



ACRYRED



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Acrylamide risk awareness across the cereal supply chain: from breeding to consumption

Anna Szafrńska



Acrylamide in Cereal Products: Progress and Prospects
Palermo, Italy, 4.06.2026

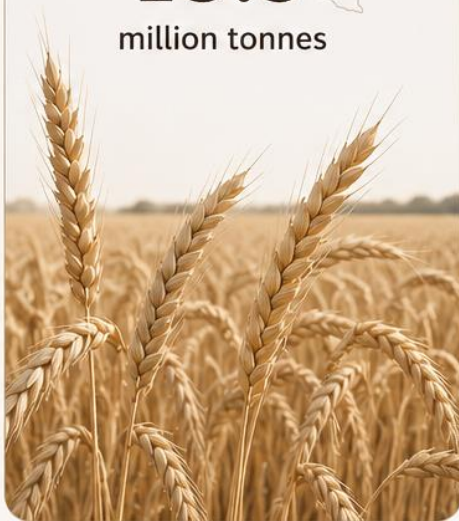


WHEAT PRODUCTION AND PROCESSING IN POLAND

WHEAT GRAIN
PRODUCTION
IN POLAND (2025)

13.5

million tonnes



WHEAT GRAIN



PRODUCTION

13.5

million tonnes
IN 2025



WHEAT FLOUR



PRODUCTION

2.5

million tonnes
IN 2024



BAKERY, PASTRY
AND PASTA PRODUCTS



PRODUCTION

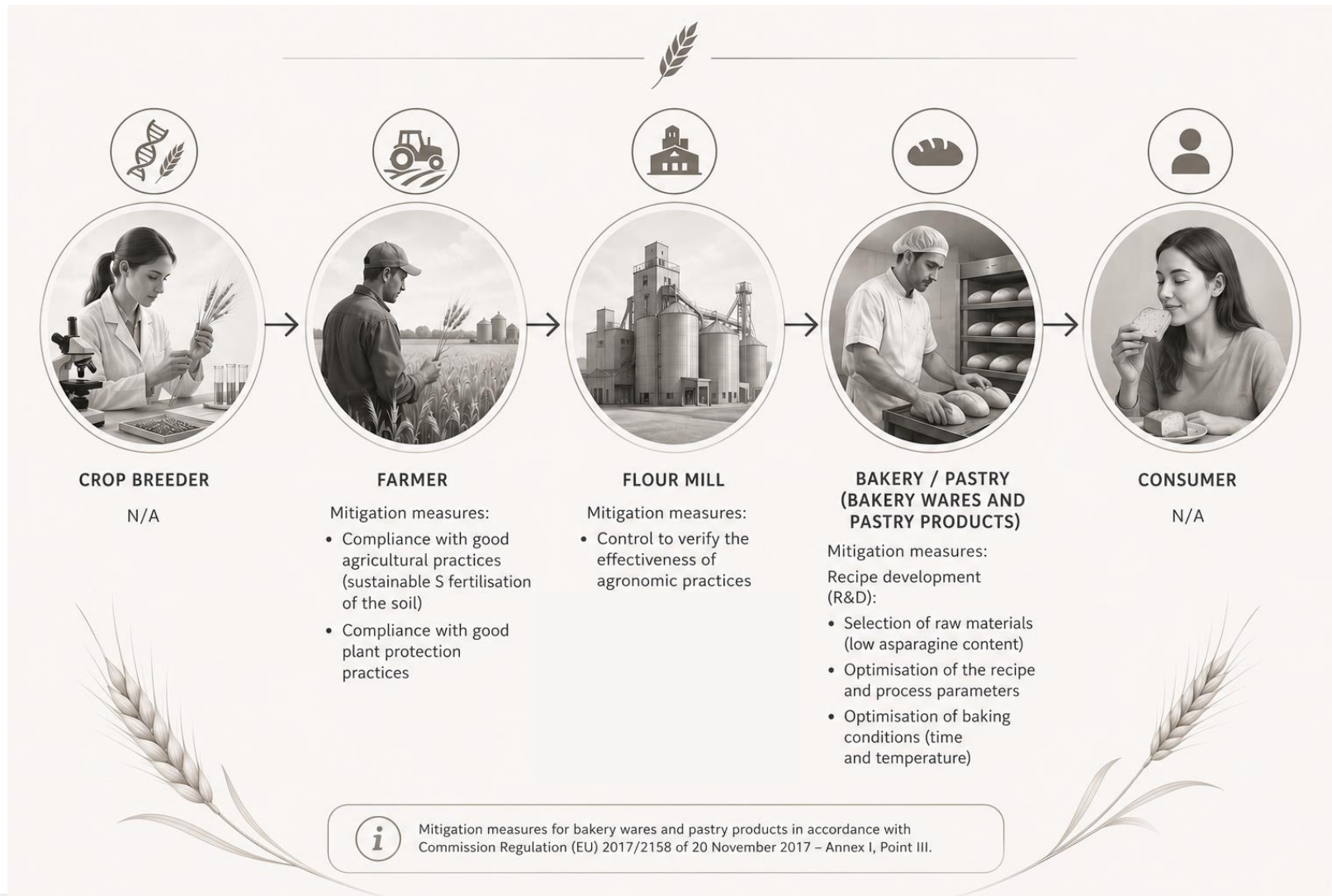
2.7

million tonnes
IN 2024



Source: Statistics Poland (GUS)

Mitigation measures for fine bakery wares



How do perceptions and knowledge of acrylamide formation and its mitigation differ across stakeholder groups in Poland?



