

# *Aged Cheese*

*as taught by Hildegardis filia Vulframni*



*Cheeses with Almonds and Cracknels painted by Clara Peeters circa 1630*

## ***History***

Cheese is one of the earliest foods known to man. Archeologists confirmed the Sumerians made reference to cheese in clay tablets dating back to 4000 B.C. In the Old Testament, David was delivering cheese to the soldiers in Saul's camp when he had his run-in with Goliath. The Greeks had a "cheese god" in the form of Aristaios, son of Apollo, and the Greek historian Xenophon wrote about a goat cheese that had been known for centuries in Peleponnesus. The Romans got hold of cheese making and added their own touches, such as adding herbs, spices and smoking.

There are many forms of aged cheese, from soft bries to hard edams and parmesans. The harder the cheese, the more portability it has. This class is going to teach you the process to make a cheese that falls somewhere in the middle as far as hardness is concerned. We will be making a Farmhouse Cheddar.

The following pages will list the ingredients and equipment needed to make aged cheese. Much of the equipment you may already have in your kitchen. All of the other supplies you can order online or scrounge from other sources.

## ***Equipment:***

***Cheese Cave:*** This needs to be a temperature controlled, out of the way area. I use a small refrigerator that Mistress Cas gave me to use for this purpose.

***Cheesecloth:*** Not the stuff you can buy in the grocery store. You need a tighter weave than that. I like to use flat baby diapers. They are still available at Walmart in the baby department, on a bottom shelf, out of the way. I like these because they already have finished edges and are reusable. You can also purchase cheesecloth at the fabric store and finish the edges yourself.

***Cheese boards:*** When the cheese has been dried, it is useful to have something on which the cheese will age. A cheese board is simply a 6 inch square piece of hardwood. Avoid oak or cherry as the tannins will affect the flavor and safety of your cheese.

***Cheese Mats:*** When the cheese has been formed and pressed, you need to dry it. That's where the cheese mat comes in. A cheese mat is made of reed or food grade plastic. Bamboo sushi mats are perfect substitutes for cheese mats. You may also use those plastic mats that are sold in the craft department.

***Cheese Wax:*** This wax creates a protective coating on the cheese to prevent the cheese from drying out during prolonged aging. More pliable than plain paraffin wax and is reusable. I purchase mine from New England Cheesemaking Supply.

**Colander:** Any kind will do as long as it is big enough to hold the curd mass.

**Curd Knife:** Anything with a blade long enough to reach the bottom of your pot of curd. Until recently, I used a large kitchen knife. I purchased a 12 inch cake decorating spatula with a plastic handle for easier use and cleaning.

**Dairy Thermometer:** You need a thermometer that has a temperature range between 0 and 220°. Candy thermometers do not have a low enough range for cheese making. You will need a couple of these, one for the milk and one for the water bath.

**Drip Tray:** This is a tray to put under the press or cheese mold to keep the whey from draining all over your counter. It also helps protect the wood surface of your cheese press from moisture while the cheese is being pressed.

**Measuring Cup and Spoons:** Glass or stainless steel tools are best because you need to keep things sterile.

**Molds and Followers:** Molds come in a variety of shapes and sizes. They contain the curd during pressing and determines the final shape of your cheese. Molds need to be made from stainless steel or food grade plastic. They can be purchased from a cheese making supply house, or you can make your own from items you already have. Large thoroughly cleaned sour cream containers are a good size for beginning hard cheese makers. You just need to drill holes all over the container from the inside out so the whey can escape during pressing. A follower is a flat piece of wood or plastic that fits snugly into the mold, to keep the cheese level on top and maintain an even pressure during pressing.

**Notebook:** Record keeping is one of the most important parts of cheese making. When things go wrong, or when they go right, you want to know exactly what you did to produce those results. Later in this handout, there is a page you can copy or use as a template to build your own page.

**Perforated Ladle:** Used for even distribution of the rennet and for moving the curds from the colander to the mold.

**Pots:** Stainless steel, glass, or unchipped enamel. Large enough to hold the amount of milk in your recipe. I also use another, larger pot to hold my pot of milk as a kind of double boiler to heat the milk gently. The outside pot should be large enough to hold the inner pot with at least 1 inch of space around all sides to accommodate warm water.

**Press:** There are many kinds of cheese presses. They all have the ability to be easily assembled and cleaned easily and the ability for you to know the amount of pressure exerted on the curd in the mold. My cheese presses are home made and cost a trip to the hardware store, a pleading look at my husband, and about \$25.

