ANTIOXIDATIVE EFFECT OF ALLSPICE IN PORK PATTIES

Nguyen Dac Vinh, Trinh Le Hung

Department of Chemistry, College of Science, VNU

Abstract. *The composition of ethanol extract from allspice and its antioxidative effect in pork patties was studied. Eugenol (52,6%) and methyleugenol (25,1%) were identified as two major allspice extract components, the content of the other compounds was lower than 4%. Roasted pork patties samples with and without added allspice extract were stored in the dark at 4°C. The results of the peroxide and thiobarbituric acid values have shown that the allspice extract has an antioxidative effect. Its action is associated with the high content of eugenol.*

1. Introduction

Lipid oxidation in muscle foods may lead to formation of short chain aldehydes, ketones and fatty acids, which contribute to oxidized flavour in meat, poultry and fish (Liu et al., 1992).

One of the most significant methods of prevention from lipid oxidation is the addition of natural and synthetic antioxidants. The most commonly used synthetic antioxidants such as BHA, BHT, etc. are quite volatile and easily decompose at high temperature and on the other hand, the present-day trend is to use natural antioxidants. An interest in using extracts from natural plants for stabilization of fat-containing foods has been increasing. The rosemary and sage extracts play an important role, and particularly rosemary is widely used in the food-processing industry. The antioxidative effect of rosemary extract in oil, oil-in-water emulsion and meat was investigated and confirmed (2,3). Some other spices were also tested for an antioxidant effect (4,5,6). Recently we tested allspice extracts for an antioxidant effect in rapeseed oil and the results were reported (7). The aim of this study was to analyse the composition and antioxidant effect of allspice in meat.

2. Experimental

Extraction of allspice

Ground allspice was obtained from the firm Kotanyi GmbH (Wolkersdorf, Austria). 10% allspice extract was prepared by extracting with 96% ethanol for 48 h at room temperature and at the occasional stirring. The extract was used after filtration.

Identification of allspice components

The composition of the allspice extract was detected by gas chromatography combined with mass spectrometry after filtration through anhydrous sodium sulphate.

The MS 25 RFA instrument from Kratos, Manchester, equipped with a Chrompack chromatographic column CP Sil & CB (25 m x 0.32 mm) was used for the GC-MS analysis; film thickness was 0.12 μm. Conditions for the GC-MS analysis were following: temperature program: 2 min isothermically at 50 °C, then temperature increase of 2 °C/min up to 260 °C; carrier gas: helium at the rate of flow of 1 ml/min; ionizing electron energy: 70 eV; ionization current: 100 μA; ion source temperature: 250 °C; scan rate of mass spectra equal to 0.6 s/decade.

Identification of mass spectra was performed by their interpretation and by comparison with the mass spectra library (NIST193).

Antioxidative effect of allspice

Allspice was added to fresh pork patties prior to roasting for 35 min at 180°C as ethanol extract in the concentration of 0.5 % (wt). The samples were stored at 4°C and analyzed during 2 weeks. The antioxidant activity of the allspice extract was expressed as the decrease in the rate of peroxide and thiobarbituric acid reactive products formation in compare to the check sample during the storage period.

Following methods were used for determination the antioxidant effect of allspice:

- determination of the peroxide value by means of the titration method, (8).

- determination of the thiobarbituric acid reactive products (TBARP) by means of spectrophotometry (8).

3. Results and Discussion

The composition of the allspice extract components, which was obtained by quantification of the GC-MS chromatogram (**Fig. 1**), is indicated in **Tab. 1**. The presence of 37 compounds was detected in allspice extract; all of them were identified.

The major allspice extract components are eugenol (52.6%) and o-methyleugenol (25.1%); the content of other compounds was less than 4%. Methylchavicol and o-methyleugenol have very similar structure to eugenol. Eugenol has an expressive odour, which can limit its use in food as an antioxidant. Other alcohols, which were identified in allspice extract, were eucalyptol (1,6 %),

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KHẢ NĂNG CHỐNG OXY HÓA CỦA HẠT TIÊU GIAMAICA TRONG QUÁ TRÌNH BẢO QUẢN THỊT

Nguyễn Đắc Vinh, Trịnh Lê Hùng

Khoa Hoá học, Đại học Khoa học Tự nhiên, ĐHQG Hà Nội

Thành phần của dịch chiết hạt tiêu Giamaica bằng etanol đã được xác định, trong đó chủ yếu là eugenol chiếm 56.2 % và metyleugenol chiếm 25.1%, các chất khác chỉ chiếm dưới 4%. Các mẫu thịt nướng đã và không được bổ sung các dịch chiết trên và bảo quản trong tủ lạnh (4^0C). Kết quả phân tích các chỉ số peroxit và axit thiobarbituric của các mẫu thịt này đã chứng tỏ khả năng chống oxy hóa của hạt tiêu Giamaica. Đó chính là do hạt tiêu có hàm lượng cao eugenol.