

Food preservation techniques

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Peter Zeuthen and Leif Bøgh-Sørensen**



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1

Introduction

One of the major advances in human history was the ability to preserve food. It was the prerequisite to man settling down in one place, instead of moving from place to place in the never ending hunt for fresh food. The earliest preservation technologies developed were drying, smoking, chilling and heating. Later on the art of controlling these technologies was developed. The work of Pasteur in the nineteenth century then made it possible to understand the real mode of operation of preservation techniques such as heating, chilling and freezing, providing the basis for more systematic monitoring and control.

The use of various compounds such as salt and spices to preserve foods was also used in ancient times. Unfortunately, the gradual use of a wider range of chemicals for preservation such as boron or coumarin sometimes led to misuse. Consumers have developed some suspicion of the use of chemical additives, sometimes with good reason in such cases as antibiotics and materials such as hexamethyltetramine (which during processing and storage develops into formaldehyde).

Consumers have fewer reservations about physical treatments, although one of the oldest technologies, smoking, is now suspected of being carcinogenic. Another more recent physical treatment which is also much under debate is irradiation. Many studies have shown it to be safe and it has been approved for use in food processing in several countries, e.g., the USA, because it has proved to be the best way to kill *Salmonella* and other pathogenic bacteria. However, irradiation of foods is not used in practice in most countries in Europe because of continuing consumer concerns about the safety of the technology.

Recent debate about preservation techniques has focused on ways of preserving foods in a way that is both safe but also preserves the intrinsic nutritional and sensory qualities present in raw and fresh food by minimising the

2 Food preservation techniques

amount and severity of subsequent processing operations. This is why minimally processed foods have gained such great popularity, although they raise new safety risks. As an example, they often rely on an effective cold chain during storage and distribution to prevent microbial growth. This book describes both established and new preservation methods which embrace biotechnology and physics. Both methods offer the possibility of preserving food safely with a minimal impact on quality. The book describes the principles behind individual preservation methods, the foods to which they can be applied, their impact on food safety and quality, their strengths and limitations. It also shows how individual techniques have been combined to achieve the twin goals of food safety and quality. The book tries to describe a *status quo* of where we are in the development of food preservation techniques at the beginning of a new millennium, and some of the things we still need to do.

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