

**Title** Study on magnetic cold storage of fruits and vegetables  
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**Citation** Abstracts, 14<sup>th</sup> World Congress of Food Science & Technology, October 19-23 2008, Shanghai, China. 721 pages.  
**Keyword** magnetic field; fruit; vegetable

### **Abstract**

**Introduction:** Most of fruits and vegetables are perishable products due to their high moisture content and respiration rate, therefore, it is difficult to preserve these fruits and vegetables in long term. Cold storage is a better and common method of maintaining the fresh quality and flavor of fruits and vegetables. In recent years, there are many studies on alternative methods for storing fruits and vegetables, such as controlled atmosphere, radiation sterilization and high voltage electrostatic field and so on. In this paper, the combination of cold storage and magnetic field application in fruits and vegetable storage was investigated. **Materials and Methods:** Apple, pear, lettuce and Chinese cabbage and spinach were chosen as the representative fruits and vegetables in the study. The samples were purchased from a local market. All the samples were rinsed and drained to remove any free water from the surfaces thoroughly. The magnetic cold storage system consisted of a refrigerator. The magnetic cold storage system consisted of a refrigerator (LC-128BP, Haier, China), magnet blocks each having the dimension of 40 mm × 25 mm × 5 mm. A magnetometer (HT20, Hengtong Magnetolectricity Co., Shanghai) was used to determine the magnetic density. **Results and Discussion:** An innovative combined magnetic field with cold storage method for fruits and vegetables was developed. Selected fruits and vegetables stored on magnetic metal mesh shelves showed better visual appearance, however, on the glass shelves, there were no obvious visual distinction between with/without magnetic field. The fruits and vegetables stored on magnetic metal mesh shelves had lower water loss than that without magnet. The results also showed that magnetic fields could maintain vitamin C contents of fruits and vegetables. Furthermore when magnetic density increased from 5 mT to 40 mT, water loss and vitamin C as well as visual appearance were improved. However, further researches are needed to investigate the mechanisms of magnetic field on extending the shelf life of the fruits and vegetables.