

LECITHIN BAKERY

BAKING

For the food formulator looking for a versatile, multifunctional ingredient, look no further than ADM lecithin. In bakery applications, ADM's lecithin is used as an emulsifier to ensure even blending, to increase moisture retention, and to improve the release characteristics of bakery products. In addition, its ability to blend dissimilar ingredients evenly and thoroughly helps improve the functionality of all your bakery products.

RECOMMENDED ADM LECITHINS

- Yelkin® lecithin: A series of standardized lecithins for yeast- and chemically leavened baked goods.
- Beakin™ lecithin: Complexed lecithin for increasing wettability of flour.
- Ultralec® lecithin: ADM's exclusive, ultrafiltered, deoiled lecithin is used in hydrophilic instantizing applications, and it provides excellent emulsification properties in reduced-fat and flavor-sensitive applications.
- Thermolec lecithin: Modified, water-dispersible lecithin specifically for high-moisture applications.

REDUCED-FAT BAKED GOODS

With the growing trend toward reduced-fat bakery products, food formulators are faced with a new challenge: creating low-fat baked goods that retain the favorable characteristics of their full-fat equivalents. One way to meet the challenge is by using an ingredient that can help restore many of these desired properties—lecithin.

PROBLEMS CAUSED BY FAT REMOVAL

- Lowered lubricity, due primarily to the decreased availability of the fat throughout the mix
- Doughs that are hard to machine because they stick to the equipment
- Moisture migration that leaves baked products with a dry texture and mouthfeel
- Poor aeration and weakened cell structure

BREADS

Lecithin is used in breads to help achieve greater loaf volumes and increase shelf life. Research has shown it to be most effective in this area in conjunction with other emulsifiers, such as monoglycerides and SSL.



Lecithin is used in pan release applications to help release the bread from the cooking surface. It can also allow for the use of a broader range of flours. Lecithin improves the sheeting properties in yeast raised baked goods. Our Yelkin, Ultralec, and Thermolec products are typically used in bread applications. Recommended inclusion rates range from 0.2-0.7% based on flour weight.

COOKIES AND CRACKERS

Lecithin is used in cookie applications to improve mixing of the ingredients, improve moisture retention, improve fat-sparing properties, and also to act as an internal release in rotary die cookies. In cracker applications lecithin is used to improve mixing, and decrease the stickiness of the dough, thereby improving dough handling and machining properties. It can also be used in conjunction with oil in top dressing applications. Lecithin will help with the dispersion of spices in top dressing oils. Yelkin TS, Ultralec P or F, and Thermolec WFC can be used in these applications. Recommended usage level is 0.2-0.5% based on flour weight.



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CAKES & DOUGHNUTS

In cake formulations it helps improve volume, crumb, and freshness. Ultralec and Thermolec WFC are typically used in this application. Recommended usage level is 1-3% based on shortening. In similar application, lecithin is an integral part of cake doughnut mixes. Without lecithin the doughnuts do not achieve the proper amount of fat absorption, leaving them dry and unsavory. In such a state it is also difficult for sugar to adhere to the doughnut.

Lecithin is normally part of an emulsifier system also consisting of monoglycerides and PGME. The recommended lecithins for this product would be Yelkin TS, Yelkin 1018, Thermolec WFC or Ultralec P at 0.2-0.5% based upon total formula weight or 1-3% based upon shortening weight.

ICINGS & FILLINGS

In icing applications lecithin helps impart smoother texture and to prevent drying. Use of lecithin has also been noticed to increase "creaminess" and stiffness of the icing. Yelkin, Yelkin 1018 and Ultralec are typically used in this application. Usage level would be 0.2-1.0% based on total formula.

PIZZA AND PIECRUSTS

Lecithin acts as a natural release agent and significantly reduces dough stickiness, which makes the dough easier to process and saves time. Ultralec™ P (or F) or Yelkin TS would typically be used in the range of 0.2-0.5% based on flour weight.



