

## Milk and Dairy Food Lecture

### I. What is milk?

- A. 87% water
- B. 13% solids { fat and fat-soluble vitamins it contains and the solids not fat, include carbohydrates, protein, water-soluble vitamins and minerals.
- C. **Our most nearly perfect food.**
- D. No other single food can substitute for milk in diet and give a person the same nutrients that you get from a glass of milk.
- E. Adults                    2 cups}  
Teenagers                4 cups}                per day  
Children                    3 cups}

### II. Nutrients

- A. Protein - body building and repair
- B. Carbohydrates - energy and warmth
- C. Fats - energy and warmth, carries fat-soluble vitamins ADEK
- D. Vitamins - Growth, prevents diseases
  - 1. Vitamin D - bones and teeth, prevents rickets
  - 2. Vitamin A - aids growth, prevents night blindness
  - 3. Riboflavin (Vitamin B2) - regulates production of energy from dietary fat, carbohydrates and protein.
- E. Minerals - strong bones and teeth, body regulation
  - 1. Calcium - bones and teeth, prevents osteoporosis
  - 2. Phosphorus - bones and teeth

### III. Shopping pointers

- A. Product name
- B. Pasteurized
- C. Homogenized
- D. Ingredients, if any are added
- E. Pull date - date on container, indicates that the milk should stay fresh 5 - 7 days after the date stamped on carton

### IV. Storage tips

- A. Pick up as one of the last items in store
- B. **Refrigerate** as soon as possible
- C. Use milk in order of purchase from individual refrigerators at home (Put freshest milk in the back and use the oldest first)
- D. Chill UHT milk before serving. Refrigerate after opened.
- E. Dry milk should be refrigerated after reconstituted
- F. Do not pour unused milk back into original container
- G. Close container so milk will not absorb flavors
- H. Canned milk - store in cool, dry place; rotate and turn cans upside down in storage every few months.

- I. Store dry milk in a cool, dry place. Humidity causes milk to lump and may change color and flavor - throw out.
- J. Freezing milk changes consistency and not nutritional value. Refrigerate to thaw.

## V. Processing of milk

- A. Pasteurization - is the process of heating raw milk to at least 145° and holding continuously for at least 30 minutes or to at least 161° and holding for at least 15 seconds in approved and properly operated equipment. The milk is then cooled promptly to 45° or lower. Milk's keeping quality is improved, but nutrient value is not significantly changed.
- B. Homogenization - is the process of breaking up milkfat into smaller globules which disperses them permanently in a fine emulsion throughout milk. This done in a homogenizer where milk is forced under high pressure through very tiny openings. Nothing is added or removed. Homogenization results in the formation of a softer curd during digestion.
- C. Fortified - is the addition of one or more vitamin (s), minerals (s) or proteins (s) not naturally present in a food. The term, fortified, also applies when added nutrients include one or more naturally present in the food.
- D. Ultra-pasteurization - is the process of heating raw milk for two to four seconds at 275 to 300 °, then aseptically packaging it to stay fresh from 60 to 90 days. The product should be kept under refrigeration. After opening it will hold only as long as any other milk.

## VI. Forms of Milk

- A. Raw milk - fresh, unpasteurized milk straight from the cow.
- B. Whole milk - contains not less than 3.25% milkfat. It must contain not less than 8.25% solids-not-fat. Almost all whole milk marketed is also fortified with vitamin D.
- C. Lowfat milk - has had sufficient milkfat removed to bring the levels between 0.5 and 2%. It also contains at least 8.25% solids-not-fat. It must contain 2000 IU of vitamin A per quart. Vitamin A is added to offset its loss caused by removal of some of the milkfat. You can find milk in this category labeled:
  - 1. lowfat
  - 2. 2 % milk
  - 3. 1% milk
- D. Skim milk - also called nonfat milk, has had sufficient milkfat removed to bring the level to less than 0.5%. It must contain not less than 8.25% solids-not-fat and must be fortified with vitamin A.
- E. Chocolate milk - is made by adding chocolate or cocoa and sweetener to 2% milk. It must be fortified with Vitamin A and addition of vitamin D is optional.

