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T H E S I S

Course in Domestic Science  
for a  
First-year, High School Student

by

Irene Taylor

1908

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This outline is meant to be a working outline. One from which the teacher can plan her lessons and add or detract from the theory part as seems desirable. The pupils work in groups of two, but individual work is given wherever possible.

The lesson periods are ninety-five (95) minutes long.

The students are in the first year of high school, and have studied elementary physiology, and are having chemistry.



## Lesson 1.

## 1. Theory

1. Enrollment
2. Explanation of Laboratory
3. Uniforms, notebooks
4. Rules for conduct
5. Housekeeper's Rules
6. Rules for dishwashing

## 2. Practice

1. Punch
2. Wash and scour desk utensils

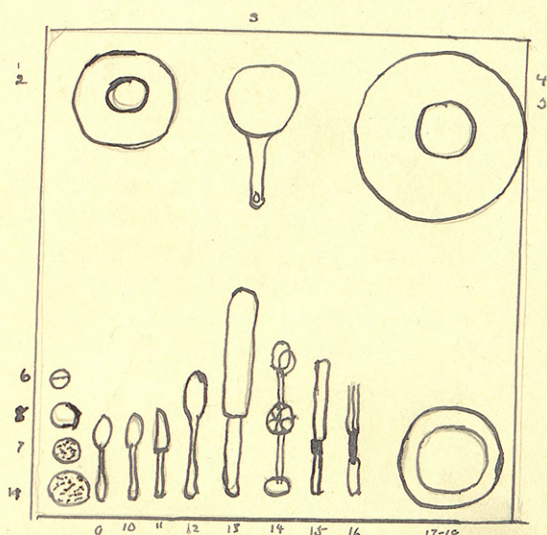
Cost .0202¢ per student



## Lesson 1.

## 1. Theory

1. Enrollment
2. Explanation of the Laboratory
  1. Utensils in cupboards
  2. Order of desk



1. cup
2. saucer
3. stew pan
4. plate
5. measuring cup
6. cookie cutter
7. pepper shaker
8. salt
9. spoon
10. spoon
11. paring knife
12. table spoon
13. spatula
14. egg beater
15. cleaver knife
16. fork
17. large bowl
18. small "

## 3. Uniform

## 1. Apron

- a. Material--Plain white cotton linen or long-cloth
- b. Style--Front gore and two side gores of a seven-gore skirt pattern--to be the length of dress, average:  
Bib--width at waist line,  $4\frac{1}{2}$  in.  
" " " top,  $8\frac{1}{2}$  " .  
" " height 8 " .  
Straps  $1\frac{1}{4}$  in. wide--cross and button at back.  
Button at side of waist line for towel and holder.
- c. Must be marked

## 2. Notebooks

- a. Open end loose leaf folder for theory work
- b. Open side loose leaf folder for recipes

## 4. Rules for conduct

1. Wash hands thoroughly on entering laboratory and be sure nails are clean.
2. Do not lay handkerchief or wraps on the laboratory table.
3. No loud talking, laughter, singing or whistling is permitted.
4. No student may leave the laboratory without permission.



5. Take out desk board and plate to hold soiled knives, spoons, etc.
6. Collect all utensils and supplies needed for work.
7. Leave all doors closed, cans and jars covered, and supply table clean.
8. Keep the desk in order during time of working.
9. Do not make work for yourself by using more utensils than are necessary.
10. Have all materials measured and ready for use before beginning to put them together.
11. Use a crockery bowl and wooden spoon for mixing cake, muffins, etc.--tin dish and spoon are liable to discolor the mixture.
12. Where eggs and milk are used, rinse out bowl in which eggs have been beaten with some of the milk.
13. All water should be poured through sink strainer and garbage removed to pail.
14. Any utensil to which food has adhered should be put to soak as soon as empty.
15. Any oily utensils should have a small quantity of hot water and washing soda put into it as soon as emptied.

#### At close of lesson

16. a- Clean all utensils used and return to proper place.
- b- Clean the match holder and soap-dish.
- c- Scrub desk-board, desk, Bunsen burner and tripod.
- d- Wash dish towel and cloth and hang straight on the rack.
- e- Wash and scour dish-pan. Rinse and wipe dry.
- f- Arrange top of desk and set stool in position.

#### 5. Housekeepers rules

1. Build fire.
2. Brush and blacken range.
3. Fill teakettles.
4. Brush floor around range.
5. Get out day's supplies and general utensils.
  - a- Fill butter, sugar and flour jars.
  - b- Take out special supplies for day's lesson.
  - c- During lesson keep supply table in order.
6. At close of lesson
  - a- Put away supplies.
  - b- Scour supply table.
  - c- Wash general utensils.
  - d- Empty and polish teakettles.
  - e- Clean sink.
  - f- Brush stove.
  - g- Leave laboratory in perfect order.
7. Clean refrigerator once each week.

#### 6. Rules for dish-washing

1. Gather dishes together, remove waste and sort.
2. Rinse egg and flour dishes in clear, cold water.
3. Fill two dishpans--one with hot soap suds and the other with clear hot water.



4. Wash with hot soap-suds; rinse with the hot, clear water.
5. Wipe and polish with a clean, dry, soft towel in the following order: glass, silver, china, wooden ware, cutlery, granite, tin, steel.
6. Change the water frequently.

#### Special rules

1. Glassware,--ammonia, washing soda, or alcohol may be used in the water instead of soap--1 tbsp. to 1 qt. of water. Their repeated use will dim the luster. Soft brushes are required for cleaning cut glass.
2. Silver,--dampen some whiting with water, alcohol or ammonia water; apply to the silver with a soft cloth and rub well. Chased silver will require a soft brush. Rub off the whiting and wash.
3. Wooden ware,--wash first with cold water. Rub brush on sapolio and scour with the grain of the wood. Wash according to previous directions.
4. Cutlery,--granite and enamel,--scour with a cork dipped in powdered sapolio. Wash by previous directions.
5. Tinware,--never dry over heat as it discolors the tin.
6. Steel ware,--apply the sapolio directly to the utensil inside and out, and scour until bright.

#### 2. Practice

1. Punch--Serve six people

$\frac{1}{2}$  c. juice

$\frac{3}{4}$  c. syrup

2 qts. water

Prepare juice by extracting from two oranges to each lemon, strain and measure, combine ingredients and pour over block of ice in punch bowl.

Oranges  $.06\frac{1}{4}$  ¢ at 30 ¢ per doz.

Lemons  $.031$  ¢ at 30 ¢ " "

Sugar  $.028$

.1215

Total  $.0202$  per pupil.



## Lesson 2.

## 1. Theory-- Combustion

1. Definition
2. Structure of flame
3. Fuel
4. Kindling point
5. Necessity for oxygen
6. Construction of range

## 2. Practice

1. Building of fire (demonstration)



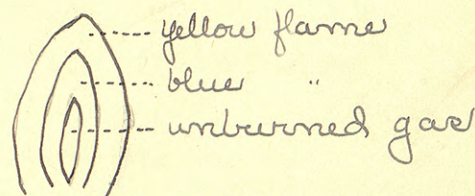
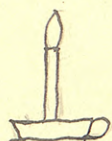
## Lesson 2.

## 1. Theory--Combustion

1. Definition: Combustion is the uniting of two or more elements to form a compound. Heat is always evolved and sometimes light and flame.

## 2. Structure of a flame:

In a candle flame



The inflammable compound which is a combination of carbon and hydrogen unite with oxygen and in the first case produce the yellow oxidizing flame at the top. This takes so much oxygen out of the air that the flame directly underneath does not have enough oxygen. It is much hotter than the oxidizing flame, and burns with a blue flame. In the center of the candle flame there is a column of unburned gas. Test by putting a toothpick through the flame.

## 3. Fuel

Fuels are divided into three classes:

## Solid

Coal--soft and hard

Wood--soft and hard

Peat

## Liquid

Petroleum compounds

## Gaseous

Acetylene

Natural gas

Manufactured gas

## 4. Kindling point

The kindling point of the different fuels differs. Paper will ignite quickly; wood that is light and porous has a lower kindling point than heavy and close-grained woods; coal has a rather high kindling point, and it takes much longer to heat it to that point than it does wood. The soft coal has a lower kindling point than hard.

5. By our definition of oxidation we know that a certain percent of oxygen at least must be present before any combustion will take place. Illustrate by candle in inverted bottle set in water.

## 6. Every range should contain:

1. Fire-box for both wood and coal. Have deep grate which revolves easily.
2. Ash-box directly under the fire box,
3. Draughts: The draughts should open one over the fire-box, one below the fire-box, one directly into the flame. This when closed will divert heat over the oven so that all the heat will circulate around it.



4. Oven: The oven should extend under all holes but the two over fire-box. The door latch should have several notches in it so that an over-heated oven can be easily cooled by being partially opened.
  5. Most ranges have water pipes in the fire-box, called water-front or water-back, according to position in which they are placed.
  6. Small cleanout spaces under cover, where soot may be removed.
2. Practice--General rules for building soft-coal fire
- a.
    1. Close all openings in stove.
    2. Open chimney draft.
    3. Shake from fire-box all cinders and ashes.
    4. Open fire-box and cover grate with crumpled paper.
    5. Lay on liberal quantity of kindling loosely arranged.
    6. Fill fire-box with small lumps of coal.
    7. Brush top of stove and replace covers.
    8. Arrange dampers for direct draft.
    9. Light fire from below.
    10. As soon as fire is well started, direct heat over oven.
  - b. Building fire (demonstration)



## Lesson 3.

## 1. Theory--Food

1. Definition

2. Composition

3. Five Food Principles

## 2. Practice

1. Tea

Cost .002 per student



## Lesson 3.

## 1. Theory--Food

1. Definition: Food is anything which when taken into the body, supplies energy, builds tissue or repairs waste.
2. Composition: Food is composed of different combinations of chemical elements. It is divided into two great classes:
  - a. Organic or combustibles
    1. Carbohydrates
    2. Fats and oils
    3. Proteids
  - b. Inorganic or incombustible
    1. Water
    2. Mineral matters

## 3. Five Food Principles

- a. Proteid: which rebuilds the tissues and yields energy and may make fat--example, meat, white of egg
- b. Carbohydrate: which produces work power, causes the storage of fat, and gives heat--example, sugar, starch
- c. Fats and oils: which furnish in the tissue an easily available store of work power and heat until need by the body--example, lard, butter
- d. Mineral matter: which furnishes the proper amount of salts needed in the body for building bony tissue and aiding chemical changes--example, common salt
- e. Water: which furnishes the required amount of moisture needed in the body

## 2. Practice

1. Tea--Simple infusion
  - 1 tsp. tea
  - 1 c. water

Bring water just to boiling point. Add tea and allow to stand two minutes. Strain infusion into hot cup and serve.

Tea .002 at 60¢ lb.



## Lesson 4.

## 1. Theory--Water

1. Composition
2. Sources
- + 3. Varieties
4. Physical Properties
5. Contamination
6. Purification
7. Uses in body

## 2. Practice

1. Taking temperature of water from tap flow to boiling
2. Hoarhound candy  
Cost .0035 per student.



## Lesson 4.

## 1. Theory--Water

1. Composition: Water is composed of one part of the element oxygen and two parts of hydrogen expressed by symbols  $H_2O$

## 2. Sources:

1. Oceans, rivers and lakes
2. Rains
3. Springs
4. Wells

All water comes from one great source, the ocean. It is continually evaporating then forming clouds which then deposit the rain. Water is never pure in nature, nearest pure in an open space after heavy rains or from springs and underground or subsoil streams.

