

Research Paper :

Studies on physical properties of spinach beet (*Beta vulgaris* L).

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ABSTRACT

Physical properties of spinach beet were studied for extending shelf-life of spinach beet using precooling and storage methods. The temperature of spinach beet was reduced from 20°C to 15°C, 10°C and 5°C within 15, 30 and 90 minute in case of forced air precooling and 30, 60 and 210 minute in case of still air precooling, respectively. The pre-cooled samples were packed in different polyethylene bags (100, 200 and 300 gauge) and stored at 5°C, 10°C and 15°C temperature. The weight loss was found maximum in 100 gauge packaging followed by 200 gauge packaging. Minimum weight loss was in 300 gauge packaging (1.86%). The shelf life of pre-cooled samples ranged between 2 to 7, 3 to 10 and 4 to 14 days for different packaging stored at 15°C, 10°C and 5°C, respectively. The discolouration of sample (fresh green to dark green) was observed after 7, 10 and 14 days.

Key words : Precooling, Weight loss, Colour, Texture, Shrinkage index, Shelf life

Spinach beet (*Beta vulgaris* L.) is well known for its medicinal value. Spinach beet is rich in folate. Folate have been found to prevent neural tube birth defects and anemia. The leafy vegetables are gaining importance because of the awareness of balanced diet amongst various sections of people. India ranks second in production of vegetables with an estimated area and production of 53.35 lakh ha and 73 Mt, respectively.

The main objective is to extend shelf life of spinach beet by precooling. Shelf life is extended by dehydration in which loss of nutrients takes place. Fresh vegetables are inherently perishable, during the process of distribution and marketing substantial losses are incurred which range from a slight loss of quality to total spoilage.

Prestorage treatment such as precooling, packaging and low temperature storage can avoid spoilage in vegetables and also helps in maintaining fresh quality of vegetables for longer time during storage and transport. Packaging preserves the quality and nutritive value of product by exclusion of oxygen and control of moisture loss. The present investigation was undertaken with the following specific objectives-to study the effect of precooling, packaging and storage temperature on the shelf life and quality of spinach beet.

METHODOLOGY

Fresh, uniform size and matured spinach beet variety local was procured from a local farmer. Sorting and grading was done manually. Cleaned and washed sample of about 500g was taken after removal of surface water for experiment. Precooling was done by still air and forced

air precooling using walk-in type precooler to achieve the temperature 5°C, 10°C, 15°C. (Hansen, 1951; Gillies, 1995; Srivastava *et al.*, 1962; Hoftun, 1993). The pre-cooled spinach beet samples were packed in three different packaging bags *viz.*, 100, 200 and 300 gauge polyethylene bags. The packed sample was further stored at 5°C, 10°C, 15°C and room temperature. Temperature of spinach beet during precooling was determined by using temperature indicator. The stored spinach beets were assessed for weight loss and quality at two days interval.

Weight loss:

Weight Loss was determined by weighing the samples before and after two days storage interval. It is calculated using equation

$$\text{Weight loss} = \frac{W_1 - W_2}{W_1} \times 100$$

where, W_1 = Weight of material before storage
 W_2 = Weight of material after each storage interval.

Sensory evaluation:

Stored spinach beet were obtained from different methods *i.e.* still air and forced air pre-cooled samples packed in 100, 200 and 300 gauge polyethylene bags stored at 5°C, 10°C and 15°C were served for sensory evaluation by a panel of 10 judges on the basis of 9 point hedonic scale (Jorwar, 2001) and the quality characteristics *viz.*, colour, texture and shrinkage was recorded.