

White paper

# Spreadable cheese quality.

– Ingredients, process & technology

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## INTRODUCTION

### Who is this white paper for?

Spreadable cheeses – such as cream cheese and processed cheese – are now made around the world, and their variety is increasing. This white paper is aimed at all dairy operators – large and small – who are interested in starting spreadable cheese production, or who are considering expanding their current range of spreadable cheese products.

Because of the broad range of topics covered, the knowledge we lay out here is of interest not just to dairy production managers and R&D specialists, but also to business developers and marketing managers.

As a measure of its prominence, spreadable cheese has a market of around 2.2 billion kilos annually, with a compound annual growth rate (CAGR) between 2017 and 2019 of 2.7%.

### A fresh look at spreadable cheese

We'll be examining three basic types of spreadable cheeses:

- **Classic cream cheese** – made by fermenting or directly acidifying fresh cream and milk, and achieving a thicker, paste like, consistency.
- **Classic processed cheese** – made by melting cheese blocks or cheese remnants, and adding emulsifying salts. These are more savoury and saltier, and have a higher pH.
- **Recombined cheese** – both cream and processed – made with a high proportion of powdered ingredients.

We'll cover the basics of producing these three distinct types of cheese, as well as the best methods for achieving the underlying structural changes – and what makes a quality product. But along the way we'll also examine how dairy processes can be modified to exploit new opportunities through product flexibility and careful process planning. A few examples:

- Lowering fat content, to meet consumer expectations.
- Introducing plant-based recipes. Replacing dairy fat with vegetable fat to satisfy vegetarian and vegan preferences.
- Increasing recipe flexibility by introducing or increasing the use of solid and powdered ingredients, which depends strongly on the type of mixer you use.
- Reducing product leftovers and avoiding costly wastage, primarily by tailoring recombined recipes.
- Considering additional treatments to achieve longer shelf life and even ambient products.

Together with our customers and partners, we've been exploring these topics for years. Now we'd like to invite you to start thinking of your spreadable cheese processes in a new way.

## **Research collaboration**

At Tetra Pak we take great pride in being in the forefront of food technology science. We regularly collaborate with the most trusted universities and research institutes in the field. For this white paper we have had a fruitful collaboration with NIZO in the Netherlands. It is widely acknowledged as a leading Contract Research Organization supporting dairy, food and health companies with the development of new applications and accelerating innovation. With over 70 years of dairy experience, NIZO operates one of the most advanced R&D centres with laboratories for chemical, physical, microbial and health research, as well as food-grade product development facilities at laboratory and pilot plant scale.

## WHAT IS A SPREADABLE CHEESE?

Spreadable cheeses are products obtained by coagulation of milk proteins (by lactic acid fermentation or acids, and in some cases with rennet), preceded or followed by concentration or melting. Thanks to those processes, the products achieve a specific molecular network and a structure that gives them a thicker, paste-like consistency and a spreadable rheological behaviour. Fat is incorporated within this protein network in order to achieve the desired taste and texture. Spreadable cheeses exist in many different variants with quite varying appearance and taste, but the basis is generally dairy proteins and dairy fat. It is possible to exchange these components for vegetable-based components, where the latter often require adding a stabilizer. The most common variants of spreadable cheese are cream cheese and processed cheese.

	Ingredients	Processing
Cream cheese	Fresh cream and milk	Fermented or directly acidified, then concentrated
Processed cheese	Cheese blocks or cream cheese or quark	Melting cheese blocks, adding emulsifying salts, and possibly flavourings
Recombined (cream or processed) cheese	Powdered ingredients and milk solids, as well as fats in the form of butter, liquid milk fat, or vegetable fat	Could use fermentation or direct acidification

### Cream cheese

A cream cheese generally has a rich and creamy mouth feel with a smooth, lump free texture. It has a uniform white to light cream colour with a taste that can be characterized as pleasantly sour with a fermented taste. A full-fat cream cheese is rich in dry matter, with a total solids percentage of about 45%, of which about 70% is fat. The product pH is around 4.6 – 4.8.

Traditionally, cream cheese is made with fresh milk and cream that are mixed to the desired fat/protein ratio. This mixture is then fermented and concentrated to achieve the desired product properties. However, it is also possible to achieve a high-quality cream cheese by recombining powdered ingredients as well as direct acidification, for example with GDL (Glucono delta-lactone), or lactic or citric acid, instead of fermentation.

The preferred product properties of a cream cheese are quite similar globally: consumers desire a rich and creamy taste and texture, and a cream cheese is often seen as a treat.

## **Spreadable processed cheese**

In comparison to cream cheese, processed cheese has a milder, savoury taste with less acidity. The colour can vary but is commonly more yellowish, although white variants exist. The dry matter occurs in wider ranges in comparison to cream cheese, although on average it could be considered similar, with values of 45%. The fat content of the dry matter also varies more, with values from around 45% to 70% fat dry matter. The pH is always higher than cream cheese and is generally around 5.7 – 5.8, corresponding to a less acidic taste.

Traditionally spreadable processed cheese is made by melting a cheese base. It could be ripened cheese blocks (cheddar is common), or a cream cheese or quark base. By adding emulsifying salts, the casein network in the base is broken, the proteins are rehydrated, and will emulsify fat released from the matrix (as well as any added fat) to achieve the desired structure. Generally direct acidification with lactic or citric acid is used to achieve the desired acidity, although there is a possibility to use fermentation using specific cultures as well, if such a taste profile is desired. The cheese base can be substituted with recombined ingredients, which increase composition flexibility compared to melting pure cheese blocks.

