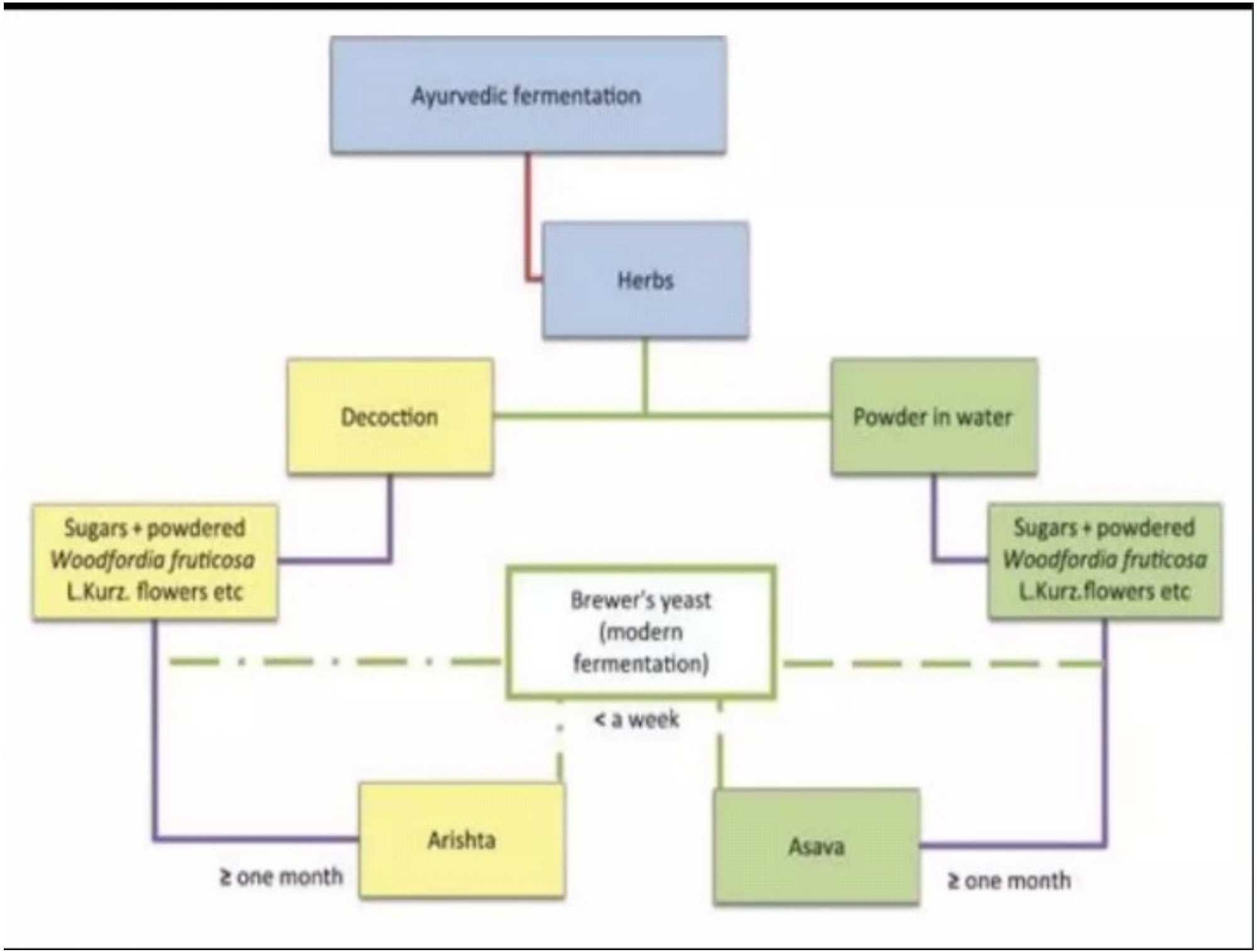
FERMENTED FRUIT BEVERAGES

Sparkling clear wines - Champagne and Cider;

Fortified wines - Sherry, vermouths; Orange wine, Perry, Tokay, Port, Feny.


