

# SCIENCE REPORT

On 7/4/2011 the students of grade8 visited the horticulture department at Chhauni kalan to witness

- The preparation of the compost in the compost pits by using the latest technology.
- The grafting of the citrus plants.
- Food & soil testing laboratories.
- The preservation of food.

The children were divided into three groups under the leadership of their science teachers Ms Malhi,

Ms Sikand , Mr Ashwani & Ms Dhami.

In the first part of their visit they learnt the preparation of compost which is a mixture of clay, sand and the organic waste. This mixture is covered with a polyethene paper to raise the temperature & the humidity level which would enhance the process of decomposition. This compost is later put either into solar sanitizers or the mechanical sanitizers to make it disease resistant.

In the second phase the children witnessed drip irrigation, budding grafting in citrus plants, fertigation, screen house & the net house. The grafting in the citrus plant is done by using the root stalk of the local citrus variety – Jatti Khatti & the bud of international citrus varieties like mandarins. The children witnessed the live demonstration of the process of budding. Children also did budding on one plant. The term Fertigation was a new concept where the fertilizer is supplied along with the water of irrigation. They observed & learnt the method of growing crops especially the vegetables in the NET HOUSES. These net houses control the entry of pests & the UV radiations, they also increase the CO<sub>2</sub> content that helps in the higher yield of the crop.

In the third phase the children saw the various farm implements like the tractor, cultivator, seed drill, manure drill, tillers, plough, leveler etc. the best part was the mini tractor which is something a new in thing. The mini tractor is used in the orchards & the poly houses.

The fourth phase was the food testing & the water & soil testing laboratories wherein the children learnt as to how the nitrogen content in the soil & food product like cheese is tested in the laboratory by the use of reagents like sodium hydroxide, boric acid & potassium permanganate.

The last phase was about the preservation of the food. At the horticulture station the fruit produce from the orchards is preserved & sold in the market. The children learnt the method of preparation of squashes of various fruits like Leechi, Lemon, orange & Mango. They also learnt the use of preservatives such as the citric acid & KMS (potassium meta sulphite).

Overall the visit was a very great learning experience. Throughout the time spent at the station the children were quite inquisitive & responsive.

The students of grade 9 visited the Vera Milk Plant Hoshiarpur on 21 April, 2011 as a part of their Science & technology curriculum after seeking a special permission from Mr. J S Kahlon – Managing Director Milkfed Punjab. The visit was quite beneficial as the students got the first hand knowledge of the various processes involved in the preparation of a wide range of Dairy products. The various processes involved are as follows

- **The collection of Milk:** The verka is a co operative society that was established as a result of the white revolution. The milk plant gets milk daily from a vast network of societies established at the village & the city level covering the entire Hoshiarpur district. The collected milk is numbered to hide the name of the society to make the system of the testing of the milk for adulteration fool proof.
- **The filtration of the milk:** The collected milk is then filtered through special filters three times before it is taken for the storage.
- **Testing of the milk for fat & adulteration:** Samples of the milk taken are tested for the amount of fat present as the milkmen are paid according to the fat contained in the milk. The milk can be also tested for any adulteration like the presence of urea, sodium bicarbonate etc.
- **Storage of the collected milk:** The filtered milk is then cooled to a temperature of 5<sup>0</sup>C by passing the milk through pipes containing cold water. This milk is then stored in big tanks with the capacity of 15000 liters.
- **Pasteurization of milk:** The cold milk is then pasteurized by passing through a special machine that raises the temperature of milk from 5<sup>0</sup>C to 77<sup>0</sup>C within 15 seconds and then immediately cooled back to 5<sup>0</sup>C & is stored for the further use. The COOLANT used for the cooling of the milk is WATER.
- This **pasteurized milk** can then be packed for sale in three different grades namely **Skimmed, Toned & double toned milk** depending upon the amount of fat present. The fat can be removed by **centrifugation of the milk**. This milk has a shelf life of two days.
- The **pasteurized milk** can be also be used further for the preparation of **butter, ghee, cheese, white butter, curd and powdered milk**.
- **Preparation of butter:** The milk cream obtained by the centrifugation of the milk is collected in a rotating tank (with a capacity of 1500 liters) that separates the butter from the butter milk by churning the cream for two hours.
- **Preparation of Ghee:** The butter obtained in previous step is then heated in an open vessel where the oil gets collected and further heated in another chamber where all the impurities get separated from the ghee. This entire procedure takes around three hours. This ghee is then packed either in polybags or in the aluminium lined paper packing.
- **Preparation of Curd:** The pasteurized milk is mixed with a culture of **bacteria** & packed in packets of 0.5 liters each. This packed mixture is then taken to an incubator where the milk curdles to form the curd. This milk is kept in the incubator for two hours.

- **Preparation of the powdered milk:** The pasteurized milk is heated from 50°C to 70°C and then sprinkled into a large conical heated chamber where the complete water from the milk evaporates & the dry powder falls into the conical end of the chamber from where it is cooled & packed.
- **Preparation of the cheese:** The pasteurized milk is heated in an open vessel to a temperature of 80°C and tartaric acid is added to coagulate the milk. This coagulated milk is put into special squeezers where 43% of water is removed from the cheese. This cheese is then packed & stored.
- **Packaging of the various products:** The packaging of the various dairy products is done with automatic machines. Curd is packed both by the machine as well as manually. The students enjoyed packing of the curd themselves.
- **Storage of the dairy products:** The dairy products are stored in storage rooms where the temperature is maintained below - 5°C .

The students were accompanied by Mr. HARVINDER , Ms. MALHI & Ms.DHAMI.

The trip was highly enjoyable as well as the students relished the yummy butter milk.

The students were given souvenir by the management of Verka milk plant.

We are extremely thankful to our Principle for providing us the guidance & giving us the opportunity to arrange for this knowledge gaining excursion.

**Ms. Kiran Dhami**