

SUMMER SCHOOL: INTRODUCTION TO TOTAL DIET STUDIES FOR ASSESSING EXPOSURE
SUNDAY 5TH JULY - FRIDAY 10TH JULY 2015, EVIRA, FINLAND

Total diet studies complement traditional monitoring and surveillance providing a scientific basis for population dietary exposure to contaminants and nutrients and the potential impact on public health. Food selection is based on (national) consumption data, prepared as eaten, and data from related foods pooled prior to analysis. TDS-Exposure is focussing on exposure to food contaminants including heavy metals, mycotoxins and persistent organic pollutants (POPs, e.g. polychlorinated biphenyls), which pose a risk to human health and the environment, and estimation of chronic exposure to pesticide residues in food as well as food additives intake. However, exposure is based on whole diets, as consumed, rather than contamination of raw commodities as previously measured, resulting in a more realistic measure of exposure to potentially harmful compounds than currently available.

TDS facilitate risk assessment and health monitoring, but some EU Member States and Candidate Countries do not have TDS programmes or use a variety of methods to collect data, and it is not clear whether data are comparable. It is important to harmonise methods for dietary exposure risks worldwide, and TDS-Exposure will standardise methods for food sampling, analyses, exposure assessment calculations and modelling, priority foods, and selection of chemical contaminants. In the process, a variety of approaches and methods for sampling and analyses will be assessed, and best practice defined. Priority contaminants for TDS and foods that contribute most to total exposure in Europe will also be established.

Information about these and existing European TDS will be published to promote better handling of dietary exposure data, and establish a legacy of harmonised methods and science-based recommendations for public health worldwide. In addition, TDS-Exposure is providing training, enabling best practice in the creation and execution of TDS programmes, and ensuring data collected are coherent with others studies globally. This TDS-Exposure Summer School is the second of three introducing key aspects of TDS and contaminant analysis.

1. Programme description

The programme consists of five elements: (1) basic foundations of total diet studies, (2) design and planning, (3) sample preparation and analysis, (4) exposure assessment and publication, and (5) quality management, each including aspects of theoretical and practical learning. **Basic foundations of total diet studies** will introduce TDS and planning as well as application of food consumption data in dietary assessment of contaminants; **Design and planning** will explain development of a food list, criteria for selecting chemical substances and populations of interest, sampling plans and collection of foods for TDS; **Sample preparation and analysis** will look at the culinary preparation of foods (as eaten) and a range of analytical issues, and how food databases are created and managed, and food information coded accurately; **Exposure assessment and publication** will explore data management using FoodCASE-Risk, exposure and risk assessment using MCRA, and how data should be processed and used appropriately; and **Quality management** will examine quality control approaches and documentation standards.

1.2. Educational objectives

The objectives of this Summer School are to introduce total diet studies, generally, and dietary exposure to contaminants, specifically:

- Explore the scientific and technical knowledge underpinning total diet studies for exposure assessment
- Provide insight into methods and approaches, and the quality of data
- Enable students to apply this knowledge in their expert field (e.g. public health, food technology, research)

1.3. Expected learning outcomes

a. Knowledge: account for the design and planning for total diet studies as well as their use in monitoring and surveillance in human health, particularly in respect of dietary contaminants. Describe food sampling, preparation and analysis, data collection and quality control, and identification and selection of relevant chemical substances and populations of interest. Explain the differences between data management and quality control options, and the principles underpinning each. Describe how research and healthcare messages should be formulated based on information from these studies, and maintain knowledge and access appropriate resources.

b. Skills: apply knowledge to carry out independent assessment of food and application of information from TDS/ TDS-Exposure as relevant to their field of expertise. Identify key aspects of TDS-Exposure research, comment on the potential and limitations, especially in exposure analysis. Understand the requirements for selecting foods, populations of interest and chemical contaminants. Use relevant IT-based tools to input and retrieve total diet study and exposure information, document and ensure data quality, and apply outcomes appropriately.

c. Competences: critically evaluate total diet studies information, particularly in reference to exposure to contaminants in specific populations. Demonstrate independent thinking in the application of information from total diet studies including exposure and national consumption patterns, and formulate healthcare messages based on these data. Participate effectively and with confidence in peer-group discussions developing/ applying information from total diet studies. Act autonomously in the creation, management and use of information from total diet studies including exposure assessment, and demonstrate skills relevant for future employment. Use lifelong learning skills for evaluation and critical thinking, and take responsibility for continuing professional development.

1.4. Career outcomes

The modules provide knowledge, skills and competence supporting an independent, professional role within international diet and health research, food manufacturing or aspects of healthcare.

1.5. Programme faculty and their credentials

Gerald G Moy served as the GEMS/ Food Manager in the 'Department of Food Safety and Zoonoses' at the World Health Organization (WHO) in Geneva for more than 20 years. GEMS/ Food, a joint WHO/ UNEP programme to monitor levels and trends of contaminants in the food supply and the diet, was instrumental in promoting total diet studies as well as the five international and several regional workshops and training courses beginning in 1999. Gerald is the co-editor of two recently published books, 'Total Diet Studies (Springer, New York, November 2013) and Encyclopaedia of Food Safety (Elsevier, London, January 2014). Amongst other consulting work, he has peer-reviewed reports from several total diet studies, including Australia and Papua New Guinea. He is also a member of the International Advisory Committee of the China National Center for Food Safety Risk Assessment, the Technical Advisory Group of World Food Program and the WHO International Virtual Advisory Group on Mass Gatherings and the Committee on Food Safety of the International Union of Food Science and Technology.

