While warm, stretch to desired thinness. When cool, break into irregular shaped pieces.

Hard Candy

1 cup sugar 2–3 drops oil flavoring: anise, cinnamon, wintergreen, fruits, etc.

¼ cup light corn syrup ¼ cup water

dash salt few drops appropriate food coloring

Butter cookie sheet. Combine sugar, syrup, water, and salt; bring to boil. Cook to 144°C or 290°F. Stir in food coloring and flavoring. Pour onto buttered baking sheet to cool. When cool, break into pieces.

5.4 Basic Crystalline Candies

Objectives:

To demonstrate the ability to prepare and evaluate crystalline candies.

To identify relationships between the ingredients in common types of crystalline candies and smoothness of the products.

To discuss the effects of small differences in different students' techniques on smoothness and quality of some crystalline candies.

To identify the effects of ripening and of spontaneous crystallization on previously prepared fondants.

To compare crystalline and amorphous candies as to proportion of ingredients, heating and handling.

Laboratory Problems:

Prepare common types of crystalline candies.

General Directions

Prepare crystalline candies according to the recipes below.

Determine end point temperature with calibrated thermometer and with cold water test.

Reserve a portion of each candy for observation in the following lab period.

Chocolate Fudge

1 cup sugar dash salt

1/3 cup milk ½ tsp. corn syrup

1 oz. unsweetened chocolate, cut into pieces 1 tbsp. butter

½ tsp. vanilla

Combine sugar, milk, chocolate, salt, and corn syrup in a small (1 quart) heavy saucepan. Heat and stir until sugar dissolves. Boil, uncovered, over medium heat to 112°C (234°F), the soft ball stage. Remove from heat and add butter, do not stir. Cool to lukewarm (43ºC) without disturbing. Add vanilla, then beat vigorously until fudge thickens and begins to lose its gloss. Pour out into buttered 6-inch square pan. Score into squares; cut when firm.

White Fudge

1 cup sugar dash salt

1/3 cup milk 1 tbsp. butter

1 tsp. light corn syrup ½ tsp. vanilla

Combine sugar, milk, corn syrup, and salt in a heavy saucepan. Heat and stir until sugar dissolves. Boil uncovered over medium heat to 113.5°C (236°F), the soft ball stage. Remove from heat and add butter; do not stir. Cool to lukewarm without disturbing. Add vanilla, then beat vigorously until fudge thickens and begins to lose its gloss. Pour into 6-inch square buttered pan. Score into squares; cut when firm.

Penuche

1 cup brown sugar 1 tbsp. butter

1/3 cup milk ½ tsp. vanilla

dash salt

Combine brown sugar, milk, and salt in a heavy saucepan. Heat and stir until sugar dissolves. Boil uncovered over medium heat to 114°C (237°F), the soft ball stage. Remove from heat and add butter; do not stir. Cool to lukewarm without disturbing. Add vanilla, then beat vigorously until candy thickens and begins to lose its gloss. Pour into 6-inch square buttered pan. Mark into squares; cut when firm.

Pralines

¾ cup sugar 2 tbsp. butter

¾ cup brown sugar 1 cup pecan halves

2/3 cup half and half

Combine sugars and half & half in a heavy saucepan. heat and stir until sugar dissolves. Boil uncovered over medium heat to 114°C. Remove from heat, add butter, but do not stir. Cool without stirring, to 65°C. Stir in nuts. Beat until candy just begins to thicken but is still glossy (about 3 minutes.) Drop by spoonfuls onto waxed paper.

Characteristics of Standard Product:

Appearance Texture Flavor

Color typical of type of candy. Satin sheen on surface.

Very fine, uniformly smooth (fudge, penuche) or grainy (pralines). Holds cut edge.

Soft but not sticky at room temperature.

Sweet, well-blended flavors typical for type of candy.

5.3 and 5.5 Evaluation Amorphous & Crystalline Candies

Evaluation:

Name of Candy Crystalline or Amorphous End Point Temperature Contribute Foreign Sugars Effect of Storage Sensory Attributes

Chocolate Fudge

White Fudge

Penuche

Pralines

Butterscotch

Caramels

Peanut Brittle

English Toffee

Hard Candy

5.3 and 5.4 Concept Review Amorphous & Crystalline Candies

What makes a candy amorphous?

What is important to do when making an amorphous candy?

What are some amorphous candies sold in the store?

List three different types of interfering agents:

Describe the different types of temperatures when making candy–

Soft Ball –

Firm Ball –

Soft Crack –

Hard Crack –

What makes a candy crystalline?

What temperature is necessary for your fudge to reach?

What does an interfering agent do?

Give two examples of an interfering agent.

Why are interfering agents used in crystalline candies?

Why do we agitate fudge once cooled?

5.5 Basic Fondants

Objectives

To apply the techniques of crystalline candy formation to making basic fondants

To examine the various interfering agents and their relationship to sugar crystal formation

Laboratory Problems

Prepare fondants of varying composition, utilizing techniques for the preparation of crystalline candies.

Observe the appearance and size of spontaneous crystals on preparation day and again on evaluation day.

Prepare fondants with the following composition

Treatment Composition

A 1 cup sugar ½ cup water

B 1 cup sugar 1/8 tsp. cream of tartar

½ cup water

C 1 cup sugar 1 tbsp. light corn syrup

½ cup water

D ½ cup brown sugar ½ cup white sugar

½ cup water

E 1 cup sugar 1 tbsp. butter

½ cup water

General Directions

Combine ingredients in heavy saucepan. Heat and stir until sugar dissolves.

Continue cooking over medium heat until mixture boils. Wipe sides of on with clean, moist cheesecloth wrapped around fork, or cover pan and boil 2 or 3 minutes.

Continue boiling until mixture reaches soft ball stage (114°C or 237°F), stirring only if necessary to keep from scorching. Check doneness with both a thermometer and the cold water test.

Immediately pour out 2/3 of the mixture onto buttered plate to cool. Pour remaining 1/3 of mixture into a labelled custard cup; cover and store until next class period. Do not scrape pan.

Cool fondant on plate to lukewarm (40°C –104°F) without disturbing.

Beat vigorously to recrystallize; then knead until fondant has a smooth, soft, plastic consistency.

Wrap half of fondant in waxed paper label, and store to ripen until next class period. Evaluate remainder and observations on chart.

Characteristics of the standard product

Appearance Texture Flavor

White in color (except for butter and brown sugar fondants). Smooth surface.

Moist, pliable without stickiness Holds a cut edge

Very smooth mouth feel.

Typical for recipe used.

6 Starch Characteristics and Cookery

6.1 Starch Paste Characteristics: White Sauces

Objectives

To use appropriate techniques for the prevention of lumping.

To use appropriate techniques for thickening a starch mixture

To observe the range of viscosity in starch-thickened sauces with proportions varying from 1 to 4 tbsp. flour per cup of liquid.

Laboratory Problems

Determine the effectiveness of various methods of separating starch granules.

Prepare basic white sauces and variations.

Preparation of sauce and variations:

WHITE SAUCE

Thin Medium Thick Very Thick

Butter or margarine 1 tbsp. 2 tbsp. 3 tbsp. 4 tbsp.

Flour 1 tbsp. 2 tbsp. 3 tbsp. 4 tbsp.

Salt* 1/8 tsp. 1/8 tsp. 1/8 tsp. 1/8 tsp.

Milk 1 cup 1 cup 1 cup 1 cup

Melt fat in saucepan. Blend in flour and salt; remove from heat. Add milk, stirring to blend; return to heat and stir gently while heating quickly to the full boil. Boil 1 minute if sauce is not to be cooked further.

*Amount of salt may vary with added ingredients or intended use of the white sauce.

WHITE SAUCE VARIATIONS

Tomato Sauce: Substitute tomato juice for milk in the above recipe for medium sauce. Omit salt.

Brown Sauce: Follow instructions for medium white sauce with the following changes: 1) Omit salt if a salted liquid is used. 2) After the flour and butter are blended, continue to heat until the mixture has turned a light brown color. 3) Substitute water, bouillon or vegetable juice for milk.

Evaluation

Sauce Appearance Texture Flavor Uses

Thin White Sauce Cream soup, vegetable sauce

Medium White Sauce Casserole base, cheese sauce

Thick White Sauce Soufflé

Very Thick White Sauce Croquettes

Tomato Sauce Tomato soup or gravy

Brown Sauce Gravy, meats

6.1 Starch-Thickened Products

Objectives:

To demonstrate increased skill in thickening starch mixtures.

To prepare some basic starch-thickened products.

To identify a standard product for pudding and to compare its qualities with commercial pudding products.

Laboratory Problems:

Prepare cream soups.

Prepare basic puddings.

Prepare commercial puddings.

Terms

Starch Gelatinization

Amylopectin

Amylose

Cereal Starch

Root Starch

Modified Starch

Sol

Gel

Retrogradation

Syneresis

Prepare cream soups:

Cream of Asparagus, Spinach, or Pea Soup

1 tbsp. flour 1 tbsp. butter or margarine

⅛ tsp. salt 1 cup milk

2 tsp. finely chopped or minced fresh onion (not dry minced) ¼ cup pureed or finely chopped vegetable

white pepper

Cook onion in butter over low heat until onion is translucent. Stir in flour and salt; remove from heat. Add milk, stirring to blend; return to heat and stir gently while heating quickly to the full boil. After the mixture has boiled 1–2 minutes, add vegetable. Heat to serving temperature and add white pepper as needed.

Pimento and Onion Soup

1 tbsp. flour 2 tsp. minced fresh onion

1 tbsp. butter or margarine 1 tbsp. chopped pimento

⅛ tsp. salt white pepper

1 cup milk

Cook onion in butter over low heat until onion is translucent. Stir in flour and salt; remove from heat. Add milk, stirring to blend; return to heat and stir gently while heating quickly to the full boil. After the mixture has boiled 1–2 minutes, add pimiento. Heat to serving

temperature and add white pepper as needed.

Cream of Celery Soup

¼ cup thinly sliced celery 1 tbsp. flour

2 tsp. minced fresh onion ½ cup milk

1 tbsp. butter ½ cup chicken or vegetable broth

Cook celery and onion in butter over low heat until vegetables are translucent. Stir in flour; remove from heat. Add milk and broth, stirring to blend, return to heat and stir gently while heating quickly to a full boil. Boil 1 minute then remove from heat.

Cream of Potato Soup

⅔ cup diced potatoes 2 tsp. flour

¼ tsp. salt ½ cup milk

1 tbsp. butter ½ cup reserved cooking liquid

2 tsp. minced fresh onion 1 tsp. fresh parsley, chopped

dash white pepper

Peel, dice and cook potatoes in enough salted water to just cover potatoes; drain and reserve cooking liquid. Cook onion in butter over low heat until onion is translucent. Stir in flour; remove from heat and add milk and reserved cooking liquid from potatoes, stirring to blend, return to heat and stir gently while heating quickly to a full boil. Boil 1 minute then remove from heat. Add potatoes and parsley; heat to serving temperature and add white pepper as needed.

Characteristics of a Standard Product

Appearance Consistency Flavor

Color typical for product.

No surface skin or fat separation.

Smooth, neither slick nor lumpy.

Viscosity similar to thin white sauce.

Mild, well-seasoned vegetable flavor.

No raw starch flavor.

Evaluation

Cream Soup Appearance Consistency Flavor

Asparagus

Spinach

Pea

Pimento and Onion

Celery

Potato

Prepare Basic Puddings

Cocoa Pudding

1 tbsp. cornstarch 1 cup milk

¼ cup sugar ½ tsp. vanilla

1 tbsp. cocoa ½ tsp. butter

dash salt

Mix cornstarch, sugar, cocoa, and salt. Blend in milk. Cook over medium heat, stirring gently until mixture boils. Continue cooking over direct heat 2 to 3 minutes, stirring slowly but constantly. Remove from heat, blend in vanilla and butter, and pour into serving dish to cool.

Chocolate Pudding

1 tbsp. cornstarch 1 cup milk

¼ cup sugar ⅓ oz. unsweetened chocolate, cut in small pieces

dash salt ½ tsp. vanilla

Mix cornstarch, sugar and salt. Blend in milk; add chocolate. Cook over medium heat, stirring gently until mixture boils. Continue cooking over direct heat 2 to 3 minutes,* stirring slowly but constantly. Remove from heat, blend in vanilla, and pour into serving dish to cool.

*Or cook, covered, in a double boiler for 10–15 minutes, stirring

occasionally.

Vanilla Pudding

¼ cup sugar 1 cup milk

1 ½ Tbsp cornstarch 1 ½ tsp butter

1/8 tsp salt ½ tsp vanilla extract

In a small saucepan, combine sugar, cornstarch and salt. Gradually stir in milk. Cook and stir over medium heat until thickened. Reduce heat; cook and stir 1 minutes longer. Remove from heat and stir in butter and vanilla. Pour into serving dish and cool.

Peach Tapioca Pudding

1 tbsp. quick-cooking tapioca ½ cup peaches, chopped fine

dash salt few drops of almond extract

⅔ cup peach juice (from can) and/or water**

Mix tapioca and salt. Blend in peach juice and/or water; let stand 5 minutes. Cook over medium heat, stirring occasionally, until mixture barely simmers. Simmer for 1 minute; remove from heat. Cover and let stand about 5 minutes to complete gelatinization of starch. Stir in peaches and almond extract. Pour into serving dish and cool.

**Add 1 tbsp. sugar for each ½ cup water.

Prepare commercial puddings

Prepare ½ package of regular packaged pudding and pie filling mix, or instant pudding mix according to package directions.

Characteristics of Standard Product

Appearance Texture Flavor

Color typical of product.

Shiny film formed on top of cooked milk puddings.

Pudding either mounds slightly or is tender gel, free from lumps.

Light, delicate mouth feel.

Distinct, slightly sweet.

Flavor typical for type of product.

Evaluation

Pudding Appearance Texture Flavor Overall Quality

Cocoa

Chocolate

Vanilla

Peach Tapioca

Packaged (Cook-N-Serve)

Packaged instant

Snack-Pack(refrigerated)

6.1 Concept Review Starch-Thickened Products

What are the three ways to separate starch and prevent lumps?

Describe a sol versus a gel and give an example of each. Which starches will form a gel and which will form a sol?

Provide a definition for the following terms Retrogradation

Syneresis

Amylose

Amylopectin

Describe the three stages of gel formation Granule Swelling

Gelatinization

After Heating

What is the effect of excess stirring on texture of starch thickened products?

Why are butter and vanilla added at the end of the cooking period rather than at the beginning?

Compare tapioca and corn starch puddings for

method of preparation.

texture after cooling.

film formation.

6.2 Cookery of Cereals and Pastas

Objectives

To recognize a variety of cooked cereal products and identify the processing that gives each its unique characteristics.

To produce and recognize standard cooked pastas and other cereal products.

To evaluate the package directions in relation to the problems encountered with lumping and retained raw starch flavor in some cereals.

Laboratory Problems

Prepare noodles and other pastas.

Prepare breakfast cereals.

Terms

Grain: Bran, Germ, Endosperm

Enrichment

Fortification

Processing: grinding, rolled, cracking, milling

Gelatinization

Whole grain

First Preparation Day:

Prepare noodles according to recipe given below:

Noodles

½ egg, beaten ¼ tsp. salt

1 tbsp. milk ½ cup flour

Combine egg, milk, and salt. Add flour to make a stiff dough, may need

1–2 Tbsp. additional flour. Roll out as thin as possible on cutting board. Let stand about 20 minutes to partially dry. Roll loosely as for jelly roll and cut ¼ -inch-wide noodles. Or roll and cut with a pasta machine. Spread on tray; cover with dish towel and let dry until next class period. (Two hours or more drying is usually recommended.)

Second Preparation Day:

Prepare noodles.

1. Laboratory Manual recipe.

Add noodles to boiling salted water, using a volume of water approximately three times that of the noodles, and cook uncovered until done, about 10 minutes. Or boil 2 minutes, cover, remove from heat, and let stand until al dente, about 10 minutes.

Evaluation of alimentary pastas:

Pasta Length of Cooking Time Volume Increase Appearance Texture Flavor

Noodle

Characteristics of standard product for pastas:

Appearance Texture Flavor

Separate, intact pieces.

Color typifying product.

Firm, yet tender. Al dente.

Moist and gelatinized throughout.

Mild; noodles have some egg flavor.

No raw starch flavor.

Directions for Breakfast Cereal Preparation

Prepare one or two servings of each breakfast cereal.

Cook according to package directions with water until cereal loses the raw starch flavor, adding additional water if necessary. Cereal may be stirred gently with a fork. Record cooking time. Record observations on chart.

Characteristics of a standard product for breakfast cereal:

Appearance Texture Flavor

Color characteristic of the cereal.

No surface film.

Light, homogeneous consistency with distinct particles typical of cereal type.

Free from lumps and unsoftened cellulose particles.

Moist, slightly chewy mouthfeel.

Mellow flavor typical of cereal type; free from raw starch flavor.

Evaluation of Breakfast Cereals

Cereal Product Type and Parts of Grain Present Type of Processing and/or Additions to Products Cooking Time Sensory Attributes

Traditional Oats (Old-Fashioned)

Quick Oats

Instant Oats

Cream of Rice

Cream of Wheat

Malt-O-Meal

Quick Grits

Instant Grits

Cornmeal

Multigrain

Other

6.2 Concept Review Cookery of Cereals and Pastas

Label whole grain

How does the amount of processing affect sensory properties of the oatmeal?

Define:

hominy –

hominy grits –

bulgur –

farina –

durum wheat –

semolina –

couscous –

pasta –

malt –

How do the following affect the proportion of water to cereal? Why?

size of particle

size of recipe

What is the major compositional difference between noodle and macaroni products?

What is the appropriate ratio of cooking water to dry pasta? Compare to ratios for rice and cereal.

6.3 Methods of Preparation – Cereal Grains

Objectives And Laboratory Problems

To prepare cereal grain dishes appropriate for a variety of menu uses.

To prepare a variety of pastas.

Prepare cereal grain and pasta dishes according to the following recipes.

Barley:

Barley Casserole

2 tbsp. butter 1 tsp. beef bouillon granules

¼ cup chopped onions 1 cup hot water

¼ cup mushrooms, sliced 1 tbsp. pimiento

⅓ cup quick pearl barley dash pepper

Sauté onions, mushrooms, and barley in butter until onions are lightly browned. Place in casserole dish with tight fitting lid. Dissolve bouillon granules in hot water. Stir in pimiento, pepper, and bouillon. Cover and bake at 350°F for 1 hour or until barley is tender and liquid is absorbed.

Corn:

Polenta with Cheese

⅓ cup yellow cornmeal ⅓ cup grated parmesan cheese

1/8 tsp. salt 1 oz. shredded Swiss cheese

⅓ cup cold water 1 cup boiling water

Mix cornmeal, salt, and ⅓ cup cold water in saucepan. Stir in 1 cup boiling water. Cook, stirring constantly, until mixture boils; reduce heat. Cover and simmer, stirring occasionally, about 10 minutes. Remove from heat. Spread ⅓ of the mixture in greased 1-pint casserole. Sprinkle ⅓ of the Parmesan and Swiss cheeses over the cornmeal. Continue to layer the cornmeal and cheeses two more times. Bake uncovered in 350°F oven until hot and bubbly, 15-20 minutes.

Millet:

Millet Casserole (Greece)

⅓ cup millet ½ egg

2 cups water 1 – 1½ tbsp. lemon juice

1 tbsp. butter 1 tbsp. Parmesan cheese

1 tsp. whole wheat flour 1 tbsp. chopped parsley

⅓ cup milk ⅓ cup vegetable stock

Boil millet and water in covered saucepan until water is absorbed, about 35 minutes.

Prepare sauce in separate saucepan. Melt butter. Blend flour into melted butter. Add milk and stock. Heat to boiling. Remove from heat. Beat egg and lemon juice; add a small amount of the sauce to the egg mixture, and return all of the egg mixture to the sauce. Heat until the egg thickens. Remove from heat; after the mixture has cooled

slightly, blend in half the cheese. Serve cooked millet in 1-pint casserole dish. Pour sauce over the millet and top with remaining cheese and chopped parsley.

Barley:

Squash, Corn, and Barley Succotash

1 cup water ½ cup quick barley

½ tsp salt 1 tbsp. olive oil

¼ cup finely chopped onion 2 cups butternut squash, peeled and cut into ½ – inch cubes

½ cup chicken broth 1/8 tsp black pepper

1/8 tsp dried thyme, crushed ¾ cup whole kernel corn

2 tbsp. snipped fresh parsley

In a medium saucepan bring water to boiling. Add barley and ¼ tsp salt. Return to boiling; reduce heat. Cover and simmer about 40 minutes or until barley is tender, stirring occasionally. Drain and set aside.

Meanwhile, in a very large skillet heat oil over medium-high heat. Add onion; cook and stir about 5 minutes or until tender. Stir in the remaining ¼ tsp salt, squash, broth, pepper, and thyme. Bring to a boil; reduce heat. Cover and simmer 10-15 minutes or until squash is just tender. Stir in corn; cover and cook 5 minutes more. Stir in barley and parsley; heat through.

Rice and Wild Rice:

Polished Rice

⅓ cup uncooked rice ⅛ tsp. salt

¾ cup water

Put rice, water, and salt in heavy saucepan; cover with tight fitting lid. Bring to a full boil; reduce heat to very low boil and cook until done,[1] approximately 15-25 minutes depending on variety of rice and temperature. (Add more water if necessary to prevent scorching.)

Fried Rice

¾ cup water ¼ cup cooked ham

⅛ tsp. salt ⅓ cup medium grain rice

1 tbsp. soy sauce 1 green onion, sliced

1 egg, slightly beaten 2 tsp. vegetable oil

Put rice, water, and salt in heavy saucepan; cover with tight fitting lid. Bring to a full boil; reduce heat to very low boil and cook until done,[2] approximately 15–25 minutes depending on variety of rice and temperature. (Add more water if necessary to prevent scorching.)

Sauté onions in oil until tender; remove onions from pan. Add rice to pan and cook until hot (add more oil if necessary), 5–10 min. Stir in onions, meat, soy sauce, and egg. Cook over low heat, stirring constantly, until eggs are cooked. Pack rice into 1 pint baking dish; invert onto plate.

Fruit Pilaf

⅓ cup brown rice ¼ tsp. ground sage

¼ cup chopped onion ¼ tsp. ground thyme

2 tbsp. uncooked wild rice ⅛ tsp. pepper

2 tbsp. chopped celery ½ apple, cored, pared, and diced

1½ tbsp. butter ¼ cup dried chopped apricots

2 cups water 2 tbsp. chopped walnuts

1 tsp. chicken bouillon granules

Sauté brown rice, onion, wild rice, and celery in butter in saucepan over low heat until onion is tender, about 10 minutes. Add water, bouillon, sage, thyme, and pepper. Heat to boiling; reduce heat and cover tightly. Gently boil about 45 minutes, until rices are done. Add more water if necessary to prevent scorching. Stir in remaining ingredients. Heat to serving temperature.

Yellow Rice

½ tbsp. butter 1 tbsp. raisins

¼ cup polished long grain rice ½-inch to 1-inch cinnamon stick

⅛ tsp. turmeric ⅛ bay leaf

⅛ tsp. salt ⅔ cup water

In a medium-sized saucepan, melt the butter over moderate heat; add the rice, and stir to mix.

Add remaining ingredients to pan; cover with tight fitting lid. Bring to a full boil; reduce heat to very low boil and cook until done,[3] approximately 15–25 minutes depending on variety of rice and temperature. (Add more water if necessary to prevent scorching.)

Rice with Vegetables

½ cup polished long grain rice 2 tbsp. fresh red pepper, chopped fine

1 cup water ¼ tsp. salt

2 tbsp. celery, chopped fine 1 tbsp. onion, finely chopped

2 tbsp. broccoli, chopped 1 tbsp. butter

2 whole mushrooms, chopped ½ tomato, blanched, peeled, and chopped

dash cayenne pepper

Boil rice, water, and ⅛ tsp. salt until rice is soft and water is absorbed. In a small frying pan, sauté the onion in butter. Add the tomatoes, red pepper, celery, and broccoli. Sauté for 4–6 minutes or until the vegetables begin to soften. Add the mushrooms and cook for an additional 1–2 minutes. Season with the remaining salt and the cayenne.

Add the rice to the vegetables and stir the mixture to combine. Cook, stirring gently, until the mixture is thoroughly heated through.

Rice Pilaf (Armenia)

½ oz. vermicelli pasta, broken into 1-inch pieces 1 cup water

1 tbsp. butter ⅓ cup converted rice

1 beef bouillon cube OR 1 tsp. beef bouillon granules Worcestershire sauce (optional)

In small skillet, melt fat. Add vermicelli and brown over low heat. Stir frequently. Add bouillon and water, and bring to a boil. Stir in rice. Cover, reduce heat, and simmer until done, approximately 20–25 minutes, stirring occasionally. Worcestershire sauce may be added.

Wild Rice Supreme

2 tbsp. wild rice 2 tsp. butter

2 cups water ¼ cup condensed cream of mushroom soup

¼ cup converted rice 1 tbsp. diced onion

¼ cup half-and-half 1 tbsp. chopped green pepper

dash fines herbs dash curry

Rinse wild rice. In covered pan, boil wild rice and water 25 minutes. Add converted rice and cook until rice is soft, 25-30 minutes. Add more water if necessary to avoid scorching. Sauté onion and green pepper in butter. Blend in soup, half-and-half, fines herbs, and curry. Add rice and serve.

Fried Rice (India)

2 tbsp. slivered almonds 1 tsp. instant chicken bouillon granules

½ cup long grain polished rice ½ medium onion, chopped

½ tsp. curry powder 2 tbsp. butter

1⅛ cups boiling water ¼ cup raisins (optional)

Spread almonds on baking sheet. Bake at 300oF until lightly browned. Sauté rice and onion in butter until rice is yellow and onion is tender. Stir in raisins, bouillon granules, and curry powder. Pour into ungreased 1-pint casserole; add water. Cover with tight fitting lid and bake in 350oF oven until liquid is absorbed, 25-30 minutes. Stir in almonds.

Wheat:

Parmesan Gnocchi (Italy)

⅔ cup milk 6 tbsp. farina (Cream of Wheat)

2 tbsp. butter 1 egg, slightly beaten

¼ tsp. salt ⅔ cup grated Parmesan cheese

8 oz. tomato, pizza or spaghetti sauce

Heat milk, butter, salt and farina, stirring slowly but constantly. Cook until mixture is very thick. Cool slightly and stir in egg and half of cheese. Chill until firm. Form into balls with teaspoon and roll in remaining cheese. Bake on greased baking sheet at 425oF until hot and light brown, about 10-15 minutes; turn once with spatula. Heat sauce; serve separately.

Tabbouleh (Middle East)

½ cup bulgur ½ cup green onions, chopped fine

boiling water ¼ cup peeled, chopped tomato

1–2 tbsp.[4] fresh mint leaves, chopped fine 3 tbsp. olive oil

½ cup fresh parsley, chopped fine 2–3 tbsp. lemon juice

salt and pepper to taste

Place bulgur in mixing bowl and add enough boiling water to barely cover. Cover and let stand 30 minutes or until water is absorbed. Cool bulgur and drain if necessary. Stir in remaining ingredients.

Couscous (Moroccan Wheat)

1 tbsp. butter 2/3 cup chicken broth

½ cup couscous 1/3 cup slivered almonds

2/3 cup fresh pea pods

Brown almonds in a bit of oil, be careful not to burn them. Set aside. Sauté pea pods until crisp tender, cool quickly under cold water, drain, pat dry and slice thin crossways. In top of double boiler, heat broth. Add butter and let melt, add couscous, stir and continue to cook in double boiler. Cover and stir several times, cooking 10–15 minutes until tender. Add almonds and peas, heat through, adding more butter if desired. Fluff before serving.

Couscous (North Africa)

⅔ cup couscous ½ cup boiling water

⅓ cup raisins 1 tbsp. butter

¼ tsp. salt ¼ tsp. ground turmeric

Mix couscous, raisins and salt in 1–quart bowl; stir in boiling water. Let stand until all water is absorbed, 2 to 3 minutes. Heat butter in skillet until melted; stir in couscous and ground turmeric. Cook and stir until heated to serving temperature, about 4 minutes.

