

Making Maltose Sugar Syrup

- The wheat grain is allowed to sprout,
- The enzyme (amylase) develops
- Hydrolyses the starch to maltose sugar
- Filtered the sugar solution
- Concentrated by evaporating

Step1: Making Crude Enzyme

- Steep the wheat grains with water for 16 hours [Keep 1 inch height of water level above the grains].
- Lay the wet cloth inside the strainer and spread out the grains on the cloth.
- Cover with another wet cloth above the grains and allows for germinating in 30 hrs. [Need to spray water on the cloth every 5 hrs.]



Germinating Wheat Grains

- **After 30 hours, sprouts come out should be about 1.5 to 2 cm long.**
[At that length of sprout, the natural amylase enzyme inside the wheat is fully activated and can be used for sugar process.]
- **Remove the grains gently and dry under bright sun.**

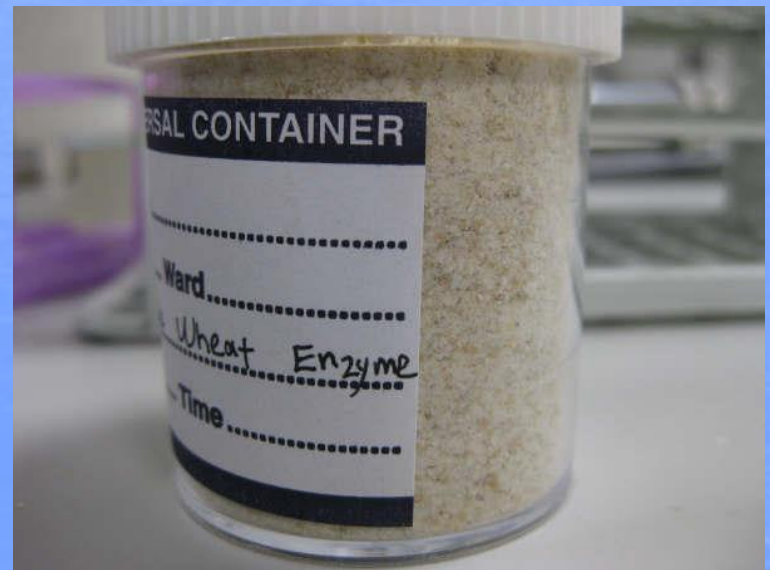


Drying sprouted wheat grains

- When the grains are fully dried, grind them into powder. [This powder is a source of crude amylase enzyme]



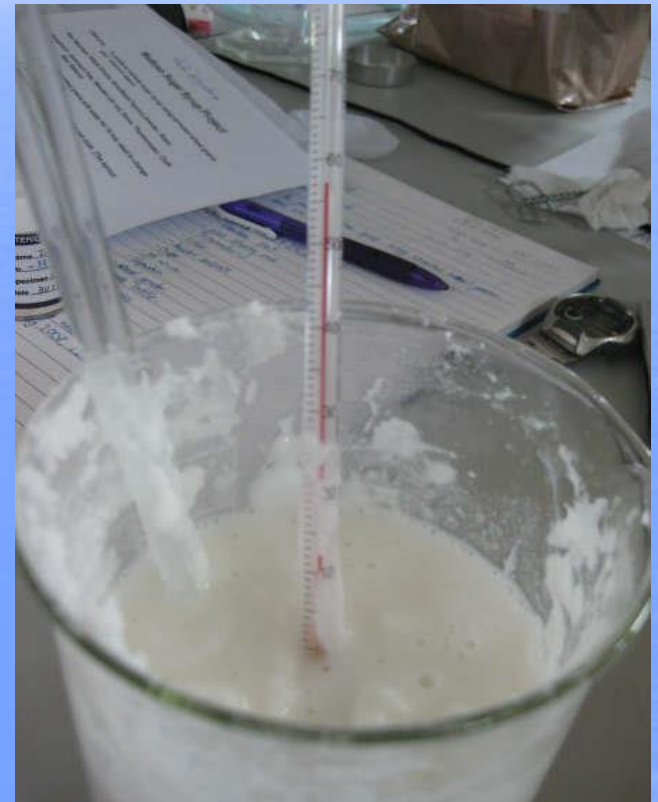
Grinding dried wheat grains



Crude Enzyme

Step2: Making Maltose Sugar Syrup

- Weigh 200g of Tapioca flour and mixed with 500ml of water in a metal pot.
- Heat 500ml of water in another metal pot until boiling.
- Transfer the Tapioca slurry into the boiling water and stir constantly until become gelatinization.



