



# FNS - Cloud

Food Nutrition Security

## Total Diet Study training using the MCRA software

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Wageningen Research and Premotec



# FNS - Cloud

Food Nutrition Security

- Standardisation of TDS input data of three countries NL, DE and BE to ensure applicability in several countries
- Harmonized approach using codes and standard formats agreed by the European Food Safety Authority (EFSA) and EU Member States for food safety
- MCRA TDS Demonstrator available in the Azure cloud
- Training materials for users (community of practice)

# Content

Lecture 1: international interest in Total Diet Studies (TDS)

Lecture 2: risk assessment based on TDS data

Lecture 3: TDS applied in Belgium for training courses of students (community of practice)

Hands-on training: how MCRA is used in a harmonized TDS approach

# Lecture 1: international interest in Total Diet Studies



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# Content lecture 1

- What is a Total Diet Study?
- Why is it important at the international level?
- EU project TDS-exposure
- FNS-Cloud project



# EFSA – FAO – WHO guidance TDS



EFSA Journal 2011; 9(11):2450

## JOINT GUIDANCE OF EFSA, FAO AND WHO

### **Towards a harmonised Total Diet Study approach: a guidance document<sup>1</sup>**

**European Food Safety Authority (EFSA), Parma, Italy<sup>2,3</sup>**

**Food and Agriculture Organization of the United Nations (FAO), Rome, Italy**

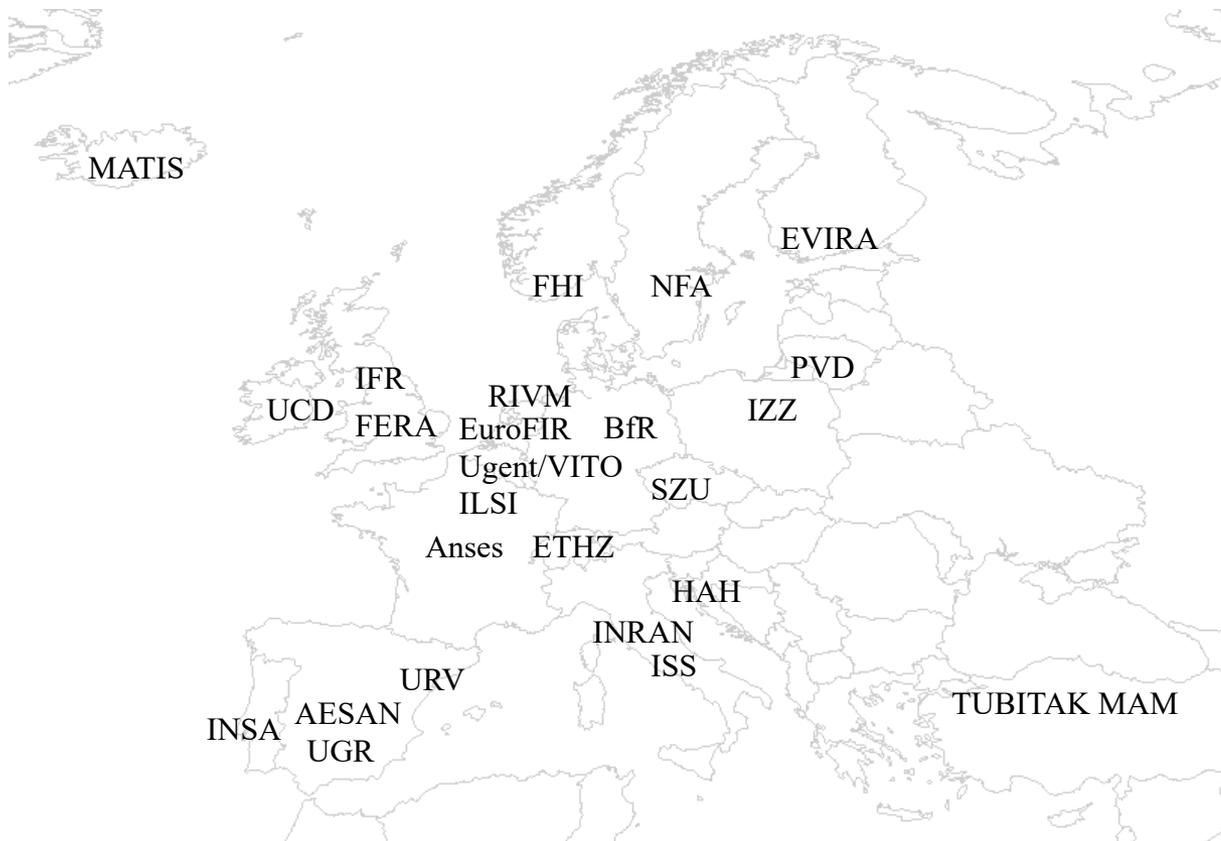
**World Health Organization (WHO), Geneva, Switzerland**

<https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/j.efsa.2011.2450>

# EU funded project TDS-exposure

- Collaborative 4–year research project
- Funded by European Commission within 7th Framework programme
- Conducted from 2012 – 2016
- Coordinator:
  - French Agency for Food, Environmental and Occupational Health & Safety (ANSES)
- <http://www.tds-exposure.eu/>

# Partners



- 26 beneficiaries

- 19 European countries: Belgium, Czech Republic, Finland, France, Germany, Ireland, Italy, Latvia, The Netherlands, Poland, Portugal, Spain, Sweden, UK, Croatia, Iceland, Turkey, Norway and Switzerland.

- Different structures:
  - 10 research centres
  - 6 food safety agencies
  - 5 universities
  - 4 national institutes for public health
  - 1 SME

# Features of TDS study



Concentrations of chemicals are analysed in **pooled homogenised food samples**:

- Average levels per sample → long-term exposure

Variation in concentrations between foods may not be fully covered

- Analysed as consumed

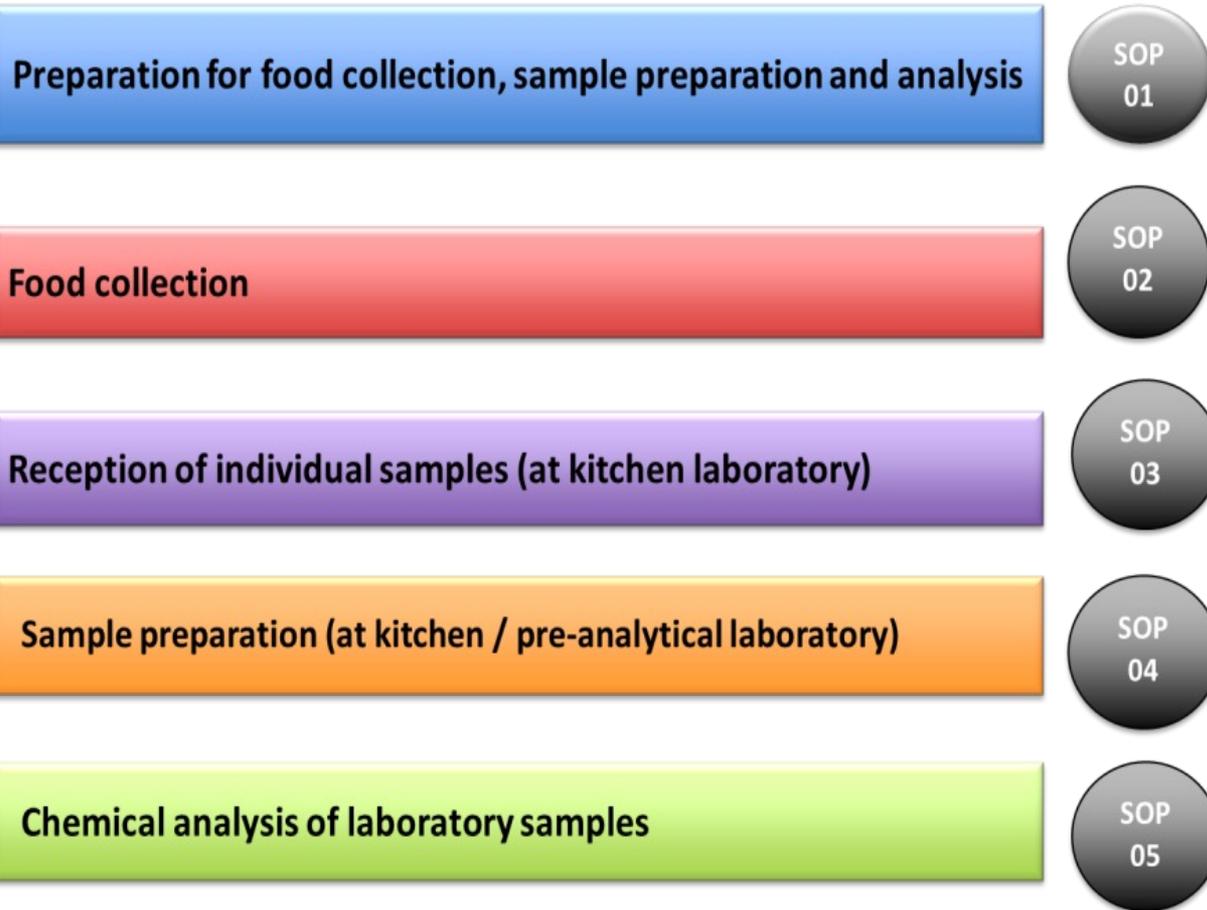
# Objective: harmonisation

## **Harmonization** of TDS method

1. Preparation of Standard Operating Procedures (**SOPs**) to assure quality and consistency of TDS
2. Testing feasibility of SOPs in practice via a **pilot study**
3. Use of the same exposure assessment software to assess the exposure to several contaminants



# Standard Operating Procedures



# Objective: harmonisation

## Harmonization of TDS method

1. Preparation of Standard Operating Procedures (SOPs) to assure quality and consistency of TDS
2. Testing feasibility of SOPs in practice via a pilot study
3. Use of the same **exposure assessment software**



# Exposure



## Food classification

- Mapping of food consumption data to analytical data obtained in TDS
- Use of FoodEx
  - International coding system, EFSA
  - Loss of detail compared to national codes
  - International standards data formats

# Total Diet Studies - 6th International Workshop in Berlin

Worldwide exchange on planning, implementation and experiences with TDS

The German Federal Institute for Risk Assessment (BfR) and the World Health Organization (WHO) hosted the "6th International

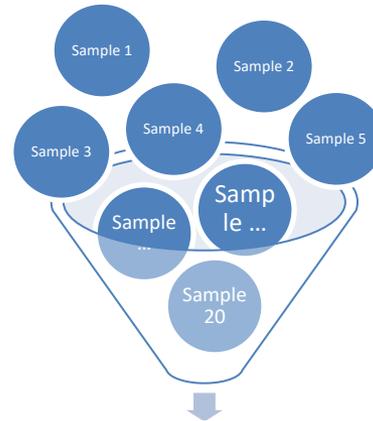
Workshop on Total Diet Studies (TDS)" on 10 and 11 October 2022.

At the conference, countries from all over the world presented results and latest developments in the field of TDS.

The event was preceded by a four-day online tutorial on planning and conducting these studies, organised by 20 representatives of countries, planning to conduct their own TDS in the future took part.



