



## Training Course

### Animal agriculture and food safety risk analysis

Duration: 2 weeks

Location: Ghent, Belgium

Date: September 4-15, 2006

#### Course overview

The course is split into two self-contained modules. The course has been significantly revised this year, particularly in Module 2 to include our research on model frameworks and model validation.

**Module 1** lasts five days and provides the basic principles of risk assessment and where it fits in to the risk analysis process. It also looks at resource, strategy and communication issues that management face in risk assessment. It covers some basic modelling principles, and gets the participants used to the risk analysis modelling environment (in this case Crystal Ball with Excel or @RISK with Excel, but the lessons apply equally well to other modelling environments). We also look at essential probability and statistics theory and various stochastic processes. This module covers material that is essential for Module 2.

Module 1 will be useful for analysts starting out in animal health, microbial, antimicrobial or toxicological food safety risk assessment who have some basic knowledge of simulation modelling and to risk managers in general. This is a key module that should be taken before attending Module 2.

**Module 2** also lasts five days and has been greatly revised this year and should appeal to those who have already attended one of David's previous courses. The focus is less on the predictive microbiology and dose-response models, and more on producing models that risk managers can put their faith in. Thus, David introduces a framework for model construction that he developed for the USDA to help find the simplest model that will adequately solve the manager's problem. The framework offers a way to demonstrate consistency of approach despite some models appearing to be very different and addresses how to structure a model that makes the best use of available data. David will also introduce a method new to food safety for indicating to a risk manager whether, given the myriad assumptions and approximations, the quality of data and level of scientific knowledge of the issue, the quantitative risk analysis results are sufficiently robust to be relied upon.

Module 2 provides an in-depth knowledge of the modelling techniques necessary for international level risk assessments. We critically look at risk models, and the participants are encouraged to bring along modelling problems they are currently faced with. Attendance of Module 1 or prior knowledge of the material covered in Module 1 will be needed. If you are considering only attending Module 2, please run through the short **self-test** (<http://www.risk-modelling.com/quiz.htm>) to make sure you have the knowledge provided in Module 1.

This module is suited to those already familiar with spreadsheets, who have some modelling experience and who are interested in developing these abilities further. The module content will enable the participants to produce realistic, professional quality models. It is designed to encourage the modeller to develop creative problem solving skills through plenty of problem exercises.

Please review **the level of computer (Excel and Windows) knowledge** (<http://www.risk-modelling.com/docs/Prerequisites.doc>) necessary before attending the course. Participants should review this information well in advance. The requirements are very basic but ensuring that all participants arrive with this basic level prevents us from wasting too much time on familiarisation with Excel rather than learning about risk modelling.

Further details on the modules are provided below.

#### Training material

All lecture notes are provided as PowerPoint files. A CD of these files is provided to each participant. Printed handouts are also provided. The CD also contains all model files produced for the course. Any extra models developed during the course are downloadable from a private page on this web site dedicated to the course.

#### Course format

The course runs from 09:00 to 17:00 each day. Morning and afternoon coffee, lunch and dinners (Tuesday, Thursday) are provided. Cocktails are offered on the Sunday from 18:00 to 20:00 before each module to meet your instructor and fellow participants.

#### Who should attend

Animal health, microbial, antimicrobial and toxicological food safety risk analysts and risk managers who have some basic knowledge of spreadsheets and simulation modelling. Statisticians and scientists providing input to a risk assessment.



## Location

Ghent (Gent, Gand depending on your preferred language) is a beautiful medieval city of canals, market places, a castle, and innumerable churches and monasteries. Despite its ancient facades, it is a vibrant city with innumerable pubs, restaurants, and shops. Belgium boasts over 450 varieties of beer, and each has its own glass.

Ghent can be accessed by train directly from Brussels or Lille (France).

There are plenty of hotels (<http://www.gent.be/gent/english/index.htm>) and guesthouses (<http://www.bedandbreakfast-gent.be/taalUK/intro.html>).

There are lots of trams in Ghent, but we recommend you stay fairly near the city centre (near the Graslei).

