

# Anaheim: Target, 2007

- Our chemical world-It's about Use!
- Food and environmentalism
- Everything goes somewhere! (*see Website*)
- Safety evaluation
- Biomonitoring: How little is *really* OK?

# ***We live in a chemical world!***

More than 31,500,000 known

- Origin

**Natural and Synthetic**

- Class

**Organic and Inorganic**

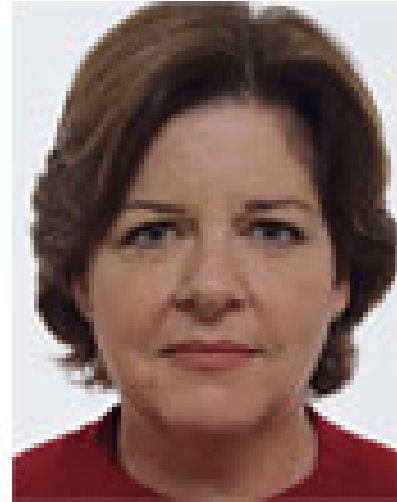
- Use

Process • ***Commercial Products*** • Pollutants

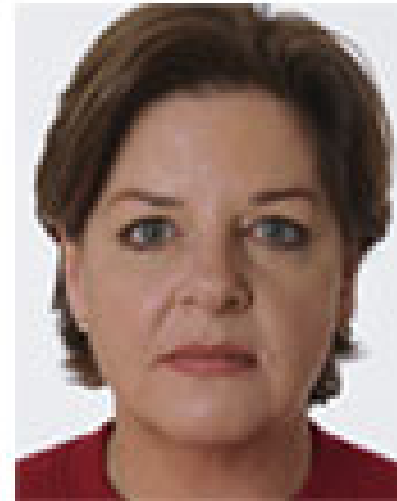
Foods • Drugs • Cosmetics • Pesticides

# BOTOX: *Botulinus* toxin

Before



After



# How much is too much? How little is OK?

## Exposure

- Dose makes the poison.
- All-or-none.

## Response

- Safe levels of everything.
- Anything spells harm.

## Safety Evaluation

- Aware testing limitations
- Testing irrelevant.

***Pesticide Perceptions are our Chemical World***

# Environmental Chemistry

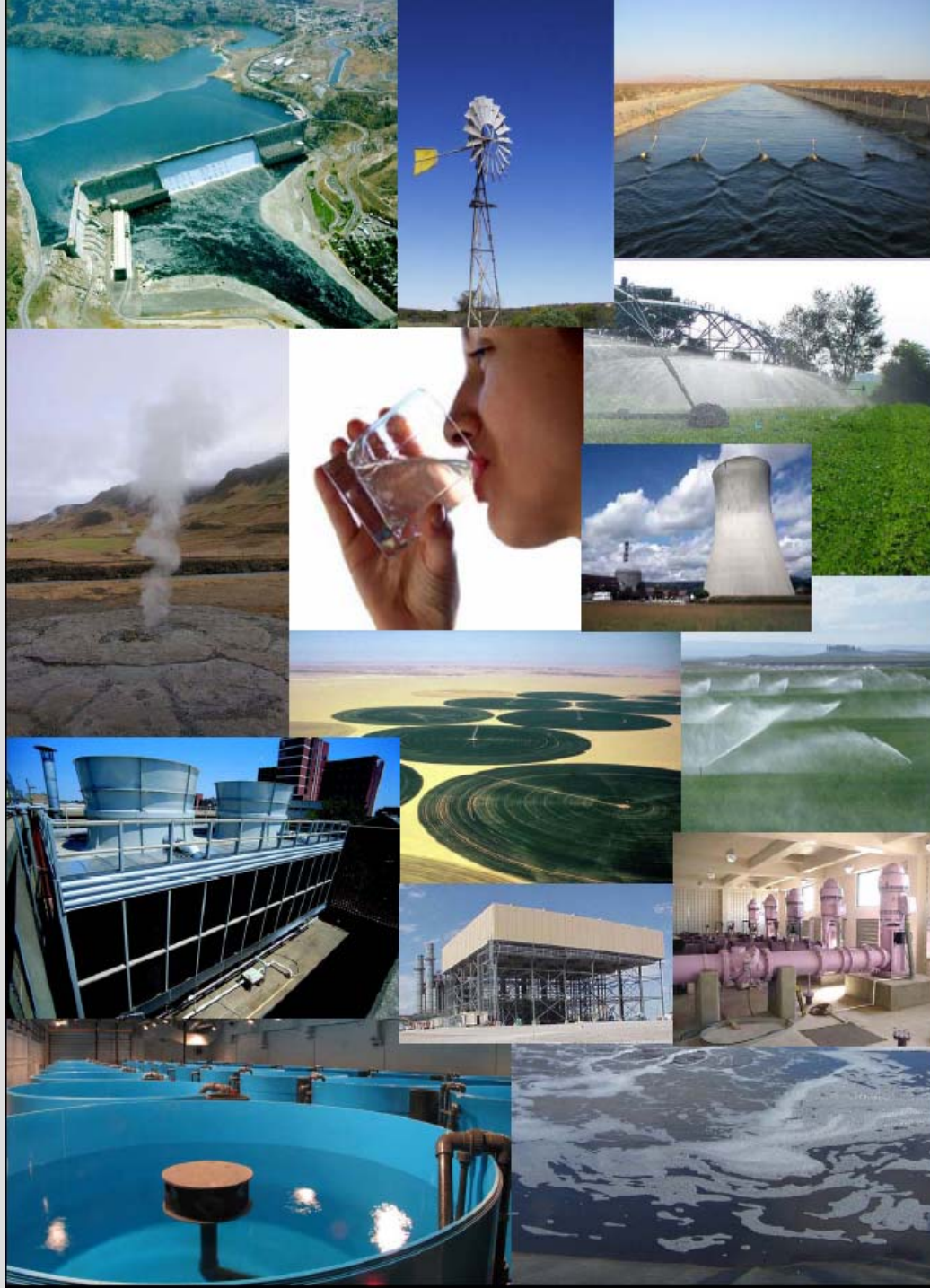
Analytical Limbo—How low can  
you go!