# Explanation and practical steps of a TDS



Step 1

Selection of foods



Step 2

Shopping on retail level



Step 3

Preparation and processing



Step 4

Pooling and homogenisation



Step 5

Analysis



Step 6

Evaluation and exposure assessment

Image rights BfR

# Lecture 2: risk assessment based on TDS data



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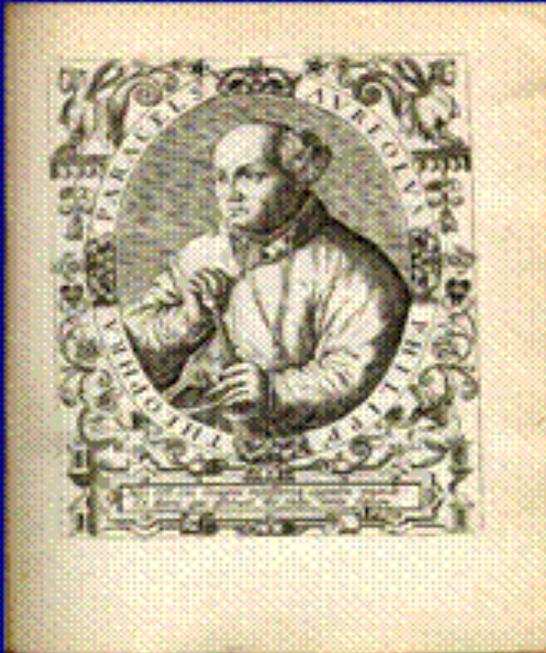
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## *Exposure is essential in risk assessment*



Phillip(pus Theophrastus Aureolus Bombastus) von Hohenheim (Paracelsus), 1493 - 1541  
Founder of toxicology

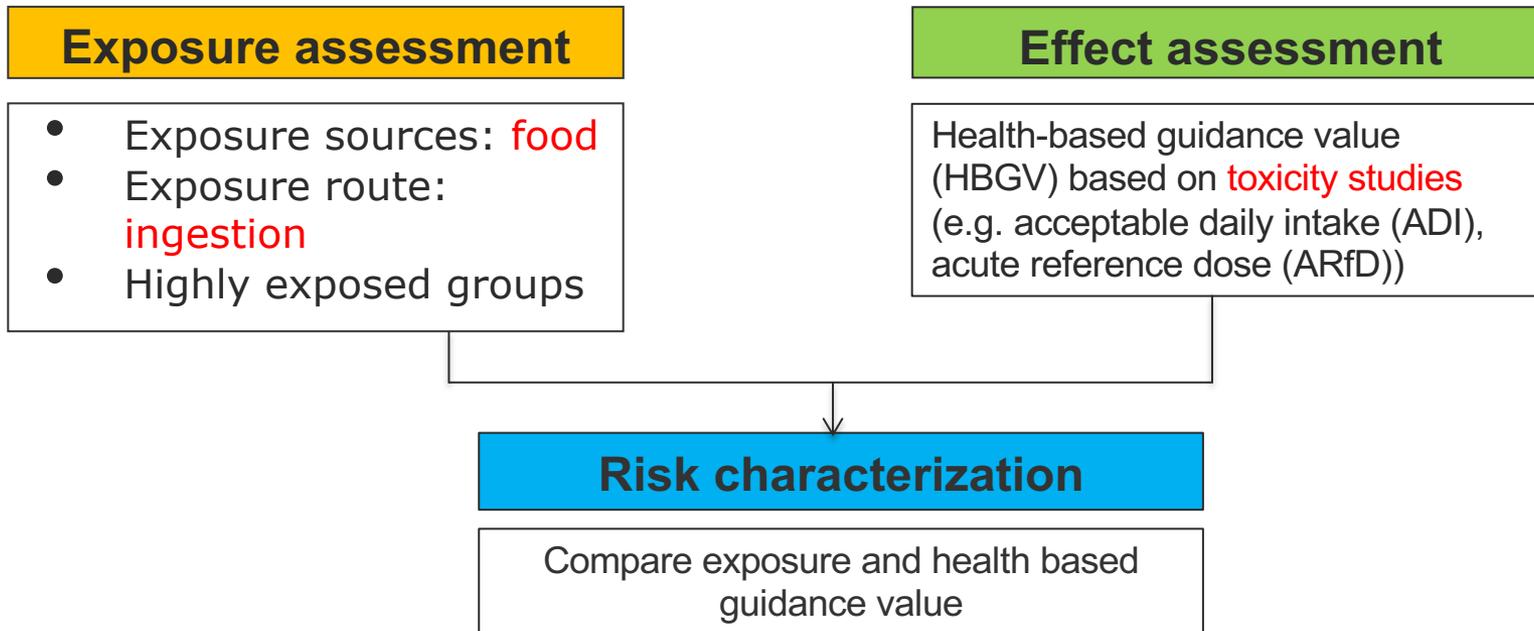
*"dosis sola facit venenum"*

*(the dose determines whether a substances is a poison)*

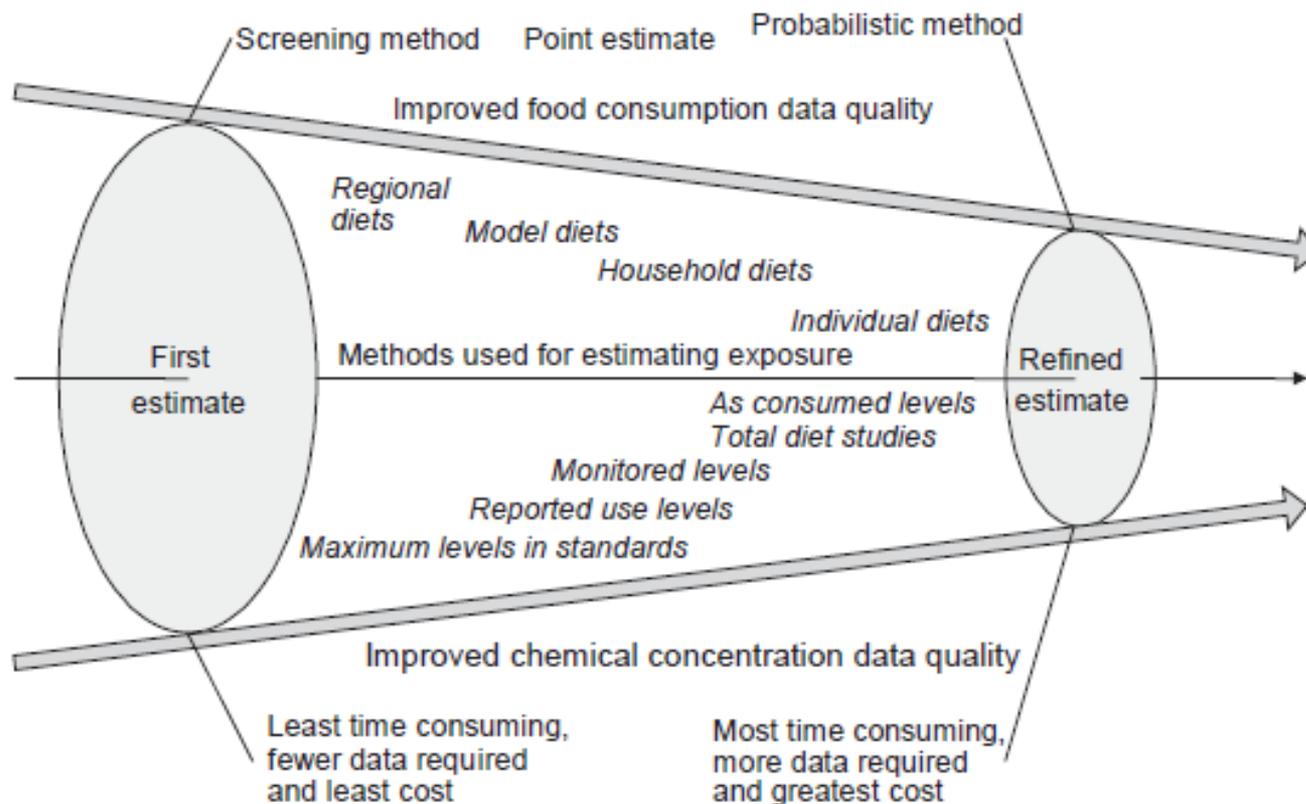
**"All things are poison and nothing is without poison, only the dose permits something not to be poisonous"**



# Risk assessment



# Stepwise (tiered) approach



# Which tier to use?

Tier to choose depends on:

- **Purpose** of the food safety assessment:
  - Realistic vs. screening
  - Refinement needed
- **Availability** of information
  - Data and models

*General: higher tier assessments may be used when lower tiers show a possible safety concern or your aim is a realistic exposure estimate*

# Dietary exposure assessment

$$\text{Dietary exposure} = \frac{\Sigma (\text{Concentration of chemical in food} \times \text{Food consumption})}{\text{Body weight (kg)}}$$



# Food consumption data

- National food consumption surveys
  - 2-7 days of food recalling (or recording)
  - EFSA comprehensive food consumption database (privacy sensitive data needs permission from data owner)
  - FAO/WHO Chronic individual food consumption database – Summary statistics (CIFOCoss)
  - FAO/WHO GIFT | Global Individual Food consumption data Tool
- Others
  - Food balance sheet data (GEMS/Food)
  - Household budget surveys
  - Food frequency information



# Individual data

- Body weight
  - Express exposure per kg body weight
  - Mean of a population
  - Body weight of an individual
- Age
  - Children vs adults
  - Women of child-bearing age
  - Elderly
- Other relevant variables:
  - Gender, socio-economic status, etc.



# Concentration data

- Monitoring data
  - EU directives to monitor for many chemicals
  - Ad hoc surveys
  - Initiatives from sector or retailers
  - EFSA Data lake data published on Zenodo
- Use levels for additives
  - From industry
- Data from Total Diet Studies (TDS)
  - Food as eaten
  - Representativeness depending on the sample size

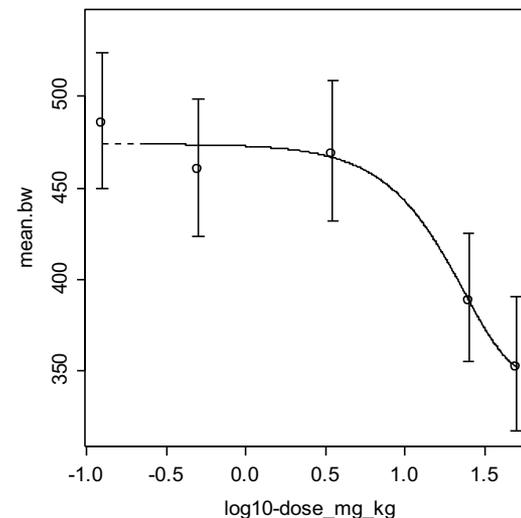


# Hazard characterisation

- Derived for adverse effects for which **no** intake level can be defined below which there is a negligible effect (NO(A)EL) as point of departure for risk assessment (PODI)

E.g. loss in IQ (lead), cancer (arsenic)

- Or PODI Intake level at which there is a **predefined x% change (e.g. 5%)** in an effect which is not deemed adverse:
  - Animal / epidemiological studies
  - Dose-response modelling



# Lecture 3. TDS applied in Belgium for understanding exposure to Nickel



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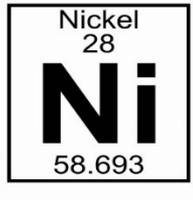


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## NICKEL ?

### Relevance of Nickel as potential food safety hazard ?

- A risk assessment of EFSA in 2015 stated that the occurrence of nickel in the diet is worrying for the general European population and for Ni-sensitive individuals (EFSA, 2015)



# Chemical food safety: substance: Single Hazard (Nickel)



Plant-based foods



Foods of animal origin



Drinks

# Data for Nickel study

- Nickel concentration in foods → investigation conducted at Ugent → Available in EFSA format (data owner)
- Belgian Food consumption data 2014 (BNFCS) → Sciensano → purchased by University of Gent for INNIBEL project and for FNS CLOUD project (no data owner)



# Food samples, sampling plan and analysis of the samples

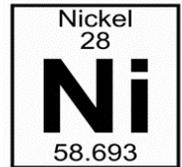
- Risk-based sampling plan

❖ In total 708 samples

❖ Three major food categories:

- Plant-based foods (N = 406)
- Foods of animal origin (N = 113)
- Drinks (N = 189)

- Microwave-assisted acid digestion, ICP-MS analysis



# Individual data (consumption)

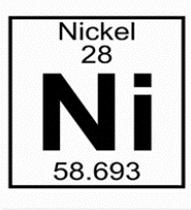
- Body weight
  - Express exposure per kg body weight
  - Body weight of an individual
- Age
  - Children, adolescents and adults



# Aggregated Dietary exposure assessment

$$\text{Dietary exposure} = \frac{\Sigma (\text{Concentration of chemical in food} \times \text{Food consumption})}{\text{Body weight (kg)}}$$





# Exposure assessment (method)

- Ni screening data (main focus on foods and drinks) → every food was analyzed separately
- Belgian food consumption data 2014
- Chronic exposure (two days consumers)
  - Pooling : Food category or Food type
  - Aggregated exposure assessment
  - Simple distribution approach



# Risk assessment

- Comparison of calculated exposure with TDI of 13  $\mu\text{g}/\text{kg}$  bw/day
- For children, adolescents and adults → no exceeding from the aforementioned reference value was observed.



# Hands-on training: how MCRA is used in a harmonized TDS approach



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# Learning goals

- Get familiar with MCRA
  - Create and run a standard action: TDS Belgium Nickel
  - Run a standard action: TDS Netherlands DON
  - Run a standard action: TDS Germany methylmercury
  - Understand seasonal and regional variation
  - Understand the output
  - Upload your own data
  - Documentation

# MCRA

- [mcr-training.rivm.nl](https://mcr-training.rivm.nl)
- MCRA training

# Opening page with short explanation

**NOTE:** This is the **temporary MCRA Training environment**. MCRA is available at <https://mcra.rivm.nl>



## Welcome to MCRA Training

Chemical exposure, hazard and risk assessment

On a daily basis, people are exposed to multiple chemicals via food intake, inhalation and dermal contact. The risk to human health resulting from this exposure depends on the effects of the different chemicals in the mixture and how they combine. MCRA stands for **Monte Carlo Risk Assessment**. It is a web-based platform containing various models that users can use to assess these health risks for specific populations in various scenarios.