Ayurvedic fermentation
Herbs
Decoction
Powder in water
Sugars + powdered
Woodfordia fruticosa
L.Kurz. flowers etc
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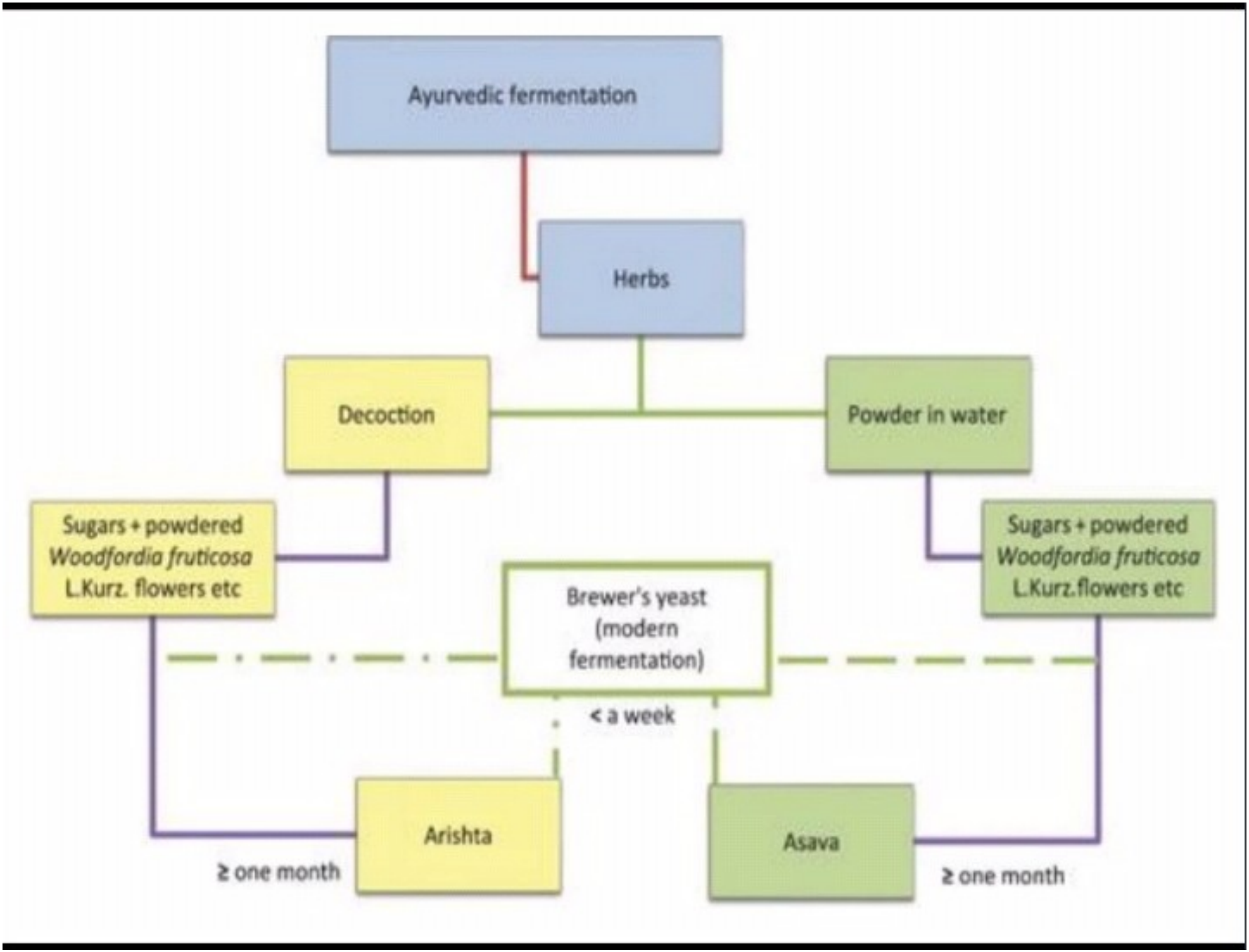
Brewer's yeast
(modern
fermentation)
< a week
Arishta
≥ one month
Asava
≥ one month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द्राक्षासव

Asava or Asavam is a category of Ayurvedic medicine prepared by the fermentation of fresh herbal juices.

