Frequently Asked Questions

1. What are the problems associated with the concentration of pulpy fruit juices?

Fruit pulps form a very viscous and sticky mass during concentration even at relatively low solid level. This causes fouling, which results in reduction of heat transfer coefficient and product quality deterioration. The pulp to serum ratio, serum viscosity and pectic substances decide the behaviour of various fruit pulps during concentration.

2. What is the alternative for concentration of pulpy fruit juices?

An alternative method for concentration of pulpy fruit juices is by separating the serum, concentrating it and adding back the serum concentrate to the pulp to obtain a pulp concentrate. This approach has been followed for a number of tropical fruits such as, orange juice, tomato juice, mango pulp and other purees

3. What are frozen juices concentrates?

Fruit juice concentrates of high degree brix (70°) are usually biologically stable. Water activity of juice concentrates such as apricot 40°brix=0.93, grape 30°brix=0.962 and orange=0.735.Retail packs of juice concentrates such as orange and apple are generally at 45° brix and have $a_{w\ of}$ about 0.90. Because this is not sufficiently low to inhibit much yeast and mold s, these foods are marketed as frozen concentrates.

4. What is water activity?

The ratio of water vapor pressure in a food material to that of pure water at the same temperature is termed water activity, a_w

5. What is osmosis and reverse osmosis?

In nature, osmosis involves the movement of water through a semi permeable membrane from regions of higher concentration to a region of lower concentration. The region of lower concentration generally contains solutes in solution and has associated with it an osmotic pressure. It is possible to reverse the normal flow of water through the membrane by applying pressure on the solute side of the membrane in the excess of osmotic pressure. This is reverse osmosis.

6. What is fruit juice concentrates?

Fruit juice concentrates are today considered as semi-finished products suitable for the production of respective fruit juices, jams and also in the preparation of fruit juice powders.

7. What is Cloud loss in fruit juice?

Cloud loss is usually attributed to be due to the activity of pectin enzymes. Pectin methyl esterase converts pectin to low methoxyl pectin which gets precipitated as insoluble pectate by combining with Ca or Mg ions. On precipitation, it carries the cloud particles along with it.

8. What is an Evaporative concentration?

Evaporation is considered to be the best developed and most widely used method. In this method of concentration, water from fruit juices is removed by boiling. For this purpose, different types of evaporators, with different shapes, design and way of operation are in use today.

9. What are the types of concentrates used in fruit juices?

Fruit juice concentration is commonly carried out in table evaporators, plate evaporators, centrifugal evaporators, agitated film and wiped film evaporators. It is needless to say that today, all evaporators used for concentration of fruit juices operate at low pressures (i.e. at low temperatures).

10. What are the types of Evaporators used in fruit juices?

They are of three types and can be classified as follows

a) Plate type (evaporator)

b) Mechanically agitated type (evaporator)

c) Centrifugal type (evaporator)

These evaporators can be classified under:

a) Low temperature evaporators

b) Mean temperature evaporators

c) High temperature evaporators

11. What are Fruit Juice Concentrates?

Fruit juice concentrates are today considered as semi-finished products suitable for the production of respective fruit juices, fruit juice beverages, jams and jellies and also in the preparation of fruit juice powders.

12. Define Aroma loss?

Fruit aroma is the major contributing factor for fruit quality. Aroma loss is one of the most important disadvantages in concentration of fruit juices. This again is dependent on the method of concentration, evaporative concentration resulting in maximum loss.

13. What is Millard reaction?

Browning reactions or non-enzymatic browning reactions are of different types. They can be due to reactions between reducing sugars and free amino acids generally termed as Maillard reactions. Browning can also be due to degradation and polymerization of ascorbic acid or polymerization of polyphenols.

14. What are the advantages of Plate type evaporators?

Advantages of plate evaporators are mainly their low head room, possibility of increasing or decreasing the heating surface by increasing or decreasing the number of plates and hence evaporation capacity and easy cleaning. They have high heat transfer coefficients. Prime costs are low.

15. What is Multistage evaporation?

Evaporation with multi effects are characterized by the fact that they have 2 or more evaporator bodies which are connected in a way that the vapours escaping from one vapour-liquid separator is fed into the heating section of the next stage to supply heat.