In MCRA, more than 50 **modules** are available to address all major areas of risk assessment, including hazard identification, hazard characterisation, exposure assessment and risk assessment. MCRA contains models following the guidelines and regulatory methodologies of the European Commission and the European Food Safety Authority (EFSA). Besides this, it also includes novel scientific models that could improve or refine future risk assessment.

MCRA was and is being developed in multiple projects, including national funded projects, **partnership between EFSA, RIVM (2015-2025)** and EU projects **ACROPOLIS (2010-2013)**, **EuroMix (2015-2019)**, **FNS Cloud (2019-2023)**, and **PARC (2022-2029)**.



MCRA documentation



Publications and reports using MCRA

## MCRA account

Use of the MCRA web-platform requires an active account. An account can be requested by filling in the registration form.



Register for an account

Do you already have an account? [Log in here.](#)

# Login

## Log in

 Username \*

---

 Password \*

---

Login

[Forgot password](#)   [Create an account](#)

# Create workspace (1)

- Select workspaces

## Using MCRA

You can specify your models, such as a dietary exposure assessment, within **actions** that are organised in **workspaces**. Each action is of a **module type** and contains selected data and settings. After specifying data and settings, the modelling task can be started. The output report contains concise sections of main results and detailed drilldown information.

The data used in the actions is organised in the **data repository**. Users have their own private data repository for uploading data. In addition, shared repository folders are available used for sharing data among user groups.

For more information on using MCRA consult the [documentation pages](#).

 Workspaces

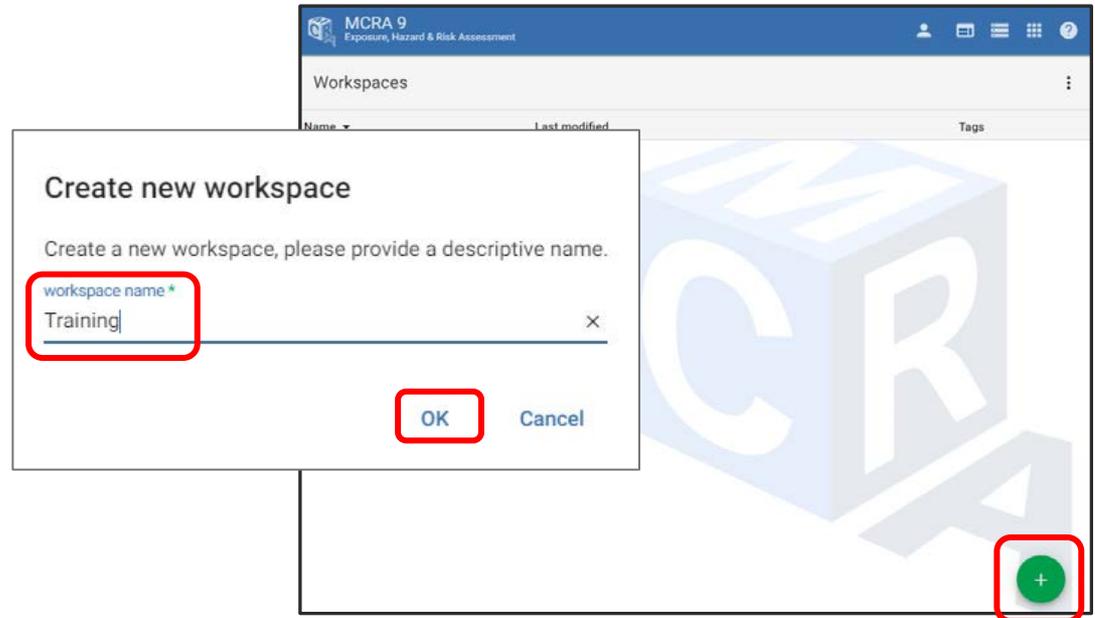
 Data

Contact: MCRA Support, National Institute for Public Health and the Environment (RIVM).

MCRA is developed by Wageningen University & Research, Biometris for RIVM and EFSA (2007 - 2023)

# Create workspace (2)

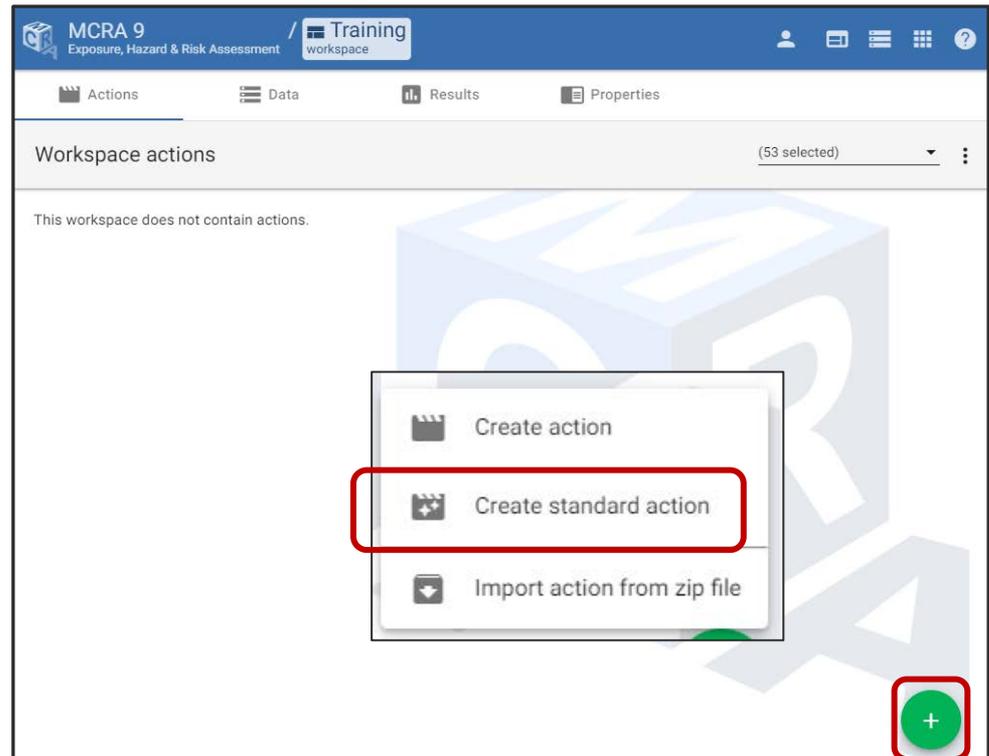
- Create workspace by clicking 
- Give the workspace a name and click on 'OK'



# Create standard action (1)

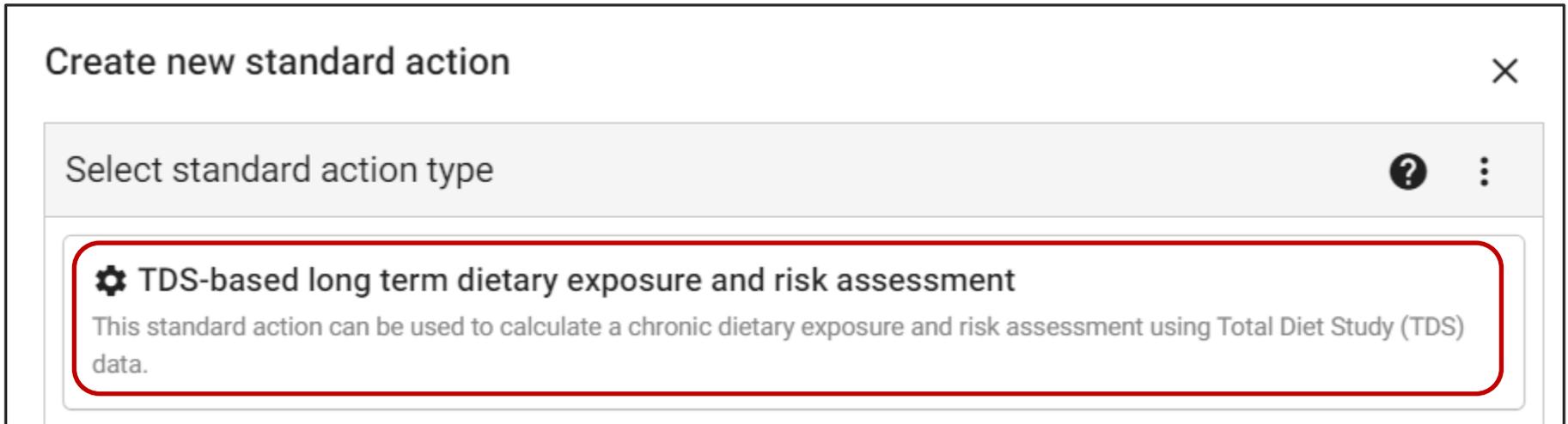
Create a standard action by clicking 

Select create standard action



# Create standard action (2)

Select 'TDS-based long term dietary exposure and risk assessment'



Create new standard action

Select standard action type

**TDS-based long term dietary exposure and risk assessment**  
This standard action can be used to calculate a chronic dietary exposure and risk assessment using Total Diet Study (TDS) data.

# Create standard action (3)

Select 'Create'

### Create new standard action ×

Specify name/description

**General**

Name  
TDS-based long term dietary exposure and risk assessment

Tags

Description

Back **Create**

# Inspect settings

- Select TDS Nickel BE Population 2014
- Press **Save Changes**

**TDS-based long term dietary exposure and risk assessment**

This standard action can be used to calculate a chronic dietary exposure and risk assessment using Total Diet Study (TDS) data.

[Go to documentation](#)

---

**Assessment settings**

Total diet study

TDS Nickel BE Population 2014

TDS DON NL Children 2016

TDS demo MeHg DE Children 2001-2002

**TDS Nickel BE Population 2014**

AgeGroup

General population

Restrict population to consumers only

Censored value handling method

**By zero (lower bound)**

By zero (lower bound)

By limit of reporting (upper bound)

Uncertainty analysis

**No uncertainty analysis**

Uncertainty analysis: 10 bootstrap cycles of 10.000 Monte Carlo iterations (for testing / demo)

Uncertainty analysis: 100 bootstrap cycles of 100.000 Monte Carlo iterations

**Save Changes**

# Navigation pane exercise

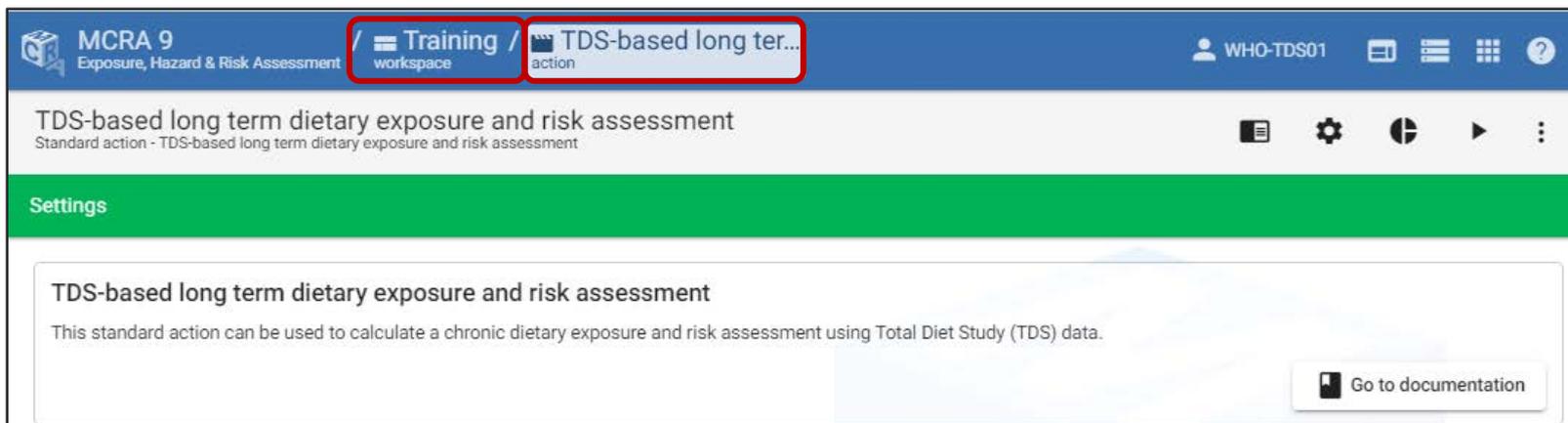
- Go to 'Settings'
- Go to 'Results'
- Run an action



The screenshot shows the FNS-Cloud interface. At the top, there is a blue header with the MCRA 9 logo and text 'Exposure, Hazard & Risk Assessment', a breadcrumb trail '/ Training / workspace / TDS-based long ter... / action', and a user profile 'WHO-TDS01'. Below the header, the main content area is titled 'TDS-based long term dietary exposure and risk assessment' with a subtitle 'Standard action - TDS-based long term dietary exposure and risk assessment'. A green bar labeled 'Settings' is visible. The main content area contains a description of the standard action and a 'Go to documentation' button. Below this, there is an 'Assessment settings' section with a 'Save Changes' button and a dropdown menu showing 'Total diet study' and 'TDS DON NL Children 2016'. The navigation pane on the right side of the interface has three icons highlighted with red boxes: a gear icon (Settings), a gauge icon (Results), and a play button icon (Run an action).