Total diet studies: What they are and why they are important (Monday, 6th July 2015, 09.00-10.30)

The protection of consumers from potential hazards in the food supply is one of the most important public health functions for any government. In this regard, the World Health Organization (WHO) has recognized total diet studies as the most cost-effective tool for assessing dietary exposures to a range of potentially hazardous chemicals and intakes of essential nutrients. The importance of total diet studies in assuring the safety of the food supply and identifying possible health risks will be described.

Learning Objectives:

1. Understand the basic differences between total diet studies and other monitoring activities
2. Appreciate the unique contribution to public health afforded by total diet studies

Véronique Sirot (ANSES) is a doctor of epidemiology and public health, and has been a scientific coordinator in the Risk Assessment Department of the French Agency for Food, Environmental and Occupational Health Safety (ANSES) since 2005. She works in the field of risk assessment providing input into the scientific committees of ANSES, particularly in the areas of seafood, as well as participating actively in several research projects. In charge of studies on exposure to food chemicals, Véronique was in the coordination team for the second French TDS (2005-2011), and is now involved in the on-going infant French TDS (2010-2014). She also participated in the EFSA working group on Total Diet Studies (2010-2011) and is author or co-author of about 40 articles on dietary exposure and risk/benefit assessment.

Criteria for selection of chemical substances and population targets (Monday, 6th July 2015, 11.00-12.30)

The lecture will be divided into three main parts. The first part concerns the selection of targeted populations for a TDS: selection criteria, presentation of the different possible population groups, and corresponding needs for the sampling plan. The second part will be a presentation about a prioritization tool for the selection of substances to be included in a TDS: selection criteria, judgments of the substances, and use of the tool. The third part will describe application of the tool.

Learning Objectives:

1. Populations: an overview of the population groups that can be targeted in a TDS and the corresponding methodological issues
2. Chemical substances: understand and to be able to apply the prioritization method to select chemicals for a TDS

Aida Turrini (CRA-NUT) has a background in statistics. She has worked at the Italian National Statistics Bureau developing software (1979-1986) but has focused on nutrition since 1986 when she became researcher at National Institute of Nutrition (INRAN). INRAN became part of the Agricultural Research Council (CRA) in 2013. Aida has been involved in three Italian nationwide dietary surveys, and coordinated the most recent one. Director of the INRAN Scientific Program for the "database system: food composition and food consumption data", Aida has considerable experience leading research teams in national and international projects covering a wide range of research where food consumption and food composition data are required including dietary evaluation and dietary exposure of the population. She has been on several Italian and European Committees as an expert in the food consumption and food information processing. She also teaches statistics and nutritional database management at graduate and post-graduate levels.

Developing a TDS food list to compose TDS samples (Monday, 6th July 2015, 14.00-15.30)

Participants will go through the multistep process of formulating a Total Diet Study (TDS) food list composed of food categories sufficiently representative for a reference diet, defining a sampling plan, and finally collecting the food products to compose the market baskets. Documentation, procedures, and tools are necessary for each of these steps and there are critical points in each. The availability of data and ancillary information are crucial. The kind of data available influences the potential to identify core foods and the alignment with dietary exposure evaluation. Information about the foods is fundamental in taking account of the variables affecting potential contamination at production (e.g. market share data for packed foods; varieties for fresh foods) or delivery (e.g. home treatment and cooking methods). Extensive white literature is available on TDS previously performed; a similarly set of technical publications is available for specific groups of substances (e.g. pesticides), and a series of reports concerning TDS carried out all over the world, especially where food composition tables are not available. TDS-Exposure has taken up the challenge of designing systems for implementing harmonised TDS studies throughout Europe, following the EFSA's guidelines to exploit the work done in the past and create an evidence-based system for TDS.

Learning Objectives:

1. Understanding the component of the process to formulate a food-shopping list
2. Aligning reference diet and composite food samples, the role of food description, and food coding systems
3. Food categories and food products, and how to obtain representatives market basket
4. Importance of ancillary information to refine the food-shopping list
5. Recording data for the future use of food products information

Siân Astley (EuroFIR AISBL) has worked extensively with individuals and organisations throughout Europe from a variety of disciplines including research, food and biotech industries and the media. She is author of more than 300 popular science articles for magazines and trade publications as well as 25 peer-reviewed papers, and she was awarded her Diploma in Science Communication in 2009 (Birkbeck University of London). After 14 years as a bench-scientist, Siân became Communications Manager for NuGO, one of the first FP6 Networks of Excellence, and was the European Communications Manager for the Institute of Food Research in Norwich (UK) until April 2012. Currently, she is the Training and Communication Manager for EuroFIR AISBL supporting training within EU-funded research projects and networks and communication of research activities.

Science Communication (Monday, 6th July 2015, 16.00-18.00)

Dissemination and communication are an integral aspect of research, but the skills and understanding necessary for effective delivery are often neglected. This lecture will explore the importance and benefits of dissemination and communication, the actors involved, and the media as a partner in public empowerment.

