Microplastics in foodstuffs

(RT 18/5 PLASTIC_IN_FOOD)

- Research project funded by the Belgian Federal Public Service of Health, Food Chain Safety and Environment (Contractual Research)
- Started: January 1st, 2019
- Duration: 24 months
- Budget: 200.000 €
- Consortium:
  - ILVO (Research Institute for Agriculture, Fisheries and Food, Flanders) - coordinator
  - Sciensano

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Aim and research questions

- AIM:
  - The project aims to identify the microplastic contamination of foodstuffs on the Belgian market

- RESEARCH QUESTIONS:
  - Which food items are most contaminated with microplastics?
  - What is the estimated daily intake of microplastics by food in Belgium?
  - What are the major exposure routes of microplastics contamination?
  - How diverse is microplastic contamination in food?

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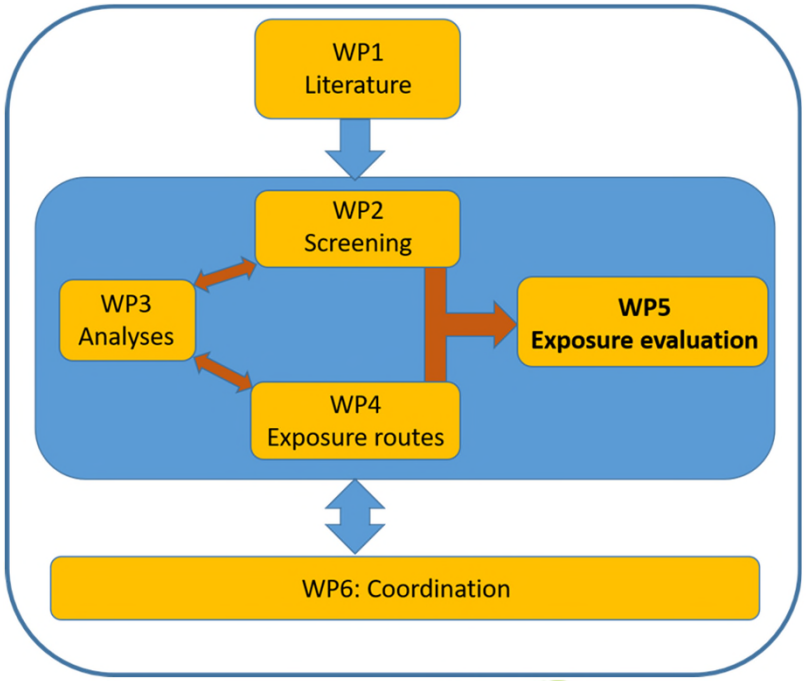
Workpackages

- WP1: Follow up of literature and international guidelines
- WP2: Sampling and sampling design for food item screening
- WP3: Microplastic analysis in different food matrices
- WP4: Exposure routes
- WP5: Exposure assessment



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WP1: Follow up of literature and international guidelines

- Especially in regard to:
  - Relevant food matrices
  - Analysis methodology for microplastic determination in food matrices
- Sources
  - EFSA documentation and guidelines
  - Baseman project: defining baselines and standards for microplastics analysis in European waters
  - Reports and guidelines from marine working groups on microplastics
  - …

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WP2 Sampling of food items

- 200 samples
- 2 steps approach (100 samples per year)

  - 1st year = **generic broad screening**

    Samples are stratified per food groups according to FoodEx2 with focus on high reported prevalence (literature, market share of the food item, consumption data, processing level (pre-packed food)

  - 2nd year = **targeted sampling**

    Focused on food items suspected to have a high impact on microplastic intake

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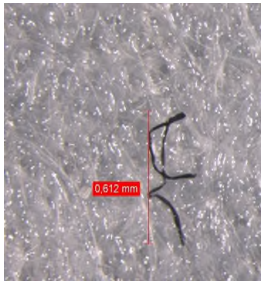
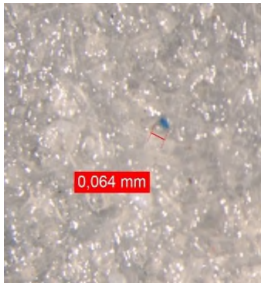
WP3: Microplastic analysis in different food items
- Method validation and quality control

