SENSORY AND COOKING QUALITY OF INDIVIDUALLY FILM WRAPPED POTATOES

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Abstract

Newly harvested Russet Burbank potatoes were cured for 3 weeks at 15.5 C. The cured potatoes were individually film wrapped either immediately, or stored at 7.2 C for 12 weeks and then film wrapped. The film wrapped potatoes stored at 20 C were compared with nonwrapped potatoes stored at 7.2 C or 20 C for cooking time and various sensory characteristics. The sensory and cooking characteristics of the film wrapped potatoes stored at 20 C were better than the baking characteristics of nonwrapped potatoes stored at 20 C but not at 7.2 C. Individual film wrapping of potatoes significantly preserved the baking and cooking quality of potatoes during storage at 20 C, 60% RH.

Introduction

There has been a turnaround in consumer attitudes regarding fresh potato consumption in the U.S. because of the high nutritional value of the potato and its low calorie count (13). Additionally, because of the growing number of microwave ovens in homes, the baked potato has regained its popularity as an important food item. Unfortunately, the resurgence in fresh potato consumption has not been matched with developments in techniques to protect and prolong quality, especially during retail marketing and storage in home environments. Problems such as moisture loss, sprouting and other postharvest disorders adversely affect the quality of fresh potatoes at the retail outlet and in the home. These problems impair the sensory characteristics of the baked or cooked item.

The introduction of individual film wrapping as a technique for extending postharvest shelf life has proven beneficial for a wide range of fruits (1). Individual film wrapping has also considerably extended the shelf life of Russet Burbank potatoes at room temperature (22-25 C) with little physical or nutritional change (19). In addition to appearance and nutritive value, factors such as texture, color and flavor determine the acceptance of baking potatoes. Changes in the sensory characteristics or the cooking quality of potatoes that may be influenced by film wrapping have not been investigated. The purpose of this study was to determine the

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influence of film wrapping on baking and cooking characteristics of Russet Burbank potatoes.

Materials and Methods

Experiment 1: Sensory Quality

Freshly harvested Russet Burbank potatoes, 6-8 ounces (= 225 g) were cured to allow suberization for 3 weeks at 15.5 C, 90% RH. The potatoes were then divided into two groups. The first group of potatoes was immediately subjected to the treatments described below and is referred to as test 1. The second group of potatoes was first stored for 3 months at 7.2 C, 95% RH and subsequently subjected to the treatments described below and is referred to as test 2. Test 1 was conducted to study the response of potatoes to the treatments early in the storage season (beginning < 1 month after harvest), whereas test 2 was conducted to study the effects of the treatments at a later time in storage (beginning > 3 months after harvest). The potatoes were evaluated by sensory methods after they had been subjected to the following treatments:

Treatment "Ref" and Treatment A- Nonwrapped potatoes stored at 7.2 C, 95% RH were used both as a reference ("Ref") and as hidden reference (Treatment A, explained below) during the sensory evaluation.

Treatment B- Wrapped potatoes stored at 20 C, 60% RH.

Treatment C- Nonwrapped potatoes stored at 20 C, 60% RH.

The temperature and relative humidity (RH) were controlled inside a modified growth chamber.

Wrapping and Storing

The potatoes were wrapped in Cryovac D-955 (Cryovac Div. W.R. Grace & Co., Duncan, SC), a heat-shrinkable, biaxially oriented polyolefin, 60 gauge (=0.015 mm) film. The water vapor transmission rate is 2g/m²/24 hr at 24 C and 100% RH. The oxygen transmission rate is 5,900 cm³/m²/24 hr per atm. at 23 C, and the carbon dioxide transmission rate is 18,000 cm³/m²/24 hr per atm. at 23 C. Cryovac D-955 was determined to be a suitable wrapping film for the extension of shelf life of Russet Burbank potatoes (19). The potatoes were wrapped using a model 6300 Weldotron magna-lock sealer and the film was heat shrunk for 5 sec using a model 7001 Weldotron heat-tunnel (Weldotron Corp., Piscataway, NJ).

Sample Preparation and Presentation

Equal numbers of potatoes were removed from each treatment at monthly intervals, unwrapped (if they were wrapped), baked, and then evaluated. Three sensory evaluations were performed in test 1, and 4 evalu-