Learning Objectives:

1. Understand the differences between dissemination and communication, how science is broadcast and received by different audiences, and who and why stakeholders matter
2. Appreciate how different communication tools can and should be used effectively

Davide Arcella (EFSA), Officer in the Risk Assessment and Scientific Assistance Directorate, Evidence Management Unit at the European Food Safety Authority (EFSA) and head of the Exposure Team, is responsible for the collection and analysis of food consumption data, and for the development and application of new methodologies for dietary exposure assessment. In this context, he carries out or supervises the assessment of exposure to different types of chemicals in food and animal feed (e.g. contaminants, flavourings, food additives, packaging residues, nutrients, and pesticides) for stand-alone reports or in support of EFSA panels or units. Davide holds a Masters in statistical and demographic sciences from "La Sapienza" University (Rome, Italy). He has worked in the area of food safety since 1998, having started his career at the Italian National Research Institute for Food and Nutrition (INRAN), where he worked for almost 10 years. He joined EFSA in 2007 and is a member of the FAO/WHO roster of JECFA experts for exposure assessment of chemicals in food.

Food consumption data and their use in dietary exposure assessment to contaminants (Tuesday 7th July 2015, 14.00-15.30)

This lecture will provide an overview of the EFSA Comprehensive European Food Consumption Database and the main principles of the dietary exposure assessment, with some appropriate illustrations.

Learning Objectives:

1. Be aware of how food consumption data are currently collected throughout Europe and collated in the EFSA Comprehensive European Food Consumption Database
2. Understand the principles of dietary exposure assessment to chemicals and especially how consumption data are used as input of exposure modelling

Oliver Lindtner (BfR) is head of unit 'Exposure assessment and standardisation'. He is a mathematician by training, and has worked on modelling for dietary and chemical exposure assessment, data sources for exposure assessment, probabilistic methods and uncertainties in exposure. Oliver is also an expert in total diet studies and served on the EFSA/ FAO/ WHO working group on TDS as well as being a work package leader for TDS-Exposure and responsible for the German pilot study within TDS-Exposure. He is head of an on-going food survey amongst German children aged between 6 months and 5 years (KiESEL-Survey) and the First German TDS, which started in 2015. Besides the TDS-working group, Oliver has been/ is a member of several other EFSA working groups, mainly CONTAM and the ANS-Panel, since 2014.

Planning a Total Diet Studies – Parts 1 & 2 (Tuesday, 7th July 2015, 09.00-12.30)

Planning TDS is a complicated process with many sequential steps. It is important to set principal objectives, decide about management/ budget and, technically, describe the main methodological components of a study. Participants will go through the main steps in detail to appreciate how components are interrelated and the main challenges and potential limitations of TDS. Specific focus will be on principles of representative sampling in relation to the TDS food list.

Learning Objective:

1. An overview of the challenges when planning a TDS including sampling
2. Understanding importance of planning for quality

Martin Rose (FERA) studied chemistry at the University of East Anglia and is an analytical chemist. He has worked on chemical aspects of food safety and quality for many years and he published extensively. Work since 1999 has included research into dioxins and other emerging food contaminants with the aim of developing work in the wider environment, food and health arena. He specialises in the application of analytical chemistry to multi-disciplinary research projects looking at aspects such as environmental pathways, remediation, risk assessment methodologies, emergency response, bioanalytical methods, ecotoxicology, reproductive toxicology and identification and prioritisation schemes for emerging contaminants. Martin was a member of the EFSA Panel on Contaminants in the Food Chain (CONTAM) (2010- 2012) and a member of the EFSA Panel on Food Additives and Nutrient Sources Added to Food (ANS) (2012- 2014).

Sample preparation and culinary operations (Tuesday, 7th July 2015, 16.00-17.30)

A key part of TDS work is that exposure calculations are based on chemical concentrations measured in the food AS EATEN. So it is important to ensure the food preparation methods used in TDS work, properly reflect consumer practice. Depending on their chemical characteristics, food preparation methods can cause concentrations to rise, fall or remain unchanged. Food preparation methods may also introduce additional extraneous contaminants unless care is taken. There is particular interest nowadays to maximise the utility (and so spread the cost) of TDS work by using archived samples for analysis for as-yet not known (completely unknown or just not yet decided) contaminants. This re-emphasises the need not only to select the correct preparation procedures but, just as important, to keep extensive records so that the relevance of the food preparation methods used can be evaluated later on.

Learning Objectives:

1. Why and how culinary operations must mimic normal consumer behaviour in the country and/or region and/or population of interest
2. How to prepare samples for analysis and/or archive in a reliable and traceable way

Marcela Dofkova (SZU) has a background of biology and qualified as specialist in public health in 2006. Since 1996, Marcela has worked in the Czech National Institute of Public Health (Státní Zdravotní Ústav) analysing data describing food consumption, nutrient intake, and dietary exposure in the Czech Republic. Marcela participated in the planning and realisation of the last national wide dietary survey organized in 2003-04 where consumption data at the individual level were collected. She also has experience in processing of data based on Household Budget Surveys. Marcela is involved in the Czech Total Diet Study, a long-term programme performed since 1994, which focuses on estimating dietary exposure/ intake of about 70 contaminants and nutrients. Results produced in national TDS serve as basis for health risk assessment associated with usual dietary habits of the Czech population, and make possible observations of trends over time. Marcela has been involved in many international research projects including TDS-Exposure and, currently, she is a member of the EFSA Network on Food Consumption Data.

