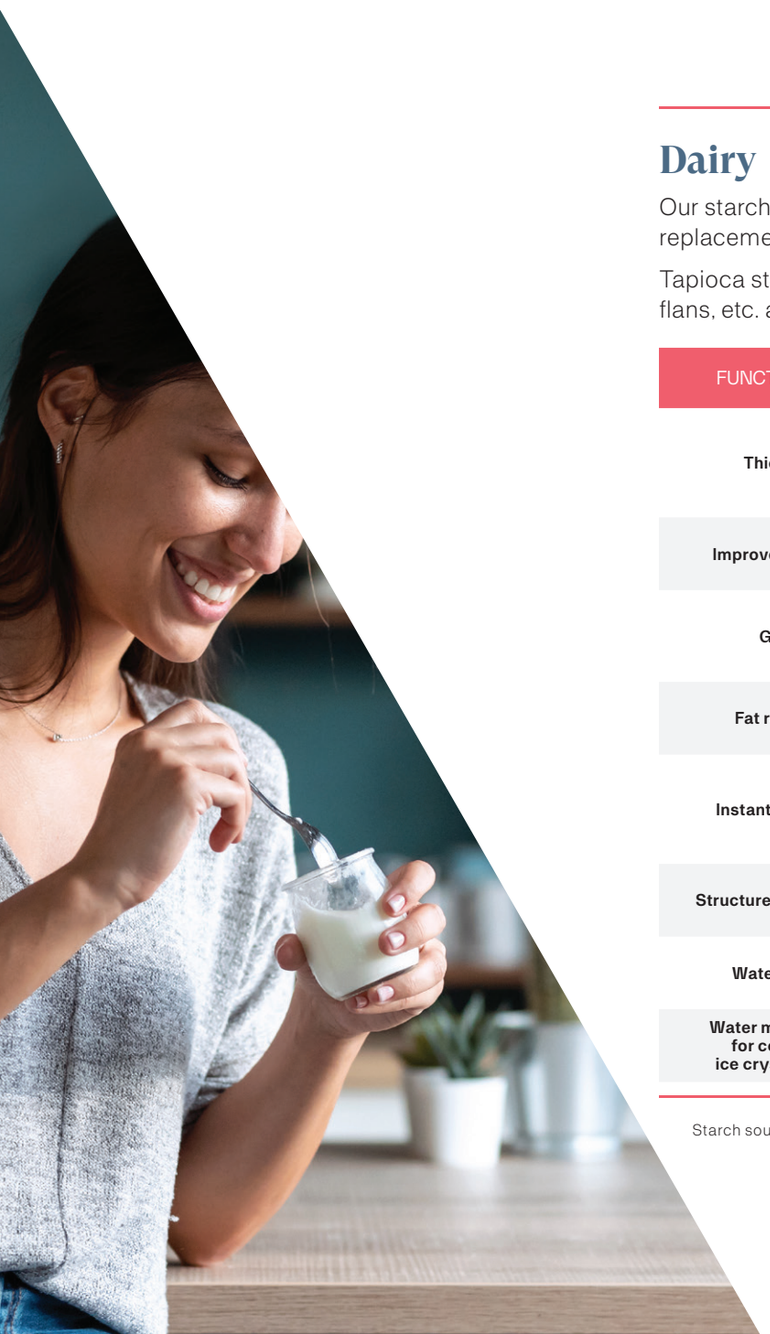
Innovative dairy solutions

Add texture appeal with Tate & Lyle

Thick, creamy yogurts. Low-fat ice cream without the ice crystals. Controlled moisture. Whatever sensory experience you wish to deliver or functional challenge you need to master, Tate & Lyle makes it easy to create the right texture that appeals to your consumers. Many dairy-product manufacturers have found that texture makes their products more desirable, with consumers willing to pay a premium price. In fact, thick yogurts demand the highest price on shelves because so many consumers equate thickness with taste.

Tate & Lyle's food starches are derived from a variety of botanical food sources and are available in native, modified, cook-up, instant and clean-label varieties. Our diverse portfolio provides options from basic thickening to highly-unique functionalities relevant to the dairy category. Also, if you need assistance, we offer experienced application guidance to help you achieve your goals.



Dairy

Our starches provide creamy texture, uniform viscosity, and improved mouthfeel for low or non-fat products. They can also be used for gelatin replacement, emulsion stabilization, water binding and gelling in a variety of dairy-based foods.

Tapioca starches in the portfolio offer a cleaner flavour for less masking of delicately flavoured dairy items like plain yogurt, vanilla puddings, flans, etc. and are also Kosher for Passover.

