CHEDDAR CHEESE

Day One:

1. Heat: 2.6 gallons (10 Litres) of milk to 89.6^{O}F in a water bath.

2. Culture: 1/8th tsp R-704 (Mesophilic Freeze-dried Culture).

3. Rennet:
   Use 10ml calf's rennet diluted in 10ml water
   or Use 5ml vegetarian coagulant in 5ml boiled, cooled water

   Leave to set in warm water for 45-60 minutes.

4. Cut the Curd: Approximately 1 cm cubes. Stir gently to ensure equal size.

5. Pitching: Let settle for five minutes.

6. Scalding: Gently heat to 95 - 100.4^{O}F. Takes 30 minutes. Ensure uniform temperature throughout. Stir gently until curd becomes firm and elastic in texture. Scalding helps expel whey from the curd and also increases acid development.

7. Drain the curd: Place a sterilised cheesecloth over a draining rack. Using a sterilised sieve, ladle the curd onto the cloth, into a rectangular shape approx. 2.5cm deep.

8. Cheddaring: Cut the curd into strips 20cm long, then turn and pile a little higher every 10 - 15 minutes to develop the acidity and the texture. Curd MUST be kept warm with a clean dry cloth. Cut and turn about three times, the strips when torn should resemble cooked chicken breast meat.

9. Milling: The purpose of milling is to reduce the curd to uniform sized pieces and to enable the salt to be distributed evenly.

10. Salt: Salt is added at the rate of 2% of the final weight, and mixed in very thoroughly. Leave the curd to cool to 78.8^{O}F.

11. Moulding: The mould is lined with sterilised cloth or nylon net, then filled with the cheese curd and pressed down with the fist. Pull the cloth up from the sides and place the follower on top.

12. Pressing: The pressure must be applied slowly for the first two hours and then it can be increased. The effectiveness will have to be judged on the resultant cheese. Pressure applied TOO FAST results in excessive whey loss. Pressure applied TOO SLOWLY results in chilling of curd and poor consolidation.

13. Turning in the Mould: The cheese mould is turned upside down and the cheese pushed out. Re-adjust the cloth and replace the cheese into the mould the other way up. Press further.

Day Two:

1. Brine: Remove the cheese from the mould and trim the edges with a knife. Soak in 20% brine solution for up to 2 hours.

2. Store: Cool, moist atmosphere that is clean and rodent-free. Wooden untreated shelves that have been removed and scrubbed. Optimum 41 - 50^{O}F, 80-90% humidity. Turn every day initially, then every two days. Store for at least 5-6 weeks.

In the Store: These cheeses can be waxed or larded before placing on the clean wooden shelves, or brine washed - every few days, i.e. rubbing the cheese both sides with a little piece of cotton cloth dipped in salt and water.

RICOTTA CHEESE

Made from the Cheddar whey

Ricotta:

(a) Heat whey to 185^{O} - 194^{O}F

(b) Add 1 tbsp salt and 40ml vinegar to the hot whey

Stir very gently, then allow the Ricotta to come to the surface

(c) Carefully skim the floating Ricotta off the surface and into a cloth-line hoop

(d) Leave to drain and apply a little pressure overnight

QUARK

Day One:

1. Heat: ½ Gallon (2 Litres) of milk to 87.8^{O}F in water bath.

2. Culture: For ½ Gallon of milk use a few crumbs of R-704 (Mesophilic Freeze-dried Culture). Sprinkle on the surface and stir well.

3. Rennet: Use 1ml calf's rennet diluted in 1ml boiled, cooled water.or

   Use ½ ml vegetarian coagulant in ½ ml boiled, cooled water

4. Stir in well and leave to set in a bucket with a lid, in a warm place (75^{O}F to 79^{O}F) over-night.

Day Two:

1. Drain the curd: cut the curd and ladle it into a muslin open-ended tube, tied to make a bag.

   Leave the "knot tied" bag to drain on a rack on a tray – which collects the dripping whey for a few hours. Turn the bag from time to time.

2. Potting the Quark: You will know when the Quark is ready to put into clean sterilised (plastic) pots - ready for use - when the curd falls easily away from the sides of the bag, when the bag is slightly raised off the rack at one end.