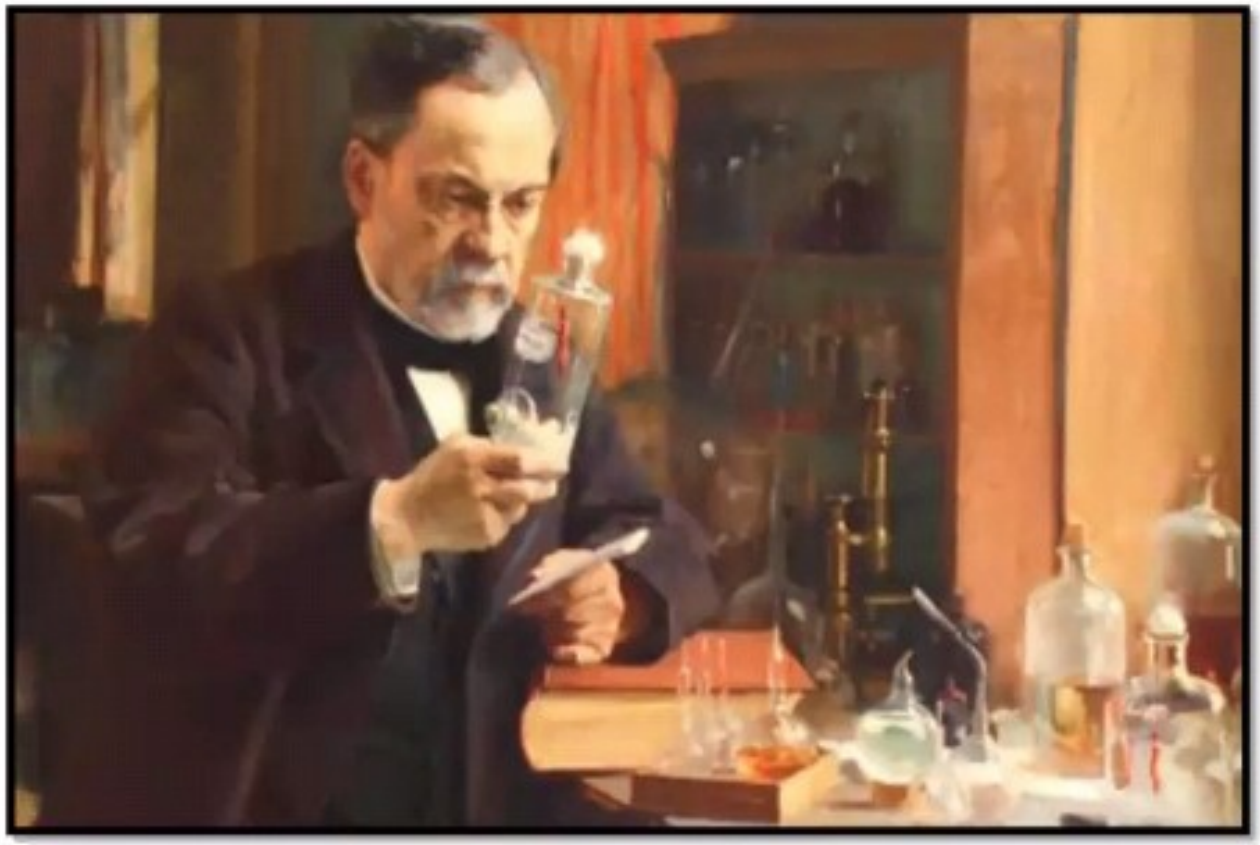
ASAVA	USE
Chandana asava	Improving complexion and stamina
Hareethaky asava	Treating general debilities, all kinds of coughs, haemorrhoids, anaemia (iron deficiency), rheumatic disorders, gastric problems, acidity and similar issues
Kanak asava	Asthma and Dyspnoea (laboured breathing)
Loh asava	Anaemia, Weight gain and Loss of appetite.
Pippaly asava	Sprue, Digestive tract issues, Anaemia, Intestinal spasms and loss of appetite
Punarnnav asava	Curing oedema (Fluid retention), Anaemia, Ascites (swelling caused by build-up of fluids in the abdomen), Spleen and liver disorders

Asnokarisnta	Menstrual cycle regulator, especially to control excessive bleeding for prolonged periods during menstrual cycle, urinary disorder
Dashamularishta	Normalization of physiological processes after childbirth in women; anti-inflammatory, Piles, jaundis, sterility in female, Pneumonia,
Aravindasava	Pediatric tonic, Appetizer
Arjunarishta	Cardiotonic
Drakshasava	General tonic, influenza, Blood toner/nourishment
Kumaryasava	Liver disorders, piles, constipation, enlargement of spleen, cooling effect, Endocrinal deficiency, Blood toner/nourishment
Lohasava	Anemia, Piles, spleen disorder, diabetes, Ascites
Draksharishta	Constipation
Saraswatharishta	Seminal weakness
Mrithasanjeevaniarishta	Sexual stimulating tonic, Weakness
Sarivadyarishta	Syphilis
Chandanasava	Autoimmune disease
Aswagandharishta	Weakness, appetizer