**Wax brush:** Used for brushing wax onto a finished cheese. Cheese wax gets very hot, so it needs to have natural bristles. Nylon ones will melt on contact. I have not tried a silicone brush in the wax.

**Wax Pot:** This can be any type of pot that you can set on top of a pot of boiling water. Wax needs to be quite hot to work on the cheese, but you don't want to put it over direct heat. It can easily burst into flames. Whatever you decide to use, know that it will need to be dedicated to only wax melting from then on. The wax is very hard to clean out completely. I just use the bowl I melt in to also store the wax.

**Care and cleaning of equipment:** Sterility is the most important part of cheese making. Most cheese failures are caused by unclean or unsterile conditions when the cheese is being made. Clean is not the same as sterilized. Clean could still have bacteria present and that does not make good cheese.

Before beginning to make your cheese, clean and sterilize your equipment. Make sure you rinse your metal and plastic equipment with hot water. Then sterilize by one of the following methods:

Immerse in boiling water for five minutes.

Steam equipment for five minutes in a large pot of boiling water.

Soak in solution of 2 TBS bleach to 2 gallons water for five minutes. Make sure you rinse well after using bleach. It will interfere with the rennet.

Soak in solution of 2 tsp iodine to 2 gallons of water for five minutes. Make sure you rinse well after using iodine. It will interfere with the rennet.

Wood parts need to be scrubbed and air dried between uses. Plastic pieces should be dipped into a solution of bleach and water and allowed to air dry. Wipe down all surfaces with the bleach solution also and allow to air dry. Place all pieces on a clean towel to air dry.

## ***Ingredients***

***Milk:*** Your milk can come from any source. Cows, goats, sheep, water buffalo, camels, horses, and mammal's produce will do. The only stipulation is that the animal should be healthy and clean. There are many sources of milk: Grocery Stores, Dairies, your own animals. Milk comes in many forms also: Raw, Cream Line, Pasteurized, Ultra Pasteurized, Homogenized, Whole, Skim, Dry, Soy, and butter to name a few. I use store bought whole milk. I do not have an economical source for raw milk and the store bought seems to do just fine for me.

If you use raw milk, you do need to pasteurize it if you are not sure the milk is disease free. You do this by heating it to 145° and holding it that temperature for 30 minutes. You then need to rapidly cool it to 40° to prevent unwanted bacterial growth.

Some store bought milk is Ultra Pasteurized. This means it was heated to 191° for at least 1 second and then rapidly cooled. This kills everything in the milk and makes it shelf stable for longer periods. This is great for big milk manufacturing companies, but bad for home cheese makers because it destroys the milk proteins and makes the milk unusable for cheese making. If milk has been Ultra Pasteurized, it should be prominently labeled as such and you should not buy it if you are purchasing milk to make cheese.

***Rennet:*** Rennet is an enzyme produced by baby ruminant animals. It allows the milk they consume to remain in their stomachs longer to give them more nutrition from their food. Traditionally, rennet for cheese making was obtained by taking the fourth stomach of a less than six month old animal, removing and reserving the milk contained therein, cleaning the stomach, replacing the milk and allowing the stomach to dry. When it was cheese making time, a thumbnail size piece of the stomach contents was put into the cheese vat. There are also vegetable rennets. Some plants with coagulating qualities are: Fig tree bark, Lady's bedstraw, and butterwort.

In our modern times, all the work of obtaining the rennet has been done for us and we can purchase ready made rennet tablets or liquid from a cheese supply company. I prefer animal rennet liquid as I feel it makes a firmer curd. Junket rennet, available in most grocery stores' Jell-o isles is a weak form of rennet. It is meant to be used for jelling desserts. Some people have been able to get it to work for cheese making, but I am not one of them.

**Water:** You would think that water is water right? Cheese making does not get along with chlorine. I use bottled or filtered water for the small amounts needed for diluting the rennet and other additions.

**Starter Bacteria:** There are two main varieties of starter bacteria: Mesophilic and Thermophilic. Meso starter is for making low temperature cheeses, thermo is for higher temperature cheeses. The starter bacteria are what raises the acid level of the milk and allows the rennet to do its job. They also help impart flavor to the cheese.

**Coloring Agents:** The main coloring agent for cheese is from the annatto plant. Most aged cheeses have a slightly yellow hue. This is provided by the carotene in the milk. Grass fed cows produce more carotene than silage fed cows. Goats milk does not contain carotene, which is why goat cheese is so white. People eat with their eyes, and expect certain things from their cheese. If you feel your cheese should be orange, then by all means, add more annatto coloring. This is available in liquid form from cheese supply companies.

