



BEER :-

Introduction: Beer is a potable alcoholic beverage fermented from barley malt and flavored with hops which is a dried rip flower of the mulberry or nettle family. Actually many cereal containing starch and sugar may be used in the brewing of beer e.g.; maize, rice, corn or wheat, but these grains lack of essential enzymes and when used require special treatment.

Beer has been produced by many cultures over the ages. The Crimean tartars made a brew from millet seed; the Russians brewed the kvass, made from kvass seed and is still consumed in many parts of Russia ; the Germans brewed a whet version called weisbier; Arabians and Africans brewed their own concoction from teff, millet, grass seeds and others; the Chinese made the kiu from rice and sorghum; the south pacific region got its version of beer from coconut; and south Americans make their beer from any grain at hand . Christopher Columbus found that native Indians made beer from corn. Worldwide, beer is very popular and a socially acceptable product because of its low alcoholic contain. It is treated as a refresher or thirst quencher.

Ingredients of BEER :-

- ✓ **Barley** : There are many varieties of barley, the ones chosen for beer production must have high starch content, low protein content and little flavour. It is for the reason that the two-row barley – which has two rows of seed on its head is considered best.
- ✓ **Hops** : hops belong to the nettle family. Scaly of the vine Humulus lupulus in Europe. The female plants bear cone-shaped formations that measure from 1-4 inches in length. The petals have tiny glands that contain oils and resins, which prevent the growth of bacteria in beer and impart a bitter flavour. It has a pleasant aroma, increasing the refreshing quality of beer and stimulating digestion. Its also preserves beer. Hops grow in a wide range of climates and soils.
- ✓ **Yeast** : It is a micro-organism to the Saccharomyces species and is capable of reproducing at a fantastic rate. Its work is to propagate and split up the sugar

components into equal quantities of ethyl alcohol and carbon dioxide. Most yeast grows best at temp; between 68°F and 113° F. yeast feed on simple sugar called glucose and often use their enzymes to convert starches or other sugars into glucose. It is carbon dioxide of the beer, which determine the amount of the fizz and the foam formation in the beer. A consistent carbon dioxide level means that the barman will not have any trouble handling beer at normal temperatures.



- ✓ **water** : It is very important ingredient. Its quality is critical and therefore, spring water is preferred. Lager beers are produced from water with low mineral content. Yeast is sensitive to water and therefore, a lot of consideration is given to the quality of water.

Contents of beer :

- Water – 89-91% by weight
- Alcohol – 3-12% by weight
- Carbohydrates, sugar or dextrin – 3-4% by weight
- Protein – 0.04-0.5% by weight
- Carbon dioxide gas - 0.04-0.5% by weight
- Minerals & salt – 0.2% by weight

Classify various types of beer :

Bottom fermented beer (LAGER): fermentation takes place at low temperature, with active yeast in the bottom of the fermentation tank. These beers are called lagers. Lagers are

smooth, light and refreshing and the most popular beers in the world. The family includes several types of beer, such as pilsener, Dortmunder, Muncher, Bock and Double Bock .

Top fermentation beer (ALE): fermentation takes place at high temperatures as the yeast develops in the top of the tank. Ales are generally more savory, coarser and denser, with higher alcohol content. The family includes pale ales, mild ales, strong ales, stouts and porters. The trappist beers, abbey and white beers, which undergo a secondary fermentation after bottling, also belong to this branch of the family.

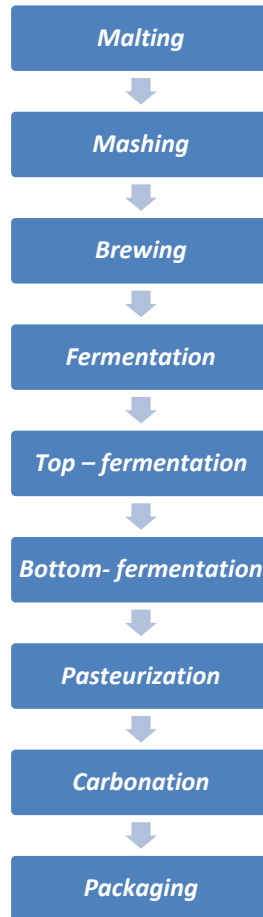
Wild fermentation beer : This fermentation not involve the addition of yeast. The must is exposed to the air in shallow tanks, catching indigenous yeasts that are present in the air. The beer continues to ferment in wooden casks for several months. This artisanal method is a specialty of the senne valley in Belgium, where the process is strictly regulated. The name limbic is reserved for the beer produced by Belgian brewers.