Quinoa

1 cup Quinoa 2 tbsp. fresh parsley, finely chopped

2 cup Water 2 tbsp. Olive oil

1 Zucchini, small, chopped 1 tsp sugar

½ red bell pepper, chopped Salt

1 Tbsp. Olive oil Pepper

2 tbsp. Lemon juice

Rinse quinoa by running water over grains in a saucepan. Drain and add two cups of water and a dash of salt to the saucepan.

Bring the water to boil. Simmer until water is absorbed (10–15 minutes). When cooked, quinoa will be translucent.

In a frying pan, heat 1 tbsp. olive oil. Add chopped bell pepper and sauté for 5 minutes on medium heat. Add chopped zucchini, season with salt and pepper, and sauté for 5 more minutes. Mix with quinoa.

Combine 2 tbsp. olive oil, lemon juice, parsley and sugar. Mix well and add to quinoa. Season with salt and pepper. Taste and adjust the lemon juice and seasoning.

Quinoa Salad

1 cup dry quinoa 2 oz chopped dry apricots

1 cup vegetable broth 3 oz feta cheese, herb seasoned

½ medium cucumber, chopped 2 tbsp olive oil

¼ cup chopped red pepper 1 tbsp red wine vinegar

¼ cup chopped green pepper ½ tsp garlic powder

1 chopped green onions 1 cup chopped fresh spinach

Simmer quinoa in vegetable broth for 15 minutes or until tender and broth is absorbed. Chill cooked quinoa 20 minutes. Add cucumber, red and green peppers, green onions, apricots, and cheese. Combine oil, vinegar and garlic powder and pour over quinoa and vegetables. Fold in chopped spinach.

Asparagus Risotto

½ pound asparagus, trimmed, cut into 1–inch lengths ¾ cup arborio rice or medium–grain white rice

2 ½ cups canned chicken broth ¼ cup water

1 Tbsp olive oil 3 tablespoons butter

¼ cup chopped onion ¼ cup + 2 tbsp freshly grated Parmesan cheese

Blanch asparagus pieces in large pot of boiling, salted water 2 minutes. Drain. Rinse asparagus under cold water. Bring chicken broth to simmer in small saucepan. Reduce heat to low and keep broth hot. Heat olive oil in heavy large saucepan over medium heat. Add chopped onion and sauté until translucent, about 4 minutes. Add rice and stir 3 minutes. Add water and cook until liquid evaporates. Continue cooking until rice is tender but still slightly firm in center and mixture is creamy, add chicken broth ½ cup at a time, stirring almost constantly, about 20 minutes. Add blanched asparagus pieces and stir until heated through, about 2 minutes. Remove from heat. Add butter and stir until incorporated. Stir in grated Parmesan cheese. Season risotto to taste with salt and pepper.

Recipe Grain Type Is the Grain a Whole Grain? Appearance/Texture/ Flavor

Barley Casserole

Polenta with Cheese

Millet Casserole

Squash, Corn, and Barley Succotash

Polished Rice

Fried Rice

Fruit Pilaf

Yellow Rice

Rice with Vegetables

Rice Pilaf

Wild Rice Supreme

Fried Rice

Parmesan Gnocchi

Tabbouleh

Couscous (Moroccan Wheat)

Couscous

Quinoa

Quinoa Salad

Asparagus Risotto

* * *

Rice is done when a kernel pressed between the fingers feels completely soft. Keep hot by putting rice in strainer over a pan containing boiling water. ↵

Rice is done when a kernel pressed between the fingers feels completely soft. ↵

Rice is done when a kernel pressed between the fingers feels completely soft. Discard the bay leaf and cinnamon stick. ↵

½ tsp. dried mint may be substituted if fresh mint is not available, but the quality will not be as good. ↵

6.4 Legumes

Objectives

To apply the principles of carbohydrate and protein cookery in rehydrating and cooking dried legumes.

To identify factors that influence the length of cooking time for dried legumes.

To prepare and taste several well-seasoned legume dishes which provide opportunities to gain increased appreciation of these economical and nutritious foods.

Laboratory Problems

Prepare legume dishes according to recipes provided. The recipe for ham broth used in several of these legume dishes is included below.

NOTE: Legumes must be soaked in advance in order to prepare and evaluate these recipes in a 3-hour laboratory period.

Terms

Gelatinization

General Directions For Preparing Legumes:

Prior to Lab:

Sort, then wash, dried legumes. One cup of dried legumes will yield approximately 2¼ cups after cooking.

Use soft water, if possible for soaking and cooking. Allow 2½ to 3 cups of water per cup of legumes. If very hard water must be used, add 1/8 tsp. baking soda per cup of beans.

Soaking Methods:

soaking legumes overnight in cold water, or

boiling legumes in water, uncovered, for 2 minutes then removing from heat, covering, and soaking for one hour.

During Lab:

Drain legumes, then cook in fresh water, or in broth according to specific recipe.

Season cooking water with ½ tsp. salt per cup of dried legumes.

Reduce foaming by adding 1 tbsp. fat per cup of legumes.

When using a pressure saucepan:

Fill only ⅓ full with water and always add 1 tbsp. fat to reduce foaming.

Cook under 15 lbs. pressure, beginning timing after pressure is reached.

Bring saucepan slowly to operating pressure and reduce pressure gradually (do not cool under running water.)

Continue preparation according to specific recipe.

Display a sample of the raw legumes with the prepared dish.

Hopping John

¼ cup dry black-eyed peas 1 tsp. chopped green pepper

1 cup vegetable broth 2 tbsp. minced onion

1 tbsp. vegetable oil 2 tbsp. chopped cooked ham

½ cup fresh water ⅓ cup condensed cream of mushroom soup

2 tbsp. long grain polished rice

Soak peas. Drain. Gently boil peas in a saucepan with broth, vegetable oil and fresh water about 15 minutes. Add rice and cook 15 minutes until peas are just tender, 15–20 minutes. Add remaining ingredients and season to taste with salt and pepper. Bake in covered one-pint casserole dish at 350°F for 30 minutes.

Edamame with Ginger, Garlic, and Sesame

2 Tbsp water 1 tsp rice wine vinegar

6 oz. frozen, shelled edamame 1 tbsp toasted sesame seeds

1 tbsp extra-virgin olive oil ¼ tsp toasted sesame oil

½ medium garlic clove, minced 1 tsp grated ginger

½ medium shallot, minced salt & pepper

Bring the water to a boil in a large skillet over high heat. Add the frozen edamame and pinch of salt, cover, and cook until the beans have thawed, about 2 minutes. Remove lid and continue to cook until the water has evaporated and the edamame are heated through, about 2 minutes. Add the oil, garlic, and shallots, and cook until the shallots are soft, about 3 minutes. Off the heat, stir in the rice wine vinegar, sesame seeds, and sesame oil, grated ginger and season with salt and pepper to taste.

Lentil Soup

¼ cup lentils ½ tsp. sugar

2½ cup vegetable broth ½ tsp. dry mustard

¼ cup chopped onion 1 tbsp. vegetable oil

¼ cup coarsely grated carrot 1½ tsp. vinegar

Salt

Combine ingredients except salt and vinegar. Gently boil until lentils are soft, about 25–35 minutes. Add vinegar and salt to taste.

Chili

½ cup dry kidney beans 1 tbsp. chopped celery

2 cups fresh water 1 tsp. lemon juice

1 tsp. salt ½ tsp. brown sugar

1 tbsp. vegetable oil ¼ tsp. Worcestershire sauce

1 slice bacon, diced ¼ tsp. vinegar

2 tbsp. chopped onion ¼ tsp. salt

¼ lb. ground beef ⅛ tsp. dry mustard

3 tbsp. ketchup 1 – 1½ tsp. chili powder

1 cup tomato juice

Soak kidney beans. Drain and combine beans, fresh water, salt, and vegetable oil in pressure saucepan. Cook at 15 lbs. pressure for 18 minutes.

Brown bacon in 6-inch skillet, remove. Sauté onion in bacon drippings, remove. Lightly brown beef, then drain off excess fat. Return bacon and onion to skillet, add remaining ingredients and drained kidney beans. Simmer covered for 30 minutes, adding more tomato juice if necessary.

Ensalada de Frijoles (Spanish Bean Salad)

2/3 cup dry garbanzo beans 3 cups fresh water

1 tsp. salt 1 tbsp. vegetable oil

½ cup commercial sour cream 3 tbsp. mayonnaise

1 tsp. grated onion 1 small clove garlic, crushed

¼ tsp. salt dash pepper

4 cups lettuce (approx. ¼ head) torn into bite-size pieces ⅓ cup chopped green pepper

½ cup sliced pitted ripe olives ½ cup shredded Cheddar cheese

Soak beans. Drain and combine beans, fresh water, salt and vegetable oil in pressure saucepan. Cook at 15 pounds pressure for 12 minutes.

Combine sour cream, mayonnaise, onion, garlic, salt & pepper. Add garbanzo beans and chill one hours or more.** Toss and chill lettuce, green pepper & olives. Add garbanzo bean mixture & sprinkle with grated cheese.

Lima Bean Chowder

⅓ cup dry lima beans 1 tbsp. butter

1 cup fresh water 1 tbsp. flour

¼ tsp. salt ½ – 1 cup milk

¼ cup diced celery salt and pepper to taste

¼ cup diced carrot 2 tbsp. chopped onion

Soak beans. Drain and combine beans, fresh water and salt. Boil 30–35 minutes. Add 1 tsp. oil if necessary to control foaming. Add remaining vegetables and continue cooking until all vegetables are tender, adding water if necessary to prevent scorching. Drain, reserving ½ cup cooking water. Add ½ cup milk (or more if there is less than ½ cup cooking water) to make 1 cup liquid. Make a white sauce with butter, flour and 1 cup liquid. Melt fat in saucepan. Blend in flour and salt; remove from heat. Add cooking liquid, stirring to blend; return to heat and stir gently while heating quickly to a full boil, remove from heat Add vegetables. Adjust consistency of chowder with additional milk or cooking liquid. Season to taste. If necessary, reheat to serving temperature.

Split Pea Soup

⅓ cup dry split peas ¼ cup diced carrots

2 cups vegetable broth ¼ cup diced celery

1 tbsp. oil 5 rosemary needles, crumbled

¼ cup chopped onion

Gently boil peas in broth with oil for 20–25 minutes. Add vegetables and seasoning. Continue to simmer until vegetables are tender, approximately 15–20 minutes more. Season to taste with salt and pepper.

Black Bean Salsa

½ cup dry black beans 1 tbsp fresh lime juice

3 cups fresh water 1 tbsp garlic, minced

½ tsp salt ¼ cup onion, diced

1 tbsp vegetable oil ¼ cup green pepper, diced

¼ cup whole kernel corn ¼ cup red pepper, diced

¼ cup Roma tomato, seeded, diced 1 tbsp vegetable oil

½ small fresh jalapeno pepper, seeded, minced salt & pepper to taste

Soak beans. Drain and combine beans, fresh water, salt and 1 tbsp of oil in pressure saucepan. Cook at 15 pounds pressure for 18 minutes. Drain and cool beans in refrigerator for 30-45 minutes. Add remaining ingredients to serving bowl with beans. Serve with tortilla chips.

Pinto Beans

½ cup dry pinto beans ⅛ tsp. pepper

3 strips bacon, diced ¼ tsp. chili powder

⅓ cup chopped onion 2 cups fresh water

½ tsp. salt

Soak beans. Drain. Brown bacon in small skillet. Drain off excess fat, reserving 1 tbsp. to control foaming. In pressure saucepan combine beans, 1 tbsp. bacon fat, bacon, onion, salt, pepper chili powder and fresh water. Cook for 18 minutes at 15 lbs. pressure. Retaining liquid, pour contents into a strainer or colander. Return liquid to the pan and boil to reduce liquid until about 3-4 tbsp. remain. Pour over beans.

Soybean Casserole

½ cup dry soybeans 1 tbsp. chopped onion

1 tsp. salt 1 tbsp. chopped green pepper

1 tbsp. vegetable oil 3 tbsp. flour

2 cups fresh water ¼ tsp. salt

1 strip bacon, diced 1 cup milk

1 cup diced celery ¼ cup fine dry bread crumbs

1 tbsp. melted butter

Soak soybeans. Drain, combine beans, salt, vegetable oil, and fresh water in pressure saucepan. Cook 22 minutes at 15 lbs. pressure.

Brown bacon in skillet; remove from pan and crumble. Sauté celery, onion, & green pepper in bacon fat until tender. Blend flour, ¼ tsp.

salt and milk thoroughly; add to celery mixture and bring to boil. Add cooked, drained soybeans and bacon. Pour mixture into a one-pint baking dish. Blend bread crumbs with butter. Top with buttered crumbs, and bake uncovered at 350°F for 30 minutes.

Tofu with Rice

¼ cup long grain polished rice ¼ cup coarsely chopped peanuts

⅔ cup water 8 oz. pkg. tofu, drained & crumbled

⅛ tsp. salt 2 tbsp. soy sauce

¼ cup chopped onion ¼ cup sliced fresh mushrooms

¼ cup chopped celery 1 tbsp. vegetable oil

¼ cup chopped carrots

Put rice, water, and salt in heavy saucepan; cover with tight fitting lid. Bring to a full boil; reduce heat to very low boil and cook until done,* approximately 15-25 minutes depending on variety of rice and temperature. (Add more water if necessary to prevent scorching.) *Rice is done when a kernel pressed between the fingers feels completely soft.

Sauté onion, celery, mushrooms and carrots in oil. Combine with cooked rice and all other ingredients except cheese. Place in greased 1 quart baking dish. Cover dish and bake at 350°F for 20 minutes. Uncover and top with cheese; bake for 5 more minutes.

Pork and Tofu

⅓ cup rice ½ tsp. soy sauce

¾ cup water ½ tsp. grated ginger root

¼ tsp. salt ½ tsp. chili paste with garlic

8 oz. pkg. tofu ½ tsp. sesame or other vegetable oil

¼ lb. ground or thin-sliced pork 2 scallions, sliced

1 clove garlic, minced

¼ cup chicken broth

Put rice, water, and salt in heavy saucepan; cover with tight fitting lid. Bring to a full boil; reduce heat to very low boil and cook until done,* approximately 15-25 minutes depending on variety of rice and

temperature. (Add more water if necessary to prevent scorching.)

*Rice is done when a kernel pressed between the fingers feels completely soft. Keep hot by putting rice in strainer over a pan containing boiling water.

Boil rice, water and salt. Remove tofu from liquid in which it was packaged. Wrap in paper towels and drain 15–20 minutes. Cut in ¼–inch cubes. Place cubes in simmering water for 10–15 minutes to firm slightly. Drain. Sauté pork and garlic until pork is well done. Add remaining ingredients and mix well. Gently stir in tofu cubes. Simmer about 5 minutes, until flavors are well blended. Serve over cooked rice.

Roasted Red Pepper Artichoke Dip with Tofu

1 1/3 cups drained, chopped canned artichoke hearts (or one 13.75oz can) ½ cup chopped jarred roasted red pepper

12 oz. cup soft silken tofu ¼ cup mayonnaise

1 cup shredded parmesan cheese 1 cup shredded Italian blend cheese

1 tablespoon + 1 teaspoon minced garlic Salt to taste

Preheat oven to 375°F. Chop the artichoke hearts and roasted red peppers and place in a medium sized mixing bowl. Measure out tofu, mayonnaise, parmesan cheese, Italian blend cheese, and garlic, place in the mixing bowl with the artichoke hearts and roasted red pepper, and stir until incorporated. Transfer artichoke mixture into an ungreased 8×8 baking dish, place in oven, and bake for approximately forty minutes or until brown and bubbly.

Hummus

½ cup dry garbanzo beans 3 tbsp lemon juice

2 cups fresh water ¼ cup tahini (sesame paste)

1 tsp. salt 2–4 tbsp reserved liquid from cooking beans

1 tbsp. vegetable oil 4 dashes hot sauce (or to taste)

2 garlic cloves

Soak beans. Drain and combine beans, fresh water, salt and vegetable oil in pressure saucepan. Cook garbanzo beans at 15 pounds pressure for 12 minutes.

Turn on the food processor fitted with the steel blade and drop the

garlic down the feed tube; process until it’s minced. Add the rest of the ingredients to the food processor and process until the hummus is coarsely pureed. Add reserved liquid until desired consistency. Add hot sauce as needed for seasoning. Serve chilled or at room temperature. Reserve cooking liquid.

Recipe Legume Sensory Attributes

Hopping John

Edamame with Ginger, Garlic, and Sesame

Lentil Soup

Chili

Ensalada de Frijoles/Spanish Bean Salad

Lima Bean Chowder

Split Pea Soup

Black Bean Salsa

Pinto Beans

Soybean Casserole

Tofu with Rice

Pork and Tofu

Roasted Red Pepper Artichoke Dip with Tofu

Hummus

6.4 Concept Review Legumes

Describe two appropriate ways of soaking dried legumes before cooking.

What ingredients were included in dried legume recipes to add complementary proteins?

When are salt and acid added in preparation of dried legumes?

What is the purpose of adding fat to the cooking water for dried legumes?

Why must legumes be soaked and/or pressure-cooked in preparation?

7 Deep Fat Frying

7.1 Deep Fat Frying

Objectives

To differentiate between oil and water as mediums of heat transfer.

To identify the qualities a food must possess to be successfully deep oil fried.

To determine the effect of various factors on the absorption of oil: Amounts and kinds of ingredients

Extent of manipulation of gluten products

Size and shape of food

Length of time food is in oil

Kind of oil and smoke point of oil

Terms

Smoke point—smoke begins to come off the surface of a hot oil

Flash point—small wisps of flame can be seen coming off the surface of hot oil

Fire point--too late—you do not want to go there

Rancidity—development of off flavors in oil as the oxidize and break down

Panko—Japanese-style bread crumbs resulting in very crisp texture

Fritter—deep fat fried food made with chopped foods and coated in batter

Croquette—mixture of meat and vegetables and mixed with white sauce and coated in batter then deep fat fried.

General Directions If the frying pan is heated on the range, put it on a back burner for safety. If an electric fryer is used, place it in safe position where no one can inadvertently catch the cord.

Keep lid close to fryer to extinguish fire in case the oil should flame. Do not cover pan unless the oil ignites.

Fill kettle only ⅓ to ½ full with oil.

Insert thermometer and heat oil to desired temperature.

Use a slotted spoon, tongs, or basket, depending on food, to transfer food into and out of oil. Do not crowd food. Make sure food is not more than one layer thick.

Hold food over oil to drain excess oil before transferring to paper towel.

Never leave heating oil unattended! (In case of fire, turn off burner and place lid on kettle to smother flame. Use wet towel, fire blanket, or fire extinguisher to smother other flames.) Do not use water to extinguish an oil fire.

Cool used oil, then pour through strainer lined with two or three thicknesses of cheesecloth.

Buttermilk Doughnuts

2¼ cups flour 1½ tsp. butter

¼ tsp. cinnamon ⅓ cup sugar

¼ tsp. nutmeg 1 egg

¼ tsp. mace ½ cup buttermilk

¼ tsp. baking soda ½ tsp. salt

½ tsp. baking powder

Sift dry ingredients. Cream butter and sugar. Add egg and buttermilk. Add dry ingredients. Mix until smooth, roll to ½ inch thickness and cover with damp towel and let stand 20 minutes. Cut with 2¾ -inch cutter and fry in 375°F (190°C) oil until brown, turning once (about 1½ minutes on each side). Drain on absorbent paper towels. Shake in granulated or sifted powdered sugar if desired.

Corn Fritters

⅔ cup sifted flour ⅓ cup milk

¾ tsp. baking powder ¾ cup whole kernel corn, well drained

½ tsp. salt ½ egg, slightly beaten

Sift dry ingredients into bowl. Combine remaining ingredients and add all at once to dry ingredients, stirring just until blended as for muffins. Fry rounded tablespoonfuls in 375°F (190°C) oil about 5

minutes or until thoroughly cooked. Drain on absorbent paper. Serve with maple syrup.

Sweet Potato Surprise

1 cup mashed cooked or canned sweet potatoes dash pepper

½ egg, slightly beaten 18 miniature marshmallows

¼ tsp. salt ¼ cup crushed cornflakes

Combine potatoes, egg, salt, and pepper. If mixture seems too dry to shape, add a little milk. Form into balls, putting a marshmallow in the center of each ball. Roll in crushed cornflakes and fry at 375°F (190°C) until brown.

French Fried Potatoes

3 medium russet potatoes, peeled

Cut potatoes into ¼–inch strips (or cut ⅛–inch strips for shoestrings, latticed slices for chips.) Soak potatoes in cold water if they are not fried immediately. Dry thoroughly before frying. Immerse in 375°F (190°C) oil (oil temperature will drop). Maintain temperature at 365°F (185°C) until well browned and cooked through, about 2–3 minutes. Drain on absorbent paper, sprinkle with salt, and serve hot.

French Fried Onion Rings

1 large mild onion 1 egg, slightly beaten

½ cup milk ½ cup buttermilk

1 cup flour 1 cup fine dry bread crumbs

Peel onion, cut into ¼–inch slices, and separate into rings. Dip rings into milk, then flour. Combine egg and buttermilk. Dip floured rings into egg–buttermilk mixture, then coat with crumbs. Place in a single layer on baking sheet and let stand for 20 minutes. Fry in 365°F (185°C) oil until golden brown. Drain on absorbent paper and sprinkle with salt.

French Fried Chicken

¼ lb. boneless breasts cut into strips 1 egg, slightly beaten

1 tsp. salt ½ cup buttermilk

½ cup flour ½ –1 cup fine dry bread crumbs

Cut chicken into 1/4 inch strips. Coat chicken with salt and flour. Combine egg and buttermilk; and dip chicken in this mixture and then in crumbs. Heat oil to 350°F (180°C) and add chicken. Temperature will drop; regulate heat to keep frying temperature at 330°F (165°C). Fry until golden brown, about 5–8 minutes of until 165°F. Drain on absorbent paper.

French Fried Shrimp with Cocktail Sauce

⅓ lb. shrimp ½ cup chili sauce

¼ cup flour 1 tbsp. lemon juice

½ tsp. salt 2 tsp. horseradish

dash pepper 1 tsp. Worcestershire sauce

1 egg, slightly beaten ½ tsp. minced onion

½ cup bread or cracker crumbs few drops Tabasco sauce

Clean shrimp. Combine flour, salt, and pepper. Coat shrimp with seasoned flour; dip into egg, then coat with crumbs. Combine ingredients in second column for cocktail sauce to serve with hot shrimp. Fry breaded shrimp in 375°F deep vegetable oil or shortening until golden brown and thoroughly cooked, about 3–5 minutes.

Tuna Croquettes

1½ tbsp. butter 1½ tsp. grated onion

3 tbsp. flour 1 tbsp. chopped parsley

½ tsp. salt 1 tbsp. lemon juice

½ cup milk ½ egg, beaten

½ cup canned tuna, drained and flaked ¼ cup fine dry bread crumbs

Make a white sauce with butter, flour, salt, and milk Melt fat in saucepan. Blend in flour and salt; remove from heat. Add milk, stirring to blend; return to heat and stir gently while heating quickly to the full boil. Stir in tuna, onion, parsley, and lemon juice. Spread mixture thinly on a cookie sheet. Chill for about 30 minutes or until stiff enough to shape. Shape in cones or balls, dip in egg, and coat well with crumbs. Chill, then fry at 365°F (185°C) until golden brown and heated through. Drain on absorbant paper and serve hot.

Orange Puffs

1 cup flour 1 tbsp. grated orange zest

1 tsp. baking powder 1 tbsp. butter, melted

½ tsp. salt 2 tbsp. orange juice

1 egg 2 tbsp. milk

¼ cup sugar

Orange Glaze

1 cup powdered sugar 2 Tbsp. orange juice

¼ tsp. grated orange zest

Sift flour, baking powder, and salt together. Beat egg until thick and lemon-colored. Add sugar gradually, beating until dissolved. Stir in orange zest and melted butter. Add approximately half of flour mixture and stir until moistened. Stir in orange juice and milk. Add remaining flour mixture, stirring just until blended Drop by teaspoonfuls into 375°F (190°C) oil and fry 2 minutes or until interior of puff is done. Turn once to brown evenly. Drain on absorbent paper. While hot, dip in orange glaze.

Orange Glaze

Blend powdered sugar with orange juice and orange zest.

Spiced Donut Balls

1⅓ cups all-purpose flour ¼ tsp. nutmeg

2 tsp. baking powder ¼ tsp. allspice

¼ tsp. salt ½ cup milk

⅓ cup sugar 1 egg, slightly beaten

1 tsp. vanilla

Cinnamon-Sugar Mixture

½ cup sugar 2 tsp. cinnamon

Sift flour, baking powder, salt, sugar, nutmeg, and allspice together. Combine milk, egg, and vanilla. Add liquid to dry ingredients, stirring only until blended. Drop by teaspoonfuls into 365°F (185°C) oil. Fry doughnut balls 3 to 5 minutes or until brown on both sides

and cooked throughout. Drain on absorbent paper. While still warm, dip in cinnamon-sugar mixture.

Cinnamon-sugar Mixture

Mix sugar with cinnamon. Coat doughnut balls thoroughly while warm.

Rosettes

½ cup flour ½ cup milk

1 tbsp. sugar 1 egg, slightly beaten

¼ tsp. salt 1 tbsp. butter, melted

Combine flour, sugar, and salt. Beat in remaining ingredients. Refrigerate at least 30 minutes. Heat timbale or rosette iron in 365°F (185°C) oil. Rub off excess oil on absorbent paper towels. Dip heated iron into batter until ¾ covered. Immerse in hot oil. While submerged, use a fork to gently remove rosette from iron. Fry briefly, turn and remove when delicately brown. Hold upside down over pan to drain place absorbent paper towels. Keep iron in oil to remain pre-heated. Stir batter occasionally. Sift powdered sugar over rosettes.

Vegetable Tempura

Fish fillets Shrimp, deveined and shelled

Scallops Cauliflower florets

Green pepper strips Sweet potatoes cut into ⅛-inch slices

Onion rings

Tempura Batter

⅓ cup all purpose flour 1 tbsp. + 1 tsp. cornstarch

¼ tsp. baking powder ¼ tsp. salt

1 egg ⅓ cup ice water

Tempura Sauce

¼ cup chicken broth ¼ cup water

¼ cup soy sauce

1 teaspoon sugar

Cut vegetables into bite-sized pieces; pat dry if necessary. Heat oil to 375°F (190°C). Dip seafood or vegetable pieces into tempura batter; allow excess batter to drip back into bowl. Fry a few pieces at a time until golden brown, turning once. Serve with tempura sauce. Drain on absorbent paper towels.

Tempura Batter

Sift flour, cornstarch, baking powder and salt until well blended. Beat egg and water until smooth. Add dry to liquid ingredients and stir just until ingredients are blended; refrigerate batter for 30-45 minutes before using.

Tempura Sauce

Combine all ingredients in a saucepan. Heat to serving temperature.

Eggrolls

¼ pound ground pork 1 tsp. grated fresh ginger

¼ head green cabbage 1 tbsp. soy sauce

1 carrot, grated 1 egg, blended

3 tbsp. chopped green onions 1 pkg. egg roll wrappers

Combine meat, onions, and vegetables. Sauté. Add soy sauce, ginger and egg. Mix and heat thoroughly. Place 1-3 tsp. mixture in each square of egg roll paper. Dampen two opposite corners and fold to form triangle. Fold two narrow ends together and press tightly to hold filling inside.

Fry in deep fat at 375°F for 4-5 minutes to golden brown. Drain and serve hot.

1. Place filling in the middle diagonally on wrap. 2. Fold bottom corner over filling; roll snuggly halfway to cover filling. 3. Fold in both sides snugly against filling; moisten edge of last flap. 4. Roll wrap up and seal top corner; lay flap-side down until ready to cook.

The browning of the outside layer of products when deep fat frying is an example of a Maillard Reaction.

