

## Introduction

The Rapid Alert System for Food and Feed (RASFF)<sup>1</sup> is used by its members to report and exchange information on any type of risk for human or animal health or the environment arising from food or feed. Data shared through the system is provided as a PDF (or csv-file) enriched by data provided through attached documents (e.g. Excel or PDF files). In order to resolve an ongoing foodborne disease outbreak, analysis of affected food/feed commodity chains with consecutive actions is required. In such an incident numerous operators of the supply chain may be affected resulting in a large amount of data provided through the RASFF system including a large amount of non-standardized supplementary materials. RASNEX 1.0, the initial version<sup>2</sup>, was designed to extract data from the semi-structured parts of RASFF notifications and to visualize included commodity chains. However, unstructured parts and supplementary materials had to be processed manually. This gap is addressed by the updated version, RASNEX 2.0, further reducing manual labour for risk assessors and risk managers working with the RASFF system allowing for a faster resolution of future foodborne contamination events.

RASFF	RASFF
<ul style="list-style-type: none"> <li>General info</li> <li>Distribution status</li> <li>Risk</li> </ul>	<ul style="list-style-type: none"> <li>Products</li> <li>Related products</li> <li>Additional information</li> </ul>

## Methodology

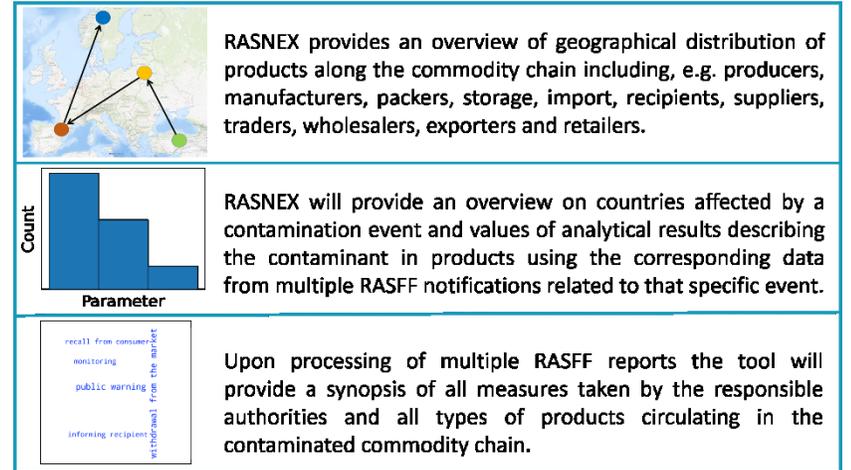
I) To extract, store and visualize data from RASFF notifications we used the following software: KNIME-4.3.2 with extensions including FoodChain-Lab<sup>3</sup> and Python 3.7. II) A dashboard was created using Python 3.7 in Plotly Dash<sup>4</sup> to read and restructure the information from RASFF supplementary materials. III) Spacy NER models to recognize addresses and company names were built and integrated with the dashboard.

## Results

RASNEX 2.0 consists of two parts: I) KNIME-workflow to read RASFF notifications and II) a dashboard that aims to extract data from supplementary materials and store it in a structured way. Upon collection of RASFF notifications related to a specific event, the KNIME-workflow will provide the following outcome:

- Semi-structured data from RASFF PDF-files stored in a machine readable way (e.g. excel table)
- Mapping the product distribution between all operators of affected commodity chains
- Histogram of reported analytical results
- Histogram of countries affected by the contamination event
- Word cloud of most frequent measures taken by authorities

The dashboard of RASNEX is used to read supplementary files, recognize addresses and names of companies and save data in a predefined structured format.



Description of the output after analysis of multiple RASFF notifications with RASNEX 2.0

## Conclusions

We have combined automatized data extraction algorithms with the manual data reading to facilitate and accelerate understanding of the evolving situation during a contamination event. RASNEX 2.0 brings us one step closer to the totally automatic processing of the RASFF documentation including their supplementary materials.

### Literature cited and acknowledgments

- [https://ec.europa.eu/food/safety/rasff-food-and-feed-safety-alerts\\_en](https://ec.europa.eu/food/safety/rasff-food-and-feed-safety-alerts_en)
- Lorenzen et al. <https://doi.org/10.1371/journal.pone.0254301>
- <https://foodrisklabs.bfr.bund.de/foodchain-lab/>
- Plotly Dash <https://dash.plotly.com>

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