Types of beer :

- ✓ **Bitter :** Pale, amber-colored beer served on draft. May be sold as light bitter, ordinary bitter or best bitter. When bottled it is known as pale ale or light ale depending on alcoholic strength.
- ✓ **White beer :** Traditional beer made with a high proportion of wheat, sometime known as wheat beers.
- ✓ **Ale :** Brewed from malted barley using a warm fermentation with a strain of brewers yeast. Compared to lager ale yeast ferments more quickly, and often produces a sweeter, fuller-bodied and fruitier taste.
- ✓ **Lager :** The name comes from German lagern (to store). Fermentation takes place at the bottom of the vessel and the beer is stored at low temperatures for up to six months and some-times longer. Sold on draft, in a bottle or can.
- ✓ **Pilsner :** This is a light, rich and mellow lager with dry crisp, hop flavour and a light colour. It is made from the hops of pilsen city in **Czechoslovakia** and considered to be one of the best quality beers in the world. Original Pilsner has to come from Pilsner and people may be duped by imitations, especially brewers who may mix Pilsner with other ones.
- ✓ **Stout :** It is very dark malt and generously flavored with hops. Has a smooth malty flavour and creamy consistency. Sold on draft or in bottles and was traditionally not chilled, **Guinness** is one ex.
- ✓ **Porter :** Brewed from charred malt, highly flavoured and aromatic. Its name comes from its popularity with market porters working in **Dublin and London**.
- ✓ **Indian pale ale (IPA) :** Heavily hopped strong pale ale, originally brewed in the UK for shipping to British colonies. The modern style is a light-coloured, hoppy, ale.

- ✓ **Trappist beer** : Beer brewed in **Trappist monasteries**, usually under the supervision for monks. **Six Belgian breweries** produce this beer, which is strong, complex and un-pasteurized, and often includes candy sugar in the recipe.
- ✓ **Mild** : It can be light or dark depending on the colour of the malt used in the brewing process. Generally sold on draft and has a sweeter and more complex flavour than bitter.
- ✓ **Abbey-style** : Ale brewed in the monastic tradition of the low countries but by secular brewers, often under license from a religious establishment.
- ✓ **Burton** : It is dark strong draft beer, this beer is also popular in winter when it is mulled or spiced and offered as a winter warmer.
- ✓ **Old ale** : It is brown and sweet and strong. Can also be mulled or spiced.
- ✓ **Strong ale** : Colour varies between pale and brown and taste between dry and sweet. Alcoholic content also varies.
- ✓ **Smoked beer: Beers** made with grains that have been smoked as part of the malting process. Various woods are used, **including alder, cherry, apple, beech or oak.** Sometimes the process uses **peat** smoke.
- ✓ **Draught beer** : It is not pasteurized and therefore, is perishable. It has to be stored at temperatures between 36-42°F . draft beer comes in kegs, either full or half. A full keg holds 31 gallons. These kegs are connected to taps in bars through a pipe pressurized with carbon dioxide or air that have to be precise in pressure to give a balanced draft drink.
- ✓ **Bavarian beer** : This beer is also called **Munchen**. It is made from the hops of Bavaria, which has a good flavour. It is light body and darker than pilsner. It gets its full body, rich flavour from heavy malt . Bavarian beers are of two types- **Helles** (light) and **Dunkel** (dark).
- ✓ **Dopple-bock** : This is full, rich lager beer of high alcoholic content ranging from 6% - 10.5%. This beer is a specialty of Bavaria and challenges many tourists.

