

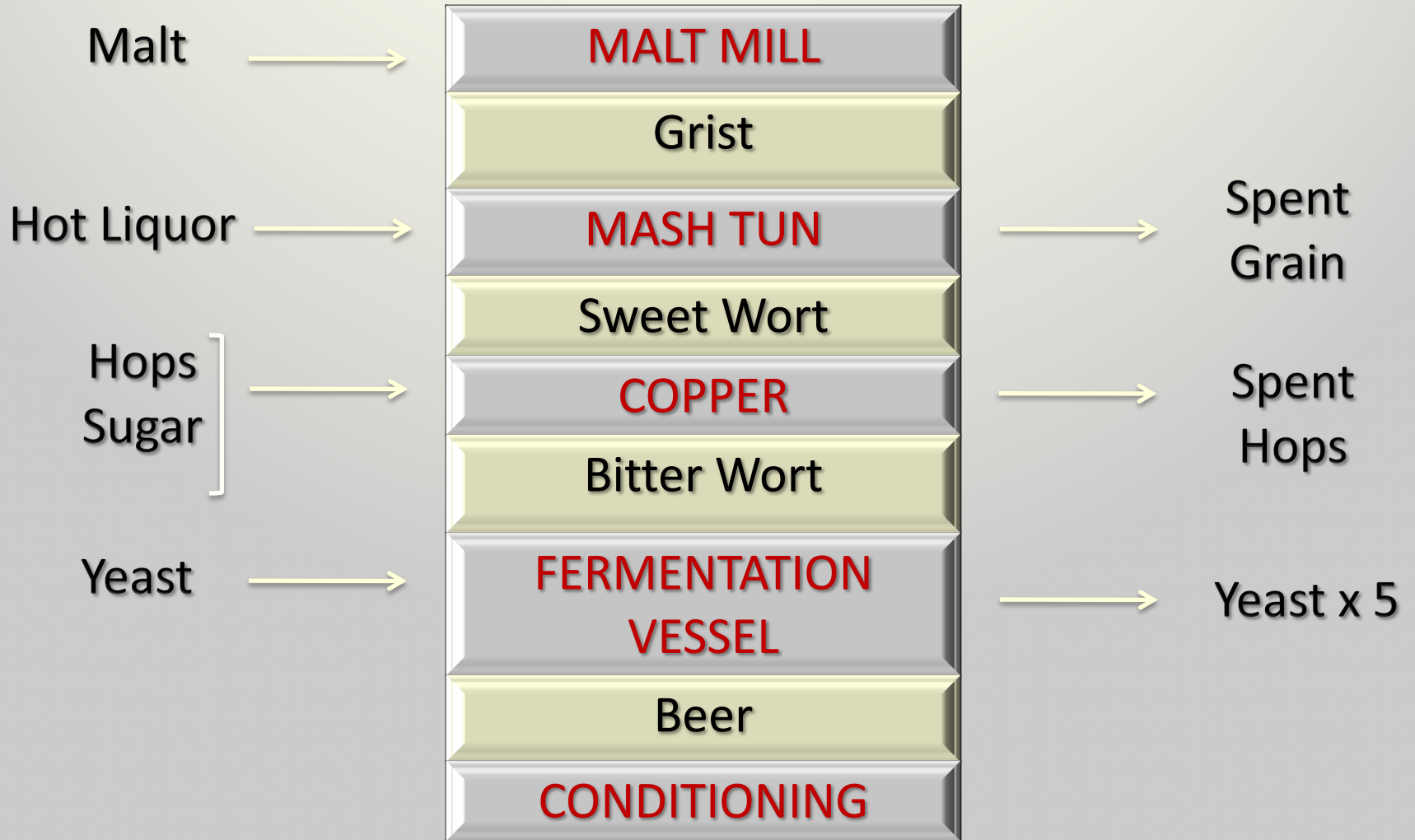


Beer & Cider

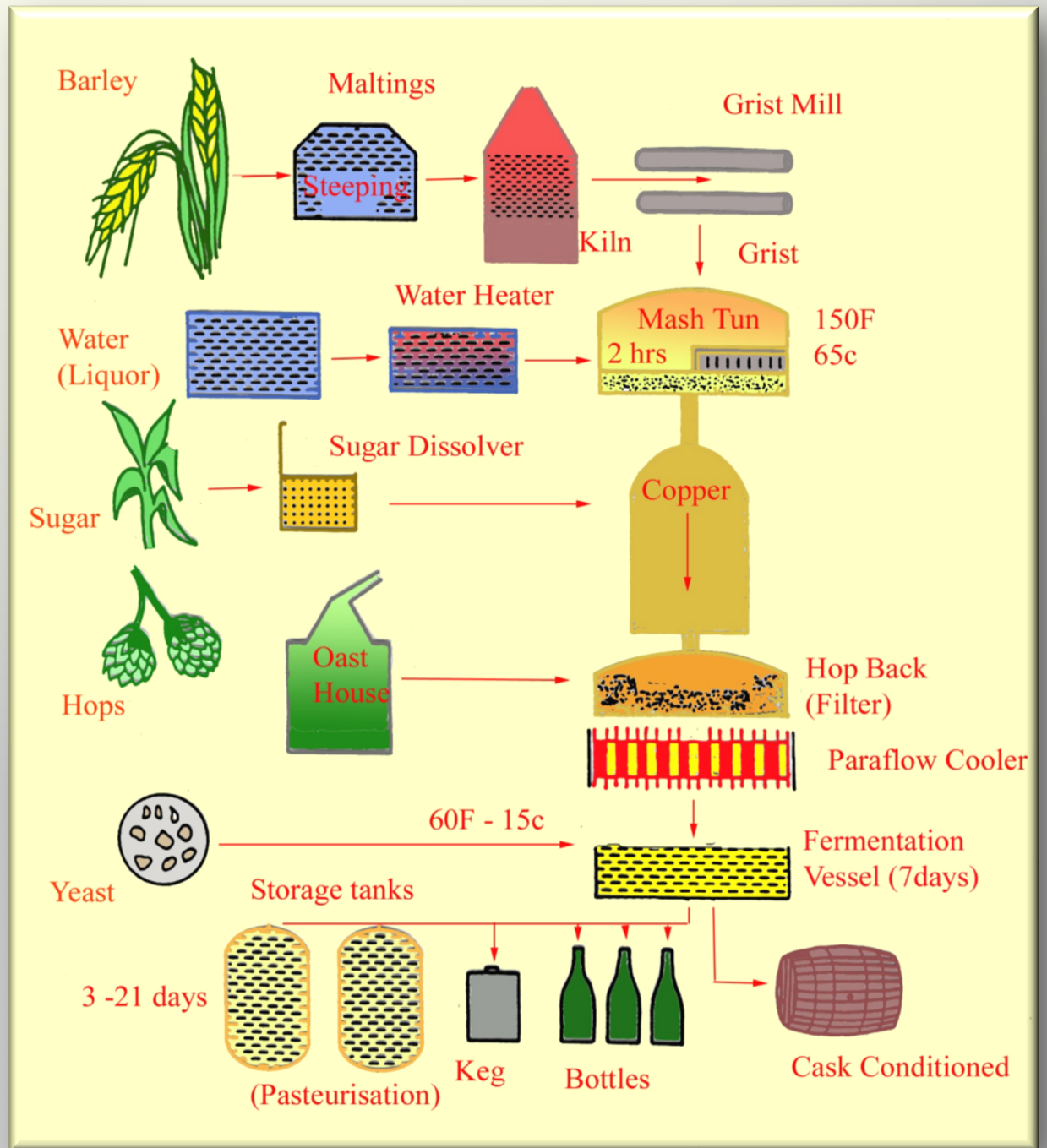
Beer Production processes

Conversion	Conversion of starches to Maltose in Malting process
Extraction	Extraction of sugar from Grist in Mash Tun
Flavouring	Addition of Hops to flavour the Wort
Fermentation	Conversion of sugars to Alcohol
Conditioning	Cask or bottle conditioning (Refermentation)

Beer Production



Beer Making Process



Beer - Ingredients

- **Malted Barley:** or other type of cereal grain.
Best beers are made with germinated barley.
- **Invert Sugar: (Glucose / Fructose)**
- **Hops** imparts bitterness and other unique qualities to the specific beer. Bitterness measured in IBU.
- **Water: (Liquor)** accounts for 85-90% of beer content.
Often chemically manipulated by large breweries.
- **Yeast:** responsible for fermentation. Strain of yeast is important to the style of the finished beer.