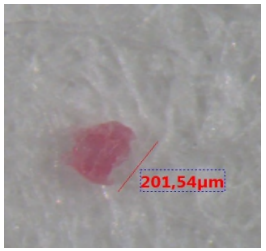
- Method validation
  - Precision, accuracy, cut-off size
  - Limit of quantification
  - Robustness and specificity
- Limiting background contamination
- Control samples



Fibers



Granules



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WP3: Microplastic analysis in different food items

- Analysis of samples

Sample preparation

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Digestion

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Filtration

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Detection

- Counting of microplastic particles
- Stereo microscope
- Reporting: particles/100g food
- Particle type: size, shape and colour
- Chemical composition (Fourier Transform Infrared spectroscopy): identify type of polymer

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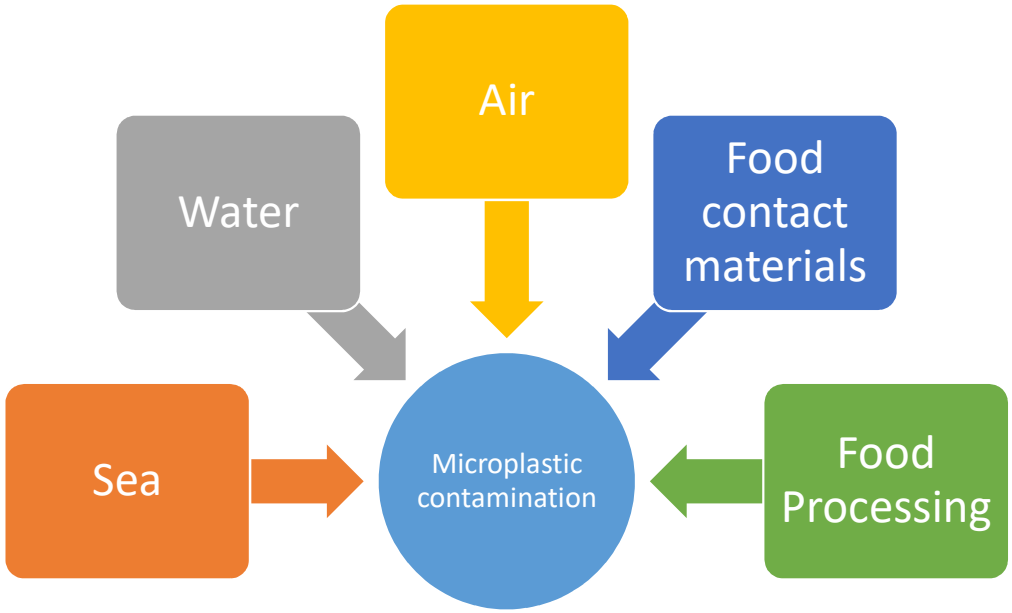
WP4: Exposure routes (limited study of environmental contamination)

- The contribution of human exposure from water, food processing and package materials will be investigated in model organisms or relevant set-ups (mussels, catering locations)
- Indirect investigation of the water exposure route (food bred in different aqueous matrices)
- Air sampling method will be optimized. Limited number of samples will be taken from rural and urban areas to estimate air contamination
- Highly contaminated samples will be selected to investigate if food contact materials may be source of contamination
- Indirect investigation of food process contamination for highly contaminated food items



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WP5 -EXPOSURE ASSESSMENT

conservative exposure estimate > consumption of a portion of mussels (225 g) (EFSA, 2016) =>7 µg of plastics.

- *Exposure assessment*
  - Food consumption survey (2014)
  - Semi-probabilistic intake assessment
    - Worst case scenario (maximum concentrations)
    - Average/median scenario (average/median concentrations)
  - subpopulations (age-related; if necessary: results-driven decision)
  - comparison with results from other dietary intake & risk assessment studies

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- Thank you for your attention!

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