MANUFACURING PROCESS OF BEER :-



Malting :- Barley steeped in water until it germinates. It is then kiln-dried to 18°F. to stop germination. The resultant product is termed as malt and is ready for grinding.

Mashing :- Crushed malt called grist is mixed with water at a temperature of 154° F for the proper length of time in a mashing Tun. The mash is mixed and cooked from one to six hours, during which the malt enzyme amylase converts the starch into maltose and the enzyme protease is broken for the beer clarity. The resultant solution called wort is a warm and sugary fluid ready for beer making. The residue is strained into a lauter tub. Lauter means ' to make clear 'in German. It is sold as stock fodder.

Brewing :- The wort is placed in huge copper or stainless steel kettles when hops are added. The mixture is then boiled to sterilise the wort and to extract the bitter flavour of the hops. The hops are drained off and the wort is cooled from 50-70° F for beer and from 37-49° F for lager beers.

Fermentation :- It is the next process where the yeast splits the sugar into alcohol and carbon dioxide . this is the most decisive phase in the brewing for attaining brews of fine taste and aroma. There are two types of fermentation.

- ✓ **Top – fermentation :-** It is fast process achieved at high temperature. The beer is produced in only a few days. It produces heavy foam on top of the brew. The wort is cooled from 50-70° F. it is filtered, bottled and packaged for immediate consumption. Ales, porters and stouts are the popular top-fermented beers.
- ✓ **Bottom – fermentation :-** It is slower process from which lager is produced. The yeast works slowly at low temperatures and the fermentation starts at the bottom identified by the bubbles of carbon dioxide that emerge at the top of the wort. This process was first introduced in Bavaria in the eighth century to preserved. Brewers fermented the beers in cool caves to preserve it.

Pasteurization :- This process is used to kill bacteria in the liquid and to stop fermentation. Pasteurization is necessary for bottled and canned beer to preserve it for longer shelf life. This is achieved by exposing the beer to 140 -150° F heat in order to kill the bacteria that spoil beer. Draft beer is not pasteurized and therefore, needs to be refrigerated and consumed quickly. They can increase the shelf life of draft beers by filtering it to remove bacteria. Beer can not last forever and must be consumed within three to four months.

Carbonation :- In this process need to add carbon dioxide to beer to make it fizzy. Beer cannot be enjoyed without carbonation and is considered 'flat'. Carbonation can be achieved by retaining the carbon dioxide during fermentation or by injecting carbon dioxide to the brew in neutral containers like glass or stainless steel .

Packaging :- Beer is packaged in various containers from bottles and cans to stainless steel kegs. The cans are coated inside with lacquer to avoid any reaction of brew to the metal cans. Bottle and cans come in quantities of (33CL, 35.5CL, 44CL, 50CL, 55CL, 1.5L). Draft beer comes in full kegs of 30 gallons and half kegs.

Beer container size :-

- Pint – 20.45 liters (4.5 gallons)**
- Firkin – 40.90 liters (9 gallons)**
- Keg – 45.50 liters (10 gallons)**
- Kinderkin – 81.80 liters (18 gallons)**
- Barrel – 163.65 liters (36 gallons)**
- Hogshead – 245.50 liters (54 gallons)**

Beers of the world :-

Name	Type	Country
Foster's ,Abbott's ,Crown , carlton's draught	Lager	Australiya
Pilsner Urquell	First developed	Czechoslovakia
Brahma		Brazil
Carlsberg, Toburg, Special dark beer	Lager	Denmark
Peroni	Lager	Italy
Asahi , kirin	Lager ,lager/stout/black	Japan
Amrit , Singha	Lager	Thailand
Heineken's, Amstel, Special dark beer		Holland
Dortmunder Union/Hansa, Lowenbrau, Bicks, Hofbrau,		Germany
Kronenbourg , Miller	Lager	French
Carta blanco		Mexico
Budweiser, Falls city, Anchorsteam, Utica club pilsner , Utica club cream ale , Uncle's ben	Lager and ale	USA
Kriek limbic, framboies		Belgian
Bass ale, white bread ale, Mackerson's Stout , Double Diamond. Bass Red/Blue triangle,	Ale / Stout /	UK