Notes on Making a Compliant Hard Cheese

If you want to be able to sell your cheese legally, the Ministry of Primary Industries (MPI) insists that you be registered and licensed with them and undergo regular audits and inspections so they can be assured that the public is not put at any food safety risk by your cheese making operation. If you use milk from your own animals, further farm assessments will need to be made or, if you buy in your milk, then you will have to prove that your milk purchase is from an approved source and the transport of it to your premises is made in a proper manner. All this bureaucracy comes at a significant cost. However MPI does have a programme for small production cheesemakers but it is quite restrictive and only permits the making of hard cheese from heat treated milk. Briefly it is limited to people who own or lease their own animals and are responsible for their sole care and management. Under this programme 6 or less cows are permitted, or 10 buffalo, or 24 sheep or 24 goats. The cheese made must be made from heat treated milk either by thermisation or pasteurisation. It must have a moisture content of less than 39%, have a pH value of 5.6 or less and a salt-in-moisture content of not less than 4%. And the entire process of the cheese make from the addition of the commercially produced cheese culture until draining the whey shall not exceed 5½ hours.

I spent a year working with MPI while they developed this programme. All my cheese (over 140) were laboratory tested to ensure that no pathogenic material was found and that the composition followed the programme's criteria. Once the authorities were assured that these could be met, then no further microbiological testing of the cheese was required under this programme. However the cheese has to be tested for compositional content three times during the year and the raw milk is laboratory tested every 2 months. I have written more detailed instructions on how to complete this paperwork - two articles have been published in the New Zealand Lifestyle Block magazine April and May 2013 editions and also this information can be accessed from this website.

During the programme trial, over a course of a year, a few of my cheeses, which are traditional hard farmhouse ones, had slightly elevated pH levels. This seemed to occur particularly when cheese was made from late lactation milk and aged for more than 9 months. Fortunately no pathogenic bacteria was found in these particular cheeses so there were no public health safety concerns, although I got a dressing down from MPI, who were not impressed when I told them the flavour of these were really good!! Subsequently I amended the way I actually made the cheese, following advice from two really excellent books, "American Farmstead Cheese" by Paul Kindstedt, published by Chelsea Green Publishing Company ISBN 978-1-931498-77-7 and "Mastering Artisan Cheesemaking" by Gianaclis Caldwell, Chelsea Green Publishing ISBN 978-1-60358-332-9. Both these books explained the chemistry and science of the cheese making process and gave me a much better understanding of what had to be done to achieve specified criteria during the make. As this level of detail is usually not given in the more popular how to cheese make books, I have included it here, adapted from the two books mentioned previously. A pH meter is essential and I have assumed freeze dried direct vat cheese culture is used.

- 1. Warm milk to 26°C and add culture. Let it set for 2 or 3 minutes and stir gently for 3-5 minutes.

 Optimum pH level 6.6 Slow vat pH 6.6 Fast vat 6.6
- 2. Ripen the milk by increasing temperature to 32° C and maintain this temperature for 30 minutes

 Optimum pH level 6.6 Slow vat pH 6.6 Fast vat 6.55
- 3. Add rennet to the milk and stir with up & down motion for one minute, top stir until it thickens a bit (flocculation) then cover and leave to set. Goal coagulation time is 45 minutes.

Optimum pH level 6.55

Slow vat pH 6.6

Fast vat 6.5

4. Cut curd and rest for 5 minutes. Then stir slowly and begin to increase temperature to 39° C over 30 minutes. Continue to hold at that temperature and stir for 45 -60 minutes. The goal pH at the end of stirring is 6.1 to 6.2. Thus:

At 1½ hours-	Optimum pH level 6.5	Slow vat pH 6.55	Fast vat 6.4
At 2 hours -	Optimum pH level 6.45	Slow vat pH 6.53	Fast vat 6.3
At 2½ hours	Optimum pH level 6.35	Slow vat pH 6.5	Fast vat 6.2
At 3 hours	Optimum pH level 6.25	Slow vat pH 6.45	Fast vat 6.05

Let curds settle for 5 minutes (pitching). Drain whey completely. Put curds in perforated vessel like a colander over a bucket with hot water in it to keep the curds warm at around 35° - 37° C, cover and leave for 15 minutes. Cut curds into slabs (cheddaring) and turn regularly until desired texture and curd pH is 5.3. This process can take up to 2 hours. Table below calculates times from beginning of make.

At 3½ hours	Optimum pH level 6.15	Slow vat pH 6.35	Fast vat 5.9
At 4 hours	Optimum pH level 5.95	Slow vat pH 6.15	Fast vat 5.95
At 4½ hours	Optimum pH level 5.7	Slow vat pH 5.95	Fast vat 5.45

When curd texture and pH is correct, mill the curd and place milled curd into another vessel to keep warm, add salt in layers with curd and leave to mellow for 5 to 10 minutes. Mix the salt well into the milled curd and pack into the cheese former (mould also spelt mold) and press. Turn cheese in the press after 15 minutes and increase pressure. Turn again in 12 hours with more pressure. Cwmglyn Cheese is usually pressed for 36 hours.

At 5 hours less 10 minutes -f	Fast vat 5.35		
At 5 hours Optimum pH level 5.5		Slow vat pH 5.6	
Milling optimum 5½ hours Optimum pH level 5.35		Slow vat pH 5.6	
At 6 hours	Slow vat pH 5.5		
Slow vat milling 6 hours 50 minutes		Slow vat pH 5.35	

The action of the salt prevents further acidification of the curd, although further slight elevation of pH levels may occur during the ageing process especially with full cream cheese matured over several months. But by following this regime, a hard cheese with the specified criteria for this particular programme should be consistently obtained and final product pH testing should ensure the pH level is below 5.6.