Mahamanjisthadyarishta	Rejuvenator
Chandanasava	Cooling Effect, Spermatorrhoea, appetizer
Khadirarishta	Cancer
Kutajarishta	Fever
Devadarvyarishta,	Diabetes
Amritarishta / Amritarishta	Malaria
Sirisharishta	Poisonous bites
Srikhandasava	Alcoholism
Vasakasava	Leprosy
Ahifenasava/ Muktakarishta	Cholera
Aragwadharishta/Chitrakasava	Leucoderma
Vidaryadyasava	Body Ache
Patrangasava	Spermatorrhoea
Vasasava/ Punarnavarishta	Oedema
Loharishta/ Lodharasava	To reduce obesitv

Known to mankind from time immemorial

Development of biochemical principles of fermentation was originated by *Lavoisier* in France in 1789 by way of analyzing the chemical composition of sugar and its fermentation products such as ethanol, carbon dioxide and a trace of acetic acid.



In 1860, *Louis Pasteur* carefully analyzed the fermentation products and showed that in addition to ethanol and carbon dioxide, other compounds such as glycerol and succinic acids are also produced.

- Fermentation process in beverage preparation is mediated through yeast and in the process it produces a range of products such as organic acids, alcohols, esters and sulphurous compounds.
- Grape wine oldest example of fermented beverage
- Wine is defined differently in the laws of different countries,
  - China wine, an alcoholic beverage Chinese word *appetite wine*.
  - *California, fermented juice of various fruits.*
- *Wine* generally denotes the product produced by fermentation of grape juice.

- "Wine is a beverage resulting from the fermentation by yeasts of the grape juice with proper processing and addition."
- Wine strictly **signifies the fermented alcoholic beverage produced from fruit juice without distillation**.

CLASSIFICATION ON THE BASIS OF COLOUR

Red

- *In making red wines, the red grapes are crushed and stemmed but the skin and seeds are left in the* must.

White

- *White wines are made from white or greenish grapes or from the juice of grapes* from which the skin have been removed.

CLASSIFICATION ON THE BASIS OF FLAVOUR

- *Dry wine contain very* little or no sugar & can be detected by testing

Sweet wine, sugar content is high enough to be detected by taste.

CLASSIFICATION ON THE BASIS OF ALCOHOL CONTENT

- Alcohol content of these two kinds of wines ranges from 7 to 20 %
  - 7 to 9 per cent alcohol *"light"*
  - *9* to 16 per cent "medium",
  - 16 to 21 per cent *"strong"*.

CLASSIFICATION ON THE BASIS OF ADDITION OF INGREDIENT

- Sparkling wine contains CO_2 & are made effervescent by secondary fermentation in closed containers, generally in the bottle itself.
- *Still wines are those which do not contain* carbon dioxide.
- *Fortified wines contain added alcohol in the form of brandy.*
- *Generally* wines with more than 12 per cent alcohol are fortified with fruit brandy (alcohol) prepared by distilling grape wine.

Equipments used for wine making

- **For crushing and pressing:**
  - Roller crusher
  - Basket press
- **Primary fermentation vessel :**
  - Open-ended cylindrical vessels of suitable size made of plastic or wood
- **Secondary fermentation vessel :**
  - Narrow mouthed containers of wood, plastic or glass.
- Thermometer, hydrometer, hand refractometer.
- Measuring cylinder. Siphon tube, filter, bottles.
- Crown corks and corking machine.

TYPES OF FERMENTED BEVERAGES

- Alcoholic beverages are divided into three general classes: Beers, Wine and Spirits.

1. **Beers** :- Beers involves a relatively short (incomplete) fermentation process and an equally short aging process (a week or two) resulting in an alcohol content generally between 3-8%.
2. **Wines :-** Wines involves a longer (complete) fermentation process and a long aging process (months or year's sometimes decades) resulting in an alcohol content between 7-18%.

