Effect of drying methods and maltodextrin concentration on pigment content of watermelon juice powder

Davinder Pal Singh Oberoi, Dalbir Singh Sogi

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Running title: Effect of drying methods….

Davinder Pal Singh Oberoi and Dalbir Singh Sogi*

Department of Food Science and Technology, Guru Nanak Dev University, Amritsar 143 005, India.
TEL: +91 183-2258802 Ext 3217; FAX: +91 183-2258820; E-mail: sogids@gmail.com

ABSTRACT

The effect of spray/freeze drying and maltodextrin concentration (3, 5, 7 and 10%) on pigment retention of watermelon juice powder from three cultivars was investigated. Incorporation of maltodextrin in watermelon juice yielded freely flowable powder. The spray dried powder has less moisture content, low water activity, high dissolution value and less reducing sugar content as compared to freeze dried powder. Lycopene of fresh watermelon juice was 4.58-6.53mg/100g on wet basis (wb) which was increased upto 56.4mg/100g (wb) in spray dried powder and 62.3mg/100g (wb) in freeze dried powder. Variation in instrumental color parameters with maltodextrin levels and dryers revealed that the freeze dried powder have lower 'L value, higher 'a' value, higher 'b' value, lower 'hue angle' and high 'chroma' values as compared to spray dried powder. In spray drying lycopene loss was influenced by high air temperature and intensive exposure to oxygen causing degradation of lycopene. The freeze dried powder retained more pigment but powder had high water activity, limited shelf life, low flowability and hygroscopic in nature. Good correlation between colorimetric values and lycopene content was observed in spray dried powder.

Keywords: watermelon, spray drying, freeze drying, lycopene, maltodextrin

Practical Application: Large amount of watermelon crops gets wasted every year due to high moisture content and limited processing. Application of spray drying technique produces product with concentrated pigment and longer shelf life. Maltodextrin was added to juice to obtain free flowing powder with better reconstitution property.