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tds exposure

Newsletter

A word from the coordinator ...

Jean-Luc Volatier (ANSES, FR)

› TDS-Exposure is now fully up-to-speed and producing new methods and results to assess exposure to chemical substances from the diet using TDS. Lists of priority substances and populations of interest have been described by WP2, and WP3 has defined priority food lists in different EU countries. It is not a surprise to see they differ according to our national eating habits. One of the roles of a project such as this is to consider these differences when proposing future guidelines for exposure assessment. Fieldwork for pilot TDS will begin next year, and we will gain collective expertise in sharing theoretical and empirical knowledge from Iceland, Portugal, Germany, and the Czech Republic. The need for capacity building is high, and we had more applications than places for the first TDS-Exposure Summer School in July; the next Summer School will be in 2014. However, I will let you discover more about these and other topics in this, the second TDS-Exposure newsletter, and visit our website (www.tds-exposure.eu) to learn more!

In this issue:

SEVENTH FRAMEWORK PROGRAMME
European Commission

› 01: Progress and achievements

› The first General Assembly, as well as the second Steering Committee (SC) meeting, was held in Norwich (UK), hosted by IFR. The General Assembly focused on progress and future activities, and this newsletter summarises those presentations, offering some insight into the activities of TDS-Exposure during the first reporting period, February 2012-July 2013.

TDS-Exposure Organisation (WP1)

› Responsible for ensure effective implementation and timely progress as well as good communication across and beyond the consortium, WP1 also provides the beneficiaries with a range of support material including the TDS-Exposure Quality Manual. This document describes management rules and procedures, and promotes the use of TDS-Exposure templates and tools for administrative and financial management by the beneficiaries. This document was established by consensus and disseminated during the first year of TDS-Exposure.

The Centre for Ecological-Noosphere Studies from the National Academy of Science, Republic of Armenia has joined TDS-Exposure as an observer and will be invited to participate in the 2014 General Assembly.

The TDS-Exposure International Advisory Board (IAB), comprised of a small number of carefully selected individuals from universities, research organisations, policy and regulatory bodies, acting at the strategic level with a consultancy and advisory function, formed in February 2013. IAB members are, currently, Philippe Verger (WHO), Katie Egan (previously US FDA), Liisa Valsta (EFSA), Caroline Merten (FAO) and Joseph Shavila (FSA – UK), and two of these experts - Liisa Valsta and Joseph Shavila - participated in the first General Assembly.

The coordination team was busy during the summer preparing the first Periodic Report, with input from all WP leaders. This report includes both scientific and financial aspects of the project, describing progress in implementation and justifying the use of resources. External experts will evaluate the periodic report, and a review meeting will be organised with the EC Project Officer during November 2013.

Choice of substances of interest and populations of consumers (WP2)

› Activities in this work package were planned to last for one year (February 2012-January 2013). Members included ANSES (WP leader, FR), INRAN/CRANut (IT), UGent (BE), HAH (HR), CNA/ AESAN (ES), ISS (IT) and TUBITAK-MAM (TR), and the aim was to identify populations of interest for TDS, evaluate the relevance of the TDS approach for different substance groups, and prioritise substances to be included in TDS.

Four main population groups and 18 subgroups were identified. These included sensitive populations (specific sensitivity to chemical substances, e.g. young children or pregnant women) and populations exposed to one or more chemicals to a greater extent than the general population because of different eating habits arising for geographical, ethnic or medical reasons (e.g. vegetarians, coastal area populations or diabetics) or because they live in a highly polluted environment. Specific foods related to these targeted populations were identified and included in the 'food baskets'. These foods were not selected for the original food list because the general population does not usually consume them.