*Even **Zero** isn't none; but it is not very much!*

- 0.1 ppm<sub>RCDDT</sub> is **one** 3.5 gallon toilet flush in 7000 sewage tanker truck loads<sub>FTT</sub>  
*or*
- 1 grain of table salt in 20 pounds
- Measurable levels are invariably below harmful amounts! ***Exposure isn't an effect!*** Food Residues are about marketing, Good Ag Practices, and trade!

# Modern Chemical Analysis

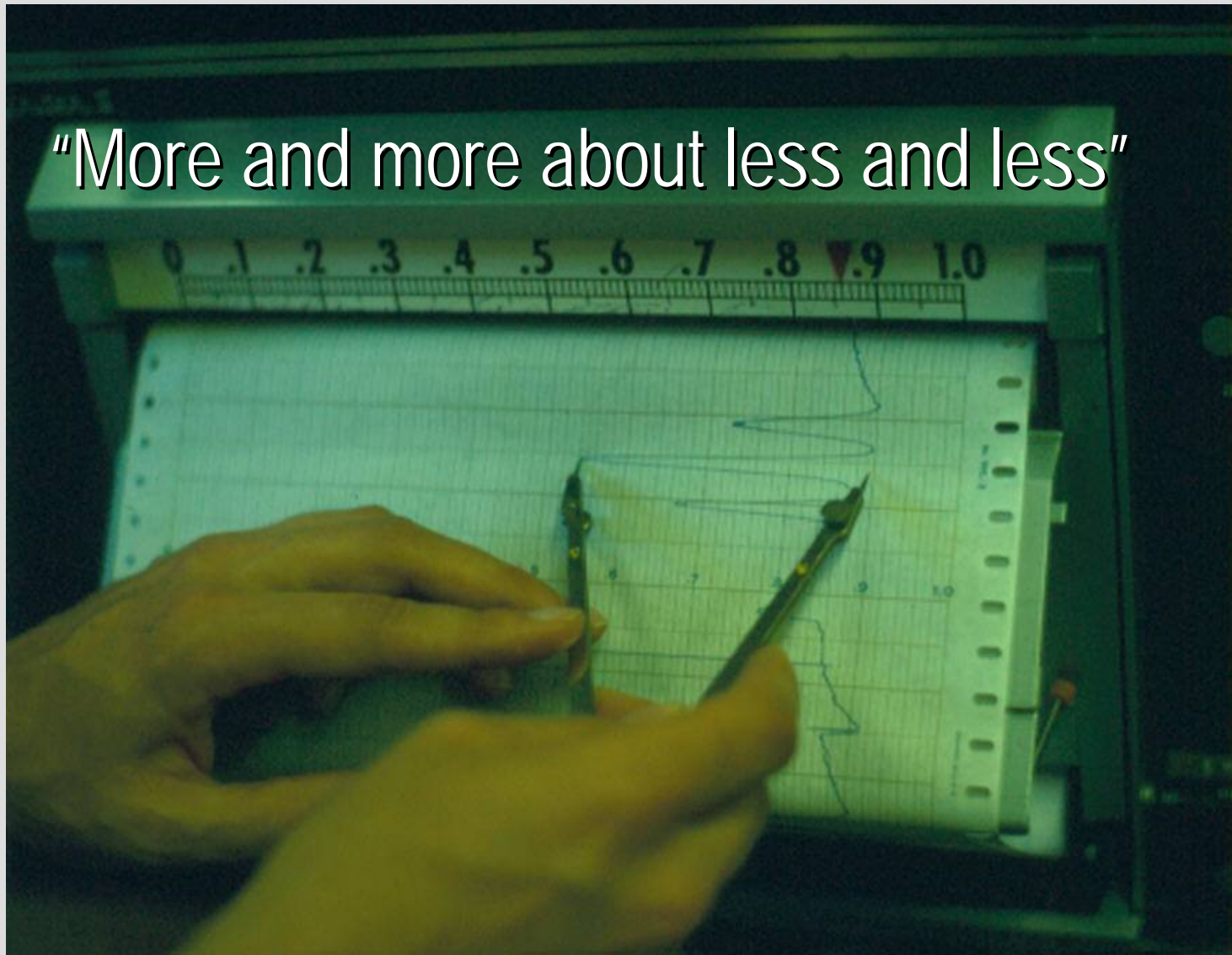
Confirms the  
*Laws of  
Conservation  
of Matter*



