

CHAPTER I



INTRODUCTION

Man may be exposed to a hazard of carcinogenic nitrosamines and N-nitroso compounds on two accounts: one by ingesting the compounds preformed in food and the other by synthesizing the compounds in stomach from nitrite and N-nitrosable compounds which may be ingested as natural constituents of food, drugs, and food addition (Kikugawa and Kato, 1991).

There is an indication of the association of some cancers with the increased use of food additives. If the use of food additives ceased many other natural substances possessing possible carcinogenic activity, such as N-nitroso compounds, would continue to be ingested (Fairweather, 1981). Most of N-nitroso compounds are potent carcinogens, which effective in most animal species, and in most organs (Swann, 1977; Fiala, Reddy and Weisburgur, 1985). N-nitroso compounds are formed by the interaction of a nitrosating agent derived from nitrite salts, which is added to foods as a preservative to inhibits the generation of *Clostridium botulinum*, with an amino substance such as secondary and tertiary amines (Lijinsky, 1977; Challis, 1985). Furthermore, carcinogenic polycyclic aromatic hydrocarbons are produced during cooking such as broiling or grilling. The epidemiological studies indicate a correlation between increased cancer incidence at some site and diets high in charred and/ or heavily smoked foods (Pariza, 1982; Adamson et al., 1993).

There are many chemicals that prevent or regulate the formation of nitrosamines or N-nitroso compounds. Moller, Dahl, and Bockman (1988) studied about a possible role of the dietary fiber i.e. wheat bran, as a nitrite scavenger and they found that wheat bran act as a nitrite scavenger under gastric like condition. Their work indicated that nitrite scavenging may be a factor in the possible role of bran in protecting against gastric cancer development. Fiber of fruits and vegetables, such as cabbago, chinese kale, pomelo peels, cucumber, waxgourd, ivygourd, papaya, rice bran, and pineapple core had different nitrite scavenging capability which are ranging from 0.1 to 0.25 μg nitrite per mg fiber(Laohavechvanich, 1994).

Dietary fiber is believed to decrease the incidence of colorectal cancer, but not all types of fiber are equally protective. A number of recent studies have questioned the philosophy that a high fiber diet will do no harm, even it does not prevent colon cancer. Harris et al. (1993) found that commercial soluble fiber currently used as emulsifiers and stabilizer in the food industry namely, κ -carragenan, γ -galactomannan, (1 \rightarrow 3,1 \rightarrow 4)- β -D-glucan, gum arabic, pectin, polygalacturonic acid and sodium carboxymethylcellulose, maintained 1,8 dinitropyrene in aqueous solution and decreased its adsorption to an insoluble dietary fiber, α -cellulose . This phenomenon suggested the possible mechanisms by which soluble fibers might enhance the development of cancer. It was, thus, enthusiastic to find out whether the same phenomenon would occur in the gastric-like condition since a previous study (Laohavechvanich, 1994) showed that some

fibers promised to inhibit the formation of mutagen which has nitrite salt as one of the precursors at pH 1-3.