The Graduate School VLAG

9-14 May 2016
Wageningen, The Netherlands

9th International Advanced Course

REACTION KINETICS IN FOOD SCIENCE

Organized by The Graduate School VLAG, in co-operation with the Food Quality and Design Group of Wageningen University (WU)

Background

The use of kinetics is necessary for many aspects of food research. Enzymatic, chemical, physical and microbial reactions in foods occur simultaneously during processing and storage, and usually it is a cascade of reactions. The food scientist needs to optimize the quality of food, and this can only be done in a quantitative way with the proper use of kinetics. Furthermore, the food process engineer needs kinetics in order to optimize processes. In addition, kinetic modelling is also useful for the nutritionist, to study the kinetics of changes during digestion and assimilation in the body (bioavailability).

Aim

The aim of the course is to acquire in-depth knowledge about kinetic modelling, and to apply and use kinetics in food science problems using modern software.

Course contents

The course will be composed of lectures, demonstrations and computer exercises. There is a possibility to discuss kinetic problems in relation to own work of participants. In the lectures, the importance of kinetic modelling will be put in perspective, including the interplay between statistics and science, followed by detailed treatment of kinetic modelling of chemical reactions, of enzymatic reactions, of microbial growth and inactivation and of some physical reactions. Also, the application of kinetics in reactor engineering will be treated, and most importantly, special attention will be given to complicating conditions as present in foods.

Participants

A basic knowledge on food science and technology as well as some fundamental knowledge of mathematics and statistics is required.

Organization

- **Prof. Tiny van Boekel**
  Food Quality and Design, WU
- **Eva Oudshoorn, MSc**
  Graduate School VLAG

Other faculty

- **Prof. Marcel Zwietering**
  Dr Heidy den Besten
  Food Microbiology, WU
- **Dr Michael Caracotsios**
  Clinical Associate Professor, Chemical Engineering Dept., Univ. of Illinois at Chicago & President and CEO, AthenaVisual, Inc., Naperville, Illinois, US
- **Prof. Bronek Wedzicha**
  Emeritus Professor of Food Science, University of Leeds, UK

Provisional programme

Monday 9 May
- opening
- introduction to the course
- aspects of modelling
- kinetics of chemical reactions
- statistical aspects of kinetic modelling

Tuesday 10 May
- kinetics of microbial growth
- inactivation kinetics

Wednesday 11 May
- kinetics of enzymatic reactions
- reactions in foods
- shelf life

Thursday 12 May
- numerical solutions of kinetic models
- parameter estimation from single-response data
- statistical inferences and residual analysis
- model discrimination and criticism

Friday 13 May
- sequential planning of experiments
- parameter estimation from multi-response data
- inferences from the posterior density

Saturday 14 May
- special topics in modelling and estimation
- concluding remarks
- closing at noon

Computer exercises will be held throughout the course to practise the theory presented in the lectures.

Course details

Language:
The course will be conducted in English.

Date and duration:
6 days, 9 – 14 May 2016

Venue and accommodation:
Lectures and demonstrations will be given at Wageningen University. A number of hotel rooms have been block booked at the Hof van Wageningen for course participants, but only until 24 March 2016. Accommodation costs are € 70,- (single room; bed & breakfast, excl. tax) or € 90,50 (double room; bed & breakfast, excl. tax). Hotel reservation is handled by Hof van Wageningen. Participants have to book their own hotel room by sending an email to: info@hofvanwageningen.nl Please mention booking code RK16.

Fee:
PhD students affiliated with the graduate school VLAG will be charged € 300. External PhD students will be charged € 550. For others, the course fee is € 2050. The fee includes the textbook *Kinetic Modeling of Reactions in Foods, by M.A.J.S. van Boekel, CRC Press/Taylor & Francis Group, Boca Raton, 767 p*., as well as other materials/ lunches/tea/coffee and one course dinner.
Cancellations may be made free of charge until 25 March 2016. After that date the charge will be 25 % of the fee paid or due. Substitutions may be made at any time.

Registration/Information:
Please register before **25 March 2016**. You will be notified before 1 April on acceptance of your registration and you will be sent instructions for payment,and further information.
The maximum number of participants is 45.
* More information concerning the contents of the course can be obtained from Professor Tiny van Boekel: tiny.vanboekel@wur.nl
* For organizational matters and registration please contact Eva Oudshoorn, e-mail: eva.oudshoorn@wur.nl.
* For registration please go to the VLAG website:

http://www.vlaggraduateschool.nl/courses/reaction-kin.htm
