

## Tackling Acrylamide in Canadian Wheat Bakery Products

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### Abstract

Acrylamide is a possible carcinogen that forms naturally during thermal processing of starchy foods. Therefore, international and European food authorities have been setting benchmark levels for food sources of acrylamide, e.g., wheat-based bakery products. This might limit Canadian wheat access to the global market, unless international importers of Canadian wheat are assured of its low acrylamide forming potential. Reducing the free amino acid asparagine (ASN) in wheat is known to be the best acrylamide mitigation strategy that can be pursued through gene editing where genes responsible for ASN formation are knocked out. No information is available on genetic mechanisms behind ASN formation in Canadian wheat cultivars. Therefore, in this study, expression patterns of ten genes that are reportedly involved in the accumulation of ASN in wheat were examined in the seeds of four Commercial Canadian cultivars at two seed filling stages. Significant differences in the expression levels of *ASN synthetase* and *glutamine synthetase* genes of the studied cultivars were observed. ASN level was closely associated with the expression levels of *glutamine synthetase* genes, i.e., *TaGS1c*, *TaGSr1* and *TaGS2p*. The information from this study could provide a backbone for the development of low ASN Canadian wheat genotypes through gene editing.