Types of Malt

- Germination malts the barley producing two enzymes - **diastase and amylase.**
- **Pale Malt:** Light roast. Maximum sugar basis of all beers.
- **Lager Malt:** Light roast. Less sugar than pale malt.
- **Crystal Malt:** Medium roast, fuller flavour, used in pale and light ales.
- **Black / Chocolate malt:** Heavy roast, caramelised sugars. Used in stouts and brown ale.

Yeasts

- Traditional beers use a top fermenting yeast
- *Saccaromyces Cerevisae*
- Lager beer is fermented with a bottom fermenting yeast -
Saccaromyces Carlsbergensis

Hops



- Hops are used for flavouring beers and are boiled with the sweet wort to extract the bitter flavours and oils.
- Also used in cask conditioned ales to add extra flavour and assist in clarification process.
- Traditional English varieties.
Fuggles and Goldings.

Beer Production



- **Malting:** barley steeped in water to germinate.
- Malted barley dried and roasted in kilns.
- Malted barley ground in grist mill.
- Grist enters a Mash Tun, hot water is added, and churned into mash.
- Mash enters Lauter Tun, and liquid drawn off leaving Wort.
- Wort goes to Hop Kiln (or brew kettle) where hops and wort are boiled for several hours.

- Wort and hops strained in hops strainer to eliminate solids. (some breweries also use centrifuge at this point)
- Flavoured wort cooled.
- Wort enters fermentation tanks and appropriate yeast added.
- After fermentation young beer is cooled and stored. Hops may be added and some times a secondary fermentation induced. (**Krausening**)
- Refrigeration and packing.

Beer Styles

Two Major Styles:

- **Ales:** made with quickly fermenting top-fermenting yeasts.
- **Lagers:** made with slower fermenting bottom-fermenting yeasts.

Ale Styles

- **Pale Ale:** usually bronze or copper coloured as opposed to dark brown.
- **Bitter Ale:** a well-hopped ale with good acidity and a hoppy bitterness in the finish.
- **Porter:** dark in colour and strong in flavour, a lighter companion to the stout.
- **Stout:** extra dark, almost black in colour made with highly roasted malts.
- **Wheat Beer or Weißbier:** made from wheat and having a tart spicy palate. Unfiltered.

Lager Styles

- **Pilsner:** a classic beer golden in colour with a flowery aroma and dry finish.
- **Bock:** German term for strong beer. Usually indicates a lager made from barley and may be golden to very dark brown in colour. Bocks are traditionally made in the winter and spring.

Lambic Beers

- A specialty of Belgium,
- Fermented in open-top containers with native wild yeasts, such as **Brettanomyces bruxellensis** and **Brettanomyces lambicus**.
- Classic lambics are vinous in character and sour.
- Aged up to three years in cask prior to release.
- Generally blended before release.

Geuze is a style produced by mixing one-year-old lambics with beers that have aged for two to three years..

The blend is then refermented with aged hops in the bottle, (bottle conditioned) giving the beer its sparkle.

- **Fruit lambics**, such as **Kriek**, are traditionally dry.
- Re-fermented with added fruits, such as sour Morello cherries for Kriek.

Conditioning

- Majority of beers are pasteurised and free of sediment.
- Cask conditioned and bottle conditioned ales contain live yeasts which create a secondary fermentation in the product.
- These beers need to be carefully separated from the sediment of yeast cells at the point of service.

Ciders and Perries

- Both popular fermented beverages produced in England, France, Spain, the U.S.
- **Cider:** from fermented apple juice or blend of apple and max.25% pear juice.
- **Perry:** from fermented pear juice or blend of pear and max.25% apple juice.

Cider-Perry: Production Process

- Harvest of fruit October/November.
- Fermentation: 4-6 weeks between 18-25°C.
- Both cider and perry can become sparkling by inducing a secondary fermentation or adding Co₂.
- Alcohol content from 2-8%.
- Some capable of ageing.
- **Scrumpy:** Higher strength. Often un-filtered. Usually still but may be carbonated.
- Dry and sweeter styles.