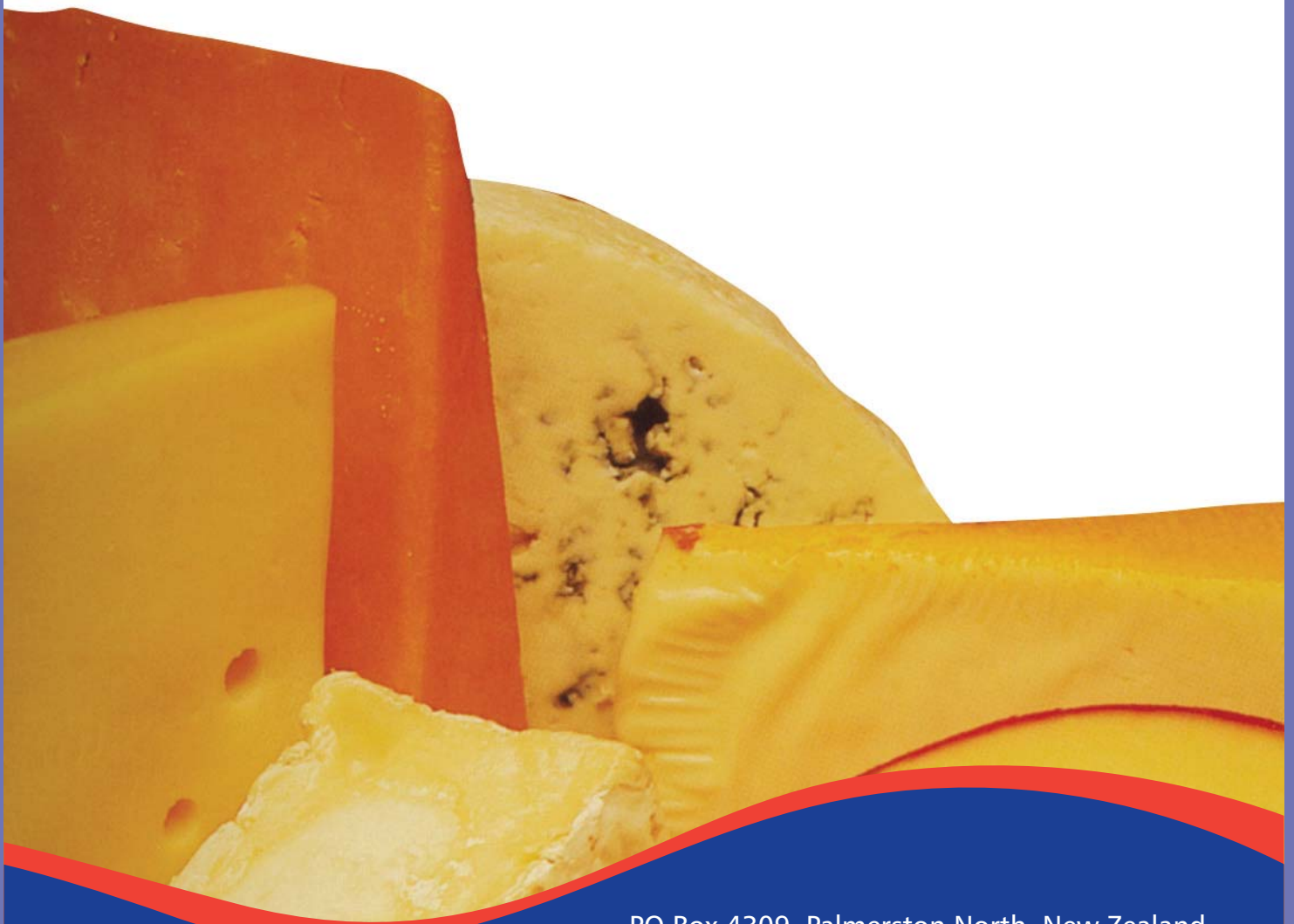


Introduction to the Cheese Making Process



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BRIEF INTRODUCTION TO THERMAFLO

We are an innovative design team working in Dairy, Juice and Food Processing industries, our work being predominantly in Asia, Australia, Pacific Basin and New Zealand. We design, build, install and commission a range of equipment for the dairy, juice and liquid food processing industries including chilling and storage systems as well as complete process lines. We have within our team many years of practical experience that is available to you. We offer a consultancy service, process flow path drawings, site drawing and technical information to assist you all the way through the stages of your project.



