Effects of Drying Techniques on Selected Functional Properties and Bioactive Compounds of Dietary Fiber from the Outer Leaves of Cabbage

Nuannarat Tawatsinlapasorn, Thitima Kuljarachanan, Naphaporn Chiewchan* and Sakamon Devahastin

Advanced Food Processing Research Laboratory, Department of Food Engineering, Faculty of Engineering, King Mongkut's University of Technology Thonburi, Bangkok 10140, Thailand

**Corresponding author. E-mail: naphaporn.rat@kmutt.ac.th*

ABSTRACT

The outer leaves of cabbage (Brassica oleracea L. var. capitata), which are usually discarded during processing or selling at the market, have been reported as a good raw material for producing functional dietary fiber powder. This study investigated the effects of different drying techniques, i.e., hot-air drying, vacuum drying and low-pressure superheated steam drying at 80°C, on selected functional properties and bioactive compounds of dietary fiber powder from the outer leaves of cabbage. The results showed that vacuum drying improved water retention capacity and swelling capacity of the dietary fiber powder compared to the hot-air dried sample. Neither the pressure level (5 and 10 kPa absolute pressure) nor steam injection before vacuum drying at 10 kPa affected the water retention or swelling capacities of the powder. No significant differences in the oil holding capacity (OHC) were observed among the samples prepared using different drying schemes. Vacuum-dried samples contained the highest contents of glucosinolates and phenolics. Overall, the results showed that powder undergoing vacuum drying at 80°C at 5 kPa possessed good functional properties and contained the most glucosinolates and phenols.

Keywords: Glucosinolates, Functional properties, Low-pressure superheated steam drying, Phenols, Vacuum drying

INTRODUCTION

White cabbage (*Brassica oleracea* L. var. *capitata*) is one of the most popular *Brassica* vegetables, commonly consumed raw or processed. The outer leaves of white cabbage, which are usually discarded during processing or selling at the market, are a rich source of dietary fiber (41-43% on a dry weight basis) (Jongaroontaprangsee et al., 2007) as well as various bioactive compounds, including glucosinolates and phenolics (Tanongkankit et al., 2010).

Jongaroontaprangsee et al. (2007) reported the potential of transforming the outer leaves of cabbage into dietary fiber powder containing associated bio-