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IIR Working Party

Data and Models for Refrigeration and Freezing of Foods

Working Party of Commissions C2 with Commissions D1 and D2

TERMS OF REFERENCE

Introduction

Most consumers are concerned about the microbial safety of their foods. Refrigeration and freezing provide a means to extend the shelf-life of foods and ensure or at least enhance their microbial safety. In many countries appropriate hygienic quality control systems such as HACCP (Hazard Analysis Critical Control Points) are now mandatory. The HACCP methodology is essentially a qualitative approach to identify microbial safety risks and to suggest appropriate control measures. Temperature control is one of the most obvious and relatively easy to implement control activities at the manufacturing level. However, abuse may occur downstream in the cold chain and may promote growth of hazardous micro-organisms. Novel, quantitative approaches such as predictive microbiology and microbial risk analysis may be used to evaluate the consequences of such temperature abuse and are gaining much attention in the food safety community. However, they rely on data on cold chain parameters such as refrigeration temperatures, relative humidities, air velocities etc. which are often not available. Further, although many mathematical models for heat and mass transfer have been described in the scientific literature, it is difficult to judge how reliable the model predictions are. Finally, there are still many unsolved problems such as the modelling of heat and mass transfer in stacks of produce, turbulence in porous media etc.

Objectives

The objective of this working party is to establish a data and model database for refrigeration and freezing of foods. Such a database could be the basis for microbial risk analysis studies and may lead to good refrigeration practice guidelines for the cold chain.

Activities

- To establish a database of typical temperature-time profiles and other relevant parameters (relative humidity, air velocity, ...) in the food refrigeration and freezing chain
- To review heat and mass transfer models and appropriate computational methods for the cold chain
- To collect these results in a special issue of the International Journal of Refrigeration
- To make the database available via the IIR Web site
- To regularly update the database.

IIR commissions concerned

- Main Commission: B2
- Links with Commissions D1 and D2

Membership

- President: Bart Nicolaï, Belgium
- Vice-president: Tuan Pham, Australia
- Secretary: Graciela Alvarez, France
- Members: TBA

Meetings

The first meeting will be organised at the Postharvest Unlimited conference in Sydney, Australia, November 2004. However, much of the co-ordination of the activities will be done through email communications.

Deliverables

A special issue of the *International Journal of Refrigeration* devoted to data and models for refrigeration and freezing of foods.

Web-based database

Bart Nicolaï
President of Commission C2
December 18, 2003