The many manufacturing methods can be related to the wide variety of spreadable processed cheeses available in the market. Products may be intended to be used as dips, bases for cooking or sandwich spreads. Adding spices or small vegetable pieces is rather common.

## **Special variants, from low-fat to high protein to vegan**

Regardless of whether a cream cheese or a spreadable processed cheese is desired, several special variants are available. One of the most common variants is a low-fat version, which is produced by many consumer brands. Generally, in order to achieve the desired texture, stabilizers and thickeners are used to produce a mouthfeel similar to the full-fat variants and to ensure enough water binding to the matrix.

Extra-protein versions also exist, primarily for cream cheese, where additional protein has been added to the product. For this variant, additional ingredients are needed to mimic the taste and texture of the original product.

The market for spreadable cheese is also adapting to vegetarian and vegan preferences within almost all segments of the food industry today. Both the dairy protein and fat of the traditional product can be exchanged for vegetable counterparts. Protein sources can be, for example, peas, soybean or oat proteins, while the fat phase can be based on a blend of vegetable oils, where coconut oil or palm oil may be present. Unfortunately, vegetable protein sources usually have reduced emulsification potential and are less soluble than their dairy counterparts, which thus creates a need for adding stabilizers and, potentially, emulsifiers for vegan products.

## QUALITY CHARACTERISTICS

### Consumer expectations, preferences and trends

Spreadable cheeses are enjoyed by all ages globally. Cream cheeses are mainly used in desserts or as spreads on their own, while processed spreadable cheeses have more varying uses, such as dips or cooking bases, where consumers are looking for time-savers.

In addition, cream cheeses are associated with typical dairy processing and are frequently made in dairy plants, while spreadable processed cheeses are manufactured in specialized factories. Cream cheeses thus enjoy a fresher image compared to spreadable processed cheeses.

Consumption of spreadable cheeses also follows the global “good for you” trend noticeable within most food production segments, where spreadable cheese is seen as a natural, fresh type of snack. However, consumers would like to avoid preservatives, artificial flavours and even stabilizers in order to have a clean label. Low-fat variants of spreadable cheeses have been with us for a while, but in order to further claim “good for you” properties, high-protein formulations have also started to appear in the market.

Another global trend starting to make its way into spreadable cheese manufacturing is the “future-friendly” food. As a result, consumers can start to look for a reduced content of animal-based proteins, aiming for vegetable-based replacements. Fully vegan spreads have also started to appear.

But consumers also want to enjoy spreadable cheese in convenient on-the-go packaging, which would entail consumption from smaller portion packs suitable for ambient transport and storage. They would also like to easily try flavours from different geographies in their local cuisine. Thus there is a growing market for local variants of spreadable cheese.

### Desirable structures and networks

There are two words used to describe spreadable cheese characteristics, and they are sometimes used interchangeably. We prefer to distinguish them when we can.

- **Network** – refers most often to the molecular level in the cheese, the results of chemical changes due to the production treatments.
- **Structure** – refers most often to how we perceive the cheese, so it’s about firmness, mouthfeel, and texture.

In addition, there is another word used in dairy operations that has more than one special meaning, **creaming**:

- In most of the dairy world, creaming is the *undesirable* agglomeration of fat globules that rises to the surface of milk products. It is counteracted by homogenization, which breaks down those fat globules and retards their tendency to rise.

In the world of processed cheeses, what we call creaming is desirable, because it describes the process step in which fat is emulsified by hydrated proteins. The heat



and shear applied enhance moisture binding by the proteins and reduce the size of the fat droplets over time, which thickens the molten mass, hence *creaming*.

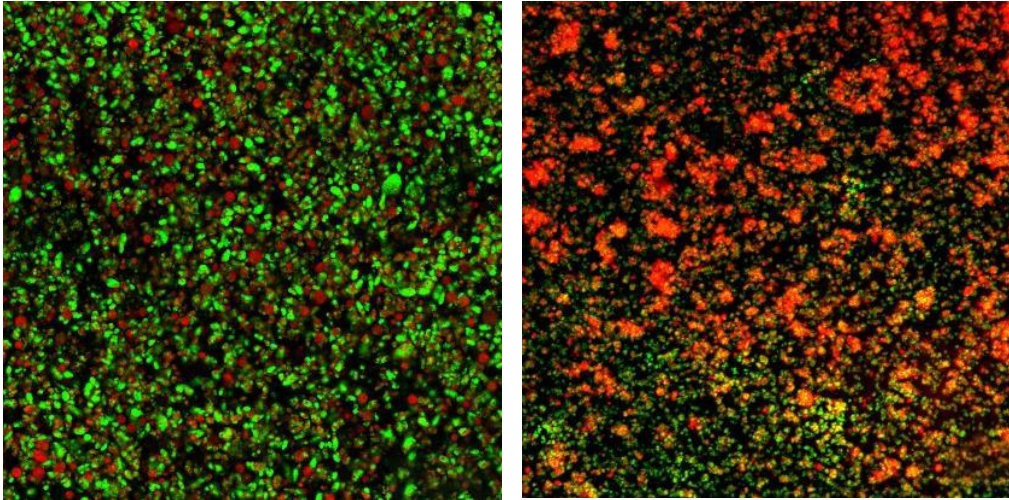
### **Cream cheese network**

To achieve a high-quality cream cheese, the colloidal stability of the milk and cream dispersion needs to be disrupted. This is achieved by heat treatment and acidification. Heat treatment will denature the whey proteins present in the milk, which to a large extent will then attach themselves to the casein micelles.

