the joy of cheese making

a guide to making vermont shepherd cheese

Vermont Shepherd
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Everything you wanted to know about cheese but were afraid to ask.....

As with cooking, a great product can only be made if you start with great ingredients. It follows that successful cheese making depends a great deal on the quality of the milk used. There are many factors affecting the quality and character of the milk:

1. The animal; breed, genetics, health
2. The health of the animal
3. Stage of lactation
4. Diet
5. Pasture content and management
6. Climate
7. Soil

And then there's the handling of the milk which also affects the quality and character:

1. Hygiene
2. Method of milking
3. Transportation of the milk to the cheese house
4. Agitation
5. Storage
6. Pasteurizing
7. Mixing warm and cold milk

Pierre Androuet was right when he said, "Every region has its mysteries, over which no technology, no chemistry has yet prevailed...vegetation, climate, rainfall, nature of the subsoil, breed of the animal, all contribute towards making a cheese into a unique, inimitable product."

You will all produce slightly different cheese. That's good! It makes life exciting (well, at least mine). This manual is to help set the standards of practice so all the cheese can be marketed under Vermont Shepherd Cheese. This manual concerns itself only with cheese making. The answers to any questions concerning animal husbandry, pasture management, stone walls or the comparison of cheese making to sex should be searched out elsewhere.

More on milk and milk handling

Composition of sheep's milk, %

Total milk solids	16.0-25.5
Proteins	4.5-7.5
Lactose	5.2-5.5
Fats	5.5-11.0
Salts	.8-1.4

As lactation ends, the fat, salt, and protein levels increase as the quantity of milk decreases.

Protein

Casein makes up 70% of the total protein in sheep's milk. Casein is a coagulating milk protein. The remaining 30% is non-coagulating proteins, which most are eliminated in the whey. Albumin, a non-coagulating protein, is the protein found in whey cheese such as ricotta.

Fat

Milk fat consists of triglyceride molecules, which comprise of one glycerol molecule and 3 fatty acid molecules. The milk fat is trapped in the curd during cheesemaking. During ripening, certain fatty acids split from the triglyceride, producing different flavors and aroma.

Lactose

Lactose is milk sugar which changes into lactic acid during cheese making. Most of the lactose left is drained off in the whey. It is the milk solid that varies the least during lactation.

Salts

The most important salt involved with cheese making is calcium. The rennet cuts up the long chains of casein which then bound to the calcium forming a matrix which traps the solids. No calcium, no coagulation.

Ideally, milk should not be stored for more than 12 hours. But, since few have the time to make cheese twice a day, the milk will have to be stored for a longer period. It is not advisable to store the milk longer than 60 hours. As the milk sits, the structure of the milk becomes less stable, which will affect the cheese.

The milk should be stored at 39 degrees Fahrenheit. Do not allow the milk to freeze!!

Never mix warm and cold milk. By mixing milkings, the cold milk is once again warmed which can increase the number of bad bacteria and destabilize the structure. The French are convinced it causes grittiness in the cheese.

Be gentle with the milk. Agitation alters the the structure of the milk. The fat can separate out and calcium can be lost.

The milk must be free of antibiotics, pathogens, and excessive bacteria and somatic cell count.

A meal without cheese is like a kiss without a squeeze.

Sanitation

"Most home cheese making failures are caused by unclean or unsterile equipment."

-Ricki Carroll

Factors affecting sanitation
1. Concentration of cleaning product
2. Duration of contact
3. Temperature
4. Elbow grease

Recommended steps of cleaning dairy equipment:
1. **Cold water rinse** to remove sugars, fats, and minerals.
2. **Clean with an alkaline cleaning product** (degreaser, soap) to remove fats and proteins.
3. **Disinfect** with bleach (200 ppm). Periodically, use Mandate or another acid to remove the milk stone.
4. **Rinse with hot water**, above 120 degrees.
5. Dry by hanging, not wiping.

Not one step or cleaner will eliminate everything. Remember, it takes **3** steps to insure all milk solids have been removed: cold rinse, soap, and disinfect.

Use nylon brushes to clean. It is a good idea to color code them--for example, red for cheese equipment cleaning, black for the floor.

Never use a sponge unless you want the inside of your cheese to look like one.

Don't use abrasive cleaners, like Comet. They scratch the surface which results in uncleanable crevices which harbor bacteria.

Don't transfer washing up liquid from one soiled container to the next.

Make sure everything is well rinsed. Sterilizing agents can inhibit the starter and rennet.

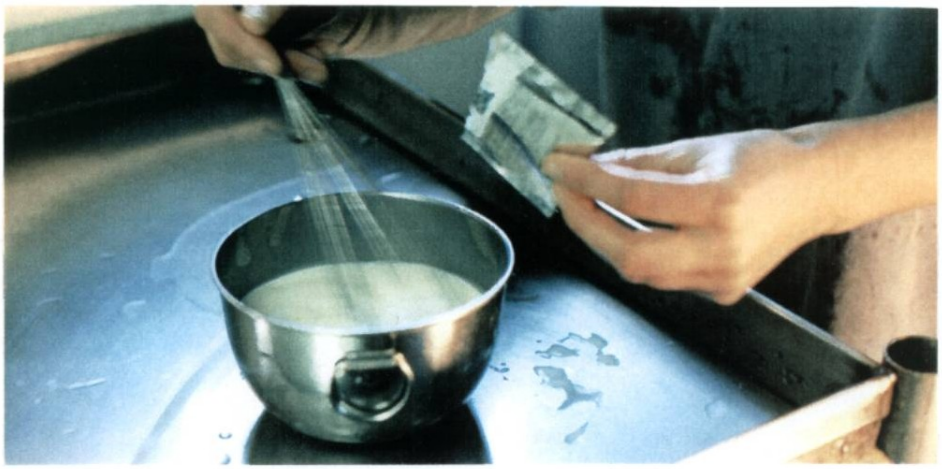
Never use anything made from aluminum or cast iron.

A turophile is a lover of cheese.