Characteristics of Standard Products for Deep Oil Fried Foods:

Appearance Texture Flavor

Outside surface should be relatively smooth and cooked to a uniform golden brown color. Interior should be cooked throughout and show

minimum oil absorption.

Crust should be tender and/or crisp (not soggy). Products should be free from any greasy flavor or mouthfeel.

7.1 Deep Fat Frying Concept Review

1. List the safety precautions for each component when frying.

Pan:

Oil:

Temperature:

2. Why is oil more efficient as a cooking medium when compared with water?

3. What are the main quality objectives in deep fat fried foods?

4. What is the difference between a batter and a breading?

5. List oils used for deep fat frying.

6. What is smoke point, flash point and fire point?

7. Describe the changes in oil as it is used and deteriorates?

8. Define the following terms – rancidity, panko, fritter and croquettes.

9. List the top two deep-fat fried snacks in the United States.

10. What happens when you overload the fryer? (Especially with potatoes)

11. What oils should not be used to deep fry foods? Why?

8 Dairy Foods

8.1 Milk and Milk Products

Objectives

To illustrate coagulation and ways of coagulating the different milk proteins.

To demonstrate some of the basic concepts of protein cookery.

To compare the appearance, texture, and flavor as well as

compositional differences among various types of milk products other than cheese.

Laboratory Problems

Observe the effect of heat on the curd and whey of coagulated milk: Effect of heat on sour milk,

Effect of heat on rennin-clotted milk.

Observe the effect of rennin on milk.

Observe the effect of heat and acid on milk.

Prepare cream of tomato soup.

Taste a variety of milks and milk products.

Terms

Denaturation

Coagulation—cheese is made when milk is coagulated with rennin (enzyme) or acid

Casein Protein

Whey Protein

Isoelectric Point (ph 4.6 isoelectric point of casein protein)

Observe the effect of heat on the curd and whey of coagulated milk:

Coagulate Casein with Acid:

In small saucepan, combine 1 tbsp. distilled vinegar or lemon juice to 1 cup milk. Stir just to blend.

Allow mixture to stand until milk has thickened, about 10 minutes.

Heat slowly, over low heat, to temperature specified in table on following page. Remove from heat.

After 5 minutes, separate curd from whey by straining mixture into a glass measuring cup through small squares of cheesecloth in a strainer.

Roll curd gently on the cloth to remove the whey.

Display the whey in measuring cup and the curd on the cheesecloth.

Record observation of firmness and texture of curd, and appearance and amount of whey.

Procedure Curd Whey Explanation

Sour milk heated to 60°C

Sour milk heated to 100°C

Coagulate Casein with Rennin.

Dissolve 1 rennet tablet in 1 tbsp. water.

Heat 1 cup milk to 45oC in a small saucepan; remove from heat.

Stir dissolved rennet into heated milk. Allow mixture to set, approximately 20 minutes.

Heat slowly on low heat without stirring to specified temperature. Remove from heat.

After 5 minutes, cut through the curd in each direction so that the surface area is cut into 1–inch squares.

Separate curd from whey by straining mixture into a glass measuring cup through a double thickness of cheesecloth lining a strainer.

Roll the curd gently on the cloth to remove the whey.

Display the whey in measuring cup and the curd on the cheesecloth.

Record observations of firmness and texture of curd, and appearance and amount of whey.

Procedure Curd Whey Explanation

Rennin clotted milk heated to 60°C

Rennin clotted milk heated to boiling

Observe the Effect of Rennin on Milk:

Dissolve 1 rennet tablet in 4 tsp. water. Use 1 tsp. of this solution with each ½ cup milk treated as specified below.

Prepare milk as directed, stir rennet in quickly, pour at once into custard cup, and set cup in a warm place.

Allow at least 20 minutes for gel to set. Test by carefully tipping

container. Record observations and conclusions on the effect of temperature and dilution of milk on the activity of the enzyme, rennin.

Procedure Firmness of gel Results and explanation

Heat milk slowly to 45°C

Boil milk, cool to 45°C

Boil milk, add rennin immediately

Use ¼ cup milk and ¼ water. Heat to 45°C

Observe the effect of heat and acid on milk.

Use ¼ cup fresh milk and ¼ cup tomato juice for each method of combining acid and milk described in the chart on next page. Stir to blend.

Method Immediate Results Results after 15 minutes Explanation

A. Cold tomato juice added to cold milk

B. Hot (180°F) tomato juice added to hot (180°F) milk

C. Hot (180°F) milk added to hot (180°F) tomato juice

Prepare Cream of Tomato Soup

Cream of Tomato Soup

Tomato Sauce

½ cup tomato juice ½ tsp. sugar

dash pepper small piece of bay leaf

White Sauce

1 tsp. celery, chopped fine 1 tsp. onion, chopped fine

½ tsp. green pepper, chopped fine 2 tsp. butter

2 tsp. flour dash salt

½ cup milk

Simmer tomato juice, sugar, pepper and bay leaf for five minutes. Remove bay leaf. In a separate pan, sauté celery, onion, and green

pepper in butter. Blend in flour and salt; remove from heat. Add milk, stirring to blend, return to heat and stir gently while heating to a full boil. Slowly stir hot tomato juice into hot white sauce. Serve immediately.

Characteristics of a Standard Product for Cream of Tomato Soup:

Appearance Texture and Consistency Flavor

Typical color

No skin or fat film

Smooth – neither curdled nor lumpy

Definite body; neither watery nor too thick

Well seasoned

Appealing blend of flavors

Evaluation:

Product Appearance Texture Flavor

Cream of Tomato Soup

Questions for Cream of Tomato Soup:

What textural differences are there between acid and rennin coagulated cheeses?

What is the pH of milk, the pH of tomato juice, and the pH of cream of tomato soup?

What is the isoelectric point of casein in milk? When making cream of tomato soup, do we want to aim for or avoid the isoelectric point (Ip) of milk? Why?

Therefore, what is the general rule for combining milk with acid ingredients such as tomato juice?

In the tomato soup recipe, we want to avoid the isoelectric point of casein, but in some food products we aim for the isoelectric point of casein. Give an example of this type of food.

Describe the distinguishing sensory properties of each of the following dairy products:

Name of Product % Fat Content, etc. Processing Sensory Characteristics

Nonfat milk (skim milk) 0.0–0.5% fat; >8.25% milk solids

Lowfat milk 0.5–1.0% fat; >8.25% milk solids

Reduced fat milk 1.0–2.0% fat; >8.25% milk solids

Whole milk At least 3.25%; >8.25% milk solids Homogenized

Half-and-half 10–12% fat

Whipped cream Light: 30–36% fat Heavy: 36–40% fat

Butter 80% milk fat

Margarine 80% vegetable or animal fat

Nonfat dry milk 0.0–0.5% fat

Evaporated milk At least 7.5% protein; >25% milk solids (skim version is also available) Homogenized, sterilized

Sweetened condensed milk At least 8.5% protein; >28.5% milk solids; 44% added sugar (lowfat version is also available) Condensed

Cultured buttermilk 0.0–1.0% fat; >8.25% milk solids Cultured (streptococcus lactis and/or Leuconostoc citrovorum)

Yogurt Varies by type, 0.0–3.5% fat Cultured (streptococcus thermophilus and/or Lactobacillus acidophilus or Lactobacillus bulgaricus)

Sour cream 18–20% fat Cultured (streptococcus lactis and/or Leuconostoc citrovorum)

8.1 Concept Review Milk and Milk Products

How is evaporated milk preserved?

How is sweetened condensed milk preserved?

Why is buttermilk called buttermilk? What is the fat content of buttermilk?

What sources of fat are permitted in the production of margarine?

8.2 Cheese – Effect of Heat

Objectives:

To determine the effects of dry heat on unripened, ripened, and process cheese.

To determine the effect of heat and previous treatment on the blending quality of unripened, ripened, and process cheese.

Laboratory Problems:

Determine the effect of temperature upon the blending properties of mild, extra-sharp (aged), and process Cheddar cheeses.

Determine the effects of dry heat on mild, extra-sharp (aged), and process cheeses.

Effect of temperature on blending properties of mild, extra sharp, and process Cheddar cheese:

Prepare 1 cup of thin white sauce for each of the nine parts of this problem.

Cool or heat the thickened sauce to the specified temperature.

Weigh 56 grams or 2 oz. (approximately ½ cup) of shredded cheese; blend into the thickened sauce.

Reheat the cheese sauce to the temperature at which the cheese was added, stirring frequently.

WHITE SAUCE

Thin

Butter or margarine 1 tbsp.

Flour 1 tbsp.

Salt 1/8 tsp.

Milk 1 cup

Melt fat in saucepan. Blend in flour and salt; remove from heat. Add milk, stirring to blend; return to heat and stir gently while heating quickly to the full boil. Boil 1 minute if sauce is not to be cooked further.

Blending qualities and flavor of each type of cheese at each temperature Temperature of Sauce Mild Cheddar Extra Sharp Cheddar Process Cheddar

45ºC

75ºC

Boiling

Effects of Dry Heat on Mild, Extra Sharp, and Process Cheddar Cheeses.

Grilled Cheese

Use 2 slices of cheese for each sandwich – mild, extra-sharp, or process Cheddar cheese

Taste unheated cheese samples and record observations in chart below.

Butter 1 side of each of 2 slices of bread. Place cheese between unbuttered sides.

Heat 1 tbsp butter in a skillet over medium-low heat.

Press the sandwich slightly and place it in the skillet. Cook until golden on the bottom, 3 to 5 minutes.

Turn, and cook until the other side is golden and the cheese melts, 3 to 5 more minutes.

Record observations in chart.

Evaluation: Effects of Heat on Mild, Extra-Sharp, and Process Cheeses

Note differences in: Fat separation, Flavor, Tenderness, and Stringiness

Mild Cheddar Extra Sharp Cheddar Process Cheddar

Unheated cheese samples

Grilled cheese sandwich

Open Toasts – 300oF Treatment

Work in groups of four. Each group will use:

3 slices white bread

1 slices mild Cheddar cheese (each large enough to cover 1 slice of bread)

1 slices extra-sharp Cheddar cheese (each large enough to cover 1 slice of bread)

1 slices process Cheddar cheese (each large enough to cover 1 slice of bread)

Preheat oven to 300oF.

For each oven, prepare one baking sheet of open-face cheese toasts as shown below. For each sheet, cut three slices of bread in half; cover two halves with one type of cheese. Label.

300oF

Heat in 300°F oven until cheese is melted; remove ½ slice of each type of cheese toast. Leave the other halves in oven for 10 minutes more.

Cut half-sandwiches of melted cheese into four pieces and evaluate cheeses immediately. Record observations page 145.

After 10 minutes additional heating, remove remaining half of each sandwich. Cut into four pieces and evaluate immediately.

Open Toasts- 500oF Treatment

Repeat steps 1-4

Leave second half of each sandwich in oven only until cheese is brown and bubbly. Cut into four pieces and evaluate immediately.

500°F

Evaluation: Effects of Time/Temperature on Mild, Sharp, and Process Cheeses

Note differences in: Fat separation, Flavor, Tenderness, and Stringiness

Mild Cheddar Extra Sharp Cheddar Process Cheddar

Unheated Cheese Samples

300°F

Slices tasted after cheese has melted

Slices tasted after 10 minutes of additional heating

500°F

Slices tasted after cheese has melted

Slices tasted after cheese has become very bubbly and brown

8.2 Concept Review Cheese – Effect of Heat

a. When mild and sharp Cheddar cheeses are melted, what differences do you expect in?

flavor?

texture?

fat separation?

How does high temperature and/or long cooking time affect cheese:

flavor?

texture?

fat separation?

How does processing of cheese change each of the following?

flavor?

texture?

fat separation?

8.3 Cheese Cookery and Varieties

Objectives

To apply principles of cheese cookery from previous labs in preparing various cheese dishes.

To identify the distinguishing characteristics of a variety of cheeses and cheese products.

Laboratory Problems

Prepare various cheese dishes using mild, sharp, and process Cheddar cheeses.

Taste a variety of cheeses.

Prepare each of the dishes according to the recipes below, using mild, sharp, and process Cheddar cheeses. Weigh cheese for each recipe.

Macaroni and Cheese

⅔ cup uncooked macaroni 3 oz. shredded Cheddar cheese

3 cups water 2 tbsp dry bread crumbs

1 tsp. butter

White Sauce

1 tbsp butter

1 tbsp flour

1 cup milk 1/8 tsp salt

Cook macaroni in boiling salted water until almost tender. Drain and rinse with hot water. Prepare white sauce: Melt butter in saucepan. Blend in flour and salt; remove from heat. Add milk, stirring to blend; return to heat and stir gently while heating quickly to a full boil. Remove from heat. Wait 45 seconds, and blend cheese into sauce. Stir in macaroni. Place in 1–pint baking dish. Melt 1 tsp butter, mix with crumbs, and sprinkle over top. Set baking dish on wire rack in pan of hot water and bake uncovered at 350°F for 30 minutes.

Cheese Rarebit (Rabbit) on Melba Toast

Melba Toast 1½ tsp. flour

1½ tsp. butter ½ cup milk

¼ tsp. dry mustard 2 oz. shredded Cheddar cheese

dash cayenne

Prepare Melba toast. Make white sauce from butter, mustard, cayenne, flour and milk. Melt butter in saucepan. Blend in flour and seasonings; remove from heat. Add milk, stirring to blend; return to heat and stir gently while heating quickly to a full boil. Remove from heat. Cool 45 seconds; blend in cheese. If necessary, heat the rarebit in a double boiler before serving. Serve immediately over Melba toast on a warmed plate.

Melba Toast

Trim crusts from two slices of bread. Cut into rectangles or triangles as desired. Place on baking sheet and bake at 300°F until a delicate brown and crisp all the way through, approximately 20–25 minutes.

Characteristics of Standard Product:

Flavor Texture

Distinctive cheese flavor, typical for type of cheese. Smooth, well-blended sauce of uniform consistency.

Some graininess expected from less-ripened cheese.

Evaluate appearance, flavor and texture of each product:

Cheese

Product Mild Cheddar Extra Sharp Cheddar Process Cheddar

Macaroni and Cheese

Cheese Rarebit on Melba Toast

Natural Cheeses and Cheese Blends

Record Observations of Various Cheeses and Cheese Blends

Note distinguishing characteristics and compositional differences. Sample cheese with cheese crackers, if desired.

Type Name % Fat*,** % Moisture* Distinguishing Characteristics Sensory Qualities

Soft, unripened Cottage 4 80 Acid coagulated (small curd)

Cream 35 54 Acid coagulated

Neufchatel 23 62 Acid coagulated

Firm, unripened Gjetost 30 13 Goats' milk, whey cheese 44% lactose

Mozzarella 22 50 Stretched curd

Soft, ripened 1–2 months Camembert 24 52 Mold and bacteria ripened

Limburger 27 48 Yeast and bacteria ripened

Semisoft, ripened 1½–4 months Havarti 36 42 Cows' or buffaloes' milk, enzyme coagulated, small openings ('eyes')

Feta 21 55 Sheep's milk, stored in salt brine, open texture

Muenster 30 42 Yeast and bacteria ripened

Firm, ripened 1–12 months or more Cheddar 33 37 Bacteria ripened

Colby 32 38 Open texture, bacteria ripened

Edam 28 42 Bacteria ripened

Gouda 27 41 Bacteria ripened

Provolone 27 41 Stretched curd smoked

Swiss 27 37 Gas forming bacteria ripened

Ripened 5 months to 2 years Parmesan 26 29 Very hard, granular, must be grated

Romano 27 31 Very hard, granular, must be grated

Blue-vein mold-ripened 2-12 months Blue 29 42 Blue mold cheese from cow's or goats' milk

Roquefort 31 39 Blue mold cheese from ewes' milk, made in Roquefort, France

Process Cheese Blends: Process Cheese is made by grinding or mixing together by heating and stirring one or more cheeses of the same or different varieties. An emulsifying agent is then blended into the mixture. Small amounts of acid, cream, water, and spices or flavorings may be added. Analysis: £ 40% moisture, ³ 32% fat for process Cheddar cheese

Example: Deluxe American Process Cheese

Cheese Food is made the same way as the cheese (process or cold pack) except that milk, skim milk, cheese whey or whey albumin, or their concentrates, may be added, as well as acid, water, spices, or flavorings. Analysis: £ 44% moisture, ³ 23% fat.

Example:

Process Cheese Spread is made the same way as process cheese food except that it may contain stabilizers, more moisture, and less fat, and must be spreadable at 70°F. Analysis: £ 44-60% moisture, ³ 20% fat for process Cheddar Cheese.

Example: Cheese Whiz

Cheese products that do not meet any of the standards listed above may be labeled "imitation cheese" or "cheese products". Example: boxed Velveeta

∗ From Composition of Foods. Dairy and Egg Products; Raw, process and Prepared. agr. Handbook No. 8-=1, 1976. pp. 1-33

** Cheeses labeled “reduced fat” must, like any other food, contain at least 25% less fat than that standard for the cheese.

8.3 Concept Review Cheese Cookery and Varieties

What textural differences are there between acid and rennin coagulated cheeses?

Define changes that occur in the protein, lipid and moisture of aged or ripened cheese.

How does processing of cheese affect the blending properties of the cheese?

What vitamin precursor is responsible for the orange color of some Cheddar cheeses?

What reaction is responsible for the color and flavor of gjetost cheese? What other product(s) in the milk and cheese laboratories have exhibited the same qualities?

9 Eggs

9.1 Eggs – Quality and Cookery

Objectives

To apply principles of protein coagulation in egg cookery.

To determine the effects of various time-temperature treatments on the characteristics of coagulated egg proteins.

To identify characteristics of high quality egg products.

To identify signs of deterioration in stored eggs.

Laboratory Problems

Prepare fried eggs to determine the effect of the two standard methods of frying eggs on the characteristics of the products.

Prepare poached eggs, scrambled eggs, and a French omelet.

Prepare hard cooked eggs to determine the effect of temperature and time of cooking on eggs cooked in the shell.

Observe effects of storage at both refrigerator and room temperatures on fresh eggs.

Fried Eggs

1. Large amount of fat

Melt 1 tbsp. butter, bacon drippings, or other cooking fat in a heavy skillet. Carefully slip egg into pan. Cook slowly, basting (pour hot fat over the egg with a spoon) frequently, until done.

2. Small amount of fat

Melt 1 tsp. butter, bacon drippings, or other cooking fat in a heavy skillet. Slip egg carefully into pan. Add 1–2 tsp. water and cover. (Steam helps to coagulate the white over the yolk.) Cook over low heat until done, approximately 3 minutes.

Poached Eggs

Fill the bottom of a small saucepan with enough water to cover egg. Do not salt water. Heat to simmering. Break one egg into a custard cup and slip egg into the water. If poaching more than one egg, tip the dish so that the egg slides toward the edge of the pan rather than toward the center. Keep water hot but below simmering. Cook until white is evenly coagulated, approximately 3–5 minutes. Remove carefully with slotted spoon.

Characteristics of the Standard Product for a Fried Egg:

Egg itself is of high quality with thick, compact white and upstanding yolk.

Appearance Texture Flavor

Yolk centered, unbroken, covered with a film of coagulated egg white.

White shiny, opaque, with no bubbles, crisp, or browned portions.

Yolk thickened, not flowing. White evenly coagulated, tender. Mild egg flavor, enhanced by flavor of fat used for frying.

Characteristics of the Standard Product for Poached Eggs:

Egg itself is of high quality with thick, compact white and an upstanding yolk.

Appearance Texture Flavor

Yolk centered, unbroken, covered with a film of coagulated egg white.

White shiny, compact, with no ragged edges.

Yolk thickened, not flowing. White evenly coagulated, tender. Mild egg

flavor.

Evaluation:

Cooking Method Appearance Tenderness Flavor

Fried, large amount of fat

Fried, small amount of fat

Poached

Hard-Cooked Eggs

Hard-Cooked Eggs Appearance Texture Acceptable?

A. Add egg to enough cold water to come at least 1” above egg. Bring to boil. Cover pan; remove from heat. Let egg stand in water 15-20 minutes. Cool immediately in ice water. When egg is cold, remove from shell.

B. Bring egg to room temperature quickly by placing egg in hot tap water. Add warmed egg to simmering water and simmer for 20 minutes. Remove from heat and cool immediately in ice water. When egg is cold, remove from shell.

c. Repeat B, but at end of cooking period, leave egg in cooking water 10 additional minutes. Remove shell.

D. Bring egg to room temperature quickly by placing egg in hot tap water. Add warmed egg to boiling water and continue to boil for 30 minutes. Remove pan from heat, and leave egg in water 10 additional minutes. Remove shell.

Characteristics of a Standard Product for Eggs Cooked in Shell:

Appearance and texture Flavor

White firm yet tender.

Yolk mealy, evenly centered in white; no green ring.

Mild egg flavor

Prepare Scrambled Eggs:

2 eggs 2 tbsp. liquid (water, milk, or tomato juice)

⅛ tsp. salt 1 tsp. butter or other cooking fat

Beat eggs with liquid and salt until blended but not foamy.

Top of range: Melt fat in a small, heavy skillet. Add egg mixture and cook slowly. As the egg begins to coagulate, lift and turn with a spatula until all of the egg is coagulated but still glossy. Allow sufficient coagulation in one place before turning so that the finished product contains large masses of soft egg rather than small pieces.

Microwave oven: Melt fat in microwave-ovenproof bowl; coat bowl with melted fat. Cook on high power for one minute, stir, continue to cook in 30 second increments stirring after each 30 seconds. Remove eggs from oven before they are completely coagulated to prevent overcooking. Let stand 1 to 3 minutes to complete cooking.

Liquid Appearance Tenderness Flavor

Water

Milk

Milk; overcooked and over-stirred

Milk; microwave-cooked

Characteristics of Standard Product for Scrambled Eggs:

Appearance and texture Flavor

Moist, tender, fluffy masses of egg.

Even light yellow color.

Mild egg flavor.

Prepare French Omelet:

2 eggs 2 tbsp. water

⅛ tsp. salt 1 tbsp. butter

Beat together eggs, water, and salt until well blended. In a non-stick omelet pan over medium-high heat, heat butter until just hot enough to sizzle a drop of water. Pour in egg mixture. Mixture should set immediately at the edges. With a rubber spatula, push cooked portions from the edges of the pan toward the center so uncooked portions can spill onto the hot pan surface. Tilt the pan as necessary, keeping the bottom covered with egg.

When the top is thickened and no visible liquid egg remains, fill one

half of omelet with fillings. (Put filling on the left side if you're right-handed and the right if you're left-handed.) With spatula, fold omelet in half. Invert to serve – turn the pan upside down over the plate, and the omelet will land with its prettiest side up.

Characteristics of Standard Product:

Appearance and texture Flavor

Coagulated yet moist and tender.

Little or no browning on surface.

Mild egg flavor.

Appearance Tenderness Flavor

French Omelet

Observe the Effects of Storage Time and Temperature Upon Fresh Eggs:

Condition Appearance of Yolk Appearance of White

Fresh

Stored two weeks in refrigerator

Stored two weeks at room temperature

9.1 Concept Review Eggs – Quality and Cookery

Understand the unique compositional differences between egg white and egg yolk.

Component Whole Egg Egg White Egg Yolk

Weight 55 grams 38 grams 17 grams

Protein 12% 10% 16%

CHO, carbs Trace Trace none

Fat 11% None 35%

Cholesterol 213 mg None 213mg

Calories 84 cal 20 cal 64 cal

white –

yolk –

Explain and be able to demonstrate the proper technique to crack-open an egg.

Explain the reason why egg white coagulates at a lower temp versus egg yolk.

What is the effect of overcooking an egg product such as scrambled egg on

flavor?

tenderness?

moistness?

What is the chemical composition of the greenish gray ring surrounding the yolk of some hard cooked eggs?

Why were some methods more effective than others in controlling the green ring formation?

What is the difference between scrambled eggs and a French omelet?

Explain the proper technique to hard-cook an egg.

Why don't we hard boil eggs in food preparation?

Describe the attributes of properly scrambled eggs.

9.2 Eggs – Custard

Objectives

To determine the influence of sugar, dilution, amount of stirring, and rate of heating on the coagulation temperature of egg protein.

To demonstrate that stirring custards during coagulation results in a sol, and that baking a custard without stirring results in a gel.

To be able to use the standard procedure for preparing stirred and baked custards.

Procedures Baked and Stirred Custards – One recipe of the custard mix will be divided to make one baked custard and a stirred custard sauce from the same mix.

Preheat oven to 375ºF and Prepare Pans:

For the baked custard

Prepare water bath for the baked custard by putting a custard cup on a wire rack in a pan of very hot water. Water in pan should be nearly the same depth as custard in cup.

For the stirred custard

Prepare the double boiler by pouring only enough water into the lower pan of the double boiler so that the top pan will not touch the water. Bring the water to a boil, and then adjust the heat to maintain simmering temperature.

Custard Mix

2 cups milk ¼ cup sugar

2 or 3 eggs ⅛ tsp. salt

To speed preparation, heat milk to 75ºC. Break eggs into a custard cup one at a time. Remove chalazae with fork. Beat eggs in a medium or large bowl with a whisk or rotary beater just enough to blend yolk and white but not enough to form a foam. Add sugar and salt and blend. Stir in milk. Proceed to cook custard – baked or stirred custard sauce.

Baked Custard

Fill one custard cup with custard mix (approximately ½ cup mix). Add ⅛ tsp. vanilla. Set the custard in the water bath and bake until no custard sticks to a clean metal knife inserted ½ inch under the surface near the center of the cup. Minimum baking time is 1 hour for the 2-egg recipe and 50 minutes for the 3-egg recipe. When the custard tests done, remove it from the hot water and chill in ice water. Unmold the chilled custard onto a plate for serving.

Stirred Custard Sauce – crème anglaise

While that custard is baking, prepare the stirred custard sauce: Cook remaining custard mix in the top of the double boiler over simmering water, stirring constantly with a rubber spatula. When stirring, be careful to remove custard from sides of the pan. While the custard is cooking, chill a bowl in ice water. Continue cooking the sauce for approximately 10-15 minutes until the mixture forms a coating on a clean metal spoon (82-84ºC for the 2-egg recipe and 77-79ºC for the 3-egg recipe). Cook slowly. (Try the test on the uncooked sauce so that change in consistency can be recognized.) The thickness will be similar to a thin white sauce. Immediately pour the coagulated custard into the chilled bowl and blend in ¼ tsp. vanilla. Continue stirring until custard is cooled.

Characteristics of Standard Product for a Stirred Custard:

Appearance Texture Flavor

Smooth.

Color dependent on that of egg yolks.

Smooth; consistency of heavy whipping cream.

Not curdled.

Slightly sweet, mild egg flavor.

Characteristics of Standard Product for a Baked Custard:

Appearance Texture Flavor

Pale golden brown. Smooth, evenly coagulated; not porous.

Uniform gel structure which holds a distinct cut edge.

Slightly sweet, mild egg flavor.

Evaluation:

Product Appearance Texture Flavor

2-Egg Baked Custard

3- Egg Baked Custard

2- Egg Stirred Custard Sauce

3-Egg Stirred Custard

9.2 Concept Review Eggs - Custard

How do the 2-egg and 3-egg custards compare in thickness or gel strength, appearance, sweetness, total flavor?

Why may stirred custards made from the same ingredients and recipe produce dissimilar products?

Why does a three-egg custard require more attention during cooking versus a two-egg custard?

Which custard products were an egg sol and which were an egg gel.

What steps were taken to prevent coagulation while making the stirred custard?

What method was used to prevent over-coagulation while making the baked custard?

Why do stirred custards made from the same ingredients and recipe have different coagulation temperatures?

9.3 Eggs – Additional Custard Recipes

Creamy Eggnog

3 tbsp Egg Yolk, pasteurized ½ cup heavy cream

1¼ cups milk ½ tsp vanilla

3 tbsp sugar

Whisk together egg yolk, milk and sugar. Cook while constantly stirring in the top of the double boiler until the mixture reaches 77°C. Remove from heat and pour into a bowl placed in an ice bath. Once cool, add the heavy cream and vanilla. Mix together. Cover and chill until ready to serve.