# Navigation pane exercise

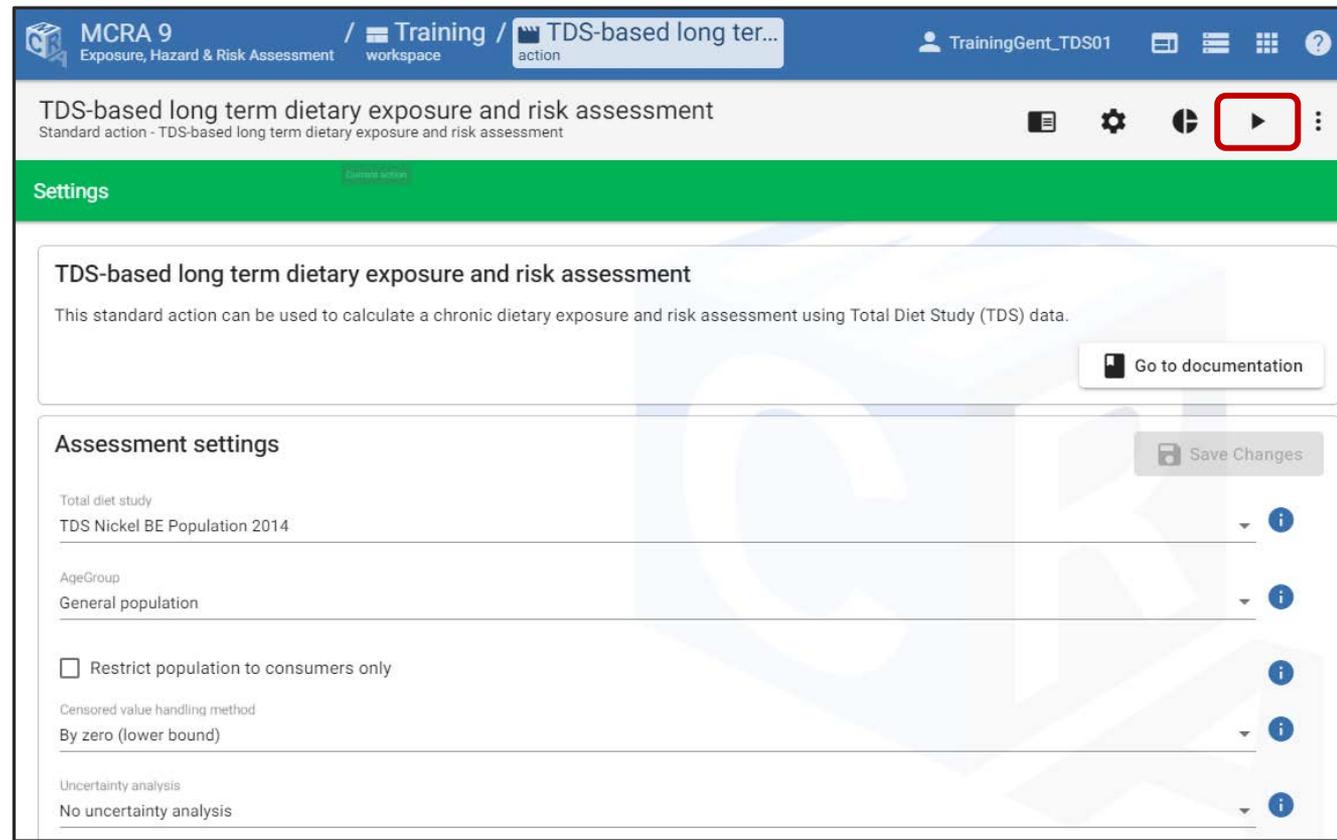
- Go to 'action'
- Go to 'Workspace'
- Go to action again



The screenshot displays the FNS-Cloud interface. At the top left, the logo for MCRA 9 (Exposure, Hazard & Risk Assessment) is visible. The navigation pane on the left shows two items: 'Training / workspace' and 'TDS-based long ter... / action', both highlighted with red boxes. The main content area shows the title 'TDS-based long term dietary exposure and risk assessment' and a description: 'Standard action - TDS-based long term dietary exposure and risk assessment'. Below this is a green 'Settings' bar. The main content area also contains a 'Go to documentation' button.

# Press run

Press run 



The screenshot displays the FNS-Cloud interface for a specific action. The top navigation bar includes the MCRA 9 logo, the current workspace 'Training', and the action name 'TDS-based long term dietary exposure and risk assessment'. A user profile 'TrainingGent\_TDS01' is visible in the top right. Below the navigation bar, the title of the action is shown, along with a 'Go to documentation' button. The main section is titled 'Settings' and contains the following configuration options:

- TDS-based long term dietary exposure and risk assessment**  
This standard action can be used to calculate a chronic dietary exposure and risk assessment using Total Diet Study (TDS) data. [Go to documentation](#)
- Assessment settings** [Save Changes](#)
- Total diet study: TDS Nickel BE Population 2014
- AgeGroup: General population
- Restrict population to consumers only
- Censored value handling method: By zero (lower bound)
- Uncertainty analysis: No uncertainty analysis

# Wait for completion and open the report

Wait until the job has finished · [Ran to completion](#)

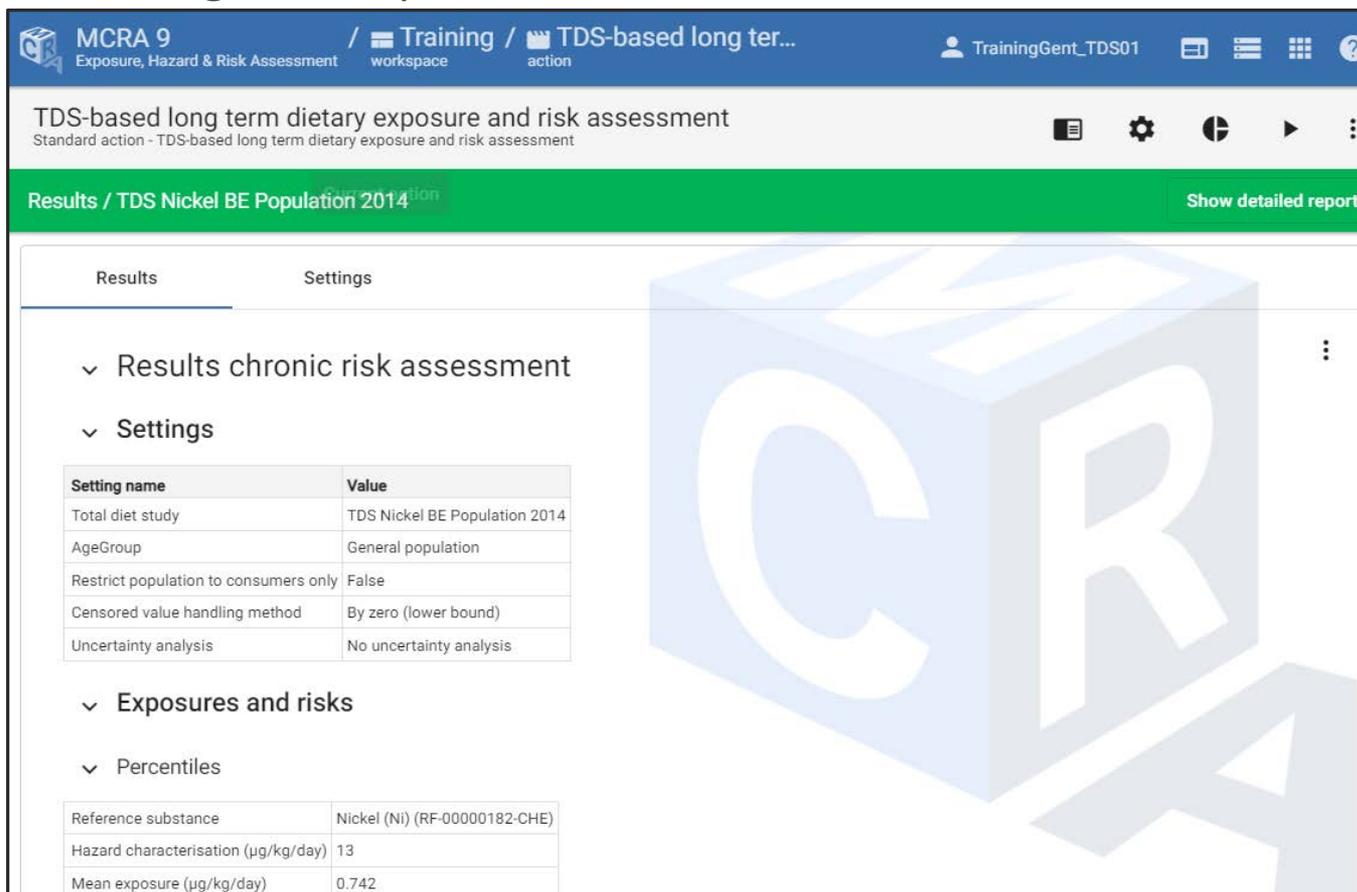
Open report by clicking on the name of the output

The screenshot shows the MCRA 9 software interface. The top navigation bar includes 'MCRA 9 Exposure, Hazard & Risk Assessment', 'Training workspace', and 'TDS-based long ter... action'. The user is logged in as 'TrainingGent\_TDS01'. The main title is 'TDS-based long term dietary exposure and risk assessment'. Below this, a green bar indicates 'Results'. A table lists the results, with one entry highlighted by a red box:

Output	Status	Message	Date	Running time
<input type="checkbox"/> TDS Nickel BE Population 2014	<a href="#">Ran to completion</a>		06-03-2023 16:04	00:00:06

# Browse through the report

- Browse through the report



The screenshot displays the MCRA 9 web interface. The top navigation bar includes the MCRA 9 logo, the text 'Exposure, Hazard & Risk Assessment', and a breadcrumb trail: 'Training / workspace / TDS-based long ter...'. The user is identified as 'TrainingGent\_TDS01'. The main title of the report is 'TDS-based long term dietary exposure and risk assessment', with a subtitle 'Standard action - TDS-based long term dietary exposure and risk assessment'. A green banner below the title reads 'Results / TDS Nickel BE Population 2014' and includes a 'Show detailed report' button. The main content area is divided into 'Results' and 'Settings' tabs. Under the 'Results' tab, there are expandable sections for 'Results chronic risk assessment', 'Settings', 'Exposures and risks', and 'Percentiles'. The 'Settings' section contains a table with the following data:

Setting name	Value
Total diet study	TDS Nickel BE Population 2014
AgeGroup	General population
Restrict population to consumers only	False
Censored value handling method	By zero (lower bound)
Uncertainty analysis	No uncertainty analysis

The 'Exposures and risks' section contains another table:

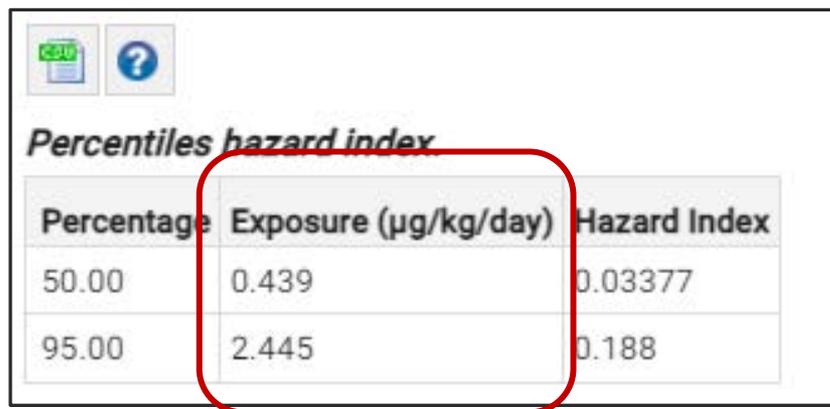
Reference substance	Nickel (Ni) (RF-00000182-CHE)
Hazard characterisation (µg/kg/day)	13
Mean exposure (µg/kg/day)	0.742

A large, semi-transparent 'MCRA' logo is overlaid on the right side of the interface.

# Exercise E1

- Report the exposure at the 50- and 95-percentile.
- Which foods are contributing most to the dietary exposure?