A general method for prioritising substances to be included in a TDS was established. Criteria for prioritisation were defined and the relative importance of each evaluated. A sensitivity analysis showed this step was crucial: evaluation is dependent on the objectives of the prioritisation and discussion amongst experts was shown to be fundamental. This tool was applied to approximately 100 substances or groups for which the TDS approach is considered as relevant, based on TDS principles. Using their expertise, beneficiaries evaluated substances against each criterion, taking into account the national situation and available data. A score was attributed to each substance for each criterion, and a total score calculated taking into account the relative importance assigned to each criterion. Trace elements (e.g. methylmercury, cadmium, inorganic arsenic, lead, aluminum, inorganic mercury), dioxins and PCBs, sulphites and nitrites, acrylamide, bisphenol A, mineral oil saturated hydrocarbons (MOSHs), 3-MCPD and related compounds, and aflatoxins were notable amongst the 15 substances of greatest interest. The rank of a substance is subjective, depending on the way its risk is assessed, and consequently on the time period and different national situations. Sensitivity analyses showed the approach was robust with little variation in ranking amongst the experts, and such an exercise should be performed when planning a TDS.

Veronique Sirot, WP2 leader (ANSES, FR)

Food sampling: food products collection (WP3)

› Objectives for this period included analysis of (a) European food consumption data to identify which food products are recorded per food categories and population groups; (b) approaches formulating food shopping lists from the literature review, food products databases including recipes and preparation, and the report describing food product data analysis including relevant statistical indexes; and (c) dissemination of this information.

A database of food lists was delivered by UCD (IE) based on aggregated food consumption data kindly provided by EFSA (derived from the Comprehensive Database). The food products database (including recipes and preparation) used these data whilst the report on data analysis will be released via the food products data analysis. The desk analysis for the protocol development organised the datasets using templates developed earlier, and the food lists were merged into a single dataset to facilitate selection and coding of a general 'core food list'. Methods reported in the literature were also included in the database.

Aida Turrini, WP3 leader (CRA Nut, IT)

Two important points arose during this work: 1) food shopping lists are largely absent in existing literature and 2) recipes and home preparation information are not available in all countries. Thus, using data based on structural characteristics identified in the literature review seems the most appropriate approach. Recipes and home preparation information will be linked from those sources that are available. The real food-shopping list is available only after collection of food products because of the level of detail required. Implementing the food-shopping-list datasets will facilitate interpretation and cross-study comparison, and the information can be used to design or refine the food-shopping plan for TDS.

Food preparation, composite formation, and chemical analysis (WP4)

› Analytical methods that can measure contaminants in food at low levels and cope with complex food matrices are key for TDS. These methods must also account for dilution effects arising in pooled samples. Otherwise, there is a risk that analyses will produce many 'not detected' at relatively high concentrations making exposure assessment unrealistic. Pooled samples also create complex, variable food matrices, and selected analytical methods must be validated for all food groups. A search of published literature and other information sources showed sensitive analytical methods are available for most of the TDS-Exposure priority contaminants.

Similarly, food preparation methods must reflect consumer practice since this can influence contaminant levels. This is perhaps best illustrated by polycyclic aromatic hydrocarbons (PAHs), which are fat-soluble organic contaminants arising from incomplete combustion in animal feed as well as human food. Because PAHs concentrate in fat, they can be lost with when meat is cooked. Thus, the concentration in food as eaten depends on the cooking method: meat can be boiled, baked, grilled, fried or barbequed etc. If the fat is discarded, a significant fraction of PAHs may be lost and exposure reduced. Where the cooking method does not release the fat or the fat is re-used (e.g. whilst making gravy or a sauce), exposure will be greater. PAHs can also be formed in the food when it is cooked meaning the final amount in any food may fall or rise depending on the cooking method. This may vary between countries, regions or even individuals since cooking is a matter of personal taste (e.g. rare, medium or well-done steak) and usual ways of cooking are important and should be mimicked in TDS. Other contaminants can behave differently; some may are unchanged, some may be destroyed and others may form on cooking.

