



AAK's flaked
fats for the
perfect pizza
experience

The Co-Development Company

AAK



Pizza has become one of the world's most popular foods. Wherever you go, you'll find people of all ages enjoying it as a delicious snack or complete, satisfying meal.

Made fresh by hand or industrially par-baked and served with different toppings, today's market offers a whole range of pizza types. Recent trends have broadened the pizza landscape, expanding both the producers' and the consumers' options.

The pizza originated in Italy, as a flat bread topped with tomatoes, cheese and other garnishing.

It initially provided a quick, inexpensive meal for working class Italians. In the early 1900s, pizza traveled across the Atlantic Ocean where soldiers returning from the war could continue to enjoy this European-style bread. In the years that followed, pizza's popularity spread around the world and it has now become a global favorite.

According to "The Original Encyclopizza", at least five factors fueled pizza's growth in popularity.

First, pizza combines ingredients from all the basic food groups. Second, it's a very sensory experience involving cutting, picking and pulling actions that get eater personally engaged. Pizza is also convivial. It involves sharing – the "breaking of bread." Moreover, it embodies exciting, universal flavors: fresh baked bread, tangy tomato, Italian seasonings, cheese and, in many cases, tasty cured meats and vegetables. Finally, pizza is infinitely versatile. Literally thousands of different variations are possible.

It's no wonder this amazing creation has risen from its humble beginnings to become one of the world's best-loved and most interesting foods.¹⁾

1) Correll J. The Original Encyclopizza: Pizza Ingredient Purchasing and Preparation. 1992.

AAK's flaked fats – for the perfect pizza experience

Mintel's report states that "pizza crusts are high on consumers' minds when choosing which pizza to buy".²⁾

AAK flaked fats are designed to enhance the texture, flavor and functionality of your pizza.

Our flaked fats make your pizzas' internal structure more open and the surface less even, given them a desirable, artisanal quality. Flaked fats can also carry flavors that make your pizzas more delicious and unique.



Sensory

- ◆ Flavor and color
- ◆ Influence on crust
- ◆ Artisanal experience



Functionality

- ◆ Maintain shape on the production line and after baking
- ◆ Reduced oiling out



Process-efficiency

- ◆ Easy handling

AAK flaked fats range and production process.

Our wide portfolio of flaked fats (also called "flaked shortenings") is grouped into different ranges, each with specific characteristics to help you create the optimal pizza. Akoflake, Cisao and Cresta® are three examples of different AAK ranges, produced and sold around the world.

AAK flaked fats are value-adding oils, crystallized in a different way from traditional shortening.

We've been innovating and customizing solutions based on vegetable oils and fats for over 140 years. Applying this long experience, we compose functional blends that provide the functionality you and your consumers want in your final application.

Traditionally, functional blends would be run through a votator (scraped surface heat exchanger). However, our functional blends are heated up into a liquid state and uniformly deposited over a large, chilled roller or belt line. As the roller or belt line rotates, the oil crystallizes on the surface. Once it hits the scraper, the crystallized fat fractures, creating flakes of the required size and thickness.

AAK flaked fats open the door to unique sensory experiences.

They improve the texture and appearance of your products, whether your pizza is sold frozen, chilled, fresh, or as a dry-mix.

Our flaked fats are not only used in pizzas, but also in pies, cookies, steamed puddings and American biscuits.

AAK flaked fats for baking are a versatile ingredient that allows you to create tasty products with a light, indulging texture. Next to that, they can make your production simpler and cleaner.

2) Mintel, "A year of innovation in pizza and pies, 2018"



Flavor and color*

By incorporating minor ingredients in precisely the right quantities, AAK delivers a whole series of benefits to your production process.

Thanks to their homogeneous distribution of flavor and/or color, our flaked fats eliminate the risk of deviations and reduce the time involved in manual dosing of small quantities.

Picture 1



When combining fats and oils to produce flakes with exactly the right fat composition, AAK has the necessary expertise and experience to add flavor and color – enabling the creation of unique, premium products.