- F. Eggnog - is a mixture of milk, eggs, sugar and cream. It may also contain added flavorings such as rum extract, nutmeg or vanilla. It's a seasonal product most readily available during the holidays.
- G. Nonfat dry milk - is the product obtained by removal of water only from pasteurized skim milk.
- H. Buttermilk - is made by adding a special bacterial culture to milk to produce the desirable acidity, body, flavor and aroma characteristic of this product.
- I. Evaporated milk - is a canned whole milk concentrate, prepared by evaporating enough water, under vacuum, from fresh whole milk to reduce the volume by half. This concentrate is then homogenized, fortified with vitamin D, packed in cans, sealed and sterilized by heat.
- J. Sweetened condensed milk - is a canned whole milk concentrate, prepared by evaporating enough water, under vacuum, from fresh whole milk to reduce the volume by half. It is pasteurized and sugar added to prevent spoilage.
- K. Whipping cream - is the fat of whole milk. *Heavy cream* contains a minimum of 36 percent fat, while *light whipping cream* contains 30 to 36 percent fat.
- L. Half-and-half - a blend of milk and cream has 10 to 12 percent fat.
- M. Sour cream - with 18 percent fat, is cream that has been soured by lactic-acid bacteria.
- N. Yogurt - is a milk product with a custardlike consistency. It is made by fermenting partially skimmed milk with special acid-forming bacteria.

## VII. Grades of Milk

- A. Grade A - has the lowest bacterial count and is the grade sold in retail stores.
- B. Grade B - safe and wholesome.
- C. Grade C - safe and wholesome.
  1. The grade does not indicate its richness, but applies only to its degree of sanitation.

## VIII. Uses of milk

- A. Beverage - it requires no preparation other than chilling. It can be served hot or cold with meals, as snacks, and as party foods.
- B. Milk as an ingredient - Milk contributes to the nutritive value, flavor, texture, consistency, and browning quality of food products. Milk in all forms can be used as an ingredient in a variety of recipes.

## IX. Principles of Milk Cookery

- A. Prevent film or scum formation
  1. Using a covered container
  2. Stirring the milk during heating

3. Beating the mixture with a rotary beater to form a layer of foam on the surface
- B. Prevent boiling over
1. The formation of the film on the boiled milk is the principal reason for the boiling over of milk. A pressure develops under the scum which forces the milk to break through the film and boil over the sides of the pan.
- C. Prevent scorching of milk
1. When milk is heated, some of its protein tends to settle out (coagulate) on the sides and bottom of the pan and can scorch easily unless the milk is heated on a very low heat.
  2. Stirring the milk while it heats helps to thin out the film.
  3. Use a double boiler to avoid scorching.
- D. Prevent curdling of milk
1. When acid is added to milk, the protein settles out in white clumps, or curds, and separates from the whey causing curdling. (Example: acids in tomatoes can cause milk protein to separate as in tomato soup)
  2. Thicken with starch either the milk or the food to be added to the milk. (Example: tomato soup - thicken milk with flour and then add the tomato, or thicken the tomato and then add the milk)
  3. Cook at a low temperature
  4. Use very fresh milk (Milk with a high acid content will curdle when heated; acids can develop from improper storage)

#### **X. Milk Substitutes**

- A. Cheese, ice cream, can replace part of milk in diet - but at added cost and they have more calories
- B. Cheese and cottage cheese - larger containers cost less
- C. Yogurt and ice cream - cost as much as three times a glass of milk

#### **XI. Stretching the Milk Dollar**

- A. Buy milk larger than quart size
- B. Buy quantity containers
- C. Home delivery cost more
- D. Use evaporated milk in cooking
- E. Nonfat dry milk in cooking and as a beverage

#### **XII. Reducing fat content in recipes calling for mil products**

- A. Use skim or 2% milk for whole milk
- B. Use yogurt for mayonnaise

#### **XIII. Sauces**

- A. Flavored liquids that have been thickened.
- B. Thickeners:
  - 1. flour
  - 2. cornstarch
  - 3. tapioca
  - 4. eggs
  - 5. vegetables
- C. Most thickeners cannot be added by themselves to hot food. They will cook into lumps.
  - 1. Add small amount to another food (sugar or cold liquid)
  - 2. Cook over low heat
  - 3. Don't overcook (may lose thickening power)
- D. White Sauce
  - 1. By varying its thickness and flavor, the sauce can be used for a variety of things.
  - 2. The secret to making a smooth white sauce is using the right amount of flour and in the proper blending of the butter and flour. Measure accurately and mix quickly.
    - a. thin - vegetable
    - b. medium - cheese sauce, casseroles, soups, gravy
    - c. thick - croquettes

E. Recipe:

	<b>Medium</b>	<b>Thin</b>	<b>Thick</b>
butter	2 Tbs.	1 Tbs.	3 Tbs.
flour	2 Tbs.	1 Tbs.	4 Tbs.
salt	¼ tsp.	¼ tsp.	¼ tsp.
pepper	dash	dash	dash
milk	1 cup	1 cup	1 cup