## 3. Varieties

a. Hard water: By hard water is meant that which contains mineral salts, usually in the form of carbonates. These salts unite easily with soap and make it less soluble so that it is difficult to cleanse with it

1. Temporary hard water contains an excess of lime salts which are precipitated upon boiling--observe the inside of teakettles.
2. Permanently hard water will not be made "soft" by boiling

b. Soft water is simply water that is free from objectionable salts. Rain water is soft water

4. Physical Properties: Water solidifies at a temperature of  $32^{\circ}F$  or  $0^{\circ}C$ . Boils at a temperature of  $212^{\circ}F$  or  $100^{\circ}C$ . This is lowered as the altitude above sea level is increased. It is increased with increased density of the water, as when salt is added to it. This is also true of the freezing point. Pure water is odorless, tasteless, and colorless.

## 5. Contamination

a. Inorganic--Water may be contaminated from inorganic material by dissolving many soluble minerals in it, which may not be harmful except in excess.

b. Organic-- Water is contaminated from

1. Dead animal matter
2. .. vegetable ..
3. bacteria -- Bacteria will be found where there is any dead animal matter or waste material, and these germs, especially those of typhoid fever and cholera, are frequently found in river waters. Not all the bacteria found in running water are hurtful. Some decompose the dead vegetable and animal matter into less harmful products and thus help to purify the water.



6. Purification--The importance of having pure drinking water can not be overestimated. Many infectious diseases are directly traceable to impure water. Ice also may be impure, for some germs are not injured by freezing.

Water is purified by

- a. Distillation--A mechanical process by which water is made absolutely pure, but it has a flat or metallic taste from absence of air and salts
- b. Filtration--By this method water is purified by being allowed to trickle through prepared beds of different materials, generally of charcoal, sand and gravel so that the bacteria are caught and leave the water purer. Filters need frequent renewal as they become clogged with impurities which furnish favorable media for the growth of bacteria.
- c. Boiling--This method will free water from all bacteria and moulds. Has a flat taste, but is easily aerated. It is the easiest method.

7. Uses in body

- a. Regulates specific gravity of all fluids in body
- b. Enters into chemical composition of the tissues
- c. Controls rate of absorption
- d. Enables blood to hold certain materials in solution
- e. Regulates body temperature
- f. Serves as carrier of food and waste

2. Practice

1. Taking temperature of water from temperature of tap flow to boiling

- a. Fill kettle about half full of water, put the water over gas burner and notice:
  1. Tiny bubbles forming in the bottom of the kettle cling to the sides, then rise to top and break. These are air bubbles and it is called simmering
  2. After the bubbles have broken and cleared off, you will notice a quiet stage. Before long larger bubbles will form on the sides of the kettle, rise and break under the water. Soon they rise to top and break. When all of the water is in such motion, it is called boiling water

2. Hoarhound Candy--Groups of two

- 1/2 tbspn pressed hoarhound
- 1/4 c. boiling H<sub>2</sub>O
- 1/4 c. sugar

Pour H<sub>2</sub>O on hoarhound. Let stand 1 minute. Strain through fine cloth, add sugar to strained hoarhound water. Boil to 192° C. Pour out and cut into squares while soft.



1990

|           |              |        |     |
|-----------|--------------|--------|-----|
| Hoarhound | .0001        | at 30¢ | lb. |
| Sugar     | .007         | at 6¢  | lb. |
|           | <u>.0071</u> |        |     |



## Lesson 5.

## 1. Theory--Mineral Matter

1. Sources
2. Kinds
3. Organic acids
4. Uses of Mineral in Body

## 2. Practice

1. Peanut Brittle

Cost 1¢ per student.



## Lesson 5.

## 1. Theory--Mineral Matter

1. Sources: The mineral matter needed for the body is derived from food in the following order: In general most from pulses and cereals, after them, vegetables, meat ranks next, and fruits and nuts least of all.
2. Kinds: Sodium chloride, common salt, is the most important salt needed. It is required in all tissues and fluids in the body with the exception of the enamel of the teeth. Potassium salts are next in importance. They are needed by muscular tissue especially, although they are common ingredients in nearly all tissues and fluids. Also calcium salts constitute a large percentage in bones and teeth. Therefore young growing animals need more than other ones. Phosphorous, which we get principally from meat, also enters into composition of bones, blood and muscles. Sulphur is derived from fibrin, egg albumen, milk and some vegetables. Iron is needed in the blood and is obtained from the blood of animals contained in meat.
3. Organic acids, found in vegetables and fruits:
  - a. Acetic -- from wine and vinegar
  - b. Tartaric-- from grapes and pineapples
  - c. Malic -- from apples, pears, peaches
  - d. Citric-- from lemons, oranges
  - e. oxalic-- from rhubarb

these are usually in combination with sodium calcium and potassium. They are of food value to the body in that they aid in digestion by regulating alkalinity of the blood.

## 4. Uses in the body

- a. To regulate the specific gravity of blood and other fluids
- b. To preserve the tissues from disorganization
- c. To enter into permanent composition of certain structures, especially bones and teeth
- d. To enable the blood to hold certain materials in solution
- e. To regulate chemical reactions of blood and other fluids

## 2. Practice-- Peanut Brittle. Groups of two

1/4 c. granulated sugar

1/4 c. water

1/4 c. chopped peanuts

Add Water to sugar, stir until it is dissolved, remove spoon and boil rapidly. Observe and record changing temperatures of boiling point. Boil to 190°C when it will be a golden brown liquid. Add peanuts, mix thoroughly, pour onto bottom of a tin pan, and press into shape with knives. Cut into



bars immediately.

Sugar .007 at 6¢ per lb.

peanuts .0125 at 10¢ per lb.

.0195

Cost 1¢ per student



## Lesson 6.

## 1. Theory--Sugar

1. Classification
2. Source of Manufactured Sugars
3. Physical Properties
4. Manufacture

## 2. Practice

## 1. Fondant

Cost per student .014.



# Lesson 6.

## 1. Theory--Sugar

1. Classification: Sugars are crystallizable carbohydrates in which oxygen and hydrogen exist in proportion to form water and carbon in the same proportion as the water.
2. Source of manufactured sugar: Sugar occurs both in fruits and vegetables, also in milk. Our common granulated sugars are made from sugar-cane and sugar-beets. Maple sugar from maple trees.
3. Physical properties
  - a. Sweet taste
  - b. Fermentable with yeast
  - c. Soluble
  - d. Chrystalline
  - e. odorless
4. Manufacture
  - a. Sugar-cane cut and crushed, then juice boiled in copper vats, strained through charcoal to cool and crystalize. Remelted, bleached by sulphuric acid. Molasses syrups are the uncrystallizable cane sugars. Brown sugar the sweetest cane sugar.
  - b. Beet sugar is made from sugar beets which are sliced and cleaned, crushed to pulp, sugar extracted by hot water, and water then evaporated. Color removed by animal charcoal. This is a coarser sugar. Not used for candies.
  - c. Maple sugar is obtained from maple trees. Sap is boiled to syrup and sugar allowed to crystallize.
  - d. Milk sugar is chemically obtained from milk.
  - e. Grape sugar is found in flowers and fruits. It is hard to crystallize. Process for making is the same as for cane sugar.

## 2. Practice

### 1. Fondant

1/2 c. sugar  
 1/4 c. water  
 spk. cream of tartar  
 Put ingredients in smooth sauce pan, stir well until sugar is dissolved. Heat gradually until when tried in cold water will form soft ball or 238°C. Take from fire, pour out into shallow buttered dish, cool to blood heat, work with a knife until it forms a cream. Pour into stone jar or bowl and let stand at least 24 hours before using.

Sugar .014 at 6¢ per lb.  
 Cream of tartar  
 Cost per student .014



## Lesson 7.

## 1. Theory--Digestion and Fermentation

1. Hydrolusis
2. Digestion
3. Fermentation
4. Digestion of Sugar
5. Absorption of Sugar
  - a. Storage of Sugar

## 2. Practice

1. Make up Fondant

Cost .02.



## Lesson 7.

### 1. Theory--Digestion and Fermentation

1. hydrolysis: By hydrolysis we mean the splitting of a complex substance into two or more simpler compounds
2. Digestion: Digestion is the conversion of food in the alimentary canal into soluble product, capable of being used by the blood.
3. Fermentation: Fermentation is the chemical decomposition of an organic compound induced by unorganized or organized ferments.
  - a. Organized ferments are those which act directly upon the substance and the chemical changes involved in the process of fermentation, occur only in the presence of the cell itself. Examples are, bacteria, yeasts, and molds.
  - b. Unorganized ferments do not act directly, and the changes are results of the presence of a soluble material secreted by the cell and acting apart from the cell which is called an enzyme.
    1. Enzymes: An enzyme is an unorganized compound that causes fermentation. Most of the changes involved in the digestion of food are brought about by the presence in the digestive secretions of these soluble ferments. Their actions are hydrolytic, proteolytic, alcohol producing and fat splitting.

### 4. Digestion of Sugar

- a. In mouth: The simple sugars and also cane sugar undergo no change in the mouth, except being put in solution.
  - b. In stomach: The simple sugars are partially absorbed. Some cane sugar by the action of hydrochloric acid, is changed into invert sugar.
  - c. In the intestine: The invert sugar is here acted upon by the intestinal juice, which converts it into two simpler sugars, levulose, or fruit sugar and dextrose, or grape sugar. Lactose or milk sugar is changed by the enzyme, lactase into dextrose, and galactase; maltose is changed by enzyme into dextrose.
5. Absorption of sugar: The sugars are absorbed as dextrose, and levulose from the intestines directly through the absorbing cells which line the intestine to the blood and what is not used, immediately is stored in the liver as glycogen.



## 2. Practice--Making up Fondant

## 1. Walnut wafers

Lay one half of a walnut meat on paraffin paper.  
Put in a small amount of fondant in a cup and set in  
boiling water until it melts, then pour a small  
amount over each walnut.

## Cost

|         |             |
|---------|-------------|
| Walnuts | .003        |
| Fondant | <u>.014</u> |
|         | .017        |

2. Mint and wintergreen wafers are made by melting  
fondant and pouring out in wafer form on the oiled  
paper after adding desired flavoring.



## Lesson 8.

## 1. Theory--Starch

1. Classification
2. Composition
3. Sources
4. Physical Properties
5. Manufacture

## 2. Practice

1. Experiments with Starch.



## Lesson 8.

## 1. Theory--Starch

1. Classification: Starch is a carbohydrate of the polysaccharide group, and is a complex substance.
2. Composition: It is composed of carbon, hydrogen and oxygen ( $C_6H_{10}O_5$ )<sub>n</sub>
3. Sources:
  - a. Vegetable--potato
  - b. Grain--cornSplit corn grain to show starch. Pare potato and let stand in cold water to show starch.
4. Physical properties: Colorless, tasteless. Shape of grains--concentric rings, white glistening powder. Insoluble in cold water. Swells and bursts cells with hot water.
5. Manufacture: In both grain and potatoes, these steps are taken. Material is ground up and soaked in water until pulpy, then strained through a sieve. It is then left to undergo fermentation. The water is then drained off and the starch is washed out. Purified by continued washings and then dried.

## Practice--Experiments with starch

## 1. Experiment 1

1 tbspn. starch  
1/2 c. boiling water  
Drop starch in water. Do not stir. Boil two minutes. Remove a lump and observe result. Starch is uncooked inside. It is transparent where well done, translucent otherwise.

## 2. Experiment 2.

1 tbspn. starch combined with 1 tbspn H<sub>2</sub>O. Pour on to this 1 c. boiling H<sub>2</sub>O. Cook five minutes, stir all the time. Observe results. Starch becomes thick and clear with no lumps. Starch grains have burst and set free starch so that it could be thoroughly cooked.