**Salt:** Salt is essential in cheese making. It enhances flavor and helps preserve the cheese. You should use non-iodized, fine grain salt in cheese making. Kosher salt crystals are way too big, and salt with iodine will impart a metallic flavor.

**Calcium Chloride:** This is a salt solution that is added to heat treated milk. Heat damages the calcium in milk and reduces the milk's clotting abilities. Adding calcium chloride to store bought cow's milk will greatly improve the quality of the curd. Goats milk is naturally homogenized and the calcium chloride helps increase its clotting abilities. This will last indefinitely on a shelf. Available from cheese supply shops or chemical supply stores.

Notes:

## The Process

1. Heating the milk. Don't just put the milk in a pot, crank the heat to high and expect to get good cheese. Place your milk in a pot that is big enough to allow you to stir without sloshing over the sides. Place this pot inside another, larger pot partially filled with heated water. This will allow the milk to gently come up to temperature.



2. Mix in Additives. If you are adding things like annatto coloring or calcium chloride, this is when you would add it, diluted with a little unchlorinated water.

3. Add the starter. Open your packet of starter culture and sprinkle it over the surface of the heated milk. Gently stir in an up and down motion to distribute evenly. Cover and allow to sit to "ripen" as long as the recipe advises.



4. Add the rennet. If using vegetable rennet tablets, allow a portion of a rennet tablet to dissolve in a quarter cup of unchlorinated water for 30 minutes while the milk is ripening. Or, dilute the specified amount of liquid rennet in a quarter cup of unchlorinated water and add it to the heated milk by slowly pouring it over your perforated ladle. Gently stir in an up and down motion for 1 minute to distribute the rennet well. Cover and allow to sit undisturbed for 45 minutes to one hour.

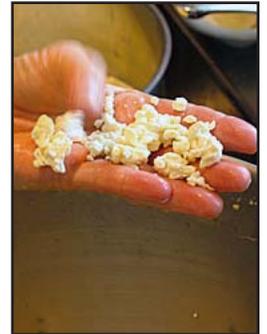
5. Check for "clean break". Insert your clean finger into the milk at a 45° angle. Slowly lift your finger straight up. If the milk has set correctly, it should crack along the length of your finger and there should be clear liquid apparent on your finger. If this has not happened yet, let the milk set for fifteen more minutes and try again.





6. Cut the curd. Once you have achieved a “clean break”, use your cheese knife to cut the curd into the proper size chunks for your recipe. Start by cutting vertically in slices and then by cutting horizontally in slices, holding the knife straight up and down. Then go back and cut along the original vertical cuts holding the knife at a 45° angle. Do the same with the horizontal cuts.

7. Cook the curd. Slowly raise the temperature of the curd while stirring gently. This helps the curd expel more whey. After about half an hour, take a handful of curds and wad them together. Now rub your thumb across the ball of curds. If it breaks apart easily, you are ready to drain, If not, continue cooking and try the wad test again in a few minutes.



8. Drain the curd. Place a piece of cheesecloth across a colander and drain the curds into it. Tie the corners together and allow to drain in a warm place for about an hour.

9. Mill and salt the curd. Place the drained curds in a bowl and break up into appropriate size chunks for the recipe. Add the salt. Don't forget the salt! Without the salt, your cheese will taste like rubber.



10. Mold the cheese. Place the curd in a cheesecloth lined mold. Neatly fold excess cheesecloth over top of cheese. Place follower on top of cheese. Place cheese in cheese press.



11.. Press cheese. Set pressure on cheese and follow recipe for turning and re-wrapping.

12. Air drying. Remove cheese from press and unwrap from cheesecloth. Place on a clean cheese mat and/or board and allow to dry. Turn the cheese several time a day to dry evenly. This can take up to a week depending on ambient humidity and temperature.



13. Waxing the cheese. Place your dried cheese in the freezer. This will help the wax to adhere better. Melt the cheese wax. Remove cheese from freezer and holding tightly, carefully dip the top half in the wax. Count to twenty, turn the cheese 180° and dip the unwaxed side into the wax. Count to 60 and redip the first side. Count to 90 and dip the remaining side again.

14. Label the cheese. Take a small piece of paper and write the kind of cheese, the date of the waxing and any other information you may want to track, place it on the cheese and paint a thin layer of wax over it. This will ensure that the cheese will always be labeled during the aging process.