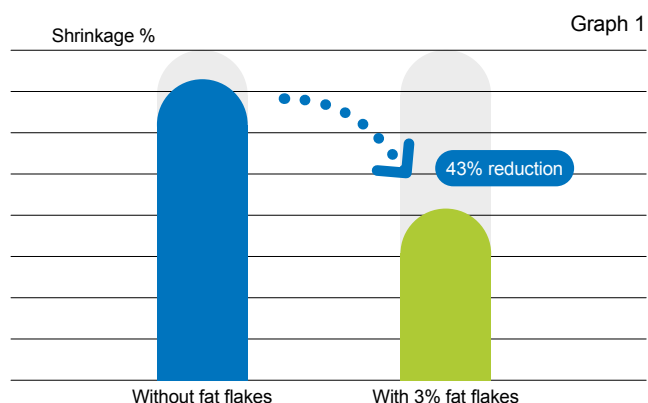
Flavor is encapsulated in the fat until the product is baked and the fat starts to melt. Encapsulation means less of the aroma is released during the production process, and the flavor of the end product is enhanced.

Our approach is to co-develop flaked fat products together with our clients in order to create signature solutions.

To meet the modern consumer's expectations, we use natural solutions wherever possible, even when it comes to additives. For example, in our butter-flavored variant, both the flavor and color are labelled as “natural”.

Maintain shape on the production line, and after baking

Using AAK's flaked fats, shrinkage is reduced by 43% (see graph 1).



Graph 1

Gluten can best be described as a rubbery mass – what is left after washing a flour-water dough with an excess of water to remove the soluble proteins and starches.

The gluten network is complex, with numerous ingredients interacting. To begin with, there are four major flour proteins: albumin, globulin, gliadin and glutenin. The most important of these are low and high molecular weight glutenins (LMW and HMW glutenins) and gliadins. Starches and pentosans are also involved in the interaction, although to a lesser extent.

HMW glutenins have the greatest impact on the strength and elasticity of the gluten network. It needs time and energy to be formed, which is why kneading and resting times are crucial to dough development.

The elasticity of pizza dough is influenced by how the gluten develops. When it is well-developed, the dough will extend and retract – as it is alternately manipulated and left to rest. With the right shape and size of fat flakes in your dough, the gluten network can be physically interrupted. This has a direct and measurable effect on the degree of retraction.

When producing pizza, two key parameters are the extensibility and elasticity of the dough. A certain degree of each attribute is beneficial to the production process; too much of either is detrimental. When you add AAK flakes, the negative impact is reduced by over 43% (see graph 1).

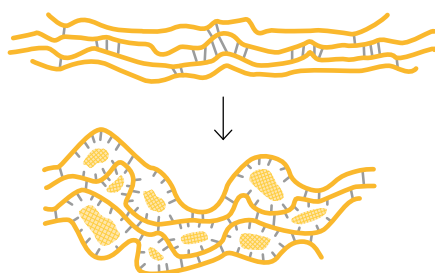


Figure 1

Local interruption of the gluten network through flakes

Our technical experts help you optimize your dough formulation and production process.

* Please check local regulations regarding the usage of flavors and colors in flaked fats.

Influence on crust

AAK flaked fats have a positive impact on the texture and mouthfeel of both thin-crust and deep-pan (thick-crust) pizza.

Shortness of bite, toughness and crispiness are all attributes that can be measured with a texture analyzer. There are two different evaluation protocols: one for thin-crust pizza and the other for deep-pan pizza.

Firstly, extensibility is used as a parameter for the textural analysis of thin-crust pizza.

This extensibility correlates with the crispiness of the pizza, which is a key determinant of mouthfeel. It tells us what degree of force is necessary to achieve a penetration depth of 40 mm into the baked product. This value is then used as an index of extensibility for thin-crust pizza. When the dough's elasticity limit is exceeded, the pizza breaks. This limit is known as the "maximum positive value".

To ensure reliable results when conducting this kind of test, samples need to be prepared carefully, following a standardized method:

- Trays are used to even out the pizza during baking and to ensure a homogenous heat transfer over the whole surface
- The recipe follows a standardized formulation for thin crust pizza, laminated to 1,5mm and pinned
- The pizza is baked at 250°C–210°C top-bottom for 5 mins.
- The top baking tray is then removed and the pizza is baked for a further 250°C–210°C top-bottom for 4 mins.
- Samples must be kept in a 60°C temperature cabinet (max 30 mins) to ensure they all have the same temperature
- When carrying out the analysis, samples must be positioned in the center between the ball probe and the heavy-duty platform.