## Lesson 9.

## 1. Theory--Starch (continued)

1. Digestion of Starch

2. Absorption of Starch

## 2. Practice

1. Rules for Making White Sauce

2. Potatoes

a. Boiled

b. Mashed

c. Riced

d. Baked

e. Stuffed

Cost .013 per student.



## Lesson 9.

## 1. Theory--Starch (continued)

1. Digestion of starch: Starch is taken into the mouth and changed to a complex sugar, maltose and a form of starch called dextren, by the action of the enzyme ptyaline of the saliva. Action continues in the stomach until neutralized by hydrochloric acid, then it passes on into the intestines. In the intestine the enzyme amylapsin continues the action begun by the ptyalin, and starch is all converted into maltose and finally dextrose.
2. Absorption of starch: The starch is mostly absorbed as sugar by the cells of the intestinal linings, but may be absorbed directly as dextrin and changed into something else before reaching the blood.

## 2. Practice--Rules for making white sauce

- 1 c. milk
- 1/4 tbspn flour
- 1/4 tbspn butter
- 1/2 tsp salt

## Methods for making

1. Mix flour and salt with an equal quantity of cold milk to smoothness. Scald remainder of milk in double boiler. Add flour and milk mixture to hot milk, cook twenty minutes, stirring until thick. Remove from heat and stir in butter.
  2. Scald milk in double boiler. Rub butter, flour and salt to smooth paste and stir into hot milk. Cook twenty minutes.
  3. Heat butter until it bubbles. Stir flour and salt into butter until smooth. Add cold milk, cook seven minutes. Stir constantly.
- |                           |       |
|---------------------------|-------|
| 1 c 1-1 white sauce costs | .023  |
| 1 c 1-2 .. .. .           | .0335 |
| 1 c 1-3 .. .. .           | .044  |
| 1 c 1-4 .. .. .           | .055  |

## 2. Potatoes

## a. Boiled potatoes

- 1 potato

Boiling H<sub>2</sub>O to cover

1/4 tsp salt to each cup water. Wash pare and remove eyes and rinse potato in cold water. Place in boiling salted water and boil twenty--thirty minutes according to size of potato. As soon as done, drain away water, remove cover, shake over heat until dry. Serve immediately.

## b. Mashed potatoes ( hot riced potato)

- 1 tsp butter
- 1 tsp cream or milk
- Salt to taste

Add butter, cream and salt to potato. Beat with fork until light and creamy. Pile lightly on hot dish and serve immediately.



c. Riced potatoes  
 1 potato  
 Boiling water to cover  
 1/4 tsp salt to each cup of water  
 Boil potato according to directions. Force through  
 ricer into hot serving dish.

d. Baked potatoes  
 1 medium-sized potato  
 Scrub thoroughly in water with brush  
 Pare thin strip around lengthwise  
 Place on pan in hot oven  
 Bake 45 to 60 minutes  
 When done roll in clean napkin and twist until skin  
 is broken  
 Serve immediately

e. Stuffed potatoes  
 1 medium-sized potato  
 1 tsp butter  
 1/8 tsp salt  
 1 tsp milk or cream  
 Bake potato according to directions  
 Upon removing from oven cut in halves crosswise  
 Scrape out inside, season and force through ricer  
 Pile lightly into shells, set in baking pan and  
 return to oven  
 Bake until delicately brown

1. Boiled potatoes  
 Cost  
 Potato .004 at 70¢ bu.

2. Mashed potatoes  
 Cost  
 Potato .004 at 70¢ bu.  
 Butter .0065 at 32¢ lb.  
 Milk .002 at 5¢ qt.  
.0125

3. Riced potatoes  
 Cost  
 Potato .004 at 70¢ bu.

4. Baked potato  
 Cost  
 Potato .004 at 70¢ bu.

5. Stuffed potatoes  
 Cost  
 Potato .004 at 70¢ bu.  
 Butter .0065 at 32¢ lb.  
 Salt  
 Milk .0002 milk or cream.  
.0107

Cost per student .0053



## Lesson 10.

## 1. Theory--Starch (continued)

1. Review Starch Digestion

2. Serving of Soup

## 2. Practice

1. Creamed Onions, method No. 1.

2. Cream of Tomato Soup, method No. 2

Cost per student \$ .033



## Lesson 10.

## 1. Theory--Starch (continued)

1. Review of starch digestion

2. Serving of soups

Soups are divided into two great classes: soups made of stock and without stock.

a. Soups made of stock have for their bases beef, veal, fish, poultry or game, separately or in combination.

1. Bouillon is made from lean beef delicately seasoned, usually clear.

2. Brown soup stock is made from highly seasoned vegetables, spices and sweet herbs.

3. White soup stock is made from chicken or veal with delicate seasonings.

4. Consomme is made from several kinds of meat and highly seasoned.

b. Soups without stock

1. Cream soups, made with a white sauce or thickened milk or cream with vegetables.

2. Purees, fish or vegetables forced through a strainer and put into a white sauce.

3. Bisques, made generally from fish, milk and seasonings and served with fish dice.

## Soup Making

A great many materials are used for soups. One may keep these on hand with but little expense. Among winter vegetables used are: turnips, carrots, celery and onions. Cream soups and purees may be made of any of these. Many food scraps may be used up in this way.

## 2. Practice--Groups of two

Creamed onions

2 medium-sized onions

1/2 c white sauce 1-1

Wash and peel onions, quarter, cook uncovered in boiling salted water until tender, -about 45 minutes. When done drain off the water, cover with hot white sauce and serve.

Flour .0005

Butter .01 at 32¢ lb.

Milk .0125 at 5¢ qt.

Salt

Onions .0071

.0301

Cost per pupil .009

Cream of tomato soup

1/2 c white sauce 1-2

1/4 c strained tomato (juice and pulp)

spk baking soda

Groups of two



Bring tomatoes to a boil and add soda. Combine with white sauce and reheat quickly. Avoid bringing to a boil. Whip with Dover beater and serve.

Cost.

|             |              |                              |
|-------------|--------------|------------------------------|
| White sauce | .0167        |                              |
| Tomatoes    | .032         | at $12\frac{3}{4}$ ¢ per lb. |
| Total       | <u>.0487</u> |                              |

Cost per student .024



## Lesson 11.

## 1. Theory--Vegetables

1. Kinds
2. Sources
3. General directions for cookery
4. Digestion of cellulose

## 2. Practice

1. Creamed and escalloped vegetables, in season--Method  
No. 3.



## Lesson 11.

## 1. Theory--Vegetables

## 1. Kinds

Most common vegetables are: potato, turnip, onion, radish, carrot, celery, bean, pea, squash, beet, cabbage, oyster plant, parsnip, spinach, cauliflower, cucumber, Kola egg plant, tomato, lettuce.

## 2. Sources

|                |                          |
|----------------|--------------------------|
|                | ) roots-ex-horse radish. |
|                | ( tuber-ex-potato.       |
|                | ) stem-ex-celery.        |
| Parts of plant | ( leaf-ex-lettuce.       |
|                | ( fruit-ex-tomato.       |
|                | ) seed-ex-lima bean.     |
|                | ( flower-ex-cauliflower. |

## 3. Composition and structure

Large percent water, fats, carbohydrates, some proteids-vegetable proteid called legumiu. Mineral matter is largest value. Cellulose--woody like fiber which forms the walls of starch grains and other parts of plants gives bulk.

## 4. General directions for cookery

- a. Vegetables with little starch generally cooked at gentle simmer. Vegetables such as lettuce, celery (inner stalks), tomatoes, cucumbers and endive contain largely water and mineral salts, both of which are lost unless cooked at gentle simmer.
- b. Vegetables with protein, sugar and some starch cooked at gentle simmer. Green peas and asparagus have enough starch so that they must be cooked to be wholesome, but it must be at a gentle simmer to retain the sugars and minerals--need but small amount of water which should form part of finished dish.
- c. Vegetables with starch and cellulose. Put on in cold water. Parsnips, salsify, carrots, turnips contain but little starch other than is found in their cellular structure. This fiber is hardened by high heat and cooking should not be carried on at a higher temperature than boiling point of water, until fiber is tender and then remove.
- d. Vegetables with much starch cook in boiling water. Potatoes, breakfast cereals, rice, macaroni, noodles and other pastes used as vegetables are rich in starch. A good potato properly cooked is mealy--cooked in simmering water it is water-soaked and soggy.
- e. Use of salt and soda. Hard water has a tendency to harden cellulose and thus keep sweet juices and other valuable compounds within the vegetables. Soft water has opposite effect. Salt added will make water hard



and intensifies color of green vegetables. Soda will soften water (1 tsp soda to 1 qt water), therefore it should be used. 1 tsp to 2 qt water should be used when dried cellular structure, as of peas, beans and lentils, are to be softened.

4. Digestion of cellulose

Cellulose is not digestible by human digestive fluids. It is softened by some. In the large intestine it is attacked by bacteria and undergoes decomposition into the gases  $\text{CO}_2$  and  $\text{H}_2\text{S}$ . It serves for bulk in the intestine. The waste cellulose is eliminated from the body.

2. Practice

Creamed and scalloped dishes.



## Lesson 12.

## 1. Theory--Fats and Oils

1. Sources

2. Composition

3. Physical Characteristics of Fats in General

## 2. Practice

1. French Dressing

2. Cucumber and Tomato Salad

Cost per student \$.02.



## Lesson 12.

## 1. Theory--Fats and Oils

## 1. Sources

## a. Animal

1. Butter, cream, lard, suet, bacon, pork, cod liver oil, fat in egg yolk.
2. Some in lean meat.
3. In connective tissues of muscles.

## b. Vegetable

1. Olive oil, cotton seed oil, linseed oil, cocoa butter, oil in nuts.

## 2. Composition

## 1. Carbon, hydrogen and oxygen.

They are compounds of fatty acids with glycerine. Add an alkali such as strong lye to fat and you get a soap, also glycerine.

## 3. Physical Characteristics of Fats in General

Colorless or slight yellow. When pure, tasteless and odorless. A low melting point and insoluble in water. Lighter than water. The fats found in animal fat are:

Alein--a very soft fat, keeps the fat of body in a liquid form.

Stearin--a solid white fat.

Palmitin--very hard fat and melts with some difficulty.

In milk fats are found broken up into small globules and is called an emulsion.

## 2. Practice

Groups of four.

## French Dressing

- 1/4 tsp mustard
- 1/3 tsp salt
- 1/4 tsp powdered sugar
- Few grains cayenne
- Yolk 1/2 egg
- 3 tsps lemon juice
- 1 tsp vinegar
- 1/4 c olive oil

Have ingredients chilled. Place mixing bowl in crushed ice. Mix egg yolk and dry ingredients. Add few drops acid, then drop by drop one teaspoon oil. Add oil and acid alternately, drop by drop, until acid is all used. The remainder of the oil may be added more rapidly, constant beating necessary throughout.

## Cost.

|                |        |
|----------------|--------|
| Mustard        | .00012 |
| Salt           |        |
| Powdered sugar | .0003  |
| Egg            | .0065  |



|             |                        |
|-------------|------------------------|
| Lemon juice | .005 at 15 ¢ per doz.  |
| Vinegar     | .0005 at 10 ¢ per gal. |
| Olive oil   | .03 at 25 ¢ per qt.    |
|             | <u>.04242</u>          |

Per pupil .0106

#### Cucumber and Tomato Salad

1 medium-sized cucumber.  
1 medium-sized tomato  
1 tsp salt  
1 c water

Pare cucumber and cut in small slices. Put to soak in salted water. Cut tomato in slices. Arrange these vegetables on a lettuce leaf and serve with mayonnaise dressing.