Food collection for TDS – Sampling plan (Wednesday, 8th July 2015, 09.00-10.30)

Collection of foods for TDS is a process based on the prepared sampling plan. This is the next step after designing of the TDS food list followed by suggesting of TDS pooled samples. TDS sample plan must take into account many additional factors including number of TDS samples, number of subsamples in the pool, selection of individual food items/brands, national/regional character of food items, seasonality in consumption, type of culinary treatment. Practicalities including throughput of food collection, transportation, storage and kitchen preparations of foods are also very important for good sampling in TDS. Participants will gain an understanding of how to keep a balance between requests and practical possibilities. A part of lecture will be dedicated also to practical experience obtained in on-going pilot study.

Learning Objectives:

1. Be aware of sampling plan as an essential basis for food collection in TDS and understanding its components
2. Understanding the main steps in the process of food collection and its relations to other parts of TDS

Stefan Voorspoels (VITO) is a pharmacist who specialises in analytical toxicology. He has expertise in a wide variety of organic and inorganic analytical techniques and food matrices. He has worked as a scientific officer at the European Institute for Reference Materials and Measurements (IRMM) where he was responsible for the certification of reference materials for food and environment. There, he developed a profound interest, knowledge and expertise in measurement quality and uncertainty. Currently, Stefan is scientific team leader of the analytical research team at the Flemish Institute for Technological Research (VITO). VITO is a contract research organization that develops, validates and applies analytical methodologies for amongst other things food analysis. The activities of VITO are ISO17025 accredited. Among his current research interests are new and emerging pollutants that have only recently entered our food chain and environment.

Analytical measurements: what's behind the numbers (Wednesday, 8th July 2015, 11.00-12.30)

Measurement data are often perceived as the absolute truth. Once out of the analytical environment, they often start to life of their own and the numbers are stripped of all meta-data. This, however, can have severe consequences towards data treatment and interpretation at a later stage. In order to assess the value of a number, it helps if the assessor has insight in how the numbers came about. After an introduction on how samples are actually analysed, it will become clear how data are generated from of a food sample. The main part of the lecture will be quality of data. The origin and background of measurement uncertainty will be discussed to reveal what is behind the numbers.

Learning Objectives:

1. Gain insight into the process of generating measurement data (speed-course analytical technology)
2. Learn about measurement uncertainty: there is more to a number than just the digits.

Jayne Ireland (DFI) is a senior research scientist with 30 years of experience in the field of food composition data. She was a founding member of the French food composition data bank and was its director from 1992 until she retired at the end of 2008. At that time she was awarded the French medal of Chevalier de la Légion d'honneur. She participated in several European projects (FLAIR Eurofoods-Enfant, COST Action 99 – Eurofoods, Balaton, EF COSUM, EuroFIR NoE and NEXUS) and food composition courses, where she promoted harmonisation of food composition databases. She now works part-time at Danish Food Informatics (DFI) on data documentation and food description, and is Secretary of the European technical committee of the LanguaL thesaurus for food description.

Systems for describing food - LanguaL/FoodEx (Wednesday, 8th July 2015, 14.00-18.00)

These lecture and practical session will provide an overview of systems for detailed description of food including LanguaL and the EFSA FoodEX food list combined with facet descriptors.

Learning Objectives:

1. Become familiar with the LanguaL multi-faceted system for food description and EFSA FoodEx2 foodlist and associated facet descriptors
2. Identify differences between the systems and their strengths and weaknesses

David Weber (ETHZ) is a PhD student in the Department of Computer Science of ETH Zurich in the Global Information Systems Group, led by Prof. M. Norrie. David studied computer science with a focus on information systems and business informatics at the University of Zurich, obtaining an MSc in 2006. For four years, he worked as a software engineer for SIX Card solutions AG before joining the GlobIS Group as a research assistant in 2011. Since 2012, David has been working to extend FoodCASE for managing total diet study data and integrating this application with the existing food composition functionality. His research concerns constraints and data quality. As well as extending and generalising constraint models to cater for different types of data quality, David is exploring how constraints can be defined and managed in single place whilst being executed by different components to optimize data quality controls. The advanced data quality framework, developed for FoodCASE, is one of his main research topics.

FoodCASE-Risk in the context of food data (Thursday, 9th July 2015, 09.00-10.30)

The lecture will present a 'big picture' view of food data and where TDS data is located in this landscape as well as details on how to import, manage and export TDS data in FoodCASE-Risk.

Learning Objectives:

1. See one possible abstraction of a TDS in a software system
2. Learn how TDS data can be used in combination with other food data

Isabel Castanheira (INSA) is a principal scientist at the Instituto Nacional de Saúde Doutor Ricardo Jorge (INSA), the Portuguese National Health Institute, and chair of TC 23 IMEKO Food and Nutrition Metrology. Her research activities are performed within three interacting themes namely: Bioinorganic Chemistry, Food Safety and Quality, and Metrology of Food and Nutrition. She is interested in analysing and studying the content of classical nutrients and contaminants in food products in terms of the comparability and reliability of the measurement values. Presently, this is undertaken as part of ORQUE SUDOE EU Project and Total Diet Study Exposure as well as other national and inter-continental projects. Her contribution to ORQUE SUDOE is focused on scientific aspects of food analysis originated from backyards of Sado estuary. The work in TDS-Exposure is focused on human exposure to food contaminants including heavy metals. She is appointed responsibility for Task 9.9 – Quality Management Practices, and cooperates scientifically with WP5 – Development and implementation of (a) quality standard framework for TDS Centres in Europe. Both work packages are committed to the development of a dedicated quality system, initially in pilot countries, but to be extended to all participating organizations.

