

# A recent survey of ergot alkaloids contamination of wheat in western Canada

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Wheat is Canada's largest crop with most of the production in western Canada. Ergot alkaloids are mycotoxins mainly produced by fungi of all species of the *Claviceps* genus. Previous studies showed that mycotoxins occur in a wide variety of crops and most of them are associated with severe diseases such as mutagenic, carcinogenic, and teratogenic activities. The aim of this study was to evaluate the occurrence of ergot alkaloids in wheat samples. Fifty-nine wheat samples were randomly selected during May and June 2016 in western Canada. The six main ergot alkaloids were determined by liquid chromatography-tandem mass spectrometry method at Prairie Diagnostic Services Inc. Results showed that ergot alkaloids were found in 56 (94.9%) wheat samples (with a mean concentration of  $1083.6 \pm 3434.3$  ppb). For ergocornine, ergocristine, ergocryptine, ergometrine, ergosine, and ergotamine, the contamination rates were 59.3%, 76.3%, 64.4%, 76.3%, 72.9% and 59.3%, and their mean concentrations were  $57.8 \pm 239.2$ ,  $569.9 \pm 1858.9$ ,  $116.6 \pm 356.0$ ,  $102.2 \pm 332.9$ ,  $32.4 \pm 111.6$ , and  $204.7 \pm 689.8$  ppb, respectively. Total ergot alkaloids concentration of 7 samples (11.9%) exceeded the recommended tolerance level (2000 ppb) for dairy cattle, which may cause severe toxic effects (reducing feed consumption, altering rumen fermentation, suppressing immunity, irritating tissues, etc.) when used in dairy cattle diets. In conclusion, results suggested that high proportion of wheat in western Canada is under threat of ergot alkaloids contamination, and more efforts are needed to minimize its harm to the dairy industry and develop a rapid screening method with non-wet chemistry and non-destructive molecular spectroscopy.