Once the "trigger" force is attained, the graph plots how the pizza responds to tension. It is stretched and, when its elasticity limit is exceeded, it breaks. The force and the distance required to cause break indicate the extensibility of the sample.

The lower the maximum positive value, the crispier the sample. The greater the distance and time taken, the more extensible the sample.

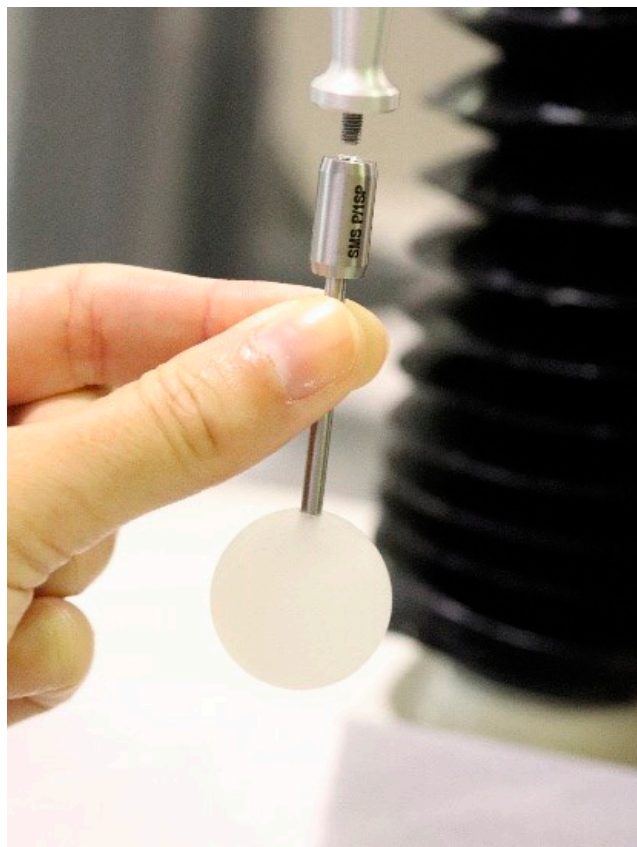
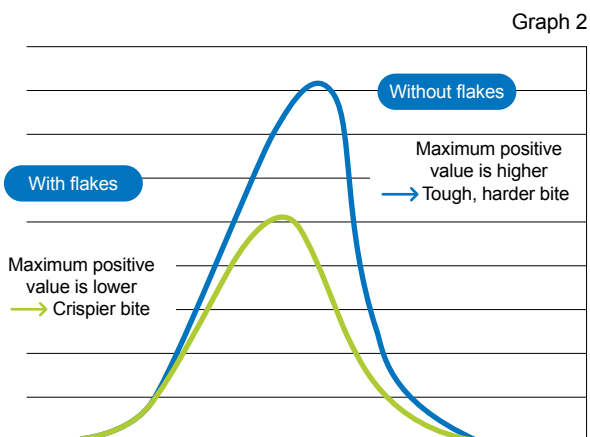
A particular melting profile will give the correct degree of crispiness.

Generally speaking, steep melting profiles have a positive impact on the mouthfeel of thin-crust pizza. AAK technologists can assist you in selecting the best one for your product.

By using textural analysis, we can see a clear difference between pizza crusts produced with AAK flaked fats and those produced without them.

As shown in the graph 2, the pizza crust produced with the correct flakes has a lower maximum positive value in comparison to the pizza crust produced without flakes. This difference is attributed to the frying effect of the flaked fat in the thin-crust pizza. This results in a crispier and more flaky crust, which is less tough and therefore more pleasant to bite into.

Picture 2



Second, for deep-pan pizza, toughness is used as a parameter for textural analysis.

This test tells you what the crust is like to eat, and at the same time, it measures the crumb softness of a deep-pan pizza.