If the heat treatment is followed by acidification (commonly achieved by fermentation) the change in pH will lower the repulsion between the casein micelles to the extent where it is practically gone (the iso-electric point). At this pH-point, the casein micelles will cluster, forming a continuous network, or gel.

The temperature and duration of the initial heat treatment determines the degree of the denaturation of the whey proteins, where more denatured whey proteins will expose more thiol groups, causing sulphur bridges between the whey proteins bound to the micellar surface of the casein clusters, reinforcing the gel network. This type of thicker protein network can hold more water, so it is less prone to syneresis (the release of water and whey from the network during storage). The protein gel can also be fortified by additional protein (powder addition). It is important, however, to ensure solubility and hydration of the powder particles to eliminate grittiness in the end product.

If fresh cream is used as the fat source, homogenization is necessary to reduce fat globule size and secure their proper dispersion and emulsification. The surface of the newly created, smaller fat droplets will then be mainly covered by milk proteins. This coverage allows the fat droplets to take their places as active fillers, interacting with the components of the protein gel. Thus, homogenization enables the fat droplets to interact with the protein network, rather than counteracting it. The size of fat globules, and their interaction in the network is affected by the homogenization pressure, and will affect the final product's appearance and other characteristics. For example, both images in **Figure 1** show acceptable products, but they have a different mouthfeel due to the size of the fat droplets.



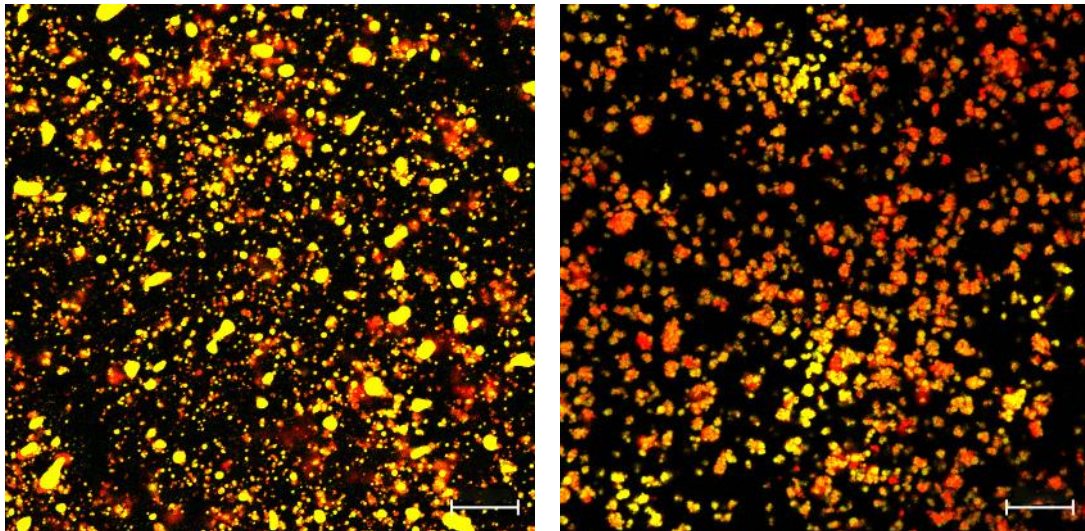
**Figure 1.** Two different cream cheese samples showing how fat is distributed in a continuous protein network. The images are acquired using scanning laser confocal microscopy; the fat phase is stained red and proteins green. (Photos – NIZO on left; ImageniT on right).

Butter and anhydrous dairy fats (e.g. butter oil) are forms of dairy fat from which almost all native fat globule membrane material and water have been removed. To assume the role of an active filler they need to be properly homogenised and emulsified to create new and relevant fat globule membranes that can later interact with a protein network. By elaborating with fat sources and droplet sizes (dispersion, homogenization, emulsification), you can obtain different product structures and mouthfeels.

The firmness of the final product will always be determined by both the firmness of the protein matrix and the fat phase. Thus, a recipe based on recombinated ingredients could tailor both the protein and fat content, to achieve a target network strength and a desired structure. In addition, downstream processing (homogenization) can be used to modify the original structure.

### **Processed cheese network**

The classic way of making processed cheese is to melt cheese blocks or a quark or cream cheese base. If this base is just heated, the water bound in the protein fat matrix is removed, causing shrinkage and aggregation of the matrix. Prolonged heating is likely to cause a separation of the fat phase, generating an overall quite unpleasant end result. The key to avoiding this is emulsifying salts. The main role of the salts is to bind the calcium stabilizing the casein micelles, which makes the micelles dissociate into smaller casein components, which in turn exposes hydrophilic parts to the surroundings, reacting with water molecules into a hydrated state, turning into powerful emulsifiers.



**Figure 2.** Fat structure of classic cream cheese (left) and classic processed cheese (right). Note the finer, more monodispersed fat phase as a result of the creaming process on the right. The images are produced by scanning laser confocal microscopy and an oil immersion lens. Fat is stained red, the protein green, resulting in co-localized as yellow. Note a higher magnification compared to Figure 1. (Photos: Imogene-iT).

During prolonged heating and shearing, these hydrated casein components will emulsify free fat released from the matrix. During the creaming process the fat is emulsified into smaller and smaller droplets during shearing, which generates a fine, more monodispersed emulsion of fat droplets in a concentrated dispersion of casein components. In comparison to cream cheese, the network of processed cheese contains a finer protein matrix (finer protein strands) and smaller fat droplets (see [Figure 2](#)). There is, however, an optimal point after which both these factors start to decrease; prolonged processing after this point is called *overcreaming* and destroys the desired structure.

