

Information Sheet: Tropane Alkaloid Contamination in Cereals

Prepared by John Points Consulting, June 2017, www.johnpoints.com

Tropanes are naturally occurring toxic alkaloids in a number of plants, including henbane, deadly nightshade, mandrake and jimson weed (native in the US). The most widely known natural tropanes are atropine and scopolamine. Atropine is a mix of two optical isomers (mirror image molecules); the pure isomer is hyoscamine.

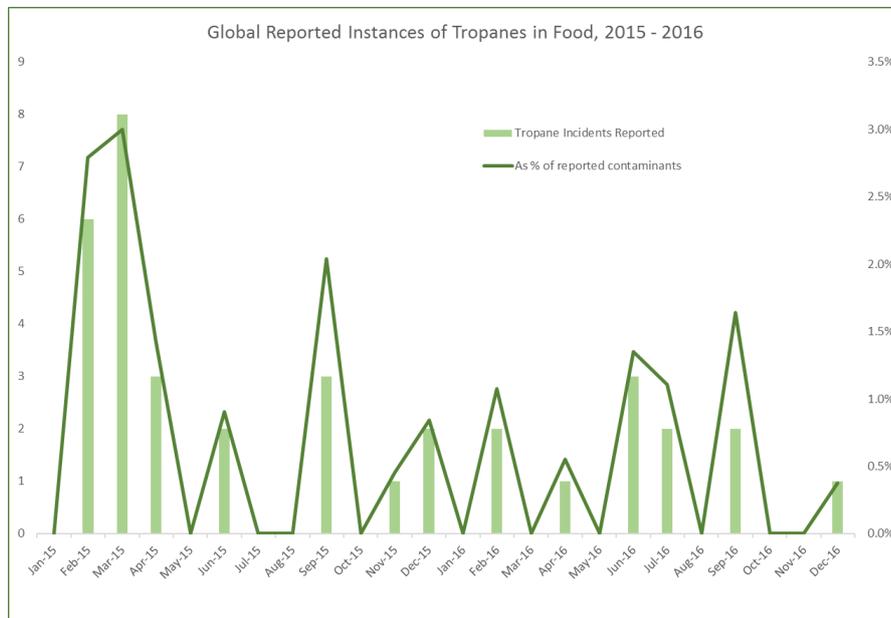
Tropanes act by interrupting the nerve signals. As well as being hallucinogenic, they have medicinal uses such as muscle relaxants or for reducing salivation.



When tropane-containing weeds are inadvertently harvested with fodder grasses then there is a risk that they can be consumed by animals. Such feed contamination has long been known as a cause of racehorses failing anti-doping tests for atropine and scopolamine. Until recently there was little consideration of any analogous contamination risk into cereals for human consumption; the presence of such well-known poisonous weeds in commercial agricultural crops seemed unlikely. This assumption has changed in the last few years, with an appreciation that the rapid market growth in non-wheat grains and flours could drive changes to the sourcing of cereals. The discovery of tropane contamination in various samples of Austrian millet flour in 2014/15 prompted the FSA to add tropanes to its watch-list of emerging risks. This led to increased awareness and testing within the UK.

A review of published incident data from the past two years¹ suggests that, despite increased testing, there is no evidence of an increase in incidents of tropane contamination. The pattern is consistent with this being a niche risk in a limited range of crops that has been occurring for a prolonged period, and was uncovered by testing changes. If you source one of the few affected ingredients (particularly millet, sorghum and corn from South-Eastern Europe – see Figures 2 and 3) then tropanes should definitely be on your risk radar. But for the bulk of flours and grains, there is no evidence that they are a more general risk.

Figure 1



Tropane incidents are considered both as absolute numbers and as a proportion of contaminant incidents (other natural toxins, environmental contaminants, agrochemical contaminants) to normalise for any change in overall testing trends or changes to Horizonscan data sources.

Figure 2

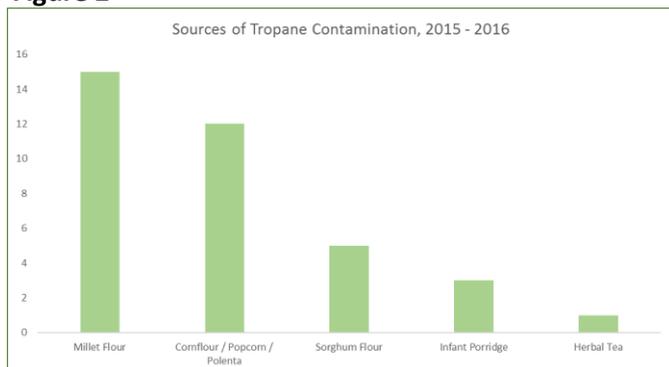
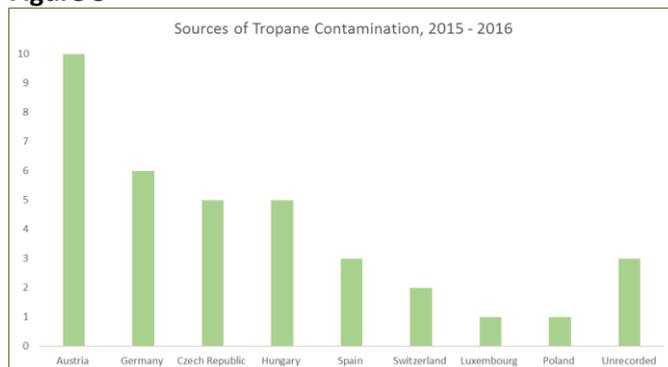


Figure 3



ⁱ Incident data sourced from Horizonscan, <https://horizon-scan.fera.co.uk>
 Image from Robert Seago, <http://wildflowerfinder.org.uk/Flowers/H/Henbane/Henbane.htm>