

1 Prioritised substance group: Acrylamide-UPDATED

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1.1 Policy-related questions

1. What is the current exposure of the EU population to acrylamide?
2. Are the exposure levels a concern for health? Is the exposure to acrylamide associated to cancer, neurological alterations and fetal growth in humans? Is the health risk dependent on long term or intermittent exposure to low quantity of acrylamide?
3. Does the exposure to acrylamide differ significantly between countries and population groups? Are the main reasons for these differences related to different dietary habits or to other factors?
4. Are the health risks dependent on age and gender?
5. Which population groups are more at risk? Are there other sources of exposure of acrylamide that need to be discovered (e.g. smoking habits or other food sources)?
6. Is it possible to identify the best biomarkers of exposure to acrylamide that can be used in HBM studies?
7. Is there a possible mixture of effect between acrylamide and other chemical substances?
8. Is there an impact from the mitigation for the production in food processing and manufacturing and REACH restrictions on the distribution of acrylamide exposure? Do we need to implement other restrictions to decrease the level of exposure of acrylamide?

1.2 Research Activities to be undertaken

Table 1 Research activities research activities to be carried out to answer the policy questions for acrylamide

| Policy related questions | Substance | Available knowledge | Knowledge gaps and activities needed |
|---|------------|---|--|
| 1) What is the current exposure of the EU population to acrylamide? (Policy makers) | Acrylamide | 2) German Environmental Survey V, 2014-2017, general population representative date for 3-17 year old children and adolescents 3) German study, general population, n=999, 2003-2004 n=999 (18). 4) NewGeneris: Danimark, Norway, Greece, England, Spain: mother-child 2006-2010 n=1,151 (5). 5) MoBa: Norway mother-child, 1999-2008, n=79 (6). 6) CAPS: Swedish case-control study for cancer, 2001-2002, n=330 (17) 7) Swedish occupational exposed, 1997-1998 n=210 (13, 14) 8) Danish post-menopausal cohort, n=740 (15, 16) | Lack of HBM data of the general population for most of the EU countries. Actions: -to generate new data based on samples from the aligned studies. Target group: occupationally exposed and general population. Based on the high content of acrylamide in certain foods (for instance baby foods and potato chips) new data should be generated in all age groups: -new born (0-6 months) -children and adolescents -adults (middle ages and elderly, men and women) -derive EU-HBM-HBGVs for workers and for the general population based on the Biomonitoring Equivalents for non-cancer Reference Dose (RfD). (Policy makers) Relevant WPs: WP7 WP8 WP10 |

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|--|------------|--|---|
| <p>2) Are the exposure level a concern for health? Is the exposure to acrylamide associated to cancer, neurological alterations and fetal growth in humans? Is the health risk dependent on long term or intermittent exposure to low quantity of acrylamide? (Additional questions)</p> <p>3) Does the exposure to acrylamide differ significantly between countries and population groups? Are the main reasons for these differences related to different dietary habits or to other factors? (Additional questions)</p> <p>4) Are the health risks dependent on age and gender? (Additional question)</p> <p>5) Which population groups are more at risk? Are there other sources of exposure of acrylamide that needs to be discovered (e.g. smoking habits or other food sources)? (Additional and policy maker questions)</p> | Acrylamide | <p>Evidence from animal studies have pointed out that acrylamide may be carcinogenic, mutagenic genotoxic, neurotoxic and have adverse effect on fetal growth.</p> <p>See also HBM studies listed above.</p> | <p>Findings from human studies are inconsistent and Human Biomonitoring is limited in Europe (5, 6, 15-20). Risk assessment is needed for both occupational settings and general population.</p> <p>Actions:</p> <ul style="list-style-type: none"> - generate new HBM data for EU populations where there is a gap that can be considered in further HBM programs.(Policy makers) - include acrylamide in general population surveys at national level to assess the EU population`s exposure to acrylamide. (Policy makers) - create occupational survey to assess whether workers are protected by acrylamide exposure. - estimate the risk of certain endpoints (fetal growth, neurological alterations and cancer) in relation to acrylamide exposure from results of current and new epidemiological studies.(Additional) -data analysis to identify current exposures levels, temporal and geographical trends and data gaps. (Additional) -collection, comparison and evaluation of existing data and integration into IPChem.(Policy makers) <p>Relevant WP: WP7 WP8 WP10 WP11 WP13</p> |
| <p>6) Is there a possible mixture effect of acrylamide and other carcinogens? (Additional question)</p> | Acrylamide | | <p>1 There is limited knowledge on a mixture effect of acrylamide and other carcinogens, particularly dietary carcinogens</p> <p>2 Actions:</p> <p>3 -To perform investigations for better understanding of mixture effects of acrylamide and dietary carcinogens e.g. benzopyrene. (Additional)</p> <p>Relevant WP: WP15</p> |

| Policy related questions | Substance | Available knowledge | Knowledge gaps and activities needed |
|--|-------------------|--|--|
| <p>7) Is there an impact from the mitigation for the production in food processing and manufacturing and REACH restrictions on the distribution of acrylamide exposure? Do we need to implement other restrictions to decrease the level of exposure of acrylamide? (Additional questions)</p> | <p>Acrylamide</p> | <p>Restrictions, monitoring, mitigations and prohibitions have been implemented for acrylamide in chemical industry, cosmetic products and in food. This might have decreased the exposure to acrylamide. A recent EU regulation aiming to reduce the level of acrylamide in food does not seem to have been respected by the food industries.</p> | <p>There is lack of evidence regarding how the level of exposure of acrylamide has been affected after the adaptation of EU regulations aimed to decrease the level of exposure.</p> <p>Action:</p> <p>-To evaluate whether the EU regulations had an impact on the reduction of exposure level of acrylamide and whether other restrictions should be implemented for the food industry. (Additional)</p> <p>Relevant WP: WP10</p> |