Chocolate Pot de Crème

1 ½ cups heavy cream ¼ cup egg yolk, pasteurized

¾ cup semi-sweet chocolate chips ¾ tsp vanilla

¼ cup sugar

In a double boiler, mix together heavy cream, chocolate chips and sugar. Cook while constantly stirring until all of the chocolate melts and the mixture reaches approximately 85°C. Remove from heat.

Meanwhile in a small bowl, whisk together the egg yolk and vanilla extract. While whisking slowly add the hot chocolate mixture into the egg yolk. Place pot de crème in an ice bath to cool before serving.

Crème Brûlée

2/3 cup half & half ½ tsp vanilla

2 tbsp sugar 2 tsp sugar

2 egg yolks

Preheat oven to 350°F. Place two water baths with racks in the oven

while it is preheating, filled approximately half full with hot water.

In a small saucepan heat half & half and 2 tablespoons of sugar over medium heat until mixture reaches approximately 80°C. Remove from heat.

In a small bowl whisk together the egg yolks and vanilla extract. While whisking slowly add the hot half & half and sugar into the egg mixture. Pour mixture in 2 1-pint baking dishes and place one dish in each of the hot water baths.

Bake for 45-55 minutes until a knife inserted comes out clean. Remove from oven and the hot water baths. Place the custard cups in an ice bath to rapidly cool. Sprinkle 1 tsp of sugar on top of each the crème brûlée cup. Ask the instructor to help broil the sugar on top.

This is the reaction that occurs when broiling the sugar layer on the crème brûlée.

Flan

½ cup milk ½ tsp vanilla

2 tbsp sugar ½ tbsp caramel sauce (instead of caramelizing sugar on the bottom

1 egg (remove chalaza)

Preheat oven to 350°F. Place two water baths with racks in the oven while it is preheating, filled approximately half full with hot water.

Spread 1-2 teaspoons of caramel sauce into the bottom of each of two custard cups.

In a small saucepan heat milk and sugar over medium heat until mixture reaches approximately 80°C. Remove from heat.

Meanwhile in a small bowl whisk together egg and vanilla extract. While whisking slowly add the hot milk and sugar into the egg mixture. Pour mixture in 2 custard cups and place one cup in each of the hot water baths. Bake for 45-55 minutes until a knife inserted comes out clean. Remove from oven and the hot water baths. Place the custard cups in an ice bath to rapidly cool. Once cool, run a knife around the custard and invert onto a plate to serve.

10 Foams

Image Source: Cheese Souffle by Pierre-alain dorange, Creative Commons Attribution 3.0

10.1 Introduction to Foam Products

Objectives

To apply the principles of foam formation.

To compare characteristics of foams to those of emulsions.

To identify the stages of egg-white foam formation and the characteristics and uses of each stage.

To determine the effects of added ingredients on stability of egg-white foam.

Laboratory Problem

Observe the characteristics of elasticity and stability in egg white foams; suggest possible uses for egg whites at various stages of foam formation.

A. Beat One Egg White to the Stages of Foam Formation shown in the table.

Record observations and explanations.

B. Beat a Soft Meringue to the Stages of Foam Formation shown in the table.Sift ⅛ tsp. cream of tartar over egg white. Beat to beginning of soft peak stage. Gradually add 2 tbsp. plus 1½ tsp. sugar while beating. Observe and record observations at each stage.

Describe differences between what you observed with egg white and what you observe with meringue.

Stage of Foam Sketch Appearance of Peak Stability

Uses

A B A B

Foamy

Soft Peak

Upper Soft Peak

Stiff Peak

Dry

10.2 Foam Products – Soufflés and Puffy Omelets

Objectives

To continue to develop skill in the preparation and evaluation of various foam products.

To identify differences in ingredients, preparation techniques, and final products between soufflés and puffy omelets.

Laboratory Problems

Prepare soufflés and puffy omelets.

Prepare a soufflé according to the assigned recipe below:

Broccoli Soufflé

½ cup cooked chopped broccoli* ⅓ cup milk

1⅓ tbsp. butter 1/16 tsp. nutmeg

1⅓ tbsp. flour ½ tsp. lemon juice

¼ tsp. salt 2 eggs

¼ tsp. cream of tartar

Heat a water bath with a rack and 1-pint baking dish; preheat oven to 350°F. Drain cooked broccoli well on a paper towel and chop finely. Separate eggs, putting whites into a medium bowl and yolks into a medium or small bowl.

Make a thick white sauce from the butter, flour, salt and milk listed above. Melt fat in saucepan. Blend in flour and salt; remove from heat. Add milk, stirring to blend; return to heat and stir gently while heating quickly to the full boil. Add nutmeg and lemon juice to sauce, stirring to blend. Add white sauce mixture gradually to egg yolks, mixing well; then add chopped broccoli.

Beat egg whites with cream of tartar to upper limit of soft peak stage. Fold about one-fourth of the foam into broccoli mixture; spread broccoli mixture over remaining egg white foam, and fold until well blended.

Pour mixture into heated 1-pint baking dish in pan of hot water. Bake uncovered at 350° F. for 35-45 minutes until none of the mixture sticks to a clean metal knife inserted into center of soufflé.

*If using frozen broccoli, thaw and chop finely to make ½ cup.

Cheese Soufflé

1⅓ tbsp. butter ⅓ cup shredded sharp Cheddar Cheese (⅓ cup)

1⅓ tbsp. flour ¼ tsp. salt

2 eggs ⅓ cup milk

¼ tsp. cream of tartar

Heat a water bath with a rack and 1-pint baking dish; preheat oven to 350°F. Separate eggs, putting whites into a medium bowl and yolks into a medium or a small bowl.

Make a thick white sauce from the butter, flour, salt and milk listed above. Melt fat in saucepan. Blend in flour and salt; remove from heat. Add milk, stirring to blend; return to heat and stir gently while heating quickly to the full boil. Blend cheese into white sauce, and then add white sauce mixture gradually to egg yolks, mixing well.

Beat egg whites with cream of tartar to upper limit of soft peak stage. Fold about one-fourth of the foam into the cheese mixture; spread cheese mixture over remaining egg white foam, and fold until well blended.

Pour mixture into heated 1-pint baking dish in pan of hot water. Bake uncovered at 350°F for about 35 minutes until none of the mixture sticks to a clean metal knife inserted into center of soufflé.

Chocolate Soufflé

2 tbsp. butter 2 eggs

½ oz. unsweetened chocolate, cut up ½ tsp. vanilla

2 tbsp. flour ⅛ tsp. cream of tartar

⅓ cup milk 3 tbsp. sugar

Heat a water bath with a rack and 1-pint baking dish; preheat oven to 375°F. Separate eggs, putting whites into a medium bowl and yolks into a medium or a small bowl.

Melt butter and chocolate: remove from heat; stir in flour, and add milk. Cook over medium heat stirring constantly until mixture thickens. Gradually add the chocolate sauce to the egg yolks, mixing well. Stir in vanilla.

Beat egg white with cream of tartar to the beginning of the soft peak stage. Gradually add the sugar and beat to the upper limit of soft

peak stage. Fold about one-fourth of the foam into the chocolate mixture; spread chocolate mixture over remaining egg white foam, and fold until well blended.

Pour mixture into heated 1-pint baking dish in pan of hot water. Bake uncovered at 375°F for 35-40 minutes until none of the mixture sticks to a clean metal knife inserted into center of soufflé.

Lemon Soufflé

2 tbsp. butter 2 tbsp. fresh lemon juice

2 tbsp. flour 1½ tsp. grated lemon zest

⅓ cup milk 3 tbsp. sugar

2 eggs ¼ tsp. cream of tartar

Heat a water bath with a rack and 1-pint baking dish; preheat oven to 375°F. Separate eggs, putting whites into a medium bowl and yolks into a medium or a small bowl.

Make a thick white sauce from the butter, flour, and milk listed above. Melt butter in saucepan. Blend in flour; remove from heat. Add milk, stirring to blend; return to heat and stir gently while heating quickly to the full boil. Blend white sauce mixture gradually to egg yolks, mixing well. Stir in lemon juice and zest.

Beat egg whites with cream of tartar to the beginning of the soft peak stage. Gradually add the sugar and beat to the upper limit of soft peak stage. Fold about one-fourth of the foam into the lemon mixture; spread lemon mixture over remaining egg white foam, and fold until well blended.

Pour mixture into heated 1-pint baking dish in pan of hot water. Bake uncovered at 375°F for 30-45 minutes until none of the mixture sticks to a clean metal knife inserted into center of soufflé.

Tuna Soufflé

1⅓ tbsp. butter ⅓ cup milk

1⅓ tbsp. flour ⅓ cup tuna

¼ tsp. salt 2 eggs

⅛ tsp. dry mustard ¼ tsp. cream of tartar

Heat a water bath with a rack and 1-pint baking dish; preheat oven to 350°F. Separate eggs, putting whites into a medium bowl, and the yolks

into a medium or small bowl.

Make a thick white sauce from the butter, flour, salt, mustard and milk listed above. Melt butter in saucepan. Blend in flour, salt and mustard; remove from heat. Add milk, stirring to blend; return to heat and stir gently while heating quickly to the full boil. Add white sauce mixture gradually to egg yolks, mixing well. Rinse fish with hot water, drain well and add to sauce.

Beat egg whites with cream of tartar to upper limit of soft peak stage. Fold about one-fourth of the foam into the white sauce mixture; spread white sauce mixture over remaining egg white foam, and fold until well blended.

Pour mixture into heated 1-pint baking dish in pan of hot water. Bake uncovered at 350°F for about 35 minutes until none of the mixture sticks to a clean metal knife inserted into center of soufflé.

Prepare a Puffy Omelet From the Recipe Below Using the Assigned Liquid:

Puffy Omelet

2 eggs, separated 1 tsp. butter

2 tbsp. sugar (orange omelet only) ¼ tsp. cream of tartar

⅛ tsp. salt 2 tbsp. liquid (water, milk)

Preheat oven to 350°F. Separate eggs, placing the egg whites in a medium bowl and the yolks in a small bowl. Add salt and liquid to the yolks and beat with an electric mixer, on highest speed, until very thick, approximately 5-7 minutes.

Melt the butter in a 6-inch heavy aluminum skillet. Coat the interior with the melted butter. Beat egg whites* and cream of tartar to upper limits of soft peak stage; fold yolk mixture into whites. Immediately pour the omelet into the pre-heated skillet and cook over medium heat until side of omelet is slightly brown, approximately 2-4 min.

Place in oven and bake until a knife inserted in center comes out clean, about 10-15 minutes. Remove from oven and invert onto warm serving plate. Serve immediately.

Characteristics of the Standard Product:

Soufflé:

Appearance Texture Flavor

Puffed, slightly rounded top.

Browned surface.

Uniform texture and color.

Even foamy structure, slightly moist but coagulated throughout.

Light, fluffy and tender.

Well seasoned.

Cooked flavor appropriate to ingredients.

Puffy Omelet:

Appearance Texture Flavor

Well-puffed, delicate brown surface.

Does not collapse when removed from the oven.

Uniform structure and color. Light, fluffy, and tender.

Delicate flavor.

Evaluation of Soufflés

Soufflé Appearance Texture Flavor

Broccoli

Cheese

Chocolate

Lemon

Salmon or Tuna

Evaluation of Puffy Omelets

Omelet Appearance Texture Flavor

Water

Milk

Sweet Omelet (Orange Juice)

10.2 Concept Review Foam Products – Soufflés and Puffy Omelets

. From a protein standpoint – why do egg whites foam?

Why are egg yolks or plastic bowls detrimental to egg white foaming?

What are the differences between soufflés and puffy omelets?

Explain why a soufflé is an example of a sol, emulsion, and foam.

In the soufflé preparation, why are the white sauce and egg yolk combined the way they are? What potential problems are in this step?

What is the purpose of lightening, i.e. first adding a small portion of the egg foam to the thickened mixture?

What problems may result from adding vegetables or fish to a soufflé?

10.2 Common Defects in Egg Foam Products (Puffy Omelet and Soufflés) and their Probable Causes

Puffy Omelets

Low volume

Underbeating yolks or whites

Overfolding (often required when egg whites are overbeaten)

Shrinkage. Some shrinkage is expected.

Overbeating

Overbaking

Collapse

Underbaking

Layer in bottom

Too little acid

Too much added liquid

Underbeating white or yolk mixture

Overbeating whites

Underfolding

Slow preparation or delayed heating

Less tender

Not enough liquid

Soufflés

Broken emulsion during gelatinization of starch

Too much evaporation.

Shrinkage

Overbeating whites

Collapse

Underbaking

Layer in bottom

Too thin white sauce

Inadequate folding

Delayed baking, oven not preheated

Water bath not preheated

Underbeaten egg whites

Underfolding

Low volume, uneven texture

Overbeating

Egg yolks coagulated when blended with thick white sauce.

10.3 Foam Products – Cakes

Objectives

To continue to develop skill in the preparation and evaluation of various foam products.

To compare characteristics of three different foam cakes as related to their ingredient combinations.

To determine the relationship of manipulative techniques in both preparing the foam and incorporating the flour to the characteristics of the final product.

Laboratory Problem

Prepare a Foam Cake – Angel, Sponge, or Chiffon

Angel Cake

⅓ cup sifted cake flour ½ cup egg whites

⅛ tsp. salt ½ tsp. cream of tartar

¼ cup sugar ¼ cup sugar

½ tsp. vanilla flavoring ¼ tsp. almond extract

Preheat oven to 375°F. Sift together flour, salt, and ¼ cup sugar three times; set aside.

In a medium (7" – 1½ qt.) bowl, beat egg whites and cream of tartar to beginning of soft peak stage. Add vanilla and almond flavorings. Gradually add remaining ¼ cup sugar, 2 tsp. at a time, and continue beating to upper limits of the soft peak stage.

Sift one-fourth of the flour-sugar mixture over meringue; fold in gently until flour just disappears. Repeat 3 times. Gently push batter into ungreased 7⅜ X 3⅝-inch loaf pan. Bake at 375oF until the cake springs back when lightly touched, about 25 minutes. Invert pan and let cake hang until cool. Cut cake with serrated knife.

Sponge Cake

⅓ cup sifted cake flour ¼ tsp. lemon extract

⅓ cup sugar, divided into three equal parts ⅛ tsp. salt

2 egg yolks 1⅓ tbsp. cold water

¼ tsp. grated lemon zest ¼ cup egg whites

¼ tsp. cream of tartar

Preheat oven to 375°F. Separate eggs; putting yolks in small (5½" – 1½ pt.) bowl, and measure egg whites into a medium (7" – 1½ qt.) bowl.

Sift together flour and one-third of sugar (about 2 tbsp.) three times. Set aside.

Beat egg yolks, zest, extract, salt, and water until very thick and lemon-colored. Gradually add one-third of sugar, beating until thick enough to mound.

Beat egg whites and cream of tartar to the beginning of the soft peak stage. Gradually add remaining one-third of sugar and continue beating to upper limits of the soft peak stage.

Sift flour mixture one-fourth at a time over yolks, folding gently until flour just disappears after each addition. Spread yolk-flour mixture over egg whites and fold in gently until well blended. Pour into ungreased 7⅜ X 3⅝-inch loaf pan. Bake at 375°F until cake springs back when lightly touched, approximately 20 minutes. Invert cake and let hang until cool. Cut with serrated knife.

Lemon Chiffon Cake

½ cup sifted all-purpose flour 3 tbsp. cold water

2 tbsp. sugar ½ tsp. vanilla

¾ tsp. baking powder ½ tsp. grated lemon zest

¼ tsp. salt ¼ cup egg whites

2 tbsp. vegetable oil ⅛ tsp. cream of tartar

1 egg yolk ¼ cup sugar

Preheat oven to 350°F. Sift first four dry ingredients into a medium mixing bowl; make a well in dry ingredients. Add vegetable oil, egg yolk, water, vanilla, and grated lemon zest in order given.

Beat with a wood spoon until smooth. Beat egg whites and cream of tartar, in a medium bowl, to beginning of soft peak stage. Gradually add ¼ cup sugar and beat to upper limits of soft peak stage. Fold flour mixture into meringue. Bake in ungreased 7¾ X 3⅝-inch loaf pan at 350oF until cake springs back when lightly touched, approximately 25-30 minutes. Invert cake and let hang until cool. Cut with serrated knife.

Characteristics of the Standard Product for Foam Cakes:

Angel Cake:

Appearance Grain Eating Quality

Dark golden brown crust, flat or slightly rounded surface, may be cracked.

Volume approximately 1½ times that of batter.

Small to medium-size air cells with thin cell walls. Tender, moist.

Sponge and Chiffon Cakes:

Appearance Grain Eating Quality

Golden brown flat or slightly rounded surface, may be cracked.

Volume approximately 1½ times that of batter.

Uniform color throughout.

Uniform structure of small air cells with thin cell walls.

Tender, slightly springy, moist.

Delicate flavor.

Evaluation:

Appearance

Foam Cakes Volume Grain (Cell & Cell Wall Size, & Uniformity)
Tenderness Flavor & Mouth Feel

Angel

Sponge

Chiffon

10.3 Concept Review Foam Products – Cakes

Describe the different stages of egg white foaming and list a product associated with each stage. foamy

soft peak

upper soft peak

stiff peak

dry

In an angel cake recipe, why is the cream of tartar added before beating the egg whites?

Explain and be able to demonstrate the technique of “folding”.

How do you prepare the baking pan for an angel cake?

Whipping egg whites _____ protein; while oven heating _____ the protein.

Why are foam cakes inverted for cooling?

Compare the characteristics of these foam cakes in relation to the ingredient combination in each.

Angel Food Cake:

Sponge Cake:

Lemon Chiffon Cake:

10.3 Common Defects in Angel Cake and Sponge Cake Products and their Probable Causes

Common Defects in Egg Foam Products and their Probable Causes

In General:

Low volume

Presence of small amount of fat

Sugar added too soon or too rapidly

Low quality eggs

Slow beating rate

Small eggs (if counted, not measured)

Low volume (shrunken)

Overbeating before sugar was added

Sugar not well blended into meringue

Soft Meringues

Low volume and curdled look

Overbeaten before sugar was added

Overbeaten

Leakage or weeping

Undercoagulation caused by

Underbeating

Placing meringue on cold filling

Short baking time at high temperature

Underbaking or Delayed baking

Low quality egg

Beading

Overcoagulation caused by

Baking on hot filling

(although this is recommended for food safety)

Failure to dissolve sugar

Overbeating

Dull or dry surface

Overbeating

Low volume, very fine cells, slick shiny surface, will not hold peaks

Sugar added too soon

Low volume, shrinkage, shiny surface

Underbeaten after sugar is added

Shrinkage

Not sealing meringue to crust

Hard Meringues or Meringue Shells

Sticky

Underbaking

Underbeating

Hard, tough

Overbaking

Brown with soft or sticky center

Too high oven temperature

Angel Cakes

Low volume

Low quality eggs

Low volume, tough, gummy, thick cell walls

Underbeating

Excessive folding or mixing

Low volume with streaks

Too much sugar or flour added at once

Underfolded

Low volume, coarse texture

Not enough folding of flour and sugar

Low volume, yellow color, coarse texture, thick cell walls, tough

Not enough cream of tartar

Low volume, fine grain, broken (collapsed) cells

Overbeating

Low volume, tough, compact

Overfolding

Fallen, sugary, crystalline, dry

Excess sugar

Shrunken (Slight shrinkage from highest volume in oven is expected.)

Pan not free from fat

Underbaking

Extreme overbaking

Failure to invert pan

Extreme overmixing

Coarse cells, uneven texture, but tender

Underfolded

Top crust separates

Excessive overbaking

Dry and tough

Overbaking

Cake falls from pan

Underbaking

Traces of fat in pan

Soggy, excessively moist cake

See causes of low volume

Underbaked

Tough

Low quality eggs

Overfolding

(often because of overbeating egg whites)

Insufficient sugar

Holes and tunnels

Insufficient folding

Batter not pushed against sides and bottom of pan

Overbeating egg whites

Chiffon and Sponge Cakes

Low volume

Overbeating egg whites

Overfolding

Low volume and thick cell walls, layering

Underbeating whites or yolks

Underfolding

Tough

Not enough liquid

Overfolding

Soggy

Too much liquid

11 Meats

11.1 Dry Heat Methods – Roasting and Broiling

Objectives

To be able to identify cuts of meat appropriate for dry heat.

To be able to prepare and recognize three stages of doneness in dry heat meat cookery.

To determine the effect of the degree of doneness on flavor, juiciness, and tenderness of broiled and roasted tender cuts of meat.

Laboratory Problems

Identify cuts of meat to be prepared in this lab.

Roast pork rib roast.

Broil steaks to the four degrees of doneness.

Terms

Dry heat Roast

Pan-Fry

Pan-Broil

Oven broil–Beef Steaks

Deep-Fat Fry

Retail cuts Beef- Rib Steak, Club Steak, Porterhouse Steak, T-Bone Steak

Pork- Rib Chop, Loin Chop, Rib Roast

Lamb- Rib Chop, Loin Chop

Degree of doneness – check by color, texture Medium rare – 63oC (145oF)

Medium – 71oC (160oF)

Well done – 77oC (170oF)

Longissimus dorsi– Loin muscle

Psoas major– Tenderloin muscle

Myoglobin; Oxymyoglobin; Denatured Globin Hemichrome

Examine all cuts of meat before cooking, noting characteristics by which each can be identified:

Roast a pork rib roast

Set oven at 325°F.

Place meat, fat side up, in an open shallow roasting pan. The ribs replace the rack usually required for roasting. A boneless roast should be placed on a rack.

Insert a meat thermometer so that the bulb is in the center of the largest muscle. The bulb should not touch bone or rest in fat. If a glass thermometer is used, first pierce the meat with a metal skewer.

Roast to 63°C. (145°F).

Let stand approximately 10 minutes before carving.

Broil beef steaks to assigned degree of doneness:

°C °F Resting Time Interior Color

Medium-Rare 63 145 3 minutes Bright pink throughout interior

Medium 71 160 3 minutes Pink center, gray toward edges

Medium-Well 74 165 3 minutes Small amount of pink in center

Well Done 77 170 3 minutes Gray

Cut through fat and epimysium (connective tissue surrounding muscle) at approximately 1-inch intervals to prevent curling.

Remove broiler pan from oven; set the oven regulator for broiling. Preheat electric, but not gas, broilers.

Place meat on rack of broiler pan 2 to 5 inches from the heat. Steaks to be cooked rare should be closer to, and steaks to be well-done farther from, the heat sources.

Leave oven door open slightly while broiling

Broil until top side is brown. The meat should be approximately, or slightly more than, half-done by the time it is browned on top.

Do not season meat in laboratory. Outside the laboratory, broiled meats are seasoned after browning because salt tends to bring moisture to the cut surface and thus delays browning.

Turn and brown other side. Test for doneness by making a small cut along the bone, or in the center of a boneless cut, with a sharp knife. Use temperature as an additional indicator.

11.2 Dry Heat Methods of Meat Cookery for Tender and Tenderized Meat

Objectives

To identify cuts of meat

To be able to prepare various cuts of meat by the methods of panfrying and pan-broiling.

To observe the effect of mechanical tenderization on the tenderness of meat.

Laboratory Problems

Identify cuts of meat.

Panfry and panbroil lamb chops, beef patties, pork chops, pork

sausage, and bacon.

Panfry mechanically tenderized steaks with and without flour coating.

Examine cuts of meat:

Panfry Instructions

Cut through epimysium (connective tissue surrounding muscle) at one-inch intervals.

Brown meat on both sides in a small amount of vegetable oil or shortening. For some cuts no additional fat needs to be added. For lean or breaded meat, use enough fat to cover the surface of the pan.

Turn meat occasionally to ensure even browning. Adjust heat so that meat is cooked to desired doneness without over- or under-browning surface.

To check doneness, make a small cut with a sharp knife along the bone, or in the center of a boneless cut.

Pan-broil Instructions

Cut through epimysium (connective tissue surrounding muscle) at one-inch intervals.

Brush pan surface with vegetable oil or shortening to prevent sticking. (Omit this step if the pan you use has a non-stick surface.)

Place meat in heavy frying pan or on a griddle.

Cook slowly, turning occasionally. Adjust heat so that meat is cooked to desired doneness without over- or under-browning of surface.

Pour off fat is it accumulates so that meat is not fried.

Test for doneness by making a small cut with a sharp knife close to the bone, or in the center of a boneless cut.

Panfry Mechanically Tenderized Steaks

Minute Steaks

2 minute steaks (mechanically tenderized and flattened beef), ¼ lb. each

1-2 tsp. oil ¼ cup flour

½ tsp. salt dash pepper

Without flour: Add oil to skillet. Add steaks. Panfry until just well done, approximately 2 minutes on each side. Season with salt and pepper.

Floured: Melt fat in skillet. Mix flour, salt and pepper. Dredge meat in flour mixture and panfry until coating is brown and meat is well done, approximately 2 minutes on each side.

Prepare Enzyme Tenderized Steak using Round Steaks

Enzyme Tenderization

Divide ½ lb. round steak ½ to inch thick, into two comparable pieces. Cut through epimysium if necessary. Treat one piece with commercial enzyme tenderizer according to label directions. Pan-broil both pieces to the medium state of doneness. Salt the untreated piece.

Retail Cut Preparation Method and End Temp. Muscles Present in Cut Sensory Attributes

Beef Rib Steak Beef Club Steak

Beef T-Bone Steak

Beef-Porterhouse Steak

Pork Rib Chop Pork Loin Chop

Lamb Rib Chop Lamb Loin Chop

Beef Minute Steak

Without Flour

With Flour

Round Steak With Enzyme

No Treatment

11.2 Concept Review Dry Heat Methods of Meat Cookery for Tender and Tenderized Meat

List 5 Dry Heat Methods

What are the minimum internal temperatures for safe consumption of the following

Minimum Internal Temperature Temperature

Whole muscle cuts of beef, veal, lamb, pork

Ground meat (beef, veal, lamb, pork)

How does increased degree of doneness alter flavor, juiciness, tenderness of the meat?

How does flouring or battering affect the sensory properties of tender meat?

What mechanical methods of tenderizing were effective?

Do all muscles in a retail cut of meat have the same tenderness?

11.3 Moist Heat Methods of Meat Cookery and Acid and Enzyme Tenderization

Objectives

To prepare less tender cuts of meat by various methods of moist heat cookery.

To determine the combined effects of heat and moisture on various meat proteins.

To determine the effect of long-term acid marination on tenderness.

To determine the effect of proteolytic enzymes on meat tenderness.

Laboratory Problems

Prepare meats by moist heat methods.

Prepare meat treated with enzyme tenderizers.

Terms

Moist Heat Methods: Braising, Stewing

Collagen

Gelatin

Tenderizing Techniques: Enzyme Treatment (Bromelain/Papain), Mechanical (grinding/swissing), Acid Marination

Myoglobin, Oxymyoglobin, denature globin hemichrome

Non-enzymatic browning

Moist Heat Tenderization

Beef Stew

½ lb. beef stew meat ½ tsp. Worcestershire sauce

1 tbsp. vegetable oil or shortening very small piece of bay leaf

¼ tsp. salt ¼ cup cubed carrots

⅛ tsp. pepper ¼ cup potatoes, cut into ¾ –inch cubes

2 cups water ¼ cup chopped onions

Roux*

Cut stew meat into ¾" cubes. In a saucepan, melt vegetable oil or shortening. Brown meat cubes thoroughly in vegetable oil or shortening. Add salt, pepper, water, Worcestershire sauce, and bay leaf. Simmer, covered, until tender, approximately 1–1½ hours. Remove bay leaf. Skim most of the vegetable oil or shortening from stew liquid. Add vegetables to the stew; continue to simmer about 30 minutes. While stew is simmering, prepare a roux. When vegetables are done, add roux a small amount at a time, bringing to a boil after each addition, until adequately thickened.

*Roux: Measure 2 tablespoons of vegetable oil or shortening into skillet and blend in 3 tablespoons of flour. Cook 1–2 minutes over medium heat until lightly browned.

