Unit 3 Topic 6

Chemistry and technology of chocolate manufacture

1)Chocolate production Un-refined local chocolate

Locally , the processing of dried fermented cocoa is largely limited to the production of the local chocolate, commonly called '**Creole Chocolate**'.This is basically a crude form of the pure unsweetened (bitter) chocolate,which is used to make a beverage.

The production of local chocolate is typically done at the household level using basic utensils. Spices such as cinnamon ,nutmeg, bay keaf are added during or after the grinding process. The mixture is shaped into balls, sticks or blocks. The end product is grated and boiled to make a chocolate beverage.

Chocolate manufacturing processes

a) Mixing-

Mixing of ingredients during chocolate manufacture is a fundamental operation employed using time-temperature combinations in a continuous or batch mixers to obtain constant formulation consistency. In batch mixing, chocolate containing cocoa liquor, sugar cocoa butter, milk fat andmilk powder is thoroughly mixed normally for 12-15 minutes at 40-50 degree Celsius.

b) Refining-

Refining of chocolate is important to the production smooth texture that isdesirable in modern chocolate confectionary.Mixtures of sugar and cocoa liquor at an overall fat content of 8-24% are refined using a combination oftwo-and-five roll refiners.

C) Conching

This process is regarded as the endpoint or final operation in the manufacture of bulk chocolate, whether milk or dark. It is an important process that contributes to the development of viscosity, texture and

flavour. Conching is usually carried out by agitating chocolate at more than 50 degree Celsius for few hours. Making chocolate considered "good" is about forming as many type V crystals as possible as this provides best appearance ,texture and creates the most stable crystals, so the texture and appearance will not degrade with time. To accomplish this temperature is carefully manipulated during the crystallization.

To give chocolate a suitable viscosity, additional cocoa butter and lecithin can be added towards the end of conching to thin or liquefy the chocolate prior to tempering.

A **conche** machine is a surface scraping mixer and agitator that evenly distributes cocoa butter within the chocolate. It promotes flavour development through heat, release of volatiles, acids and oxidation.

d) Tempering- The final process is called tempering. The fats in cocoa butter can crystallize in six different forms. The primary purpose of tempering is to assure that only the best form is present.

Two classic ways of manually tempering chocolate are

- Working the molten chocolate on a heat absorbing surface, until thickening indicates the presence of sufficient crystal “seeds" ,the chocolate is then gently warmed to working temperature
- Stirring solid chocolate into molten chocolate to" inoculate" the liquid chocolate with crystals

Chocolate tempering machines or temperers with computer controls can be used for producing consistently tempered chocolate. The temper of chocolate can be measured with a chocolate temper meter to ensure accuracy and consistency. A sample cup is filled with the chocolate and placed in the unit which then displays or prints the results.

The uniform sheen and crisp bite of properly processed chocolate are the resultof consistently small butter crystals produced by the tempering process.

Chocolate processing machine

Price- 75 lakh/unit

Conche machine

- Price- 3,50,000
- Capacity- 40kg/hour