Objectives of the survey:



- Assess acrylamide awareness among stakeholders across the cereal supply chain.
- Evaluate current practices and mitigation strategies used to reduce acrylamide formation.
- Identify barriers, knowledge gaps, and opportunities for improving food safety through education and stakeholder cooperation.

Materials and Methods



- Anonymous online surveys (Microsoft Forms)
- Target groups: plant breeders, farmers, millers, bakers, and consumers
- Distribution via Agricultural Advisory Centres, COBORU, Polish Plant Breeders Association and IBPRS-PIB networks
- Survey period: January – April 2026
- Voluntary participation
- Statistical analysis: descriptive statistics (means, percentages) and subgroup comparisons according to demographic and production-related characteristics (i.e. age, place of residence, education level, farm size, company size, production scale, and other relevant respondent characteristics).



<https://pixabay.com/pl/users/qualityrendersmicrostock-13404983/>



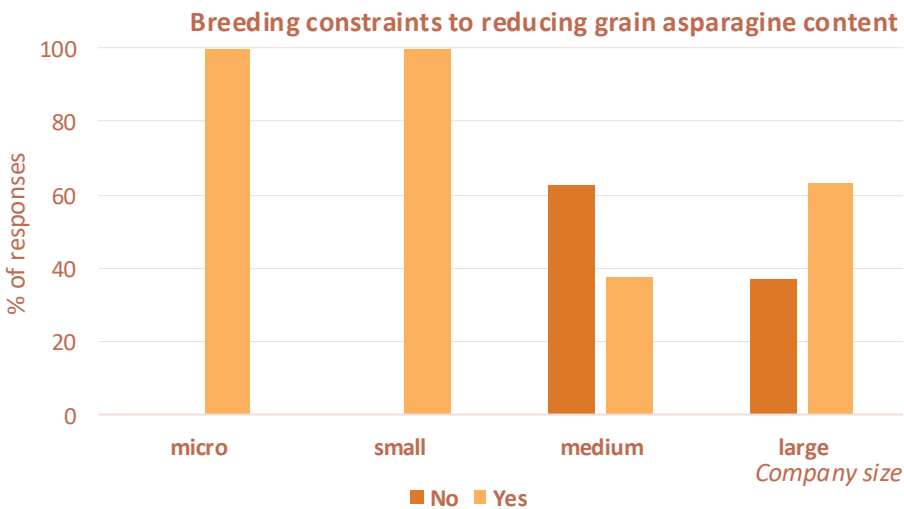
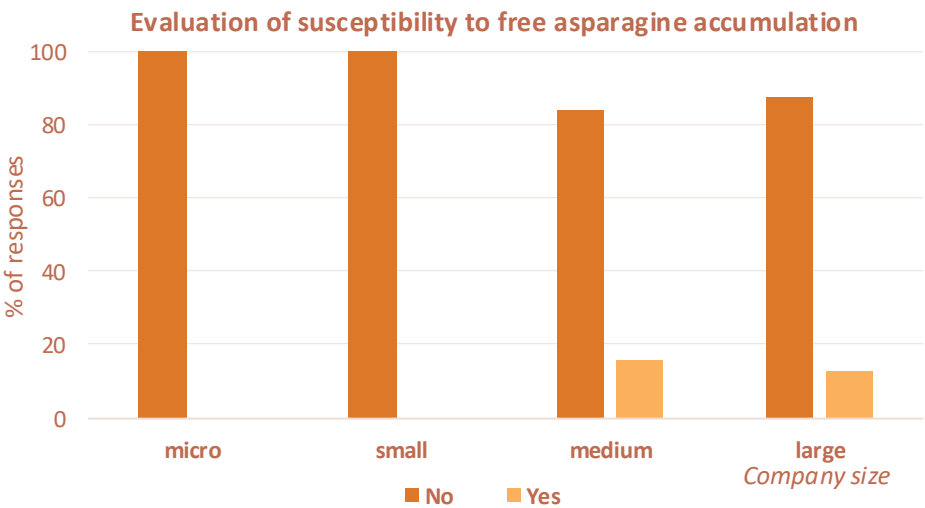
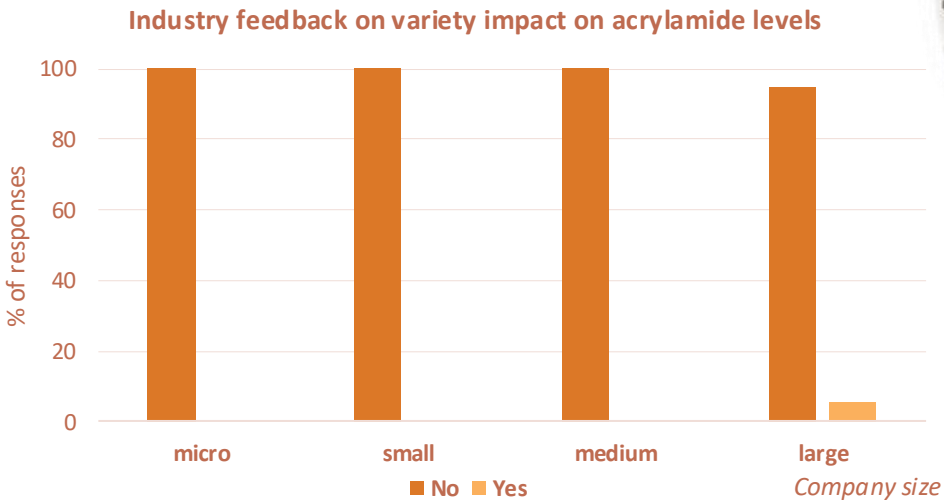
	Breeders company size (No. of employees)	Farm size (ha)	Milling capacity (t/day)	Bakery company size (No. of employees)	Consumers Age (years)/ Place of residence
n	29	240	34	45	603
	Micro-enterprise (<10) Smal (10-49) Medium (50-249) Large (> 250)	< 10 10-25 26-50 > 50	< 100 100-450 451-800 > 800	Micro-enterprise (<10) Smal (10-49) Medium (50-249) Large (> 250)	<25 26-40 41-60 > 60 Rural area City up to 250,000 inhabitants City over 250,000 inhabitants
n – number of responses					