Gelatinization [viscous starch]

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- Add 10g of crude enzyme and stir until liquefaction [viscose starch becomes thin as a liquid]
- Stop heating when liquefaction is completed. Then, use a thermometer to monitor the temperature.



Liquefaction

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Saccharification

- At 55 °C, add in 20g of crude enzyme and stir. Maintain the temperature at 55 °C for 2 hrs and stir constantly.



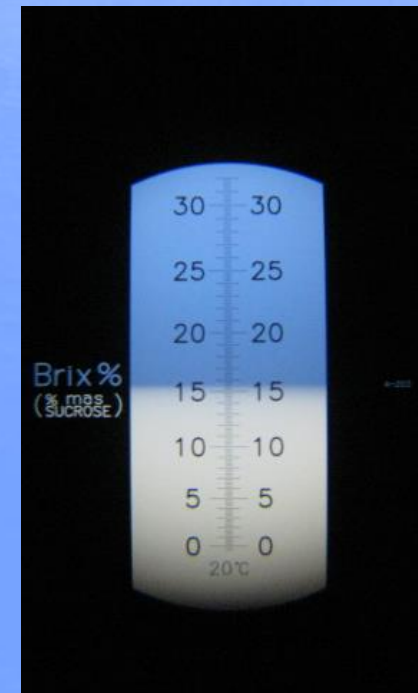
Saccharification [starch to sugar]

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- Pour the slurry into two separate bag filter and filter to get clear sugar solution [sugar content will be about 15-17 %]. Filtration may take 3 to 5 hrs.



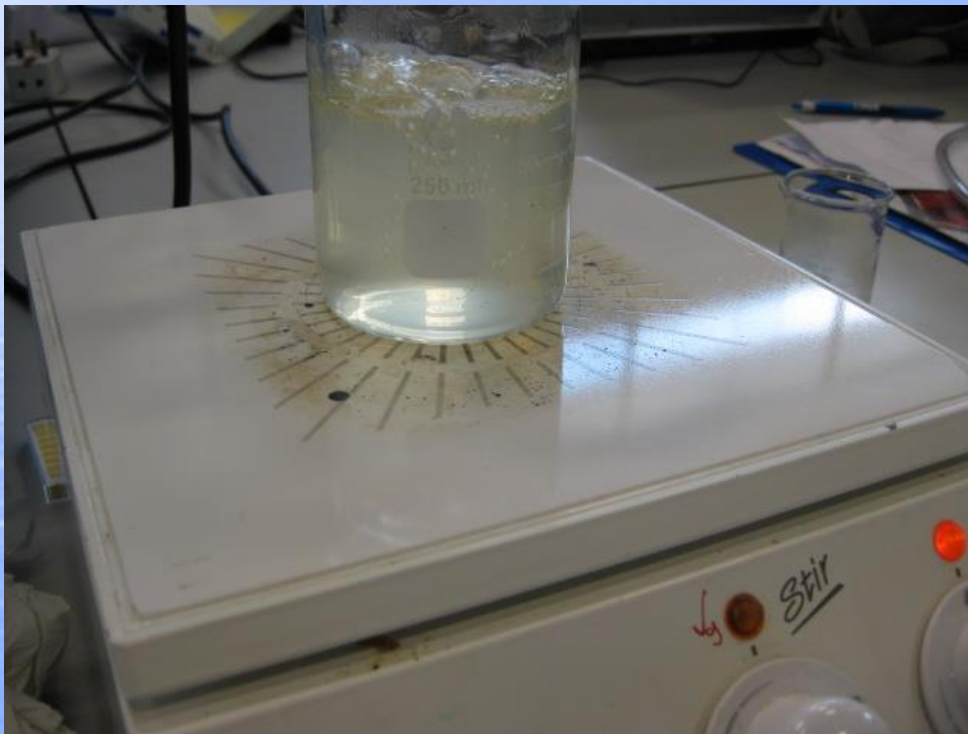
Filtering the clear sugar solution



15% sugar

Making Maltose Sugar Syrup

Boil the clear solution until to get sugar content about 80%.



Concentrating by evaporation



82% sugar

Making Maltose Sugar Syrup

- **Transfer the concentrated maltose solution into sample bottles**



Product sugar syrup