#### Cost

|          |              |
|----------|--------------|
| Cucumber | .003         |
| Tomato   | .0125        |
|          | <u>.0155</u> |

Per student .0077



## Lesson 13.

## 1. Theory--Fats and Oils (continued)

1. Digestion of Fats and Oils

2. Uses in Body

3. Food value

## 2. Practice

1. Soap



# Lesson 13.

## 1. Theory--Fats and Oils (continued)

### 1. Digestion

The action on fats in the mouth is that of grinding which sets free the fat globules. The tissue may be dissolved and broken up and fat drops set free by the heat of the stomach. In the small intestine either one or two things takes place: emulsification or saponification. The digestive enzyme which act on fat are lipase or steapsin aided by bile.

Act upon fats

1. Forming an emulsion of the drops so that they become part of the solution.
2. Fats are oxidized into fatty acids and glycerine. The strong alkali sodium carbonate makes a soap of the fatty acids.

The cells of the small intestines absorb these soaps and emulsions and form them into the original fat as they pass through the cell wall. They are taken up by the lacteal system and carried to the blood from where they nourish the body.

### 2. Uses in the Body

1. Furnish energy for the development of heat.
2. Supply force.
3. Make tissues more plastic.
4. Serve as a protective covering for delicate organs.
5. To serve for storage of energy.

### 3. Food Value

Quick foods to build up tissue. Are distinctly laxative in their action. Excess of fat cannot be absorbed.

## 2. Practice

Soap

- 1 c old fat
- 3 tsp lye



## Lesson 14.

## 1. Theory--Cocoa and Chocolate

1. Source
2. Composition
3. Manufacture
4. Adulteration
5. Food Value

## 2. Practice

1. Making cocoa, chocolate
2. Chocolate Cornstarch Mould

Cost per student \$ .022



## Lesson 14.

## 1. Theory--Cocoa and Chocolate

## 1. Source

Cocoa and chocolate are both prepared from the cocoa bean, or pulpy seeds of the exotic cocoa tree. Theobroma cocoa grows in Brazil, British West Indies, and Venezuela. The fruit which looks like a small cucumber contains two or three dozen small seeds, which become brown and hardened in the sun. The cocoa starch grains are spherical.

## 2. Composition

Albumen 15-20%

Theobromine 1.8 %

Fats 30 %

Starch 8-10 %

Some minerals

## 3. Manufacture

## 1. Cocoa

Cocoa is made by grinding the kernels into a paste, to which starch or sugar is added. If starch has been used, the cocoa must be boiled for some minutes, but if diluted with sugar it is only necessary to mix it with boiling water or milk. Cocoa may be either fermented or unfermented. The first process improves the flavor. The cocoa bean contains so much fat that it cannot be powdered unless fat is removed by artificial processes. So cocoa contains rather less strength than chocolate.

## 2. Chocolate

Chocolate is manufactured from the husked, dried, ground and fermented cocoa seeds, which are roasted and made into a paste and compressed into cakes by moderate pressure. To increase the flavor and nutrient power of the cakes more or less sugar (but at least 50 percent) is added and various flavoring extracts. The husks of the seeds are separately sold and used to make an inferior drink.

## 4. Adulteration

Cocoa and chocolate are adulterated by addition of starch, ground husks of cocoa beans, arrow-root and wheat or glucose.

## 5. Food Value

Cocoa alone has small food value because fat has been taken out. If made with milk and cream it adds to food value. Their especial value is a stimulating and agreeable beverage.

In chocolate the fat gives it considerable food value. Cocoa is good for invalids, as with less fat, they may be borne by an enfeebled stomach. Chocolate is used



many times as a drink for growing children.

2. Practice

1. Cocoa

- 2 tsp cocoa or grated chocolate
- $1\frac{1}{2}$  tsp sugar
- $\frac{1}{2}$  c milk

Mix cocoa and sugar. Cook in boiling water until smooth and glossy. Add to scalding milk. Mix thoroughly and serve with or without whipped cream.

Cost

|       |                  |
|-------|------------------|
| Cocoa | .008 at 50 ¢ lb. |
| Sugar | .0012 at 6 ¢ lb. |
| Milk  | .0125            |
|       | <u>.0217</u>     |

Chocolate

Same receipt as for cocoa.

2. Chocolate Cornstarch Mould

- $1\frac{1}{2}$  c milk
- $1\frac{1}{4}$  square chocolate
- 1 tbsp sugar
- 3 tsp cornstarch
- spk salt
- 7 drops vanilla

Add sugar, salt and cornstarch to milk as in white sauce. Heat chocolate over hot water. Combine with thick mixture and add vanilla. Pour out in wet moulds and set in cold water. When cold, unmold by slipping wet knife around edge.

Cost

|        |                       |
|--------|-----------------------|
| Milk   | .014 at 5 ¢ per quart |
| Choco- |                       |
| late   | .009                  |
| Sugar  | .0016 at 6 ¢ per lb.  |
| Corn-  |                       |
| starch | .00013                |
|        | <u>.02473</u>         |

Cost per student .012.



## Lesson 15.

## 1. Theory--Cereals

1. Kinds and Use
2. Composition
3. Food Value
4. Cookery
5. Manufacture of so-called Breakfast Foods

## 2. Practice

1. Cream of Wheat with Figs

Cost \$.005



## Lesson 15.

## 1. Theory--Cereals

1. Kinds and specific value of wheat and oats used principally in North
  - a. Wheat contains a percent of all food principles.
  - b. Oats--some fats and proteids--very nutritious on this account.  
In the South and temperate climates some corn, wheat, barley, oats and rye are used.
  - c. Rice contains principally starch and proteids.
  - d. Corn--starch, fats and sugar.
  - e. Barley and wild rice have salts.

## 3. Food Value

Cereals supply starch for the giving of heat and energy to the body. They repair tissues. Enables body to grow. They are easily grown and not expensive in themselves. Manufactured cereal breakfast foods are, as a class, nutritive, convenient and reasonably economical.

## 4. Cookery

We cook cereals

1. To sterilize material.
2. To improve flavor, and appearance.
3. To produce such changes in structure that the digestive juices may act more readily upon the nutrients present.

## 5. Manufacture of so-called Breakfast Foods

Most cereals as a rule are simply husked and more or less crushed. The grains are first very carefully cleaned. The husks of grains such as barley and rice are very thoroughly removed. The husked grain is cooked for some time by steam and while still wet is run between rollers and pressed into thin flakes. After drying it is put on the market as rolled grains. The ready to eat brands are prepared in several ways. Some are cooked in water then dried and crushed, some are a mixture of grains, some have added common salt, malt and sugar molasses, and some caramel or other similar coloring matter. Those which look like dried crumbs are probably made into a dough, baked, crushed and browned. Corn is a native American cereal. The germ of corn is relatively large and rich in fat, which tends to become rancid in keeping and is therefore sometimes removed in preparing the more popular meals. In some sections the whole grain is called hominy and the partially crushed ones samp.

## 2. Practice



## Cream of Wheat with Figs

1/8 c cream of wheat

1 1/2 figs (3 dates)

3/4 c boiling H<sub>2</sub>O

1/16 tsp salt.

Cook figs in the water.

Add cream of wheat slowly to boiling salted water. Stir  
and let cook till thick. Will take about twenty minutes.  
Serve immediately with cream and sugar.

## Cost

Cream of wheat .0035

Figs .002

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 .0055

Cost per student .005



## Lesson 16.

## 1. Theory--Fruits

1. Composition
2. Cookery
3. Food Value in General

## 2. Practice

1. Apple Sauce
2. Blushing Apple with Whipped Cream

Cost per student \$.02



## Lesson 16.

### 1. Theory--Fruits

#### 1. Composition

- a. Water, 85 - 90 %.
- b. Proteid, 0.5 %.
- c. Fat, .50 %.
- d. Carbohydrates,  $5\frac{1}{2}$  -  $10\frac{1}{2}$  %.
- e. Cellulose,  $2\frac{1}{2}$  %.
- f. Minerals, 0.5 %.

As a general rule about one-half to three-quarters of the total carbohydrate in a fruit consists of sugar, the particular variety known as levulose. The amount of cellulose varies greatly in different fruits. It is lessened by cultivation. The mineral constituents of fruits are of considerable importance. They consist mainly of potash united with various vegetable acids such as tartaric (grape), citric (lemon), malic (apple).

#### 2. Cookery

Cooking renders most fruits more digestible by softening their cellulose and converts the gums into a gelatinous form.

#### 3. Food Value

Fruits contain chemical compounds which are laxative. Chiefly valuable for their acids, sugars, salts and water. They are refreshing, stimulating, and assist in purifying the blood. Bananas, dates and figs are most nutritious owing to their large amount of sugar. Melons, oranges and lemons and grapes contain largest amount of water. Apples, lemons and oranges contain valuable potash salts. Thoroughly ripe fruits should be freely indulged in, especially between meals. The water then moistens the contents of the intestines. When taken with a meal the water is quickly absorbed. Over ripe fruit has a number of bacteria lodging on it and should be avoided. Fruits are distinctly laxative.

### 2. Practice

#### Apple Sauce

Wash and pare one large apple, cut into eighths. Add one-eighth cup sugar and one-fourth cup water. Boil gently until tender.

#### Cost

|       |       |
|-------|-------|
| Apple | .01   |
| Sugar | .0034 |
|       | <hr/> |
|       | .0134 |

Cost per student .0067

#### Blushing Apple

- 1 tsp orange juice
- 1 red apple
- 1 tbs sugar
- 1/2 c water

Wash and core the apple. Place in small kettle. Add



sugar and water and boil until tender, turning as often as is necessary. When done lift water and carefully lift skin. Scrape off red portion of pulp from skin and apply to apple. Reduce water in which it was boiled to a syrup. Remove from fire. Add orange juice and pour over the apple. Serve cold with ~~w~~hipped cream.

## Cost

|                  |                     |
|------------------|---------------------|
| Orange juice     | .004 @ 30¢ per doz. |
| Apple            | .01                 |
| Sugar            | .0017 @ 6¢ per lb.  |
| Total            | <u>.0157</u>        |
| Cost per student | .01                 |



## Lesson 17.

## 1. Theory--Eggs

1. Classification
2. Composition
3. Structure

## 2. Practice--Experiments with Eggs to Determine

1. Solubility
2. Point of Coagulation
  - a. of yolk
  - b. of white
3. Action with Acids
4. Action with Alkalies



## Lesson 17.

## 1. Theory--Eggs

## 1. Classification

Proteid food--albumen is muscle-building food.

## 2. Composition

The egg, like milk, contains all ingredients necessary to support life and develop the organism.

Proteids

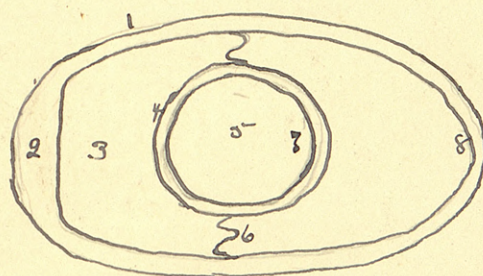
Fat

Mineral

Water

## 3. Structure

The egg consists of three parts: shell 11%, white 57%, yolk 32%.



1. Shell
2. Air space
3. Albumen
4. Yolk membrane
5. Yolk
6. Suspensory cords
7. Vitelline
8. Membrane lining

The shell composed of carbonate of lime is porous. The yolk contains most of the proteid, vitellin, fat and salts. It is the nucleus of the young animal. The white is composed principally of proteid, albumin, has some fat, mineral and a great deal of water. Heat will harden this albumin as will also the action of acids.

## 2. Practice--Experiments with Eggs to Determine

## Expt. 1. Solubility

Take a little egg white on saucer and cut up with a vegetable knife. Filter through a sieve in cold water. Note results.