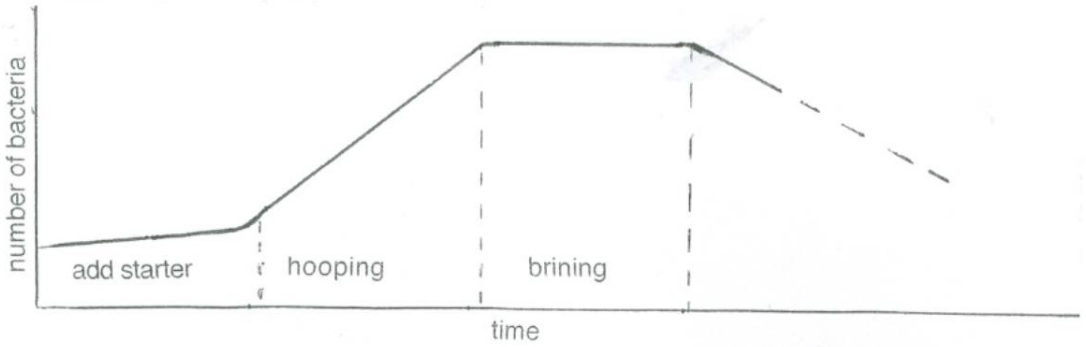
Starter

The starter consists of lactic bacteria. They consume the lactose in the milk producing lactic acid which increases the acidity (lowers the pH). This also neutralize the activity of less desirable bacteria. Acidity development is crucial to sufficient draining, which affects texture and body of the cheese. Proper acidity also helps break up fatty acids which helps to develop the flavor.

There are 3 different types of starter. Vermont Shepherd is made using a mesophilic lactic acid starter culture. It consists of streptococcus lactic, subspecies cremoris and diacetylactis. It is a "direct vat inoculation" or DVI starter. It must be added to warm milk, above 70 degrees, *never* use water. Its optimal growth range is between 77-86 degrees. 80% of the bacteria will die at 104 degrees.



The bacteria divide every 20-30 minutes, under favorable conditions. The most intensive time of lactic bacteria multiplication should occur between hooping and brining. It is very important to keep the cheese room temperature optimal for bacteria growth, 70-78 degrees, during the time of hooping and pressing. The number of bacteria peaks right before the cheese goes into the brine, stays stationary for a period and then starts to decline.



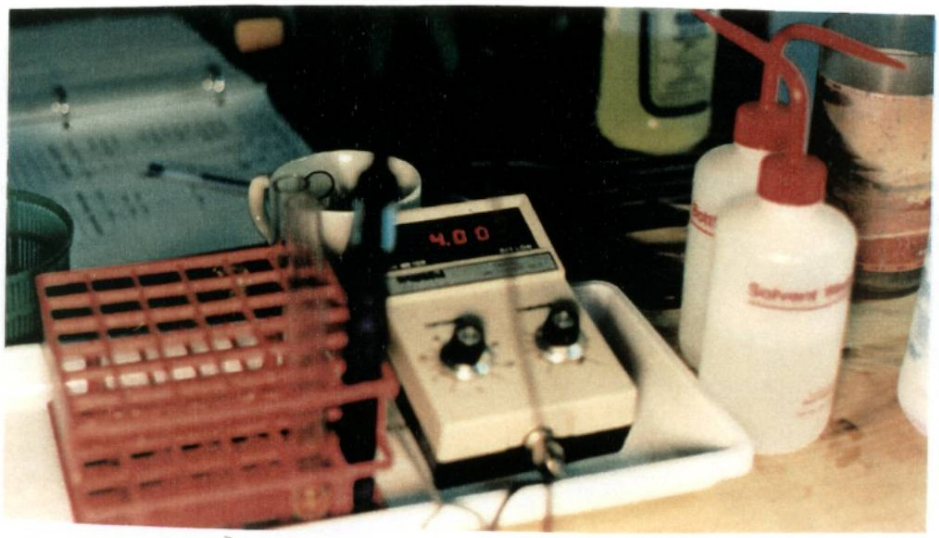
The starter needs to be stored in a cool place, 39-45 degrees (your refrigerator). It also has a shelf life, so make sure to check the use by date.

It's important to use the correct dose, 1 unit per 250 pounds of milk. One package contains two units. Using too much starter can make the cheese dry and bitter. Using too little can allow the bad bacteria to take over.

The starter will fail if there are antibiotics or antiseptics in the milk. If there is an excess of bad bacteria (coliform, staph, clostridium) they will take over and the starter will fail. This will result in blown up cheese (spongy), or coagulation will not occur.

It is important to alternate the MA4001 with the MA4002 to help prevent phage. Phage is a virus that will kill the lactic bacteria.

A pH meter is an easy and fast way to track acidity development during cheese making. pH stands for hydrogen potential. It measures the total acidity in terms of its hydrogen ion concentration. The scale ranges from 0-14, 0 being most acidic and 14 the least.



The pH of the cheese just before it goes into the brine should be between 5-5.3. If it is lower than 5.0 the cheese doesn't mature as well and tends to be dry and bitter. If it is higher than 5.6, there is a good chance the cheese will be spongy and provide an environment favorable for pathogens.

It is important to look at everything, especially time and temperature, if the rise in acidity is not sufficient. Don't immediately add more starter.

"He who does not eat cheese will go mad"

-French proverb

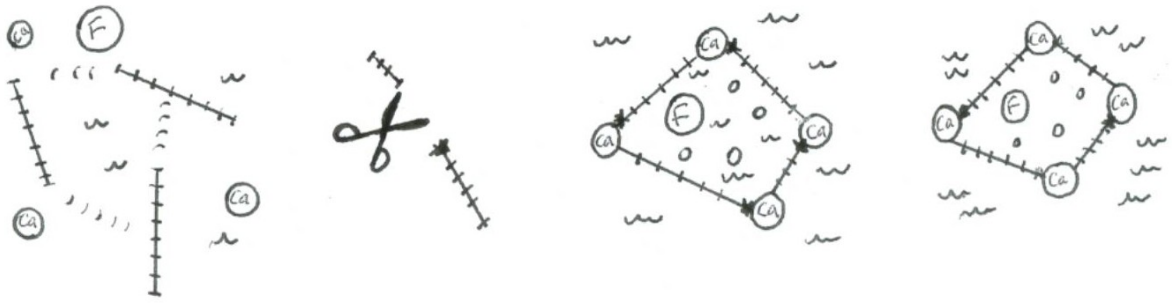
Rennet

Rennet consists of two coagulating enzymes, chymosine and pepsin, extracted from the fourth stomach (abomasum) of a young milk fed ruminant, most commonly a calf. It can also be made from fungi and bacteria. Calves rennet contains 90% chymosine.