Depending on the intended structure and the mixing equipment available, a homogenization step might be necessary to achieve the smallest possible fat droplet size, which will result in the smoothest possible texture and thicker consistency of the final product.

A manufacturing process based on utilization of different cheese bases (cheese blocks, quark base, cream cheese base) can easily be replaced by recombined ingredients (caseinates and whey powders for the protein matrix) and dairy or vegetable fats.

### **Measuring quality during processing**

Assessing the quality of a spreadable cheese – especially its structure – is not an easy task since it is often described in terms of “mouthfeel”, “creaminess” and “appearance”. These parameters are difficult to assess in a qualitative way using a scientific approach. But as luck would have it, there are some more well-established parameters, measurable with scientific methods, that do correlate to the quality characteristics mentioned.

### **Firmness and stickiness**

You can measure the firmness of a product based on the force required by a probe – a texture analyser – to penetrate a certain depth into a product matrix. By removing the probe again, you can obtain a value of the stickiness of the product. Both these values relate to the structure of the network which, in turn, is dependent on the ingredients and processing. The obtained values relate largely to mouthfeel, although no clear reference values yet exist – it varies from product to product and consumer preferences. If the structure becomes too firm though, it affects spreadability, which generally is considered to have a negative effect on consumer acceptance. Such products are sometimes described as brittle.

### **Coarseness – graininess, grittiness and sandiness**

The coarseness of a product reflects the presence of small particles. Differences in particle size and hardness are commonly described by different terms. If softer grains are present the *graininess* may be due to curd particles (separate protein/protein-fat aggregates) with a structure or hydration level that deviates from the rest of the network. Such grains are often soft, reasonably large, and can sometimes be dissipated by stirring or homogenization.

Due to processing conditions (such as excessive heating), such grains could lose their ability to bind sufficient water and shrink and harden as a result, which could turn the description of the product into *gritty*.

If a product is perceived as *sandy* it is often due to insufficient recombination of powdered ingredients. Some particles have not achieved enough hydration and will, when dispersed in the matrix, give a perception of sandiness, and sometimes a dry texture.

While there were no clear references for firmness/stickiness for spreadable cheese, a high-quality spreadable cheese can, with few exceptions, be stated to be smooth.

### **Syneresis/whey separation**

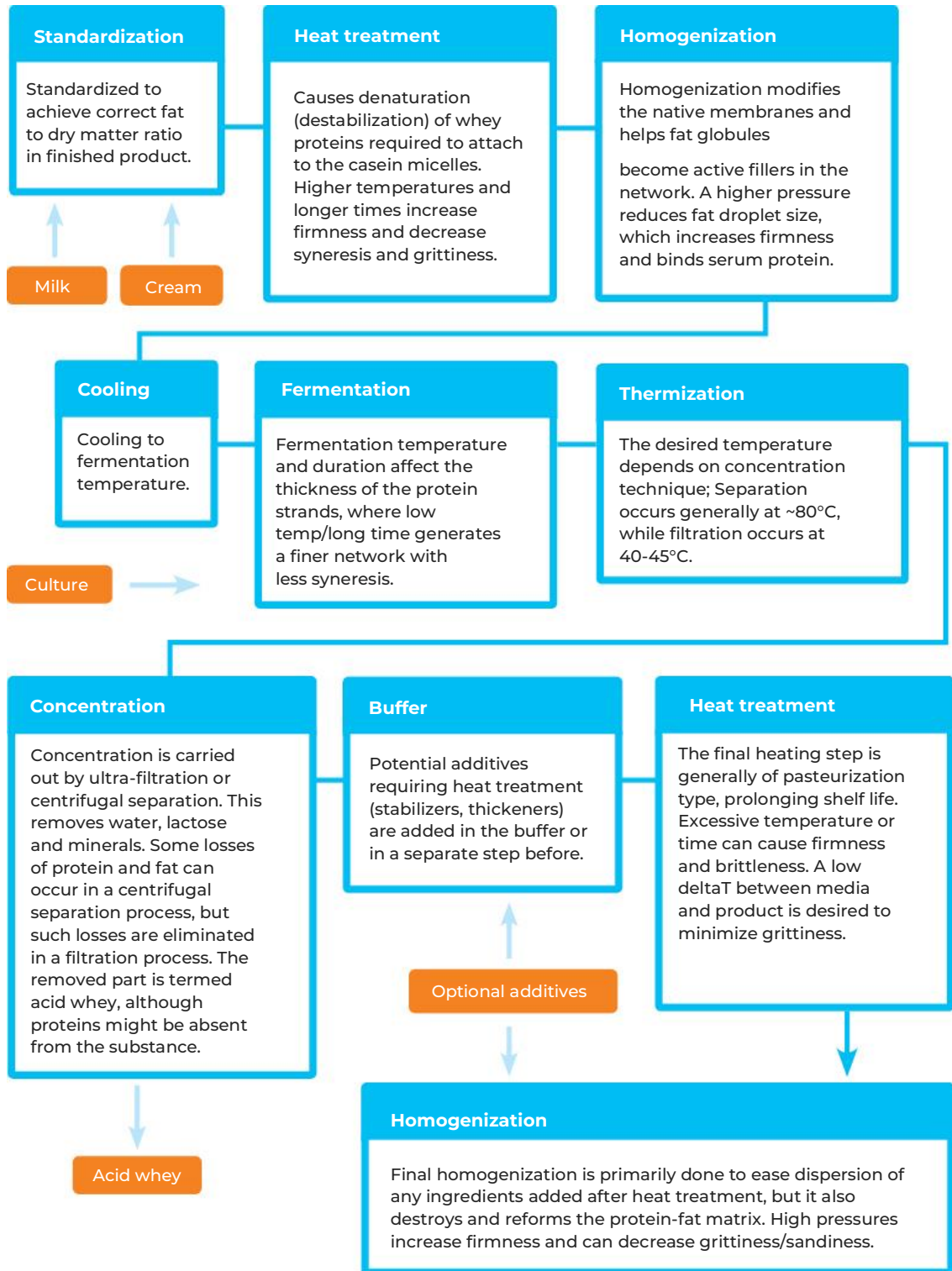
The structure of cream cheese and its water binding ability, as we mentioned earlier, depend on creation of a dense network of casein micelles linked with whey proteins, with fat globules acting as active fillers.