These are complicated aspects of TDS and exposure analysis. Documents from EFSA and the US FDA were invaluable as a starting point and, currently, there is particular interest in maximising output by using archived samples for analysis of previous 'unknown' contaminants (completely unknown or as yet undecided). This re-emphasises the need not only to choose the correct cooking procedures but also keep extensive records so the relevance of the food preparation methods can be evaluated later.

Development and implementation of a quality standard framework for TDS Centres in Europe (WP5)

› Participants have focused on developing and implementing a quality standard frameworks for TDS Centres in Europe with the creation of a European TDS-Vocabulary and TDS-Network, offering contacts and a common 'technical' language amongst the countries involved. Development of a total quality management strategy (European Foundation for Quality Management - EFQM) began with identification of required results using a self-assessment EFQM questionnaire, completed by ANSES (FR), AESAN (ES) and SZU (CZ). This will help develop examples of best practice in approaches, indicators and targets. Activities that are important for design and development of TDS methods have also been identified, which will enable critical control points to be pinpointed and, ultimately, TDS-related standard operating procedures (SOPs) developed in parallel with training.

A SWOT analysis for two food identification and classification systems has been completed. This compares the suitability of EFSA's FoodEx and LanguaL for use in exposure assessment, and includes results from the proposed pilot study TDS food list. The need for further developments will be identified during the WP9 pilot TDS.

Other work has included defining laboratory quality profile by contaminant. Information on current practices was gathered, including accreditation, method validation and participation in proficiency schemes for the WP2 priority substances list and heavy metals, which will be used for the pilot studies (i.e. selenium, copper, mercury, cadmium and manganese). To enable the correct choice of analytical method during future TDS, a database/wiki on analytical methods for each WP2 contaminant is being developed,

Paul Finglas, WP5 leader (IFR, UK)

Finally, to support definition of assay quality and performance requirements, a literature search has identified eight performance criteria, based on z scores or En-scores; criteria for acceptance relate to ISO 17025. The next step will be to start discussions about design of the certification framework using the ISO9001 approach.

Database management, description (WP6)

› It is important that a comprehensive data management solution for TDS data can be provided that will ensure the quality and sustainability of data collected as well as supporting user tasks and allowing them to work in parallel. The knowledge gained from development of a food composition management system (FoodCASE) is being exploited to implement a data management system specifically for TDS, FoodCASE-Risk.

During this first period, the focus has been on collecting functional and process-oriented requirements as the basis for producing a software requirement specification (SRS) document. The first task was to research the literature and interview several project partners and external TDS experts to gain an in-depth understanding of TDS. The data-relevant process steps were identified and a data model created covering all relevant properties of foods and contaminants. In addition, concepts such as data life cycle (from sampling to data usage), integration with food composition data and data tagging (adding semantics to data records) were added. All results were specified in the FoodCASE-Risk SRS and the first draft discussed in a workshop seeking further feedback from users. After the incorporation of the workshop feedback, the next step was to integrate FoodCASE-Risk as a component in the existing FoodCASE software, thereby allowing food composition data to be connected to TDS data. Once the first version of FoodCASE-Risk has been completed, a usability study will be carried out so a second version can be developed, also based on user feedback. In addition to the development work, we have been investigating ways in which a data management system can improve data quality by providing better methods of supporting and controlling data entry and maintenance. This includes developing solutions that allow users to define data quality requirements in a simple way and in a single place, in contrast to existing systems where only limited quality constraints can be specified declared and many checks are hard-coded in application programs and handled by different components.

Karl Presser, WP6 leader (ETHZ, CH)

Variations and trends (WP7)

› In February 2013, work to increase the understanding of differences in food consumption in sub-populations of interest and how this influences the establishment of TDS food lists started.

Food lists from National Dietary Surveys in the Czech Republic, France, UK and Belgium are available to study how ranking of food groups varies by different sub-populations. Data from these surveys can be used to fill in details about total number of participants, numbers of males and females, participants in different ages (e.g. children, elderly). There is also interest in information about vegetarians and those exposed to high levels of contaminants, and we aim to identify food groups of special interest for pregnant women using data from the Norwegian Mother and Child Cohort Study.