*Everything  
goes  
somewhere*

**that only  
chemical  
analysts  
can find!**

"More and more about less and less"



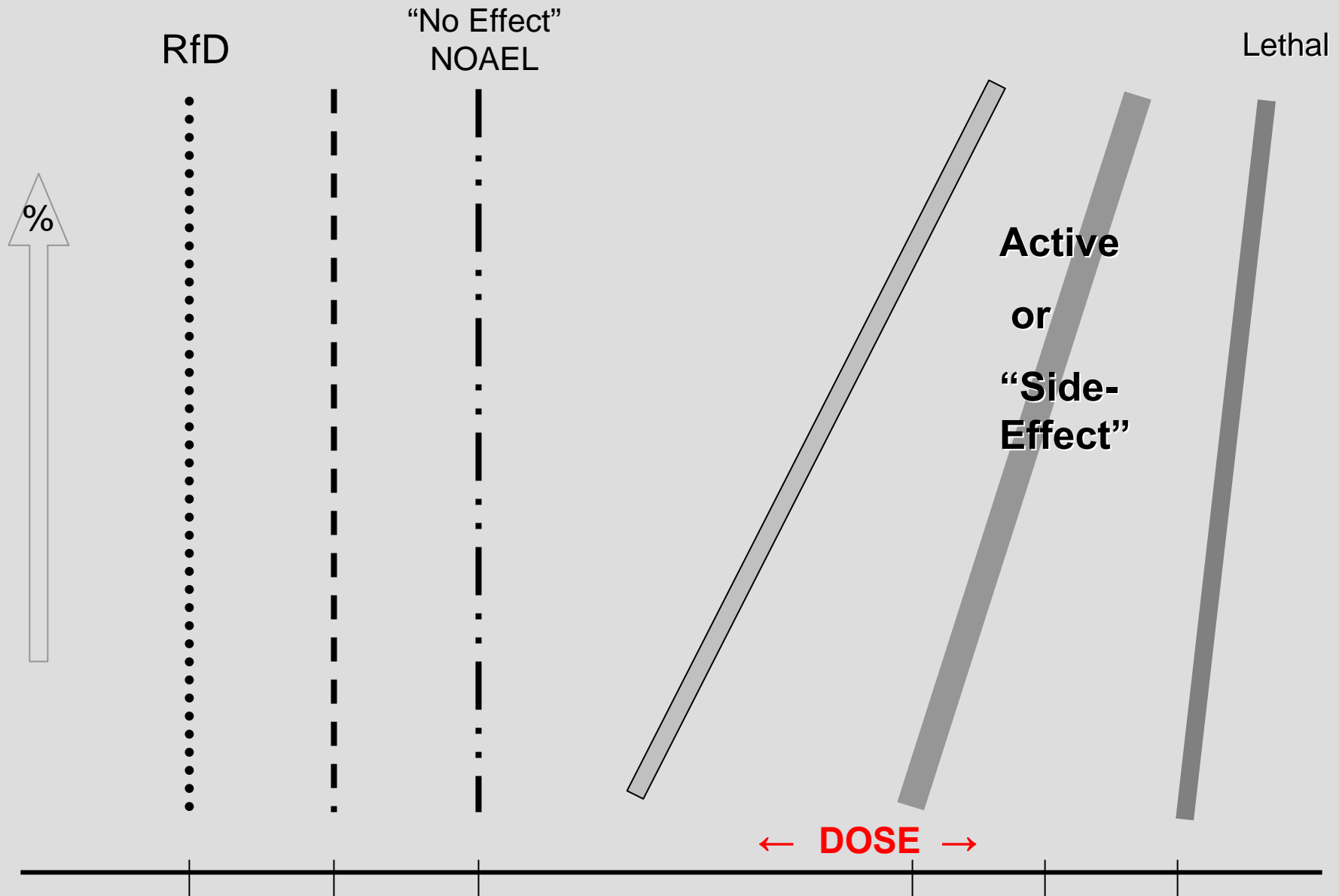


# Safety Evaluation

Scientific Studies in Support of  