# Exposure at p50- and p95



**Percentiles hazard index**

Percentage	Exposure ( $\mu\text{g}/\text{kg}/\text{day}$ )	Hazard Index
50.00	0.439	0.03377
95.00	2.445	0.188

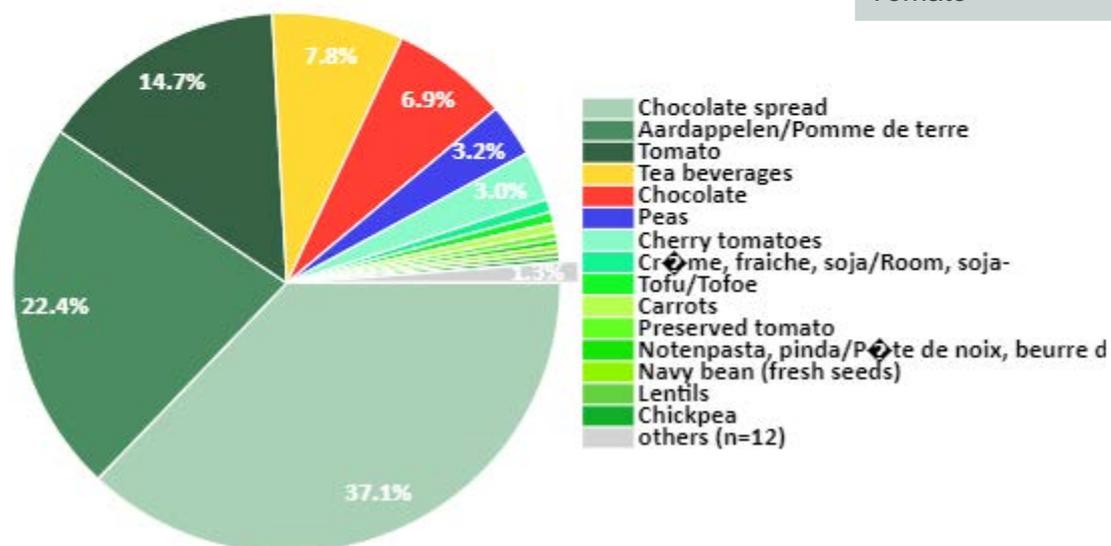
# Foods contributing the most

## Exposures by modelled food (total distribution)

Total 37 modelled foods.

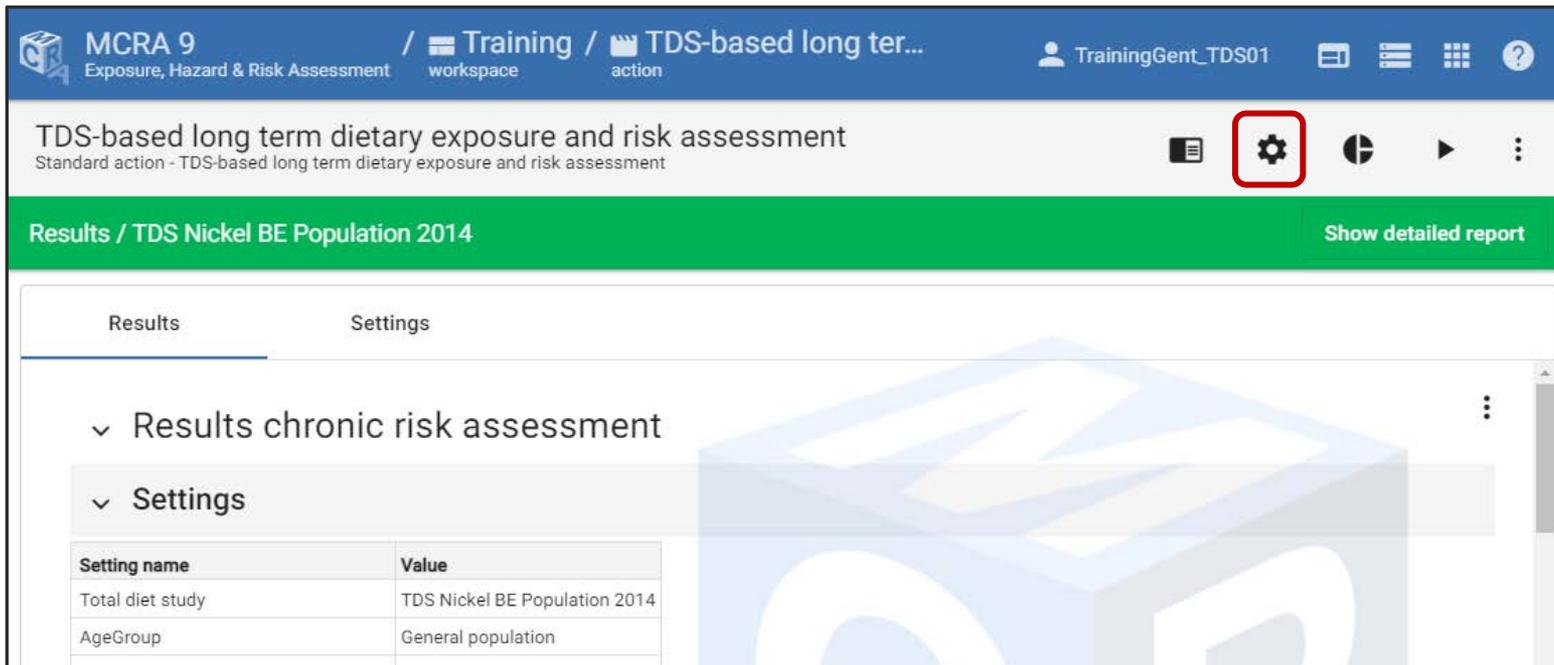
*Contribution to total exposure distribution for modelled foods.*

Food	Contribution (%)
Chocolate spread	37.1
Aardappelen/pomme de terre	22.4
Tomato	14.7



# TDS Netherlands

- Go to Settings 



The screenshot displays the MCRA 9 software interface. The top navigation bar includes 'MCRA 9 Exposure, Hazard & Risk Assessment', 'Training / workspace', and 'TDS-based long ter... action'. The user is logged in as 'TrainingGent\_TDS01'. The main title is 'TDS-based long term dietary exposure and risk assessment' with a subtitle 'Standard action - TDS-based long term dietary exposure and risk assessment'. A red box highlights the settings gear icon in the top right. Below this is a green bar with 'Results / TDS Nickel BE Population 2014' and a 'Show detailed report' button. The 'Settings' tab is active, showing a table of settings.

Setting name	Value
Total diet study	TDS Nickel BE Population 2014
AgeGroup	General population

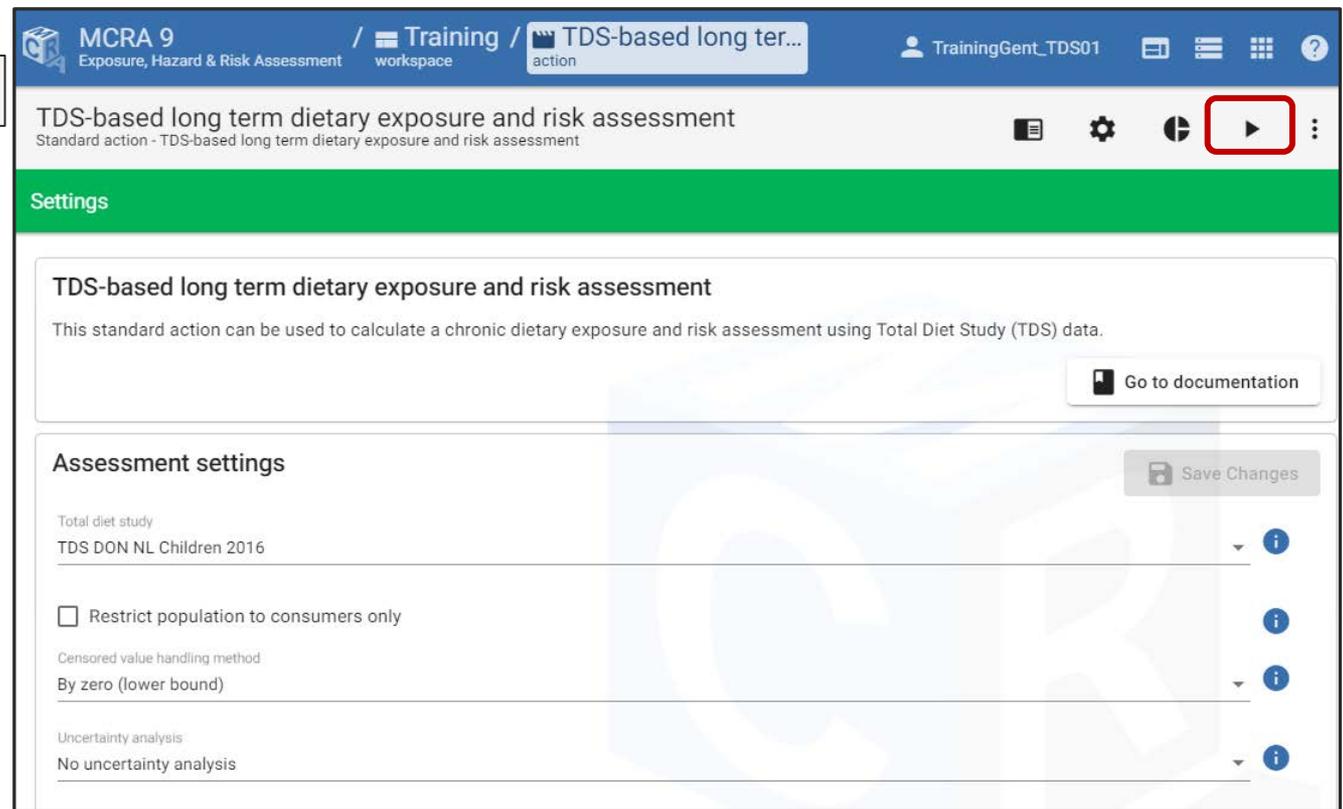
# Inspect settings

- Select TDS DON NL Children 2016
- Press **Save Changes**

The screenshot shows the MCRA 9 software interface. The top navigation bar includes 'MCRA 9 Exposure, Hazard & Risk Assessment', 'Training workspace', and 'TDS-based long ter... action'. The user is logged in as 'TrainingGent\_TDS01'. The main content area is titled 'TDS-based long term dietary exposure and risk assessment' and includes a 'Settings' section. Under 'Assessment settings', the 'Total diet study' is set to 'TDS DON NL Children 2016'. A dropdown menu is open, showing three options: 'TDS DON NL Children 2016' (highlighted with a red box), 'TDS demo MeHg DE Children 2001-2002', and 'TDS Nickel BE Population 2014'. A red box also highlights the 'Save Changes' button in the top right corner of the settings area.

# Press run

Press run 



The screenshot shows the FNS-Cloud interface for the 'TDS-based long term dietary exposure and risk assessment' action. The top navigation bar includes 'MCRA 9 Exposure, Hazard & Risk Assessment', 'Training / workspace', and 'TDS-based long ter... action'. The user is logged in as 'TrainingGent\_TDS01'. The main content area is titled 'Settings' and contains the following information:

- TDS-based long term dietary exposure and risk assessment**  
This standard action can be used to calculate a chronic dietary exposure and risk assessment using Total Diet Study (TDS) data.  
[Go to documentation](#)
- Assessment settings**  
[Save Changes](#)
- Total diet study: TDS DON NL Children 2016
- Restrict population to consumers only
- Censored value handling method: By zero (lower bound)
- Uncertainty analysis: No uncertainty analysis

# Wait for completion and open the report

Wait until the job has finished →

Ran to completion

Open report by clicking on the name of the output

The screenshot shows the MCRA 9 software interface. The top navigation bar includes 'MCRA 9 Exposure, Hazard & Risk Assessment', 'Training / workspace', 'TDS-based long ter... action', and a user profile 'TrainingGent\_TDS01'. The main title is 'TDS-based long term dietary exposure and risk assessment'. Below this is a green bar labeled 'Results' with 'Current action' in light green. The main content area is titled 'Results' and contains a table with columns: Output, Status, Message, Date, and Running time. The table has two rows: 'TDS Nickel BE Population 2014' and 'TDS DON NL Children 2016'. The 'TDS DON NL Children 2016' row is highlighted with a red box. The 'Status' column for both rows contains a blue button labeled 'Ran to completion'.

