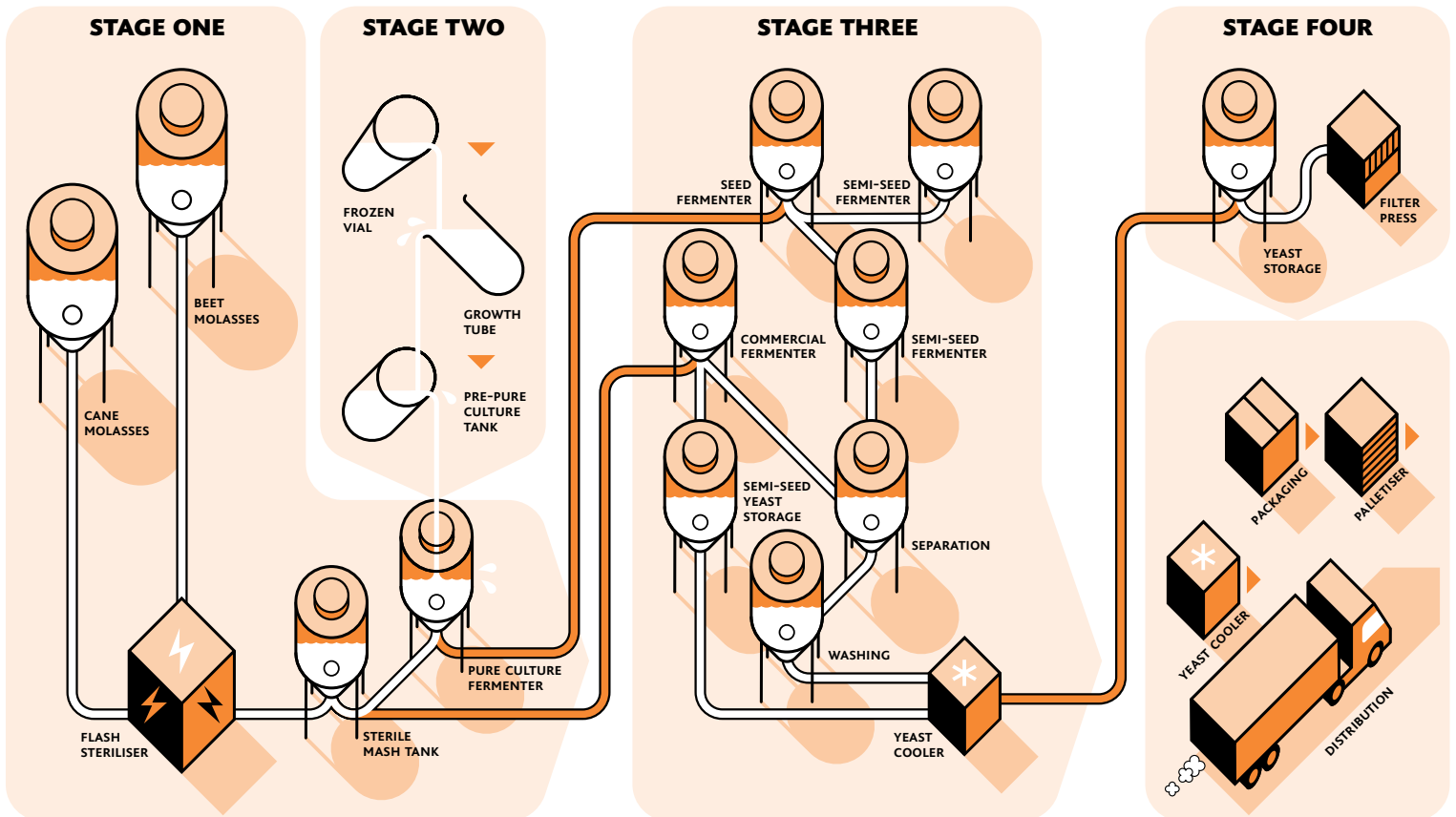


The magic ingredient: The yeast production process

The essential ingredient in the production of so many of our day-to-day products. But how is it made?



STAGE ONE – MOLASSES AND RAW MATERIAL PREPARATION

Yeast production takes approximately five days from start to finish and begins with the energy source for yeast growth – sugar. Beet and cane molasses are commonly used because the sugars present in molasses are readily fermentable. Yeast also needs minerals, vitamins and salts for growth, which are often added to the molasses prior to flash sterilisation which produces the mash or wort used to feed the yeast as it grows.

STAGE TWO – CULTURE OR SEED YEAST PREPARATION

Yeast production starts with a pure culture tube or frozen vial of the appropriate yeast strain. This yeast serves as the inoculum for the

pre-pure culture tank where seed is grown under sterile conditions before being transferred to a larger pure culture fermenter. From the pure culture vessel, the grown cells are transferred to a series of progressively larger seed and semi-seed fermenters. These later stages are conducted as fed-batch fermentations where the yeast is fed molasses, phosphoric acid, ammonia and minerals.

STAGE THREE – FERMENTATION AND HARVESTING

At the end of the semi-seed fermentation, the spent molasses are removed and the yeast is washed with cold water and held in a storage tank at 34 degrees Fahrenheit (1 degree Celsius) before it inoculates the commercial fermentation tanks.

These commercial fermenters are up to 50,000 gallons in size and are the final step in the fermentation process.

Following addition of the seed yeast, aeration, cooling and nutrient additions are started to begin a 15–20 hour fermentation. At the beginning of the fermentation, the liquid seed yeast and additional water may occupy only about one third to one half of the fermenter volume. Constant additions of nutrients during the course of fermentation bring the fermenter to its final volume. The rate of nutrient addition increases throughout the fermentation and by the end of the process the number of yeast cells will have increased by between five and eight times. During fermentation the temperature

is kept at approximately 86 degrees Fahrenheit (30 degrees Celsius) and the pH in the range of 4.5–5.5.

STAGE FOUR – FILTRATION AND PACKAGING

At the end of fermentation, the resultant broth is separated, washed with water and re-centrifuged to yield a yeast cream, which is then cooled to about 45 degrees Fahrenheit (7 degrees Celsius). Cream yeast can be loaded directly into tankers for delivery direct to customers or can be pumped to a plate and frame filter press and dewatered to a cake-like consistency, which is crumbled into pieces and refrigerated. Bags of yeast can then be distributed to customers in refrigerated trucks.