Patterns of Pesticide Use

Safety is about use!

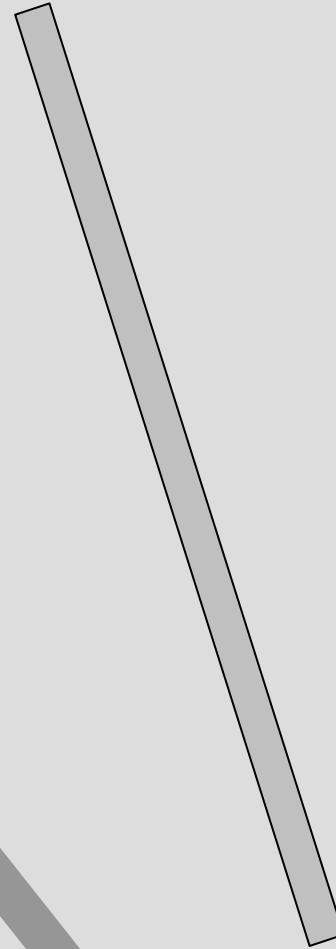
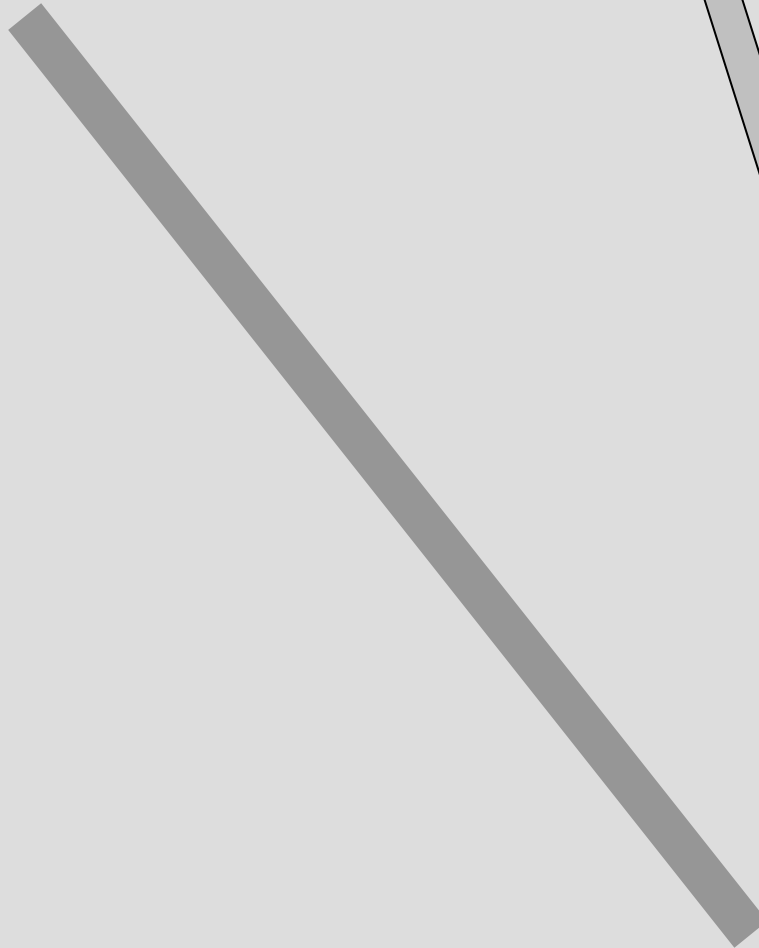
# Safety Evaluation: Exposure-Response Relationships



