RiskBenefit4EU – Partnering to strengthen the risk-benefit assessment within EU

“RiskBenefit4EU – Partnering to strengthen the risk-benefit assessment within EU using a holistic approach” is a recent European project funded by EFSA (GP/EFSA/AFSCO/2017/01-GA02) in a joint initiative of 5 organizations from 3 EU member states: National Institute of Health Dr. Ricardo Jorge (INSA), Portugal, Economic and Food Safety Authority (ASAE), Portugal, Faculty of Food Sciences and Nutrition, University of Porto (UPORTO), Portugal, Institut National de la Recherche Agronomique (INRA), France and National Food Institute, Technical University of Denmark (DTU), Denmark. This project aims to strengthen the EU capacity to assess and integrate food risks and benefits in the areas of microbiology, nutrition and toxicology through the development of a harmonized framework that will be available to EU member states organizations (https://riskbenefit4eu.wordpress.com/).

Recently this project joined the Risk Benefit Assessment Network created (link) to promote the contact between researchers and disseminate the available knowledge on this domain.

RB4EU and RBA network both intend to expand research among young students and early stage researchers in order to contribute for a better food and health policy in Europe promoting future training and the application of harmonized developed tools in other countries.

Expected Results

The expected impact of RiskBenefit4EU stands to help further developing and establishing RBA as a tool and to contribute, collaborating with other international networks, to provide scientific evidence to inform risk management decisions in the area of food safety and nutrition at a national, regional and international level. RiskBenefit4EU will create a harmonized framework that different EU institutions could use and apply for their realities and food problems. Furthermore, the collaborations to be settled will provide a unique opportunity to establish critical mass thinking for this research area namely among early stage researchers.

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State of the art

Data from a recent Portuguese national project that studied the toxic effects of children exposure (under 3 years old) to multiple mycotoxins in infant foods (MYCOMIX) reported the co-occurrence of 21 mycotoxins and metabolites present in breakfast cereals primarily marketed for children. This study showed that 96% of the analyzed breakfast cereal samples were contaminated with mycotoxins. The output of this project also highlighted the knowledge gaps on the contra-balance beneficial health effect of these foods, and the need to determine the risk-benefit balance, since the evaluated food products, namely breakfast cereals, are simultaneously recognized vehicles of food components, like nutrients, vitamins and water soluble and insoluble fibers, which could be assumed as beneficial for children health.

Question to brainstorm at EFSA Conference?

Can we ever have a quantitative tool that enable food and health authorities to estimate the balance between risks and benefits of foods usually contaminated by mycotoxins, as cereals-based products?

Health risks associated with consumption of cereal-based foods, an important source of nutrients with beneficial health effects, could increase in the near future due to climate changes in Europe (dry conditions and increased ambient temperatures).

Health risks:
- chemical (e.g. mycotoxins) hazards
- microbiological (e.g. Bacillus cereus) hazards
- Dietary fiber (e.g. prevention and treatment of childhood obesity, maintenance of normal blood glucose and lipid levels and blood pressure, risk reduction for future chronic diseases, such as cancer, cardiovascular disease (CVD), and type 2 diabetes)

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Kick-off meeting RB4EU
17th January 2018, EFSA (Parma, Italy)
together, e.g. TK-TD models or Dynamic Energy Budget (DEB) models.

Pre-sets and default values are available for all parameters. Inputs are not ‘hard-coded’ in the platform and can be stored in an up-to-date relational database.

Monte Carlo method is used to propagate variability/uncertainty from all inputs through all linked models. Platform can work with a single mean (no variability) or with multiple populations (e.g. poor and extensive metabolisers). Populations can be defined in terms of customizable distributions on chosen parameters (e.g. clearance) and pre-sets are available.

An automated report is generated in Word or PDF, summarising the models applied, input values, TK parameters, generic plots. Full numerical outputs can also be exported. Experimental data can be used for validation of the models and displayed alongside the outputs.

Currently, the models implemented in TK plate have been developed for humans and rats in the context of exposure to single compounds and binary mixtures. These models are based on extension of functions and compound-specific data from the US-EPAs ‘hitk’ R package. Default mean and variability values for physiological and TK parameters are based on our meta-analyses of the literature. Performance of the current version of the tool has been demonstrated in case studies modelling single compounds and binary mixtures.

STAYING RELEVANT IN A CHANGING WORLD

65. Risk-benefit assessment in foods: a tool for a better food and health policy in Europe

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Risk-benefit assessment in foods: a tool for a better food and health policy in Europe

RiskBenefit4EU - Partnering to strengthen the risk-benefit assessment within EU using a holistic approach, is a recent European pilot project funded by EFSAs and coordinated by Portugal (PT), integrating a multidisciplinary team from health and food institutes, national food safety authorities, R&D institutions and academia from PT, Denmark (DK) and France (FR). The main objectives of RiskBenefit4EU concerns the development of a set of Risk-Benefit Assessment (RBA) tools to assess and integrate food risks and benefits in the areas of microbiological, nutritional and chemical components through the development of a harmonised framework. This pilot project will validate the RBA framework created using a Portuguese case study on cereal-based foods. The research idea for food safety risk assessment is to create an international network on RBA to promote and disseminate the outputs and knowledge acquired under RiskBenefit4EU, at European level, This network aims to promote knowledge and capacity building on RBA (acquired under RiskBenefit4EU) among European early stage researchers and to apply the harmonised framework on their countries. Health risks associated with consumption of cereal-based foods, an important source of nutrients with beneficial health effects, could increase soon due to climate changes in Europe (dry conditions and increased ambient temperatures could promote an increase in toxins production; occurrence of emergent compounds) so the dissemination and use of the RBA harmonised tools related with ingestion of cereal-based foods and derivatives could contribute to support future food and health policy in Europe.

66. Food risk–benefit assessment: 'methodological development based on an infant milk diet case study

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Food risk–benefit assessment (RBA) aims to scientifically assess human health risks and benefits associated with food consumption in the same integrative methodology, regardless of the field of research, including microbiology, chemistry and/or nutrition. Although these three components are often present simultaneously on consumers plates and in their diets, up until the last decade they have been traditionally studied independently. Since the beginning of the 21st century, RBA has emerged resulting from activities and development under EFSA guidance, European projects (Brafo, Calibra, Bepranibef...) and in particular RBA case studies.

The objective of the present work was to propose a method to perform a three-disciplinary RBA, including microbiological, chemical and nutritional dimensions. This work was performed as part of a PhD project focusing on the infant milk-based diet (breast milk and infant formulas), taking into account a selection of risk or beneficial factors,