The area under the curve, achieved under defined conditions, provides us with a toughness index. A lower value indicates a less tough pizza with a softer crust.

When conducting tests on deep-pan pizza, the following standardized formulation is used:

- ◆ Reduced by lamination to 3,5mm
- ◆ Placed in a baking tray and pinned
- ◆ Proofed for 2hrs at 27°C, 85% RH
- ◆ Baked in a deck oven for at 250°C, 230°C top-bottom for 12 mins
- ◆ After baking, the deep-pan pizza is stored in a temperature cabinet of 60°C for a maximum of 30 mins

Picture 3



The texture analysis is done using a pizza tensile rig, attached to a texture analyzer.

Before testing begins, the height must be calibrated to ensure the distance between the upper and lower attachment is the same for each sample.

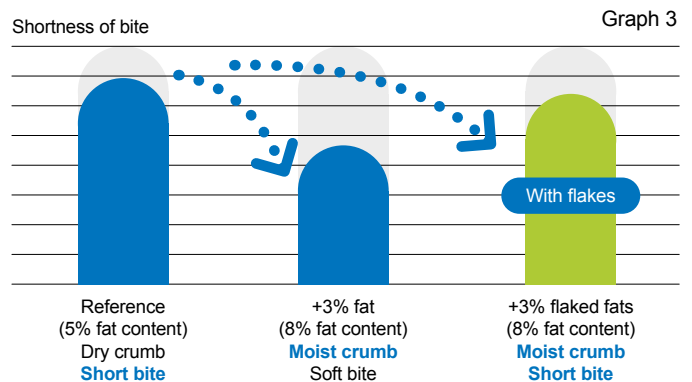
Sample preparation involves cutting a rectangular (3,5 cm x11 cm) piece out from the center of the pizza. The rectangular strips are then tested individually by placing one end on the lower four prongs and the other end on the upper four prongs. This is done in such a way as to avoid bending the sample (see picture 3).

At the start of each new measurement, the sample is torn apart by the grips. After the maximum tension force has been reached and the sample has broken, the grips steadily return to their original position.

The positive area under the curve gives an indication of the shortness of the sample. The lower this value, the softer the pizza. However, a softer pizza is not necessarily a good thing.

With deep-pan pizza, shortness of bite is generally thought to give the most pleasant mouthfeel. This shortness is measured as the maximum positive force on the graph. A pizza that is low in fat will have a dry mouthfeel. You can overcome this by increasing the fat content but doing so will also increase the softness of the crumb.

To get the best of all worlds, producers can swap out part of their usual added fat for AAK flaked fats. The result is a pleasant mouthfeel (moist crumb) combined with a crust that has the desired shortness in bite (see graph 3).



Artisanal experience

It's not only about mouthfeel; appearance also has an impact on the artisanal experience.

Flaked fats can be used to make pizzas more visually appealing. They create clear air pockets and an attractive open dough structure.

Different flake thicknesses are used in accordance with the thickness of the crumb.

Research has shown that neither the SFC % (solid fat content) curve nor the SMP (slip melting point) have any impact on the size of the air pockets.

While small, thin fat flakes (<0,5mm) enable a better texture in thin-crust pizza, thicker flakes (>0,5mm) lead to the creation of large air pockets that are evenly distributed throughout the crumb.