It takes 12-13 air dried stomachs to make 1 L of 1:10,000 strength rennet.

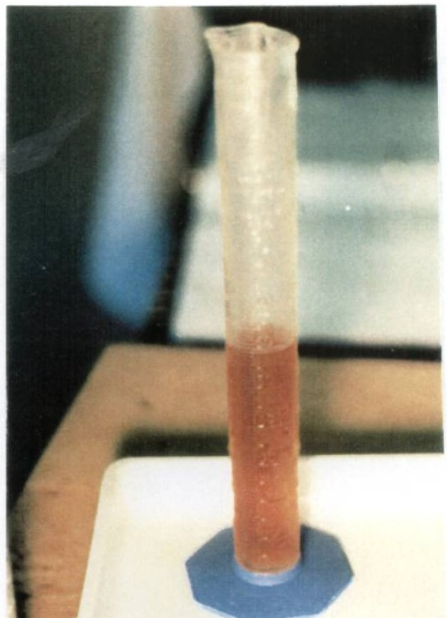
The rennet used to make VT Shepherd Cheese is Chymostar Classic. It is a blend of fermented chymosin and animal enzymes. It is extremely sensitive to sanitizer and high mineral content water.

Rennet simply cuts cuts the amino acid chains of the casein which then attach themselves to the calcium forming a cage. The cage traps the milk solids. As the temperature and acidity increase, the cage contracts which helps squeeze out the whey.



Rennet must be stored in a cool, dry place away from light and earthquakes. 42-45 degrees is ideal.

It is very powerful! It is very important to use the correct dose, 7 cc per 100 pounds of milk. It is important to dilute it with *cool* water before adding it to the vat. Distilled water is recommend, especially if your water is high in minerals. It is recommended to dilute it 15-20 with water.



Rennet is inactive below 58 degrees and is killed at 140. It is most active between 84 and 104. It is added at 90 degrees to make it easier to control coagulation.

Cover the vat after you add the rennet. The curd doesn't like drafts or change in temperature. The temperature of the curd at the start of cutting should be the same temperature as the milk when the rennet was added. A drop in temperature could result in a change in texture.

The milk should coagulate in 15-45 minutes. If it is too fast an impermeable film will form around the curd which traps the whey which can lead to dryness, bitterness, wet spots on the rind, and discoloration of the cheese. If it is too slow, the curd can get cold which can result in fat loss, crumbly, brittle cheese and sandy texture. Vermont Shepherd fully coagulates, on average, after 30 minutes.

A guide to help know when it is time to cut: The time from the addition of rennet to the time initial signs of coagulation should be half the time it takes from the addition of rennet to cutting time. For example: Add rennet at 9 am, initial signs of coagulation at 9:15, curd is ready to cut at 9:30.

Some rennet remains in the cheese after draining, which aids the breakdown of the curd during maturing. Rennet is deactivated at 140 degrees. Swiss type cheeses are reheated to 140 degrees which gives them that rubbery texture.

Cutting and reheating

"This part of cheese making is just like sex."

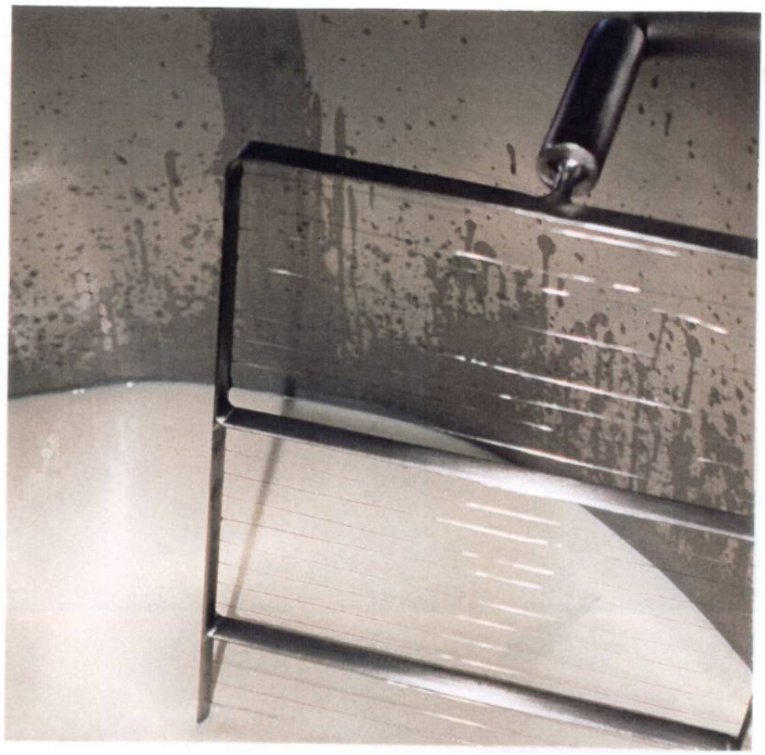
-David Major

Cutting increases the surface area of the the curd resulting in greater and faster draining of the whey. Draining has one of the largest effects on the outcome of the cheese.

The curd temperature should not drop from the time of renneting to cutting. It could result in loss of milk solids.

The curd should be cut when it passes the clean break test. Raise the curd from below with your finger. It is ready to cut when it breaks cleanly; forms a sharp, clean, slit, and the whey is clear, i. e. does not contain small particles of curd.