As we are also refrigeration, heating, ventilation and air conditioning engineers we can provide our clients with appropriate solutions not only for their process requirements but also these areas as well.

THERMAFLO has successfully completed projects for clients such as Nestle, NZ Dairy, Sanitarium, Jaffa Juice, Unilever, Milk Vita and many other companies for a range of processes that includes fresh milk, butter, cheese, yoghurt, ice cream and juice processing.



Customer service is the single most important thing to us. We all strive to achieve and maintain excellent customer relations at all times and we pride ourselves on our customer service. Quality service is maintained both from project inception through to full capacity production during the project as well as after the project has finished. It is this commitment to our customers that has enabled us to build our business and this has provided a solid base for our future growth.

BRIEF INTRODUCTION TO CHEESE AND THE CHEESE MAKING PROCESS

This booklet's purpose is to provide a very simple overview of cheese and the cheese making process. The equipment described is to set up a very basic cheese process that will produce a range of fresh and soft cheeses. THERMAFLO also designs and builds more sophisticated equipment (such as HTST pasteurisers) for specific client's requirements.

As you know cheese has been known to mankind for centuries and has been referred to as one of the foods of the Gods in Greek mythology.

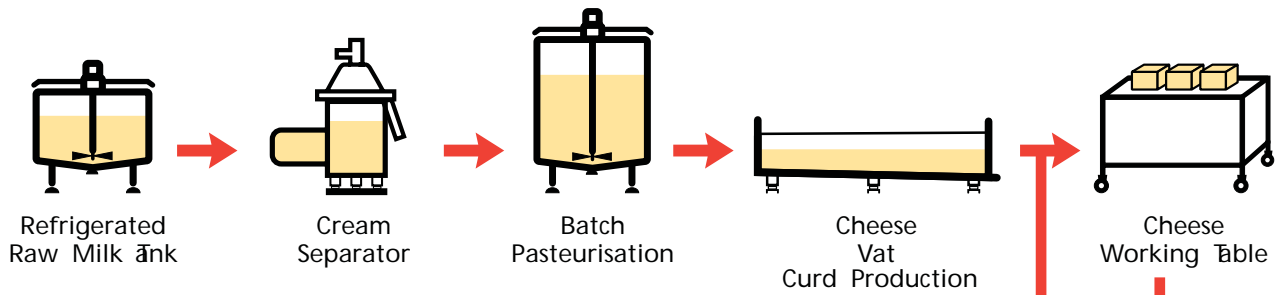
Today, there is a huge variety of cheeses available and many are unique to a specific geographical locations, having been developed over the years so that they have distinctive local flavour. Many cheese types also carry the local village, town or regions names where they originated such as Cheddar in the UK and Camembert in France.

Even although there are many varieties of cheeses they can be broadly classed into several different categories. These are extra hard (such as Parmesan), hard and semi hard cheeses (such as cheddar). These varieties of cheeses typically have been pressed using a reasonable amount of pressure and ripened or cured over a period of time and are lower in moisture content. Soft cheeses typical maybe pressed but only using a small amount of pressure, have a shorter ripening period, are cured by mould growth on the outer surfaces (such as Camembert) or interior ripened (such as blue cheeses) and have a higher moisture content.