If the network is not dense enough or if there is excess of water, the liquid phase (containing soluble components like lactose, acids, minerals, non-denatured whey proteins etc.) will run out and become visible in the package. This phenomenon is called syneresis. To reduce or eliminate syneresis it is necessary to increase water binding ability of the network and/or reduce amount of water. Excessive syneresis is generally not accepted by consumers and so its absence is a quality marker for cream cheese.

During manufacturing several steps are necessary, including stabiliser mixing, in order to create a high-quality network with sufficient water binding ability. For a classic cream cheese much of the whey is removed during the concentration step as a by-product, termed *acid whey*. For the recombined option of cream cheese, recipes are formulated to completely eliminate creation of acid whey, by adding functional whey proteins as ingredients, typically in combination with other stabilizers.

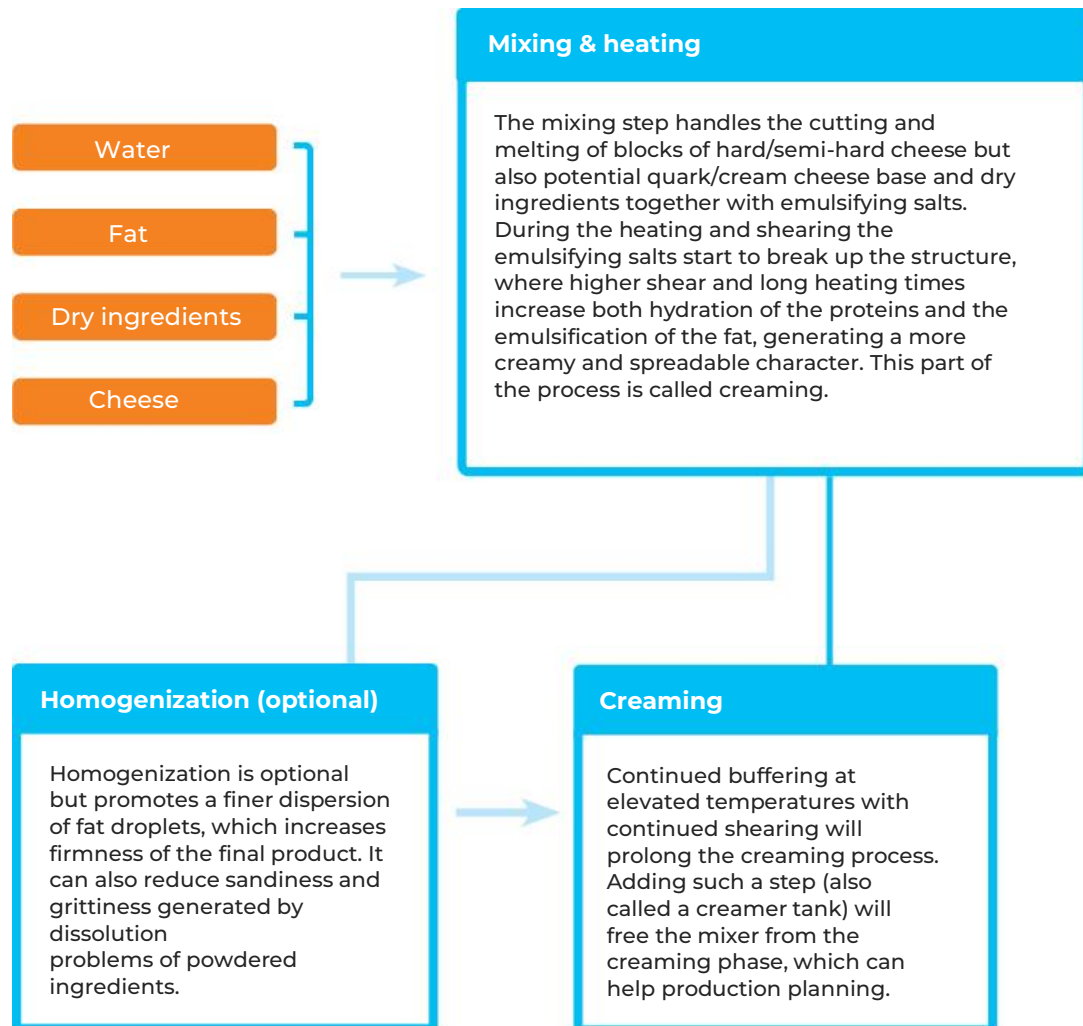
## A classic cream cheese process

The classic way of making cream cheese – and producing a high-quality network – is a continuous process utilizing fermentation and concentration.



