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Say Cheese!

Food Safety Basics

There are four major pathogens associated with fresh cheese. Any of these can cause foodborne illness. They are: Salmonella, E. coli, Listeria monocytogenes, and Staphylococcus aureus. These pathogenic bacteria are controlled by good sanitation of equipment and food contact surfaces, proper cooking, cooling and handling of cheese curds during processing, and proper hand washing.

Wash Hands Frequently

- Personal cleanliness is a must. Wash your hands thoroughly and frequently. *E. Coli* resides in the human nose and intestines. Wash your hands if you rub your nose, or if you wipe your face or skin.
- Bandage any cuts or burns on hands before handling food or use disposable gloves.

Essential Tools/Equipment

1. Large stock pot, generally 6 to 8 quarts. The pot should be stainless steel or unchipped enamel. Avoid pots made of aluminum or other reactive metals.
2. Thermometer, digital or a candy thermometer. Make sure the thermometer goes low enough for your recipe as some candy thermometers start at 200°F.
3. Measuring spoons and cups, stainless steel, glass or plastic.
4. Long–handled spoon and slotted spoon. You need a spoon for stirring as well as a spoon to remove the curds from the whey. They can be stainless steel, plastic or nylon. However, stainless steel is the easiest to clean.
5. Large bowl for catching drained whey.
6. Cheese cloth, butter muslin or flour sack towel to drain the curds.
7. Colander or strainer made from any non-reactive material (plastic, metal, enamel). As with other utensils, avoid aluminum or other reactive material, even when lined with cheesecloth.

Clean and sterilize all equipment before and after cheese making. Most home cheese making failures are caused by unclean or unsterile equipment. When finished with a utensil, rinse it thoroughly with cold water. Then wash it in hot water with a good dishwashing detergent. Rinse thoroughly in hot water.

Sanitization

You must sterilize your equipment before use.

1. Boil all cheese-making equipment for 5 minutes or soak all cheese-making equipment in a bleach water solution for 2 minutes.
2. Reuse cheese cloth, butter muslin or flour sack towel **only** if they have been sanitized.

Bleach Water Solution:

- 1 gallon of water
- 2 tablespoons household unscented bleach

Cleaning and Reusing Cheesecloth or Butter Muslin

How to Reuse Cheesecloth or Butter Muslin:

1. Rinse immediately after use.
2. Wash in the washing machine or by hand in the sink.
3. Avoid detergents and fabric softeners. Use only mild detergent if necessary, and rinse thoroughly to remove any soap residue.
4. If there are bits of curd sticking to the cloth, rinse with whey or white vinegar to help remove it.
5. For sterilization, boil the cheesecloth or butter muslin for about 5 minutes or soak it in the Bleach Water Solution. If soaking in bleach solution, rinse thoroughly before hanging it out to dry.
6. As soon as the cheesecloth or butter muslin is dry, fold and store in a zipper-style plastic bag until ready to use again.

Milk

Milk is a complicated substance. Seven-eighths of it is water. The rest is proteins, minerals, milk sugar (lactose), milk fat, vitamins and trace elements. As a result, variation in the quality of cheese does occur, depending on the type of milk used. When we make cheese, we cause the protein part of the milk to curdle. Cheese can be made from whole milk, 2%, 1%, skim milk or reconstituted milk powder. Whatever type of milk is used, it should always be pasteurized. The fresher the milk, the better the cheese.

- Raw milk is that which is collected from a dairy animal and not processed further. **It may contain harmful bacteria**. **Raw milk should be pasteurized before it is used in the production of soft cheese.**
- Pasteurized milk is milk that has been heated to destroy all pathogens. Commercially produced milk, purchased in the store, has been pasteurized.
- UT (Ultra-Pasteurized) or UHT (Ultra High Temperature) pasteurized milk is milk that has been heated to 191° to 212°F and 280°F respectively to kill bacteria and extend shelf life. Avoid using this milk as this process changes the protein structure of the milk, preventing it from separating into curds and whey.
- Homogenized milk is milk that has been subjected to a process that breaks up the fat globules so that they will no longer separate from the milk. Most milk purchased at the store has been homogenized. You can use homogenized milk to make cheese.
- Whole milk is pasteurized milk with 3.25% fat (by weight)
- Skim milk is milk that has had some, or all, of its fat removed.
- Milk Powder can be reconstituted and used in cheese making.

Pasteurization

Pasteurization destroys most disease producing organisms and limits fermentation in milk, beer and other liquids by partial or complete sterilization. The pasteurization process heats milk to 161°F for 15 seconds, inactivating or killing organisms that grow rapidly in milk. Pasteurization does not destroy organisms that grow slowly or produce spores. While pasteurization destroys many microorganisms in milk, improper handling after pasteurization can re-contaminate milk. Raw milk can also be pasteurized on the stovetop. *Microwaving raw milk is not an effective means of pasteurization because of uneven heat distribution.*

Cheese Salt

Cheese salt is merely a salt that is non-iodized. Iodized salt harms and inhibits bacterial growth and well-being that is essential to any good cheese-making. **You can use any non-iodized salt in cheese-making.** Salt is important in a number of cheese-making steps: it adds to the flavor of the cheese, it helps to dry the curds during draining and it will help to kill bacteria and other harmful growth when used as a brine.