Survey results: Cereal Breeders



Breeders: acc. to company size:

Micro-enterprise	3.4% of responses
small	3.4%
medium	65.5%
large	27.7%



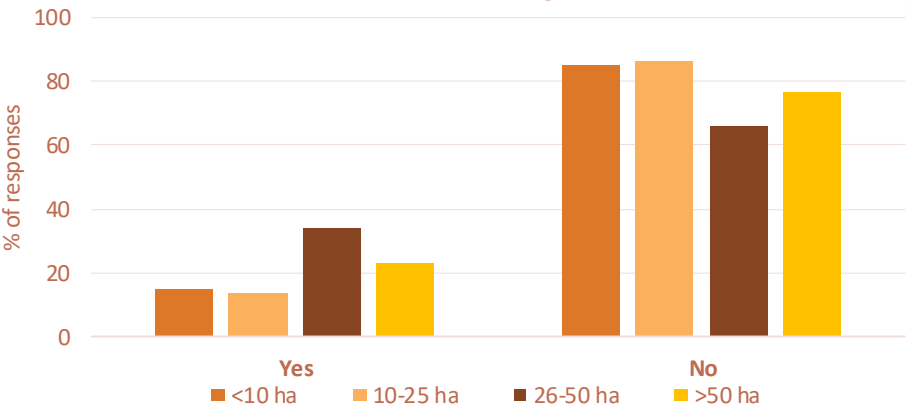
Survey results: Farmers



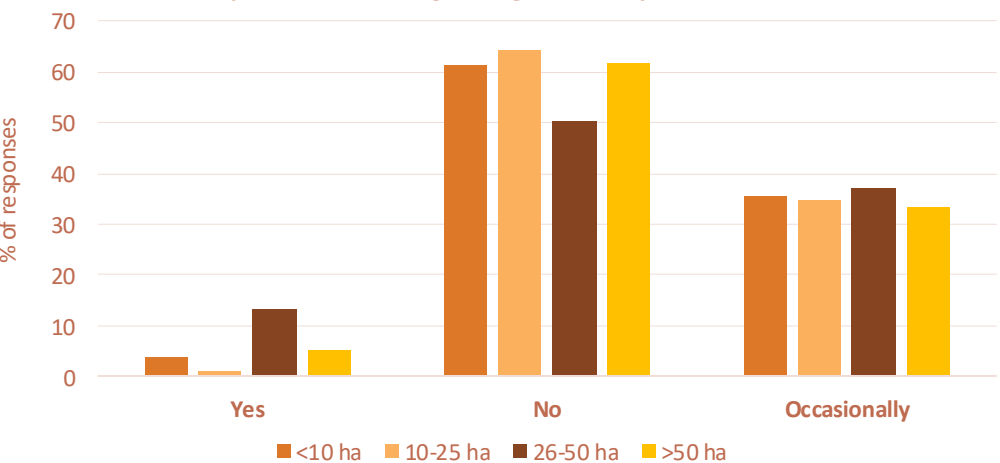
Farmers: acc. to agricultural farm area:

< 10 ha	34% of responses
10-25 ha	34%
26-50 ha	16%
>50 ha	16%

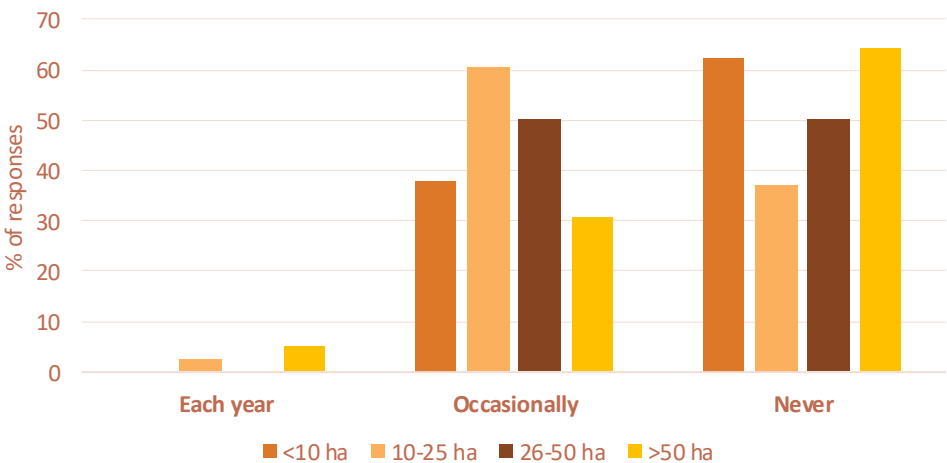
Do you know the relationship between S content in the soil and the level of ASP in grain?



Grain buyers ASP reduction recommendations regarding the implementation of good agricultural practices