Quality Management Principles and Practices suited to TDS (Thursday 9th July 2015, 11.00-12.30 and 14.00-15.30)

Lectures will focus on quality concepts required for TDS process. Initially, a brief overview of quality tools will be presented. The key concepts that support TDS generic flowchart will be introduced. Documentation and identification of mandatory and recommended requirements will also be outlined.

Learning Objectives:

1. Gain insight of quality practices and principles in place at TDS projects
2. Evaluate the advantages and limitations of quality management practices implemented in TDS beneficiaries

Jacob van Klaveren received his education in Human Nutrition at Wageningen University (NL). He is an advisor for the national government, WHO, EFSA and the European Commission on various food safety issues. Since 2010, he has worked at the Dutch National Institute for Public Health and the Environment (RIVM) as senior scientific advisor for model development and integration of models in public health and risk assessment issues. Jacob has been involved in many European projects regarding integrated risk assessment and model development, and he coordinates ACROPOLIS, a project aiming to improve cumulative and aggregated exposure in Europe.

Exposure assessment at the international level (Friday 10th July 09.00-12.30 including practical)

Exposure assessment needs input data from consumption surveys and concentration data from either monitoring programmes or from Total Diet Studies. Monitoring programs are often biased towards targeted sampling. TDS concentration data are assumed to be more representative, but the quality of TDS data is also influenced by uncertainties. In this lecture, we will highlight different exposure models and the relevance of good input data for an optimal exposure assessment.

Learning Objectives:

Understand different exposure models and the relevance of good input data for TDS

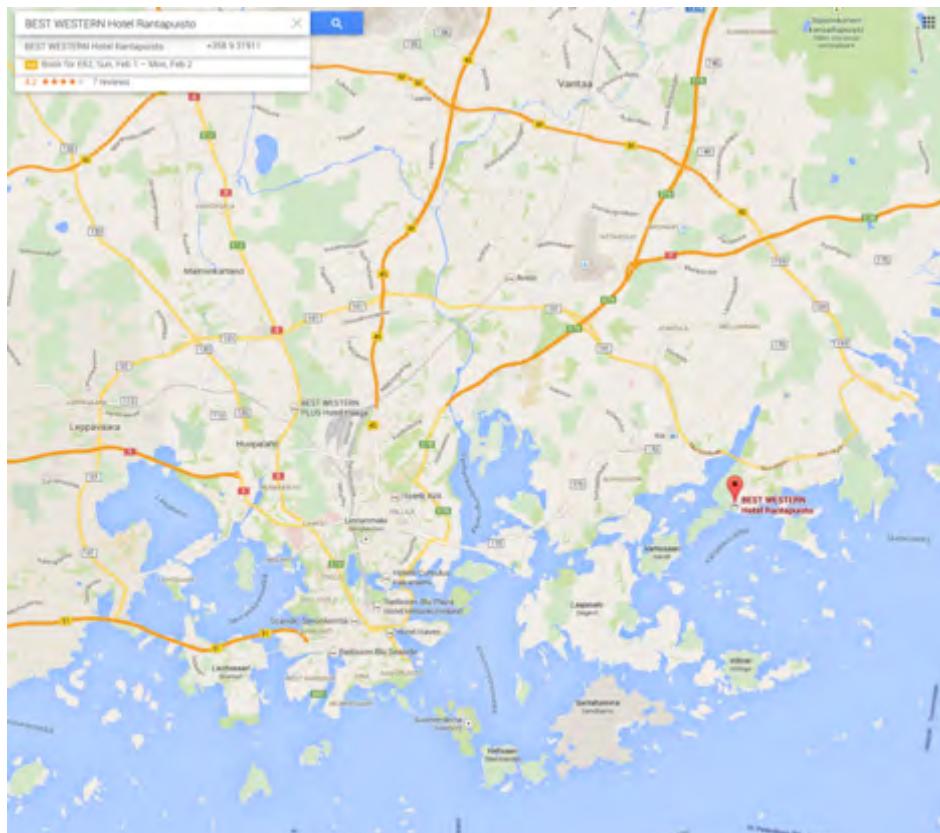
1.6. Contact information

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1.7 Location

Best Western Hotel Rantapuisto, Ramsinniementie 16, 00980 Helsinki, Finland



2. Admission requirements

a. Standard undergraduate entry requirements

Applicant should have at least a Bachelor of Science at Honours level (BSc Hons) or equivalent in food science or another science subject (e.g. dietetics, biology or chemistry or completed the non-clinical teaching for undergraduate medicine). Those with degrees in other science or engineering topics will be accepted provided they have A-level(s) or equivalent (Advanced Higher or International Baccalaureate) in biology, biochemistry or human biology.

b. English language proficiency

These modules will be taught in English and are highly interactive. To benefit from the learning, candidates should be conversant in English and able to understand the lectures, take part in discussions and follow supplementary information.

c. Eligibility

Applications are complete and received before the deadline, and applicants meet the following criteria:

- Employee or student of a Beneficiary of TDS-Exposure
- Resident of a country/ region without existing TDS (country/ regions with established TDS will be considered)
- New to established TDS (employees and students in an established within TDS)
- TDS-Exposure Beneficiary willing to pay travel costs

