we are experts in emulsifiers and stabilizers for bakery, confectionery, dairy, ice cream, margarine and fine foods - and we're happy. Share our expertise, our company values can be defined in just three words: loyalty, responsibility and commitment.

we aim to be the preferred partner and supplier of quality products, application service and know-how to regional and multinational food companies. We are dedicated to getting the best results for our customers. We care about our employees and have a declared aim that Palsgaard must be a pleasant place to work. Palsgaard knows that our most important resource is the know-how and dedication found in our employees.

Palsgaard® SA 6620 - The “leaner” label cake emulsifier
Consumer demand for leaner label products or labels with less E-numbers are growing stronger and stronger. For industrial producers of cakes this challenge is difficult to overcome as consumers at the same time demand high quality cakes at low cost together with healthier cakes.

A lot of demands at the same time, but Palsgaard can offer the long term solution to these and other challenges with our activated cake emulsifier Palsgaard® SA 6620 specifically designed for industrial baking.

In this article we present 8 major benefits, and 5 additional advantages of using Palsgaard® SA 6620 in industrial cake production.

1. The “leaner” label cake emulsifier
Palsgaard® SA 6620 is targeted at non-aerated and aerated cake batters such as pound cakes, muffins, cup cakes, Swiss rolls and all types of sponge cakes. Palsgaard® SA 6620 is a sophisticated activated cake emulsifier with the simplest possible declaration. Palsgaard® SA 6620 comes in powder form and consists of a natural activating medium (wheat flour), and of the emulsifier Polyglycerol Ester (PGE). We call it “1+0” as it contains only one ingredient that needs to be added to the label, since wheat flour, in most cases, is already on the label. This is the simplest possible declaration for an activated cake emulsifier.

Several industrial cake emulsifiers contain 4 additives/E-numbers or even more. Add to this the same number of different carrier materials such as sorbitol, propylene-glycol, glycerol, ethanol, skim milk powder, caseinate, soy protein, maltodextrine, sugar, water, preservatives, etc.: It makes a long list of ingredients, and it can be difficult to decide on the correct labelling, especially if these ingredients are also a part of other functional ingredients such as flavours, preservatives, etc.

With Palsgaard® SA 6620 this long list of ingredients can be reduced to “1+0”. That makes it very easy to label, calculate nutritional profiles and decide on correct declarations.

2. Healthier cakes
Equally strong as the demand for leaner labels is the consumer demand for healthier cakes. Each year the pressure is increasing. First trans fats had to be removed from cakes, and now the pressure is increasing on saturated fats. This means that vegetable fat sources such as hydrogenated fats, shortenings, margarines, etc are under pressure to be reformulated or taken out of cake formulations or alternatively be replaced by healthier unsaturated fat sources.

The good news is that Palsgaard® SA 6620 offers the solution: With Palsgaard® SA 6620 it is possible to substitute fat sources with high amounts of saturated fats for healthier liquid vegetable oils with a high amount of unsaturated fats. Possible liquid oil sources could be sunflower oil, soybean oil, rape seed oil, cotton seed oil, etc.

Palsgaard® SA 6620 has the advantage that it can carry high
amounts of liquid oil, making this activated cake emulsifier the perfect long term solution for healthier cake formulations.

3. Extended shelf life
Shelf life is a very important issue in industrial cake manufacturing. Palsgaard SA 6620 has a starch complexing effect due to its content of specialized emulsifier. It will delay the retrogradation process, increase the softness of the cake and shelf life is therefore extended.

4. Positive product claims
Consumers increasingly consider product claims important when deciding on their purchases, which makes it important for industrial cake manufacturers to consider what claims to put on their products. Palsgaard® SA 6620 offers a long list of positive product claims that can added to the labelling, depending on the formulation: Examples of claims with Palsgaard® SA 6620 can be reduced/lower saturated fats, no trans fats, less additives, no preservatives, non-GMO, Kosher & Halal.

5. Easier product development
As Palsgaard® SA 6620 only consists of one emulsifier and one activating medium (wheat flour), it is now easier to make adjustments when developing new products or making adjustments to existing ones. As it is no longer necessary to consider multiple ingredients and effects, which are often contradictory or undesired, it paves the way for safer and less costly product development.

The fact that Palsgaard® SA 6620 can carry high amounts of liquid oil also means that it is possible to develop juicier cakes with softer bite and texture, and to achieve more and longer softness during storage, compared to cakes that are high in saturated fats as cakes with harder fats tend to harden over time.

6. Easy premixing
Palsgaard® SA 6620 offers the manufacturer the opportunity to formulate healthy cakes with liquid oils. To be able to take advantage of this we recommend a very simple and efficient two step procedure, where all ingredients except...
oil are added at the beginning of the mixing, and just before finishing mixing oil is added at a lower mixing shear. This procedure guarantees the best functionality when using Palsgaard® SA 6620. Palsgaard® SA 6620 can also be used in oil-free formulations. In this case, we recommend a method where all ingredients are mixed together in one single mixing step - simple and effective.

The two or one step method of Palsgaard® SA 6620 at the same time offers a solution to a faster premixing of your ingredients. The premixing step in industrial cake production is often time consuming and involves a number of separate steps. In many cases 4-6 steps are needed. This can create bottlenecks in the production. Using the two step method means mixing time reduction and increased capacity and could mean that a planned investment in increased capacity may be postponed or avoided all together.