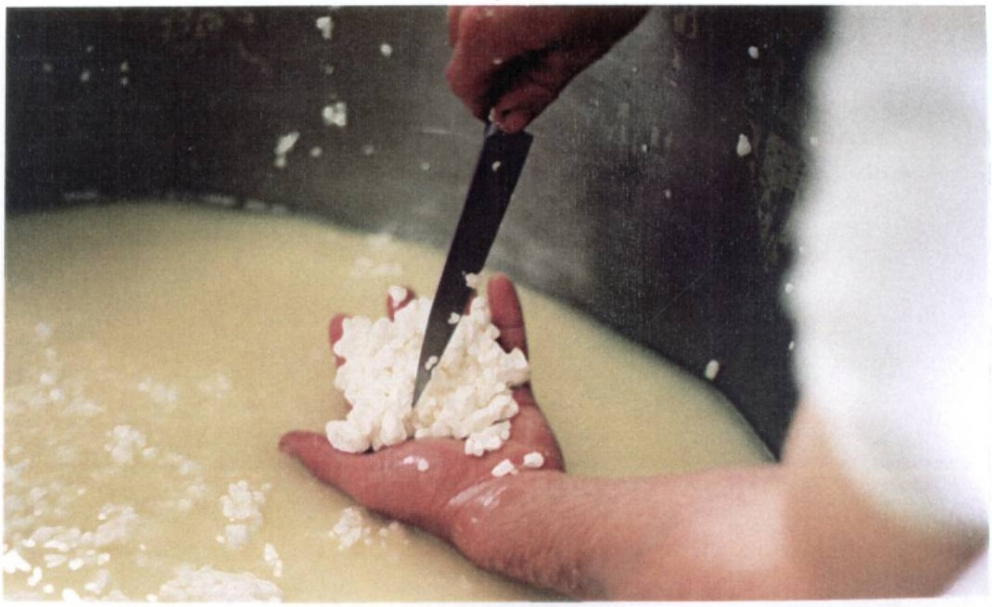
The initial cut should be with a cheese harp, which causes the least amount of damage and loss to the curd.



Cutting should begin slowly and then speed up. There may be a brief, 30-60 seconds, resting period between initial go around and further cutting.

Curd should be cut to the size of a kernel of corn, or 3-4 mm. It should be cut as regular as possible or whey can be trapped and cause everything from wet spots to dry textured cheese to discoloration.

It is difficult to cut all the curd to uniform and correct size with just the cheese harp. After cutting with the harp, while reheating and stirring, use a knife to cut the missed curd into uniform size.



Begin reheating the curd 1-5 minutes after cutting. Reheating influences the acidity development and curd retraction, which squeezes the whey out like a sponge. Reheating should be 2 degrees per 5 minutes. The time needed to reach 96 degrees should not be *under* 15 minutes. If the curd is heated too quickly, the curd becomes impermeable and whey will be trapped resulting in many problems from fountains to dry cheese. If it is heated too slowly, the curd becomes fragile and too much of the milk solids will be lost to the whey.

The curd should not be heated over 103 degrees due to the risk of killing the majority of the lactic acid producing bacteria. Make sure the thermometer is correct by placing it in boiling water, it should read 212, at sea level. Also, get to know your vat. They all heat and retain heat slightly differently.

Make sure the curd doesn't burn. Stir it *gently* from the bottom and the edges as you are reheating and finishing cutting. Be careful not to over agitate the curd, especially the first 15 minutes after cutting. Stir gently for a few minutes after you turn off the heat.

The vat heater might need to be turned off before the actual temperature of the curd reaches 101, due to residual heat in the jacket will cause the temperature to coast upward. Each vat is different, get to know your vat..

Initially press the cheese in the vat. First, settle the curd with your hands and then press it with a stainless steel press. If you press it too much, it becomes too difficult to work with and pressing and drainage will not be complete. If it is pressed too little, you will lose a lot of curd when you drain the whey.

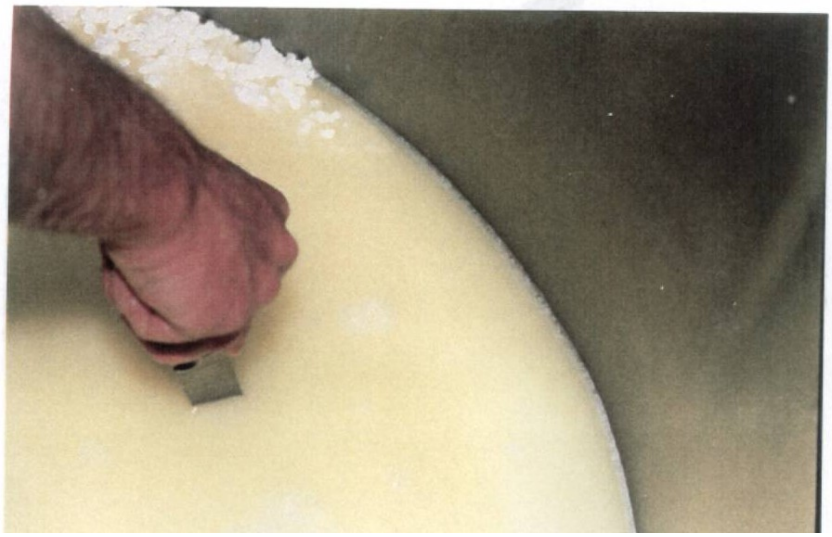
Right before you drain the whey, take the pH of the whey. The acid in the whey continues to bond and thus pull the minerals from the curd. So, the whey will have a higher pH at the end of draining than the beginning. You should adjust the rate of draining depending if you have too much acidity or too little.

From draining through moulding, no dawdling allowed.

Leave just enough whey in the vat to barely cover the cheese. It will keep the curd warm, protected and easier to mould.

"Cheese making is like a table with three legs: It has to result in a nutritious product, a nontoxic product and provide pleasure. If one of the legs breaks or is missing, you don't have a table anymore."