Frequency of soil sulfur testing

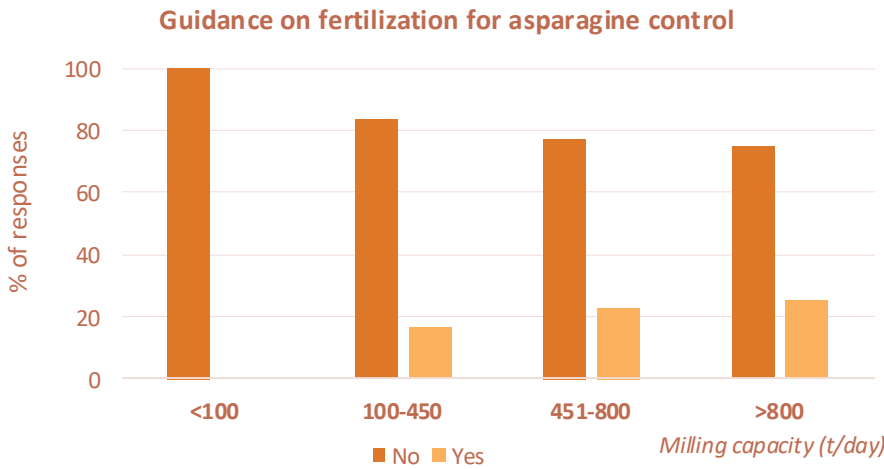
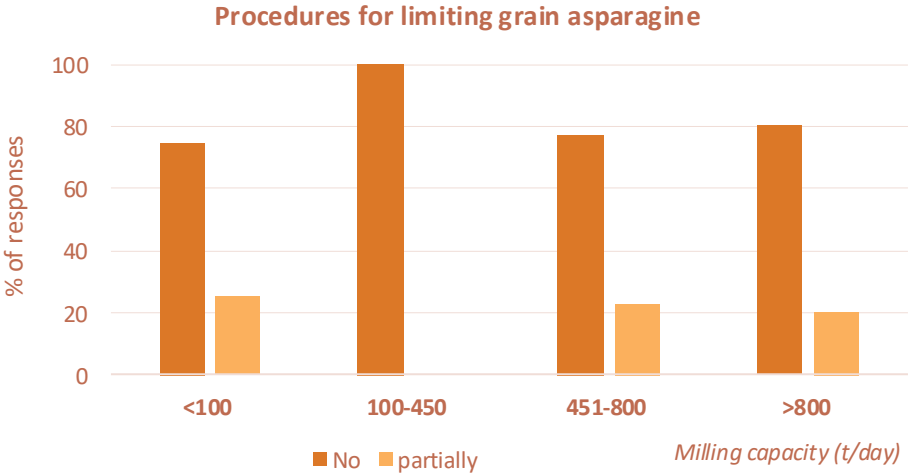
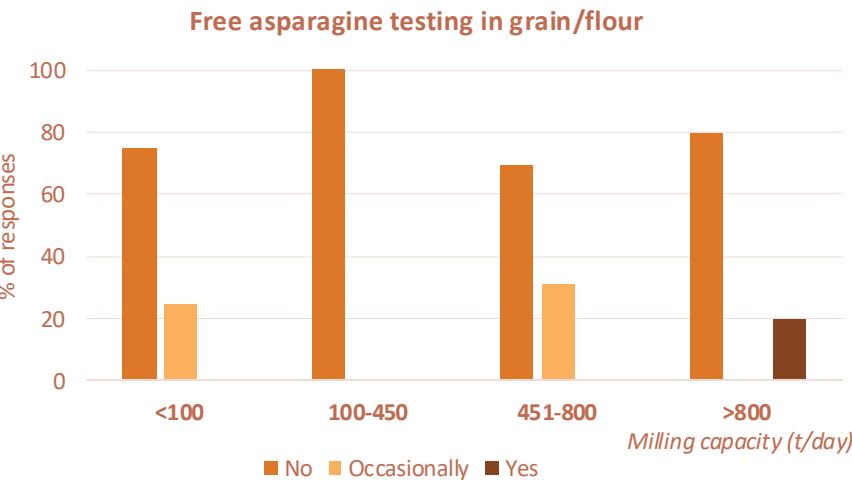


Survey results: Millers



Millers: acc. to milling capacity (t/day):