Without flakes



With flakes



Reduced oiling out

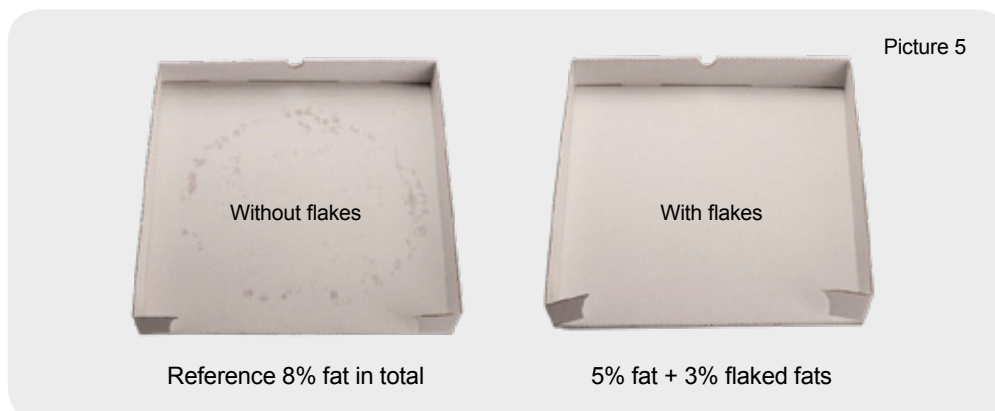
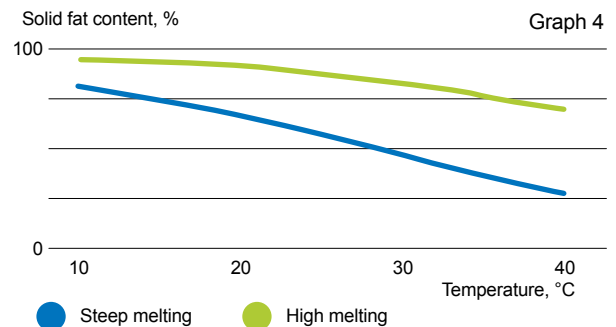
Consumers are increasingly choosing food that is readily available and requires little effort to prepare. For this reason, more and more people are having meals delivered.

Pizzas are usually transported in cardboard boxes, while the pizza is still warm (ex: 50°C). However, since the dough contains fat and/or oils, these boxes tend to become soggy during transit.

In this situation, flaked fats offer a significant advantage. The amount of oil that migrates to the cardboard box (see picture 5) can be drastically reduced simply by choosing the right size flakes with the right melting point. This not only prevents oiling out, but also gives the crust a better texture. Not getting oily fingers is an added benefit for anyone who likes to eat pizza with their hands!

As shown in the graph, the SMP (slip melting point) and the SFC% curve (solid fat content) impact oiling out from the pizza base.

By combining the correct fats and oils, AAK's flaked fats give your pizza dough the best melting profile.



Easy handling



The blocks of hard fat traditionally used for baking can be hard to handle. They may need extra processing to break them into the right size for production. This is not only time-consuming but also adds a health and safety risk.

By contrast, AAK's flaked fats are easy to handle and scoopable. In addition, they can be used in automatic lines, enabling a seamless production process.

In most dough-based applications, fat flakes are incorporated directly into the dough towards the end of the mixing process when it is completely developed (500 BU).

This maintains the structural integrity of the flake and ensures an even distribution of fat and flavor. If the flakes are added too early, their structure deteriorates, which defeats the purpose of adding them.



Share a slice of your perfect day

Together, let's make
moments of friendship

Today's consumers want customized baked goods with premium quality and an artisanal feel. However, they don't want to give up availability, convenience and consistency.

AAK flaked fats make it possible for producers to meet these apparently conflicting demands – to offer their consumers unique sensory experiences while also simplifying the production process.

Through co-development, we bring together our customers' skills and know-how with our own in-depth expertise in vegetable oils & fats for food applications.

Whatever is on the menu – vegan, vegetarian, fast casual, breakfast pizza, focaccia, naan bread, thin or thick (deep-pan) crust pizza, fresh or par-baked, sweet or savory, round or square with original or flavored crumb