3. Programme overview

a. List of modules

Introduction to TDS studies

Criteria for selection of chemical substances and population targets

Planning of TDS

Food consumption databases and use in dietary assessments of contaminants

Developing a food list including food classification systems

Sampling plan

Food collection for TDS

Sample preparation and culinary operations

Analytical Issues

Langual and FoodEx2 including practical exercise

Data management: FoodCASE-Risk

Exposure and risk assessment: MCRA including practical exercise

Uses of TDS information

Quality management systems

b. Programme schedule:

Time	Session	Sunday, 5th July 2015	Monday, 6th July 2015	Tuesday, 7th July 2015	Wednesday, 8th July 2015	Thursday, 9th July 2015	Friday, 10th July 2015
		Get together	Basic TDS/ Design and planning	Design and planning	Sample preparation and analysis	Exposure assessment	Quality assessment
08.15-09.00			Registration & Welcome, Siân Astley - EuroFIR AISBL				
09.00-10.30	Session I		Total diet studies: What they are and why they are important, Gerald Moy	Planning TDS - Part 1, Oliver Lindtner - BFR	Food collection for TDS, Marcela Dofkova OR Jiri Ruprich - SZU	FoodCASE-Risk in the context of food data, David Weber - ETHZ	Exposure assessment, risk characterisation and communication (MCRA), Jacob Van Klaveren - RIVM
10.30-11.00							BREAK
11.00-12.30	Session II		Criteria for selection of chemical substances and population targets, Veronique Sirot - ANSES	Planning TDS - Part 2, Oliver Lindtner - BFR	Analytical measurements: what's behind the numbers, Stefan Voorrips - VITO	Quality management principles and practices suited to TDS I, Isabel Castanheira - INSA	Hands-on data handling (MCRA), Jacob Van Klaveren
12.30-14.00							LUNCH
14.00-15.30	Session III		Developing a food list including food classification system, Aida Turrini - CRA NUT	Food consumption databases and use in dietary assessments of contaminants, Davide Arcella - EFSA	Systems for describing food: LanguaL/FoodEx, Jayne Ireland - Danish Food Informatics	Quality management principles and practices suited to TDS II, Isabel Castanheira - INSA	Knowledge evaluation, certificates feedback, etc., Siân Astley EuroFIR AISBL
15.30-16.00							BREAK
16.00-18.00	Session IV		Science Communication, Siân Astley - EUFIR AISBL	Sample preparation and culinary operations, Martin Rose - FERA	PRACTICAL: Systems for describing food: LanguaL/FoodEx	FREE TIME	CLOSE
18.00-18.30	Session V			FREE TIME			
18.30-19.00				FREE TIME	FREE TIME	CLOSE	
19.00	Session VI	informal get-together and dinner	Conference Dinner	Dinner and free time	Dinner and free time		

c. Description of exercises:**Criteria for selection of chemical substances and population targets (Monday, 6th July 2015, 11.00-12.30)**

EXERCISE: (part 3 of the lecture) will consist in an application of the prioritization tool. Depending on time, the exercise could be about the definition of the weights allocated to prioritization criteria and/or the evaluation of one or several substances regarding the prioritization tool

Systems for describing food - Langual/FoodEx (Wednesday, 8th July 2015, 14.00-18.00)

EXERCISE: The intention is to present an overview of the Langual and FoodEx tools and try to code some products and discuss the outcomes. Participants are encouraged to bring a few food labels (actual or printed label information) for a range of products from their own country, which they can try to code, either individually or in groups, and see what interesting problems arise. The value of the exercise is in getting an idea of what is involved and the difficulties. The systems are very comprehensive and complex so it will just be a snapshot with (hopefully) some interesting discussion but not necessarily all the answers!

Quality Management Principles and Practices suited to TDS (Thursday 9th July 2015, 14.00-15.30)

EXERCISE: Describe a flowchart for TDS project at country-level and identify similarities and differences with a generic TDS flowchart

Exposure assessment at the international level (Friday 10th July 2015, 11.00-12.30)

EXERCISE: Students will learn how to upload TDS data to the MCRA software and how to perform an exposure assessment with different input data.