-paraphrased quote of John D'Alos
French affineur

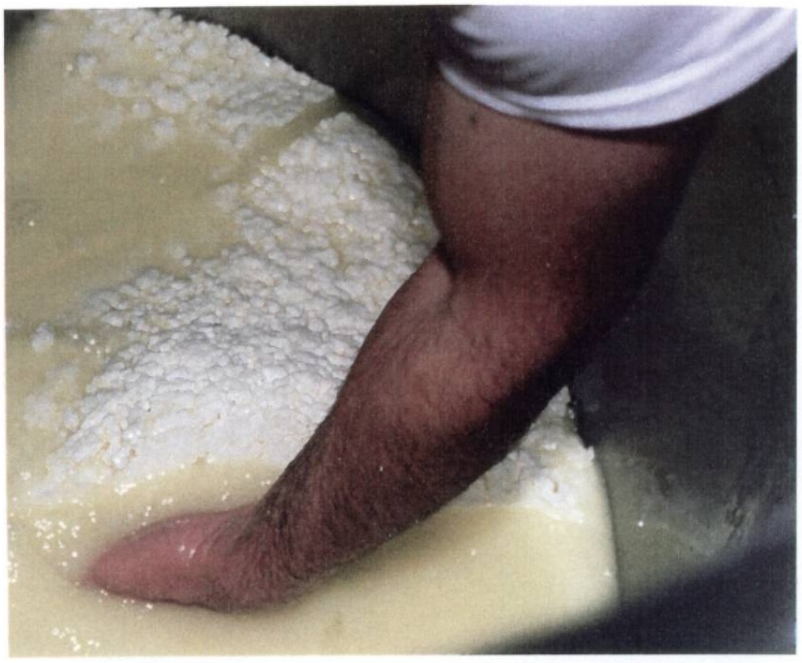


Moulding or hooping and pressing

The curd becomes stiffer, tougher, and harder to work with quickly once the whey has been drained. It is important that moulding is done quickly.

At this time, the number of lactic bacteria are starting to multiply like rabbits. The acidity development aids in the draining of the whey. The bacteria are sensitive to temperature. It is very important that the room temperature is maintained between 70-78.

The curd should be cut into slabs as even as possible.



Try to avoid piece mealing a slab together. It makes it difficult to work with, press evenly, and drain. The number of slabs should be the pounds of milk divided by 50. Sometimes it's more or less, depending on breed, stage of lactation, and diet.

The temperature of the cheese clothes and moulds should be the same temperature as the curd. Otherwise, the outside curd becomes impermeable and there's that trapped whey problem again. It's easy to do by dipping them in the whey left in the vat.

Apply even pressure when kneading and pressing. This will help draining and promote an even bodied cheese.

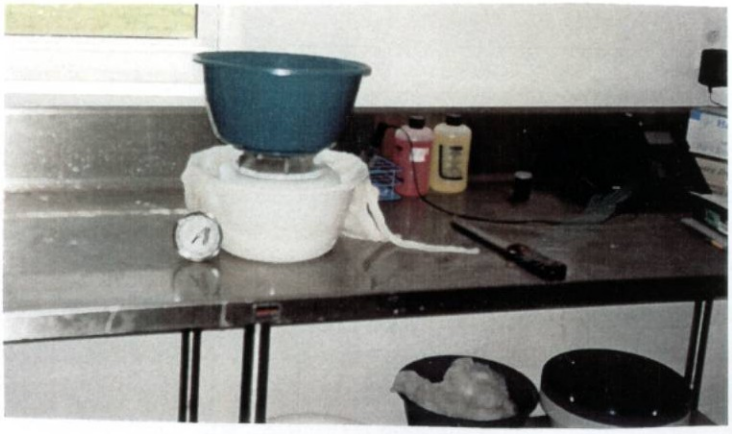
When kneading, start out soft and gentle but fast, pushing just enough to get an initial basic shape. When rekneading the cheese push harder and slower, waiting to move your hands until you feel the heat coming through.

The squirting is from the release of pockets of whey trapped in the curd. It is important you knead a cheese until the squirts are gone. Otherwise, there could be discoloration, fountains, and dry cheese.

Don't let the cheese sit in puddles of whey during draining. It won't drain efficiently or sufficiently and the minerals will be pulled.

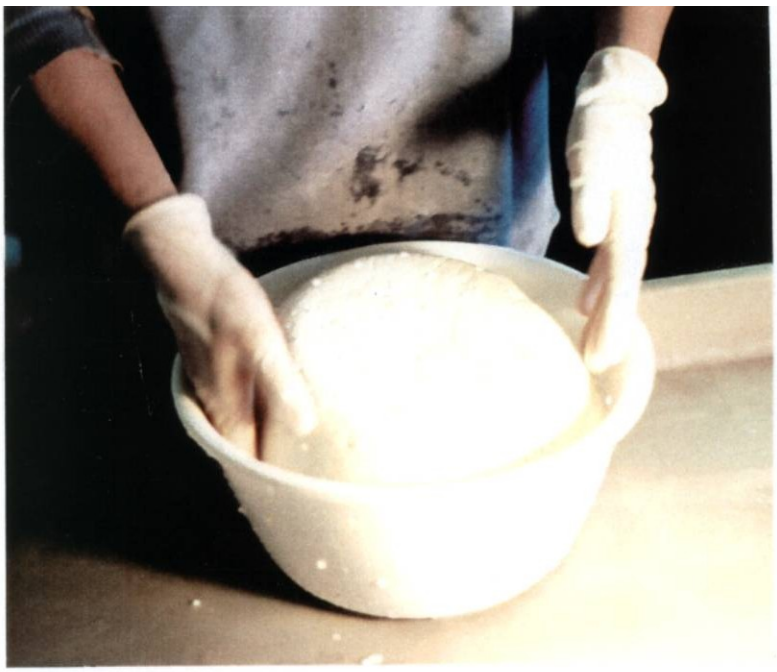
There will be a point when kneading becomes more detrimental than beneficial. The curd will crack, difficult to knead, and feel chilly. STOP kneading.

An easy, accurate, and cheap way to press the cheese is by putting bowls full of whey or warm water on top of them. The bowls should be filled with whey to the same level as the cheese to be pressed. If the cheese only fills half the mould, then only fill the bowl half full of whey.