Output	Status	Message	Date	Running time
<input type="checkbox"/> TDS Nickel BE Population 2014	Ran to completion		06-03-2023 16:04	00:00:06
<input type="checkbox"/> TDS DON NL Children 2016	Ran to completion		07-03-2023 10:27	00:00:07

# Browse through the report

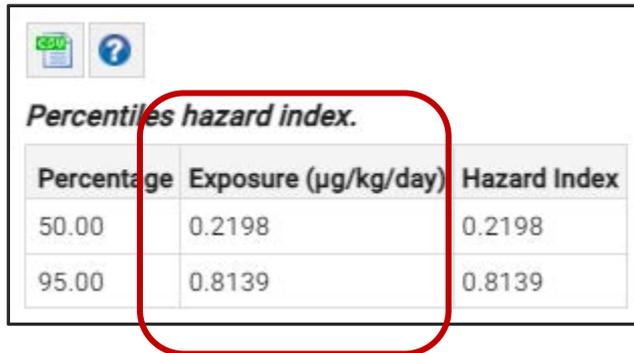
The screenshot displays the FNS-Cloud web interface. The top navigation bar includes the MCRA 9 logo, the text 'Exposure, Hazard & Risk Assessment', and a breadcrumb trail: '/ Training / workspace / TDS-based long ter... action'. The user is identified as 'TrainingGent\_TDS01'. The main header shows the report title 'TDS-based long term dietary exposure and risk assessment' and a sub-header 'Standard action - TDS-based long term dietary exposure and risk assessment'. Below this, a green bar indicates the current action: 'Results / TDS DON NL Children 2016', with a 'Show detailed report' button. The main content area has two tabs: 'Results' (selected) and 'Settings'. Under 'Results', there are expandable sections for 'Results chronic risk assessment' and 'Settings'. The 'Settings' section contains a table with the following data:

Setting name	Value
Total diet study	TDS DON NL Children 2016
Restrict population to consumers only	False
Censored value handling method	By zero (lower bound)

# Exercise E2

- Report the exposure at the 50- and 95-percentile.
- Which foods are contributing most to the dietary exposure at main level?
- Which foods are contributing most to the dietary exposure at level 1?

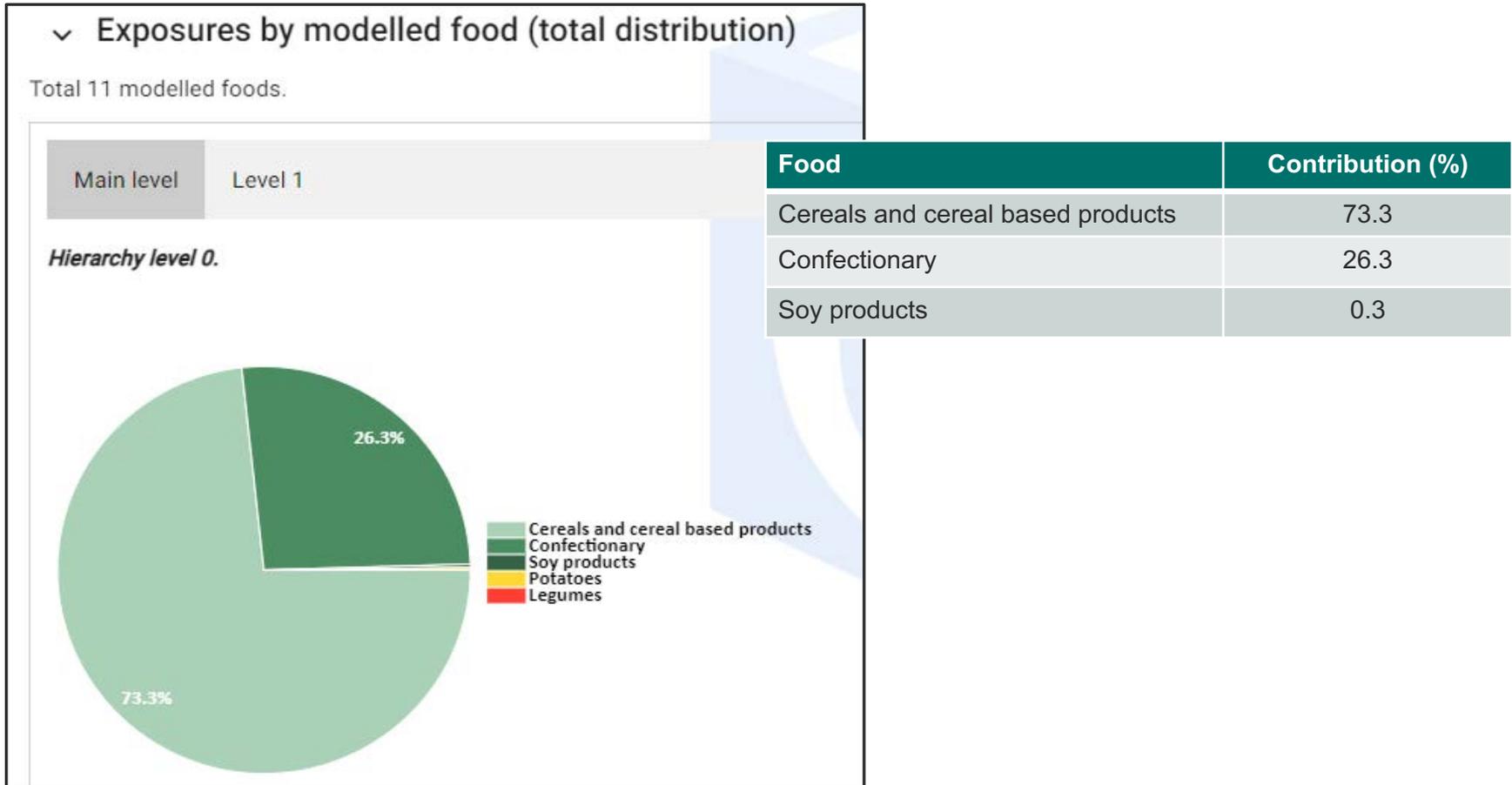
# Exposure at p50- and p95



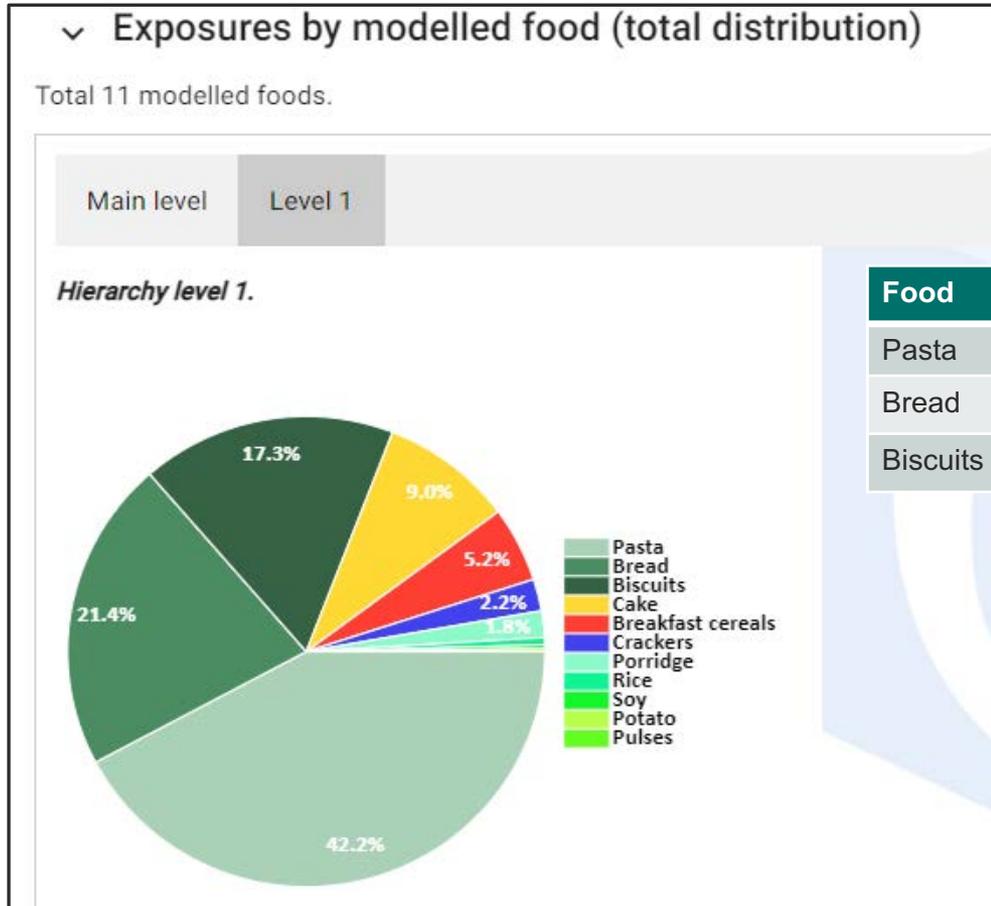
**Percentiles hazard index.**

Percentage	Exposure (µg/kg/day)	Hazard Index
50.00	0.2198	0.2198
95.00	0.8139	0.8139

# Foods contributing the most at main level



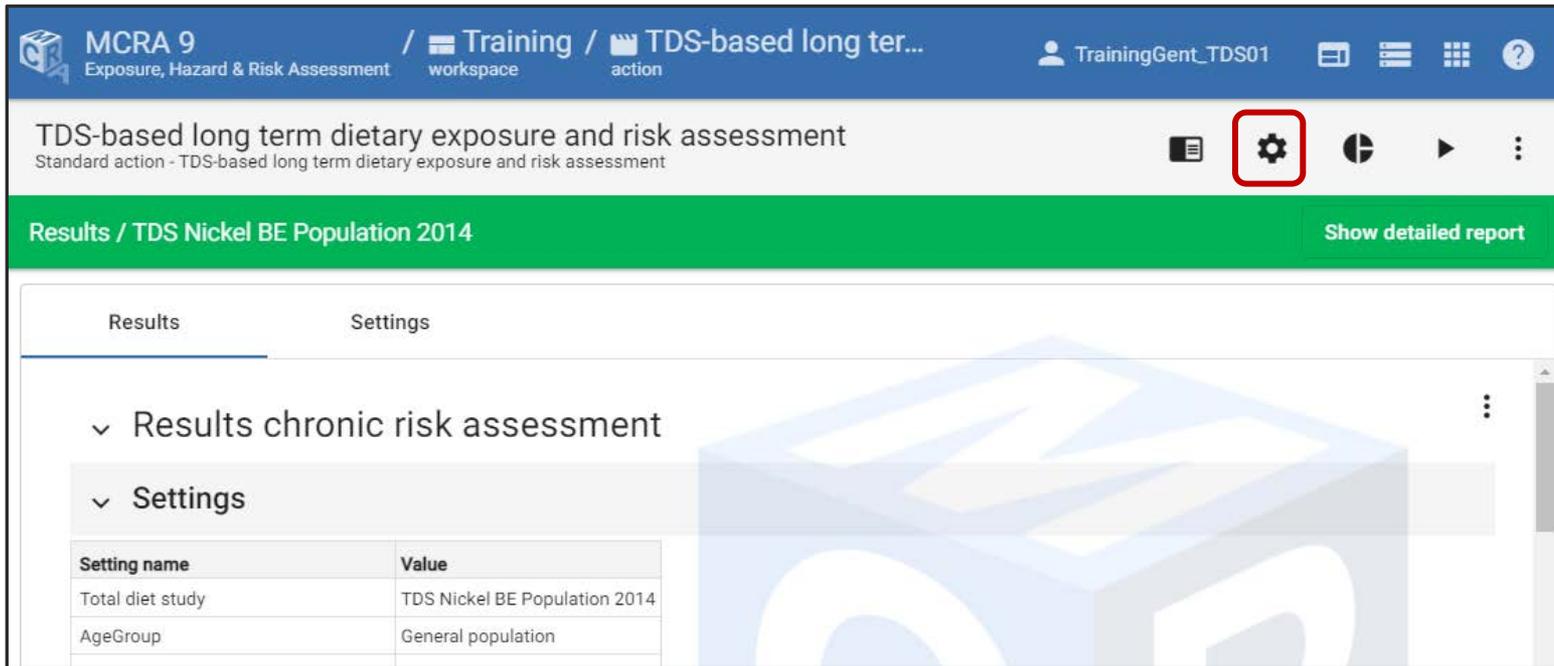
# Foods contributing the most at level 1



Food	Contribution (%)
Pasta	42.2
Bread	21.4
Biscuits	17.3

# TDS Germany seasonal and regional

- Go to Settings 



The screenshot shows the MCRA 9 software interface. The top navigation bar includes 'MCRA 9 Exposure, Hazard & Risk Assessment', 'Training / workspace', and 'TDS-based long ter... action'. The user is logged in as 'TrainingGent\_TDS01'. The main title is 'TDS-based long term dietary exposure and risk assessment' with a subtitle 'Standard action - TDS-based long term dietary exposure and risk assessment'. A red box highlights the settings gear icon in the top right. Below this is a green bar with 'Results / TDS Nickel BE Population 2014' and a 'Show detailed report' button. The 'Settings' tab is active, showing a table of settings for 'Results chronic risk assessment'.

Setting name	Value
Total diet study	TDS Nickel BE Population 2014
AgeGroup	General population

# Inspect settings

- Select TDS demo MeHg Children 2021-2002
- Select Region North and Season Summer
- Press **Save Changes**

**Settings**

**TDS-based long term dietary exposure and risk assessment**  
This standard action can be used to calculate a chronic dietary exposure and risk assessment using Total Diet Study (TDS) data.