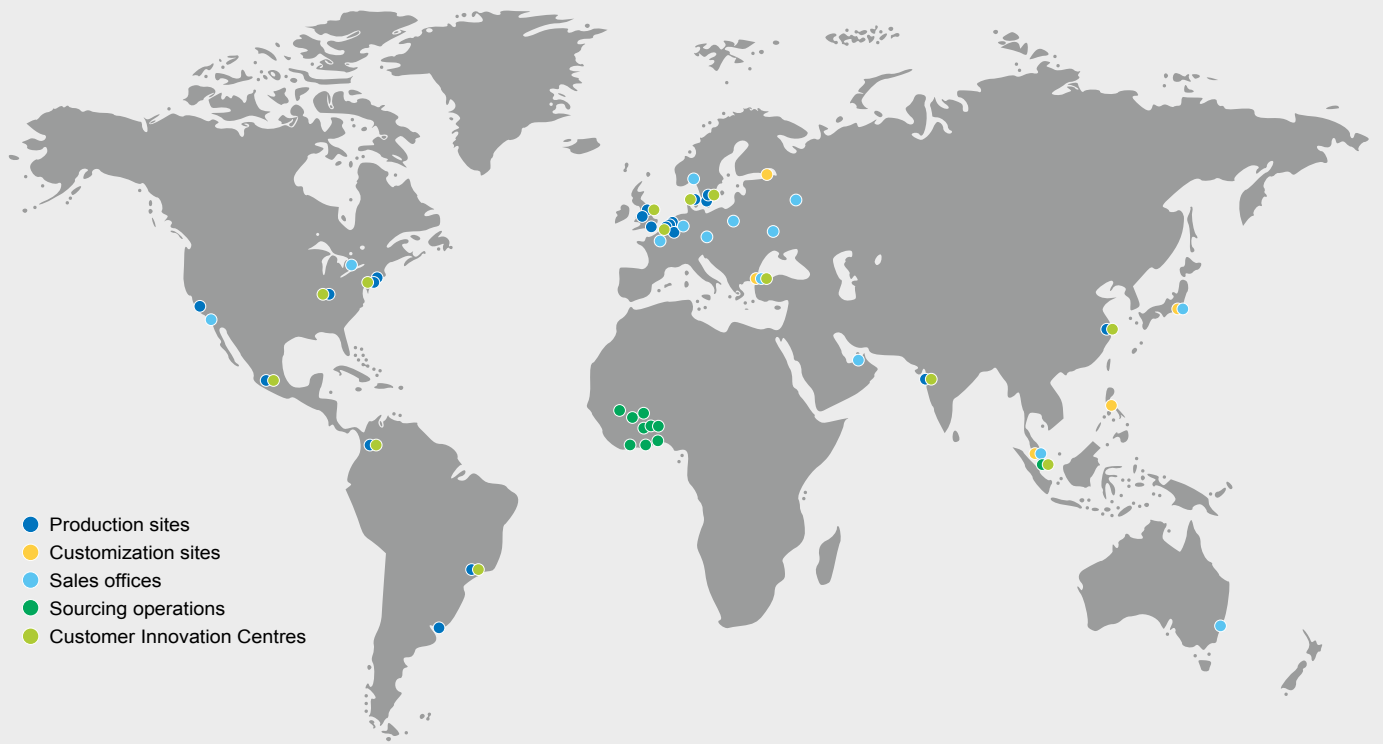
– we're always ready to help you achieve perfect pizza moments!

Contact us at pizza@aak.com

Together, let's make the perfect pizza!

The Co-Development Company

The AAK logo is positioned in the bottom right corner of the advertisement. It consists of the letters 'AAK' in a bold, blue, sans-serif font. The background of the entire advertisement is a circular photograph of a young man and woman smiling and eating pizza together on a rooftop. The man is wearing a black and white striped shirt, and the woman is wearing a light pink t-shirt. They are both holding slices of pizza. The background shows a cityscape with buildings under a clear sky.



The first choice for value-adding vegetable oil solutions

We develop and provide value-adding vegetable oil solutions in close collaboration with our customers, enabling them to achieve long-lasting business results. We do so through our in-depth expertise in oils & fats within food applications, working with a wide range of raw materials and broad process capabilities.

Through our unique co-development approach, we bring together our customers' skills and know-how with our capabilities and mindset. By doing so, we solve customer-specific needs across many industries – Chocolate & Confectionery, Bakery, Dairy, Special Nutrition, Foodservice, Personal Care, and more.

AAK's proven expertise is based on more than 140 years of experience within oils & fats. With our headquarters in Malmö, Sweden, more than 20 production facilities and customization sites, and sales offices in more than 25 countries. Our more than 3,600 employees are dedicated to providing innovative value-adding solutions to our customers.

We are AAK – The Co-Development Company



Explore more at
www.aak.com

Or contact us at
pizza@aaak.com

