

Experimental Design for Product Reformulation, Optimisation and Preference Modelling

Duration - dependent on modules selected (1-3 days)
(CON2-2)

Pre-requisite

A knowledge of basic statistics is recommended before attempting this course.

Course Summary

This course provides hands-on training in experimental design (DoE) for researchers and new product developers who need to understand how product components work together to influence consumers and to optimise performance characteristics. Directed towards the analysis of data from consumer and sensory trials, we cover the application of classical design techniques to preference mapping and liking optimisation.

Software

A statistics package with DOE functionality is required to take part in the workshops and put into practice the techniques discussed. We recommend Design Expert, JMP or MINITAB but can advise on suitability of other software packages.

Flexibility

We can customise the module content to meet specific requirements.

Course Content

Module 1 Exploring Ingredient and Process Functionality using DoE Introduction

- Introduction to Experimental design, why is it so important? What are the advantages of the approach.
- Contexts for use, product data, sensory data, consumer responses.
- Factorial designs and Analysis, statistical assessment of effects, interpretation of interactions,
- Model selection techniques

Module 2 **Designing Experiments For Data Collection Using Sensory Panels And Consumer Tests.**

- How to set up and analyse experiment to allow for measurement uncertainties inherent in sensory and consumer data

Power

- Investigating the power of my experimental design

Exploring Process Functionality using Fractional designs

- What if we want to investigate lots of factors but can't afford a full experiment?
- Introduction to fractional designs - benefits and risks of these approaches
- Exercises in generating fractional process designs
- Analysis of fractional designs

Module 3 **Product, Process and Package Optimisation**

- Response Surface designs aims and applications
- Exercises in generating optimisation designs
- Analysis and display of models for optimising consumer response.
- Contour plots, Response surface plots
- Presentation and decision making, optimising for both cost and quality
- Optimisation– desirability measures and interpretation

Module 4 **D Optimality**

- D-Optimality concepts
- Generating a design to a fixed sample size.
- Evaluating the design

Mixture Designs

- Introduction to simple mixture designs , designing within mixture constraints

Module 5 **Further Topics****I can't control my factors – what can I do?**

- Identifying factors in multivariate data
- Principal Components with rotation.
- Taking the factors into design software and analyzing as an experimental design

Consumer Test Applications

- Using D-Optimal designs to select an optimal subset of products from the sensory profile for consumer testing
- Designing the product test and designing the consumer test

External Preference Mapping

- Modelling consumer responses based on sensory product data to identify the optimal product. Preference mapping in multiple dimensions

Now I've found the optimal product – how do I make it?

- How to predict properties of the most desired product

Conjoint Analysis

- Applications of experimental design to concept testing: motivations and purpose.
- Conjoint analysis jargon
- Applications and example

For further information and pricing contact:
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