**Assessment settings**

Total diet study\*  
TDS demo MeHg DE Children 2001-2002

Region  
North

Season\*  
Summer

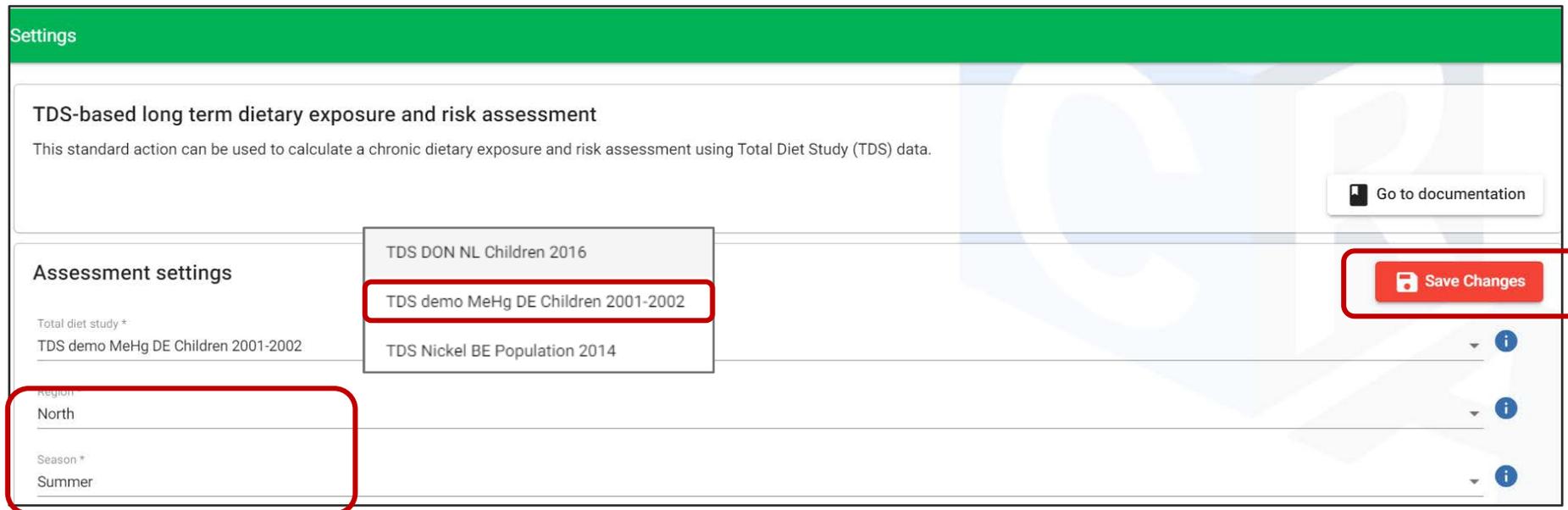
TDS DON NL Children 2016

**TDS demo MeHg DE Children 2001-2002**

TDS Nickel BE Population 2014

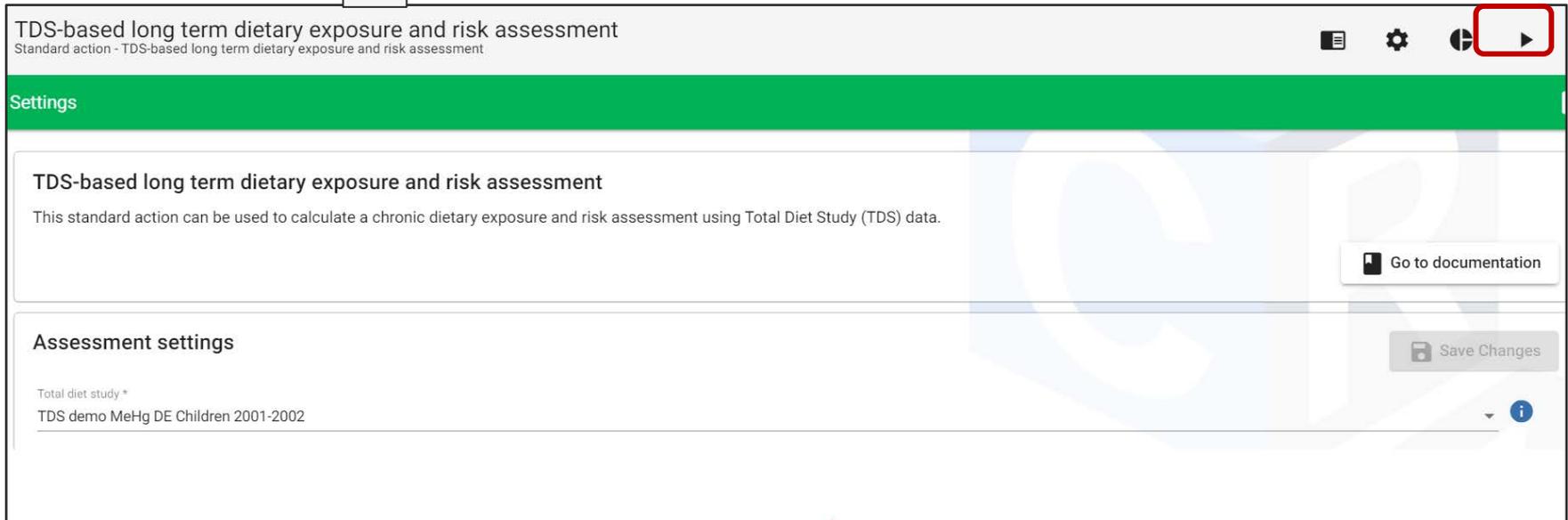
Go to documentation

**Save Changes**



# Press run

Press run 



The screenshot shows the FNS-Cloud interface for the 'TDS-based long term dietary exposure and risk assessment' standard action. The interface includes a header with the title and a sub-header, a settings bar, and a main content area with a description and assessment settings. A red box highlights the 'Press run' button in the top right corner of the interface.

TDS-based long term dietary exposure and risk assessment  
Standard action - TDS-based long term dietary exposure and risk assessment

Settings

**TDS-based long term dietary exposure and risk assessment**  
This standard action can be used to calculate a chronic dietary exposure and risk assessment using Total Diet Study (TDS) data.

**Assessment settings**

Total diet study \*  
TDS demo MeHg DE Children 2001-2002

Go to documentation

Save Changes

# Wait for completion and open the report

Wait until the job has finished →

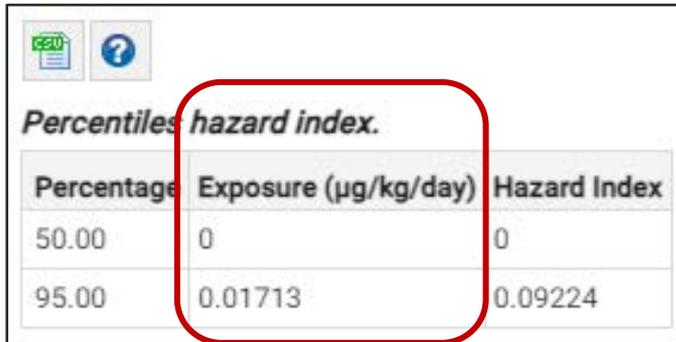
**Ran to completion**

Open report by clicking on the name of the output

The screenshot shows the MCRA software interface. The top navigation bar includes the MCRA logo and the text 'Exposure, Hazard & Risk Assessment'. The current workspace is 'TDS voorbeeld' and the action is 'TDS-based long ter...'. The user is 'donkersgoed'. The main title is 'TDS-based long term dietary exposure and risk assessment'. Below this is a green 'Results' header. The main content area shows a table of results with a search filter 'Type filter text here'. The table has the following data:

Output	Status	Message	Date	Running time
<input type="checkbox"/> TDS Nickel BE Population 2014	<b>Ran to completion</b>		12-09-2023 12:03	00:00:09
<input type="checkbox"/> TDS DON NL Children 2016	<b>Ran to completion</b>		12-09-2023 12:14	00:00:06
<input type="checkbox"/> <b>TDS demo MeHg DE Children 2001-2002 (Conventional - North - Summer)</b>	<b>Ran to completion</b>		12-09-2023 12:22	00:00:03

# Exposure at p50- and p95

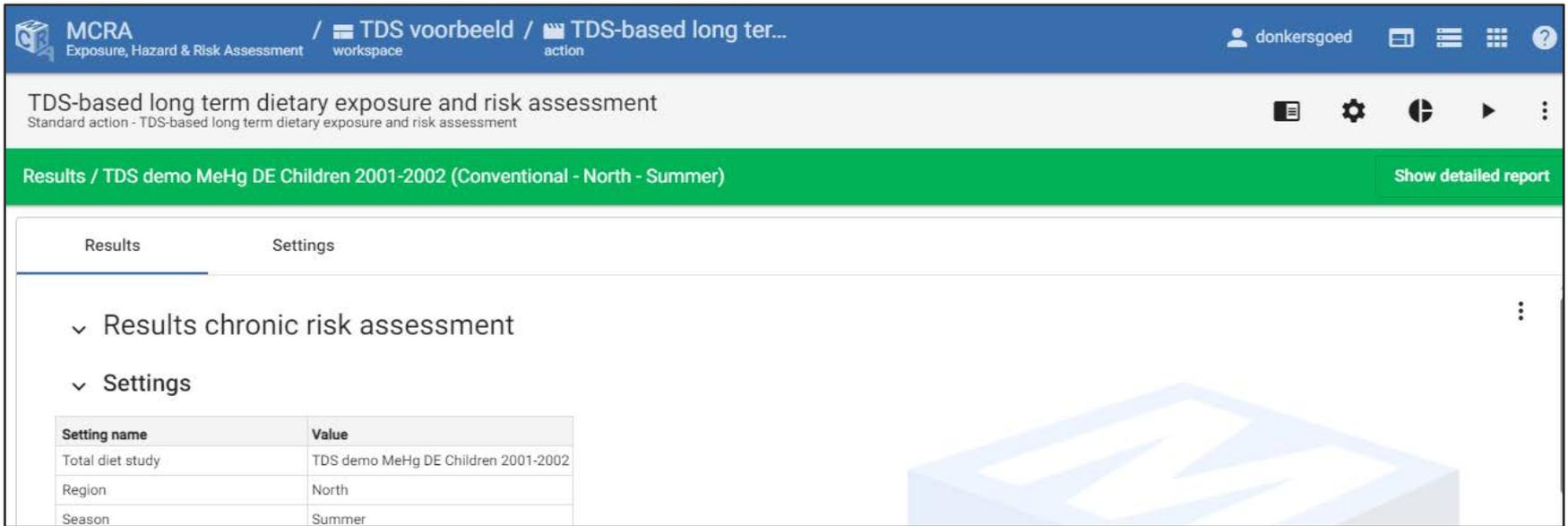


*Percentiles hazard index.*

Percentage	Exposure ( $\mu\text{g}/\text{kg}/\text{day}$ )	Hazard Index
50.00	0	0
95.00	0.01713	0.09224

# TDS Germany seasonal and regional

- Go to Settings 



The screenshot displays the MCRA (Exposure, Hazard & Risk Assessment) software interface. The top navigation bar includes the MCRA logo, the current workspace 'TDS voorbeeld', and the action 'TDS-based long ter...'. The user 'donkersgoed' is logged in. The main title is 'TDS-based long term dietary exposure and risk assessment', with a subtitle 'Standard action - TDS-based long term dietary exposure and risk assessment'. Below this, a green bar indicates the current results: 'Results / TDS demo MeHg DE Children 2001-2002 (Conventional - North - Summer)', with a 'Show detailed report' button. The interface has two tabs: 'Results' and 'Settings', with 'Settings' selected. Under 'Settings', there are two expandable sections: 'Results chronic risk assessment' and 'Settings'. The 'Settings' section contains a table with the following data:

Setting name	Value
Total diet study	TDS demo MeHg DE Children 2001-2002
Region	North
Season	Summer

# Inspect settings

- Select TDS demo MeHg Children 2001-2002
- Select Region South and Season Winter
- Press **Save Changes**

**Settings**

### TDS-based long term dietary exposure and risk assessment

This standard action can be used to calculate a chronic dietary exposure and risk assessment using Total Diet Study (TDS) data.