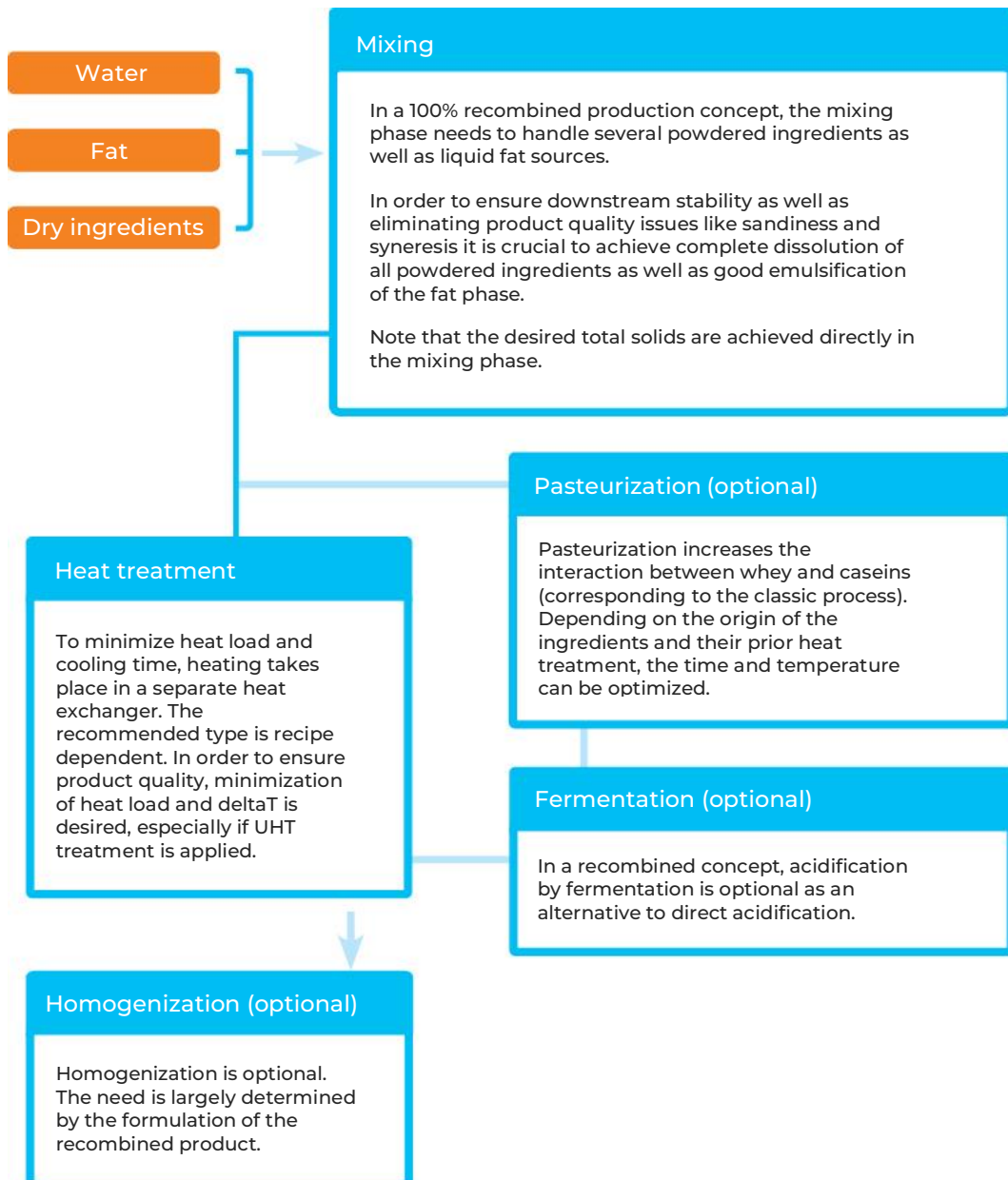
## A classic processed cheese process

The classic way of making processed cheese is with a batch process.



## A recombined process for spreadable cheese

Using a recombined concept working with 100% powdered ingredients eliminates potential issues of quality consistency that may be due to variation in ingredient composition of fresh milk or cheese blocks. The same concept can also be used to manufacture both cream cheese and processed spreadable cheese. By tailoring the composition using recombined components, together with a UHT heat treatment in suitable heat exchangers, this production concept enables aseptic processing as well as packaging, which in turn enables ambient distribution and storage (see *Ambient products in sight*).



## KEY ENABLERS OF SUCCESSFUL PROCESSING

### Mixing in a high-shear mixer

With the exception of the classic cream cheese production concept, the mixing step is among the most vital operations of the line.

During the manufacturing of classic processed cheese, efficient shearing in combination with heating is an absolute necessity to ensure the important steps of grinding and melting of the cheese blocks in as well as initiating the creaming process (see *A classic processed cheese process*).

In the recombined production concept for spreadable cheese, efficient powder dissolution and dispersion is very important, which can be difficult if the recipe requires cold swelling thickeners or stabilizers. In addition, proper emulsification of the fat phase of a recombined product is required to achieve high product quality and stability over time. Adequate heat regulation during the mixing phase is also necessary, in order to handle different fat sources at optimal temperatures.

A versatile high-shear mixer can solve all these challenges. For classic processed cheese, a unit fitted with optional knife blades could allow the feeding of large blocks of hard cheese directly into the unit, eliminating the pre-grinding/cutting of cheese blocks. The mixer should be designed to handle cheese blocks and powdered or liquid ingredients equally well.

The design of the mixing vessel should promote both efficiency and flexibility of processes and recipes. It should be capable of supplying heat for cheese melting as well as for the creaming process, with the option of direct steam injection to fine tune the process with very rapid heating steps. This will allow a greater flexibility in the ingredient market to ensure high quality production, even if variation in the sourcing of cheese blocks occurs.