< 100	12% of responses
100-450	35%
451-800	38%
>800	15%

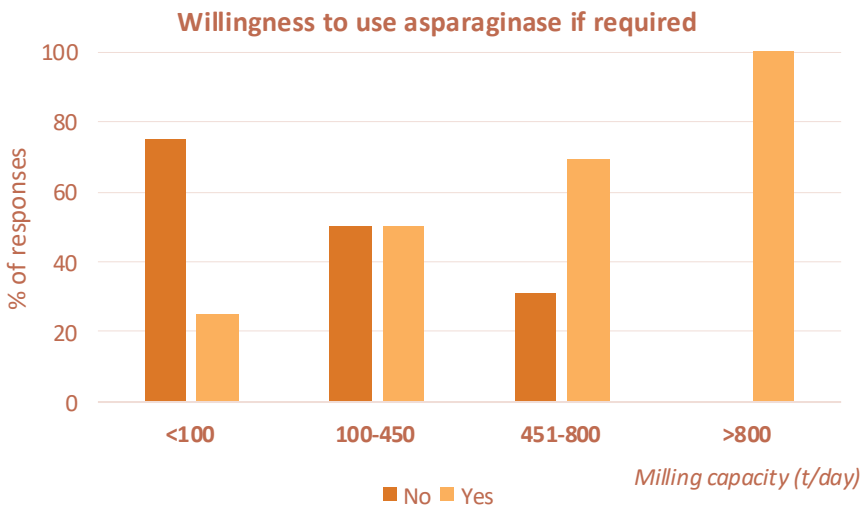
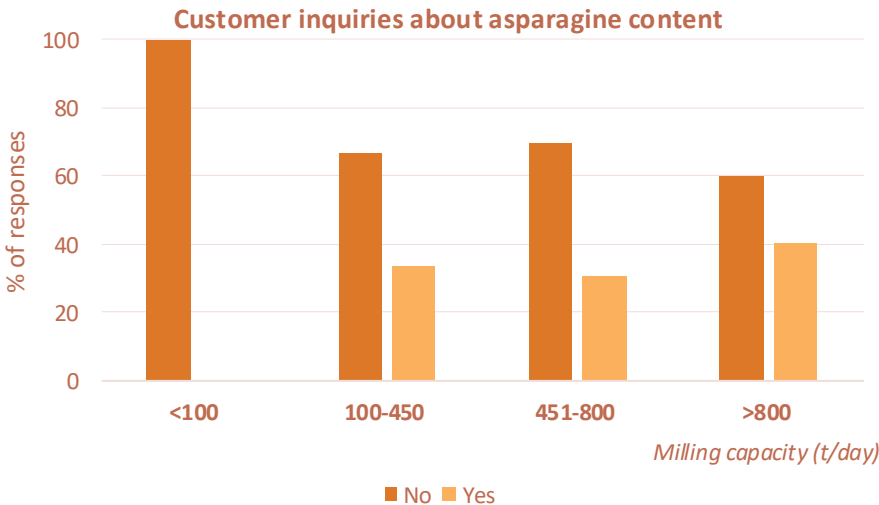
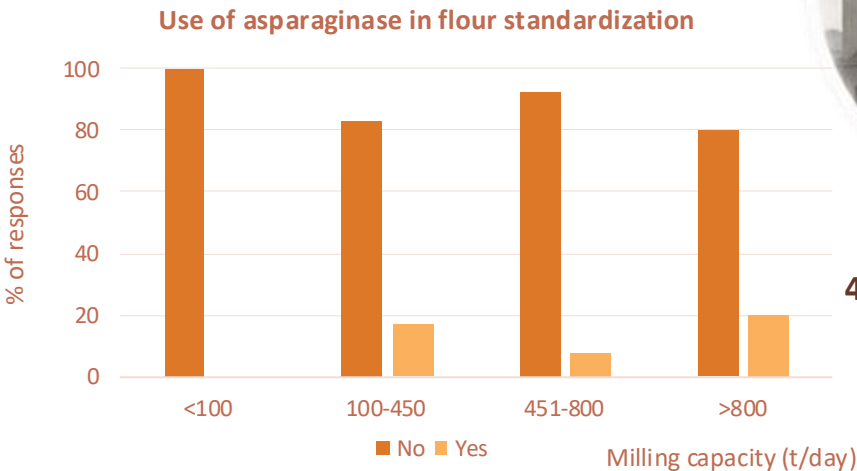