## Prerequisites

All models are developed using Excel and Crystal Ball or @RISK. It is essential that all participants are reasonably proficient in Excel (see prerequisites). Both courses are very intensive so, to save time, for @RISK users it is important to make themselves familiar with the basic principles of @RISK by going through the **on-line tutorial** (<http://www.palisade.com/training/risk45.html>). Crystal Ball users can take the Crystal ball on-line tutorial that is available **here** (<http://www.crystalball.com/tutorial.html>).

Participants are required to bring laptops loaded with Microsoft Word, Microsoft PowerPoint and Microsoft Excel and Decisioneering's Crystal Ball 7 or Palisade's @RISK 4.5 Professional installed, and with a CD drive. Trial copies of Crystal Ball and @RISK are available free of charge from **Decisioneering** (<http://www.crystalball.com/>) and **Palisade** ([http://www.palisade.com/html/trial\\_versions.html](http://www.palisade.com/html/trial_versions.html)) web-sites but these should not be installed too early as trial versions run out after 7 days for Crystal Ball and 10 days for @RISK. We can arrange copies of @RISK at a 20% discount should you wish to purchase.

Participants intending to take Module 2 only should ensure that they have already taken a course equivalent to Module 1 or possess the equivalent knowledge. Booking preference is given to people taking both modules.

## Free ModelAssist

**ModelAssist** (<http://www.risk-modelling.com/software.htm>) from Vose Consulting is a comprehensive risk analysis training and reference software tool. ModelAssist provides an in-depth explanation of all of the risk analysis concepts, techniques and methods introduced in this course and greatly complements the course material. It is particularly helpful as a reference for participants of the material that has been presented during the course. ModelAssist will be available to participants at a reduced price.

## Teaching philosophy

All of Vose Consulting's courses aim to help the participants understand (rather than 'learn') risk analysis, which can only be achieved through a relaxed, informal and interactive environment, through plenty of examples and hands-on exercises where students apply and adapt what they have learned.

## Social events

Part of the value of specialist courses like these is the contacts one makes with others in the same field. It is quite a long course, and we'll need a break from time to time. The entertainment we provide is an excellent opportunity to relax, have some fun, build a rapport with other participants, establish some contacts and sample some of the local culture.

We therefore arrange optional fun, interactive social events which take advantage of local attractions, cuisine and culture. All social events are included in the course fee.

## Training Costs

Module 1 only £1,750.00  
Module 2 only £1,750.00  
Module 1 & 2 only £2,750.00

Discounts are available for multiple bookings and postgraduate students studying relevant fields, subject to availability. 10% discount is available to any full fee participant paying 30 days before the course start date.



**Course content by module (Module 1)**

**MODULE 1: INTRODUCTION TO RISK ANALYSIS, SOFTWARE, STOCHASTIC PROCESSES AND THEIR MODELLING**

**Day 1**

- Introduction to risk analysis
  - The partition of risk assessment and risk analysis in the management of risk
  - Establishing a risk policy
  - The roles of risk managers and risk assessors
  - Risk communication
- Introduction to risk assessment:
  - Moving from an intellectual exercise to a useful decision tool
  - Identification of a risk
  - Establishing risk assessment objectives
  - Creating and managing a risk assessment team
- Difficulties in modelling biological systems

**Day 2**

- Introduction to risk analysis modelling methods
  - Monte Carlo simulation, Crystal Ball or @RISK and Excel
  - Calculation vs. simulation
  - Uncertainty, variability and inter-individual variability
- Typical modelling results, their presentation and interpretation
  - Introduction to descriptive statistics
  - Mean, standard deviation, skewness, kurtosis, percentiles
- Introduction to probability theory
  - Probability concepts
  - Graphical representations of risk events: Venn diagrams, fault trees and event trees
  - Probability vs. population distributions, relative vs. cumulative, discrete vs. continuous

**Day 3**

- Binomial Process
  - Binomial, beta, negative binomial and geometric distributions
- Problems to solve
- Nested binomials

**Day 4**

- Poisson process
  - Poisson, gamma, m-Erlang and exponential distributions.
- Mixed Poisson and binomial processes
- Problems to solve
- Renewal process and its modelling

**Day 5**

- Hypergeometric process
  - Hypergeometric and inverse hypergeometric distributions
- Problems to solve
- Central Limit Theorem
  - Normal and lognormal distributions
- Markov process





