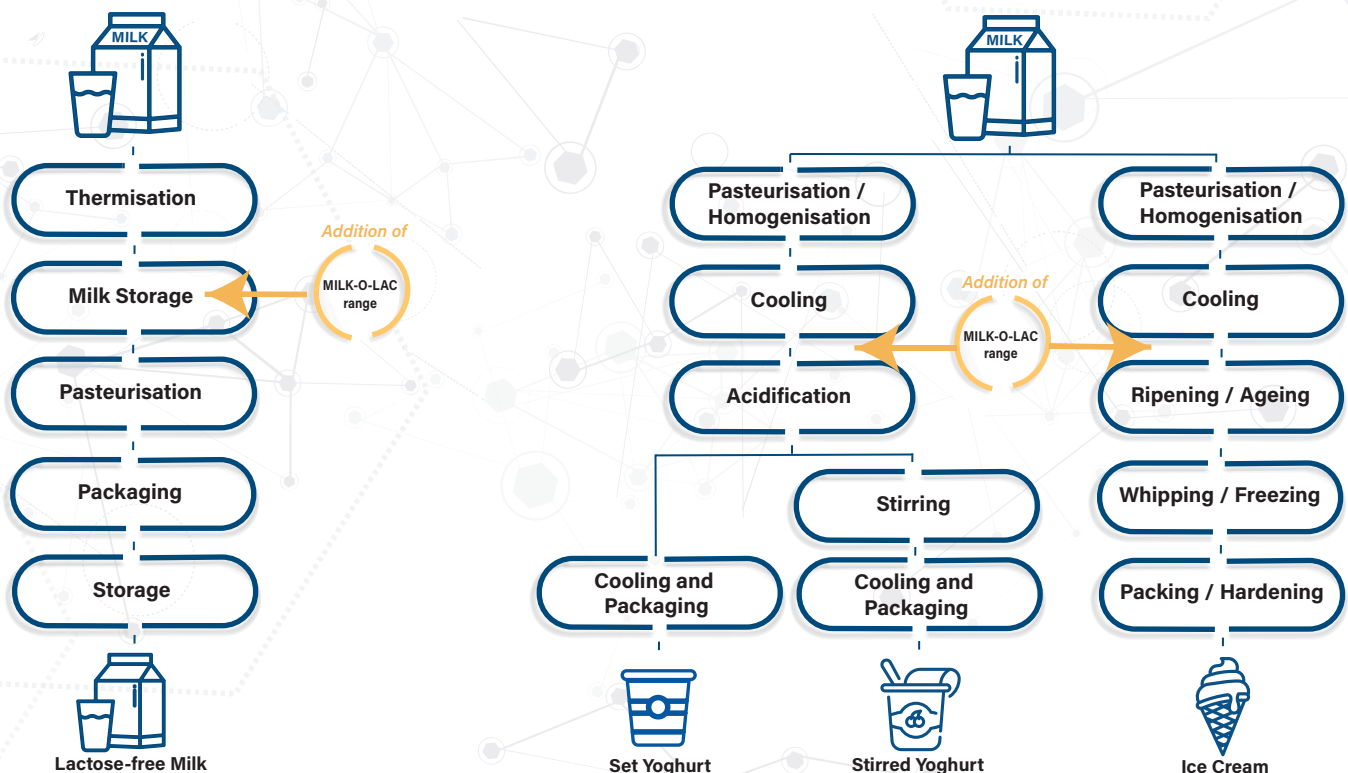
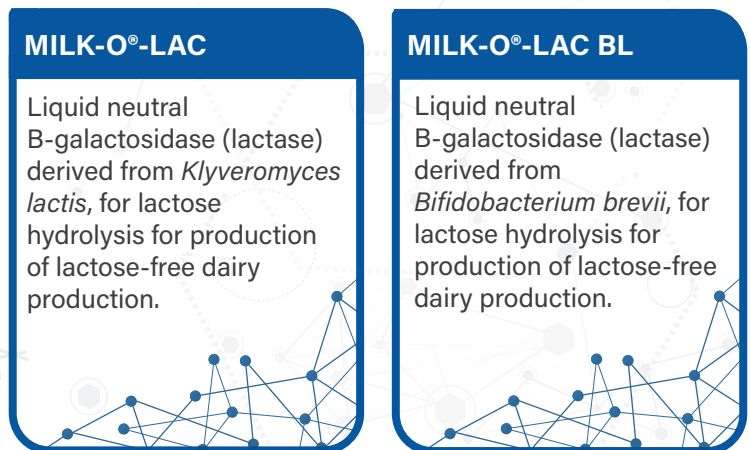


# MILK-O®-LAC FOR LACTOSE-FREE DAIRY PRODUCTION

Most dairy foods, including those produced from milk from cows, sheep and goats contain the natural sugar lactose. In addition to dairy proteins this natural sugar lactose is one of the main components of animal-milk derived products that individuals have an intolerance or allergy to. Lactase enzymes can be used to breakdown the lactose that is present in dairy milk into the two sugars glucose and galactose which are two much more easily digestible sugars. Hydrolysis of the lactose in dairy products can also improve the solubility and generate a sweet flavour, reducing the need for sugar additives.

