

Gouda: Washed Curd Howto



Written by Pav

Gouda cheese and its variants, such as Edam are made in the Netherlands. It has the characteristic of being a cheese whose curd is washed with hot water. This is fairly unique for hard cheeses, and the result is a milder, sweeter cheese because washing the curd takes away lactose sugar from the whey and replaces it with water. It's also a wonderful cheese to make because it tasted good fresh and the flavor improves with age. Gouda is rather tricky because it has some nuances in culture selection and during the make. Here are our notes and details for it. It's useful to keep these considerations in mind when making the cheese.

- The body is semi-firm to firm.
- The final fat in dry matter corresponds to a protein-to-fat ratio of about 1.05-1.1. This means for home cheesemaking 2% milk does not have enough fat and raw or whole milk has too much fat. The appropriate fat content if you cannot figure out protein-to-fat ratio is about 2.5%-2.8% fat. This means using skimmed milk or combining 2% and whole milk to achieve a traditional gouda style.
- The cheese has small openings in the body, but they are formed by lactic bacteria that produce CO2 and not propionic bacteria. The typical choice is *Lactococcus lactis diacetylactis* (along with regular *L. lactis*). Some makers also like to use *Leuconostoc*. A classic Flora Danica by itself, such as the one that Chr Hansen makes is not the best choice for the cheese. A better choice is a continental cheese culture. The make here uses Danisco culture because that is familiar to most people, and combines some Flora Danica with a classic MM series acidifier.

Ingredients, Equipment, and Supplies

Quantity	Description
3 gallons	Milk, PF of 1.1. This is about 2.5-3% fat.
1/8 tsp	MM100 or similar
1/8 tsp	Flora Danica or similar
3/4 tsp	Single strength calf rennet. Or use whatever equivalent rennet schedule applies for your concentration. Dissolved in 1/4 cup ice cold distilled water
as preferred	Annatto for cheese color. Usually for 3 gallons this is about 1/16 tsp.
20-24%	1 gallon of brine. Use our table to make it. You can also use saturated if it's already made. But if making a fresh batch use brine a little below saturation.
Pot or vat big enough to contain milk and	

another pot to heat water.
Thermometer, 0-212 F. pH meter if you have it
Colander with muslin or cheesecloth, spoon for stirring
Cup or bowl that floats, such as yogurt cup.
Wax or vacuum sealer, or cheese paint for aging.
Measuring equipment, cups, spoons

Process

Step	Step Time	Time from Step 1	pH Target
Gather all your ingredients and equipment in one place.	N/A	0:00	N/A
Sanitize all the tools by filling the pot with a few inches of water, and putting everything that fits in it, closing the lid and letting it steam for 30 seconds. You can also dip everything in a solution of 1 gal water with 1 tablespoon of chlorine in it. If using chlorine, rinse with water after. Or use your normal sanitizing schedule (starsan, paracetic acid, phosphoric acid, etc).	0:05	0:05	N/A
Pour the milk in the pot and heat on the stove to 86F. Add the annatto (if using), and culture. Let the culture sit for a few minutes so it becomes hydrated and then stir everything for 15-30 seconds. Use up and down strokes or stir in such a way as to get all the milk from bottom to top mixed in. Let the milk ripen for 30-45 minutes. The pH should drop slightly, by .05-.1 to about 6.55.	0:45	0:50	6.55
Dissolve the rennet in 1/4 cup cold water and stir it in. Add to milk and stir with 10-15 up-down strokes to evenly distribute the rennet. Note the time. Stop agitating, put the cup/bowl to float on top and let it sit. After 10 minutes check the cup by nudging it. When you nudge it and it doesn't move, that's the surface gel point. Note the time it has taken to reach the surface gel point from the time you added rennet and multiply by 3 to get the total time to wait from adding rennet to cutting curd. It usually takes about 10-15 minutes to surface gel and 30-45 minutes total before cutting the curd.	0:40	1:30	6.5
Cut the curd into 3/8" pieces and let it sit for 5 minutes for the curd to firm up and heal. It is very delicate and prone to breaking, waiting helps it to firm up.	0:05	1:35	6.5
After healing the curd, start to stir it gently without heating to create collisions among the curd pieces, which encourages the curds to release whey. stir gently for 20 minutes or until pH is 6.4. pH is the driver, but if you don't have a meter, stirring for 20 minutes is about right. While you are stirring take a little less than a gallon of water and heat it to 130-135F.	0:20	1:55	6.4-6.45
Start washing the curd in three stages. Take a quart (4 cups) of the whey and scoop it out of the pot. Now add a quart of hot water. Stir the curds so that the temperature is distributed. Then stir occasionally for 4-6 minutes. Next take 1.5 quarts (6 cups) and do the same thing: scoop out the whey and replace with hot water. Stir this for 5-8 minutes. And then scoop out another 6 cups and add the rest of the hot water. Stir to equalize the temperature. The temperature should be somewhere around 100-102F. If it is not, heat the pot until it is.	0:25	2:20	6.4

<p>You should notice the acidity start to increase. The pH target for matting the curds and draining whey is 6.2-6.3. After you wash the curds, you need to stir them until you hit the right moisture-in-curd target. there's no great way to measure this at home, so a good rule of thumb is to stir for another 15-20 minutes. After that the curds should be about right. The curds should mat together, but not be too soft and still retain their individual shapes. When you reach this point, drain off almost all of the whey, leaving just a little bit on top of the curds. Let the curds settle for 5-10 minutes under whey.</p>	0:30	2:50	6.25
<p>Next you need to press the curds under whey. This is to eliminate or reduce mechanical openings in the cheese and create an even body. You can do this by pressing your hands into the curds on the bottom, or you can take a piece of cutting board and cut it to the shape of your pot and press it in. Or you can pack the curds into a mold, reserve the whey, and put the mold into the whey and press in the whey.</p>	0:10	3:00	6.2
<p>Pack curds into a mold and press under 4-6 PSI. If you don't have a fancy press, use whatever you can find and what's available. The weight at this point is to eliminate mechanical openings. If you press under whey, they curd has already knit. So this is important, but mostly for presentation. This cheese does stick a little, so if you have this issue, flip repeatedly during the first hour, or spray your cloth/liner with a calcium chloride/vinegar/water solution. Press until the whey pH of the whey running off is about 5.6. If you have no way to measure this, it takes about 4-6 hours at an ambient room temp of 70-72 degrees. Try to keep the room warm, it's important for the bacteria to develop acidity.</p>	~6:00	9:00	5.6
<p>Make up a gallon of brine per the table and brine the cheese for 10-11 hours. This is over 3 hours per lb of cheese. If making a fresh brine, use whey or add a tablespoon of calcium chloride solution and a few tablespoons of vinegar to get the calcium and acid levels to the same levels in the cheese. If you don't, the cheese will leach calcium and get slimy on the outside.</p>	~10:00	19:00	5.5-5.6
<p>Take the wheel out and let it dry off. It needs to be kept at a humidity of 70-80% and a moderate room temp of 55-65. Let it dry for 2-3 days or until it is dry to the touch. After that, you can wax it, vacuum pack it, or paint with a cheese sealant.</p>	N/A	N/A	N/A
<p>Age for at least 4 weeks, preferably closer to 8-12 before eating. The flavor improves with age. You don't need to maintain humidity if it is waxed or vacuum packed. But you do need to try and maintain temperature. If you have no dedicated space, put it in the warmest spot in your fridge, like the vegetable crisper on the bottom, or wherever the warmest spot is. Ideally, age at 50-52F.</p>	N/A	N/A	N/A