

## VTT's Research on Multifunctional starters

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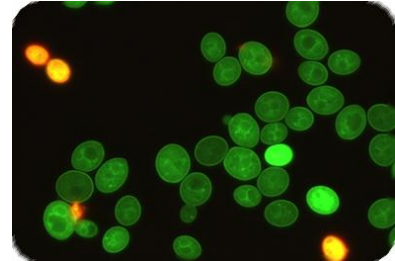
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*Microbes are widely applied to modify food raw materials to obtain safe, wholesome and tasty products. Living health-benefiting microbes (probiotics) can have positive health effects which are intermediated by host's immune system or microbiota. VTT has long experience in applying and controlling bacteria, yeasts and moulds in food processes. We help our customers to use microbes in a controlled way for improved products and to effectively prevent harmful microbes in their processes. Multifunctional starter mixtures offer a tool to produce novel products with desired nutritional and technological properties for the food and beverage industry.*

### 1. Characterization of beneficial bacteria, yeasts and filamentous fungi

- ✚ Antimicrobial potential of bacteria and fungi
- ✚ Mode of action mechanisms
- ✚ Viability and stability of starter cultures
- ✚ Fermentation and downstream processing

### 2. Technological and functional properties of starters

- ✚ Enzyme production
- ✚ Impacts on flavour and aroma
- ✚ Texture improvement with exopolysaccharides

### 3. Combination of biological, physical and chemical treatments

- ✚ Design of starter mixtures
- ✚ Combining mixed cultures with other alternatives such as heat treatment, modified atmosphere and natural preservatives
- ✚ Enhancement of activity of antimicrobial agents by cell permeabilizers

### 4. Health-benefiting microbes (probiotics)

- ✚ characterisation novel, potential probiotic strains
- ✚ formulation and stabilisation of probiotics for food and beverage products
- ✚ interactions between probiotics and gastrointestinal (GI) microbiota
- ✚ for more information about probiotics see the folder in question

### 5. VTT Culture Collection

- ✚ identification, deposit and delivery of the microbial strains
- ✚ <http://culturecollection.vtt.fi/>