Suppliers in the U.S.A

Caprine Supply Catalogue (Cheese making and Goat Equipment)
6657 Woodland Road
Shawnee
KANSA 66218
Tel: 1-800-646-7736
www.caprinesupply.com

The Cheese Maker (Cheese making Kits and Cultures)
C/- Cedarburg Homebrew and Wine
W62 N590 Washington Ave
Cedarburg, WI 53012
Tel: 414-745-5483
www.thecheesemaker.com

New England Cheese Making Supply Co (Cheese making Ingredients and Equipment – online store available)
Box 85 Ashfield
Massachusetts 01330
Tel: 413-628-3808
Email: info@cheesemaking.com
www.cheesemaking.com

CheeseSupply.com (Online Cheese making Supplies)
P.O. Box 31125
Bellingham, WA 98228
Tel: 866-205-6376
Email: sales@cheesepeople.com
www.CheeseSupply.com

GETTING STARTED

Be meticulously clean
It is essential that all the equipment that is going to come into contact with the milk or cheese is clean and sterilised before use. This includes cleaning your hands.

For sterilising I use sodium hypochlorite from the supermarket – it is for baby's bottles and the dilution rate is on the packaging. Use cold water as hot water causes the sterilising agent to evaporate. Make the solution up fresh on the cheesemaking day.

Beware of inhibitory substances such as antibiotics, or using too strong a sterilising agent, as they may have a detrimental effect on the cheese starter culture and could ruin the cheese.

If you have an aversion to chemicals, use boiling water. In the early days of cheese making boiling water was used to sterilise.

Do not bake bread, bottle fruit, brew beer or make wine on the same day as you wish to make cheese. Yeast can grow in the cheese creating large holes, particularly in hard cheese, and as a result it will blow up like a football. Although harmless, this does affect the texture, cutting quality and appearance of the cheese. This is important if you want other people to eat and enjoy your cheese.

HOME PRODUCED MILK

Always remember that good quality cheese is manufactured from good quality milk.
Milk must be stored cool for no longer than two days. The milk must be free from taints, so be careful with foodstuffs such as roots, brewers' grain and onion weed as these may be detected in the finished product.

If you intend using raw milk and no cheese making culture, your cheeses may vary from magnificent to disastrous – that is just the way it is.

To ensure the milk is of good hygienic quality all milking equipment and receptacles must be cleaned and sterilised before use. Poor hygiene could result in bacterial taints even if the bacteria do not survive for long in the pressed cheese. The toxins produced can remain viable and may cause food poisoning – this is the main reason for pasteurisation.

EQUIPMENT

Most equipment can be found in the kitchen, although some more specialised pieces are required in order to make better cheese.

Here is a list of the things I find make life a lot easier:

Cheese vat A stainless steel pot or bucket that fits inside another larger pan - so that the milk or curds can be kept warm or heated gradually.

Thermometer Range 0 – 200^{O}F. Use an alcohol one, or a special dairy thermometer, but not a mercury one.

Curd knife For small quantities, a long, sharp, round ended kitchen knife is fine

A whisk, measuring jug, spoon and ladle An assortment of different sizes come in handy, especially a flat perforated ladle and a colander or sieve for separating the curds and whey. A measuring cylinder or syringe to measure small amounts of rennet accurately.

Cheesecloth I find plain nylon net curtaining is idea for lining the cheese moulds. For draining soft cheese however, use finer gauge cotton muslin. Cut the pieces just large enough – do not have them too big.

Cheese tray and mat A plastic-coated fridge rack is very useful to help with draining the curd and can be placed over a tray to catch the dripping whey

Hoops and moulds These are the containers that the curds are placed into to give the shape of the cheese.

Cheese press Essential if you want to make hard cheese.

Buckets and bowls Various sized bowls, yoghurt, ice-cream and food grade buckets with lids, all come in handy during cheese making. Do not use any containers with cracks or scratches, as they will harbour bacteria.

Clock or timer These are useful, as the length of time you leave each step will change the nature of the cheese.

Acidity measuring equipment Often recommended for more consistent results, to measure the pH accurately can be quite expensive. Recipes often give optimum pH measurements for different steps. For the beginner, I recommend simply concentrating on time and temperature.

