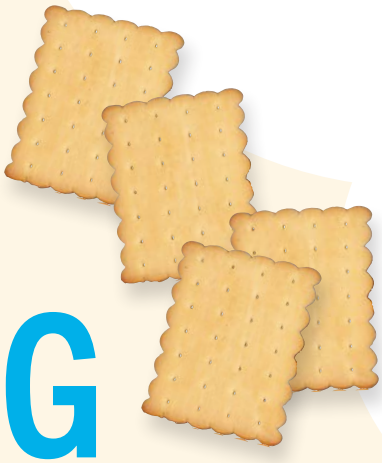
DID YOU KNOW?

Acrylamide is a possible carcinogen identified in starchy foods by the Swedish National Food Administration in 2002

Acrylamide is reported in wheat based products in part per billion (ppb) scale, yet still considered a hazard

WHO & European Commission (EC) have been regularly monitoring acrylamide levels in foods since 2002

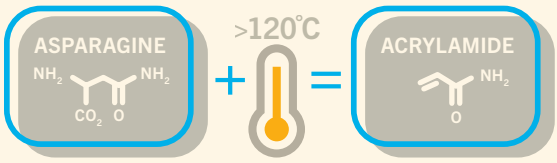


SPONSORS

COLLABORATORS

TACKLING ACRYLAMIDE

in wheat-based products



Asparagine (ASN) is the main precursor to acrylamide formation in wheat-based products

ASN reduction is the best acrylamide mitigation strategy

GENETICS

Breeding for low ASN wheat genotypes

HOW?

AGRONOMY

Sulfur (S) and nitrogen (N) fertilization treatments

RESEARCH LEAD: Martin Scanlon and Ali Khorshidi, Food and Human Nutritional Sciences, University of Manitoba

DIG DEEPER! Addressing the asparagine challenge

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TACKLING ACRYLAMIDE
in wheat-based products

WHAT WE DO

VISION
To maintain Canadian wheat markets through assuring customers that Canadian wheat fulfills safety and functionality requirements

MISSION
To ensure acrylamide levels in bakery products made from Canadian wheat meet benchmarks set by EC

PLAN
To implement genetic and agronomic strategies to reduce ASN levels in Canadian wheat

ACTIVITIES
Three main categories have been defined:

Agronomy
- Eight registered hard red spring wheats
- Four fertilization (N × S) regimes
- Six site years

Genetics
- Gene expression: to identify genes responsible for creation, accumulation and mitigation of free ASN (advise the breeder)
- Breeding: to breed lines with low ASN formation potential

Analysis
- Wheat ASN content
- Bread acrylamide content
- Gluten strength
- Dough performance

WHAT WE HAVE FOUND

Significant effects of Genotype & Environment on ASN content

PROJECT OUTCOMES

- Role of agronomic practices in formation of ASN in wheat and acrylamide in bread
- Lines with low ASN, yet good gluten quality
- Genes responsible for formation & mitigation of wheat ASN
- Training 2 post doctoral fellows and 2 Master's students

Food photo created by wirestock, topntp26, mrsiraphol, master1305, azerbaijan_stockers - www.freepik.com

PUBLISHED RESEARCH: 1. Free asparagine concentrations in Canadian hard red spring wheat cultivars. 2019. Canadian Journal of Plant Science (Free access). 2. Effects of growing environment, genotype, and commercial fertilization levels on free asparagine concentration in Western Canadian wheat. 2021. Cereal chemistry (Free access). 3. Association of asparagine concentration in wheat with cultivar, location, fertilizer, and their interaction. 2021. Food Chemistry

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