TORTILLA & FLAT BREADS

Lecithin will help tortillas and flat breads stay flexible and rollable without breaking when folded and be soft without sticking together. Ultralec- ADM's exclusive, ultrafiltered deoiled lecithin is excellent in reduced fat and flavor sensitive applications. Usage level would be 0.5% based on total formula.

OTHER APPLICATIONS

In piecrust lecithin is used to prevent shrinkage. The recommended lecithin and usage level would be Yelkin or Ultralec at 0.5-1.0% based on flour. Lecithin can also be used in noodle applications to improve dough handling and machining properties. Yelkin TS or Ultralec™ P (or F) would typically be used in the range of 0.2-0.5% based on flour weight. Yelkin TS would normally be added with any oil in a formulation, while the Ultralec™ would be added to the dry mix. Deoiled lecithin has found usage in the production of oriental (pre-fried, instant) noodles. Based upon flour weight, 0.2-0.4% Ultralec™ P can be added along with the seasoning blend to the formulation to improve texture of the finished noodle.

Internal release in waffle and waffle-cone products by use of lecithin. As the batter is heated the lecithin moves to the surface to effect release of the baked product. Product recommended for this would be Yelkin TS, Yelkin 1018 or Beakin LV30

In piecrust, pasta, pancakes/waffles, a 1-3% lecithin on a shortening weight basis promotes fat distribution, facilitates mixing and acts as a releasing agent. The result is even browning without the typical spots. Lecithin also promotes the tendency of the fat to cover the sugar, flour and other slightly polar ingredients that would otherwise tend to repel fat. This reduces mixing time and can improve texture and height.

Lecithin Applications

Application	Suggested Products	Usage
<i>Aqueous release</i>	Yelkin 1018, Performix E/PS, Ultralec P/F	10-15% of water
<i>Baked Goods</i>	Ultralec P/F, Thermolec WFC, Yelkin series	0.2-1% flour basis
<i>Belt release</i>	Beakin series, Thermolec series, Performix CC, Yelkin series	3-7% in oil
<i>Bread/yeast raised products</i>	Ultralec P/F, Thermolec WFC, Yelkin series	0.5-1% flour basis
<i>Cake & donuts</i>	Ultralec P/F, Yelkin 1018, Thermolec WFC, Yelkin series	0.2-0.5% formula basis or 1-3% fat basis
<i>Carmel corn</i>	Beakin LV1 and LV3	5-10% in coating oil
<i>Chocolate & compound coatings</i>	Ultralec P/F, Yelkin series	0.2-0.7% formula basis
<i>Cocoa powder</i>	Beakin series, Yelkin 1018, Yelkin series	1-3% spray coating by weight
<i>Colors & flavors</i>	Ultralec P/F, Yelkin 1018, Thermolec WFC	0.5-2% formula basis
<i>Cookies & crackers</i>	Ultralec P/F, Thermolec WFC, Yelkin series	1-3% flour basis
<i>Dry bakery mixes</i>	Ultralec P/F, Thermolec WFC, Yelkin series	0.5-1% flour basis
<i>Ice cream (waffle) cones</i>	Beakin LV1, Beakin LV30, Yelkin series	0.2-0.7% formula basis
<i>Icings & fillings</i>	Ultralec P/F, Yelkin 1018, Thermolec WFC, Yelkin series	0.2-1% formula basis
<i>Lo-fat cookies/crackers</i>	Ultralec P/F, Thermolec WFC	0.5-1% flour basis
<i>Margarine</i>	Ultralec P/F, Yelkin series	0.3-1% formula basis
<i>Milk powders</i>	Yelkin 1018, Performix E/PS, Ultralec P/F	0.5-1% spray coating by weight
<i>Noodles</i>	Ultralec P/F, Yelkin series	0.2-0.5% flour basis
<i>Pie crust</i>	Ultralec P/F, Yelkin series	0.5-1% flour basis
<i>Pizza crust</i>	Ultralec P/F, Yelkin series	0.2-0.5% flour basis
<i>Release</i>	Beakin series, Thermolec series, Performix CC	5-15% oil basis
<i>Tortillas & flat breads</i>	Ultralec P/F, Yelkin series	0.5-2% formula basis
<i>Waffles & pancakes</i>	Yelkin 1018	0.5-2% formula basis