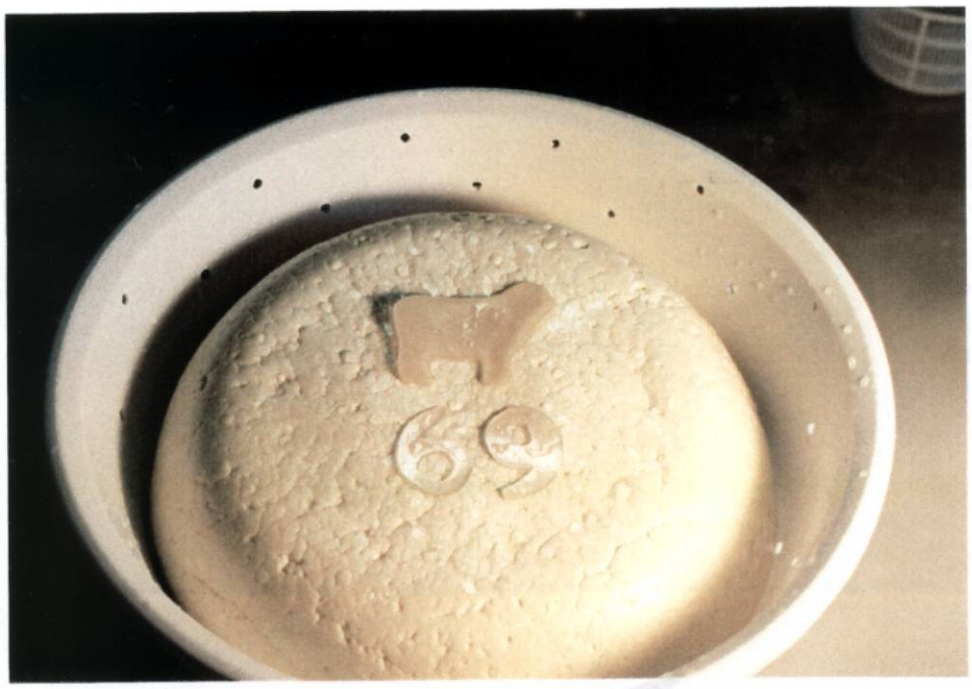


Make sure whey is dripping out the holes while the cheese is pressing. If not, the top is too big.

Make sure the weight and top are straight or the cheese will be lopsided.



Turn the cheese over during kneading to help shape and drain the curd.



Center the farm and batch information on the cheese before wrapping it in cheese cloth.

A dinner which ends without cheese is like a beautiful woman with only one eye"
-Brillat Savarin

Salting

Salt helps form a rind to protect the cheese. Salt helps limit all bacteria growth, aids in drainage, affects the texture and flavor of the mature cheese, and also preserves the cheese.

There are three ways to salt a cheese; brining, salting the curd before moulding, or dry salting the exterior. Vermont Shepherd is brine salted. Course solar salt is used.

Make up the brine 2-3 days prior to use so you have time to adjust it.

It is important to stir the brine often (every time you put a cheese in or turn one over) so whey does not get trapped next to the cheese and aerates the brine.

It is important to turn the cheeses over when they are in the brine. 4 times per day is recommended.

Make sure the exposed side of the floating cheese is covered with salt. Use the salt from the bottom of the tank. You may also submerge the cheese, or turn the cheese over every 6 hours.

The brine should simulate the cheese as closely as possible in temperature and pH.

Store the cheese overnight in the same cooler as the brine. They will be the same temperature in the morning. By adjusting the time you put the cheese in the cooler you can affect the pH of the cheese.

The temperature of the brine should be around 55 degrees. Above 60 there is danger of undesirable bacteria and yeast growth.

If the cheese is warmer than the brine, fat from the cheese will seal the rind which decreases penetration.

The final pH of the cheese, before going into the brine, should be between 5-5.3.

If the brine is more acidic than the cheese (lower pH), the calcium ions will be pulled from the cheese into the brine resulting in a very hard rind.

If the brine is less acidic than the cheese (higher pH) the rind will be slippery.

You can wait for the brine to be at the same pH as the cheese by brining numerous batches or you can add lactic acid (2-4 ml/2.5 gallons brine) to increase the acidity (decrease the pH). Acidified whey can be added to increase the acidity as long as the acidity of the whey is lower pH than the brine. Water can be used to increase the pH of the brine (water is pH 7).

Salt absorption will increase with the curd moisture content due to the pore size of the casein matrix.

Brines can become contaminated with yeasts, undesirable bacteria, and mucor. Remember to be clean.

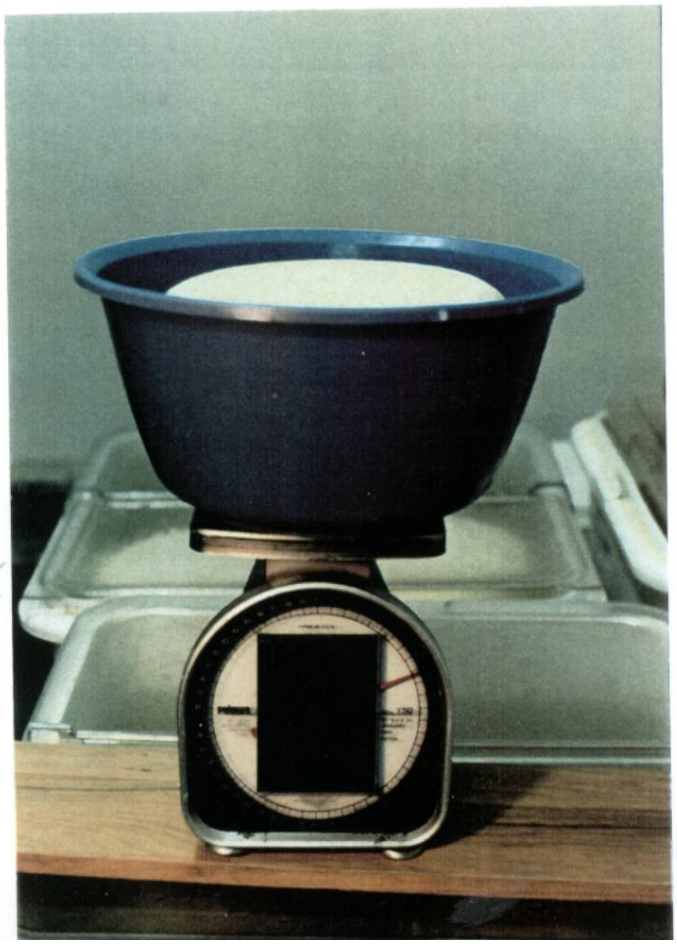
A salometer measures density. It is not just measuring sodium chloride. Density changes with temperature. At 60 degrees, a reading of 48=12% NaCl, 88=22%, 92=23%. You should receive a chart with your salometer.