1. **Spirits** :- Spirits typically contain 37.5% alcohol or greater and are not infused with flavors during the distilling process however some modern spirits are infused with flavor after distilling.
2. **Fruit vinegar** :- **Vinegar** is a liquid consisting mainly of acetic acid (CH_3COOH) and water. The acetic acid is produced by the fermentation of ethanol by acetic acid bacteria.

Sources

Grains	Fruits	Vegetables
Barley	Grape	Ginger
Rye	Apple	Potato
Corn	Pear	Sweet potato
rghum	Plum	Cassava
Wheat	Pineapple	Molasses
Rice	Banana	Agave
Millet	Ginger	
ckwheat	Myrica	
	Rubra	
	Pomace	

Sources

Fruits	Vegetables	other
Grape	Ginger	Palm
Apple	Potato	Honey
Pear	Sweet potato	Milk
Plum	Cassava	Sugar
neapple	Molasses	Sugarcane
anana	Agave	
Ginger		
Myrica		
Rubra		
omace		

MEDIA PREPARATION

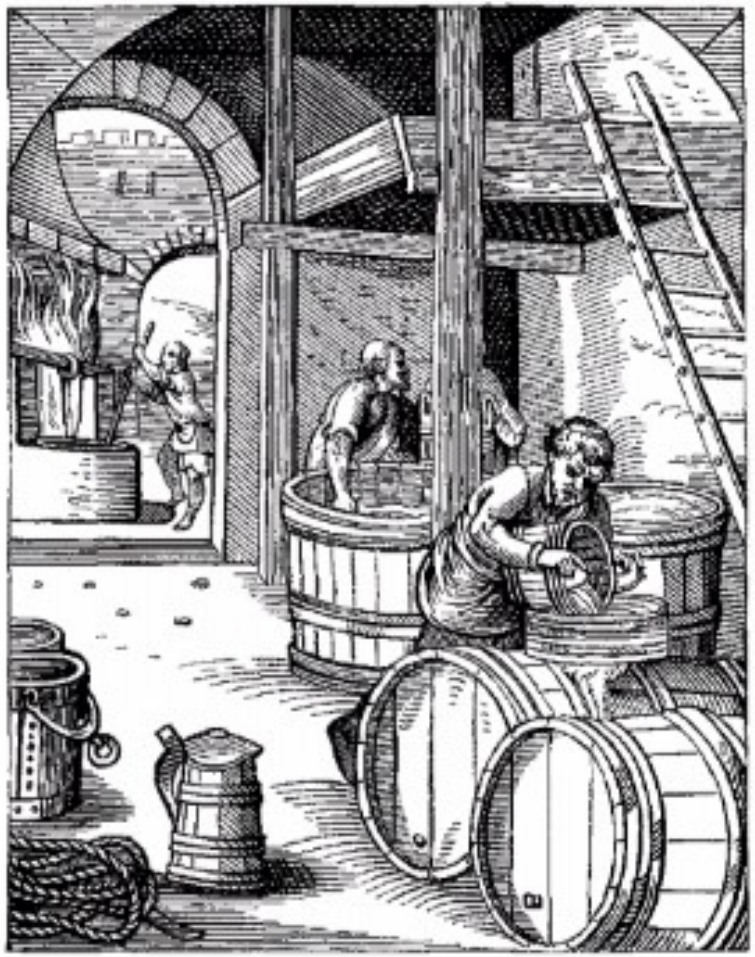
- Growth media are required for industrial fermentation
- microbe requires water, oxygen, an energy source, a carbon source, a nitrogen source and micronutrients for growth.

- **Special consideration** :-

Trace elements	Precursors
Antifoaming agents	Inhibitors
Buffers	Inducers
Growth factors	Chelators

BREWING: THE BEER PRODUCTION SYSTEM

- The process of beer production is a branch of zymurgy called brewing.
- Beer uses many varying ingredients, production methods and traditions.



