Quality

Texture and fermentation

Application

Yoghurt manufacturing

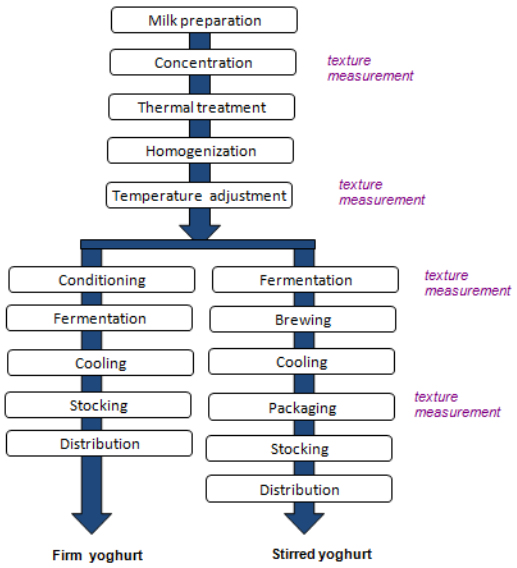
Targets: Yoghurt industries, dairy industries, firm, liquid, stirred, greek yoghurt manufacturies

Application

Yoghurt is the result of milk fermentation by two lactic thermophilic bacteria. The main role of these bacteria is to reduce milk pH in order to form a gel and provide acidulate taste and savor to the gel. Fermentation leads to milk solidification usually called “white mass”. It can be consumed in this state (firm) or after brewing providing a creamy or liquid consistency.

Yoghurt manufacturing process includes various steps: milk preparation, concentration (the consistency and viscosity of the yoghurt are for a large part depending on the milk solids, which are regulated by international norms, around 10%-20% of weight), thermal treatment which will lead to serum expulsion, homogenization and culture. Culture is done in tanks and agitation is required to have good homogeneity of the mix milk/ferments. In big factories, this is realized in continuous process. At this step, the process will differ for firm or stirred yoghurt productions. To obtain firm yoghurt, the white mass is immediately filled in pots and fermentation happens directly into the pots. Whether brewed and liquid yoghurts ferment in tank and are then brewed and/or homogenized before being filled in pots.

Yoghurt manufacturing steps



Consistency, texture, fermentation, concentration and dry extract are common viscosity correlations used in the food and beverage industries. Consistency is the most direct correlation to viscosity as it indicates a resistance to movement.

In yoghurt manufacturing, **consistency and texture are of utmost importance, for which viscosity is the correlated parameter.**

Challenges

During yoghurt production cycle, some recipes are instable and/or fragile due to their complexity. Moreover, the time is crucial: it is important to reduce the time at the maximum between preparation phase and packaging phase, because this is when lactoserum pockets are created.

At the end of fermentation, the tank or pots contain yoghurt but may also contain pockets of whey (milk plasma / lactoserum). These pockets of whey should not enter in the stirring/mixing step neither in an excessive way in the pot.

Possible consequences of excessive whey in final yoghurt packaging are:

- Diluted yoghurts
- Whey instead of yoghurts
- Increase of customer complaints
- Sales decrease
- Decrease of brand image

Solution

The MIVI sensor is the consistency meter most sensitive on the market. It provides a vibrating measurement detecting any variation in the state of the material. By default, the MIVI is calibrated in viscosity units. Whey has a lower viscosity than yoghurt and can be detected by the MIVI sensor just before the stirring/mixing step. The inline viscometer, correlated to texture and concentration values, helps to remove whey from normal process of yoghurt manufacturing.

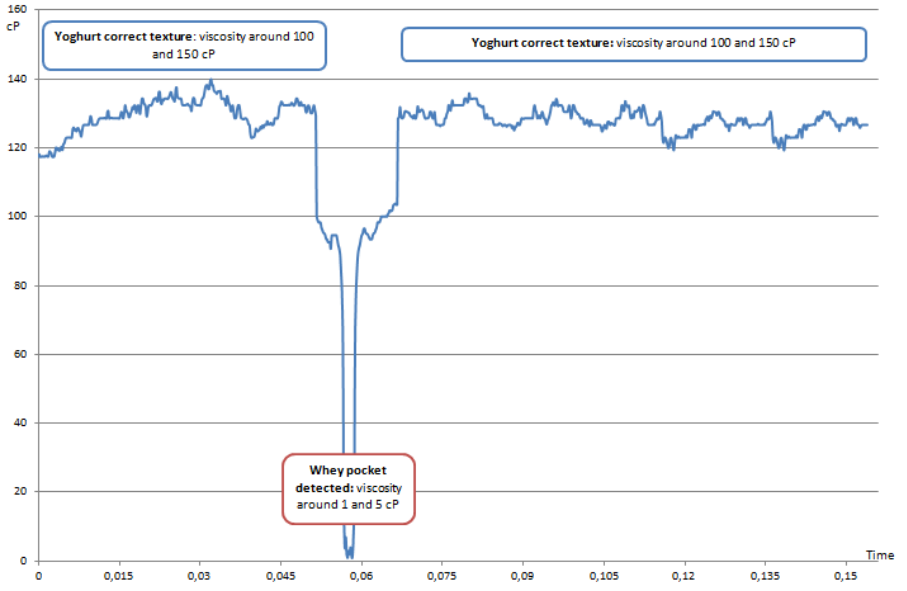
Installation

According to the yoghurt type produced, the MIVI process viscometer can be fitted:

- After the homogenization tank for firm yoghurt (**MIVI A**)
- On the conditioning line for stirred or liquid yoghurt, before filling the pots (**MIVI B&C**)

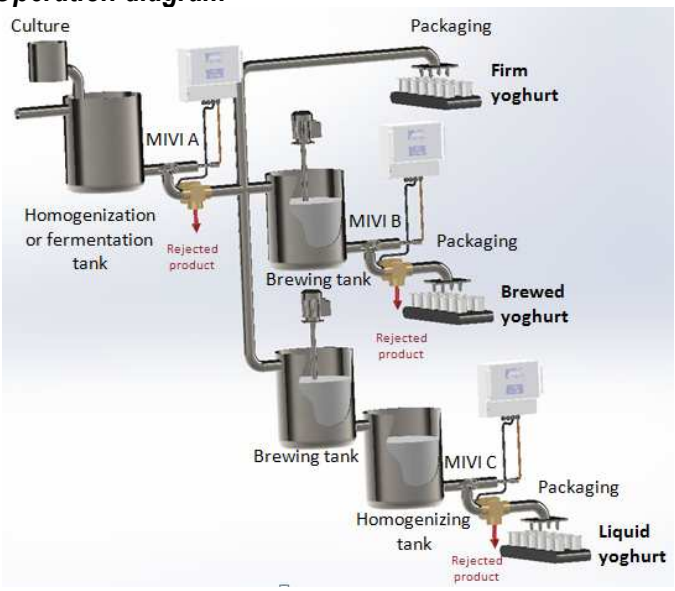
It continuously delivers viscosity information to the processor. This information is used to control the valve which either lets the product follow filling operations or diverts detected whey from packaging.

Records in yoghurt production line in South West of France



Onsite installation at a yoghurt manufacturing facility

Operation diagram



Key product characteristics:

- Repeatable and reliable
- Designed for sanitary environment (design according to 3A specifications and IP67 protection)
- Low influence of flow rate variations (measurement at high shear rate in 2nd Newtonian stage)
- Easy to install and to use
- Rugged
- No drift
- No maintenance
- High pressure