

Research Paper :

## Evaluation of keeping quality of spinach in low cost cooling devices

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### ABSTRACT

The present study was undertaken for testing the keeping quality of spinach in low cost cooling devices. Five models of low cost cooling devices were compared in terms of temperature, humidity and keeping quality of the spinach stored in three different conditions. One was open condition ( $C_1$ ), second was perforated polythene bags ( $C_2$ ) and third was unperforated polythene bags ( $C_3$ ). The results indicated that considering temperature, humidity and keeping quality model 'D' (covered with gunny bag filled with charcoal) is better to store spinach. Among the storage conditions ( $C_2$ ) condition (perforated polythene bag) was found to be satisfactory in all models. Also, it was found that moisture and vitamin 'C' retention was more in model 'D' with ' $C_2$ ' condition (perforated polythene bags).

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The importance of vegetables in the diet is well known. Vegetables and fruits are the only natural sources of protective foods, as they supply nutrients, vitamins and minerals. Vegetables contain most of the nutrients that are essential for food health.

Vegetable are perishable products. They have high moisture content and they are tender in nature. They continue to respire after they are harvested. The freshness of the vegetables as observed through their firm, crisp texture and bright colour, is lost with the loss of moisture, which causes vegetables to wilt and become limp. Therefore, the process of respiration must be slowed during storage by control of temperature and relative humidity (Mudambi and Rajgopal, 1987).

Best storage conditions for storage of vegetables and fruits are provided in electric refrigerator by control of temperature and humidity which retard natural respiration and microbial spoilage (Medved, 1986). However, refrigerator is costly and is not within the reach of low income urban and rural families. The low-income families practice the vegetable storage by wrapping in the gunny and other cloth material. Wrapping certain vegetables and fruits in polythene or cellophane or coating them with wax improves the keeping quality (Begum, 1989). Wrapping vegetables in perforated polythene bag is advised to have aeration and better keeping quality.

Therefore, an inexpensive device that will provide lowering down of temperature to create cooling effect storage of vegetables is a need for low-income families. The investigations were carried out with the following objectives : to find out the effect of different cooling

materials used in the devices on the keeping quality of the spinach and to estimate the moisture content and vitamin 'C' content of the spinach stored in the selected devices and stored in different conditions.

### METHODOLOGY

Five models of the low cost cooling devices were selected for the study. The low cost cooling devices were rack made of iron rods with shelves, placed in a galvanized iron tray with water. One galvanized iron tray with water was kept at the top of the rack having holes from all four sides. The rope was inserted in the holes for slow but continuous flow of the water on the gunny bag to keep it moist. The height of the device was 3 feet. The racks were covered with the different materials from all the four sides. Model 'A' was covered with khas material, model 'B' was covered with desert bag cloth, model 'C' was covered with thin gunny bag filled with moss. Model 'D' was covered with thin gunny bag with charcoal and model 'E' was covered with thick gunny bag.

All five models were compared in terms of temperature, humidity and keeping quality of the spinach stored in 3 different conditions; one was open condition ( $C_1$ ), second was perforated polythene bags ( $C_2$ ) and third was imperforated polythene bags ( $C_3$ ).

Fresh spinach (350 g) was cleaned and stored in each low cost cooling device using 3 different containers. The keeping quality was adjudged by evaluating the physical characteristics such as colour, aroma, texture and overall freshness on 5 point scale by a panel of 10 judges. Data obtained were evaluated by using variance