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ACCEPTED MANUSCRIPT

Impact of pre-harvest rainfall on the distribution of fusarium mycotoxins in wheat mill fractions

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Legislative limits for *Fusarium* mycotoxins decrease from unprocessed wheat to processed products. A previous observational study identified a seasonal difference in the distribution of DON but not ZON within mill fractions. Rainfall is known to influence the production of these mycotoxins in wheat, but the effects of rainfall on their distribution within mill fractions is not known. Laboratory and field experiments were conducted to determine the impact of different watering regimes on the distribution of DON and ZON in wheat mill fractions. Results indicated that repeated wetting and drying could cause movement of DON towards equilibrium across the mill fractions. Whereas, high levels of rainfall could cause a large reduction of DON in the grain, predominantly from the bran fraction, resulting in a proportional increase within white flour. ZON was detectable in fewer samples but results indicated it is less mobile within the grain. It is important for processors to be aware of the variation of mycotoxin distribution within mill fractions and the drivers of this variation to ensure limits set for grain intake result in mill products within mycotoxin legislative limits.

Keywords: fusarium; mycotoxin; deoxynivalenol; zearalenone; wheat; milling; flour; bran; offal; water

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