



ACRYRED

Deliverable 4 – WG5

Overview of research activities in Europe to reduce acrylamide in cereal-based foods for the field of health impacts of MR products

Project Name	Reducing Acrylamide Exposure of Consumers by a Cereals Supply-chain Approach Targeting Asparagine
Actual Delivery Date	18/10/2022
Working Group	WG5
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Grant Period	1



Executive Summary

The main objective of the WG5 is to enable a dialogue on the parameters that should be considered in a risk – benefit analysis of Maillard reaction products and the impact of mitigation measures on the risk – benefit balance.

This objective requires an interdisciplinary approach and cooperation between the working groups, especially WG3 and WG4. In Grant Period 1, WG5 activities have focused on supporting the above objective under Tasks 5.1, 5.2 and 5.3, namely the establishment of an active platform of WG5 members through virtual and face-to-face meetings, the promotion of project information through conferences and webinars, and the sharing of information through various means (exhibitions, seminars, websites, communication media). Most valuable was to provide expert information, professional experience, and tutorials through the Training School, including lectures and practical sessions on the evaluation of acrylamide mitigation measures in food technology. The Proceedings of this Training School are available to all CA members. In the frame of the CA 21149 ACRYRED, a scientific publication was published.





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Introduction

The ACRYRED Action will be structured in five Working Groups (WGs). WG1 will comprise the Action Management Committee (Action MC), facilitating the interdisciplinary exchange of knowledge. The other four WGs will all have input to the WG1, for example on topics to be discussed in. Researchers will choose one or several of these four WGs to discuss their research interests in more detail.

First, each WG2-5 will identify all relevant researchers throughout Europe and prepare a detailed overview of the relevant research in their field, identifying baseline of understanding and gaps (task x.1). The WG will organise a workshop to bring all stakeholders together. In the second task, for the identified gaps, the WG2-5 will prioritize and identify potential ways to fill the gaps. First, this will be laid down in a draft research agenda for the next five years. The draft research agenda is the input for an extensive process of consultation, both with researchers from the domain of each WG in two workshops in year 3 and 4 (disciplinary) as well as with all other domains, mainly through the central WG1 and the two conferences. After the second workshop with relevant researchers, the draft research agenda is communicated with WG1 (task 1.1) and will serve as input for the first conference. In year 3 and 4, the research agenda will be discussed in two iterations, during workshops of the central WG1 and the disciplinary workshops of WG2-5. These discussions will result in a final version of the research agendas for each WG and the overarching interconnections of these. Each WG will organise its activities, which includes meetings, workshop, publications, and dissemination activities. Especially WG1 will organise two conferences to communicate the results of the Action with a broad public of stakeholders. Furthermore, WG1 organises the interdisciplinary ACRYRED training school and six calls for 40 short-term scientific missions and ITC Conference Grants

Objectives of the document

WG5: Dialogue on risk-benefit of MR products associated with cereals and impact of mitigation measures

Objective: To enable a dialogue on the parameters that should be considered in a risk – benefit analysis of MR products and impact of mitigation measures on the risk – benefit balance.

- Task 5.1 To make a detailed overview of the relevant research in risk – benefit balance of MR products as relevant to cereal-based foods.
- Task 5.2 To align amongst stakeholders on a draft a strategic research agenda for the field.
- Task 5.3 To develop content for the ACRYRED training school on the risk – benefit balance of MR products, and to identify candidates for participation in this training school.

1. WG5 activities in GP1

Activities of WG5 consisted of WG meetings, conference participation, webinar, exhibition, seminar, web page, organization of a training school, the Proceedings and publications. All activities were focused on deliverable D5.1: Overview of research activities in Europe to reduce acrylamide in cereal-based foods for the field of health impacts of Maillard reaction products.

1.1 Meetings

After a general kick-off meeting (18/10/2022), the WG5 team counting 26 participants from 11 countries was established. Considering the complementarity of WG3 and WG5 activities, we as leaders of WG3 and WG5 decided to organize the first town-hall meeting as a joint meeting of both WGs (18/01/2023).

The first separate WG5 meeting was held on **24/03/2023** virtually with the participation of 15 members of 46 participants from 19 countries. During the meeting, two approaches to risk / benefit dialogue were discussed: 1) to collect information about mitigation measures in food industry; 2) to review scientific information on acrylamide mitigation measures described in literature.

Information about an open call for STSM and conference grants was spread among participants which were encouraged for hosting as well as applying for grants.

Additionally, a decision to organize the first training school was confirmed. The training school was dedicated to both young researchers and experienced technologists in order to share knowledge and to increase skills in assessment of mitigation measures which could be used in food technology.

The second meeting of WG5 participants was held on **27/04/2023** virtually, attended by 24 participants. More details about the training school intention and the upcoming MC meeting in Martonvásár was spread.

The WG5 meeting in person was held on **12/05/2023** in Martonvásár (Hungary) with participation of 10 members in person and 1 person on line.

Activities of WG5 were divided to two approaches:

- questionnaire development, validation and distribution;
- literature and patent database searching.

All WG5 participants (current number that time 49) were asked by questionnaire (released in **24/05/2023**) in which part of the WG5 activities they preferred to participate in. 16 answers were received which declared their willingness to be engaged in these tasks.

Currently, at the end of GP1, the current number of WG5 members is 66 out of 214 project participants.