## Expt. 2. Point of Coagulation

Repeat above and heat water containing egg. Test with thermometer. Try with both white and yolk.

## Expt. 3. Little egg white on saucer. Pour over it a little vinegar. Note results.

## Expt. 4. Repeat with solution of baking soda.



## Lesson 18.

## 1. Theory

1. Digestion of Proteid
2. Absorption
3. Digestion of Egg

## 2. Practice

1. Soft Cooked Eggs
2. Omelet

Cost per student \$.02



## Lesson 18.

## 1. Theory--Eggs

## 1. Digestion of Proteid

Mouth--no action.

Stomach--pepsin, an enzyme found in gastric juice.

Acts in the presence of hydrochloric acid, also in gastric juice upon albumin, such as in eggs, casein, albumins and globulins, as in milk, albumin and globulin, as in meat, and converts them into acid albumin--these into substances called proteoses and later peptones. In the small intestine trypsin acts on proteids in an alkaline media. It continues action of pepsin in forming proteoses and peptones until all the proteid has been changed.

## 2. Absorption

Absorption takes place from small intestine as peptones to the tissues. When proteid is oxidized it fulfills three purposes: that of tissue building, and heat and energy supplying. The waste products are  $\text{CO}_2$ ,  $\text{H}_2\text{O}$  and urea eliminated through the skin, lungs and kidneys.

## 3. Digestion of Egg

Egg albumin when eaten raw or almost raw is very well absorbed. If eggs are not directly absorbed from the intestine, they decompose, forming  $\text{H}_2\text{O}$  and ammonia, which produce indigestion. Eggs should not be cooked at very high temperature as the albumin is very indigestible.

## 2. Practice

## 1. Soft Cooked Eggs

1 egg

Put on in cold water, set at back of stove and let gradually come to boil. Serve immediately.

Cost

1 egg .013 at 16¢ per doz.

Cost per student .0065

## 2. Omelet

Group of two.

1 egg yolk

2 tbsps liquid

1/12 tsp salt

1/2 tsp butter

1 egg white

Beat yolk slightly, add liquid and salt. Beat white until stiff and dry. Melt butter in omelet pan. Fold yolk mixture into white and pour into omelet pan. Cook slowly until set and under portion delicate brown. Slip spatula under half of omelet next to handle of pan. Fold omelet and turn onto heated plate. Serve immediately.

Cost

Egg .013 at 16¢ per doz.

Butter .0032 at 32¢ per lb.

.0162

Cost per student .0162.



## Lesson 19.

## 1. Theory--Milk

1. Composition

2. Classification

## 2. Practice

1. Rennet Pudding

Cost per student \$.01





## Lesson 19.

## 1. Theory--Milk

## 1. Composition

Water--87 - 88 %.

Proteids--3 -  $3\frac{1}{2}$  %.

Sugar--4 - 5 %.

Fat-- $3\frac{1}{2}$  -  $4\frac{1}{2}$  %.

Mineral matters--7 %.

Milk is a complete food but not a perfect one. It contains the three nutritive constituents: proteid, carbohydrate, and fat, but not in the right proportion to make a perfect food. The principle proteid of milk is casein, though there is another (lact albumin) present in smaller quantities. The carbohydrate of milk is called milk sugar, or lactose, which is not a sweet substance. It is easily decomposed into lactic acid, souring the milk. The fat of milk is found in perfect emulsion, and is therefore easily digested. (1, 500,000 fat globules to one tiny drop of milk.) The fats are olein, palmatin and stearin. Minerals are abundant and are necessary for the young animals. Phosphate of potash, phosphate of lime, and citric acid are combined with lime, forming citrate of calcium.

## 2. Classification

Milk is classified as a proteid food.

## 2. Practice

## Rennet Pudding

1/8 rennen tablet.

1 tsbp sugar

1/2 c milk

1 tsp water

Dissolve Rennet tablet in 8 tsps water and use one tsp of the solution. Dissolve sugar in milk and heat milk to 37 degrees C. Add rennen solution, turn into wet mould and allow to remain undisturbed at room temperature until firm. Unmould and serve with cream and sugar.

## Cost

Cream .012

Milk .006

Sugar .0017

Rennen .0012

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.0209

Cost per student .01.



## Lesson 20.

## 1. Theory--Milk (continued)

1. Change in Cookery
2. Change Caused by Fermentation
3. Contamination and Care
4. Sterilization
5. Pasteurization
6. Digestion of Milk

## 2. Practice

1. General Rules for Custards
2. Steamed Caramel Custard

Cost per student \$.01.



## Lesson 20.

## 1. Theory--Milk (continued)

## 1. Change in cookery

High temperature hardens the albumin. Needs shower moderate temperature. Its digestibility is considerably lessened. The fat is less promptly absorbed than normally. The mineral salts are dissociated in some degree from their organic compounds.

## 2. Changes Caused by Fermentation

Lactic acid formed from lactose by action of bacteria.

## 3. Contamination and Care

## a. Source of supply

1. Unhealthy cow.
2. Workers about cow.
3. Utensils used.
4. Infective water.

1. Cow may have tuberculosis.
2. Infectious diseases may drop from workers clothes or breath.
3. Dirty utensils or that have been washed in infected water.
4. Polluted water. Milk should always be kept in sterile utensils and handled with greatest care.

## 4. Sterilization.

Simply heating to boiling point and letting it remain from 1 hr. to  $1\frac{1}{2}$  hrs. This gives it a peculiar taste. It lessens the digestibility of the proteid as it coagulates the casein. It destroys the ferments.

## 5. Pasteurization

Pasteurized milk is not as digestible as fresh milk, but very much better than sterilized. To pasteurize it it is necessary to heat it to 107 degrees. This kills harmful bacteria uniformly. It should remain at this temperature thirty minutes.

## 6. Digestion of milk

Digestion of milk is the same as that of proteid with the exception that rennin, an enzyme in the gastric juice, acts on milk to coagulate it, separating it into curd and whey. The curd contains the casein which is digested as all proteids are in stomach and intestine.

## 1. Practice

## General rules for custards

## 1. Principle

The principals in the cookery of eggs must be followed. 160 degrees F. is a very gentle temperature. Custards are mixtures of egg and milk, sweetened and flavored.

## 2. Methods

- a. Soft custard--in a double boiler.
- b. Baked custard.
- c. Fried custard.
- d. Frozen custard.



3. Utensils
  - a. Steamed custards--use a double boiler.
  - b. Baked--set in moulds in hot oven.
4. General rule for soft custard
  - a. 1 egg  
1 c milk  
2 tbspn sugar  
1/2 tspn flavoring
  - b. Method of combining  
Heat milk in double boiler. Be sure milk is sweet.  
Pour hot milk over the beaten egg and other ingredients mixed together.
  - c. Precaution
    1. If cooked too long, curdles.
    2. Stir constantly to keep smooth and avoid lumping.
    3. Do not mix much sugar with egg as it makes yellow threads through liquid.
    4. Do not beat the eggs too light.
    5. Pour hot milk over the egg to avoid lumping.
5. Tests when done
  - a. Steamed custard
    1. It will keep up on the spoon.
    2. The foam disappears.
    3. It coats on spoon.
    4. It thickens.
  - b. Baked custard
    1. Knife blade will come out clean.
    2. It puffs up on top.
6. Substitutes for eggs and how fewer may be added
  - a. Cornstarch flour with egg.
  - b. Gelatine with egg.
7. Kinds
  - a. Caramel custard.
  - b. Tapioca.
  - c. Chocolate. Cocoanut.
8. Used as a foundation for
  - a. Tapioco cream.
  - b. Basis of many ice creams and frozen custards.
  - c. Gelatin cream.
  - d. Custard with fruit.
  - e. Custard pies.
9. Serving
  - a. Soft custard
    1. By itself.
    2. As a sauce for
      - a. Snow pudding.
      - b. Orange sponge.
      - c. Jellies.
      - d. Rice in it.
    3. Custard with floating island.
    4. Custard in cups with white of egg and jelly.
    5. Poured over cake, fruit or jelly.
10. Remarks
  1. If curdles, beat with an egg beater or pour back and



- forth using two dishes.
2. When cooling stir occasionally to prevent coating forming.
  3. More mellow if flavored while hot, but more flavoring required.
  4. When used as a sauce have custard thin enough to pour.
  5. If served in cups is thicker.
  6. For a richer custard use more eggs in proportion to the milk. (6-8 to a quart)
  7. Usually allow two tbspn sugar to an egg.
  8. Yolks alone make a smoother custard.
  9. Whites of eggs may be used as a meringue or beaten separately and added to mixture.
  10. If yolks alone are used substitute two yolks for 1 egg. For white custard use two whites.
  11. Pour custard immediately from double boiler to avoid further cooking.

#### Steamed caramel custard

1/2 c scalded milk

1/2 egg

1-1/2 tbspn sugar

spk salt

5 drops vanilla

Caramelize 1 tbspn sugar and add to hot milk.

When caramel is dissolved, complete according to rule for steamed custard.

#### Cost

|       |              |         |      |
|-------|--------------|---------|------|
| milk  | .0125        | at 5 ¢  | qt.  |
| egg   | .0065        | at 16 ¢ | doz. |
| sugar | .0025        | at 6 ¢  | lb.  |
|       | <u>.0215</u> |         |      |

Cost per student .0107.



## Lesson 21.

## 1. Theory--Cheese

1. Composition
2. Manufacture
  - a. Kinds
3. Food Value
4. Digestibility
5. Bacteria Concerned in Cheese Making

## 2. Practice

1. Cheese Souffle
2. Cheese Pudding

Cost per student \$.04.



## Lesson 21.

## 1. Theory--Cheese

## 1. Composition

Proteid

Casein

Fats

Salts

Water

Cheese is a concentrated proteid food.

## 2. Manufacture

## 1. Kinds

Cream

Rockfort

Cottage

Limberger

Neufchatel

## 2. Coloring

Some cheese are highly colored by vegetable coloring matter.

## 3. Coagulation--by rennin for separating the curd from whey. Curds cut into cubes and whey drained off. It is pressed into moulds. Left to ripen.

## 3. Food Value

Cheese can replace meat or proteid. 1 pound of cheese is equal in nourishment to 2 pounds of meat.

## 4. Digestibility

Not easily digested. Proteid molecules are surrounded by fat. Constipation is often result of eating of cheese.

## 5. Bacteria concerned in cheese making

Certain kinds of bacteria are introduced into cheese to improve the flavor. May be contaminated by infected utensils or molds.

## 2. Practice

## Cheese pudding

2 thin slices of bread buttered.

1/3 c. grated cheese

1/8 tsp salt

1 egg

1/2 c milk

Butter a baking dish. Cut one slice of bread round to fit bottom of dish. Place in dish, add cheese, and cover with second round of bread. Mix egg, milk and salt and pour over the contents of the dish. Bake according to rule for baked custard, ~~brown~~ing top slightly. Serve hot.

## Cost

|        |                  |
|--------|------------------|
| Cheese | .005             |
| Bread  | .01 at 5¢ loaf.  |
| Salt   |                  |
| Egg    | .013 at 16¢ doz. |
| Milk   | .012 at 5¢ qt.   |
| Butter | .001 at 32¢ lb.  |
|        | <hr/>            |
|        | .041             |



Cost per student .02

Cheese souffle

1/4 c milk  
1 tbsp flour  
1 tbsp butter  
1 egg yolk  
1/8 tsp salt  
1/4 c grated cheese  
1 egg white

Make milk, butter, flour and salt into white sauce. Add cheese and stir until melted. Cool slightly and add yolk of egg. Beat the white until stiff and dry and fold into the mixture. Turn into a buttered dish. Set in pan of water. Bake in slow oven until souffle is firm, when pressed with teaspoon. Serve as soon as removed from oven.