Recipes

No-rennet Queso Blanco (Latin American White Cheese)

Heat-acid or no-rennet Queso Blanco is a white, semi-hard cheese made without culture or rennet. It is eaten fresh and may be flavored with peppers, herbs and spices. It is considered a "frying cheese" meaning it does not melt and may be deep fried or grilled.

Ingredients:

4.6 fl oz (137 ml) vinegar (5% acidity)
9.2 fl oz (274 ml) distilled water
1 gallon pasteurized milk
1 teaspoon cheese salt
Spices to taste

Equipment:

Liquid measuring cup
Measuring spoons
6 to 8 quart stainless steel pot (for milk)
6 to 8 quart stainless steel pot (for boiling water)
Slotted spoon
Colander or strainer
1 large bowls, 4 to 6-quart size
Butter muslin, flour sack towel or cheese cloth
Boilable bag
Extra spoon
Thermometer
Timer

Queso Blanco Instructions:

1. Heat milk to 176°F (80°C) over a period of 20 minutes.
2. Add vinegar (5% acidity) to water and then add slowly to the hot milk until the whey is semi-clear and the curd particles begin to mat together and become slightly stretchy. You should be able to stretch a piece of curd about 0.39 inches (1 cm) before it breaks. It may not be necessary to add all of the vinegar.
3. Separate the curd by filtering through a cloth bag until free whey is removed.
4. Work in salt and spices to taste.
5. Press the curd (high pressure is not required).
6. Package curd in boilable bags (vacuum package if possible) and place in boiling water for 5 minutes to sterilize the surface and prevent mold growth.

Queso Blanco may keep for several weeks if properly packed and stored in a refrigerator, but should be eaten in as fresh a state as possible.

Source: New Mexico State University, Cooperative Extension Service. Guide E-216

Mozzarella Cheese

Yield: ¾ Pound

Ingredients:

1 gallon milk (not ultra-pasteurized)
1 ½ teaspoons citric acid
1 teaspoon cheese salt (optional) (Salt substitutes and/or herbs can be used as an alternative.)
1 ¼ cup cool water (chlorine free), divided
¼ rennet tablet or ¼ teaspoon liquid rennet

Equipment:

2 small bowls
Liquid measuring cup
Measuring spoons
6 to 8 quart stainless steel pot (for milk)
Slotted spoon
Sharp knife
Colander or strainer
2 large bowls, 4 to 6-quart size
Butter muslin, flour sack towel or cheese cloth
Heat resistant, food safe, rubber gloves
Timer
Thermometer
Ice for ice water bath

Mozzarella Cheese Instructions:

1. Dissolve tablet/liquid rennet in ¼ cup of cool, chlorine-free water. Stir; set aside.
2. Mix citric acid into 1 cup cool, chlorine-free water. Ensure the citric acid is fully dissolved.
3. Pour the citric acid solution into the large pot and add 1 gallon of milk, stir gently. Some curdling will take place because the milk is now quite acidic.
4. Heat milk slowly to 90°F while stirring. Use thermometer to check temperature.
5. Take pot off burner, add rennet solution while stirring slowly top to bottom (folding) for approximately 30 seconds.
6. Cover pot with lid and leave undisturbed for 5 minutes.
7. Check the curd. It should look like custard, with a clear separation between the curd (white mass) and the whey (greenish liquid). If the curd is too soft or the whey is milky, let sit for a few more minutes.
8. Cut the curds in a 1-inch checkerboard pattern with a long knife.
9. Place the pot back on the stove and heat to 105°F while stirring SLOWLY and GENTLY! Use a thermometer to check temperature.
10. Take off the burner and continue slowly stirring for 2-5 minutes. (More time will make firmer cheese)
11. Using a slotted spoon, scoop the curd from the pot into the colander set in a large bowl. Allow the whey to drain into the bowl. Add ¾-1 teaspoon salt (or to taste) to the curd. The salt will work into the cheese in the following steps.

12. Fold the curd over on itself as it drains to increase the amount of whey running off. The more you work the curd at this point the drier the mozzarella will be. Rest the colander with the curd in a third of the whey in a bowl to keep the curd warm.
13. Stretching the curds: Pour two-thirds of the whey back into the large pot, place it on the stove and heat to 175°F. The whey simmering on the stove at 170°F to 175°F is used to heat the curd so it is malleable enough to stretch. This is very hot, so use the slotted spoon (or heat resistant gloves) to dip the curd in the whey.
14. Take about a third of the curd and place it on the spoon and dip it into the hot whey. Work the curd by pressing together and folding over. Place back in the whey to keep hot. Keeping the curd in a thin, rectangular shape will help facilitate even heating. It will begin to get sticky. As the curd begins to meld together, pull it from the hot whey and begin to stretch it. If the curd does not stretch, check and adjust the whey temperature and re-immerse the curd. At first it may be a bit lumpy. As the curd is stretched, it will become quite smooth.
15. Stretch it out several times and fold it back on itself and repeat. If it begins to cool too much, (you will notice it begin to tear), place it back in the hot whey to reheat. When it seems to form a consolidated mass and develop a sheen (it looks like taffy), pull it all back into a ball for your final cheese. The more you work the cheese, the firmer it will be.
16. Drop cheese balls into ice water to cool.
17. To store: Place it in an airtight container or wrap in plastic wrap and refrigerate. Use this cheese within one week or freeze for up to one month. If your cheese is too soft to shred for pizza, place it in the freezer, then shred when it's partly frozen.
    Recipe adapted from: University of Alaska, Fairbanks Extension, Making Fresh Mozzarella, publication FNH-00063