d. Additional reading

- Andersen, Buchberger & Worsfold (2013) European Analytical Column Trends – Meeting Report *Trends in Analytical Chemistry* **46**: xvii-xix
- Castanheira I., Roe M., Westenbrink S., Ireland J., Møller A., Salvini, S. Beernaert H. Oseredczuk M. C, Calhau M. A. (2009) Establishing quality management systems for European food composition databases. *Food Chemistry* 113: 776-780 - <http://dx.doi.org/10.1016/j.foodchem.2008.05.091>
- Effective Media Communication during Public Health Emergencies (WHO Handbook); Theory at a Glance (National Cancer Institute, US Department of Health and Human Services) - <http://www.who.int/csr/resources/publications/WHO%20MEDIA%20HANDBOOK.pdf>
- EFSA (2011); Use of the EFSA Comprehensive European Food Consumption Database in Exposure Assessment - <http://www.efsa.europa.eu/en/efsajournal/pub/2097.htm>
- EFSA Scientific Report 'Evaluation of the FoodEx, the food classification system applied to the development of the EFSA Comprehensive European Food Consumption Database' European Food Safety Authority (EFSA), Parma, Italy <http://www.efsa.europa.eu/en/efsajournal/doc/1970.pdf>
- EFSA Scientific Report (2011) Report on the development of a Food Classification and Description System for exposure assessment and guidance on its implementation and use. European Food Safety Authority (EFSA), Parma, Italy <http://www.efsa.europa.eu/en/efsajournal/doc/2489.pdf>
- EFSA Technical Report (2011) The food classification and description system FoodEx 2. European Food Safety Authority (EFSA), Parma, Italy <http://www.efsa.europa.eu/en/supporting/doc/215e.pdf>
- EFSA, FAO and WHO (2011) Towards a harmonised Total Diet Study approach: a guidance document. *EFSA Journal*, 9(11): 2450 - <http://www.efsa.europa.eu/en/efsajournal/pub/2450.htm>
- EFSA/FAO/WHO (2011) State of the art on total diet studies based on the replies to the EFSA/FAO/WHO questionnaire on national total diet study approaches. Prepared by the Working Group on Total Diet Studies, European Food Safety Agency, Parma - <http://www.efsa.europa.eu/en/supporting/pub/206e.htm?wtrl=01>
- FSA (Food Standards Agency UK), 2006. Guidelines for undertaking surveys. FSA, 92 pp. - <http://www.food.gov.uk/multimedia/pdfs/fsasurveysguidance.pdf>
- FSANZ (Food Standards Australia New Zealand) 2008. 22nd Australian Total Diet Study: A total diet study of five trace elements: iodine, selenium, chromium, molybdenum, and nickel - <http://www.foodstandards.gov.au/publications/documents/ATDS.pdf>
- Greenfield H & Southgate DAT (2003) Food Composition Data: Production, management and use (2nd Edition). Food and Agriculture Organization of the United Nations, Rome (IT) Part 1, Chapters 1-7 <ftp://ftp.fao.org/docrep/fao/008/y4705e/y4705e00.pdf>, Part 2, Chapters 8-12 <ftp://ftp.fao.org/docrep/fao/008/y4705e/y4705e01.pdf>
- Hendrik Emons (2013) Letter to the Editor: Analytical chemistry and metrology have scientific basis *Trends in Analytical Chemistry* **48**: xv-xvi
- Ireland J. & Møller A. Describing a food using LanguaL™ facets A-Z (2010-02-26) - http://www.langual.org/download/Presentation/LanguaL_facets_A-Z_2010-02-26.pdf
- Ireland J., Møller A. (2000) Review of international food classification and description. *Journal of Food Composition and Analysis* 13 (4), 529-538 <http://www.sciencedirect.com/science/article/pii/S0889157500909219>
- Leblanc JC (2006) Fish and seafood consumption study and biomarker of exposure to trace elements, pollutants and omega 3. CALIPSO, 160 pp. - <http://www.afssa.fr/Documents/PASER-Ra-CalipsoEN.pdf>
- Lin, CC, Wang, WC & Yu, WD (2008) Improving AHP for construction with an adaptive AHP approach (A³) *Automation in Construction* 17: 180-187 - <http://bit.ly/19t1N2I>
- Møller A., Ireland J. LanguaL™ 2012 – The LanguaL™ Thesaurus, EuroFIR Nexus Technical Report D1.17a. Danish Food Information, 2013 - <http://www.langual.org/download/LanguaL2012/LanguaL%202012%20Thesaurus%20-%20Final.pdf>

- NZFSA (New Zealand Food Safety Authority), 2005. 2003-04 Total Diet Survey - http://www.foodsafety.govt.nz/elibrary/industry/2003_04-Analyses_Environmental.pdf
- Overview of the procedures currently used by EFSA for the assessment of dietary exposure to different chemical substances. EFSA Journal 2011 9(12): 2490 - <http://www.efsa.europa.eu/en/efsajournal/doc/2490.pdf>
- Principles and methods for the risk assessment of chemicals in food. Chapter 6: Dietary exposure assessment of chemicals in food. WHO, Environmental Health Criteria 240 - http://whqlibdoc.who.int/ehc/WHO_EHC_240_9_eng_Chapter6.pdf
- Transparency in Risk Assessment – Scientific Aspects on EFSA website. EFSA Journal (2009) 1051: 1-22 - <http://www.efsa.europa.eu/de/scdocs/doc/1051.pdf>
- WHO (1985) Guidelines for the Study of Dietary Intakes of Chemical Contaminants, World Health Organization, Geneva - <http://www.who.int/foodsafety/publications/chem/contam/en/index.html>
- WHO (2004) Total Diet Studies: A Recipe for Safer Food, World Health Organization, Geneva - <http://www.who.int/foodsafety/publications/chem/recipe/en/>
- WHO (World Health Organization), 2002. GEMS/Food Total Diet Studies. Report of the 2nd International Workshop on Total Diet Studies. Food Safety Programme Department Of Protection Of The Human Environment World Health Organization. Brisbane, Australia, 4-15 February 2002. WHO, Geneva, pp 56-58 - http://www.who.int/foodsafety/publications/chem/tds_feb2002/en/index.html
- Saaty, TL (1980) The Analytic Hierarchy Process: Planning, Priority Setting, Resource Allocation. McGraw-Hill, NY
- Moy G and Vannoort R (in press) Total Diet Studies, Springer, New York
- Rehurkova I (2002) Monitoring of the dietary exposure of the population of chemical substances in the Czech Republic: design and history. Central European Journal of Public Health 10(4): 174-179
- Ruprich J, Rehurkova I (2002) "Chemon" – TDS project – dietary exposure to chemical substances, Proceedings from the Total Diet Study Sub-Regional Training Workshop, WHO GEMS/Food Euro, 25-30 November 2002, Brno, Czech Republic
- Sirot V, Volatier JL, Calamassi-Tran G, Dubuisson C, Menard C, Dufour A & Leblanc JC (2009). Core food of the French food supply: second Total Diet Study. Food Additives and Contaminants part A-Chemistry Analysis Control Exposure & Risk Assessment, 26 (5), 623-639
- Turrini A, Lombardi-Boccia G (2002) The formulation of the market basket for evaluating the Italian total diet 1994- 96. Nutrition Research 22(10): 1151-62
- FoodEx2 browsing tool (revised April 2015) <http://www.efsa.europa.eu/en/datex/datexfoodclass.htm>
These two zip files should be extracted to the same folder (e.g. C:\FoodexBrowserHome). Instructions for installation are given in "Instructions for using the browsing tool.pdf"
It would also be useful to download and extract "FoodEx2-InterpretingAndCheckingTool-2015-04-27.zip" and "The food classification and description system FoodEx2 (revision 2).pdf"
- LanguaL™ Food Product Indexer (October 2013) and LanguaL™ Thesaurus Database 2014 http://langual.org/langual_food_product_indexer_database_2014.asp
- LanguaL tutorial in English or Spanish may be useful http://www.langual.org/langual_food_product_indexer_database_2014.asp
- Indexed dataset examples - http://www.langual.org/langual_indexed_datasets.asp