Stay tuned.....more info to come on salometer readings for brine tanks and the effect on the cheese. Right now we recommend to make a saturated solution . Saturated solution, in this case, means make sure there is salt on the bottom. Please record your salometer reading for each batch. Sorry for the delay.

The brining time is dependent on the weight of the cheese and salometer reading. The recommended brining time is 4.5 hours per pound at 24%. It is ok to be flexible:

weight of cheese in lbs	time in brine
5-6	24 hours
7-9	36 hours
10-11	48 hours

Weight above that add a meal per pound. That is, if the 11 pound wheel comes out at breakfast, take the 12 pounder out at lunch.



Problems and possible causes

Milk

The pH of the milk is different than it has been
1. If it is higher, check for mastitis and high somatic cell count. pH may also increase at the end of lactation.
2. If it lower, check the temperature of the cooled milk. It should be 39 degrees. Check sanitation practices.

Milk has red or grayish blotches especially during coagulation or is pink coming out of the teat
1. Milk has blood in it. Check for wounds or sores on udder or pink milk coming from within.

Problems during make

Milk does not coagulate
1. Check for mastitis, high somatic cell count, and colostrum.
2. Check the mineral content of the water used to dilute the rennet, or switch to distilled water.
3. Antibiotics or antiseptics present in the milk.
4. Too little rennet added.
5. Milk is too old.
6. Rennet was mixed with warm water or milk.
7. Poor quality rennet was used. Check ubd, storage temperature.

Insufficient acidification--pH too high
1. Check starter ubd and storage.
2. Temperature of cheese room during draining was too cold.
3. Curd was reheated above 103.
4. Bad bacteria present.
5. Starter was added too close to the time of renneting. Make sure there is at least 30 minutes between. 45 is ideal.
6. High somatic cell count or end of season lactation.
7. Phage.
8. High somatic cell count.
9. Whey drained too quickly.
10. Cheese put into cooler too soon.

Over acidification--pH too low
1. Too much starter was used.
2. Starter was added too early.
3. pH of milk was low.
4. Temperature of cheese room during draining was too high.
5. Whey not drained fast enough.
6. Cheese not put into cooler soon enough.

Flavor problems

Sour taste
1. Over acidification.
2. Excess moisture in curd.

Bitter taste
1. Trapped whey.
2. Over acidification.

Soapy taste
1. Milk too high in fat, end of lactation.
2. Insufficient acidification.

Texture
Dry
1. Room temperature was too high.
2. Too much rennet added.
3. Curd got cold during coagulation.
4. Curd was reheated incorrectly.
5. Times were too long (draining whey, putting cheese into cooler, etc)
6. Agitation of milk or curd.
7. Over acidification.

Pasty
1 Insufficient acidification.
2. Milk is too high in fat.
3. Trapped whey.
4. Improper reheating of curd.
5. Times too short

Gritty or sandy body
1. Mixing warm and cold milk.
2. Agitation of milk or curd
3. Too little rennet was added.

Spongy Body
1. Coliform present in the milk. Check milking technique and sanitation.
2. Insufficient acidity
3. Too much rennet was used.
4. Phage. Rotate starters.

Appearance

Discoloration of the curd
1. Trapped whey.
2. Uneven salting.

Fountains or wet spots on rind
1. Trapped whey.
2. Insufficient acidification

Poil de chat, cat's fur, mucor on rind
1. Contamination. Could be in water, milk, air, clothing, brine
2. Insufficient acidification.
3. Insufficient salting
4. Brine acidity was not the same as the curd.
5. Excess moisture in cheese.
6. Maturing room too humid or warm.

Slimy rind
1. Brine acidity different than the cheese.
2. Starter was added too close to renneting time.

Outside cracking
1. Improper kneading and pressing.
2. Improper drainage.
3. Curing room too dry and drafty.

Blue cheese
1. Over acidification.
2. Cheese salted unevenly.
3. Matured at too low of temperature.

After reading this, making Vermont Shepherd Cheese should be a breeze! Hardly anything can go wrong. Good Luck! If you have any questions please contact the cheese hot line at 802.387.4473.

RICOTTA

1. Strain the whey with cheese cloth. It needs to be free of curd.
2. Place in a nonreactive pot and heat over high heat.
3. Stir often so it doesn't burn or stick.
4. Bring to just under a boil (200 degrees). A good indication is 3 bubbles.
5. Turn off the heat.
6. Drain in a cheese cloth lined colander.

The whey should be used within one hour. It spoils quickly.

This is a low yield cheese. Yield will increase late in lactation.

Milk can be added to make a higher, creamier yield. Use 1/2 quart milk for every gallon of whey.

Salt will increase the flavor and shelf life but it is not necessary.

Refrigerate.