What is Pasteurisation?

It is heat treatment of milk to kill off harmful bacteria (known as pathogens or spoilage organisms) which may affect the health of those eating the cheese. After heat treatment, it becomes the cheese maker's responsibility to make sure that no unwanted bacteria gain entry into the milk. Employing good hygiene ensures this.

Pasteurisation Method

The milk is heated to 150°F, using a water bath, for at least 30 minutes and then cooled immediately to 90°F. Or if the milk is going to be kept for a few days it must be cooled immediately to 41°F and stored at this temperature.

STARTER CULTURE

Starter culture is usually milk that has been inoculated with lactic bacteria. It can be obtained freeze-dried or in a liquid form. It is added to the milk early on in the cheese making process and the lactic bacteria grow and multiply and produce lactic acid. The lactic acid gives the characteristic flavour to the cheese.

I believe in keeping things simple, so I use just one general-purpose culture for all the cheeses that I make at home. The variation in time, temperature and process are the factors that make the different types of cheese.

It is possible to make your own starter, but it is not to be recommended for the beginner. It is more reliable and safe to use a commercial direct vat culture.

The culture that I use is called R704 (Mesophilic Freeze-dried Culture). There is a list of suppliers at the end of these notes

Note:

This culture **must** be stored in the freezer. It is concentrated and only the smallest amounts are required. $1/8^{th}$ of a teaspoon per 2.6 Gallons (10 litres) of milk.

I advise dividing the packet of culture into several small zip lock bags and using them one at a time. This helps to keep the culture fresh, uncontaminated and viable.

RENNET

After the starter culture milk requires an enzyme to coagulate or set it in order for it to become cheese. Water is added to the rennet to ensure an even distribution and rapid mixing in the milk.

The water is boiled and then cooled to room temperature because hot water destroys the action of the rennet. Usually the cooled, boiled water is added to the rennet in a 1:1 ratio.

Types of Rennet

Traditional Rennet is an enzyme from a calf's stomach, which causes the milk to set.

Vegetarian Coagulant (Modulaise) is generally used for vegetarian and kosher products.
It is an extract manufactured from moulds and fungi and has a very similar coagulating action to rennet.

Cottage cheese and other soft cheeses such as panir and mascaponi can be made using lemon juice, or vinegar.These form the curd by separation, as in souring, but not by coagulation and are not suitable for making hard cheeses.

Storage in the fridge

Over time and with exposure to sunlight rennet loses its activity. The supplier provides the liquid rennet in large bottles. It is good practice to transfer it into a small brown bottle from which it can be used. The rest should remain in the fridge at all times.

Renco, which is a rennet for making junket, is available usually in the dessert section at good supermarkets in New Zealand.
There is a suppliers listed at the end of these notes.

As a guide at 88°F the following table applies

Cows Milk	2.6 Gallons (10 Litres)	10 ml rennet or	10ml water or
		5 ml vegetable coagulant	5ml water
Goats Milk	2.6 Gallons (10 Litres)	15 to 20ml rennet or	15 to 20ml water or
		7 to 10ml vegetable coagulant	7 to 10ml water
Sheeps Milk	2.6 Gallons (10 litres)	5ml rennet or	5ml water or
		2.5 to 5ml vegetable coagulant	5ml water

The quality of rennet used is also dependent on the manufacturer's dilution – these are guidelines and apply to the rennet available in New Zealand at the time of writing.

The action of rennet in different types of milk is basically the same. However the quantity used must be adjusted depending on the total solids of the milk – the higher the solids, the less rennet required.

Often the quantity required needs a certain amount of trial and error adjustment to find the most suitable amount for a particular type of milk and consequently cheese.

How do I use the rennet?

Once the cooled water is added to the rennet in a 1:1 ratio, it must be thoroughly stirred into the milk that has been heated to 31°C. The pot must now be left undisturbed for 45 to 60 minutes at this temperature of 31°C. If the temperature drops during this period of time the rennet will not set the curd sufficiently, resulting in a poor soft set.
On the other hand the temperature of the water bath must not be too hot or else the resulting set will be tough.