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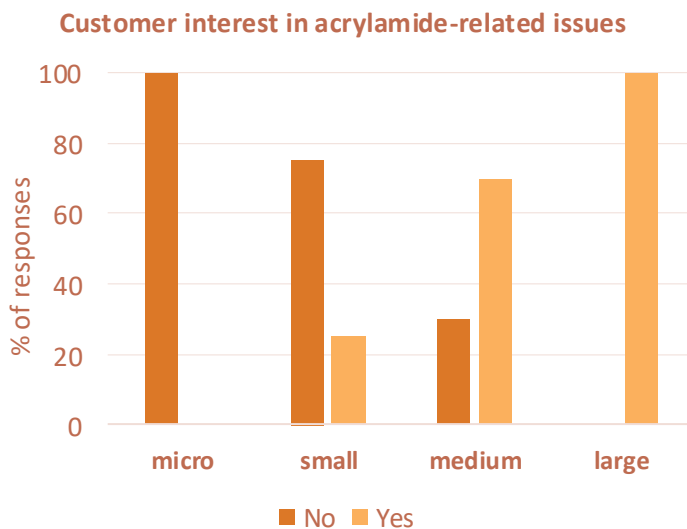
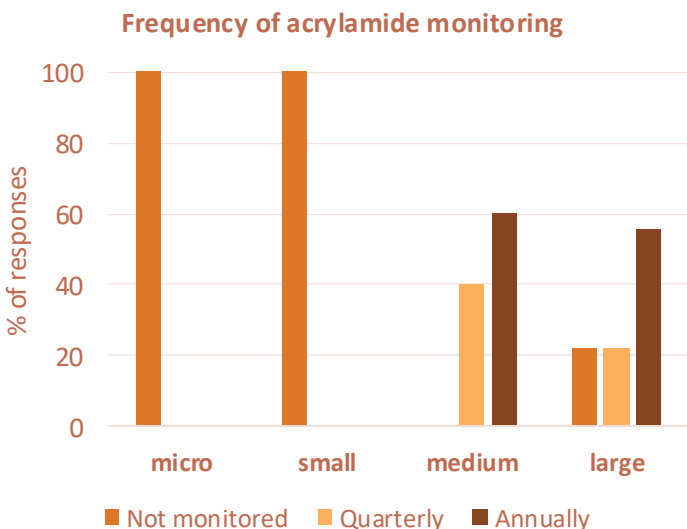
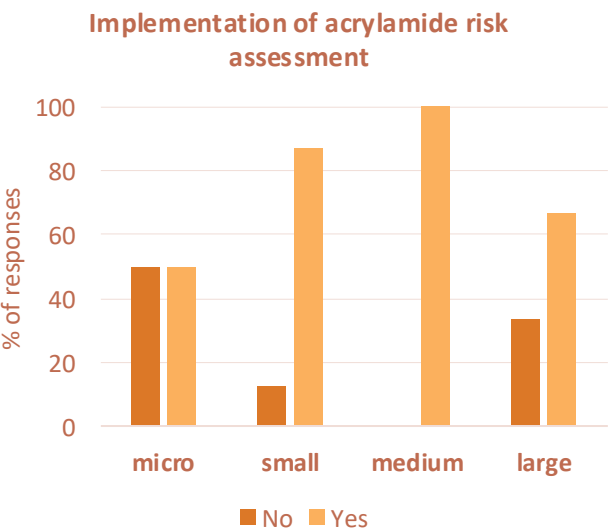
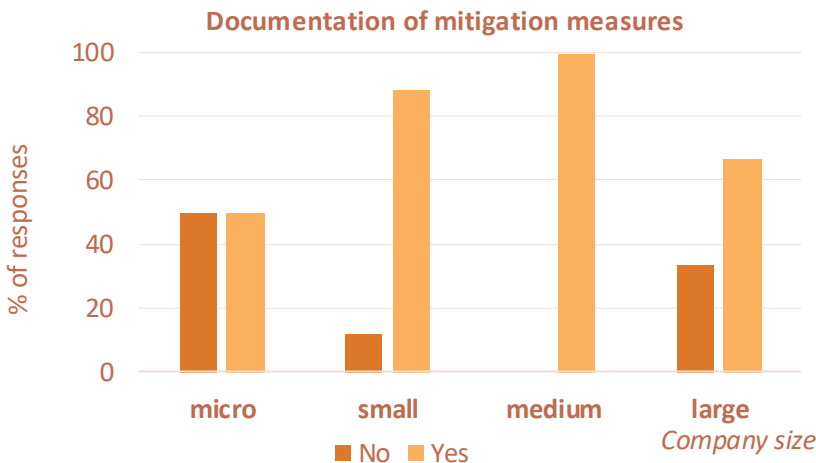