FUNCTIONALITY	TATE & LYLE STARCH SOLUTION			BENEFITS
	Cook-Up		Instant	
Thickening	CLARIA® Bliss 580* CLARIA® Elite* CLARIA EVERLAST® 585* MAXI-GEL® 617	RESISTAMYL® 349, 368 REZISTA® Max 5857, 5767 REZISTA® 682 TENDERFIL® 428 THIN-N-THIK® 99		Stable under high processing conditions. e.g. Yogurt, processed cheese
Improved firmness	CLARIA® Elite* CLARIA® Bliss 580* MIRA-CLEER® 516	NUSTAR® 140 REZISTA® Max 5857, 5767		Increase product firmness and yield. e.g. Processed cheese, analog cheese
Gelling	Pure Food Powder* MERIZET® 100* MIRA-SET® 285	BRIOGEL® 5093, 5204 STA-SLIM® 151 THINGUM® 107	CLARIA TOP-GEL®* MIRA-GEL® 463* SOFT-SET®	Replaces or reduces the need for gelatin. e.g. Yogurt, processed cheese
Fat reduction	CREAMIZ® STA-SLIM® 143 STA-SLIM® 151		STA-SLIM® 142 STA-SLIM® 150 MIRA-MIST® 662	Provides creamy texture to low-fat formulations. e.g. Ice cream, yogurt
Instant thickening			CLARIA® Instant 340, 360* MERIGEL® 340, 347 MIRA-THIK® 470 MIRA-SPERSE® 629 STARCO™ 447	Rapidly hydrates in high solid formulas. Creates high viscosity with creamy texture. e.g. Instant puddings, instant desserts
Structure development	BRIOGEL® 5093, 5204 MIRA-QUIK® MGL NUSTAR® 140	REZISTA® STA-MIST® 7415 THINGUM® 107	MIRA-MIST® 662	Provides body in low protein formulas and aids in partial casein or caseinate replacement. e.g. Processed cheese
Water binding		REZISTA® 682 TENDERFIL® 428 THIN-N-THIK® 99	MIRA-THIK® 468, 603	Reduction of syneresis. e.g. Yogurt, dairy desserts
Water management for controlling ice crystal growth	LO-TEMP® 452, 453, 588 TENDERFIL® 428	REZISTA® REZISTA® HV		Retains smooth texture in frozen products. e.g. Ice cream

Starch source: CORN (MAIZE) | TAPIOCA | POTATO

*Labels simply as corn, tapioca or potato starch

Texture Development

- **Gelling**—Our specialty gelling starches can achieve the short, cuttable texture that's desired in many dairy products, including yogurt, sour cream, and dairy-based dips and spreads. They can also be successfully used to develop high-quality, gelatin-free products for preferred label appeal.
- **Creamy**—Whether it's processed and RTE (ready to eat) or an instant mix, starches can help create the rich, creamy texture found in high-quality dairy products, including sauces and puddings.
- **Structure**—When used in combination with proteins or other hydrocolloids, starches add structure to dairy products such as processed cheese, cheese dips and sauces. These ingredients can also totally or partially replace high-cost ingredients such as casein and caseinate.
- **Mouthfeel improvement**—Starches can be used to maintain a creamy, highly indulgent texture in a wide range of reduced-fat yogurts, RTE desserts, ice creams and processed cheeses.

Process Functionality

- **Heat and shear tolerance**—Optimize viscosity while maintaining starch functionality through processing. In addition, pasteurization, high-pressure, high-temperature and shear conditions require a stable starch.

Finished Product Stabilization

- **Ice-crystal growth**—Starches can add the premium in ice cream, helping to control ice-crystal formulation, particularly in reduced- or low-fat varieties. Controlling ice-crystal growth over shelf life ensures this pleasant eating quality is maintained even after distribution and consumer use.
- **Melt characteristic**—Starches offer the ability to produce analogue and processed cheeses with excellent sliceability, shred and melt characteristics for a wide range of end-use applications.
- **Moisture management**—Prevent syneresis by adding starches in puddings and yogurts.

Viscosity Development

- **Heat process**—From UHT (ultra-high temperature) and HTST (high-temperature short-time) processing to homogenization and fermentation, the right starch is critical to the final product quality.
- **Cold process**—Our wide range of instant, or cold-water swelling, starches enable the convenience of cold processing for a variety of products, including dairy desserts, dips and mousses.

Clean Label

Enjoy a clean-label claim and great taste, too, with CLARIA® Functional Clean-Label Starches, which label simply as "starch", "corn starch" or "tapioca starch"** yet perform similarly to modified food starches. The CLARIA® line offers a clean, neutral taste and colour comparable to modified food starches and is versatile across a broad range of applications and sophisticated processes.

Plant Based Products

The availability and quality of non-dairy cheeses has grown considerably. Many products with acceptable taste and texture are available and prepared from sources such as nuts, soy protein, solidified vegetable oils and a variety of plant-based proteins (e.g. pea protein). Our portfolio of starch options can provide functionality in either dairy products or non-dairy alternatives, depending on the nature of the product, processing, and storage requirements. Some of them might perform similarly, but others may offer a unique advantage/functionality due to differences in processing.

About Tate & Lyle

We are a leading global food and beverage ingredients and solutions supplier, with a 160-year history of ingredient innovation. Through our purpose, *Transforming Lives Through the Science of Food*, we believe that together, we can successfully grow our businesses whilst having a positive impact on society. Partner with us to create healthier, tastier and more sustainable food and beverage solutions for consumers.

For more information, please visit us at tateandlyle.com