1.2 Dissemination conference grant

DCG grant – EuroFoodChem XXII Belgrade:

Conference title: XXII EuroFoodChem Congress

Conference web-page: <https://xxiieurofoodchem.com/>

Conference venue: Belgrade, Serbia Conference

Start and end date: **14/06/2023 to 16/06/2023**

Title of the presentation: Asparaginase treatment of fruit additives enriching biscuits

Co-authors: Zuzana Ciesarová, Kristína Kukurová, Viera Jelemenská, Jana Horváthová, Janka Kubincová, Miona Belovic, Aleksandra Torbica

Outcomes: The main outcome of the participation at the XXII EuroFoodChem Congress was to draw attention to the CA 21149 ACRYRED project, make it visible and to present a part of the results arising from the collaboration within the project between two institutions (the Slovak institution National Agricultural and Food Centre and the Serbian institution University of Novi Sad, Institute of Food Technology), both involved in CA 21149 ACRYRED. Scientific outputs are closely related to the topic of the ACRYRED project. Highlighting the collaboration can be motivating for the audience as they can recognize CA ACRYRED as a good opportunity to set fruitful and productive platform for collaboration. The congress was attended by more than 200 participants, mainly young and early career scientists. The presentation attracted attention and was personally discussed with attendees. It was a good opportunity to build collaboration with some food technologist expert working in acrylamide issue and I invited them to join CA 21149 ACRYRED, which is an excellent platform to build network in the field of acrylamide prevention. Besides this, it was also promoted the upcoming training school and opportunities for STSM and ITC conference grants.

1.3 Webinar

The 1st ACRYRED Webinar was organized on June 06, 2023, virtually by Dr. Christine Nowakowski and Dr. Claudia Passos through the Zoom platform. To support young scientists in their career, the intention is to invite them to give a presentation of their own research connected with the ACRYRED topic. The first invited young speaker was Veronika Vavrova – a MSc student graduated from the Slovak University of Technology, Faculty of Chemical and Food Technology in Bratislava in the Master's program Food, Hygiene, Cosmetics. She presented her work entitled "Valorisation of legumes by fermentation – impact on the potential of acrylamide formation" as a part of her diploma work "Legumes in Functional Foods: Advantages and Risks" supervised by Dr. Zuzana Ciesarová and Dr. Kristína Kukurová, National Agricultural and Food Centre, Food Research Institute – Slovakia (SK). In the webinar, she presented part of her work related to the fermentation of legumes (peas, lentils, beans) by *Actinomucor elegans* and how this process affected the potential of acrylamide formation in related food products.

1.4 Exhibition, seminar, web page

CA 21149 ACRYRED project was promoted on the national level in Slovakia by different means:

- National agricultural and food exhibition AGROKOMPLEX 2023 (Nitra, Slovakia), 17 – 20/08/2023 (a roll-up was displayed during all four days)
- Informative webinar for professionals organized by NPPC – VÚP via Teams platform, 28/04/2023, number of participants: 58
- Information on CA 21149 ACRYRED project has been displayed on the institutional web page: <https://www.vup.sk/index.php?mainID=250&navID=269>; <http://www.nppc.sk/index.php/en/projects>

1.5 WG5 Training School

Date: **September 07 – 08, 2023**

Local Organizer: National Agricultural and Food Centre, Food Research Institute (NPPC, VUP)

Location: Bratislava, Slovakia

Title: Approach to assessment of acrylamide mitigation measures in cereal-based food processing

Intention: Interdisciplinary training, networking, and knowledge exchange to build capacity on monitoring and assessment of acrylamide mitigation measures applied in industrial production

Dedication: young researchers, early career researchers, PhD students, innovators, food technologists in the field of food production at risk of acrylamide

Number of trainees: 20 in person, 5 virtually (lecture sessions) from 12 countries

Number of lecturers: 9, number of trainers: 6

Among the speakers were prominent personalities who have long been profiled in the field which provided 9 lectures focused on implementation of acrylamide mitigation measures and their impacts on various aspects of food product quality, including experience from practice – production of long shelf-life snacks. The lectures were followed by a practical part, namely the demonstration of a unique sensor for rapid determination of asparagine in raw materials, developed by Curtis Analytics Ltd. (UK), and training of participants in the analytical laboratories of NPPC VÚP. Participants who completed the training school in full were issued a certificate of completion.

1.6 The Proceedings of the Training School

The lectures presented on the training school and procedures of the practical training sessions were collected in the Proceedings distributed on USB to participants. They are also available online on ACRYRED Repository for all CA 21149 ACRYRED members.

[USB TS Proceedings 07-08 Sept 2023 Bratislava](#)

1.7 Publications with an acknowledgement

In the GP1, the publication with an acknowledgement included produced by WG5 members was:

Ciesarová, Z.; Kukurová, K.; Jelemenská, V.; Horváthová, J.; Kubincová, J.; Belović, M.; Torbica, A.: Asparaginase Treatment of Sea Buckthorn Berries as an Effective Tool for Acrylamide Reduction in Nutritionally Enriched Wholegrain Wheat, Rye and Triticale Biscuits. *Foods* 2023, 12, 3170.

<https://doi.org/10.3390/foods12173170>

Conclusion

WG5 Risk-benefit of MR Products and its Mitigation

Activities of WG5 have enabled a dialogue on the parameters that should be considered in the risk – benefit analysis of MR products and on the impact of mitigation measures on the risk – benefit balance.

The meetings and the Training School were an appropriate platform to engage members and keep them in touch, to encourage them to find out suitable tools to disseminate information on the need for acrylamide mitigation among stakeholders.

The Proceedings of the Training School fully meet the objective of the Deliverable D5.1 Overview of research activities in Europe to reduce acrylamide in cereal-based foods for the field of health impacts of MR products.

[USB TS Proceedings 07-08 Sept 2023 Bratislava](#)

Further activities will focus on:

- Supporting young researchers in applying for STSM grants and ITC conference grants;
- Increasing project visibility through dissemination activities;
- Promoting awareness of the scientific conference to be organized by the CA 21149 ACRYRED in the GP2
- Strengthening dialogue with industry partners to involve them in the acrylamide mitigation strategy.