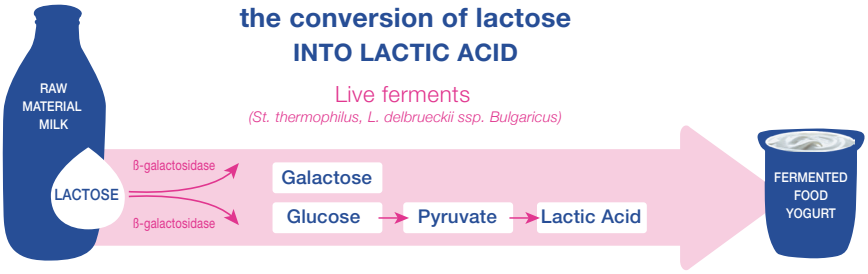
Live Ferments & Fermentation of Milk into Yogurt

YOGURT IN NUTRITION
INITIATIVE FOR A BALANCED DIET

During fermentation, the enzymatic activity of the raw material and the metabolic activity of microorganisms can change the nutritive and bioactive properties of food matrices in a manner that has beneficial consequences for human health [1]
As they multiply, the bacteria produce compounds that change the flavor, texture and nutrients in the milk to give us what we know as yogurt.

LACTIC FERMENTATION
the conversion of lactose INTO LACTIC ACID



Live ferments
(St. thermophilus, L. delbrueckii ssp. Bulgaricus)

CONVERSION OF LACTOSE

➤ contributes to improved digestion of lactose in individuals with lactose maldigestion [2]

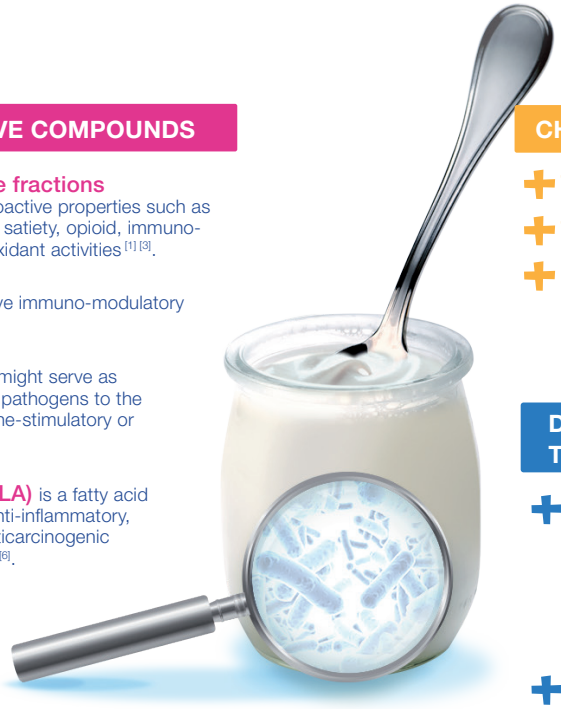
PRODUCTION OF LACTIC ACID

Lactic Acid
⬇pH

➤ anti-inflammatory properties of lactic acic [1]

PRODUCTION OF BIOACTIVE COMPOUNDS

- **Several peptides or peptide fractions** have been investigated for their bioactive properties such as anti-hypertensive, anti-thrombotic, satiety, opioid, immuno-modulatory, osteogenic, and antioxidant activities [1] [3].
- **Free amino acids** can also have immuno-modulatory functions [1].
- **Exopolysaccharides (EPS)** might serve as anti-oxidants, prevent adhesion of pathogens to the intestinal mucosa, or confer immune-stimulatory or hypocholesterolemic activities [1].
- **Conjugated linoleic acid (CLA)** is a fatty acid with putative atheroprotective [1], anti-inflammatory, immune-modulatory, antibiotic, anticarcinogenic and antiobesogenic properties [4] [5] [6].



CHANGES IN YOGURT MATRIX PROPERTIES

- **Taste:** typical acidic flavor of yogurt.
- **Texture:** EPS production and increase of viscosity [7] [8].
- **Improved shelf-life** [9].

DELIVERY OF LIVE FERMENTS TO THE GI TRACT

- **Microorganisms in the diet**
  The consumption of 'living' fermented foods potentially increases the numbers of microorganisms by up to 10 000-fold [10].

  It could be equivalent to introducing new, albeit transient, bacteria into the indigenous, intestinal microbiota [1].
- **Practical vehicle**
  The delivery of microorganisms to the GI tract is supported by the food matrix, which promotes the long-term survival of microorganisms during distribution and storage [1].

  The consumption of "live yogurt cultures in yogurt contributes to improve digestion of lactose in individuals with lactose maldigestion" [2].

INCREASED CONCENTRATIONS OF VITAMINS

- **The B vitamins,** including folate, riboflavin, and B12, are synthesized from various non-vitamin precursors by certain bacteria [1].

References : **[1]** Marco ML *et al.*, Health benefits of fermented foods: microbiota and beyond. Current Opinion in Biotechnology 2017; 44:94–102. **[2]** Scientific Opinion on the substantiation of health claims related to live yoghurt cultures and improved lactose digestion (ID 1143,2976) pursuant to Article 13(1) of Regulation (EC) No 1924/2006. EFSA Journal 2010;8(10):1763. **[3]** Hill D *et al.*, Recent advances in microbial fermentation for dairy and health. F1000Res. 2017; 6:751. **[4]** Khosravi-Darani K *et al.*, Bioproduction of Conjugated Linoleic Acid in Yogurt by Probiotic Bacteria. International Journal of Biotechnology for Wellness Industries, 2014; 3:62-68. **[5]** Wang YW and Jones PJ, Conjugated linoleic acid and obesity control: efficacy and mechanisms. Int J Obes Relat Metab Disord. 2004;28(8):941-55. **[6]** Bhattacharya B *et al.*, Biological Effects of conjugated linoleic acids in health and disease. J Nutr Biochem. 2006;17(12):789-810. **[7]** Lina TY *et al.*, Exopolysaccharides production as affected by lactic acid bacteria and fermentation time. International Journal of Biotechnology for Wellness Industries, 2014; 3:62-68. **[8]** Patel S *et al.*, Potentials of Exopolysaccharides from Lactic Acid Bacteria. Indian J Microbiol. 2012; 52(1):3–12. **[9]** Haug *et al.*, Bovine milk in human nutrition: A review. Lipids Health Dis. 2007, 6:25. **[10]** Lang JM *et al.*, The microbes we eat: abundance and taxonomy of microbes consumed in a day's worth of meals for three diet types. PeerJ. 2014 Dec 9;2:e659. doi: 10.7717/peerj.659. eCollection 2014.