Survey results: Bakers



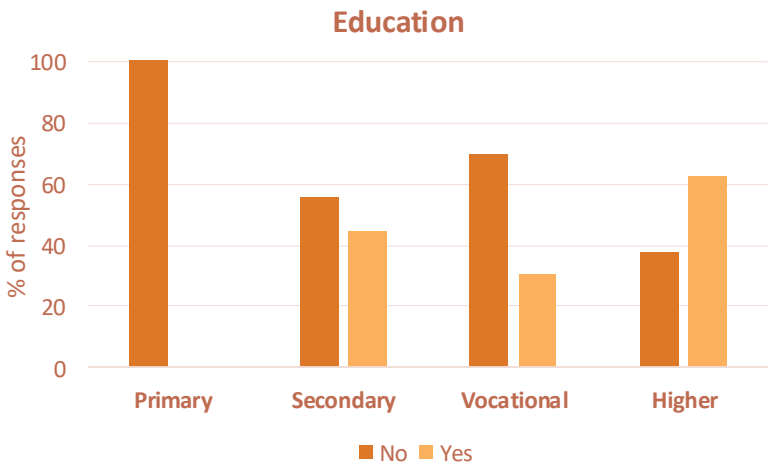
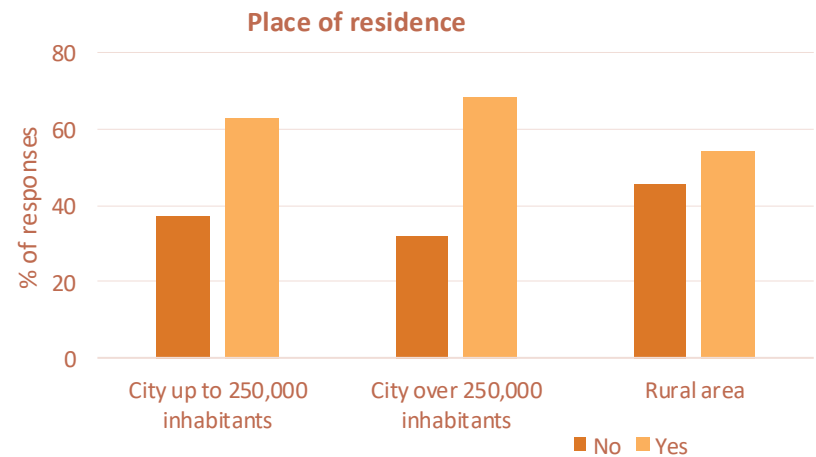
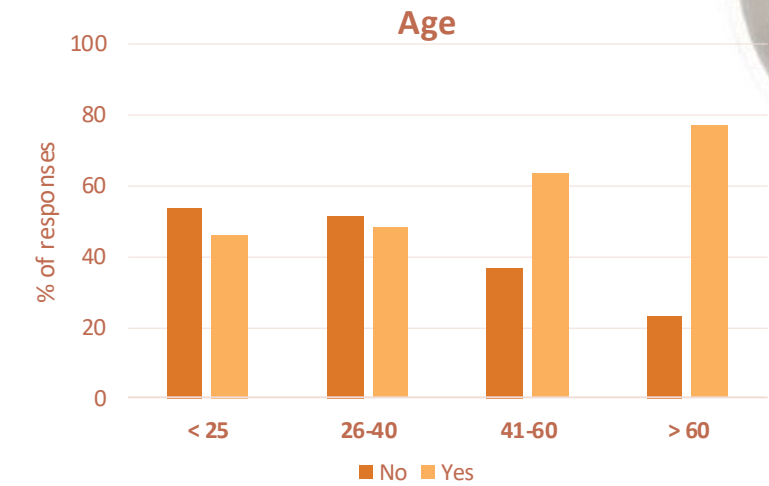
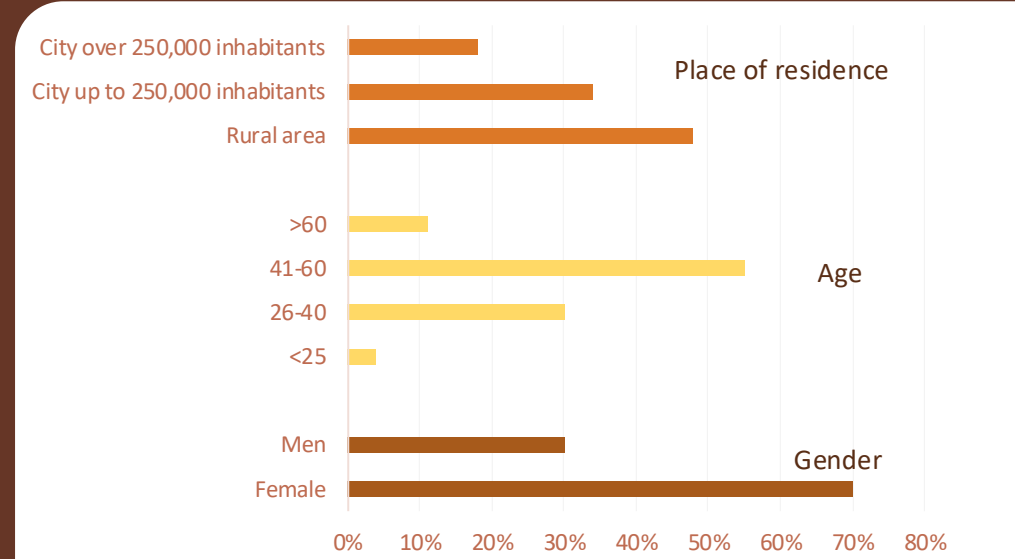
Bakers: acc. to company size:

Micro-enterprise	10% of responses
small	40%
medium	5%
large	45%



Survey results: Consumers

Do you know what acrylamide is?



Conclusion



- Among breeders, 86% were unfamiliar with EU Regulation 2017/2158, and did not assess risk of free asparagine levels in breeding materials. Limited engagement is partly due to a lack of demand signals from downstream sectors.
- Farmers showed similarly low awareness: 62% had never encountered the concept of acrylamide in cereal products, and most lacked knowledge of agricultural practices influencing asparagine levels, including sulfur fertilization.
- Milling companies demonstrated limited involvement, with 83% not measuring free asparagine in grain and obtained flours and few implementing mitigation strategies. Only 17% reported using asparaginase in the range of 40 to 800 ppm. Information exchange between supply chain actors was minimal.
- In contrast, bakeries exhibited high awareness: over 80% of large companies conduct regular risk assessments, implement mitigation measures, and monitor acrylamide levels in accordance with EU requirements.
- Consumer awareness was also limited: only 56% recognized products potentially containing acrylamide, while 80% based bread choice primarily on crust color.
- The findings highlight the urgent need for improved education and communication across the entire cereal supply chain to effectively reduce acrylamide formation from farm to fork.



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Thank you for your attention!

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