To overcome the lack of information on variability in food chemical concentration, by learning about variability from secondary data, we will concentrate on statistical analyses for substances that are also relevant for the pilot studies (i.e. selenium, copper, mercury, cadmium and manganese). Ideally, data on aflatoxin should also be statistically analysed under the auspices of variability in food. These data will be in the EFSA SSD-format to enable comparison.

Gerhard Heinemeyer, WP7 (BfR, DE)

In the meantime, data have been requested from France, Belgium, Czech Republic, Germany, Spain and the Netherlands as well as data for fish from Iceland.

Exposure assessment (WP8)

› Exposure assessment is an important aspect of risk evaluation based on data generated in TDS. Several countries have performed TDS in the past, and new TDS data will be collected by WP9 and in future national TDS. Risk managers can evaluate trends and/or risk-reducing measures based on TDS and monitoring. In general, TDS data are of good quality because samples are collected from the market and prepared using household methods. However, there are limitations with respect to exposure assessment. Our aim is to improve exposure assessment methodology and harmonise interpretation of TDS exposure using historical and future data.

The quality of TDS data from several countries differs significantly because of differences in study design and details provided in pooling samples for analysis. Countries like Belgium, Spain and the Netherlands have performed a less detailed TDS with fewer pooled samples compared to France and the Czech Republic. In the UK, food is pooled in broad food categories before it is analysed for residues and contaminants so it is not possible to known how residues are distributed in individual food items or in pooled samples, introducing uncertainty that can potentially result in over- or underestimations of the actual exposure. Another source of uncertainty is the number of food items not sampled or analysed. Some countries focus TDS on specific chemicals like dioxins and sampling of foods on fish and animal products rather than foods from plant origin.

Representatives from European countries that have previously performed TDS have been trained to organise TDS data in a harmonised fashion, and link data to consumption, using the Monte Carlo Risk Assessment (MCRA) software, to ensure a standardised approach for exposure assessments at the international level. Historical TDS data have been organised using country-specific coding, and we have developed a method to transform historical data using FoodEx1 codes. Our plan now is to work through scenarios addressing the methodological aspects of the exposure assessment.

Jacob van Klaveren, WP8 leader (RIVM, NL)

Implementation of TDS methodology on country level – pilot studies (WP9)

› We aim to implement and test harmonised TDS methodology in five countries (CZ, DE, FI, IS, PT). Activities are broken down into nine consecutive tasks. Six deal with harmonisation (not standardisation) of TDS method protocols while three are related to pilot studies required to test the feasibility of TDS plans and methods in real life.

During our workshop in Norwich, involving 30 experts and observers, we discussed results from the first year's activities, which were dedicated to the creation of so-called national TDS sample/food lists. This very complex work, never done before, used the new EFSA food coding system FOODEX2 for harmonised classification of the most consumed food commodities in individual countries. National experts selected staple foods categorised as 20 basic food groups, separated into solid and liquid in character, representing at least 90% (mass) of habitual national diet for adults and elderly, and combined them into 'pooled TDS food samples', which will be analysed in the future. The experts offered many important ideas about how to perform this work with an appropriate level of quality to obtain reproducible, comparable and transparent results useful for exposure assessment and risk characterisation.

Following presentation of the achievements in creating the TDS sample/food lists, the experts discussed tasks including creation of TDS food shopping lists (SZU), how to model kitchen preparation used for particular foods (methods, INSA), how to pool individual food items/brands into pooled TDS samples (MATIS), how to prepare bulk pooled TDS samples for dispatch to analytical laboratories (EVIRA) and, finally, how to fulfil basic quality requirements and harmonise standard operational procedures (INSA). The presence of experts in different aspects of TDS theory and practice made for a challenging discussion. But, the workshop concluded that a combination of international experience, existing tools and instruments could help create and realise a better-designed, more efficient European TDS.