Creamy Beef and Mushrooms

½ lb. lean boneless flank steak 4 ounces small mushrooms, sliced

¾ tsp beef bouillon ½ cup evaporated milk

1 cup water 2 tbsp. all-purpose flour

¼ tsp dried thyme, crushed 1/8 tsp ground nutmeg

1/8 tsp salt 1 oz egg noodles

½ bay leaf 1 tsp lemon juice

4 ounces pearl onions, peeled*

Cut veal into 1–inch pieces. Lightly coat a saucepan with cooking spray. Preheat saucepan over medium heat. Brown veal in hot saucepan. Add beef bouillon, water, thyme, salt, and bay leaf. Bring to boiling;

reduce heat. Cover and simmer for 35 minutes. Halve any large fresh pearl onions. Stir onions and mushrooms into veal mixture. Return to boiling; reduce heat. Cover and simmer for 15 minutes more or until onions and mushrooms are tender.

In a separate small saucepan, prepare egg noodles: Bring 3 cups water to boil in saucepan, add 1 tsp salt and noodles. Stir gently, return to a boil and cook uncovered 6-8 min. Drain.

Combine evaporated milk, flour, and nutmeg. Add to veal mixture. Cook and stir until thickened and bubbly. Cook and stir 1 minute more. Remove from heat. Discard bay leaf. Stir in cooked noodles and lemon juice.

*Blanch onions in boiling water for about 10 seconds. Drain, chill, trim and slip off skins.

Swissed and Braised Beef Round Steak

¼ lb. round steak, 1-inch thick ¼ tsp. pepper

¼ cup flour 1-2 tbsp. vegetable oil or shortening

1 tsp. oregano ⅓ -⅔ cup tomato juice or water

½ tsp. salt

Cut through the epimysium at 1-inch intervals around the piece of meat. Mix flour, oregano, salt, and pepper. Place meat on cutting board, sprinkle with seasoned flour and pound with swissing iron. Turn meat, flour and pound. Repeat this process until meat is about ½ of original thickness. Melt vegetable oil or shortening in heavy skillet; brown meat on both sides. Add juice or water, cover tightly, and simmer on low heat approximately 90 minutes, or until fork tender.

Braised Breaded Pork

1 egg, beaten 2 tbsp. flour

1 tbsp. milk ¼ tsp. salt

¼ lb. pork blade chop 2 tbsp. fine cracker crumbs

1 tbsp. vegetable oil or shortening

Mix egg and milk. Coat meat with mixture of flour and salt. Dip meat in egg wash and then in cracker crumbs. Melt vegetable oil or shortening in a heavy frying pan. Brown meat on both sides in vegetable oil or shortening, being careful not to loosen the breading. Cover and cook on low heat until fork tender, approximately 45-60

minutes.

Pressure Pan Pot Roast

½ lb. heel of round beef roast ⅛ tsp. pepper

2 tbsp. vegetable oil or shortening ¼ cup chopped onions

¼ tsp. salt 3 cups water

Brown meat slowly in vegetable oil or shortening in pressure pan. Pour off drippings into liquid measuring cup, save for gravy. Set meat on rack. Season; add onions and water. Cook about 30 minutes at 15 lbs. pressure. Remove petcock. Cool pan at room temperature for 5 minutes; then reduce heat under cold running water. Make gravy.*

*To make gravy:

Allow fat to separate from retained drippings in liquid measuring cup. Skim off fat and return to cooking pan; stir in 1½ tbsp. flour and heat 1–2 minutes. Add water to remaining liquid in measuring cup to make 1 cup; add to pan. Stir constantly until mixture boils, scraping the pan so that any solidified meat juices are blended into the gravy. Continue to boil for one minute. Season to taste with salt and pepper.

Oven Pot Roast with Vegetables

½ lb. blade roast (beef) ⅛ tsp. pepper

1–2 tbsp. vegetable oil or shortening 2 medium potatoes, peeled & cut into 1” pieces

½ cup tomato juice ½ cup sliced onions

1 medium carrot, peeled, chopped in 1–inch pieces ½ tsp. salt

Brown roast in vegetable oil or shortening in heavy skillet that can be put into the oven. Pour off drippings into liquid measuring cup, save for gravy. Add tomato juice and onions; season with salt and pepper. Cover tightly and cook in 300°F oven 1½ to 2 hours. If liquid evaporates, add more liquid during the baking period. About 45 minutes before serving time, add potatoes and carrot. Remove meat and vegetables from skillet and place on warm platter. Make gravy.*

*To make gravy:

Allow fat to separate from retained drippings in liquid measuring cup. Skim off fat and return to cooking pan; stir in 1½ tbsp. flour and heat 1–2 minutes. Add water to remaining liquid in measuring cup to make 1 cup; add to pan. Stir constantly until mixture boils, scraping

the pan so that any solidified meat juices are blended into the gravy. Continue to boil for one minute. Season to taste with salt and pepper.

Lamb Chops with Sour Cream

2 blade or arm lamb chops 2 tbsp. sliced green onions

dash salt and pepper 1 tsp. flour

½ cup water 2 tbsp. dairy sour cream

½ chicken bouillon cube 2 tsp. sliced green onion tops

⅛ tsp. thyme ½ tsp. fresh chopped parsley

¼ cup chopped celery

In a skillet, slowly brown chop in small amount of hot vegetable oil or shortening. Drain vegetable oil or shortening. Sprinkle chop with salt and pepper. Add next 5 ingredients. Cover; simmer 30–45 minutes until meat is tender. Remove chop from pan. Pour drippings into measuring cup. When fat comes to the top, skim off. Add water to remaining drippings to make ½ cup. Add 1 tsp. oil to pan. Add flour and blend. Return drippings to pan and boil 2 minutes. Return chop to pan; cover with sour cream; cover and heat through without curdling sour cream. Top with green onion tops and parsley before serving.

InstantPot Pulled Pork

1 lb pork shoulder ½ tsp. onion powder

2 tsp. salt 1 tbsp. vegetable oil

1 tsp. black pepper ¾ cup chicken broth

½ garlic powder

Add all dry ingredients to a bowl and whisk together. Add pork to coat well with spices. Brown pork in sauté pan. Sear pork for two minutes on each side. Remove pork. Deglaze sauté pan with chicken broth. Place pork and broth into InstantPot. Set InstantPot to pork setting, then adjust cook time to 25 minutes. Once cooked, release steam and shred pork.

Beef Tongue Tacos

½– ¾ lb.beef tongue 2 medium tomatoes, diced

2 cups water ½ white onion, diced

½ white onion, sliced 1 bunch fresh cilantro, chopped

2 cloves garlic, crushed ¾ cup cheddar cheese, shredded

1 bay leaf 3 tbsp lemon juice

¼ tsp salt 14 corn tortillas

Wash tongue in cool water. Trim away any bony parts. Place tongue on meat rack in pressure pan, add water, onions, garlic, bay leaf, and salt and cook at 15 lbs. pressure for 40 minutes. Cool pan at room temperature for 15 minutes. Open pan, cool tongue, remove skin, and shred the meat into strands.

Meanwhile, combine tomatoes, onion, and cilantro in a medium bowl. Mix well and set aside. In a small skillet, heat tortillas, one minute on each side. To assemble tacos, layer tongue and tomato mixture inside folded tortilla and sprinkle with cheese and lemon juice. Serve immediately.

Recipe Retail Cut Cooking Method Sensory Attributes

Beef Stew

Creamy Beef and Mushroom

Swissed and Braised Beef Round Steak

Braised Breaded Pork

Pressure Pan Pot Roast

Oven Pot Roast with Vegetables

Lamb Chop with Sour Cream

InstantPot Pulled Pork

Beef Tongue Tacos

11.3 Concept Review Moist Heat Methods of Meat Cookery and Acid and Enzyme Tenderization

What are the two moist-heat methods used to cook less tender cuts of meat? How are these methods different from eachother?

Difference between these two methods

What are three reasons that meat should be cooked by moist heat?

List 3 common ways o tenderize meat before cooking.

What is the difference between collagen and elastin?

11.4 Variety Meats

Objectives

To demonstrate methods of cookery used for variety meats.

To develop increased appreciation of variety meats.

Laboratory Problems

Prepare variety meats according to recipes below.

Crispy Fried Liver

¼ lb. sliced calves' liver 2 tbsp. milk

2 tsp. grated onion 1 tbsp. lemon juice

½ egg, beaten 2 tbsp. flour

½ clove garlic, pressed ¼ tsp. salt

½ cup fine cracker crumbs dash pepper

3 tbsp. vegetable oil or shortening

Remove any membrane from liver and snip out veins with scissors. Cut the slices into strips 1–1 ½ inches wide; sprinkle with lemon juice. Combine flour, salt, and pepper. Combine milk, onion, egg, and garlic. Dredge liver in flour mixture. Dip floured slices in milk mixture, then in crumbs. Fry in hot vegetable oil or shortening for 3–4 minutes per sides.

Liver and Apple Pâté

4 tbsp. butter 3 Tbsp apple juice

½ Granny Smith apple, peeled, cored, and cut into ½–inch dice ¼ tsp. salt

2 tbsp. chopped shallots ¼ tsp. freshly ground black pepper

⅓ pound chicken livers 2 tbsp. heavy cream

Melt 1 tablespoon butter in a medium skillet over medium heat. Cook the apple stirring often, until softened, about 5 minutes. Add the

shallots and continue cooking until tender, about 2 minutes. Transfer to a bowl.

Melt 1 tablespoon butter in the skillet over medium-high heat. Add chicken livers and cook, stirring occasionally, just until they are firm and slightly pink in the center, about 6 minutes. Combine with apples, shallots and apple juice. Let cool. Add thyme, salt and pepper, pulse to blend in a food processor. With the processor running, add the remaining butter and the heavy cream. Transfer to a serving bowl cover, and refrigerate until chilled.

Chicken Liver Stroganoff

⅓ cup polished rice 1 tsp. paprika

¾ cup water ¼ tsp. salt

dash pepper 1 cup chopped onion

½ cup sour cream 2 tbsp. butter

¼ lb. chicken livers

Boil rice, water and salt. Sauté onion in butter until tender; remove onion. Cut chicken livers into bite-size pieces and season with a mixture of paprika, salt and pepper. Sauté livers in butter, cover, and cook over low heat until just done, about 5 minutes. Drain off vegetable oil or shortening. Stir sour cream and onions into mixture in skillet. Heat to serving temperature; do not let mixture curdle. Serve over hot rice.

Evaluation

Recipe Process Preparation Overall Palatability

Crispy Fried Liver

Liver and Apple Pâté

Chicken Liver Stroganoff

11.5 Poultry Cookery

Objectives

To determine the effects of moist and dry heat cookery on poultry.

Laboratory Problems

Demonstrate washing and disjointing poultry.

Prepare poultry by dry heat method.

Prepare poultry by moist heat method.

Chicken Fabrication Demonstration:

Disjointing into halves, quarters, and individual portions.

Cleaning.

The following directions show one method of disjointing poultry. This method will result in ten individual pieces.

Place the chicken, back side down, on an easily cleaned surface. Pull the leg and thigh away from the body; cut through the skin and between the muscles toward the hip joint.

Cut through the joint. (If the chicken is less tender, e.g., a stewing hen for fricassee, it may be necessary to break the joint with the hands.) Cut through the muscle and skin close to the body. Repeat on the other side.

To separate the thigh from the leg, bend the thigh and leg together to locate the joint, and cut through the joint.

Pull wing away from body to locate the wing joint. Cut through the joint; repeat on other side.

To separate the breast from the back, locate the junctions of back and front ribs. On each side, cut through the skin and ribs from the tail end toward the neck. Bend the breast away from the back to break the joint, and then cut the pieces apart.

Cut the back crosswise into two sections. Cut the breast lengthwise or crosswise into two sections.

Check the individual pieces to see that the chicken was adequately eviscerated; if necessary, remove kidneys.

Prepare poultry according to recipes utilizing dry heat:

Minimum cook temp 165°F

Broiled Chicken

2–3 pieces broiler–fryer chicken 2 tbsp. butter, melted

2 tbsp. lemon juice

Brush chicken with mixture of butter and lemon juice. Place skin side down on broiler pan and broil 6–7″ from heat. Turn and baste every 5 to 10 minutes. Chicken is done when thickest pieces are 165oF or juices run clear, 10–20 minutes.

Oven-baked Chicken

2–3 pieces broiler-fryer chicken ½ tsp. salt

2 tbsp. butter ½ tsp. paprika

¼ cup flour dash pepper

Heat oven to 350°F. In oven, melt butter in 8″ square baking pan. Mix flour, salt, paprika, and pepper. Coat chicken pieces thoroughly with the flour mixture, then roll in butter. Place chicken, skin side down, in the pan. Cook uncovered 30 minutes. Turn chicken; cook 15–20 minutes longer or until thickest pieces are 165°F or juices run clear.

Fried Chicken

2–3 pieces broiler-fryer chicken ½ tsp. paprika

¼ cup flour dash pepper

½ tsp. salt vegetable oil for frying

Preheat oven to 350°F. Combine flour and seasonings in paper or plastic bag; add 2 pieces of chicken at a time and shake. Place on rack to let coating dry. Heat a layer of vegetable oil or shortening about ¼ -inch deep in skillet until a drop of water will sizzle when added. Brown meaty pieces first; then add small pieces. Don’t crowd. Brown one side, turn with tongs and brown other side. Transfer to baking pan and complete cooking in 350°F oven about 10–20 minutes until thickest pieces are 165°F or juices run clear.

Roast Cornish Hen

1 lb. Cornish game hen Melted butter

Dressing:

3 tbsp. chopped onion

¼ tsp. salt

½ cup diced celery ¼ tsp. pepper

3 tbsp. butter ½ – ¾ tsp. poultry seasoning

3 cups dry bread cubes hot water to moisten

Preheat oven to 350°F. Check cavity to see that lungs, kidneys, etc., have been completely removed. Rinse the bird thoroughly with cold running water, inside and out. Pat dry with paper toweling. Rub the cavity lightly with salt. Rub skin with melted butter and place the bird, breast side up, on a rack in a roasting pan. Insert thermometer into center of inner thigh muscle. Roast uncovered at 350°F, basting every 30 minutes with pan drippings or melted butter. Roast until thickest portion is 165°F or juices run clear, approximately 60 minutes.

Dressing:

Sauté onion and celery in butter until vegetables are barely tender. Gently toss bread cubes and seasonings with vegetables and butter. Add enough liquid to barely moisten. Bake in a greased, covered baking dish for 45 minutes at 350°F. Do not allow stuffing to stand at room temperature for more than a few minutes before serving.

Chicken in Chili Sauce

2 chicken thighs ¼ tsp sugar

⅓ cup tomato sauce ⅛ tsp salt

½ tsp parsley ⅛ tsp Tabasco sauce

½ tsp chili powder

Place chicken thighs, skin side up, in 1-pint microwave-safe casserole, with thickest parts toward outside edge. Mix remaining ingredients; spread over chicken. Cover dish and microwave on medium high setting (385 watts) until thickest parts of chicken are 165°F or juices run clear, approximately 9 to 11 minutes.

Prepare poultry according to a recipe utilizing moist heat:

Chicken Cacciatore

2-3 pieces chicken ¼ cup chicken broth

1 tbsp. olive oil ¼ tsp. sugar

⅓ cup sliced fresh mushrooms ⅛ tsp. salt

¼ medium onion, sliced ¼ tsp. dried rosemary, crushed

1 garlic clove, minced ¼ tsp. dried thyme

½ cup canned diced tomatoes, with liquid ⅛ tsp. dried oregano

2 tbsp tomato paste ⅛ tsp. black pepper

1 tsp. fresh parsley, chopped

In a skillet, cook chicken in hot oil about 10 minutes or until light brown, turning to brown evenly. Remove chicken, set aside. Add mushrooms, onion and garlic to drippings in skillet. Cook about 5 minutes or until vegetables are just tender. Return chicken to skillet.

In small bowl combine tomatoes, paste, broth, sugar and dried spices. Pour over chicken in skillet. Bring to boiling; reduce heat, cover and simmer for 30–35 minutes or until chicken is no longer pink. Sprinkle with parsley.

Evaluation:

Recipe Dry or Moist Heat Method? Appearance Texture Flavor

Broiled Chicken

Oven-Baked Chicken

Fried Chicken

Roast Cornish Hen

Dressing

Chicken in Chili Sauce

Chicken Cacciatore

11.6 Fish and Shellfish Cookery

Objectives

To become familiar with appropriate methods of preparation of fish and shellfish.

To identify the characteristics of high-quality raw fish as well as the characteristics of well-prepared fish products.

To become acquainted with a variety of fish.

Laboratory Problem

Prepare fish and shellfish according to recipes below.

Characteristics of the Standard Product for Fish and Shellfish:

The appearance, texture, and flavor of the product is highly dependent upon the quality of the fresh fish as well as preparation techniques. Fish should separate easily into flakes; when cooked beyond this stage, it shrinks and becomes tough and dry. Overcooking shellfish likewise toughens the muscle.

Salmon Patties

2 tbsp. egg, beaten ⅛ tsp. black pepper

1 tbsp. milk 7 oz. (1/2 can) canned salmon

2 tbsp. chopped green onion 2 tbsp. bread crumbs

½ tsp. dried dill weed 1 tbsp. cooking oil

Drain salmon, remove skin and bones. Combine the egg, milk, green onions, dill and pepper in a medium bowl. Add salmon and bread crumbs. Mix well. Form into four ½ inch thick patties. Heat oil in skillet. Cook patties over medium-low heat about 3 minutes, turn and cook 3 more minutes or until golden brown.

Crab Louis

3-5 large lettuce leaves 1-2 tomatoes, cut in eighths

1 cup salad greens, torn into bite-sized pieces 2 hard-cooked eggs, quartered

6-8 ripe or green olives ¼ lb. crabmeat, cooked

Louis Dressing:

⅓ cup chili sauce

¼ cup mayonnaise

½ tsp. freshly minced onion ¼ tsp. sugar

⅛ tsp. Worcestershire sauce salt to taste

Chill salad ingredients if necessary. Line serving bowl with large lettuce leaves; add lettuce pieces. Arrange remaining ingredients except dressing. Serve dressing separately for laboratory evaluation.

Louis Dressing:

Mix ingredients. Let stand at least 30 minutes to blend flavors.

Panfried Fish Fillets

¼ lb. fish fillets 1 egg

2 tbsp. flour 1 tbsp. water

¼ tsp. salt ¼ cup bread or cracker crumbs

dash pepper vegetable oil or shortening for frying

Combine flour, salt, and pepper. Coat fish fillets with seasoned flour; dip into egg beaten with water, then coat with crumbs. Fry fillets until the surface is golden brown and interior is opaque and can be separated into flakes, about 5–7 minutes. Turn once with spatula during frying.

Broiled Fish Fillets

¼ lb. fish fillets 1 tbsp. fresh or frozen lemon juice

1 tbsp. butter, melted salt and pepper

Brush fish fillets with mixture of butter and lemon juice. Place fillets, skin side up, on broiler pan 3 to 4 inches from heat. Broil about 4 to 5 minutes on each side. Turn with spatula and baste occasionally. Broil until flesh is opaque and can be separated into flakes. The surface may not brown. Season with salt and pepper.

Lobster Tails with Lemon–Butter Sauce

1 lobster tail 2 tbsp. butter, melted

1 tsp. fresh or frozen lemon juice

Place lobster tail in enough boiling salted water to cover. (Use 1 tsp. salt per quart water.) Bring water back to boil; reduce heat and simmer approximately 5 minutes if fresh or 15 minutes if frozen, until tail is creamy white and opaque. Drain. With kitchen shears, cut away the thin undershell, leaving meat in tail. Reheat if necessary. Combine butter and lemon juice; heat. Serve with lobster tail.

Oyster Stew

2 tbsp. butter ½ cup half-and-half

½ cup fresh oysters with liquid salt

¾ cup milk pepper

Melt butter in small saucepan. Add oysters with liquid liquor; stir over low heat until edges curl. Heat milk and cream in another saucepan; add oysters and cooking liquid. Heat just to serving temperature. Add salt and pepper to taste.

Creole Shrimp with Rice

2 tbsp. chopped green pepper 1–2 drops Tabasco sauce

2 tbsp. diced celery ⅛ tsp. salt

1 tbsp. chopped onion dash pepper

¼ clove garlic, minced ⅓ lb. peeled, deveined shrimp*

1 tbsp. vegetable oil ⅓ cup rice

¾ cup canned tomatoes ¾ cup water

1½ tsp. tomato paste ¼ tsp. salt

½ bay leaf ½ sprig thyme

Sauté green pepper, celery, onion, and garlic in oil. Add tomatoes, tomato paste, and seasonings; simmer 20 minutes. Boil rice, water and salt until rice is soft, about 20–35 minutes. Remove bay leaf from tomato mixture; add shrimp to sauce and simmer 5 minutes longer. Serve creole shrimp over rice; garnish with parsley.

*Thaw frozen shrimp, rinse in cool water, and pat dry before adding to other ingredients.

Salmon Steak with Tartar Sauce

1 salmon steak

Tartar Sauce:

1½ tsp. butter ¼ cup salad dressing or mayonnaise

dash salt 2 tsp. minced dill pickle

dash paprika 1 tsp. grated onion

¼ tsp. Worcestershire sauce 1 tsp. chopped pimento

1 tsp. minced onion 1 tsp. fresh parsley, minced

Preheat oven to 350°F. Place salmon in greased baking dish. Melt

butter; add seasonings, Worcestershire sauce, and onion. Spread over salmon. Bake at 350°F for 25–30 minutes or until fish is opaque and can be separated into flakes. Combine ingredients for tartar sauce and serve with hot salmon steaks.

Baked Stuffed Fish

¼ cup chopped celery ¼ tsp. savory

1 tsp. chopped onion 1 tbsp. chopped sweet pickle

2 tbsp. butter 1 tsp. chopped parsley

¼ tsp. salt 1 cup day-old bread cut into ¼ inch cubes

dash pepper ½ lb. whitefish fillets

Sauté celery and onion in butter. Add seasonings, pickle, parsley, and bread cubes. Toss well. If stuffing seems dry, add a tablespoon of water or milk. Sprinkle fillets with salt. Place stuffing between two fillets. Fasten together using small skewers or toothpicks. Brush with melted vegetable oil or shortening and place on greased baking sheet. Bake in a moderate oven (350°F) for approximately 15–20 minutes or until fish is opaque and can be separated into flakes.

New England Clam Chowder

⅓ cup peeled, diced carrots 2 Tbsp flour

⅓ cup peeled, diced potatoes 1 Tbsp cold water

½ cup water 1 Tbsp butter

2 tbsp. minced onion ½ cup milk

½ can minced clams (7 oz., save liquid) or 5–8 (depends on size) fresh clams* salt to taste

dash pepper

Boil carrots and potatoes in ½ cup water until tender. Sauté onion and clams in butter; add vegetables with cooking water. Add flour mixed with 1 tbsp. water; return to boil for one minute. Add reserved clam liquid, milk, and seasonings. Heat to serving temperature. Do not boil.

* Boil fresh clams in enough water to cover until shells pop open. Remove clams, cut into small pieces. Save ¼ cup water in place of reserved clam liquid.

Poached Fish Fillets with Lemon Parsley Sauce

½ lb. fish fillets ½ tsp. salt

1 tbsp. oil ½ bay leaf

2 tbsp. onion, chopped ½ cup water

2 tbsp. chopped celery 1 sprig parsley

1 tbsp. lemon juice

Lemon Parsley Sauce

¼ cup butter

2 tsp. lemon juice

½ tsp. grated lemon zest 2 tsp. chopped parsley

Sauté onions and celery in oil in a skillet. Place fillets on top of vegetables. Add water and seasonings. Cover and simmer until fish is opaque and can be separated into flakes, about 8 minutes; do not turn fish. Carefully transfer fish to a heated platter with a wide spatula; arrange vegetables on fish. Serve with Lemon Parsley Sauce.

Lemon Parsley Sauce:

Heat butter and lemon juice in a saucepan. Add grated lemon zest and parsley.

Evaluation:

Recipe Appearance Texture Flavor

Salmon Patties

Crab Louis

Panfried Fish Fillets

Broiled Fish Fillets

Lobster Tails with Lemon–Butter Sauce

Oyster Stew

Creole Shrimp with Rice

Salmon Steak with Tartar Sauce

Baked Stuffed Fish

New England Clam Chowder

Poached Fish Fillets

12 Gluten Development

12.1 Muffin Method

Objectives

To apply standard techniques for gluten formation by preparing a product in which gluten forms very readily.

To differentiate among various forms of wheat flour and the gluten balls made from these flours.

Laboratory Problems

Prepare muffins.

Terms

Gluten=Gliadin and Glutenin + liquid + manipulation

Muffin Method- mix dry ingredients, make a well, add liquid ingredients with minimal mixing.

Creaming

Gliadin and Glutenin are wheat proteins

Muffins

Yield: 6 medium muffins.

2 under-stirred (5 secs. mixing)

2 standard (10 secs. mixing)

2 over-stirred (1+ min. mixing)

1 cup sifted all-purpose flour ½ cup milk

1 tbsp. sugar ½ egg (2 tbsp.)

1½ tsp. baking powder 2 tbsp. + 1½ tsp. oil

¼ tsp. salt

Heat oven to 425°F; grease the bottoms of muffins cups in pan. Sift flour, sugar, baking powder, and salt together 3 or 4 times to mix thoroughly. Add egg to milk and blend thoroughly with whisk or rotary beater. Add oil and mix.

Make a well in the dry ingredients in a large (8½" – 2½ qt.) bowl; add the liquid ingredients all at once to the dry. With a rubber spatula or wooden spoon, immediately start to stir as quickly as possible without splashing the mixture out of the bowl. Try to mix in 10 seconds; do not mix longer than 20 seconds. Stop stirring the instant the dry ingredients are just dampened. The batter should be lumpy but should not show particles of dry flour. To place muffins in pan, use a spoon and cut against side of the bowl, with one clean stroke. Fill each muffin cup 2/3 full. Place spoon directly in muffin pan and push batter from it with another spoon or rubber spatula. Bake at 425oF until golden brown, approximately 12–15 minutes. Let stand 1–2 minutes before removing from pan.

Characteristics of a Standard Product for Muffins:

Appearance Texture Flavor

Symmetrical shape.

Golden brown top with a pebbled surface resembling cauliflower.

Creamy white interior. No tunnels.

Moderate grain as evidenced by even, medium-sized holes and fairly thin cell walls.

Moist and tender

Mild, pleasing flavor.

Evaluation:

Characteristics Under stirred Optimal Mixing Over stirred

Appearance

Texture

Flavor

Examine Display Tray of Various Kinds of Flour and Gluten Balls:

Examine display tray of various kinds of wheat flour and gluten balls:

bread, all-purpose, cake, pastry, and rye.

Characteristics of Various Kinds of Flour Type of Flour Protein Content of Flour Volume of Gluten Ball Explanation

Whole Grain Flours

Whole Wheat

Rye

Oat

Refined Wheat Flours

Bread

All-Purpose

Pastry

Cake

12.1 Concept Review Muffin Method

Define gluten.

Describe the characteristics of over-stirred muffins. Why do these characteristics occur?

Describe the characteristics of under-stirred muffins. Why do these characteristics occur?

Steps for the muffin method

Muffin Ingredient Function

Ingredient Function

All-Purpose Flour

Sugar

Baking Powder

Salt

Milk

Egg

Oil

12.2 Shortened Cake – Conventional Method

Objectives

To illustrate the function of gluten in another baked product.

To demonstrate the effect of increased sugar and fat on gluten development by preparing a shortened cake by the conventional method.

Laboratory Problem

Prepare a Yellow Shortened Cake by the Conventional Method

Yellow Cake

¾ cup sifted cake flour 1 tbsp vegetable shortening

¾ tsp baking powder ¼ tsp vanilla

1/16 tsp salt ¼ cup + 2 tbsp sugar

1 tbsp butter ½ egg (2 tbsp)

¼ cup milk

Heat oven to 375°F.