FLUID LECITHINS			
Product	Typical Analyses		Applications
STANDARD LECITHINS			
Yelkin® T	AI, % 65 min. H2O, % 1.0 max. HI, % 0.05 max.	Color: 17 max. AV: 30 max. Form: Opaque plastic	Viscosity: N/A
Yelkin TS	AI, % 62 min. H2O, % 1.0 max. HI, % 0.05 max.	Color: 17 max. AV: 30 max. Form: Translucent fluid	Viscosity: 100 max. (Stokes, 25°C)
Yelkin SS	AI, % 62 min. H2O, % 1.0 max. HI, % 0.05 max.	Color: 14 max. AV: 30 max. Form: Translucent fluid	Viscosity: 100 max. (Stokes, 25°C)
Yelkin DS	AI, % 62 min. H2O, % 1.0 max. HI, % 0.05 max.	Color: 12 max. AV: 30 max. Form: Translucent fluid	Viscosity: 100 max. (Stokes, 25°C)
PURIFIED LECITHIN			
Yelkin Gold	AI, % 62 min. H2O, % 0.5 max. HI, % 0.05 max.	Color: 14 max. AV: 30 max. Form: Translucent fluid	Viscosity: 100 max. (Stokes, 25°C)
COMPLEXED LECITHINS			
Beakin® LV1	AI, % 50 min. H2O, % 0.8 max. HI, % 0.05 max.	Color: 14 max. AV: 25 max. Form: Translucent fluid	Viscosity: 20 max. (Stokes, 25°C)
Beakin LV3	AI, % 32 min. H2O, % 0.8 max. HI, % 0.05 max.	Color: 14 max. AV: 25 max. Form: Translucent fluid	Viscosity: 10 max. (Stokes, 25°C)
Beakin LV30	AI, % 32 min. H2O, % 0.8 max. HI, % 0.05 max.	Color: 14 max. AV: 25 max. Form: Translucent fluid	Viscosity: 10 max. (Stokes, 25°C)
Performix™ CC	AI, % 50 min. H2O, % 0.8 max. HI, % 0.05 max.	Color: 14 max. AV: 28 max. Form: Translucent fluid	Viscosity: 30 max. (Stokes, 25°C)
Performix™ E	AI, % 50 min. H2O, % 0.8 max. HI, % 0.05 max.	Color: 14 max. AV: 26 max. Form: Translucent fluid	Viscosity: 30 max. (Stokes, 25°C)
Performix PS	AI, % 50 min. H2O, % 0.8 max. HI, % 0.05 max.	Color: 14 max. AV: 26 max. Form: Translucent fluid	Viscosity: 65 max. (Stokes, 25°C)
MODIFIED LECITHINS			
Yelkin 1018	AI, % 58 min. H2O, % 1.0 max. HI, % 0.05 max.	Color: 17 max. AV: 38 max. Form: Opaque fluid	Viscosity: 250 max. (Stokes, 25°C)
Thermolec® 57	AI, % 56 min. H2O, % 0.8 max. HI, % 0.05 max.	Color: 14 max. AV: 28 max. Form: Translucent fluid	Viscosity: 30 max. (Stokes, 25°C)
Thermolec 200	AI, % 62 min. H2O, % 0.8 max. HI, % 0.05 max.	Color: 14 max. AV: 30 max. Form: Translucent fluid	Viscosity: 75 max. (Stokes, 25°C)
Thermolec WFC	AI, % 60 min. H2O, % 1.0 max. HI, % 0.05 max.	Color: 13 max. AV: 30 max. Form: Translucent fluid	Viscosity: 100 max. (Stokes, 25°C)
DEOILED LECITHINS			
Product	Typical Analyses		Applications
ULTRA-FILTERED DEOILED LECITHINS			
Ultralec® P	AI, % 97 min. H2O, % 1.5 max.	Color: Light gold Form: Powder	Viscosity: N/A
Ultralec F	AI, % 97 min. H2O, % 1.5 max.	Color: Light Gold Form: Fine granules	Viscosity: N/A

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