Cost

|        |                   |
|--------|-------------------|
| Milk   | .006 at 5¢ quart. |
| Flour  | .005              |
| Butter | .01 at 32¢ lb.    |
| Egg    | .013 at 16¢ doz.  |
| Cheese | .0045 at 16¢ doz. |
|        | <u>.0385</u>      |

Cost per student .019



## Lesson 22.

## 1. Theory--Meats

## 1. Beef

1. Composition

2. Structure of Muscle Fiber

3. Effects of Heat

4. Methods of Cooking

5. Digestion

## 2. Practice

1. Pot Roast (demonstration)

2. Pan Broiled Steak

Cost per student \$.04.



## Lesson 22.

## 1. Theory--Meats

## 1. Beef

## 1. Composition

Water  
 Proteid in muscle fiber  
 Connective tissue  
 Fat  
 Ash  
 Extractives

## 2. Structure of Meat Fiber

Muscle tissue made up of a number of small fibers bound together by connective tissue. Each of these fibers are made up of bundles of little fibers. These fibers are hollow in center. In the tube we find water, mineral matter, proteid, extractives. The proteid is called myosin.

## 3. Effects of Heat

Causes connective tissue to swell and tend to push juice out of muscle fibers. Dry heat hardens connective tissue, develops flavor, makes meat more digestible, kills bacteria and parasites, removes some of fat, diminishes the amount of water.

## 4. Methods of Cooking

1. Boiling--plunging meat into boiling water, allowing it to boil vigorously for 5 minutes. Finish cooking at a lower temperature. This retains juices.
2. Stewing--putting meat into cold water and allowing it to come to boiling point, using as small amount of water as possible and cooking for a long time. It draws out the juices.
3. Braising is steaming meat in its own juices in the oven.
4. Frying is plunging meat into hot fat.
5. Steaming is cooking meat by steam on top of stove.
6. Broiling is cooking meat over or in front of clear fire.
7. Roasting is cooking meat before or in front of a clear fire with a reflector to concentrate heat.
8. Baking or oven roasting is baking in oven

## 5. Digestion

In mouth fibers swell up and become softened. Color changes to grayish yellow. In stomach fibers fall apart and it becomes a pulp. Pepsin in the presence of HCl and trypsin in the presence of an alkali act upon proteid in the meat and change it to peptones.

In intestines

Steapsin in the presence of an alkali acts upon fat.



## 2. Practice

## Pot Roast

Choose a small compact piece of beef. Wipe with a clean damp cloth. Sear all surfaces. Plunge into boiling water and boil rapidly 5 minutes. Choose a kettle to fit roast and avoid an excess of water. Add 1 tsp salt for each pound of meat. Draw to the back of the range and cook slowly until done. At least 30 minutes to the pound and 30 minutes to the pot. During the latter process have the kettle uncovered until all water is evaporated. Brown the meat in the kettle.

Cost

Meat \$ .24

## Pan Broiled Steak

Remove from steak all bone, fat and cartilage. Oil a smoking hot frying pan with a small portion of beef fat. Place the steak in pan and thoroughly sear on under side. Sear on reverse side. After both sides are seared turn every ten seconds until cooked. Lift onto a hot platter, sprinkle with salt, and serve with or without parsley butter. Avoid puncturing with a fork while cooking.

Cost

Steak \$ .15

Cost per student .037.



## Lesson 23.

## 1. Theory--Meats (continued)

1. Cuts of Meat

2. Selection

## 2. Practice

1. Baked Hamburg

2. Croquettes

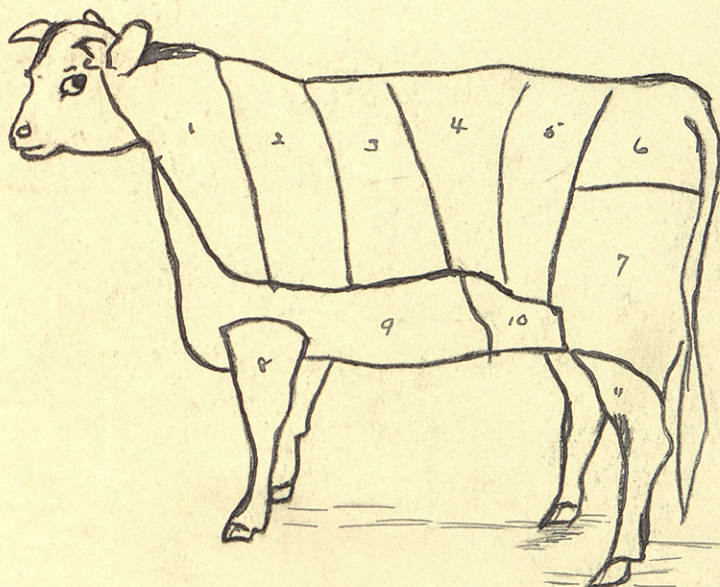
Cost per student \$.02.



## Lesson 23.

### 1. Theory--Meats (continued)

#### 1. Cuts of Beef



1. Neck
2. Chuck
3. Prime of ribs
4. Porter House
5. Sirloin
6. Rump
7. Round
8. Skin
9. Plate
10. Flank
11. Shank

#### 2. Selection

1. Lean meat is firm, elastic. When first cut it is purplish red. Surface becomes bright moist red when exposed to air. More tender cuts are fine grained and are well streaked with fat.

#### 2. Fat Meat

Floppy, dark or coarse beef without fat is poor. Good beef fat is white. Meat is toughest just after killing and it is improved by standing. Flesh of young animals is more tender and digestible than older animals. Shorter the fiber the more digestible piece of beef.

#### 2. Practice

Eight people.

#### Hamburg Steak

- 1 lb. beef
- 1 egg
- 1 tsp salt
- 1 tsp onion juice

Grind the meat with a food cutter, beat the egg slightly, add egg, salt and onion juice to meat, mix thoroughly. Shape into small cakes and pan broil.

#### Cost

|             |                 |
|-------------|-----------------|
| Beef        | .10 at 10¢ lb.  |
| Egg         | .013 at 16¢ lb. |
| Onion juice | .0002           |
|             | <u>.1132</u>    |

Cost per student .0141.



## Croquettes      Six people.

1 c 4-1 white sauce

 $1\frac{1}{2}$  c cold cooked ground meat loosely measured

1 egg

1 c dry bread crumbs

Add the meat to hot white sauce. Spread in a dish and cool. When cold shape as desired. Crumb egg and crumb again. Fry in deep fat and drain on absorbent crumpled paper. Serve hot with or without sauce. Egg should be beaten slightly and 1 tbsp of milk or  $H_2O$  may be added.

## Cost

White sauce 1-4      .005

Egg      .013

Dry bread crumbs      .003

Meat      .06 at 12¢ lb.

.081

Cost per student .013.



## Lesson 24.

## 1. Theory--Fish

1. Classification
2. Sources
3. Composition
4. Digestibility
5. Nutritive Value

## 2. Practice

1. Fish Turbans
2. Creamed Oysters in Crustades

Cost per student \$.07



## Lesson 24.

## 1. Theory--Fish

## 1. Classification

Proteid food.

## 2. Sources

## a. Fresh water

Cat fish, trout, carp, salmon, buffalo.

## b. Salt water

Cod, herring, mackeral, bluefish.

## 3. Composition

Proteid in form of albumins or albuminoids. Fat varies in dark and white-fleshed fish. More in dark, small percent in white.

Mineral salts.

Water.

## 4. Digestibility

Dark-fleshed fish on account of much oil in tissues are harder to digest.

## 5. Nutritive Value

Excellent food to replace meat in diet. Relieves kidneys as there is no waste as in meat to be thrown off by them. It equals beef in nourishment because it is more easily digested.

## 2. Practice

## Fish Turbans

1/4 lb. white fish or carp.

1 slice bacon

Cut fish in strips and roll. Fasten with skewer. Place the slice of bacon on top. Salt and place.



## Lesson 25.

## 1. Theory--Legumes

1. Classification
2. Composition
3. Food Value
4. Kinds

## 2. Practice

1. Boston Brown Bread
2. Canned Peas in Timbols



## Lesson 25.

## 1. Theory--Legumes

## 1. Classification

Legumes are proteid food.

## 2. Composition

Starch, cellulose, water, mineral matter, proteid.

Proteid is called legumin. It is an easily digested proteid. Legumes are general in lacking fat; exception, peanuts.

## 3. Food Value

They contain more nourishment than any other vegetable.

Build tissue as they contain proteid.

Dry are used as concentrated food.

Cheap source of proteid food.

## 4. Kinds

Green peas.

Shelled beans.

Lima beans and others.

Lentils.

Peanuts.

## 2. Practice

## 1. Boston Brown Bread



## Lesson 26.

## 1. Theory

1. Written review on Proteid.

## 2. Practice

1. General Rules for Pastry

2. Apple Pie

Cost per student \$.02.



## Lesson 26.

## 1. Theory

1. Written review on proteid.

## 2. Practice

## 1. General rules for pastry

1. Measure butter and flour and chill.
2. Add salt to flour and cut butter into flour with knives.
3. Use just enough water to make the particles of the mixture adhere together.
4. Turn on to unfloured board and work together with knives.
5. Roll very thin, handling as little as possible.

## Plain pastry

1/2 c flour

3 tbsp butter

spk salt

Ice water to moisten

Follow general directions

## 2. Apple Pie

Wash, pare and slice into thin slices tart, easily cooked apples. Cover pie tin with pastry. Arrange sliced apples smoothly in a pan. Sprinkle liberally with sugar and lightly with cinnamon. Add small pieces of butter. Make perforations in upper crust. Moisten edge of under crust.



## Lesson 27.

## 1. Theory--Tea and Coffee

1. Source
2. Manufacture
3. Kinds
4. Food Value

## 2. Practice

1. Boiled Coffee
2. Percolated Coffee
3. Tea  
Infusion

Cost per student \$.012.



## Lesson 27.

## 1. Theory--Tea and Coffee

## 1. Source of Tea

Tea is made from the leaves of a shrub.

## 2. Manufacture

The quality of tea depends upon its size when picked, the smallest being the best. After picking, the leaves are rolled at once or left to ferment for 24 hours. They are then dried in the sun or by a gentle artificial heat then are rolled.

## 3. Kinds

Black tea is that which has been allowed to ferment before rolling. The best black tea comes from India and Ceylon. There are many varieties of Black tea

Olong--most expensive.

Ceylon--English breakfast.

Pekoe--fine.

Green tea made from unfermented leaves and sometimes artificially colored.

Gunpowder tea.

Japan tea, generally green.

## 4. Food Value

Tea not a substitute for food. It is a mild stimulant if used in moderation. The tannin, which is brought out by cooking the tea, interferes with digestion as it hardens the albumin and hurts the coating of the stomach.

## Coffee

## 1. Source

From seed of the fruit of coffee tree. The different kinds of seed--flat and round--make different coffees.

## 2. Manufacture

The berries grow in a pod from which they must be shelled and the pulp taken from them. The different sizes of berries are separated by sifting through a screen. The berries after scouring are ready for roasting, which develops the flavor and odor. It is then ground, put in jars, and sealed.

## 3. Kinds

Mocha and Java coffees are best made.

## 4. Food Value

Same as tea. More stimulating than tea and is due to the caffeine. Used moderately it is a good thing but too much causes insomnia and nervous troubles.

## 2. Practice

## Boiled Coffee

1/4 c coffee finely ground

1/4 egg

5/8 c cold water

2 c boiling water.