## Benefits of using MILK-O®-LAC

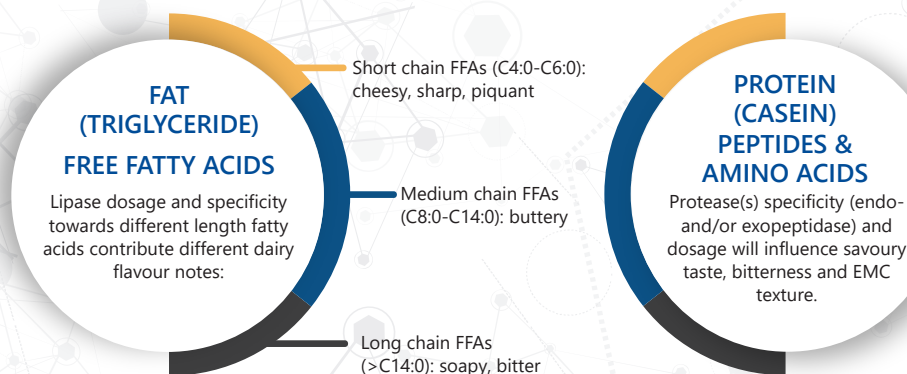
- Breakdown of lactose to make dairy-based products suitable for consumers with a lactose intolerance or allergy.
- Enhanced sweet flavour of dairy products. Increase the natural sweetness without the need for additives, sweeteners or added sugars.
- Sugar reduction in dairy-based products.



# BIOCATALYSTS' RANGE OF PRODUCTS FOR DAIRY PROCESSING

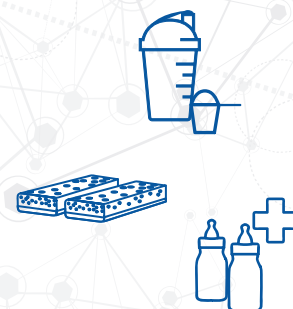
## Enzymes Used to Modify Dairy Substrates for Flavour Generation

Dairy substrates contain fats and proteins that can be modified using enzymes to enhance dairy flavours. Different combinations of lipases (**Lipomod**<sup>®</sup>) and proteases (**Promod**<sup>®</sup>) from Biocatalysts range of products can be used to hydrolyse the fats and proteins to develop unique flavour profiles to be used in the production of dairy ingredients



## Enzymes Used for the Hydrolysis of Dairy Proteins

Milk contains two primary protein groups, casein and whey. During the manufacture of cheese, the liquid whey separates from the 'curd' or coagulated casein. Whey protein is a popular choice for use in sports and clinical nutrition products due to it being a high-quality protein, which is efficiently absorbed and is a rich source of branched chain amino acids such as isoleucine, leucine and valine, for repairing and building muscle following exercise. Casein protein is rich in branched chain amino acids (BCAAs), unlike whey, casein is a slow-digesting protein and therefore its role in nutritional products differs. The lower amino acid absorption rate of casein makes it a significant protein for elderly nutritional products to assist with recovery and reduce muscle breakdown. The unique proteolytic activities of endopeptidase and exopeptidases deliver added value and functionality in terms of degree of hydrolysis (**Promod**<sup>®</sup>) to improve the digestibility, allergenicity and solubility of dairy proteins and the enhancement of flavour of the dairy hydrolysates (**Flavorpro**<sup>®</sup>).



## Products Used in the Production and Preservation of Natural Cheese

Cheese starts its journey as animal milk, primarily cow's milk for harder cheeses, with certain cheese types produced from sheep and goat's milk. The process of solidifying the milk to make cheese can be accelerated through the use of enzymes. Our range of **MILK-O<sup>®</sup>-REN** products are natural microbial rennet preparations derived from *Rhizomucor miehei* improving the continuity of supply whilst making them suitable for products where Kosher and Halal certified processing aids are required. Microbes can grow on the surfaces of cheese causing spoilage. Preservatives such as



Prevent growth of undesirable microorganisms



Prevent late-blowing defects



Protect against spore-forming bacteria

natamycin (**MILK-O<sup>®</sup>-CID**), nisin (**MILK-O<sup>®</sup>-NIS**) and lysozyme (**MILK-O<sup>®</sup>-LYS**) can be used to protect the surfaces of cheese and the brine baths against the growth of spores, as well as continued prevention following the cheese ripening process. These natural preservative solutions prevent spoilage and extend shelf life of dairy products.