7. Efficient direct addition
Food companies are increasingly automating their production lines for the purpose of improving productivity, quality and outputs. Often implementation of quality programmes such as HACCP leads to increased automation. Palsgaard® SA 6620 can be handled automatically as a powdered ingredient and it can be added directly to the cake batter without prehydration, preparatory steps or product loss. This is in contrast to the handling of gels, shortenings and other cake emulsifiers in paste form. Automation means a minimum of manual handling and maximum security for correct dosages. Using Palsgaard® SA 6620 will mean less error, less rework and no waste of emulsifier.

8. Cost-in-use
There are several reasons for basing your industrial cakes on Palsgaard® SA 6620 from a cost-in-use perspective. When evaluating the cost-in-use of an ingredient it is necessary to look both at the “hard” and “soft” benefits of a product. Looking at the “hard economical” benefits is many times easier. Palsgaard® SA 6620 does have an attractive price per kg, but only looking at the price per kg may in many cases also prove to be a short term view. Increasingly, the “soft” benefits such as being able to state that the cakes are healthier, having a leaner label, positive claims, positive nutritional profile, increased capacity, etc. will be important through increased consumer pressure.

Direct addition and automation also reduces overall unit costs.

Not considering the “soft” benefits of an ingredient can in the long term prove to be costly for industrial bakers.

Additional advantages

1. High tolerance to mechanical treatment
Together with the fast activation of Palsgaard® SA 6620 in cake batters it is important that a cake emulsifier can withstand mechanical treatment, especially in industrial cake productions. Palsgaard® SA 6620 has a proven ability to withstand mechanical treatment. Palsgaard® SA 6620 retains the

---

**Figure 1:** Microphoto of a Palsgaard® SA 6620 powder particle. The total surface area of a 15 kilo carton of Palsgaard® SA 6620 equals 4 - 5 football fields.

**Figure 2:** Stability of a cake batter exposed to variations in pumping intensity and time when using Palsgaard® SA 6620.
same specific gravity and cake batter structure after mixing, aeration and baking. Figure 2 (below) shows the stability of a cake batter exposed to variations in pumping intensity and time when using Palsgaard® SA 6620.

2. The flexible, activated cake emulsifier
Many industrial cake producers choose to use different cake emulsifiers depending on the application being baked. Palsgaard® SA 6620 makes the choice easy, as this activated cake emulsifier can be used for all types of aerated and non-aerated cakes. This makes Palsgaard® SA 6620 a very flexible ingredient to use in different cake types such as sponge cakes, Swiss rolls, cup cakes, muffins and other cakes. New product development also becomes easier as only one emulsifier has to be considered.

3. Achieving full performance from a lean label emulsifier
Full benefit of Palsgaard® SA 6620 is achieved by making sure, that the emulsifier is properly distributed in the cake batter. Figure 3 (below) illustrates potential cake volume as a function of work input. It shows a typical S-curve behaviour. At low energy input Palsgaard® SA 6620 is physically distributed and solubilised in the batter and as the energy input is gradually increased by further mixing, the emulsifier is building an ideal emulsion and dispersion for further processing in the aerator.

4. PGE specifically for industrial baking
What makes Palsgaard® SA 6620 specially suited for industrial cake baking is the Polyglycerol Ester (PGE) emulsifier. The PGE has been optimized for high functionality in cake batters, as the PGE is designed to capture air and create a stable batter film resistant to high shear and stress during mixing, pumping and baking. The PGE has been developed to release from the wheat flour medium into the cake batter at the right moment due to the PGE’s optimal structure and distribution of chain lengths.

The PGE has been optimized for whipping stability and long shelf-life of minimum 18 months. During the extrusion process the PGE achieves the important alpha form which is critical in order to keep Palsgaard® SA 6620 whipping active for minimum 18 months. The PGE is also unique, as one single emulsifier does the job where in other cases more emulsifiers are needed to achieve the same functional properties. All these parameters are important factors in creating a fast reacting and stable cake emulsifier specifically designed for industrial baking.

Figure 3: Illustrates potential cake volume as a function of work input. It shows a typical S-curve behaviour. At low energy input Palsgaard® SA 6620 is physically distributed and solubilised in the batter and as the energy input is gradually increased by further mixing, the emulsifier is building an ideal emulsion and dispersion for further processing in the aerator.
5. Services

Finding the optimal recipe
As a dedicated supplier of ingredients to the industrial cake industry, Palsgaard offers extensive technical support covering all aspects in formulating new products and optimizing recipes and processes with Palsgaard® SA 6620. The focus can be on adjusting existing recipes, developing new formulations, optimizing costs or creating healthier cakes – Palsgaard can assist in finding the optimal solution to all of these requirements.

The benefit of a pilot plant
Our fully equipped industrial baking pilot plant provides the best basis of understanding the complex nature of industrial baking. Palsgaard’s pilot plant starts with a premixer, buffer tank, aerator, depositor, 2 zones convection oven, cooling conveyor and an automatic roller for Swiss rolls.

Palsgaard’s customers can also take advantage of the temperature and moisture chambers for shelf-life testing, equipment for measuring water activity, moistness, volume and softness of the cakes after baking. Our industrial scale pilot plant helps to make realistic trials which can easily be scaled up to industrial size. Palsgaard offers theoretical and practical support which takes its starting point in your specific set up and working conditions. In this way implementing Palsgaard® SA 6620 into your recipe becomes an easy task.

Get your own cost-in-use calculations
To get your own cost-in-use calculations with Palsgaard® SA 6620 as your activated cake emulsifier, please visit www.palsgaard.com to locate your local Palsgaard office.