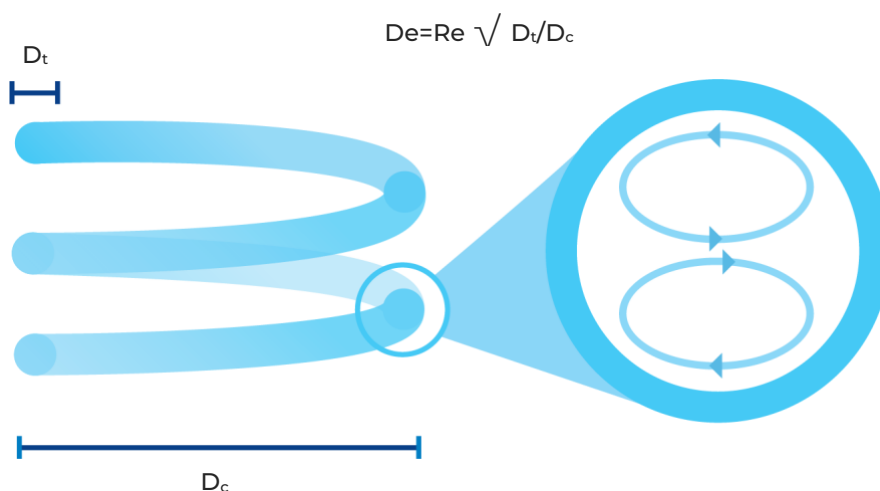
For a recombined concept, the high shear achieved in the unit should allow for dispersion of all powdered ingredients, to eliminate sandiness. The high shear should also ensure rapid, complete emulsification of liquid fat. Very small droplet sizes are required to ensure a stable formulation over time and can eliminate the need for downstream homogenization. If the unit has a variable shear capability, then in combination with the vessel agitator it should be able to function as both a high shear mixer and a gentle blender, which allows an optimized creaming process of classic processed cheese, as well as incorporation of particles into the final product matrix, if so desired.



### Final heating in a coiled heat exchanger

Both classic cream cheese production as well as the recombined concept for spreadable cheese include a heating step for the final fully formulated product. This heating step finalizes the structure and ensures the target shelf life. Due to the high final viscosity of a spreadable cheese product, it is difficult to obtain an acceptable pressure drop while ensuring runtime, due to fouling. Thus, the market is dominated by heat exchangers based on a “scraped surface” design. But in such units the product residence time as well as the  $\Delta T$  between product and heating media are not always optimal, if the objective is to achieve the highest possible quality with minimized grittiness. These factors become more pronounced in the context of UHT treatment.

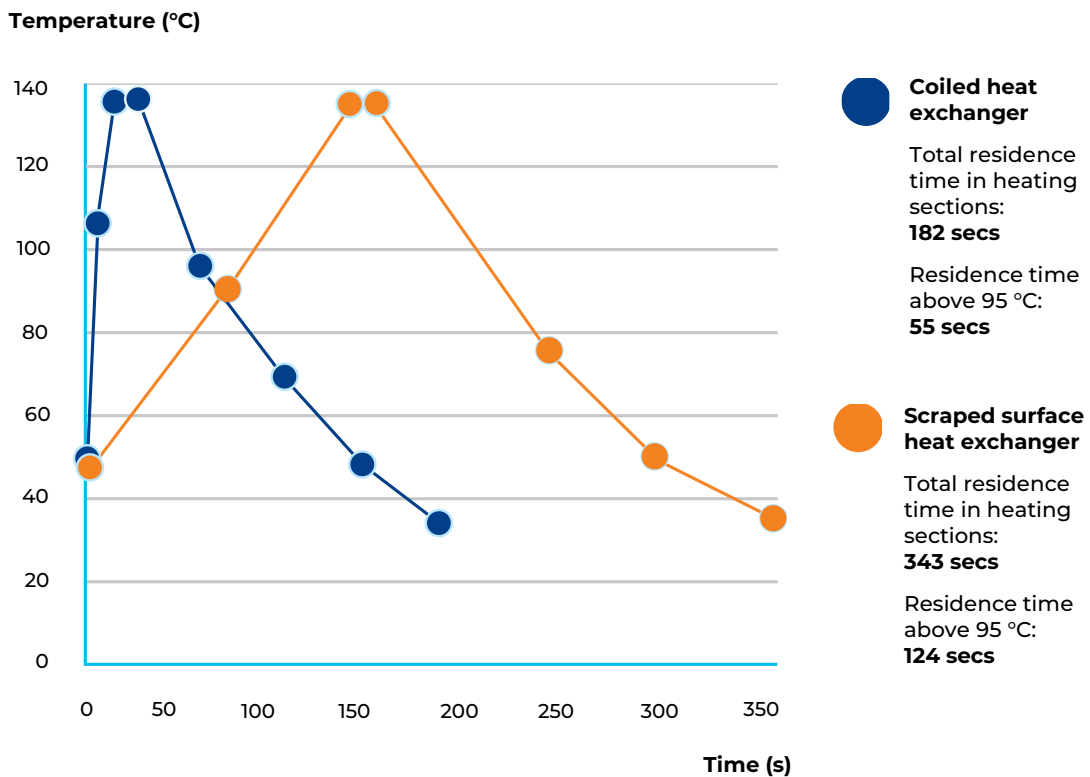
An innovative new design involving coiled heat exchangers delivers a number of advantages. The very high-pressure rating of the coils allows them to withstand large pressure drops, which in turn enables a very high product velocity through the coils. The high velocity and the narrow coil design produce something called the *Dean Effect*. This generates a secondary flow pattern that increases heat transfer, resulting in a more rapid heating and cooling compared to scraped surface heat exchangers, which in turn minimizes heat load and thereby better preserves product colour and taste. In addition, fouling is minimized by the increased shear forces generated by the high flow velocity at the walls of the tube.