INGREDIENTS

- Water
- Starch source
- Hops
- Yeast
- Clarifying agents

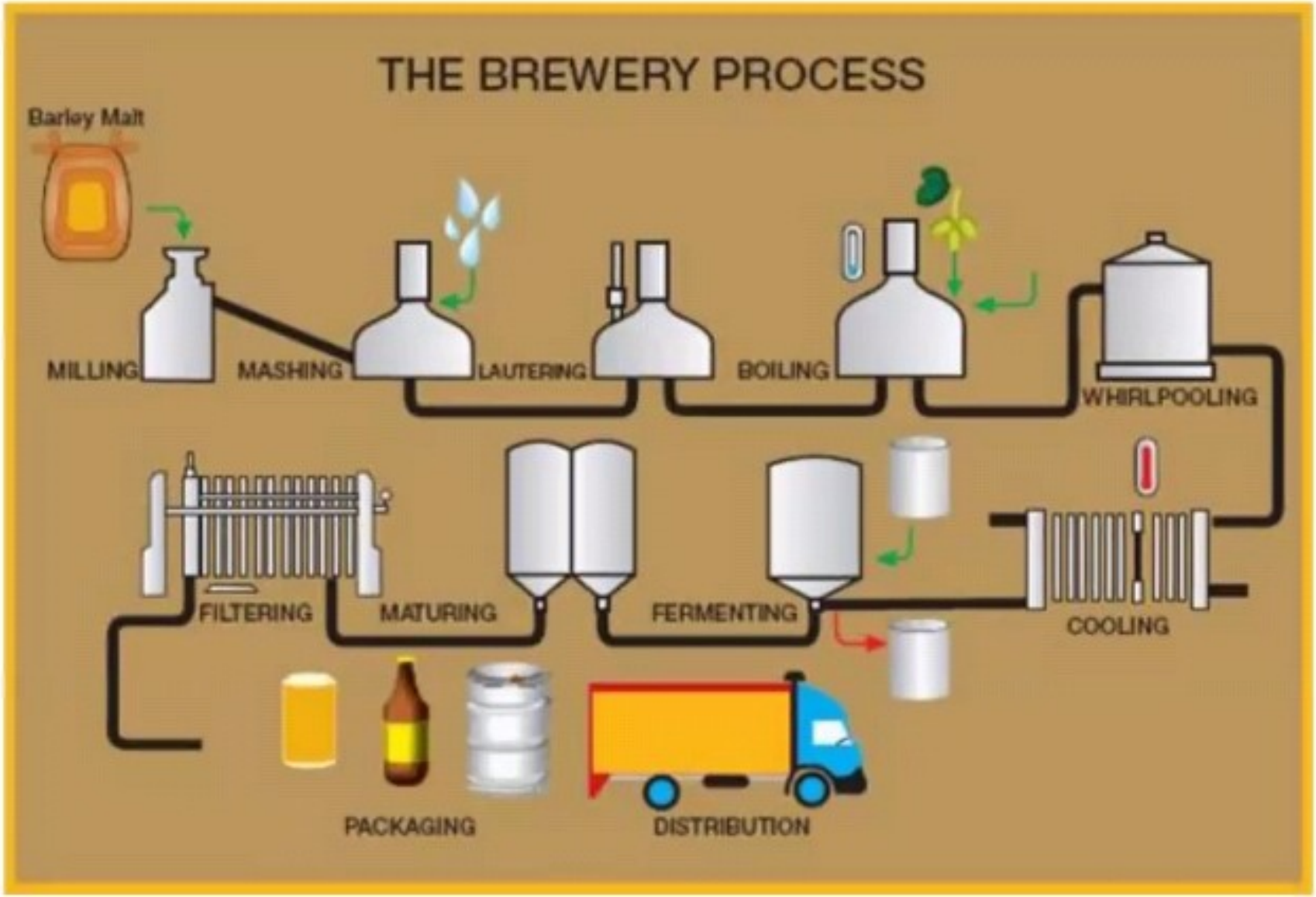
STARCH SOURCE

- The most common starch source used in beer is malted grain.
- Barley malt is used as the major source of starch.
- It has fibrous husk and rich with the enzyme amylase (convert starch to sugar).

COMPOSITION OF MALT

components	% dry weight
1. Starch	58
2. Sucrose	4
3. Reducing sugars	4
4. Hemicellulose	6
5. Cellulose	5
6. Lipids	2
7. Protein	12
8. Amino acids /peptides	1
9. Minerals	2
10.Others	6

PROCESS OF BEER PRODUCTION



- Beer is the world's oldest and most popular alcoholic beverage. Possibly dating back to the 6th millennium BC.

- Produced by the fermentation of sugars derived from starch-based material the most common being malted barley.

- Many international and national companies producing beers and energy drinks.

  Ex. Kingfisher, etc…