e. Review of learning

- *model answers will be provided after the event*

Total diet studies: What they are and why they are important (Monday, 6th July 2015, 09.00-10.30)

1. What are some of the challenges in protecting the public from risks posed by chemicals in the food supply?
2. What are the main advantages of total diet studies in assessing dietary exposure to chemical?

Criteria for selection of chemical substances and population targets (Monday, 6th July 2015, 11.00-12.30)

1. What typologies of populations can be targeted in a TDS?
2. What are the main steps of the HAP method?

Science Communication (Monday, 6th July 2015, 16.00-18.00)

1. What is the difference between dissemination and communication?
2. What are the five Ws and 1H?
3. What is the primary difference between how scientific publication deliver information compared with other sources?

Planning a Total Diet Studies (Tuesday, 7th July 2015, 09.00-10.30)

What are the core components in a TDS planning?

Sampling plan for a TDS and its relation to the food list (Tuesday, 7th July 2015, 11.00-12.30)

1. What are the most important issues to remember concerning sampling?
2. What are the two disadvantages of pooling?
3. What are the main conditions that must be considered when planning a TDS?
4. How to prevent TDS estimates from biased estimates?

Developing a TDS food list to compose TDS samples (Monday 6th July 2015, 14.00-15.30)

1. Which criteria are fundamental for formulating a TDS food-shopping list representative of a reference diet in a population group?
2. *Which tasks are necessary to transform a TDS food list in a TDS food-shopping list?*
3. Why is recording food information important?
4. How many "main" steps are in a protocol for collecting food products for a TDS?
5. The more detailed is the food consumption list the better is represented the reference diet
6. Food description and coding are
7. Advantages in recording food shopping list data

Food collection for TDS – Sampling plan (Wednesday, 8th July 2015, 09.00-10.30)

1. What are the main features that characterize national respectively regional foods?
2. Which information about sampling and sampled food items is useful to register into collection report?

Food consumption data and their use in dietary exposure assessment to contaminants (Tuesday 7th July 2015, 14.00-15.30)

1. What are the main needs in term of food consumption data in order to perform an exposure assessment?
2. What are the main sources of food consumption estimates?

Sample preparation and culinary operations (Wednesday, 8th July 2015, 09.00-10.30)

1. What is the guiding principle and the single most important aim of food preparation done in the TDS kitchen?
2. What are the advantages and disadvantages of using tap water in the reconstitution of dehydrated foods and for cooking in the TDS kitchen, compared to the alternative of using distilled or deionised water.

Analytical measurements: what's behind the numbers (Wednesday, 8th July 2015, 11.00-12.30)

1. Briefly describe how the dioxin concentrations are determined in a fish composite sample. What kind of meta-data will help you to assess the quality of the numbers given to you?
2. What are the two main approaches in how an uncertainty budget can be established? How can one assess whether a reported uncertainty is realistic or not? And how can an uncertainty be lowered if necessary?

Systems for describing food - Langual/FoodEx (Wednesday, 8th July 2015, 14.00-18.00)

1. What is the central feature of FoodEx2?
2. What is the main purpose of Langual?
3. Which FoodEX2 facet type and facet code would be used for a 'smoked' food and what is the associated Langual code?
4. How can a Langual term be added or amended?

FoodCASE in the context of food data (Thursday, 9th July 2015, 09.00-10.30)

1. What is the advantage of using an electronic information system to manage TDS data in comparison to a basic tool such as EXCEL or ACCESS?
2. Describe the basic steps of TDS, and explain how FoodCASE-Risk covers these steps including missing elements

Quality Management Principles and Practices suited to TDS (Thursday, 9th July 2015, 11.00-12.30 & 14.00-15.30)

1. What is the difference between harmonization and standardization?
2. What are the sections and steps of TDS flowchart and associated quality documents?