How to Make Vermont Shepherd Cheese in 50 Easy Steps

before you make the cheese

1. Check the temperature of the cheese making room. It should be around 72 degrees Fahrenheit by the time moulding occurs. Moulding should *never* occur below 66 degrees.
2. Sterilize all the equipment you will be using that day. Make sure it is all well rinsed. Make sure you have enough cheese clothes, moulds, tops, etc., ready for that days production. Dividing the pounds of milk by 50 will give you a rough estimate of 10 pound cheeses, at the beginning of the season.
3. Rinse the vat with hot water.

heating the milk (1-1.5 hours)

5. Begin slowly heating the cold milk.
4. Take pH and temperature of the milk. pH should be consistent from batch to batch, between 6.60-6.70.
6. Stir gently.
7. When vat milk reaches the same temperature as the warm milk add the warm milk.

adding the starter (35-45 minutes to acclimate)

8. When milk is between 77-80 degrees Fahrenheit add 1 unit of Rhone-Poulenc EZAL MA4001 or MA4002 starter for every 250 lbs of milk. Try to be consistent at what temperature the starter is added. 1 package contains 2 units. Starter should be whisked with warm milk before adding it to the vat.
9. Stir often but gently.
10. Heat milk to 90 degrees Fahrenheit.
11. Turn off the heat.
12. Stir gently.
13. Take pH of the milk. It should have decreased by .02.

adding the rennet (~30 minutes to set)

14. Measure Chymostar rennet very carefully. 7cc per 100 pounds of milk.
15. Dilute rennet 15 to 1 with cold distilled water and add to milk.
16. Stir gently and then halt movement of milk.
17. Cover the vat.
18. Let the milk set until the curd passes the "clean break test"--Stick your finger in the curd and curl it up towards your hand. If the whey is clear and the break in the curd is sharp and doesn't stick to your finger it passes. It should coagulate completely in 20 to 45 minutes.

cutting

19. Cut the curd to the size of a kernel of corn using a cheese harp.
20. Take the pH of the whey. It should be within .1 of the milk.

reheating (27 minutes)

21. Begin reheating at the rate of 2 degrees Fahrenheit per 5 minutes,. The initial 15 minutes of reheating should be slow and then it doesn't matter so much. It is very important not to reach 96 degrees under 15 minutes.
22. Stir gently whilst continuing to the cut curd with a knife until all the curd is the size of a kernel of corn.
23. Continue heating until 101 degrees Fahrenheit is reached. It's very important that it not go above 103 degrees because a portion of the starter bacteria will be killed.

finish reheating

24. Turn off the heat.
25. Gently push the curd to the bottom of the vat beginning with your hands and then a plate.
26. Take the pH of the whey *before* removing the whey. If the pH is higher than 6.5 you might consider letting it sit until it drops.
27. Remove the whey but leave the curd slightly covered to keep it warm and protected.

moulding (~45 minutes)

28. Cut the curd into uniform slabs equal to the number of cheeses that will be produced.
29. Put the slabs of curd into cheese bowls (moulds).
30. Knead the curd into the rough shape of the bowl.
31. Turn cheese over and knead other side. If there is more than 1 cheese, press cheese with weight in between kneading. One pound pressure should be applied for each pound of cheese.
32. Continue steps 30 & 31 until the curd is ready, each time pressing slower and slower. But the overall pressing must be done quickly or the curd gets too hard and cold to work with.

cheeses in cloth

33. Center the farm identification and batch number neatly on top of the cheese.
34. Drape the cheese cloth over the top of the cheese and bowl.
35. Place your hand on top of the cheese and flip the cheese out of the bowl, holding the cheese cloth and identification in place.
36. Turn the cheese over so the cloth is now the top of the cheese.
37. Smooth out the cloth. It is important there are no creases.
38. Place the bowl over the cheese like a hat. Turn it over.
39. Neatly cover the top of the cheese with the rest of the cloth and cover with an appropriately sized lid. Between the lid and the bowl there should be only a tiny amount of cheese showing. If it's too big, it will not press; too small, a lip will form that will have to be trimmed.
40. Separate the 2 layers of cheese cloth sticking out from the lid, pulling to straighten.
41. Return to press. Don't let the cheese sit in a puddle of whey and make sure they are level.

1 hour turn

42. One hour later, turn cheese over and return to press.

turn and put in cooler

43. 1 1/2 hours after the 1 hour turn, turn the cheese over again, leave in bowl but stop pressing.
44. Take the pH.
45. Place moulded cheese in cooler.

put in brine

46. The next morning take the pH of the curd and whey. The curd should be 5.0-5.3. Ideally, 5.1.
47. Place the cheese in a brine that is of proper acidity, salinity, and temperature and has been agitated. Proper acidity is the same pH as your cheese. We are still working on the salometer reading, so for now make sure there is salt on the bottom of the tank. Temperature of the brine should be the same as the cheese--54-59 degrees Fahrenheit. Cover cheeses with salt from the bottom, or submerge the cheese. Be sure to turn cheeses over often in the brine (3-4 times per day)

time taken out of brine

48. Remove cheese from brine when sufficiently salted. Brining time: 4.5 hours per pound of cheese.
49. Store cheese on a clean wooden shelf in a cool, still, room, 54-59 degrees Fahrenheit but constant--no temperature variation, with 90-95% humidity .
50. Turn cheese daily until shipped to the cave.

voilà vermont shepherd cheese!

YOU MUST FILL OUT A RECORD OF CHEESE PRODUCTION FOR EACH AND EVERY BATCH.

THERE MUST BE 2 COPIES OF EACH BATCH--ONE FOR YOU AND ONE FOR THE CAVE.

IT MUST BE READABLE.

IT MUST BE COMPLETE.

record of cheese production batch #____ date____ # of wheels____

farm: weather:

lbs milk: pasture: visitors:

---

	time	temp	pH	
begin heating.....	_____	_____	_____	
add starter 1u/250lbs....	_____	_____		culture #_____
add rennet 7cc/100lbs...	_____	_____	_____	
cutting.....	_____			
begin reheating.....	_____	_____		
finish reheating.....	_____	_____	_____	
moulding.....	_____	room___		
cheeses in cloth.....	_____		whey____/curd_____	
comments.....				
1 hour turn	_____			
turn & put in cooler	_____		whey____/curd_____	

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put in brine..... _____ whey____/curd_____

brine: salometer: tank 1_____ tank 2_____ pH: tank 1_____ tank 2_____

weight of wheels	timeout of brine	weight of wheels	time out of brine
_____		_____	
_____		_____	
_____		_____	
_____		_____	
_____		_____	
_____		_____	
_____		_____	

Comments, Observations, use extra page if needed:

"**Missteakes** HAPPEN

when YOU'RE

ANGRY *tired*

frustrated

or in a hurry

if you don't RESPECT

THAT

you're going to have

trouble

-old man moody, ski lift shepherd,
head cheese maker, weirdo and freak