**Figure 3.** Secondary flow in coiled tubes, generating the Dean Effect.

The Dean Effect in a coiled tube can be explained this way: the velocity near the centre of the tube is always greater than the velocity of the fluid near the wall (laminar flow), so the fluid near the centre is subjected to a greater centrifugal force. This difference in centrifugal force creates a secondary flow perpendicular to the tube axis consisting of two symmetric vortices, called the *Dean vortices*. The magnitude of the Dean effect ( $De$ ) can be calculated in a formula involving the ratio between the tube and coil diameter, as well as the Reynolds number ( $Re$ ), which is the ratio between the inertial forces and the viscous forces in the fluid.

The rapid heat transfer has a profound effect if UHT treatment (140°C) is used, as **Figure 4** illustrates. Using a coiled system, residence time above 95°C, as well as the total residence time, are roughly half those of a scraped surface system.



**Figure 4.** Comparison of heat load in coiled vs. scraped surface heat exchangers.

The decreased heat load minimizes chemical alterations to the product during UHT treatment. For example, longer exposure to heat treatment accentuates the Maillard reaction, which causes increased product browning. This is not always present directly after heat treatment but might appear after some time in storage. You can see the clear impact on product colour in **Figure 5**.



**Figure 5.** UHT treated spreadable processed cheese samples from a Tetra Pak® Coiled Heat Exchanger (left) and a scraped surface heat exchanger (right) after five months storage at 5°C (lower samples) and 30°C (upper samples).

## **Ambient products in sight**

As we just saw, a coiled heat exchanger enables a much shorter residence time and a lower heat load applied to products like spreadable cheese during UHT treatment. As a result, both cream cheese and spreadable processed cheese, which were previously considered impossible to process and fill aseptically, are now enabled for ambient distribution.

It is currently possible to implement aseptic lines, given our current capabilities. The possibility of more heat-stable formulations, in combination with advanced mixing and heating technologies, allows for aseptic UHT processing of both cream cheese and processed cheese in the same recombined line concept. Both types of products can also be aseptically packed in sustainable carton packages of convenient portion sizes.

## **Increased protein functionality**

An optimized heat treatment is not enough to ensure the highest possible quality; product formulation is also a vital part. An additional key objective is the increased heat stability and increased functionality of whey proteins, which is achievable by denaturation followed by colloidalization (Dissanyake et al. 2013).

If pure whey proteins are denatured to a gel by heat at low pH, and the gel is then subsequently sheared, small particles are obtainable called microparticulated whey. By allowing the denaturation and aggregation to occur at different pH levels, different temperatures and different calcium concentrations, you can obtain whey protein particles with different sizes and different properties (Raikos 2010, Ipsen 2017). These particles can be spray dried while maintaining their properties, which allows them to be added as ingredients in a recombined spreadable cheese process (Ipsen 2017).

Addition of microparticulated whey can be used to increase heat stability of emulsions and to increase water binding capacity of acid milk gels. Thus, they can be used to induce gel firmness and to counteract graininess and syneresis in spreadable cheese (Ipsen 2017). In addition, microparticulated whey can increase the sense of creaminess in a dairy fat product, as the very tiny particles affect mouthfeel.

Using the recombined option, and combining microparticulated whey with different properties, ingredient suppliers then have a great deal of flexibility in tailoring recipes to achieve a number of difficult target formulations, for example:

- Clean label formulations using no stabilizers
- High-yield recipes
- Products with reduced syneresis
- Heat-stable formulations
- Increased creaminess in low-fat formulations
- ... and many more possibilities.

## TETRA PAK – YOUR PARTNER IN PROCESSING

We have solid experience within spreadable cheese production, as well as many other food processing categories. Our customer and solution experience are based on deep understanding and extensive specialist knowledge. We are able to offer customized solutions targeting your requirements and can help you design or upgrade lines based on your specific processing needs, with the lowest total cost of ownership.

At our Product Development Centre (PDC) in Lund, Sweden, and our Technology Test Centre (TTC) for mixing in Aalborg, Denmark, customers can carry out spreadable cheese product trials together with our specialists with unique comprehensive expertise in food processing. The TTC addresses batch processing while the PDC addresses both batch and continuous processing. Customers can experiment with recipes and use the latest processing equipment.

Thanks to our well established industrial and technology profile, we can support your innovation and production, helping you meet the changing tastes and demands of your marketplace. The right plant design and processing design can offer you unlimited new business opportunities – through new products, improved quality, and lower costs. We offer:

- Extensive knowledge of processing technologies, as well as how to implement them
- PDC, TTC and dedicated technology specialists
- Valuable knowledge and experience through partnerships with suppliers of technology, ingredients and supplies
- Processing modules and line concepts for a wide range of mixing and heating technologies , as well as filtration and separation
- End-to-end offerings, handling everything from incoming raw ingredients to pallets of finished products on your loading dock.

We rely on a great deal of R&D expertise to keep our products and solutions at the forefront of the food processing industry. As an innovator, we actively explore and develop the challenges of the food and beverage industry. We collaborate with customers, universities, and other business partners to develop new applications and find the best solutions for producing new products with flexibility. We develop customized solutions for your needs and maintain a leading position in developing new technologies and new line concepts.

For more information, visit our website:

<https://www.tetrapak.com/processing/spreadable-cheese>

Or contact us: [taste.success@tetrapak.com](mailto:taste.success@tetrapak.com)

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