

## ***Public Health Scientist with expertise on Dioxin***

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This role involves less imagination than some of the others. The idea is to give students a good sense of scientific uncertainty, as well as of what *is* known about dioxin and dioxin-like compounds (i.e., carcinogenic, reproductive and developmental health affects associated with dioxin.) Explain that the dose is important in determining damage. Remember, the students do not know exactly where it came from or for how long the chickens were exposed. They also do not know if humans who ate the chickens could have been exposed to enough to cause health effects. Mention the ongoing EPA reassessment of Dioxin and background levels of dioxin/WHO Tolerable Daily Intake. Also, in playing this role, take advantage of the fact that you are not representing a government agency. You do not have to worry about your constituents, politics, etc.

### **Questions for Public Health Scientist with expertise on Dioxin and ANSWERS:**

#### **Q: What is dioxin?**

A: Dioxin is a chemical, most often we think of 2,3,7,8-tetrachlorodibenzo-p-dioxin or TCDD. In addition to TCDD there are other compounds that have similar structures and act similarly in the environment. Together, these are often referred to as "dioxins".

#### **Q: Where does dioxin come from?**

A: Dioxins have no commercial usefulness by themselves. They are formed during combustion processes, such as waste incineration, forest fires and backyard trash burning, and during manufacturing processes such as in the production of herbicides for killing weeds and the manufacturing of bleached paper.

#### **Q: How could it kill chickens?**

In laboratory animals, dioxins are highly toxic, cause cancer, and alter reproductive, developmental and immune function. High doses of dioxins could kill chickens.

**Q: What happens to humans who are exposed to dioxin?**

A: In general the effects of dioxin on humans were only observed in populations that were highly exposed. Some studies have shown that chemical workers exposed to high levels of dioxin had increased cancer. Other studies in highly exposed people show that dioxin exposure can lead to reproductive and developmental problems, increased heart disease and increased diabetes. Many of them had what we call chloracne, as Ukrainian presidential candidate Viktor Yushchenko had last year.

The effect of the long term low level exposure that is normally experienced by the general population is not known.

**Q: If something causes cancer, why would chickens be born with two heads? What other problems might there be, other than cancer?**

A: Two headed chickens would be the result of something disrupting the reproductive system. This is a different response from cancer, but something like dioxin could do both (i.e., cause cancer and have reproductive outcomes). The long-term effects of dioxin exposure on human immunity, reproduction and development, and other organs and systems remain focal points for ongoing research.

**Q: Could people eating dioxin-contaminated chicken get sick?**

A: Depending on the amount of dioxin ingested, and over what period of time, humans could get sick.

**Q: How much dioxin do we need to eat to get sick?**

A: We don't know. The World Health Organization, a large, international organization, has recommended a Tolerable Daily Intake for dioxins. This is based on what they think is safe given the effects considered to be the most sensitive in experimental animals, namely endometriosis, developmental neurobehavioural effects, developmental reproductive effects and immunotoxicity.

**Q: Should people in Massachusetts be concerned about this?**

A: *[make this one up!]*