Mix coffee, egg and 2 c cold water. Boil 3 minutes, add



water and allow to boil up once. Draw to the back of range. Add 1/2 c cold water to stand 1 minute to settle. Decant into a heated coffee pot.

Cost

Coffee .02 at 35¢ lb.

Egg .003

.023

Cost per pupil .01.

Tea

1 tsp tea

1 c water

Bring water just to boiling point. Add tea and allow to stand 3 minutes without boiling. Strain tea into hot cup and serve.

Cost

Tea .002 at 60¢ lb.



## Lesson 28.

## 1. Theory--Leavening Agents

1. Definition
2. Object of Raising Food
3. Varieties
  1. Air
  2. Water

## 2. Practice

1. Popovers
2. Clean Closets

Cost per student \$.016



## Lesson 28.

## 1. Theory--Leavening Agents

## 1. Definition

Leavening is the process of raising food, making it porous and baking it so as to retain its porosity.

## 2. Object of raising food.

To make it much more easily digestible. Reduces mechanical work of stomach.

## 3. Varieties

## 1. Air

## 2. Water

## 3. Soda with an acid.

a. Soda with molasses.

b. Soda with cream of tartar.

c. Soda with sour milk.

## 4. Baking powders.

## 1. Air

Air is used to make food light and porous.

Example--popovers, sponge cakes, meringues or kisses, or other foods where white of egg is used.

Air is beaten in the white of egg and held.

## 2. Water

Heat expands air and water and causes water to form steam. This of course expands the dough which rises.

## 2. Practice

## Popovers

1/2 c flour

1/2 c milk

1/2 egg

1/8 tsp salt

2 tsp butter

Beat the egg thoroughly. Add gradually while beating the milk and flour with which the salt has been sifted.

Put 1/2 tsp butter in each hot muffin pan. Fill the pans half full with the batter and bake in a moderate hot oven 30 minutes. Serve immediately.

## Cost

Flour .00025

Milk .014

Egg .006

Butter .013

.03325

Cost per student \$.016.



## Lesson 29.

## 1. Theory--Leavening Agents (continued)

## 1. Soda

## 1. Source

## 2. Action with Acids

## 2. Batters and Doughs

## 2. Practice

## 1. Ginger Bread

Cost per student \$.013



## Lesson 29.

## 1. Theory--Leavening Agents (continued)

## 1. Soda

## 1. Source

Soda is made from sodium chloride and common salt by a chemical process of treating it with ammonia gas and carbon dioxide gas.

## 2. Action with acids

Soda is an alkali. Lemon juice, sour milk, molasses, vinegar contain acids. When added to soda they cause it to effervesce forming a gas, carbon dioxide. The mixture, if now tasted, will not taste acid nor of soda. This takes place in batters. It is called neutralization. The giving off of  $\text{CO}_2$  ends when mixture is heated,

Proportions for proper neutralization

1 pt thick sour milk

1 tsp soda

## 2. Batters and Doughs

Proportions for different batters

## 1. Thin or pour batters

Equal amounts of dry and liquid--Example, popovers.

## 2. Drop batter

1 liquid to 2 parts dry--Example, muffins.

## 3. Soft dough

1 liquid to 2-2/3 parts dry--Example, cake.

## 4. Stiff dough

1 liquid to 3 1/2 to 4 parts dry--Example, bread.

## 2. Practice

## 1. Ginger bread

2 tbsp butter

1/4 c sugar

1/2 egg

1/4 c molasses

1/8 tsp cinnamon

1/4 c sour milk

1/8 c flour

3/8 tsp soda

1/2 tsp ginger

1/8 tsp salt

Sift flour, salt, spice and soda together. Mix the ingredients in order given and combine with flour mixture. Bake in a moderate oven 30 minutes

Cost

Butter .013

Sugar .0065

Egg .0065

Cinnamon .00023



|                  |               |
|------------------|---------------|
| Milk             | .0007         |
| Soda             | .0003         |
| Ginger           | <u>.00021</u> |
|                  | .02744        |
| Cost per student | .013          |



## Lesson 30.

## 1. Theory

## a. Yeast

1. Definition
2. Structure
3. Conditions Necessary for Growth

## b. Baking Powders

1. Composition
2. Reaction
3. Adulterations

## 2. Practice

1. Make Yeast
2. Baking Powder Biscuits

Cost per student \$.02



## Lesson 30.

## 1. Theory

## a. Yeast

## 1. Definition

Yeasts are natural agents which produce fermentation. They are microscopic plants which multiply by budding.

## 2. Structure

The yeast cell is a microscopic oval one called "body". They are composed of protoplasm which contains granules. Exists in three states.

## 1. Resting state.

2. Growing state. Yeast placed with proper food will grow and multiply by process known as budding. Upon the sides of yeast plant appear small buds. This little bud increases until it is as large as original plant then it separates and begins to form buds. Under adverse conditions yeasts produce a different reproductive body known as a spore. They are capable of resisting for a long time adverse conditions. Are very light and distributed by winds.

## 3. Conditions necessary for growth

1. Warmth, about 65 - 68 degrees is best state for yeast.

2. Moisture

3. Food--yeast requires some starch and sugar to produce CO<sub>2</sub> form. Also nitrogen that it may reproduce.

## b. Baking Powders

## 1. Composition

a. Soda (corborate)

b. Acids (cream of tartar)

c. Filling--consists of fine starch, cornstarch, arrow-root, etc. It is necessary to combine the soda and cream of tartar.

## 2. Reaction

The soda and cream of tartar act upon each other aided by heat and moisture and form CO<sub>2</sub> and Rochelle salts. This latter is a laxative salt, similar to those found in Epsom salts. There is usually enough moisture in a batter to start the action. The gas is formed and fills the dough with bubbles and makes it rise. As the gas expands and the bubbles stretch and become thin. At this stage the mixture should be put into oven where the heat sets the mixture and imprisons the gas. Baking powder is generally used in the proportion of 1-2 tsp to 1 c flour.

3. Baking powder is often adulterated with starch and alum so that an unwholesome sediment is left as a residue in the mixture.



## 2. Practice

## Yeast

1 medium sized potato  
 1 tbspn sugar  
 1 c rapidly boiling water  
 3/4 tspn salt  
 1/4 dry yeast cake

While water boils rapidly grate potato into water. Boil until clear like laundry starch. Stir sugar and salt in while hot. Cool to lukewarm, then add yeast cake which has been soaked in lukewarm water. Allow to ferment in stone jar 24 hours. Place in cool dark place. Will keep about two weeks and last cup may be used in place of yeast cake in making a new supply.

## Cost

Yeast .005 at 2 ¢ cake.  
 Potato .004  
 Sugar .0016 at 6¢ lb.  
 Cost per student .01.

## Baking Powder Biscuit

1/2 c flour  
 1 tbspn butter  
 2 tsp baking powder  
 spk salt

Milk to make into soft dough

Sift flour, baking powder, and salt together. Cut in the butter with a knife and add milk. The dough should be as soft as can be handled without sticking. Roll and cut quickly. Bake in a hot oven.

## Variations

## Twin Biscuits

Cut two circles of biscuits about 1/2 in. thick. Butter the top of one and place the other one on top of that.

## Cost

|               |        |
|---------------|--------|
| Flour         | .00025 |
| Butter        | .0065  |
| Baking powder | .008   |
| Milk          | .0062  |
|               | <hr/>  |
|               | .02095 |

Cost per student .0104.



## Lesson 31.

## 1. Theory--Wheat and Flour

1. Source of Wheat
2. Structure of Wheat Grain
3. Flour
  1. Average Composition
  2. Varieties
  3. Milling

## 2. Practice

1. Experiment for Gluten and Starch in Flour



## Lesson 31.

### 1. Theory--Wheat and Flour

#### 1. Source

The wheat plant belongs to the family of grasses.

#### 2. Structure of Wheat Grain

If a grain of wheat be cut into thin slices and examined under a microscope it will be found to consist of the following parts

- a. Bran--an outer envelope composed mainly of cellulose which also contains mineral matter. It contains the coloring matter  $13\frac{1}{2}\%$ .
- b. Endosperm or Kernel. This consists of two large masses of nutritive material, starch and gluten, for the use of the embryo. It makes up 85% of the grain.
- c. Germ or Embryo. This is simply the young plant. It contains fat, mineral matter and proteid. It makes up about  $1\frac{1}{2}\%$  of the whole grain. Endosperm used mostly in flour. Other layers found in German breads, graham and whole wheat flours.

#### 3. Flour

##### a. The average composition of flour is

|                    |       |
|--------------------|-------|
| Water              | 14.5% |
| Nitrogenous matter | 11.0% |
| Fat                | 1.2%  |
| Starch & sugar     | 69.0% |
| Cellulose          | 2.6%  |
| Mineral matter     | 1.7%  |

##### b. Varieties

- a. Patent flours--the best flour that can be milled. It is used for fancy breads and pastry for it has a larger proportion of starch than is wanted for bread flour.
- b. Bread flours are mixtures from a blend of different wheats called "seconds". A blend is used because wheats differ in composition, some being rich in gluten and poor in water (strong wheats), while others are more starchy and contain more moisture.
- c. Baker's flour which contains the poorer flour--that mixed with bran and flour from breads. Contains a great deal of starch, not much gluten.
- d. Low grade flour--all shipped out of this country. It is the leavings from bakers' flour ground once or twice again.

##### c. Milling

###### 1. Cleaning

1. Process of removing chaff, etc. by means of sets of suction and wire sieves.
2. Blending of wheat (different varieties of hard wheat).
3. Cleaned by magnets of iron, steel, etc.
4. Scoured twice (horny layer of bran removed and collected by dust collector.)



5. Tempered--2 lbs. of water to 1 bu. wheat (4 hrs. to temper).

6. Third scouring (chaff removed by suction).

7. Steam may be added.

## 2. Breaking of flour

### 1. First break

1st break stock or tailings.

1st break chop or (middlings--break flour).

Wheat passes through corrugated rollers. Stock and chop pass through scalper of wire screen. Chops are sifted through screen. Stocks pass on to second break.

2. After third break middlings are purified bran, removed middlings purified by suction and screens.

3. Germ removed. Germ middling passed through smooth rollers and germ flattened out. Sifted to separate germ from endosperm.

4. Purified middlings are ground between smooth rollers five times to make patent flour. Bolted after each grinding to separate flour from coarser particles of middlings.

5. Left over middlings from 5th grinding are ground two or three times to make Bakers' flour. Bolted after each grinding from Bakers' flour are ground to make Low Grade flour (always exported).

6. Break flour added to Bakers' flour.

3. Bleached by electrified air

4. End products are bran and shorts

## 2. Practice

### Experiment 1

Put some flour in the middle of a rag. Twist ends together and wash in water to remove starch. When no more starch will press out, open cloth and notice the mass left. Notice its tenacity. Gluten gives to bread this quality so that it will expand evenly. Good bread flours have an equal proportion of starch and gluten.



## Lesson 32.

## 1. Theory--Bread

1. Digestibility
2. Mixing
3. Object of Kneading
4. Baking Rules
5. Cooling and Care of Loaves

## 2. Practice

1. White bread

Cost per student \$.03.



## Lesson 32.

## 1. Theory--Bread

## 1. Digestibility

White bread is easily digested if twenty-four hours old. New bread having more moisture forms a pasty mass which is not so readily penetrated by digestive juices.

## 2. Mixing

There are two methods

## a. Sponge

Take all liquid materials and stir in enough flour to make mixture consisting of drop batter. This is allowed to ferment for some time, then remaining flour added and kneaded, after which follows general directions.

## b. Stiff dough

By this method the ingredients are all mixed together and all the flour is added as the dough is kneaded. Then this is allowed to rise till twice its bulk, then cut down and after again rising is shaped into loaves and put into pans.