Jirí Ruprich, WP9 leader (NIPH/SZU, CZ)

Training and Spreading of Excellence (WP10)

› TDS-Exposure aims to promote knowledge and skills development amongst the organisations running and evaluating TDS for food safety and risk assessment in Europe through a coherent set of closely inter-related training and education activities. These activities make use of existing knowledge and training activities, sharing experience within and beyond the consortium, and facilitate excellence in future TDS. To date, the focus has been on (1) creating a framework for the summer schools including programme topics and assessment, which also forms the basis of the new elearning module, (2) establishing the needs and capabilities of beneficiaries for delivering targeted workshops exploring topics such as TDS design and planning, and data management amongst others and (3) promoting exchange amongst beneficiaries with experience and knowledge and those seeking to establish TDS in regions currently lacking this approach to population monitoring. With the first TDS-Exposure Summer School completed successful, efforts can turn to workshop, exchange and the elearning storyboard as well as organisation of the TDS-Exposure Summer School 2014. Visit http://bit.ly/1bcpKxD

TDS-Exposure Summer School 2013 (Sunday 7th July-Friday 12th July 2013), INSA (PT)

› The programme consisted of five elements: (1) basic foundations of TDS, (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. The objectives were to introduce TDS, generally, and dietary exposure to contaminants, specifically, whilst exploring the scientific and technical knowledge underpinning TDS for exposure assessment, offering insights into methods and approaches as well as data quality, which would enable students to apply this knowledge in their expert field (e.g. public health, food technology, research). For more information visit http://bit.ly/1bcvKqr

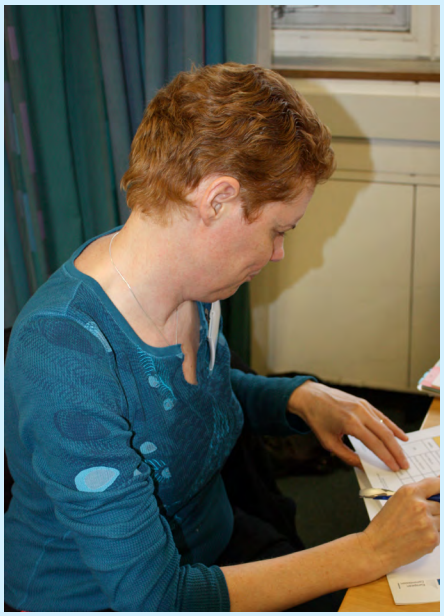
› There were 21 delegates from 15 organisations (13 TDS-Exposure beneficiaries, three external organisations) in 14 countries as well as 13 lecturers (10 TDS-Exposure and three external). TDS-Exposure Summer School 2013 was hosted by Instituto Nacional de Saúde Dr. Ricardo Jorge, Lisbon (PT), and delegates were selected by application.

On Sunday when everyone gathered at Pharmacia for an informal dinner Lisbon was 'enjoying' some of its hottest weather this summer (42 °C), described by one lecturer as "*like walking into a hairdryer on full*". Teaching and learning in English with temperatures so high is challenging, even with air conditioning, and everyone made the most of time in garden where the poster and science communication sessions were held. INSA embraced its temporary residents whether translating the lunch menu or joining the taught sessions, which was appreciated by all as was the Portuguese food and music at the Quinta da Dona Rosa old chapel restaurant on Tuesday evening.

Bringing about a summer school from nothing on a topic as complex as TDS is difficult and INSA, specifically Paula Alvito, Marina Rocha Pité, Luísa Oliveira and Ana Morais, is to be congratulated for delivering a programme of learning, which was appreciated by the students and lecturers alike, and will go on to form the basis of TDS-Exposure Summer School 2014 and 2015.