15. Aging the cheese. Place the cheese in your cheese “cave” and allow to age. Turn the cheese periodically.

# Farmhouse Cheddar

Recipe from Ricki Carroll's Book "Home Cheese Making"

2 Gallons whole milk	½ tsp liquid rennet (or ½ rennet tablet)
½ tsp calcium chloride (optional)	1 TBSP cheese salt
1 packet mesophillic starter	Cheese wax

1. Heat the milk to 90°F. (If you are using goat's milk, heat to 85°F.) Add calcium chloride if using. Add the starter and stir thoroughly. Cover and allow the milk to ripen for 45 minutes.
2. Add the diluted rennet and stir gently with an up-and-down motion for 1 minute. If you are using farm-fresh cow's milk, top-stir for 1 minute with the flat underside of the ladle no more than ½ inch deep to blend the butterfat that rises to the surface. Cover and let set at 90°F (85°F for goat's milk) for 45 minutes, or until the curd gives a clean break.
3. Cut the curd into ½ inch cubes.
4. Place the pot in a sink full of hot water and slowly heat the curds to 100°F, increasing the temperature by no more than two degrees every 5 minutes. This will take about 30 minutes. Stir gently to keep the curds from matting. The curds will shrink noticeably in size as the heating continues and you stir gently. The yellowish whey will grow in quantity as the curds shrink.
5. Cover the container and let the curds set for 5 minutes. Pour the curds into a cheesecloth-lined colander. Tie the corners of the cheesecloth into a knot and hang the bag in a convenient spot to drain for 1 hour. Do not hang in a drafty spot — the curds need to stay relatively warm.
6. Place the drained curds in a bowl and break them up gently with your fingers into walnut-sized pieces. Mix in the salt.
7. Firmly pack the curds into a 2-pound mold lined with cheesecloth, then neatly fold the cheesecloth over the top. Apply 10 pounds of pressure for 10 minutes.
8. Remove the cheese from the mold and gently peel away the cheesecloth. Turn over the cheese, re-dress it, and press at 20 pounds of pressure for 10 minutes.
9. Repeat the process but press at 50 pounds of pressure for 12 hours.
10. Remove the cheese from the mold and carefully peel away the cheesecloth. Air-dry the cheese at room temperature on a wooden board until a nice rind has developed and the surface is quite dry. This can take 2-4 days, depending on the weather. Turn the cheese several times a day so moisture will not collect on the bottom.
11. Wax the cheese.
12. Age the cheese for at least 1 month.