Line bottom of 6×3¼ –inch loaf pan with waxed paper; lightly grease paper.

Sift cake flour, baking powder, and salt together three times. Set aside.

Measure vanilla flavoring, butter and vegetable shortening into a small bowl; mix well using an electric mixer. If fats get too soft, chill the bowl in ice.

Creaming:

Add measured sugar by teaspoons to butter and shortening with an electric mixer, creaming each time until light and fluffy. After all the sugar is added, beat about 200 strokes, or one minute with electric mixer.

Wash mixer beaters and in another small (5½“ – 1½ pt.) bowl, beat egg about 3–5 minutes at high speed with an electric mixer until thick and foamy. Add egg by thirds to creamed sugar, butter and shortening,

beating 100 strokes, or ½ minute with electric mixer, after each addition.

Alternate additions of flour and milk:

Add ¼ of the flour mixture; hand stir (don't beat) just until the flour is blended, about 10–15 strokes.

Add ⅓ of the milk and hand stir just until the milk is blended, approximately 8–10 strokes. Repeat alternate additions of flour and milk.

After the final flour addition, stir batter 100 strokes.

Immediately push batter into cake pan and snap the pan. (Raise pan 6 inches from table top, then set it down sharply.)

Bake at 375°F until cake springs back when touched lightly in the center, about 25–30 minutes.

Cool on rack 10 minutes, then remove from pan. Do not cut until cake has cooled to room temperature.

Characteristics of a Standard Product for Cake:

Appearance Texture Flavor

Uniform golden brown.

Slightly rounded top with a smooth, fine-grained surface.

Fine, uniform grain evidenced by small air cells with thin cell walls.

Very tender crumb – practically no resistance when bitten.

Smooth, light mouthfeel.

Mild, sweet flavor.

Evaluation:

Yellow Cake

Appearance

Texture

Flavor

12.2 Concept Review Shortened Cake – Conventional Method

Why is it important to have the sugar and fat well-blended when preparing batter by the conventional method?

Why must the amount of stirring be controlled after the flour and liquid additions are begun?

Why is the optimum amount of stirring dependent upon the fat and sugar content of the batter?

What are the characteristics of the final product if the cake batter is over-stirred?

What are the characteristics of the final product if the cake batter is under-stirred?

12.3 Biscuit or Pastry Method

Objectives

To apply principles of gluten development in the preparation of soft doughs.

To develop techniques of light kneading and rolling.

Laboratory Problems

Prepare rolled biscuits.

Compare examples of convenience products with biscuits prepared from basic ingredients.

Biscuits

Yield: 6 Biscuits

1 cup sifted all-purpose flour 1½ tsp. baking powder

¼ tsp. salt 3 tbsp. shortening

⅓ cup milk (approximate)

Heat oven to 425°F. Sift flour, baking powder, and salt together three times. Cut fat into dry ingredients scraping pastry blender as needed until the mixture resembles coarse corn meal. Make a well in the center of the dry ingredients; add milk and stir with a fork vigorously and quickly until blended (about 20-30 strokes) or until dough follows the fork. Sprinkle about 1 tsp. of flour onto counter. Form dough into a ball and knead lightly with finger tips 10 to 15 times.

Roll to ½ -inch thickness for 6 biscuits. Handle carefully to avoid distorting the shape. Dip cutter or knife into flour. Hold the cutter so that the pressure while cutting is even. Place cut biscuits on an ungreased baking sheet.

Bake at 425°F until golden brown, about 12–15 minutes.

Drop Biscuits

Prepare dry ingredients and shortening according to biscuit recipe above. Increase milk to ½ cup and stir only until dry ingredients are moistened. Do not knead or roll dough. Drop dough from a tablespoon onto a greased baking sheet. Bake 10–12 minutes.

Characteristics of a Standard Product for Biscuits:

Appearance Texture Flavor

Symmetrical shape, vertical sides with a fairly smooth level top.

Golden brown exterior.

Biscuits should double in volume during baking, and seem light in relation to volume.

Medium–fine grain with relatively thin cell walls.

Light, creamy white crumb that peels off in layers.

Crisp yet tender crust.

Moist, tender crumb with a mild, pleasing flavor.

Evaluation:

Product Appearance Texture Flavor

Rolled Biscuits

Dropped Biscuits

12.3 Concept Review Biscuit or Pastry Method

Why is only an approximate measure given for the liquid in biscuits?

What are the characteristics of over–manipulated biscuits?

Of under–manipulated biscuits?

What other products can be made by the pastry or biscuit method?

12.4 Pastry – Fruit Pies

Objectives

To compare compositions of various fats by studying labels.

To develop skillful manipulative techniques in handling pastry.

To identify the role of each ingredient in pastry.

To apply the principles involved in making a fruit-filled double crust pie.

Laboratory Problem

Prepare a single crust pie shell appropriate for a cream or chiffon pie filling.

Prepare a fruit pie, following the recipes and procedures given below for double crust pies:

Pastry

	Single Crust	Double Crust
Sifted flour	½ cup	1 cup
Salt	¼ tsp.	½ tsp.
Lard OR Vegetable shortening	2 tbsp.	2 tbsp. + 1½ tsp.
	¼ cup	⅓ cup
Cold water	1 tbsp. (approx.)	2 tbsp. (approx.)

Preheat oven. Mix flour and salt; cut in fat until size of small peas. Sprinkle water over flour mixture while tossing lightly with a fork. Work dough against side of bowl until it holds together. Shape into a ball.

Procedure for a Single Crust Pie Shell:

On lightly floured board or countertop, roll dough into circle about 8 inches in diameter, less than ⅛-inch thick or until only a slight dent remains when finger is pressed into dough. Use pastry guides to keep thickness even.

Carefully lift and ease into 6-inch pie pan without stretching. Trim off excess dough leaving ¼-inch overhang; fold this under itself and crimp crust without stretching.

Prick bottom and side of crust with a 4-tined fork.* Bake at 425°F for 8-10 minutes or until a golden brown. If crust bubbles in oven, prick with fork. Cool before filling.

* Omit this step if the filling is to be baked in the uncooked shell, e.g., for a fruit, pumpkin or pecan pie.

Procedure for Double Crust Pie:

Divide dough in half. Roll one half into a circle 8 inches in diameter, less than ⅛ inch thick, or until only a slight dent remains when finger is pressed into dough. Use pastry guides to keep thickness even.

Fit into 6-inch pie pan without stretching; trim off excess at edge of pan.

Roll out top crust and cut steam vents.

Place filling in pie shell; moisten edge of bottom crust with water. Place top crust on; press gently around edge. Cut excess crust, leaving ¼-½ -inch overhang; fold this under bottom crust and crimp edge.

Place pie pan on a baking sheet and bake at 450°F for 10 minutes. Reduce heat to 400°F and bake 20-30 minutes, or until crust is golden brown and fruit, if raw when placed in pie shell, is cooked.

Apple Pie

Pastry for 6-inch double crust pie 1½ cups sliced, peeled cooking apples

1¼ tsp. flour ¼ cup sugar

⅛ tsp. cinnamon 1 tsp. lemon juice

1 tsp. butter

Prepare pastry through step 3, above. Combine apples with dry ingredients and place in pie shell. Sprinkle with lemon juice and dot with butter. Proceed as directed for double crust pie.

Peach Pie

Pastry for 6-inch double crust pie 1½ tsp. cornstarch

2 tbsp. peach juice from can 2 tbsp. sugar

¾ cup drained, canned, sliced freestone peaches 1/6 tsp. cinnamon

dash nutmeg 1 tsp. butter

Prepare pastry through step 3, above. Mix cornstarch, sugar, cinnamon and nutmeg. Blend in peach juice. Cook over medium heat until thickened. Remove from heat and add peaches and butter. Pour cooked filling into pie shell. Proceed as directed for double crust pie.

Blueberry Pie

Pastry for 6-inch double crust pie 1½ tsp. cornstarch

¾ cup drained, canned berries 3 tbsp. sugar

½ tsp. lemon juice 2 tbsp. berry juice from can

1 tsp. butter

Prepare pastry through step 3, above. Mix cornstarch and sugar; blend in berry juice. Cook over medium heat until thickened. Remove from heat and add berries, lemon juice and butter. Pour cooked filling into pie shell. Proceed as directed for double crust pie.

Cherry Pie

Pastry for double crust pie 2 tbsp. cherry juice from can

¾ cup drained, canned sour cherries ¼ cup sugar

⅛ tsp. almond extract 2 tsp. quick cooking tapioca

1 tsp. butter

Combine all filling ingredients except butter. Let stand 20 minutes. Prepare pastry through step 3, above. Pour filling into pie shell and dot with butter. Proceed as directed for double crust pie.

Characteristics of the Standard Product: Fruit Pies

See section 12.5

Evaluation:

See a list of common defects in pastry and pies in section 12.6.

Pastry Shortening Pastry Filling

Appearance Texture Flavor Appearance Texture

Apple

Peach

Blueberry

Cherry

12.5 Pastry – Cream Pies

Objectives

To review the principles of foam formation.

To practice techniques of pastry preparation for a single crust pie.

To apply principles of starch and egg cookery to a cream filling containing both ingredients.

Laboratory Problems

Prepare a cream pie.

General Directions for Preparing a Cream Pie:

Bake 6-inch single crust pie shell

Sifted Flour ½ cup

Salt ¼ tsp.

Lard OR Vegetable shortening

2 tbsp. 2 tbsp. + 1½ tsp.

Cold Water 1 tbsp. (approx.)

Preheat oven. Mix flour and salt; cut in fat until size of small peas. Sprinkle water over flour mixture while tossing lightly with a fork. Work dough against side of bowl until it holds together. Shape into a ball.

On lightly floured board or countertop, roll dough into circle about 8 inches in diameter, less than ⅛-inch thick or until only a slight dent remains when finger is pressed into dough. Use pastry guides to keep thickness even.

Carefully lift and ease into 6-inch pie pan without stretching. Trim off excess dough leaving ¼-inch overhang; fold this under itself and crimp crust without stretching.

Prick bottom and side of crust with a 4-tined fork. Bake at 425°F for 8-10 minutes or until golden brown. If crust bubbles in oven, prick with fork. Cool before filling.

Prepare filling See below. Cover; set aside while making soft meringue.

Make merengue See below

Top with Soft Meringue and Bake Pour hot filling into pie shell. Do not overfill; leave enough pie crust above the filling to allow meringue to seal. Spread meringue evenly over filling, sealing it to crust. Make swirls with spatula, but avoid making sharp peaks or ridges. Bake at 350°F until golden brown, 10-15 minutes.

Soft Merengue

1 egg white 1/8 tsp. cream of tartar

2 tbsp. and 1 ½ tsp. sugar

Separate egg. Reserve yolk for filling. Sift cream of tartar over egg white. Beat to beginning of soft peak stage. Gradually add sugar by teaspoons while beating, Beat to upper limit soft peak stage. Use immediately.

Vanilla Cream Pie

Bake 6-inch single crust pie shell; cool. Reduce oven temperature to 350°F.

¼ cup sugar 1 egg yolk, slightly beaten

2 tbsp. + 1½ tsp. flour 2 tsp. butter

dash salt ½ tsp. vanilla

1 cup milk baked pie shell

Stir together sugar, flour, and salt in saucepan. Combine milk and egg yolk and gradually stir into sugar mixture. Cook over medium heat, stirring constantly, until mixture thickens and boils. Boil and stir one minute. Remove from heat; stir in butter and vanilla. Cover while making meringue, see above.

Pour hot filling into pie shell. Do not overfill; leave enough pie crust above the filling to allow meringue to seal. Spread meringue evenly over filling, sealing it to crust. Make swirls with spatula, but avoid making sharp peaks or ridges. Bake at 350°F until golden brown, 10–15 minutes.

Chocolate Cream Pie

Bake 6–inch single crust pie shell; cool. Reduce oven temperature to 350°F.

⅓ cup sugar ⅓ oz. unsweetened chocolate, cut up

2 tbsp. + 1½ tsp. flour 1 egg yolk, slightly beaten

dash salt 2 tsp. butter

1 cup milk ¼ tsp. vanilla

Combine sugar, flour, and salt in saucepan. Stir in milk and chocolate. Cook over medium heat, stirring constantly, until mixture boils and chocolate is melted. Boil 1 minute. Gradually add about half the hot mixture to the egg yolk while stirring; then add to mixture in pan. Bring to boil. Remove from heat; stir in butter and vanilla. Cover while making meringue.

Pour hot filling into pie shell. Do not overfill; leave enough pie crust above the filling to allow meringue to seal. Spread meringue evenly over filling, sealing it to crust. Make swirls with spatula, but avoid making sharp peaks or ridges. Bake at 350°F until golden brown, 10–15 minutes.

Lemon Meringue Pie

Bake 6–inch single crust pie shell ; cool. Reduce oven temperature to 350°F.

⅓ cup sugar 1 tbsp. butter

1 tbsp. cornstarch 1 tsp. grated lemon zest

1 egg yolk, slightly beaten 1 tbsp. lemon juice

½ cup water

Stir together sugar and cornstarch in small saucepan. Blend egg yolk with water; gradually stir into sugar mixture. Cook over medium heat, stirring constantly, until mixture boils. Boil 1 minute. Remove from heat; stir in butter, lemon zest, and lemon juice. Cover while making meringue.

Pour hot filling into pie shell. Do not overfill; leave enough pie crust above the filling to allow meringue to seal. Spread meringue evenly over filling, sealing it to crust. Make swirls with spatula, but avoid making sharp peaks or ridges. Bake at 350°F until golden brown, 10–15 minutes.

Butterscotch Cream Pie

Bake 6-inch single crust pie shell ; cool. Reduce oven temperature to 350°F.

⅓ cup brown sugar ½ cup milk

2 tbsp. cornstarch 1 egg yolk, slightly beaten

⅛ tsp. salt 2 tsp. butter

½ cup water ½ tsp. vanilla

Combine sugar, cornstarch, and salt in saucepan. Mix water, milk, and egg yolk; gradually add to starch-sugar mixture. Cook over medium heat, stirring constantly, until mixture thickens and boils. Boil one minute. Remove from heat. Stir in butter and vanilla. Cover while making meringue.

Pour hot filling into pie shell. Do not overfill; leave enough pie crust above the filling to allow meringue to seal. Spread meringue evenly over filling, sealing it to crust. Make swirls with spatula, but avoid making sharp peaks or ridges. Bake at 350°F until golden brown, 10–15 minutes.

Characteristics of the Standard Product: Fruit Pies

Pastry:

Appearance Texture Flavor

Light golden brown color.

Slightly blistered surface.

Thin layers of baked dough.

Crisp, dry, and tender.

Delicate flavor influenced by the type of fat used.

Filling

Appearance Texture Flavor

Filling contained within pie shell (should not cook out of vents excessively or out of edges).

Fruit pieces plump, moist, and intact.

Filling thickened, but flowing slightly when cut.

Little or no soaking of bottom crust.

Tender, soft fruit pieces. Cooked flavor appropriate for type of fruit.

Characteristics of the Standard Product for Cream Pies:

Filling

Appearance Texture Flavor

Delicate gel structure that shows a slight bulge on cut edge. Smooth, uniform texture that feels light. Delicate flavor appropriate for type of pie.

Meringue

Appearance Texture Flavor

Glossy, puffy, slightly irregular surface.

Golden brown raised areas, depressions lighter in color.

No beading or leakage.

Easily cut, not sticky.

Fine grained interior, thoroughly baked.

Tender and slightly moist.

Delicate, sweet flavor.

Evaluation of Cream Pies

Filling Flavor Crust Filling

Quality Soakage Appearance & Viscosity Flavor & Mouthfeel

Vanilla

Chocolate

Lemon

Butterscotch

Meringue

Appearance: Volume, Browning, & Glossiness Tenderness, Moistness, & Flavor Beading

12.6 Common Defects in Pastry and Pies and their Probable Causes

Tough Pastry

High protein flour

Substitution of equal amount of butter or margarine for fat

Insufficient fat

Fat not distributed well enough

Too much water

Uneven distribution of water, requiring more manipulation

Over stirring after water is added

Dough not rolled immediately

Re-rolling

Excess flour on rolling board

Crumbly, Mealy (not flaky) Crust and//or Too Tender to Remove from Rolling Board

Low protein flour

Too much fat

Fat too soft (warm) or melted

Fat cut in too finely

Too little water

Under-mixing after water is added

Reduced flakiness, or flakes not separated

Low protein flour

Not enough water to provide steam

Under-mixing

Over-mixing

Excess shrinking or misshapen crust

Dough stretched when shaping in pan

Dough rolled to uneven thickness

Excess re-rolling or patching dough

Also see “Tough Pastry”

Puffing of a pie shell baked without filling

Insufficient crust perforations

Crust too brown or browned very rapidly

Rolled too thin

Very dry

Uneven browning

Dough rolled to uneven thickness

Edges too high

Pie placed too high or too low in oven

Pie placed too close to oven walls or to other pan

Not enough filling

Crust doesn’t brown

Too little fat

Over-mixing

Too much flour used when rolling dough

Crust rolled too thick

Wet dough

Soaked lower crust∗

Shiny pie tin

Filling allowed to stand in crust before baking

Placing pie pan on foil or baking sheet

Too low oven temperature

Too short baking time

Cold filling

Also see “Crust doesn’t brown”

Custard pie:

Overcooked filling (syneresis)

Two-crust fruit pie

Fruit filling not thickened before baking

Insufficient vents

Break or tear in bottom crust

∗ Suggestions to prevent soaked lower crust

Use high initial baking temperature

Custard Pies:

Brush crust with slightly beaten egg white and bake at high temperature for a few minutes to coagulate egg white

Use a filling with a high egg-to-milk ratio

Preheat milk for filling

Chill pie crust for 1 hour before filling

Partially pre-bake the crust before adding the filling

Fruit Pies:

Coat with melted butter

One Crust Pie, e.g. Pumpkin or Custard

Crust rises through the filling

Tear or hole in crust

Two-Crust Fruit Pies

Top crust “tents”

Inadequate vents in top crust

Fresh fruit was not packed firmly

Pie filling boils over

Too much filling

Top and bottom crusts not sealed together well

Insufficient thickening of filling

Inadequate vents in top crust

Vents too close to edge of pie

Oven shelf not level

Uneven thickness of top crust

Over-baking

Cream Pie Meringues

See Common Defects in Egg Foam Products in section 10.4

12.6 Concept Review Pastry – Fruit Pies and Cream Pies

List the steps for the pastry method

Ratio of flour to liquid for pastry dough?

List function of ingredients in pie dough

Ingredient Function

Salt

All-Purpose Flour

Water

Lard/Shortening

What is the difference between lard and shortening?

What problems occur if the fat melts early in the preparation of pie dough? Why is solid fat used in pastry dough?

Describe the flakiness of pie crust in which the fat has been cut in very finely, compared to one in which the fat is left in larger pieces.

What preparation technique is responsible for tenderness?

flakiness?

crispness?

12.7 Interaction of Ingredients

Objectives

To compare characteristics of cakes made by different methods.

To compare effects of various leavening systems on cake volume and texture.

To determine the roles and interactions of ingredients in cakes.

Laboratory Problems

Prepare quick-mix yellow cake.

Prepare pound cake.

Compare characteristics of quick-mix, conventional method (p. 213), and pound cakes.

Quick Mix Yellow Cake

½ cup sifted cake flour ¼ cup milk

⅓ cup sugar ½ egg (2 tbsp.)

¾ tsp. baking powder ¼ tsp. vanilla

2 tbsp. vegetable shortening ¼ tsp. salt

Heat oven to 375°F. Line bottom of 6 X 3¼–inch loaf pan with waxed paper. Grease the paper. Measure cake flour, sugar, baking powder, shortening, salt and half the milk into mixer bowl. Mix thoroughly for 2½ minutes with electric mixer on medium speed. Add remaining milk, egg, and vanilla; mix for 3 minutes on medium speed. Bake at 375°F until cake springs back when touched lightly, about 25–30 minutes. Cool 10 minutes on rack; remove from pan. Do not cut cake until cake has cooled to room temperature.

Pound Cake

1 cup sifted all–purpose flour ½ cup butter, room temperature

¼ tsp. salt ½ tsp. vanilla

⅔ cup sugar 2 eggs

Heat oven to 350°F. Line bottom of 7⅜ X 3⅝–inch loaf pan with waxed paper. Grease the paper. Sift together flour and salt. Cream butter and vanilla with electric mixer until light and fluffy. Add sugar by tablespoons while beating. Beat until sugar is fairly well dissolved and mixture is light. Beat eggs with electric mixer until foamy. Add eggs in thirds, beating about 1 minute after each addition. Gradually add flour to creamed mixture, beating continually. After all flour is added, beat for 2 minutes on medium speed. Pour into prepared pan. Bake at 350°F for 20 min.; reduce heat to 325°F and continue baking for 25 minutes or until toothpick comes out clean. Cool 10–15 minutes before removing from pan. Do not cut cake until cake has cooled to room temperature.

Interaction of Ingredients in Batters and Doughs

Shortened cakes and other similar products based on gluten structure may vary from high to low fat ratio. The correct proportion of one ingredient is dependent on the proportion of other ingredients and on the amount of manipulation. The following general rules account for the differences in formula for muffins, conventional and quick mix cakes, etc.

Balance structural with tenderizing ingredients.

Structural Tenderizing

flour fat

eggs sugar

Flour/liquid ratios and manipulation also influence structure.

Balance liquid and dry ingredients.

Liquid Dry

milk flour

egg sugar

water

This is necessary to control gluten potential, maintain optimum flow properties, provide liquid for steam, etc.

Balance sugar and liquid. As sugar/liquid ratio increases, protein coagulation temperature rises and allows more expansion before the gluten is coagulated. Optimum sugar/liquid ratios allow expansion for optimum volume and tenderness. Beyond that, the cake may run over the top of the pan, burn, or collapse. Increased sugar requires both increased liquid and increased structural components. Egg provides both.

Balance leavenings. As one leavening is increased, another may be decreased. Leavening agents include baking powder, baking soda and acid, steam, air in foams (egg, creamed fat and sugar), and yeast.

As proportions of flour and liquid approach 2:1, manipulation yields more gluten, and the amount of manipulation is more critical.

As the proportion of tenderizing ingredients increase, beating should be increased, and the grain becomes finer.

Method Amount per cup of Flour: Flour to Liquid Ratio Mixing Time* Baked Cake

Baking Powder (tsp.) Fat (tbsp.) Sugar (tbsp.) Egg (tbsp.) Liquid (tbsp.) Appearance Texture Flavor

Muffins

Yellow Conventional Cake

Pound Cake

* * *

Yellow Quick-mix Cake

Chiffon Cake

* After both flour and liquid have been added

12.7 Concept Review Interaction of Ingredients

Suggest two factors other than the composition of baking powder that could cause loss of leavening power at room temperature.

Give two substitutions for baking powder that you could make at home.

Describe the functions of the following ingredients in a cake batter (indicate interrelationships among ingredients):

Shortening

Sugar

Egg

Milk

Cake flour

Baking powder

Salt

Vanilla

12.8 Methods of Preparation – Baked Products

Objectives

To review various techniques for preparation of baked grain products.

To use a variety of grain flours in baked products.

Laboratory Problems

Prepare chemically leavened baked products.

Prepare steam-leavened baked products.

Prepare yeast-leavened baked products.

Prepare Chemically Leavened Baked Products:

Whole Wheat Muffins

½ cup sifted all-purpose flour 2 tbsp. vegetable oil

2 tbsp. sugar ½ egg

1 tsp. baking powder ½ cup milk

¼ tsp. salt ½ cup whole wheat flour

Preheat oven to 400°F. Grease bottom of 6 muffin cups. Sift first 4 ingredients together. Blend in whole wheat flour. Combine liquid ingredients; add to dry, and stir just until ingredients are blended. Fill muffin cups ⅔ full. Bake at 400°F until golden brown, 15–20 minutes.

Bran Muffins

¾ cup unprocessed wheat bran ½ cup plus 2 tbsp. sifted flour

¼ cup boiling water ¼ tsp. salt

¼ cup brown sugar ½ tsp. baking soda

¼ cup butter ½ cup buttermilk

½ egg, beaten

Preheat oven to 400°F. Grease bottom of 6 muffin cups. Combine ¼ cup wheat bran with ¼ cup boiling water, stir and let water absorb into bran, about 5 minutes. In separate medium bowl, blend sugar and butter with hand mixer. Sift together the flour, soda and salt. Combine moist bran with beaten eggs, remaining ½ cup of bran, buttermilk, sugar-butter mixture, and sifted dry ingredients. Stir until well blended. Spoon into prepared muffin tins. Bake 12–15 minutes.

Brown Bread

⅔ cup whole wheat flour ⅓ cup mashed ripe banana

⅓ cup yellow cornmeal ⅓ cup buttermilk

¼ tsp. salt ¼ cup unsulfured molasses

⅓ tsp. baking soda ¼ cup raisins

Preheat oven to 350°F. Mix together flour, cornmeal, salt, and soda. Stir in remaining ingredients. Turn into a greased and floured 6 x 3¼ inch loaf pan. Bake in 350°F oven for 45 minutes or until pick inserted in center comes out clean. Cool 10 minutes; turn out of pan and serve warm with butter.

Fruit Cobbler

½ cup sifted flour ⅓ cup sugar

1½ tsp. sugar 1½ tsp. cornstarch

¾ tsp. baking powder ¼ cup fruit juice from can (may need to supplement with simple syrup)

¼ tsp. salt 2 tbsp. shortening

1½ cups fruit ¼ cup milk

1 tsp. butter

Preheat oven to 400°F. Sift together the flour, 1½ tsp. sugar, baking powder, and salt. Cut in shortening until the mixture resembles coarse corn meal. Add milk and stir to make soft dough. Blend ⅓ cup sugar, cornstarch, and fruit juice; boil 1 minute and add fruit. Pour fruit mixture into 1 quart baking dish. Dot with butter. Drop dough by spoonfuls on hot fruit mixture. Bake at 400°F for 20–25 minutes.

Blueberry Scones with Lemon Glaze

1 cup flour 2 tbsp. + 1 ½ tsp. chilled butter

1 ½ tsp. baking powder ½ cup fresh blueberries

¼ tsp. salt ½ cup heavy cream

1 Tbsp. sugar

Lemon Glaze:

3 tbsp. lemon juice

1 ½ tsp. butter

1 cup powdered sugar 1 tsp. lemon zest

Sift together flour, baking powder, salt and sugar. Use a pastry blender to cut in the butter until it looks like coarse crumbs. Fold in the blueberries. Make a well in the center and add heavy cream. Fold together just until incorporated. Press the dough onto a lightly floured surface 1 ¼ inch thick, about 6×3 inches. Cut into 4 triangle shapes. Bake on an ungreased baking sheet for 15–20 minutes at 400°F. Let cool.

Dissolve powdered sugar in lemon juice. Heat in microwave or double boiler, if necessary. Whisk in butter and zest until smooth. Drizzle over scones.

Southern Spoon Bread

1 cup cornmeal 1 cup milk

2 cups milk 3 egg yolks

1 tsp. salt 3 egg whites

1 tsp. baking powder ¼ tsp. cream of tartar

2 tbsp. melted shortening or vegetable oil Butter

Preheat oven to 325°F. Cook cornmeal and 2 cups milk until consistency of mush. Remove from heat; add salt, baking powder, shortening, and 1 cup milk. Add egg yolks. Beat egg whites with cream of tartar to the upper limit of the soft peak stage. Fold about one-fourth of the foam into the corn meal mixture. Spread corn meal mixture over the remaining foam and fold until well blended. Bake in greased 2-quart baking dish at 325°F for 1 hour. Spoon into warm dishes; top with butter.

Irish Soda Bread

¾ cup whole wheat flour ½ tsp. salt

½ cup all-purpose flour ¼ tsp. baking soda

¾ tsp. sugar ½ cup + 2 tbsp. buttermilk or sour milk

Preheat oven to 375°F. Mix dry ingredients together. Add enough milk to form a soft dough. Knead on lightly floured board 2 minutes. Form into round cake. Cut a cross on the top of loaf with very sharp floured knife. Bake at 375°F for 25-35 minutes on well-greased baking sheet. Cool. Cut in thin slices.