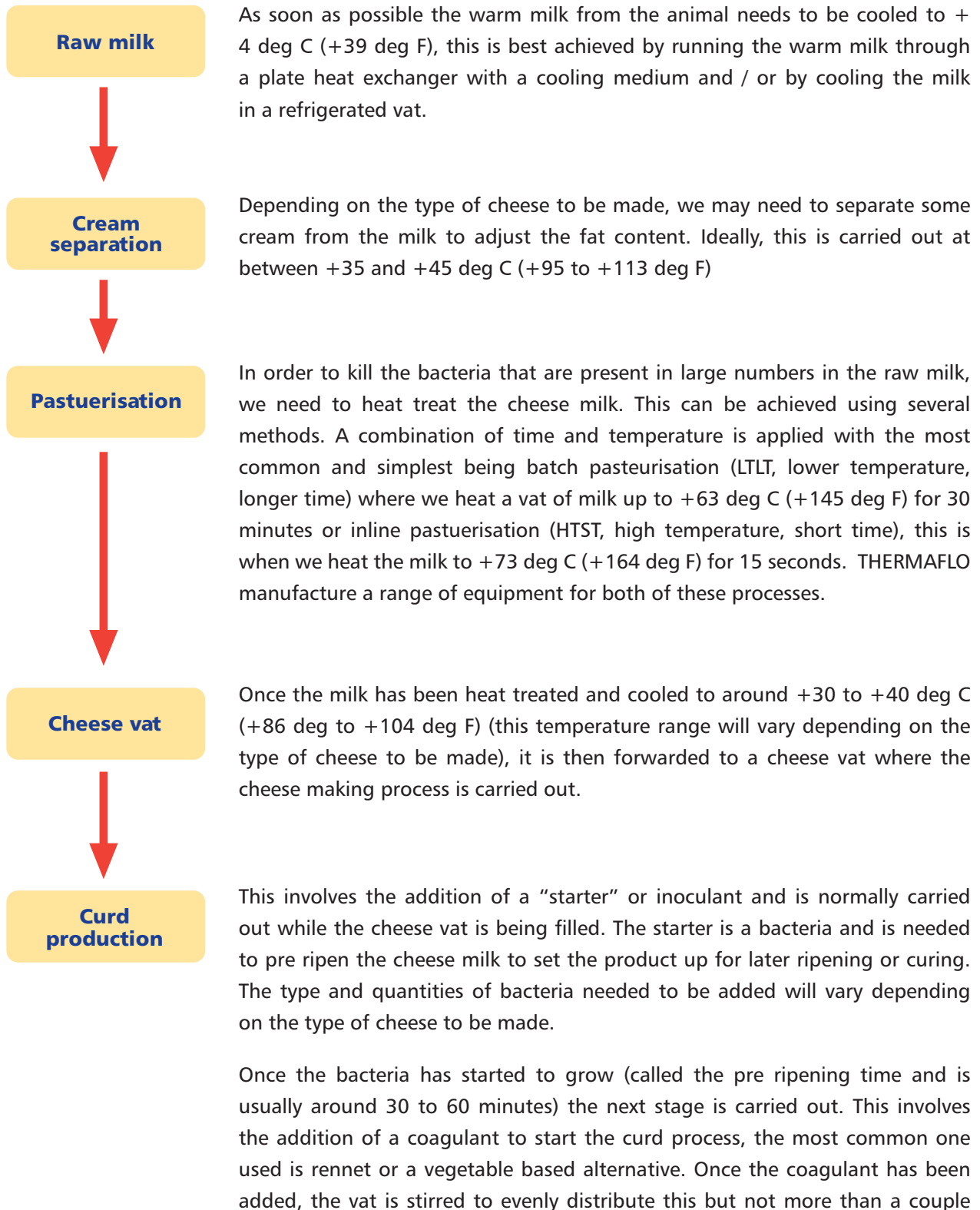
Another category are the unripened cheeses or fresh cheeses (such as cottage cheese), these typical are made and are sold for consumption within a day or two.

So once you add different fat contents of the cheese milk and different types of milk i.e. goat, sheep or cow milk to the above variations, you have a myriad of different possibilities to make up that unique cheese.





While there is a large number of cheese making methods, both traditional and modern, there are some basic main stages which are common to most types of cheeses, these are:



**Curd
Production
Continued**

of minutes so that the milk comes to a stand still in the vat within 8 to 10 minutes. The curd (most of the solids in the milk), some times referred to as clotted milk and the whey (most of the liquids) start to separate, this is usually after around 30 minutes.

Once this clotting process is complete, the curd can then be cut using specially designed cutting blades (wire knives), this gently breaks the curd up into "grains". Depending on the type of cheese being made will determine the size of the grains needed and therefore the width of the wire knives. Generally speaking the finer the grains, the lower the moisture content of the finished cheese.

From here the cheese making process becomes specific to the type of cheese being made, this may require stirring of the curd, draining of the whey, heating or cooking of the curd, final stirring etc, all at different times and temperatures.

**Moulding
and draining**

Once the curd is prepared in the cheese vat it is then scooped out into cheese moulds or "hoops" to form the shape. Depending on the cheese type, these hoops maybe pressed to help release whey from the curd (the degree and time of pressing will depend on the cheese, cheese such as blue vein and Camembert are just left to self press). Once pressed, the cheese is taken out of the moulds, if they are not in the final size after moulding they are then cut to size.

Brining

Again depending on the cheese, the moulded product is usually bathed in a salt solution, this adds to taste, retards the starter activity, helps to reduce the moisture content of the cheese and produces a smoother texture.

Ripening

The moulds are then ripened, wrapped and distributed for sale.