Yield: 2 pounds

# Cheese Record Form

**Type of Cheese** \_\_\_\_\_ **Date Made** \_\_\_\_\_ **Type of Milk** \_\_\_\_\_ **Amount of Milk** \_\_\_\_\_

## 1. Ripening

Type of starter \_\_\_\_\_

Amount of starter \_\_\_\_\_

Time starter added \_\_\_\_\_

Milk temp at starter addition \_\_\_\_\_

## 8. Pressing the Curd

Time at start \_\_\_\_\_

Pressure at start \_\_\_\_\_

Pressure at end \_\_\_\_\_

Date at end \_\_\_\_\_

## 2. Renneting

Type of rennet \_\_\_\_\_

Amount of rennet \_\_\_\_\_

Time added \_\_\_\_\_

Milk temp at addition \_\_\_\_\_

## 9. Air drying

Date started \_\_\_\_\_

Date finished \_\_\_\_\_

## 3. Cutting the Curd

Size of curd \_\_\_\_\_

Time curd was cut \_\_\_\_\_

## 10. Waxing

Date waxed \_\_\_\_\_

## 4. Cooking the Curd

Time of cooking curd \_\_\_\_\_

Temp at start of cooking \_\_\_\_\_

Temp at finish of cooking \_\_\_\_\_

## 11. Aging

Temp during aging \_\_\_\_\_

Humidity during aging \_\_\_\_\_

## 5. Draining the Curd

Time draining started \_\_\_\_\_

Time draining ended \_\_\_\_\_

## 12. Eating

Date of first bite \_\_\_\_\_

## 6. Milling the Curd

Time of Milling \_\_\_\_\_

Size of curd \_\_\_\_\_

## 7. Salting the Curd

Amount of salt added \_\_\_\_\_

Type of herb added \_\_\_\_\_

Amount of herb added \_\_\_\_\_

Notes: \_\_\_\_\_

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# Cheese Record Form

**Type of Cheese** \_\_\_\_\_ **Date Made** \_\_\_\_\_ **Type of Milk** \_\_\_\_\_ **Amount of Milk** \_\_\_\_\_

## 1. Ripening

Type of starter \_\_\_\_\_

Amount of starter \_\_\_\_\_

Time starter added \_\_\_\_\_

Milk temp at starter addition \_\_\_\_\_

## 8. Pressing the Curd

Time at start \_\_\_\_\_

Pressure at start \_\_\_\_\_

Pressure at end \_\_\_\_\_

Date at end \_\_\_\_\_

## 2. Renneting

Type of rennet \_\_\_\_\_

Amount of rennet \_\_\_\_\_

Time added \_\_\_\_\_

Milk temp at addition \_\_\_\_\_

## 9. Air drying

Date started \_\_\_\_\_

Date finished \_\_\_\_\_

## 3. Cutting the Curd

Size of curd \_\_\_\_\_

Time curd was cut \_\_\_\_\_

## 10. Waxing

Date waxed \_\_\_\_\_

## 4. Cooking the Curd

Time of cooking curd \_\_\_\_\_

Temp at start of cooking \_\_\_\_\_

Temp at finish of cooking \_\_\_\_\_

## 11. Aging

Temp during aging \_\_\_\_\_

Humidity during aging \_\_\_\_\_

## 5. Draining the Curd

Time draining started \_\_\_\_\_

Time draining ended \_\_\_\_\_

## 12. Eating

Date of first bite \_\_\_\_\_

## 6. Milling the Curd

Time of Milling \_\_\_\_\_

Size of curd \_\_\_\_\_

## 7. Salting the Curd

Amount of salt added \_\_\_\_\_

Type of herb added \_\_\_\_\_

Amount of herb added \_\_\_\_\_

Notes: \_\_\_\_\_

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# Cheese Record Form

**Type of Cheese** \_\_\_\_\_ **Date Made** \_\_\_\_\_ **Type of Milk** \_\_\_\_\_ **Amount of Milk** \_\_\_\_\_

## 1. Ripening

Type of starter \_\_\_\_\_

Amount of starter \_\_\_\_\_

Time starter added \_\_\_\_\_

Milk temp at starter addition \_\_\_\_\_

## 8. Pressing the Curd

Time at start \_\_\_\_\_

Pressure at start \_\_\_\_\_

Pressure at end \_\_\_\_\_

Date at end \_\_\_\_\_

## 2. Renneting

Type of rennet \_\_\_\_\_

Amount of rennet \_\_\_\_\_

Time added \_\_\_\_\_

Milk temp at addition \_\_\_\_\_

## 9. Air drying

Date started \_\_\_\_\_

Date finished \_\_\_\_\_

## 3. Cutting the Curd

Size of curd \_\_\_\_\_

Time curd was cut \_\_\_\_\_

## 10. Waxing

Date waxed \_\_\_\_\_

## 4. Cooking the Curd

Time of cooking curd \_\_\_\_\_

Temp at start of cooking \_\_\_\_\_

Temp at finish of cooking \_\_\_\_\_

## 11. Aging

Temp during aging \_\_\_\_\_

Humidity during aging \_\_\_\_\_

## 5. Draining the Curd

Time draining started \_\_\_\_\_

Time draining ended \_\_\_\_\_

## 12. Eating

Date of first bite \_\_\_\_\_

## 6. Milling the Curd

Time of Milling \_\_\_\_\_

Size of curd \_\_\_\_\_

## 7. Salting the Curd

Amount of salt added \_\_\_\_\_

Type of herb added \_\_\_\_\_

Amount of herb added \_\_\_\_\_

Notes: \_\_\_\_\_

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Resources:

## Books:

***Home Cheese Making***, Ricki Carroll, 2002, Storey Publishing,  
ISBN - 13:978-1-58017-464-0

***Making Artisan Cheese: Fifty Fine Cheeses That You Can Make in Your Own Kitchen***, Tim Smith, 2005, Quarry Books, ISBN - 1-59253-197-0

***Practical Cheesemaking***, Kathy Bliss, 1988, Crowood Press Ltd.,  
ISBN - 1-86126-553-0

## Supplies:

**New England Cheesemaking Supply Company**  
P.O. Box 85, 292 Main Street  
Ashfield, MA 01330  
[www.cheesemaking.com](http://www.cheesemaking.com)

## Websites:

[www.cheesemaking.com](http://www.cheesemaking.com) is where I buy my supplies. There is a comprehensive help section and they are willing to answer any questions you call or email with.

<http://biology.clc.uc.edu/Fankhauser/Cheese/cheese.html> is a chemistry teachers website. He has been successful using inexpensive ingredients and equipment.