Herb Corn Sticks

5/6 cup (½ c. + ⅓ c.) sifted all-purpose flour ⅜ cup cornmeal

¼ tsp. crumbled dried marjoram 1½ tsp. baking powder

¼ tsp. thyme ¼ tsp. salt

½ egg 1 tbsp. sugar

¾ cup milk 2 tbsp. butter

Preheat oven to 425°F. Sift flour again with baking powder, salt, and sugar. Stir in cornmeal, marjoram, and thyme. In another bowl, beat egg; stir in milk and melted butter, then add all at once to the dry

ingredients and stir just until mixture is moistened. Spoon into well-greased corn stick pans, filling about ¾ full. Bake in hot oven (425°F) for 20 minutes, or until golden brown.

Prepare Steam-Leavened Products:

Danish Puff

3 tbsp. butter 3 tbsp. butter

¼ cup sifted powdered sugar ⅓ cup sifted flour

⅓ cup water 2 tsp. water

⅓ cup sifted flour ¼ tsp. almond flavoring

¼ tsp. almond flavoring 1 tsp. milk

1 egg

Preheat oven to 350°F. Cut 3 tbsp. butter into ⅓ cup flour. Sprinkle with 2 tsp. water and mix with fork until dough forms a ball. Pat onto an ungreased baking sheet.

Bring 3 tbsp. butter and ⅓ cup water to a boil. Remove from heat; immediately add ⅓ cup flour; stir until smooth. Add ¼ tsp. almond flavoring and egg, and beat well. Spread evenly over the pastry layer. Bake for about 45-60 minutes, until top layer is crisp and brown. Puff will shrink when removed from oven.

Mix powdered sugar, ¼ tsp. almond flavoring and milk. Spread on puff while still warm.

Sesame Seed Wafers

½ cup sifted cake flour 1½ tsp. sugar

½ cup whole wheat flour 2 tbsp. shortening

¼ tsp. salt 2-3 tbsp. ice water

2-3 tsp Sesame Seeds

Preheat oven to 425°F. Mix dry ingredients together. Cut in shortening with pastry blender. Stir in ice water until the dough is the same consistency as pie dough. Roll out 1/8″ thick on a lightly floured board. Sprinkle with sesame seeds and roll lightly with rolling pin. Cut into 1-inch squares. Bake on lightly greased baking sheet for approximately 8 minutes or until brown.

Dessert Crepes

½ cup sifted flour ⅔ cup milk

½ tsp. salt 1 tbsp. butter, melted

1 tbsp. sugar ½ tsp. grated orange zest

2 eggs, well beaten ½ cup warm pie filling

Sift flour, salt and sugar. Combine eggs, milk, butter, and orange zest. Add to flour mixture, blending until smooth. Make one crepe at a time. Pour a spoonful of batter on hot, lightly greased griddle for each 4-inch pancake. Tilt griddle to make pancake as thin as possible. Bake until browned, turning to brown both sides. Remove to warm platter. Place a 2-3 tablespoons of warm pie filling in center of each pancake and roll up.

Cheese Straws

1 cup sifted flour ⅓ cup butter

½ tsp. salt 1 cup grated sharp Cheddar cheese

¼ tsp. dry mustard 1½ tbsp. ice water

⅛ tsp. cayenne 1 tsp. celery seed

Preheat oven to 350°F. Sift dry ingredients together. Cut in butter and half the cheese with pastry blender. Add water. Blend lightly. Roll ⅛ inch thick. Sprinkle with remaining cheese. Fold dough in half. Roll ⅛ inch thick again. Cut into strips 3 inch by ½ inch. Sprinkle with celery seed. Bake 12 minutes at 350°F or until light brown.

Chicken Almond Puffs

½ cup flour 2 eggs

⅛ tsp. salt ¼ cup finely diced chicken

¼ cup butter 1 tbsp. finely chopped toasted almonds

½ cup chicken broth dash paprika

Preheat oven to 450°F. Mix flour and salt. Combine butter and chicken broth in pan; bring to boil. Remove from heat; immediately add all the flour and stir vigorously until mixture forms a ball and leaves sides of pan. Add eggs, one at a time, beating thoroughly after each. Continue beating until a thick dough is formed. Stir in chicken, almonds, and paprika. Drop by heaping teaspoonfuls onto greased baking

sheet. Bake at 450°F for 10 minutes; reduce heat to 350°F and bake 5–10 minutes or until browned. Serve hot.

Prepare Yeast-Leavened Breads:

Swedish Limpia

2¾ –3¼ cups unsifted white flour 1 tsp. grated orange peel

1 cup unsifted rye flour 1 pkg. active dry yeast

2 tbsp. firmly packed dark brown sugar 1 tbsp. butter, softened

1 tsp. salt 1⅓ cups very warm tap water (50–55°C)

1 tsp. caraway seeds

Combine flours; in a large bowl thoroughly mix 1¼ cups flour mixture, sugar, salt, caraway seeds, orange peel, and undissolved activated dry yeast. Add softened butter. Gradually add very warm tap water to dry ingredients and beat 2 minutes at medium speed of electric mixer, scraping bowl occasionally. Add ½ cup flour. Beat at high speed 2 minutes, scraping bowl occasionally. Stir in enough additional flour to make a soft dough.

Turn out onto lightly floured board; knead until smooth and elastic (about 8 to 10 minutes). Place in a greased bowl, turning to grease top. Cover; let rise in a warm place, free from draft, until doubled in bulk, about 45 minutes. Punch dough down; turn out onto lightly floured board. Shape into a round ball.

Place on greased baking sheet. With sharp knife make 3 slits across surface of the ball. Cover; let rise in warm place, free from draft, until doubled in bulk. Bake at 400°F about 30 minutes, or until done. Remove from baking sheet and cool on wire rack.

12.9 Yeast Bread

Objectives

To demonstrate the principles of yeast leavening.

To determine the distinctive characteristics of yeast bread in relation to other batter and dough products.

Laboratory Problems

Prepare Yeast Bread From the Following Recipe:

Terms

Straight Dough Method

Knead

Proof

Ferment

Saccharomyces cerevisiae

White Bread

1¼ tsp. active dry yeast or fast acting yeast* ½ tsp. salt

2 tsp. shortening 2 tbsp. warm water (46°C, 115°F)

2 tsp. sugar ½ cup scalded milk** (92°C, 198°F for 1 min.)

1½ – 1¾ cups bread flour

Hydrate yeast in 46°C (115°F) water. If milk is refrigerated, warm to 27°C (81°F).

Blend milk with shortening, sugar, and salt in a medium bowl; cool to lukewarm. Add yeast and approximately ¾ cup flour to milk mixture. Beat with spoon until batter falls from spoon in “sheets.” Stir in enough flour to make a soft, easily handled dough. Turn out onto floured surface and let rest 5 minutes. Knead until surface is smooth with small blisters, about 10–15 minutes. Place dough in greased bowl, turning once to grease top. Cover with clean moist towel and let rise in warm place (26–32°C, 79–90°F) until double, 45–60 minutes or 30 minutes if using fast acting yeast. Punch down and shape into loaf on un-floured board, cloth or counter.

With fingers, flatten dough and work out any large bubbles.

Press flattened dough into a rectangle about 5″ X 10″.

Starting at narrow end, roll dough toward you; seal end of dough to roll, pinching seam.

* Some examples of fast acting yeast:

RED STAR® QUICK-RISE™ Yeast

RED STAR® Bread Machine Yeast

Fleischmann’s RapidRise™ Yeast

Fleischmann’s Bread Machine Yeast

SAF® Bread Machine Yeast

**Milk for entire class may be scalded, then measured for individual recipe.

Seal ends of roll with edge of hand to form a thin strip about ½ inch wide.

Tuck ends of roll under and place loaf, seamed side down, in greased 6 X 3¼ –inch pan.

Cover and let rise in warm place (85°F or 29°C) until almost doubled, 25–30 minutes or 15 minutes if using fast acting yeast.

Bake loaf at 425°F for 25 minutes. Remove from pan immediately and cool.

Characteristics of a Standard Loaf of White Bread:

Appearance Texture Flavor

Large volume in relation to weight, symmetrically shaped.

Light golden brown surface, creamy white interior.

Moderately fine, even grain.

Interior springy to touch.

Fairly tender with relatively little resistance to the bite.

Bland, pleasing, and somewhat nutlike flavor.

12.9 Concept Review Yeast Bread

Describe effects of the following ingredients on yeast leavened products that would not apply to other gluten products that don’t contain yeast.

Salt

Sugar

Wheat germ

Milk

How does yeast affect gluten strength?

What fermentation temperature range yields the best quality bread?

12.10 Yeast Rolls

Objectives

To apply the principles and techniques involved in the preparation of yeast doughs to a variety of yeast products.

To continue to determine the distinctive characteristics of yeast products in relation to other batters and doughs.

Laboratory Problems

Prepare yeast roll dough and shape into a variety of products.

Yeast Rolls

1¼ tsp. active dry yeast 1 tbsp. sugar

2 tbsp. warm water (46°C) ¾ tsp. salt

½ cup scalded milk ½ egg

1 tbsp. vegetable shortening 1½–1¾ cups all-purpose flour

Hydrate yeast in warm water. Mix scalded milk, shortening, sugar, and salt. Add ½ cup of flour and mix well. Cool to lukewarm if necessary. Add yeast and egg, and beat well. Stir in only enough flour to make a soft dough and let rest 5 minutes. Knead on floured board until smooth and elastic, about 10 minutes. Place in greased bowl, turning dough over to grease top; cover with damp cloth. Let rise in warm place (26–32°C) 30 minutes.* Punch down and shape into rolls.

Place on greased baking sheet.** Let rise in warm place until almost double in bulk. Bake plain rolls at 425°F for 10–12 minutes or until golden brown. Bake sweet rolls at 375oF for time specified. When rolls are done, remove from pan and place on cooling rack to cool.

*Or refrigerate up to 72 hours. Punch down as needed. After refrigeration, let stand at room temperature at least 30 minutes.

**Baking sheet need not be greased for plain rolls.

Potato Rolls

¼ cup mashed potatoes 3 tbsp. sugar

1¼ tsp. active dry yeast ½ tsp. salt

2 tbsp. warm water (46°C) ½ egg, beaten

¼ cup scalded milk 1¼ -1½ cups all-purpose flour

2 tbsp. vegetable shortening

Prepare instant or fresh mashed potatoes.

Hydrate yeast in warm water. Mix scalded milk, shortening, sugar, and salt. Cool to lukewarm. Mix in yeast, potatoes, and eggs. Add one cup flour and beat until smooth. Add just enough flour to make a soft dough and let rest 5 minutes. Knead on floured board until smooth and elastic, about 10 minutes. Place in greased bowl, turning dough over to grease top. Cover and let rise in a warm place (26-32°C) until double in bulk.* Shape into rolls; let rolls rise in a warm place until double in bulk. Bake plain rolls at 425°F for 10-12 minutes and sweet rolls at 375°F about 12-14 minutes or until done.

Bran Rolls

1¼ tsp. active dry yeast 3 tbsp. sugar

¼ cup warm water (46°C) ½ tsp. salt

¼ cup unprocessed wheat bran ½ egg, beaten

¼ cup boiling water 1½-1¾ cups all-purpose flour

¼ cup vegetable shortening

Hydrate yeast in warm water. Pour boiling water over bran and add shortening, sugar, and salt. Cool to lukewarm; add yeast and egg. Add ½ cup flour and mix well. Add just enough flour to make a soft dough and let rest 5 minutes. Knead on floured board until smooth and elastic, about 10 minutes. Place in greased bowl, turning over to grease top. Cover and let rise in a warm place (26-32°C) until double in bulk.* Shape into rolls; let rolls rise in a warm place until double in bulk. Bake plain rolls at 425°F for 10-12 minutes and sweet rolls at 375°F for about 12-14 minutes or until done.

*Or refrigerate up to 72 hours. Punch down as needed. After refrigeration, let stand at room temperature at least 30 minutes.

Whole Wheat Bread or Rolls

1¼ tsp. active dry yeast ½ tsp. salt

½ cup warm water (46°C) ⅔- ¾ cup all-purpose flour

2 tbsp. vegetable shortening ⅔– ¾ cup whole wheat flour

1½ tbsp. sugar

Hydrate yeast in warm water. Measure shortening, sugar, and salt into bowl; mix; add yeast. Add ½ cup all-purpose flour and beat until smooth. Add remaining flour, alternating additions of white and whole wheat flours so that approximately equal amounts of each are included. Add just enough flour to make a soft dough and let rest 5 minutes. Knead on lightly floured board until smooth and elastic, about 10 minutes. Place dough in greased bowl, turning to grease top. Cover and let rise in a warm place (26–32°C) until double in bulk*.

Shape into rolls or loaf; if loaf, use greased 6 x 3¼ –inch pan. Let rise in warm place until double in bulk. Bake bread at 425°F for about 25 minutes, rolls at 425°F about 10–12 minutes, and sweet rolls at 375°F for about 12–14 minutes.

*Or refrigerate up to 72 hours. Punch down as needed. After refrigeration, let stand at room temperature at least 30 minutes.

Shape for Yeast Roll Dough

Handle dough carefully. Shape without tearing. Bake on baking sheet prepared with nonstick spray.

Bow Knots

Roll dough into a rectangle about 9 inches long and ½ inch thick. Cut into 9 X ½–inch strips and roll with hands to smooth the edges. Loosely tie into knot. Place on baking sheet. Brush with lightly beaten egg white and sprinkle with sesame seeds. Cover and let rise until doubled in bulk.

Braids

Roll dough into a rectangle about 9 inches long and ½ inch thick. Cut into 9 X ½–inch strips and roll with hands to smooth the edges. Braid 3 strips into a long braid. Cut braid into sections, each about 3 inches long. Pinch each section together at each end, tucking ends underneath. Place on baking sheet. Brush with honey and sprinkle with poppy seeds. Cover and let rise until doubled in bulk.

Parmesan Butterhorns

Roll dough into a 9–inch circle. Brush with mixture of 1 tbsp. melted butter, 1 tsp. snipped parsley, ¼ small clove garlic, minced, and 1 tbsp. Parmesan cheese. Cut into 12 pie–shaped pieces; roll each toward point. Place on baking sheet, point down. Cover and let rise until doubled in bulk.

Cloverleaf Rolls

Pinch off enough dough for 1 inch balls. Tuck and pinch edges underneath each ball to make smooth tops. Place three balls in each greased muffin cup. Cover and let rise until doubled in bulk.

Clothespin Rolls

Roll dough into a rectangle about 9 inches long and ½ inch thick. Cut into 9 X ½-inch strips and roll with hands to smooth the edges. Wrap around greased peg clothespins; press gently to seal ends. Place on baking sheet, cover, and let rise until doubled in bulk. Immediately after baking, remove clothespins by twisting gently.

Crescents

Roll dough into a 9-inch circle. Brush lightly with melted butter. Cut into 12 pie-shaped pieces. Roll up tightly, beginning at rounded edge. Place rolls, with point tucked underneath, about 2 inches apart on baking sheet. Curve slightly to form crescents. Cover and let rise until doubled in bulk.

Fan Tans

Roll dough out into a rectangle, 13 X 9 inches. Brush with melted butter. Cut rectangle lengthwise into 6 strips, 1½ inches wide. Pile strips on top of one another. Cut into 12 equal pieces about 1 inch long. Place cut side up in greased muffin pans. Cover and let rise until doubled in bulk.

Parsley Fan Tans

Roll dough as described for Fan Tans. Add ½ tsp. lemon juice to 1 tbsp. melted butter before brushing on dough. Sprinkle buttered dough with 1 tbsp. chopped parsley and 2 tsp. chopped chives before stacking dough strips. Continue as for Fan Tan recipe. After Fan Tans are placed in muffin cups, sprinkle tops with 1 tsp. parsley.

Parker House Rolls

Roll dough ¼ inch thick. Cut into 2½-inch circles. Crease with dull edge of knife just off-center. Brush center with butter. Fold larger side over smaller so edges just meet. Seal and press folded edge firmly. Place 1 inch apart on baking sheet. Cover and let rise until doubled in bulk.

Snails

Roll dough into a rectangle about 9 inches long and ½ inch thick. Cut

into 9 X ½-inch strips and roll with hands to smooth the edges. Starting at one end, wind strip around and around to form coil. Tuck outside end firmly underneath. Cover and let rise in a warm place until doubled in bulk.

* * *

Braids, Coffeecake, and Sweet Rolls

Braided Bread

Divide dough into three equal parts. Shape into strands of equal length, about 10 inches long. Braid. Cover and let rise until doubled in bulk. Bake 15 minutes at 375°F. Top with one of the following and bake 15 minutes longer.

2 tsp. caraway seeds and ½ cup shredded Cheddar cheese.

½ cup diced Swiss cheese and paprika.

Braided Pineapple Coffeecake

⅓ cup shredded coconut 1 tbsp. melted butter

½ cup well-drained, crushed pineapple 1 egg white

3 tbsp. brown sugar ⅛ tsp. cinnamon

Topping:

3 tbsp. sliced almonds

Toast coconut in 325°F oven until delicate brown, about 5-7 minutes; mix together with pineapple, brown sugar, and cinnamon. Roll dough into 8 X 12-inch oblong. Place on baking pan. Brush dough with melted butter. Spread pineapple-coconut filling lengthwise down the center third of the dough. With scissors make two-inch cuts in from the side at 1-inch intervals along both long edges of dough. Alternately fold strips over filling, herringbone fashion. Cover and let rise until doubled in bulk. Brush with slightly beaten egg white; sprinkle with almonds. Bake at 375°F for 20-25 minutes or until golden brown.

Butterscotch Rolls

Topping:

¼ cup brown sugar 2 tbsp. butter

1 tsp. light corn syrup

Filling:

2 tbsp. butter

¼ cup sugar

¾ tsp. cinnamon

Heat topping ingredients slowly in 8 X 8-inch baking pan, stirring to blend. Roll dough into a 12 X 8-inch rectangle, ¼ inch thick. Brush with 2 tbsp melted butter. Sprinkle with cinnamon-sugar mixture. Starting with long side, roll up as for jelly roll. Seal long seam. Cut into twelve 1-inch slices. Arrange rolls, cut side down, in prepared pan. Cover and let rise until doubled. Bake at 375°F for 20-25 minutes or until done. After 1 minute, turn pan upside-down on serving plate, letting pan remain over rolls for approximately 5 minutes, while topping drizzles down over rolls.

Cinnamon Rolls

Filling:

2 tbsp. melted butter ⅓ cup sugar

1 tsp. cinnamon

Icing:

½ cup confectioners' sugar

1½ tsp. milk

¼ tsp. vanilla

Roll dough into a 9 X 12-inch rectangle. Brush with melted butter. Sprinkle with cinnamon-sugar mixture. Roll up as for jelly roll. Seal long edge to roll by pinching dough. Cut into 12 1-inch slices. Place cut side down in greased 8-inch square baking pan. Cover and let rise until double. Bake at 375°F for 20-25 minutes or until done. Remove from pan and frost with icing while still hot.

Lemon-Cinnamon Twists

Filling:

2 tbsp. melted butter ⅓ cup sugar

½ tsp. cinnamon

Icing:

½ cup confectioners’ sugar

1 tsp. lemon juice

1 tbsp. soft butter

Roll dough into 8 X 16-inch rectangle. Brush with melted butter. Sprinkle with cinnamon-sugar mixture. Fold dough in half length-wise and cut into 16 strips, 1 inch wide. Pick up each by the ends and twist in opposite directions. Place on greased baking sheet. Let rise until double. Bake at 375°F for 10-12 minutes. Brush with icing while hot.

Cream Cheese Pinwheels

Filling:

4 oz cream cheese, softened 2 Tbsp. sugar

1 ½ tsp. lemon juice

Roll dough into a 6×12 inch rectangle and cut into 8 3-inch squares.

Combine filling ingredients; spoon onto center of each square. To form pinwheels, diagonally cut dough from each corner to within ¾ inch of the center. Fold every other point toward the center, overlapping pieces. Moisten center edges with water; pinch to seal. Place 3 inches apart on greased baking sheets. Cover and let rise in a warm place until doubled.

Bake at 350°F for 15-20 minutes or until lightly browned. Remove from pan and cool on a wire rack.

Orange Swirls

Filling:

2 tbsp. butter ¼ cup sugar

2 tsp. grated orange peel

Icing:

½ cup confectioners’ sugar

½ tsp. grated orange peel

2 tsp. orange juice

Roll dough into 16 X 8-inch rectangle. Brush with melted butter. Sprinkle with mixture of sugar and orange peel. Starting with the long side, roll up as for jellyroll. Seal long seam. Cut into 12 pieces. Place each roll cut side down in a greased muffin cup, pressing center of spiral up slightly from underneath. Cover and let rise until double. Bake at 375°F for 12-14 minutes or until done. Remove rolls from pan and frost while still warm with orange icing.

Swedish Tea Ring

Filling:

2 tbsp. butter, softened ⅓ cup brown sugar

1 tsp. cinnamon ⅓ cup raisins

Icing:

½ cup confectioners' sugar

1½ tsp. milk

¼ tsp. vanilla 6 maraschino cherries, halved (optional)

Roll dough into 9 X 13-inch rectangle. Spread with butter and sprinkle with mixture of brown sugar, cinnamon, and raisins. Roll up, starting with long side, as for a jelly roll. Seal long seam. Stretch roll to make even and shape into a ring, sealed edge down, on a greased baking sheet. Pinch ends together. With scissors, make cuts ⅔ of the way through ring at 1-inch intervals. Turn each section on its side. Cover and let rise until doubled. Bake at 375°F about 25 minutes or until done. Frost with icing while hot, decorating with maraschino cherries if desired.

Characteristics of the Standard Product for Yeast Rolls:

Appearance Texture Flavor

Rolls of uniform, moderate size.

Light golden brown surface.

Creamy light interior.

Moderately fine, even grain.

Interior springy to touch. Tender, mild, pleasing, and somewhat nutlike flavor, complemented by the addition of the other flavorful ingredients.

Evaluation

Recipe or Shape Appearance Texture Flavor

Yeast Rolls

Potato Rolls

Bran Rolls

Whole Wheat Bread or Rolls

Bow Knots

Braids

Parmesan Butterhorns

Cloverleaf Rolls

Clothespin Rolls

Crescents

Fan Tans

Parsley Fan Tans

Parker House Rolls

Snails

Braided Bread

Braided Pineapple Coffeecake

Butterscotch Rolls

Cinnamon Rolls

Lemon–Cinnamon Twists

Cream Cheese Pinwheels

Orange Swirls

Swedish Tea Ring

12.10 Yeast Rolls Concept Review

List and describe the function of each of the ingredients in the yeast loaf bread recipe:

Ingredients Function

Fill in the following terms related to bread:

Food for yeast: _____ (yeast breaks sucrose down into glucose and fructose)

Ideal temperature for yeast fermentation: _____, (yeast cells die at 140 degrees Fahrenheit or greater)

_____

Also known as bread machine yeast, comprised of more active yeast strains and may also contain enzymes and other additives to shorten the rising and proofing times by half.

_____

Adding water to active dry yeast to “wake them up” for proper yeast fermentation.

_____

Heating the milk to 180○F before used in bread making. If this step is skipped, the dough is slack and sticky and the bread is coarse and has low volume.

Flour to liquid ratio in yeast bread? _____

_____

Manipulation of bread dough for proper gluten formation in bread dough, generally done by pressing and folding of dough until a smooth, not sticky dough is formed.

_____

Steps include hydration, first rise, shaping and second rise or proof

_____

Large increase in volume of bread dough when placed in the oven caused by rapid yeast fermentation as the temperature increases in the oven. After the oven spring occurs, the fermentation stops and the yeast is dead.

Describe the desirable characteristics of a yeast-leavened bread:

13 Steam Leavening

13.1 Cream Puffs and Popovers

Objectives

To prepare baked products that have little gluten development.

To demonstrate the techniques needed to produce a steam-leavened product.

To determine the importance of the emulsion to the success of a steam-leavened cream puff.

Cream Puffs

Yield: 5 medium puffs

2 tbsp. butter 1 egg, blended

¼ cup water ¼ cup sifted flour

Vanilla Pudding

Heat oven to 425°F. Add butter to water in saucepan. Bring just to a boil. Immediately remove from heat and add all the flour. Stir quickly until mixture leaves sides of pan and forms a ball around the spoon. Cool slightly and add egg in two portions, beating well after each addition. Drop by tablespoons onto ungreased baking sheet; do not add to puffs already on pan. Bake at 425°F for 20 minutes; reduce heat to 325°F and bake 10 minutes. Turn off heat. Pierce each cream puff on the side with a sharp knife, and let stand in oven for 10 minutes. Cool and fill, with vanilla pudding.

Vanilla Pudding

¼ cup sugar 1 cup milk

1 ½ Tbsp cornstarch 1 ½ tsp butter

1/8 tsp salt ½ tsp vanilla extract

In a small saucepan, combine sugar, cornstarch and salt. Gradually stir in milk. Cook and stir over medium heat until thickened. Reduce heat; cook and stir 1 minutes longer. Remove from heat and stir in butter and vanilla. Pour into serving dish and cool.

Popovers

Yield: 4 medium popovers

½ cup milk ⅛ tsp. salt

1 egg ½ cup sifted flour

Heat oven to 425°F. Prepare popover pan.* Combine ingredients in small mixing bowl; beat with rotary beater until smooth. Fill cups ⅓ to ½ full. Bake at 425°F for 20 minutes. Reduce heat to 325°F and bake 15 minutes. Turn off heat, pierce each popover with a sharp knife, and let stand for 10 minutes. Serve warm with butter and jam.

* Cast iron pans require preheating and should be greased before preheating. Coated steel pans require greasing, but not preheating.

Characteristics of the Standard Product:

Cream Puffs

Appearance Texture Flavor

Volume three to four times that of dough, irregular surface. Uniform, golden brown crust.

Hollow interior.

Crisp yet tender outer crust. Interior slightly moist.

Mild flavor, with no predominance of egg flavor.

Popovers

Appearance Texture Flavor

Volume up to five times that of batter, dark golden brown crust, irregular shape. Hollow interior.

Crisp yet tender outer crust. Interior slightly moist.

Mild pleasing flavor.

Evaluation

Product Appearance Texture Flavor

Cream Puffs

Popovers

13.1 Concept Review Cream Puffs and Popovers

What is the ratio of flour to liquid in cream puffs? in popovers?

What ingredient is responsible for structure in popovers and cream puffs? (Compare the interior of these products with that of a gluten ball.)

Why do cream puffs contain proportionally more egg than popovers?

Why doesn’t the flour lump when added to the boiling water in cream puffs?

Why is it necessary to gelatinize the starch in cream puffs, but not in popovers, before baking?

Appendices

Appendix A – Terms Used in Evaluating Food Products

Visual Evaluation:

Appearance – aspect or contour

broken frothy rough smooth

cloudy greasy scum sparkling

clear lustrous sediment stringy

crumble muddy shiny translucent

curdled opaque shriveled dull

plump shrunken

Color – normal for substance, pleasing to the eye

bright faded normal snowy white

creamy gray off-color yellow

discolored greenish pale dull

golden brown rich

Shape – proportionate dimensions

broken irregular thick even

oval thin flat round

uneven

Size

irregular medium uniform large

small

Grain – structural quality – such as crystals in candies and ice creams, size of pores in cake and bread, thickness of cell walls in breads or cakes

amorphous fine granular coarse

foamy heavy crystalline grainy

porous

Flavor Characteristics:

Odor – volatile substances affecting sense of smell

acid burnt fragrant weak

acrid delicate strong

Taste – sensations produced by substances listed

bitter salty sweet sour

Flavor – quality which affects the relish, zest or savor. Combination of taste and odor

astringent delicate raw starch

bland flat rich stimulating

blended mellow scorched strong

brisk pungent stale tasteless

burned

Mouthfeel and Texture Characteristics:

Consistency – degree of firmness, density, viscosity, fluidity, plasticity, resistant to movement

brittle frothy runny soggy

crisp full-bodied syrupy hard

crumbly gummy solid mealy

curdled liquid stiff thin

firm rubbery soft

Lightness – well leavened, not dense; having low specific gravity

fluffy light in weight for size porous

Moistness – degree of moisture. In fruits and meats called juiciness

dry moist water

Tenderness – ease with which can be cut, broken, pulled apart or masticated

tender tough

Texture – feel of substance between fingers or in the mouth; differences caused by grain, tenderness, moisture content, etc.

brittle granular oily smooth

chewy limp pasty soggy

fibrous lumpy rubbery sugary

firm mealy slimy stringy

grainy mushy

Appendix B – Meat Charts

Appendix C – Laboratory Guidelines

Attire:

Lab coats are required. Lab coats may be purchased at the University Bookstore or at Chemistry Stores in Gilman Hall. Hair must be covered with a hairnet, no caps will be allowed in laboratory. All students must wear enclosed shoes while in the food preparation laboratory.