Siân Astley, WP10 leader (EuroFIR, BE)

I would also like to thank Paula, Marina, Luísa and Ana, the lecturers and the delegates for making the week so successful!



Dissemination and stakeholder-user communication (WP11)

› TDS-Exposure aims to ensure wide-scale dissemination of project developments to beneficiaries and beyond to key stakeholders, the wider scientific community and the general public. To achieve this, a website was developed and launched on 30th April 2012, and it has been updated regularly since. To date, more than 1900 visitors have visited the website. To ensure visibility and recognition of TDS-Exposure, a flyer was also developed and is available online at print quality in English, French, German, Portuguese, Spanish, Italian, Swedish and Finnish.

More than 1200 flyers have been distributed throughout Europe during the first 18 months of the project. In addition, the first e-newsletter was published and distributed to more than 2500 stakeholders globally in October 2012. An initial network of TDS experts from around the world has been established, and this network will be expanded throughout the lifetime of the project. The planning and organisation for the first TDS-Exposure Stakeholder Workshop is already well underway (Upcoming Events).

Helga Gunnlaugsdóttir, WP11 leader (MATIS, IS)

› 03: Upcoming events

Stakeholders' Workshop, 5th February 2014

La Maison des Associations Internationales (MAI), Rue Washington, Brussels (Belgium) - 5th February 2014

TDS-Exposure will only truly be successful if its outcomes are widely adopted by relevant stakeholders. Therefore, it is important the project delivers results that meet the needs of these stakeholders and stakeholders are aware of the project and its outputs. This requires continued stakeholder involvement throughout the project. To accomplish this, TDS-Exposure will host a one-day workshop on 5th February 2014 at MAI in Brussels. The aims of this workshop are primarily to obtain feedback from stakeholders about TDS-Exposure activities and results, and to determine what further steps can be taken to ensure applicability of any output for them. The workshop is relevant for participants with an interest in TDS and food contamination risk assessment, e.g. food authorities, risk managers and decision makers, and the food and beverage industry as well as academic researchers in food safety and public health.

› Join our training (WP10)

Our objective is to promote knowledge and skills development across TDS-Exposure through training and education activities.

TDS-Exposure Summer School 2014 will be hosted by TUBITAK (TR), but there will also be workshops during the year focussing on different topics. A new e-learning module will support these face-to-face activities.

To participate, your organisation must be a beneficiary of TDS-Exposure **or** willing to fund attendance. Priority will be given to those countries/regions without TDS, but individuals including PhD and Masters students or new to established TDS are welcome.

Details are published online (http://www.tds-exposure.eu/?q=training-and-spreading-excellence) or contact: sian.astley@eurofir.eu

› 05: Project partners

Coordinated by ANSES, the TDS-Exposure consortium includes 26 beneficiaries, including 10 research centres, six food safety agencies, five universities, four national institutes of public health, and one SME. The range of expertise covers: analytical chemistry, exposure assessment, food safety, epidemiology, statistics and modelling, and social sciences.

French Agency for Food, Environmental and Occupational Health & Safety

Ghent University

National Food and Nutrition Institute

Croation Food Agendy

National Health Institute

European Food Information Resource

Institute of Food Safety, Animal Health and Environment

TUBITAK Marmara Research Centre Food Institute

National Institute for Public Health and the Environment

Finnish Food Safety Authority Evira

University Rovira i Virgili

National Food and Nutrition Institute

Ministry of Health, Social Services & Equality - Spanish Food Safety & Nutrition Agency

Flemish Institute for Technological Research NV

Consiglio per la Ricerca e la Sperimentazione in Agricoltora Institute

The Secretary Of State For Environment, Food And Rural Affairs

National Food Agency

Federal Institute for Risk Assessment

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Norwegian Institute of Public Health

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TDS-Exposure at a glance

› Duration: 4 years
› Budget: over 7.5 million Euros
› Partners: 26
› Countries: 19
› Work Packages: 11

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