[Go to documentation](#)

#### Assessment settings

Total diet study *	TDS DON NL Children 2016
TDS demo MeHg DE Children 2001-2002	<b>TDS demo MeHg DE Children 2001-2002</b>
	TDS Nickel BE Population 2014

Region \*

**South**

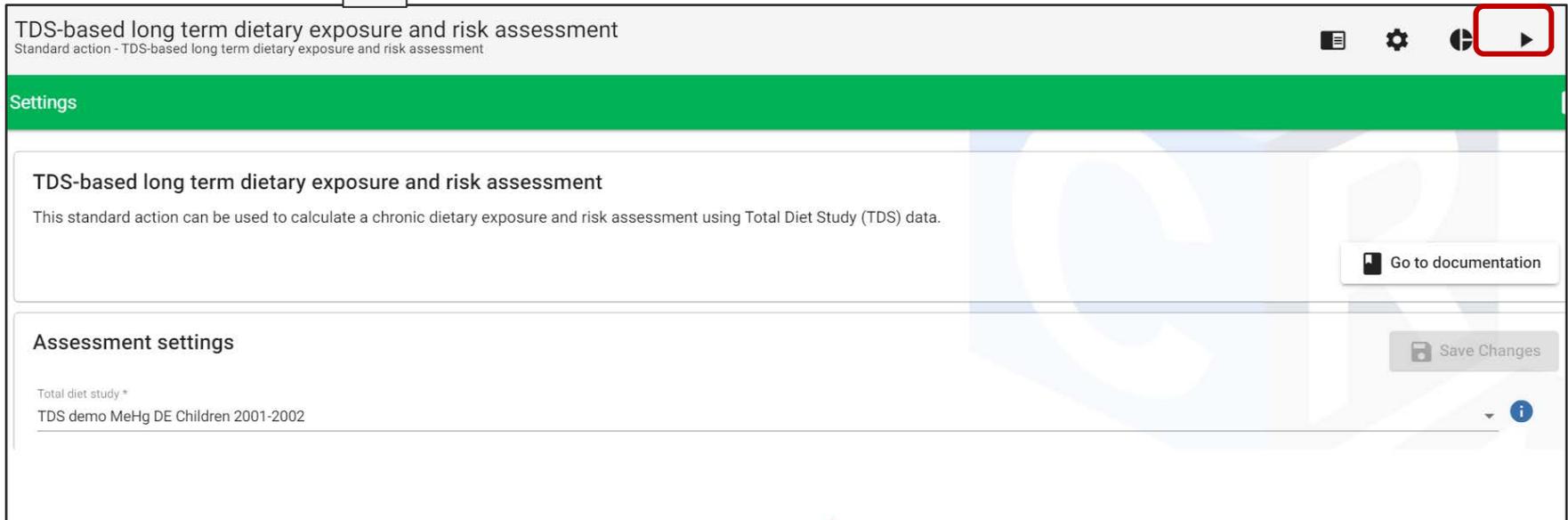
Season \*

**Winter**

**Save Changes**

# Press run

Press run 



The screenshot shows the FNS-Cloud interface for the 'TDS-based long term dietary exposure and risk assessment' standard action. The interface includes a header with the title and a sub-header, a settings bar, and a main content area with a description and assessment settings. A red box highlights the 'Press run' button in the top right corner of the interface.

TDS-based long term dietary exposure and risk assessment  
Standard action - TDS-based long term dietary exposure and risk assessment

Settings

**TDS-based long term dietary exposure and risk assessment**  
This standard action can be used to calculate a chronic dietary exposure and risk assessment using Total Diet Study (TDS) data.

[Go to documentation](#)

**Assessment settings**

Total diet study \*  
TDS demo MeHg DE Children 2001-2002

[Save Changes](#)

# Wait for completion and open the report

Wait until the job has finished →

**Ran to completion**

Open report by clicking on the name of the output

Results

Results 🔍 Type filter text here ⋮

<input type="checkbox"/> Output	Status	Message	Date	Running time	⋮
<input type="checkbox"/> TDS Nickel BE Population 2014	<b>Ran to completion</b>		09-09-2023 08:05	00:00:08	⋮
<input type="checkbox"/> TDS DON NL Children 2016	<b>Ran to completion</b>		11-09-2023 20:17	00:00:08	⋮
<input type="checkbox"/> TDS demo MeHg DE Children 2001-2002 (Conventional - North - Summer)	<b>Ran to completion</b>		11-09-2023 20:20	00:00:03	⋮
<input type="checkbox"/> TDS demo MeHg DE Children 2001-2002 (Conventional - South - Winter)	<b>Ran to completion</b>		11-09-2023 20:51	00:00:08	⋮

# Exposure at p50- and p95

North summer

Percentage	Exposure (µg/kg/day)	Hazard Index
50.00	0	0
95.00	0.01713	0.09224

South winter

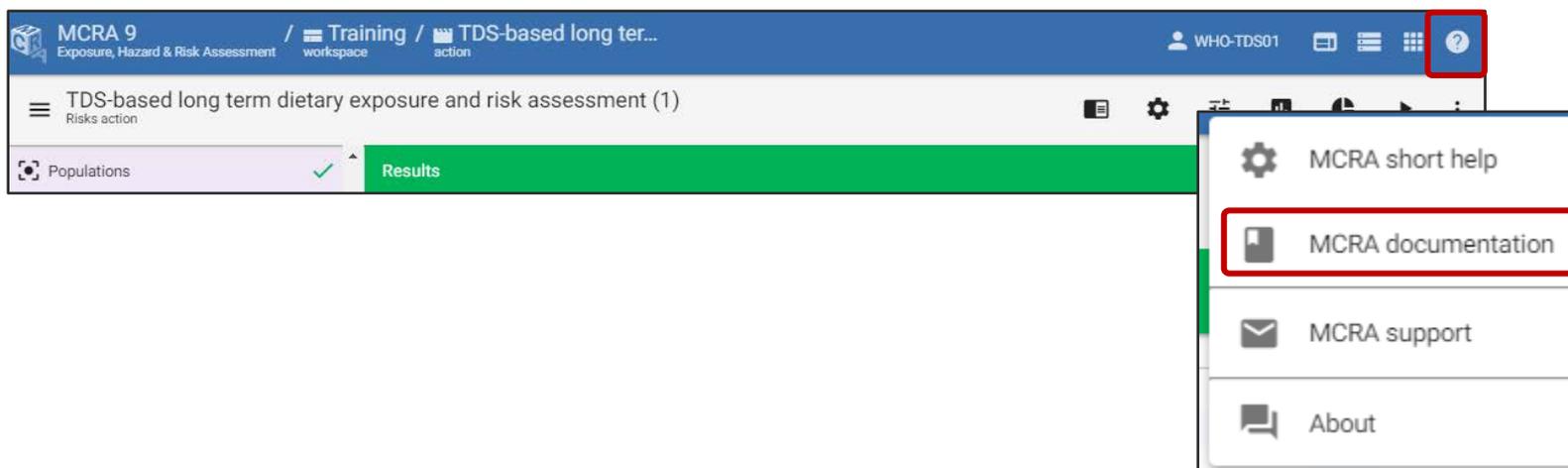
Percentage	Exposure (µg/kg/day)	Hazard Index
50.00	0	0
95.00	0.01035	0.05574

# Upload own data

- > It is possible to organize your own TDS data in the standard formats (relevant for TDS centers)
- > Use standard templates as agreed with the European Food Safety Authority (EFSA)
- > Follow-up training for TDS centers on how to upload data to MCRA, if you are interested mail to MCRA support
- > More functionalities for analyzing TDS data available in MCRA in full actions

# MCRA Documentation (1)

- By clicking on ? you can go to the MCRA documentation.



# MCRA documentation (2)

**MCRA Documentation**  
Download as PDF

**USER GUIDE**

- Introduction to MCRA
- Examples

**REFERENCE MANUAL**

- Modules
- Standard actions
- Type and Unit definitions
- Application Programming Interface (API)
- Appendices
- Glossary

**BIBLIOGRAPHY**

- Publications using MCRA
- References
- Colophon
- Change Log

MCRA 9.1.48  
Documentation history

» MCRA documentation

## MCRA documentation

Reference and user manual for MCRA 9 (version 9.1.48).

### User guide

- Introduction to MCRA
- Examples

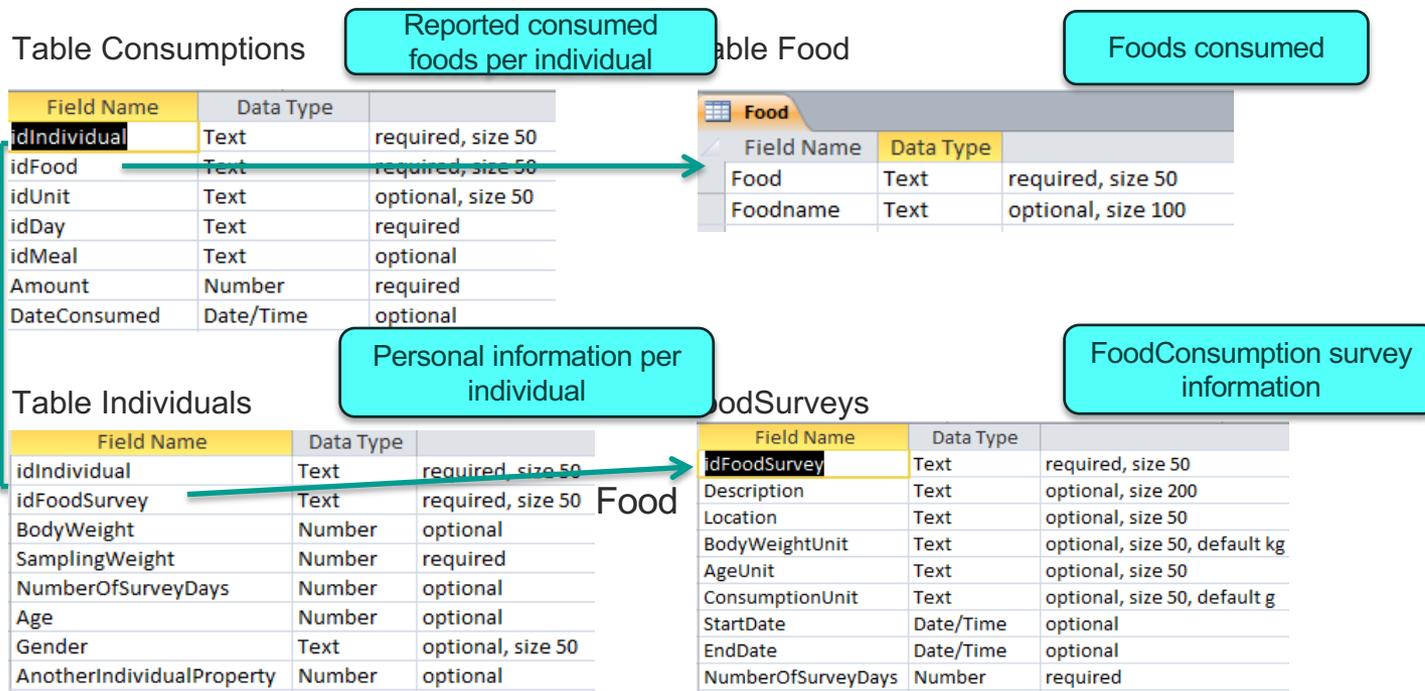
### Reference Manual

- Modules
- Standard actions
- Type and Unit definitions
- Application Programming Interface (API)
- Appendices
- Glossary

### Bibliography

- Publications using MCRA
- References
- Colophon
- Change Log

# Consumptions - format



# Catalogues - Foods

## Table Foods (format)

Field Name	Data Type	
idFood	Text	required, size 50
Name	Text	required, size 100

## Table Foods (example)

A026F	Beerwurst
A00QG	Beetroots
A00AJ	Beignets
A01DT	Berries and small fruits
MENG.CRAC.12-18	beschuit, knackebrod
A01FE	Bilberries (generic)
A00AE	Biscuit with inclusions, filling or coating
A009V	Biscuits
MENG.KOEK.24-36	Biscuits
A00AB	Biscuits, oat meal
A03RA	Biscuits, rusks and cookies for child
A009X	Biscuits, sweet, plain
A00AA	Biscuits, sweet, wheat wholemeal
A034G	Bitter chocolate

The foods table is the main table of the food definitions. Includes all food codes present in Consumptions, ConcentrationsSSD, TDSFoodSampleComposition, FoodCompositions, ReadAcrossFoodTranslations, FoodHierarchy

# 2. Concentrations - format

## Table ConcentrationsSSD

Field Name	Data Type
labSampCode	Short Text
labSubSampCode	Short Text
sampCountry	Short Text
prodCode	Short Text
sampY	Number
sampM	Number
sampD	Number
analysisY	Number
analysisM	Number
analysisD	Number
paramCode	Short Text
resUnit	Short Text
resLOD	Number
resLOQ	Number
resVal	Number
resType	Short Text

composi

Field Name	Data Type
idTDSFood	Short Text
idFood	Short Text
PooledAmount	Number

The TDS food sample compositions table contains the descriptions of the TDS samples and specifications of the foods (with amounts) included in the TDS samples.

Concentrations data are analytical measurements of chemical substances occurring in food samples.



Thank you for your attention!

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