## 3. Object of kneading

The dough is kneaded the first time to distribute evenly the little yeast plants and other ingredients. To give body to the dough and bring out the elasticity of the gluten and to make the mixture smooth. The second kneading is to break up the large cavities caused by gas bubbles, and to make the texture uniform and fine. The time of kneading depends upon the quantity of flour and shortening that is to be incorporated into the dough. The stiffer and richer the dough longer time required to make it smooth. The second kneading should be only of such length as is needed to put the dough into the proper shape for baking.

## 4. Baking Rules

Bread is baked

1. To kill ferment.
2. To make soluble the starch.
3. To drive off the carbon dioxide.
4. To form a brown crust of pleasant flavor.
5. Bread should be baked in a hot oven. If oven be too hot the crust will brown quickly before the heat has reached the center and prevent further rising. The loaf should continue rising for the first 15 minutes of baking, then it should begin to brown and continue browning for the next 20 minutes. The last 15 minutes it should finish baking when the heat may be reduced.

Tests when done

When bread is done it will not cling to sides of pan and may be easily removed. It has peculiar hollow sound when tapped.

Biscuits require a hotter oven

5 minutes to rise.

8 minutes to brown.



Bread may be brushed over with melted butter, milk or water, three minutes before taking from ovens. This makes crust more tender.

Test for oven

Put 1 tsp flour in a pan. If oven browns it in five minutes the heat is right to put bread in.

#### 5. Cooling and care of loaves

Remove loaves at once from pans. Place side down on a wire bread rack. If a crisp crust is desired allow to cool without covering. Keep in a covered tin box or stone jar. Never wrap with a cloth as it will absorb moisture and transmit an unpleasant taste to bread.

#### 2. Practice

White bread Cost \$.03

1/4 c yeast

1 tbspn sugar

1 tsp salt

1 c scalded milk

1 tbspn shortening

Add butter, salt and sugar to milk while hot. Cool to lukewarm and add yeast. Stir in a small quantity of flour until dough can be lifted out with spoon leaving dish perfectly clean. Put on to a floured board and knead in a little flour at a time until loaf is spongy and elastic. Place in a double boiler and cover tightly, let rise over night, cut down in the morning before half-past seven. Shape into loaf on unfloured board about noon. Place in a buttered bread pan. Be sure to work into corners of pan and have loaf free from creases and even across top. Let rise until double its bulk. Bake in oven at 400 degrees F. Cool right side up on a wire rack. Keep in tin bread box. Never wrap in box or paper. Always bake in individual pans.



## Lesson 33.

## 1. Theory--Bread (continued)

1. Tests for Good Bread

2. Standard Loaf

3. Faulty Loaf

## 2. Practice

1. Whole wheat Bread

Cost \$.03 per student



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Lesson 33.

1. Theory--Bread (continued)

1. Tests for good bread

It should not be clammy, moist or compact to touch, should be elastic both on pressing loaf and crumb. Crumb should not make a doughy mass when pressed. No streaks, but be all one color. Fine and regular grain. Sweet nutty flavor.

2. Standard loaf

1. Shape--regular.
2. Size--9 x 4 x 4, depending on size of pans.
3. Crust--crisp, not dry,  $\frac{1}{4}$  in. deep on all sides. Color golden brown.
4. Crumb--creamy white.
5. Grain--fine and regular.
6. Texture--friable and easily broken, should not pull or stretch.
7. Flavor--sweet nutty.

3. Faulty bread

1. Bad flour.

- a. Wheat mouldy in stack or bin.
- b. Flour stored in mouldy place.
- c. Adulteration by cheaper flours.

2. Yeast

- a. Weak.
- b. Containing foreign micro-organisms.

3. Manipulation

- a. Mixing
- b. Kneading  
Quantity  
Manner
- c. Unclean utensils
- d. Temperature
- e. Length of fermentation.
- f. Bacteria in liquid

4. Baking

- a. Temperature  
Too hot or too cold
- b. Time
- c. Size of loaf

5. Cooling

- a. Leaving in tins
- b. Cooling in direct draft

6. Care

- a. Keeping in unsuitable place

2. Practice

1. Whole wheat bread

Recipe same as for white bread, only use  $\frac{1}{2}$  whole wheat flour instead of all white flour.



## Lesson 34.

## 1. Theory--Freezing Mixtures

1. Rules for Freezing

2. Kinds

3. Food Value

## 2. Practice

1. Philadelphia Icecream

2. Orange Sherbet



## Lesson 34.

## 1. Theory--Freezing Mixtures

## 1. Rules for freezing

- a. Adjust freezer and see that all parts match and run well.
- b. Wash and scald can and dasher.
- c. Crush ice a small uniform size.
- d. Pack freezer, three parts ice to one part salt in layers.
- e. Turn occasionally during packing. Constantly if cream is in can. A layer of ice should be last layer to prevent salt from working into can.
- f. For Philadelphia ice-cream chill then turn very rapidly at first.
- g. The gain of ice-cream depends upon amount of salt used. More salt makes it coarse. The ice should come as high as cream. Fill can  $\frac{2}{3}$  full only. Overcrowding the can will make it coarse.
- h. Do not pour off salt water until freezing is done.
- i. To pack  
After freezing is done draw off all water. Repack with ice and salt, using four parts ice to one part salt. Put a stopper in the hole of the can from which dasher should have been removed and cream packed down. Cover the top with new papers or a cloth. Do not pack sherbets (or acids) in a tin.

## 2. Kinds

## a. Creams

1. Plain or Philadelphia cream.
2. Custard cream--Example, caramel custard cream.
  - a. Thickening with eggs.
  - b. Thickening with cornstarch.
  - c. Thickening with gelatine.

## b. Ices

Sherbets are water ices with white of egg, and sometimes gelatine.

Granite is water ice frozen, with a great deal of salt.

Frappe is a half-frozen ice or sherbet using equal parts of ice and salt.

## 3. Food value

Ice-creams, on account of the cream used, are valuable as a good. These frozen dishes are valuable in illness, especially fevers, because they are cooling and distribute heat. They retard digestion and fats are hardened by them so that one should not use fats with ices.

## 2. Practice

1. Philadelphia Ice-cream.



## 2. Orange Sherbet

1/3 c orange juice

1/2 tspn lemon juice

1/3 c cold water

4 tspn syrup

1 egg white beaten stiff

Combine orange and lemon juice with the syrup and water. Strain and partially freeze. Add egg white beaten and complete freezing.

## Cost

Orange juice .0125

Lemon juice .005

Sugar .0064 at 6¢ lb.

Egg .0065

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 .0304

Cost per student .015.



## Lesson 35.

## 1. Theory

## 1. Serving

Rules for serving and arranging table

## 2. Practice

## 1. Cream of Asparagus Soup

## 2. Crisp Crackers

Cost per student \$.02



## Lesson 35.

## 1. Theory--Serving

## 1. Rules for serving and arranging table

## b. Setting of tables for informal meals

Place the knife with the blade turned in at the right, the fork with the tines turned up at the left, from eight to ten inches apart and one inch from edge of table. Place the glass at the right point of the knife, the napkin at the left of the fork. Have the covers exactly opposite. Table cloths should be changed at least twice a week and napkins every day.

## Breakfast

Place the sugar-bowl and spoon-holder in front of the hostess. The cups and saucers in a semicircle at her left, the handles pointing toward the hostess, cream pitcher at left. Cereal dishes in front of host. If fruit is served, a plate is put at each cover with fruit on it. Fruit spoon or knife is placed at the right of the breakfast knife. The cereal spoon is placed at the right of other spoons. A table spoon for serving cereal and the silver needed for serving meat course are placed in front and a little to right of cover.

## c. Luncheon and Dinner

Place the soup spoon at the right of knife and the soup ladle at the right and a little in front of the host cover. If a sauce or dish requiring a teaspoon is served, the teaspoon is placed by the dish and directly on a line with it. Sugar bowls and spoon holders are placed before hostess. The silver and china for desert are placed on the side-board.

a. Size of the table should be according to number of guests, each person to have twenty to thirty inches, at least. Silence cloth of knitted or flannel is first put on table. Serves two purposes: to deaden sound and to protect table. Table cloth also chosen to fit table--should have about nine inches drop on every side. The creases should be lengthwise of table. The silver and china for one person is called a cover. It depends upon menu and taste of individual if all silver be put on table. For a long dinner in which many courses are served and that require much silver, it would over-crowd table to put it all on at once, so silver is brought in with each course. At an informal dinner it is all right to have it all on at once.

## Serving

Place and remove everything at the right of persons served. Exceptions--(1) Do not reach in front of



a person, rather remove from left, (2) Pass all things from left. In bringing or removing silver or small articles use a tray. Fill the glasses three-fourths full. Crumb the cloth just before desert using a plate and napkin, beginning with the hostess and working to right. Place warmed plates in front of the one who serves. Then the platter and utensils for serving. If a fork is used in serving, place it at the left and a little in front of cover. In removing the course, remove the platter and food dishes then the plate and silver from each cover, beginning with the hostess and passing to the right. Never pile dishes but place them on the tray side by side. Work quietly. Hostess always served first, then served to right.

#### Suggestions and reminders

Wait for signal from hostess before taking seat at table. Spread napkin with only one fold in it. Never leave a spoon standing in a cup. When not in use place knife and fork across one side of plate, never resting on plate with handle on table. Break bread and muffins into small pieces, never cut or bite. Dip away from self when dipping, and take it from side of spoon. Do not cut salad with knife but break it with fork. Keep elbows down. Make no noise with the lips or mouth and keep the lips closed when chewing. Never come to table late without an apology to hostess. Never leave the table unless serving without asking to be excused. Never start to rise from table unless hostess does. Do not fold your napkin unless hostess folds hers. Need not be folded unless guest will remain for more than the one meal.

## 2. Practice

Cream of asparagus soup

1/4 c finely cut asparagus

1/4 c cold water

1/4 tsp salt

1/2 c white sauce 1-1

Cook asparagus in cold water at a gentle simmer. Drain and strain through puree strainer into white sauce. Serve immediately.

Cost

Asparagus .006

White sauce .011

.017

Cost per student .01

Crisp crackers

2 small crackers

1 tsp butter

Butter crackers and brown in hot oven.



|                  |              |
|------------------|--------------|
| Cost             |              |
| Crackers         | .003         |
| Butter           | <u>.0065</u> |
|                  | .0095        |
| Cost per student | .0095        |



## Lesson 36.

## 1. Theory--Cakes

1. Methods for Mixtures

2. Rules for Baking Cake

## 2. Practice

1. White Cake with Caramel Frosting

Cost per student \$.18



## Lesson 36.

## 1. Theory--Cakes

## 1. Rules for mixing cake

1. Have a good fire.
2. Get out utensils. Oil and rub pans with melted butter, covering bottom and ends with clean paper cut to fit and oil the paper.

## To mix butter cakes

1. Use a wooden spoon.
2. Cream butter carefully then add sugar, gradually creaming all the while.
3. Add yolks of eggs and beat well, then the flavoring.
4. Pour milk in but do not stir. Sift in the flour and baking powder which have been well mixed then beat well.
5. Fold in carefully the egg whites which have been beaten dry.
6. Turn into center of pan and tip until corners are filled.

## 2. General rules for baking cake

When baking cake the time should be divided into four periods as follows, and watched carefully:

1. The cake should begin to rise but no sign of browning.
2. There should be little browned spots and it should be well risen. This is the critical stage when cake is most liable to fall.
3. Cake should be brown all over the top.
4. Cake should shrink from edge of pan and rebound when pressed on top.

Test for correct heat of oven

White paper should be turned brown in five minutes.

## 2. Practice

White cake with caramel frosting