Jewelry should be limited to small rings, earrings and watches. Coats, backpacks and other belongings not required in the laboratory should be left in the lockers provided in the hall outside the lab.

Housekeeping Duties:

Unit Duties: Units must be kept clean, orderly and completely equipped. Individuals or groups are responsible for leaving units clean at the end of class.

Care of cooking and serving utensils:

Rinse or soak utensils immediately after use. Wash all dishes with hot soapy water changing water as often as necessary. Use extra care with starchy, sugary and greasy dishes.

For your own safety, DO NOT put sharp knives to soak in dishwater. Rinse dishes with hot water, dry, and replace in units.

Care of ranges:

Wipe range tops and fronts. Wash broiler pan and clean up any oven spills.

Check to see that oven and surface burners are turned off at the end of class.

Care of sinks, cabinets, and countertops:

Sinks and countertops must be washed and dried at the end of the period.

Replace non-unit equipment and utensils in the appropriate place.

At the end of class, towels and dishcloths should be folded and hung to dry on the racks provided. Place a clean towel and dishcloth in unit drawer.

General Laboratory Duties:

The following duties are the responsibility of all students to maintain the orderly operation of the laboratory.

Be responsible for general orderly appearance of the laboratory

After evaluation, remove display paper and clean display area

Return perishable food to the refrigerator in proper storage containers

Wash empty containers and return to food cart

See that all dishes are taken after evaluation

Wash special equipment used by the instructor for demonstration, evaluation or sampling

Be sure cupboard doors and drawers are closed at the end of class

Empty garbage bowls and wastebaskets

Sanitation:

Washing Hands

Wet hands with warm, running water.

Add soap and rub hands together to make a soapy lather for at least 20 seconds.

Rinse hands and forearms thoroughly under warm, running water.

Dry hands thoroughly with a clean paper towel.

Washing Dishes

Discard food into garbage bowl.

Fill the sink with hot soapy water. Rub dishes with dishcloth in the sink.

Rinse dishes with hot water.

Stack clean, rinsed dishes in dish drain,

Dry dishes with a clean dishtowel.

Handling Food

Refrigerate foods at less that 40oF. Heat foods to at least 165oF.

Do not allow food to sit at room temperature for more than 2 hours.

Use a serving spoon for serving and your own utensils for tasting.

Wrap left-over foods in plastic wrap, foil, or place in a plastic container with a tight-fitting lid.

Come to work with clean hands and clothes.

Wear a clean lab coat and hairnet.

Appendix D – Glossary of Cooking Terms

-A-

Aerate – To pass dry ingredients through a fine-mesh sifter so large pieces can be removed. The process also incorporates air to make ingredients like flour, lighter. Sifting dry ingredients aerates them while distributing small amounts of chemical leaveners or dry seasoning evenly through the mixture. Use sifters, sieves or tamis to both aerate and sift.

Al dente – Italian for “to the tooth.” It describes pasta that is cooked until it offers a slight resistance when bitten into, rather than cooked until soft.

-B-

Bake – To cook food, covered or uncovered, using the direct, dry heat of an oven. The term is usually used to describe the cooking of cakes, other desserts, casseroles, and breads.

Bard – To tie fat around lean meats or fowl to keep them from drying out during roasting. The fat bastes the meat while it cooks, keeping it moist and adding flavor. The fat is removed a few minutes before the meat is finished, allowing the meat to brown. Barding is necessary only when there is no natural fat present.

Baste – To brush or spoon food as it cooks with melted fat or the cooking juices from the dish. Basting prevents foods from drying out and adds color and flavor. That’s because basting tools, such as brushes and bulb basters, could be sources of bacteria if contaminated when dipped into uncooked or undercooked meat and poultry juices, then allowed to sit at room temperature and used later for basting.

Batter – An uncooked, wet mixture that can be spooned or poured, as with cakes, pancakes, and muffins. Batters usually contain flour, eggs, and milk as their base. Some thin batters are used to coat foods before deep frying.

Beat – To make a mixture smooth by briskly whipping or stirring it with a spoon, fork, wire whisk, rotary beater, or electric mixer.

Bias-slice – To slice a food crosswise at a 45-degree angle.

Blackened – A popular Cajun cooking method in which seasoned fish or other foods are cooked over high heat in a super-heated heavy skillet until charred, resulting in a crisp, spicy crust. At home, this is best done outdoors because of the large amount of smoke produced.

Blanch – To cook raw ingredients in boiling water briefly. Blanched vegetables are generally “shocked” i.e. plunged immediately and briefly into an ice water bath to stop the cooking process and

preserve color and crunch.

Blend – To combine two or more ingredients together with a spoon, beater or blender.

Broil – To heat a liquid to its boiling point, until bubbles break the surface. “Boil” also means to cook food in a boiling liquid.

Bone – To remove the bones from meat, fish or fowl. Use a sharp boning knife and angle the blade toward the bone to avoid tearing or nicking the flesh.

Braise – To cook food, tightly covered, in a small amount of liquid at low heat for a long period of time. Sometimes, the food is first browned in fat. The long, slow cooking tenderizes meats by gently breaking down their fibers. The braising liquid keeps meats moist and can be used as a basis for sauce. Use wine, stocks or water as components in braising liquid.

Brine – Heavily salted water used to pickle or cure vegetables, meats, fish, and seafood.

Broil – To cook food a measured distance below direct, dry heat. When broiling, position the broiler pan and its rack so that the surface of the food (not the rack) is the specified distance from the heat source. Use a ruler to measure this distance.

Broth – The strained clear liquid in which meat, poultry, or fish has been simmered with vegetables and herbs. It is similar to stock and can be used interchangeably with it. Reconstituted bouillon can also be used when broth is specified.

Brown – To cook a food in a skillet, broiler, or oven to add flavor and aroma and develop a rich, desirable color on the outside and moistness on the inside.

Brush – To apply a liquid, like a glaze, to the surface of food using a pastry brush.

Butterfly – To split food (meat, fish, fowl) down the center, cutting almost, but not completely through. The two halves are then opened flat to resemble a butterfly.

–C–

Canel – To create small V-shaped grooves over the surface of fruits or vegetables for decorative purposes using a canelle knife. The fruit or vegetable is then sliced, creating a decorative border on the slices.

Caramelize – To heat sugar until it liquefies and become a clear

caramel syrup ranging in color from golden to dark brown. Fruits and vegetables with natural sugars can be caramelized by sautéing, roasting or grilling, giving them a sweet flavor and golden glaze.

Carve – To cut or slice cooked meat, poultry, fish, or game into serving-size pieces.

Chiffonade – To slice into very thin strips or shreds. Literally translated from French, the term means “made of rags”. Often used on fresh herbs or lettuce.

Chill – To cool food to below room temperature in the refrigerator or over ice. When recipes call for chilling foods, it should be done in the refrigerator.

Chop – To cut food into bite-size pieces using a knife. A food processor may also be used to chop food. Chopped food is more coarsely cut than minced food.

Clarify – To remove sediment from a cloudy liquid, thereby making it clear. To clarify liquids, such as stock, egg whites and/or eggshells are commonly added and simmered for approximately 15 minutes. The egg whites attract and trap particles from the liquid. After cooling, strain the mixture through a cloth-lined sieve to remove residue. To clarify rendered fat, add hot water and boil for about 15 minutes. The mixture should then be strained through several layers of cheesecloth and chilled. The resulting layer of fat should be completely clear of residue. Clarified butter is butter that has been heated slowly so that its milk solids separate and sink, and can be discarded. The resulting clear liquid can be used at a higher cooking temperature and will not go rancid as quickly as unclarified butter.

Cream – To beat a fat, such as butter or shortening either alone or with sugar, to a light, fluffy consistency. May be done by hand with a wooden spoon or with an electric mixer. This process incorporates air into the fat so baked products have a lighter texture and a better volume.

Crimp – To pinch or press pastry or dough together using your fingers, a fork, or another utensil. Usually done for a piecrust edge.

Crisp-tender – A term that describes the state of vegetables that have been cooked until just tender but still somewhat crunchy. At this stage, a fork can be inserted with a little pressure.

Curdle – To cause semisolid pieces of coagulated protein to develop in a dairy product. This can occur when foods such as milk or sour cream are heated to too high a temperature or are combined with an acidic food, such as lemon juice or tomatoes.

Cure – To treat food by one of several methods for preservation purposes. Examples are smoking, pickling – in an acid base, corning – with acid and salt, and salt curing – which removes water.

Cut-in – To work a solid fat, such as shortening, butter, or margarine, into dry ingredients. This is usually done with a pastry blender, two knives in a crisscross fashion, your fingertips, or a food processor.

-D-

Dash – Refers to a small amount of seasoning that is added to food. It is generally between 1/16 and 1/8 teaspoon. The term is often used for liquid ingredients, such as bottled hot pepper sauce.

Deep-fry – To cook food in hot fat or oil deep enough so that it is completely covered. The temperature of the fat is extremely important and can make the difference between success and failure. When the fat is not hot enough, the food absorbs fat and becomes greasy. When the fat is too hot, the food burns on the exterior before it has cooked through. Fat at the correct temperature will produce food with a crisp, dry exterior and moist interior. An average fat temperature for deep-frying is 375 degrees, but the temperature varies according to the food being fried. Use a deep fryer, an electric fry pan or a heavy pot and a good kitchen thermometer for deep-frying.

Deglaze – To remove browned bits of food from the bottom of a pan after sautéing, usually meat. After the food and excess fat have been removed from the pan, a small amount of liquid is heated with the cooking juices in the pan and stirred to remove browned bits of food from the bottom. The resulting mixture often becomes the base for a sauce.

Devein – To remove the blackish-gray vein from the back of a shrimp. The vein can be removed with a special utensil called a deveiner or with the tip of a sharp knife. Small and medium shrimp need deveining for aesthetic purposes only. However, because the veins in large shrimp contain grit, they should always be removed.

Dice – To cut food into tiny cubes (about 1/8- to 1/4-inch).

Double Broiler – A two-pan arrangement where one pan nests partway inside the other. The lower pot holds simmering water that gently cooks heat-sensitive food in the upper pot.

Drain – To pour off fat or liquid from food, often using a colander.

Dredge – To lightly coat food that is going to be fried with flour, breadcrumbs or cornmeal. The coating helps to brown the food and provides a crunchy surface. Dredged foods need to be cooked

immediately, while breaded foods, those dredged in flour, dipped in egg then dredged again in breading, can be prepared and held before cooking.

Drizzle – To randomly pour a liquid, such as powdered sugar icing, in a thin stream over food.

-E-

Emulsify – To bind together two liquid ingredients that normally do not combine smoothly, such as water and fat. Slowly add one ingredient to the other while mixing rapidly. This action disperses tiny droplets of one liquid in the other. Mayonnaise and vinaigrettes are emulsions. Use a good whisk for steady, even emulsification.

Extracts, Oils – Products based on the aromatic essential oils of plant materials that are distilled by various means. In extracts, the highly concentrated oils are usually suspended in alcohol to make them easier to combine with other foods in cooking and baking. Almond, anise, lemon, mint, orange, peppermint, and vanilla are some commonly available extracts.

Some undiluted oils are also available, usually at pharmacies. These include oil of anise, oil of cinnamon, oil of cloves, oil of peppermint, and oil of wintergreen. Do not try to substitute oils for ground spices in recipes. Oils are so concentrated that they’re measured in drops, not teaspoons. Oil of cinnamon, for example, is 50 times stronger than ground cinnamon. You can, however, substitute 1 or 2 drops of an oil for 1/2 teaspoon extract in frosting or candy recipes.

-F-

Fillet – verb – To create a fillet of fish or meat by cutting away the bones. Fish and boning knives help produce clean fillets.

Noun – A piece of meat or fish that has no bones.

Flake – To gently break food into small, flat pieces

Flour (verb) – To coat or dust a food or utensil with flour. Food may be floured before cooking to add texture and improve browning. Baking utensils sometimes are floured to prevent sticking.

Flute – To make a decorative impression in food, usually a piecrust.

Fold – To combine a light mixture like beaten egg whites with a much heavier mixture like whipped cream. In a large bowl, place the lighter mixture on top of the heavier one. Starting at the back of the bowl, using the edge of a rubber spatula, cut down through the middle of

both mixtures, across the bottom of the bowl and up the near side. Rotate the bowl a quarter turn and repeat. This process gently combines the two mixtures.

Fry – To cook food (non-submerged) in hot fat or oil over moderate to high heat. There is very little difference between frying and sautéing although sautéing is often thought of as being faster and using less fat.

-G-

Grate – To reduce a large piece of food to coarse or fine threads by rubbing it against a rough, serrated surface, usually on a grater. A food processor, fitted with the appropriate blades, can also be used for grating. The food that is being grated should be firm. Cheese that needs to be grated can be refrigerated first for easier grating.

Grease – To coat a utensil, such as a baking pan or skillet, with a thin layer of fat or oil. A pastry brush works well to grease pans. Also refers to fat released from meat and poultry during cooking.

Grill – To cook food on a grill over hot coals or other heat source. The intense heat creates a crust on the surface of the food which seals in the juices. The grill should be clean and must be heated before the food is laid on it. The food can also be basted and seasoned.

Grind – To reduce food to small pieces by running it through a grinder. Food can be ground to different degrees, from fine to coarse.

-H-

Homogenize – To create an emulsion by reducing all the particles to the same size. The fat globules are broken down mechanically until they are evenly distributed throughout the liquid. Homogenized milk and some commercial salad dressings are two examples of homogenized foods.

-I-

Infuse – To steep an aromatic ingredient in hot liquid until the flavor has been extracted and absorbed by the liquid. Teas are infusions. Milk or cream can also be infused with flavor before being used in custards or sauces.

-J-

Joint – To cut meat and poultry into large pieces at the joints using a very sharp knife.

Julienne – To cut food into thin sticks. Food is cut with a knife or mandoline into even slices, then into strips.

-K-

Knead – To mix and work dough into a smooth, elastic mass. Kneading can be done either manually or by machine. By hand, kneading is done with a pressing-folding-turning action. First the dough is pressed with the heels of both hands and pushed away from the body so the dough stretches out. The dough is then folded in half, given a quarter turn, and the process is repeated. Depending on the dough, the kneading time can range anywhere from 5 to 15 minutes. During kneading, the gluten strands stretch and expand, enabling dough to hold in gas bubbles formed by a leavener, which allows it to rise.

-L-

Lard – To insert strips of fat (lardons) or bacon into a dry cut of meat using a utensil called a larding needle. Larding makes the cooked meat more succulent and tender.

Line – To cover the bottom and sides of a cassoulet, mold or terrine with a thin layer of bacon, pork fat, flavorings or pastry. Cake pans are frequently lined with parchment paper to prevent the cake from sticking to the pan after baking.

-M-

Macerate – To soak foods, usually fruit, in liquid so they absorb the liquid’s flavor. The macerating liquid is usually alcohol, liqueur, wine, brandy or sugar syrup. Macerate is also frequently applied to fruits sprinkled with sugar, which intensifies natural flavor of the fruit by drawing out its juices.

Marble – To gently swirl one food into another. Marbling is usually done with light and dark batters for cakes or cookies.

Marinate – To soak food in a seasoned liquid mixture for a certain length of time. The purpose of marinating is to add flavor and/or tenderize the food. Due to the acidic ingredients in many marinades, foods should be marinated in glass, ceramic or stainless steel containers. Foods should also be covered and refrigerated while they are marinating. When fruits are soaked in this same manner, the process is called macerating.

Mash – To crush a food into smooth and evenly textured state. For potatoes or other root vegetables, use a ricer, masher or food mill. While food processors provide a smooth texture more like a puree or a paste, they should not be used for potatoes.

Mince – To cut food into very tiny pieces. Minced food is cut into smaller, finer pieces than diced food.

Mirepoix – A seasoning composed of finely diced sautéed vegetables and herbs and sometimes diced ham, bacon, or salt pork.

Mix – To stir or beat two or more foods together until they are thoroughly combined. May be done with an electric mixer, a rotary beater, or by hand with a wooden spoon.

Moisten – To add enough liquid to a dry ingredient or mixture to make it damp but not runny.

Mount – To whisk cold butter, piece by piece, into a warm sauce for smooth texture, flavor and sheen. Each piece of butter must be thoroughly incorporated before a new piece is added so that the sauce does not break (or separate into liquid and fat).

Mull – To slowly heat a beverage, such as cider, with spices and sugar.

-N-

Nap – To completely coat food with a light, thin, even layer of sauce.

-O-

Open Faced – A sandwich prepared with just one piece of bread which is topped with a wide variety of meats, vegetables, cheeses and heated or not.

-P-

Pan-broil- To cook a food, especially meat, in a skillet without added fat, removing any fat as it accumulates.

Parboil – To boil food briefly in water, cooking it only partially. Parboiling is used for dense food like carrots and potatoes. After being parboiled, these foods can be added at the last minute to quicker-cooking ingredients. Parboiling ensures that all ingredients will finish cooking at the same time. Since foods will continue to cook once they have been removed from the boiling water, they should be shocked in ice water briefly to preserve color and texture. Cooking can then be completed by sautéing or the parboiled vegetable can be added to simmering soups or stews.

Pare – To remove the thin outer layer of foods using a paring knife or a vegetable peeler.

Peel – To remove the rind or skin from a fruit or vegetable using a

knife or vegetable peeler.

Pinch – A small amount of a dry ingredient (the amount that can be pinched between a finger and the thumb).

Poach – To cook food by gently simmering in liquid at or just below the boiling point. The amount of the liquid and poaching temperature depends on the food being poached.

Pot Roast – To cook meat slowly by moist heat in a covered pot. The meat is first browned, then braised either on top of the stove or in the oven. Pot roasting is good for tougher cuts of meat which require longer cooking times to break down connective tissue.

Pound – Pounding thinner cuts of meat tenderizes it by breaking down muscle. Kitchen mallets are generally used for pounding, but it can be done using a small frying pan as well. First place the piece of meat between two pieces of plastic wrap or wax paper.

Preheat – To heat an oven or a utensil to a specific temperature before using it.

Process – To preserve food at home by canning, or to prepare food in a food processor.

Purée – To grind or mash food until completely smooth. This can be done using a food processor or blender or by pressing the food through a sieve.

-Q-

Quadriller – To mark the surface of grilled or broiled food with a crisscross pattern of lines. The scorings are produced by contact with very hot single grill bars which brown the surface of the food. Very hot skewers may also be used to mark the surface.

Quench – To quickly place a heated object in cold water. This is usually done to either stop the cooking process or to separate the skin of an object from the meat. This process is sometimes referred to as “shocking.”

-R-

Reconstitute – To bring a concentrated or condensed food, such as frozen fruit juice, to its original strength by adding water.

Reduce – To decrease the volume of a liquid by boiling it rapidly to cause evaporation. As the liquid evaporates, it thickens and intensifies in flavor. The resulting richly flavored liquid, called a reduction, can be used as a sauce or as the base of a sauce. When

reducing liquids, use the pan size specified in the recipe, as the surface area of the pan affects how quickly the liquid will evaporate.

Rice – To push cooked food through a perforated kitchen tool called a ricer. The resulting food looks like rice.

Roast – To oven-cook food in an uncovered pan. The food is exposed to high heat which produces a well-browned surface and seals in the juices. Reasonably tender pieces of meat or poultry should be used for roasting. Food that is going to be roasted for a long time may be barded to prevent drying out.

Roux (roo)- A French term that refers to a mixture of flour and a fat cooked to a golden- or rich-brown color and used for a thickening in sauces, soups, and gumbos.

-S-

Sauté – To cook food quickly in a small amount of fat or oil, until brown, in a skillet or sauté pan over direct heat. The sauté pan and fat must be hot before the food is added, otherwise the food will absorb oil and become soggy.

Scald – To dip fruits or vegetables in boiling water in order to loosen their skins and simplify peeling. The produce should be left in the water for only 30 seconds to prohibit cooking, and should be shocked in an ice water bath before the skin is removed

Scale – To remove the scales from the skin of a fish using a dull knife or a special kitchen tool called a fish scaler.

Score – To cut narrow slits, often in a diamond pattern, through the outer surface of a food to decorate it, tenderize it, help it absorb flavor, or allow fat to drain as it cooks.

Sear – To brown meat or fish quickly over very high heat either in a fry pan, under a broiler or in a hot oven. Searing seals in the food’s juices and provides a crisp tasty exterior. Seared food can then be eaten rare or roasted or braised to desired degree of doneness.

Season – To add flavor to foods. To coat the cooking surface of a new pot or pan with vegetable oil then heat in a 350 degree oven for about an hour. This smoothes out the surface of new pots and pans, particularly cast-iron, and prevents foods from sticking.

Section – To separate and remove the membrane of segments of citrus fruits. To section oranges, use a paring knife to remove the peel and white rind. Working over a bowl to catch the juice, cut between one orange section and the membrane, slicing to the center of the fruit. Turn the knife and slide it up the other side of the section along the

membrane, cutting outward. Repeat with remaining sections.

Seed – To remove the seeds from fruits and vegetables.

Shred – To cut food into thin strips. This can be done by hand or by using a grater or food processor. Cooked meat can be shredded by pulling it apart with two forks.

Shuck – To remove the shells from seafood, such as oysters and clams, or the husks from corn.

Sieve – To strain liquids or particles of food through a sieve or strainer. Press the solids, using a ladle or wooden spoon, into the strainer to remove as much liquid and flavor as possible.

Sift – To pass dry ingredients through a fine mesh sifter so large pieces can be removed. The process also incorporates air to make ingredients like flour, lighter. Synonymous with AERATE.

Simmer – To cook food in liquid over gentle heat, just below the boiling point, low enough so that tiny bubbles just begin to break the surface.

Skewer – To spear small pieces of food on long, thin, pointed rods called skewers.

Skim – To remove the scum that rises to the surface from a liquid when it is boiled. The top layer of the liquid, such as the cream from milk or the foam and fat from stock, soups or sauces, can be removed using a spoon, ladle or skimmer. Soups, stews or sauces can be chilled so that the fat coagulates on the surface and may be easily removed before reheating.

Skin – To remove the skin from food before or after cooking. Poultry, fish and game are often skinned for reasons of appearance, taste and diet.

Slice – A flat, usually thin, piece of food cut from a larger piece. Also the process of cutting flat, thin pieces

Snip – To cut food, often fresh herbs or dried fruit, with kitchen shears or scissors into very small, uniform pieces using short, quick strokes.

Smoke – To expose fresh food to smoke from a wood fire for a prolonged period of time. Traditionally used for preservation purposes, smoking is now a means of giving flavor to food. Smoking tends to dry the food, kills bacteria, deepens color and gives food a smoky flavor. The duration of smoking varies from 20 minutes to several days. The most commonly used woods are beech, oak and chestnut to which aromatic

essences are often added. Small home smokers are now available.

Springform Pan – A round pan with high sides and a removable bottom. The bottom is removed by releasing a spring that holds the sides tight around it. This makes it easy to remove food from the pan.

Steam – Steaming retains flavor, shape, texture, and nutrients better than boiling or poaching.

Steep – To allow a food, such as tea, to stand in water that is just below the boiling point in order to extract flavor or color.

Stew – To cook food in liquid for a long time until tender, usually in a covered pot. The term also refers to a mixture prepared this way.

Stir – To mix ingredients with a spoon or other utensil to combine them, to prevent ingredients from sticking during cooking, or to cool them after cooking.

Stir-fry – A method of quickly cooking small pieces of food in a little hot oil in a wok or skillet over medium-high heat while stirring constantly.

Stock – The strained clear liquid in which meat, poultry, or fish has been simmered with vegetables or herbs. It is similar to broth but is richer and more concentrated. Stock and broth can be used interchangeably; reconstituted bouillon can also be substituted for stock.

Supreme – To remove the flesh sections of citrus fruit from the membranes. Using a sharp knife, cut away all of the skin and pith from the outside of the fruit. Place the knife between the membrane and the flesh of one section and slice down. Turn the knife catching the middle of the fruit. Slice up, removing each section sans membrane.

Sweat – To cook vegetables in fat over gentle heat so they become soft but not brown, and their juices are concentrated in the cooking fat. If the pan is covered during cooking, the ingredients will keep a certain amount of their natural moisture. If the pan is not covered, the ingredients will remain relatively dry.

-T-

Temper – 1. To slowly bring up the temperature of a cold or room temperature ingredient by adding small amounts of a hot or boiling liquid. Adding the hot liquid gradually prevents the cool ingredient, such as eggs, from cooking or setting. The tempered mixture can then be added back to hot liquid for further cooking. This process is used most in making pastry cream and the like. 2. To bring chocolate to a state in which it has snap, shine and no streaks. Commercially

available chocolate is already tempered but this condition changes when it is melted. Tempering is often done when the chocolate will be used for candy making or decorations. Chocolate must be tempered because it contains cocoa butter, a fat that forms crystals after chocolate is melted and cooled. Dull grey streaks form and are called bloom. The classic tempering method is to melt chocolate until it is totally without lumps (semisweet chocolate melts at a temperature of 104 degrees F.) One third of the chocolate is then poured onto a marble slab then spread and worked back and forth with a metal spatula until it becomes thick and reaches a temperature of about 80 degrees F. The thickened chocolate is then added back to the remaining 2/3 melted chocolate and stirred. The process is repeated until the entire mixture reaches 88–92 degrees for semisweet chocolate, 84–87 degrees for milk or white chocolate.

Tenderize – To make meat more tender by pounding with a mallet, marinating for varying periods of time, or storing at lower temperatures. Fat may also be placed into a piece of meat to make it more tender during cooking.

Toast – The process of browning, crisping, or drying a food by exposing it to heat. Toasting coconut, nuts, and seeds helps develop their flavor. Also the process of exposing bread to heat so it becomes browner, crisper, and drier.

Toss – To mix ingredients lightly by lifting and dropping them using two utensils.

Truss – To secure food, usually poultry or game, with string, pins or skewers so that it maintains a compact shape during cooking. Trussing allows for easier basting during cooking.

–U–

Unleavened – Any baked good that has no leavener, such as yeast, baking powder or baking soda.

–V–

Vandyke – To cut zigzags in edges of fruit and vegetables halves, usually oranges, tomatoes or lemons. The food is usually used as a garnish to decorate a dish.

–W–

Weeping – When liquid separates out of a solid food, such as jellies, custards, and meringues.

Whip – To beat ingredients such as egg whites or cream until light and fluffy. Air is incorporated into the ingredients as they are whipped,

increasing their volume until they are light and fluffy.

Whisk – To beat ingredients together until smooth, using a kitchen tool called a whisk.

–X–

XXX, XXXX, 10X – An indicator on a box of confectioners' sugar of how many times it has been ground. The higher the number of X's the finer the grind.

–Y–

Yakitori – A Japanese term meaning "grilled."

–Z–

Zest – To remove the outermost skin layers of citrus fruit using a knife, peeler or zester. When zesting, be careful not to remove the pith, the white layer between the zest and the flesh, which is bitter.

Sources

Better Homes and Gardens Glossary of Cooking Terms, 2009. http://www.bhg.com/recipes/how-to/cooking-basics/glossary-of-cooking-terms/

http://www.international-gourmet.net/glossary.htm

Appendix E – Image Sources

Introduction

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