# What about everyday exposures and safety evaluation?

Normal

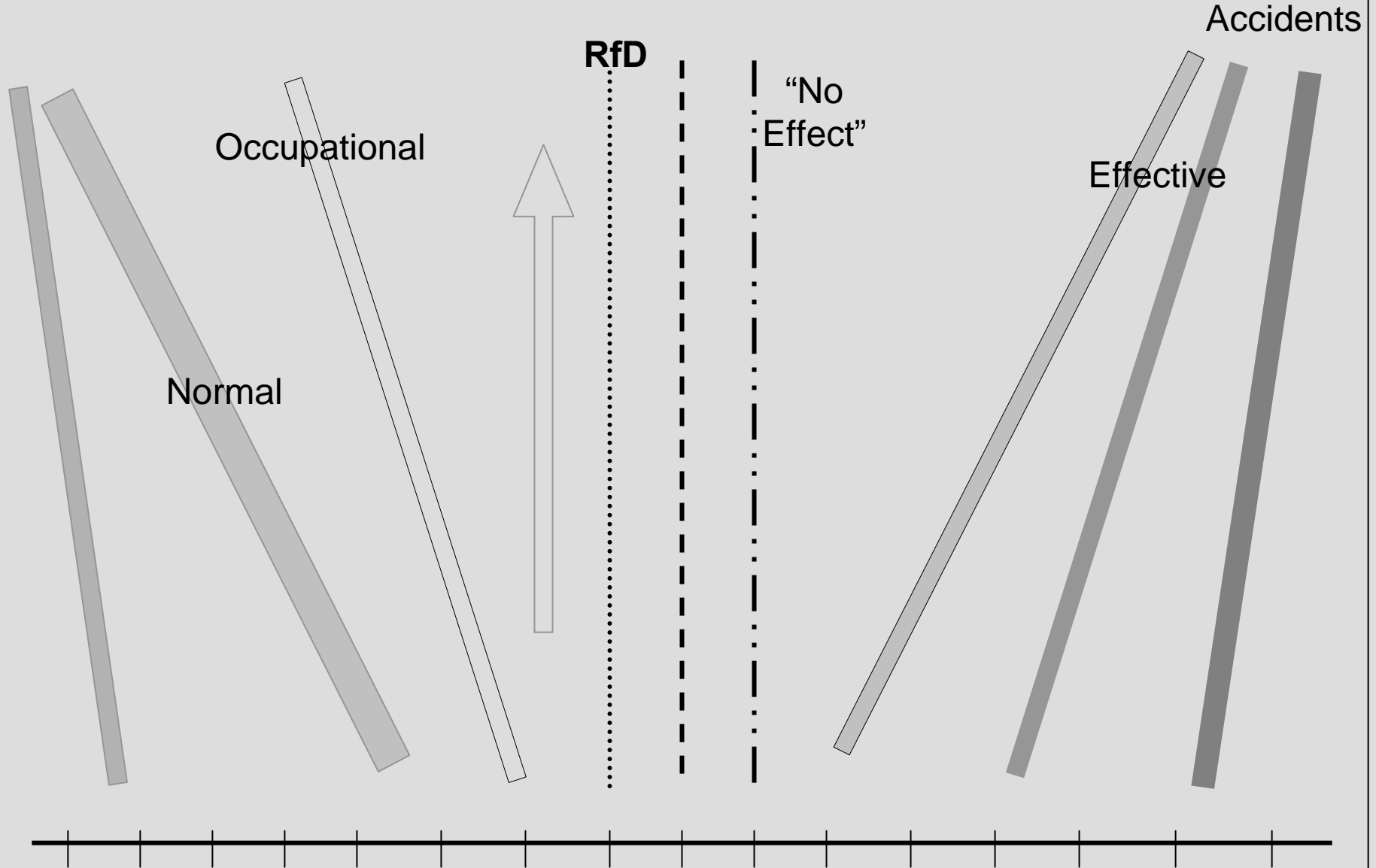
Occupational



← DOSE →



# Yes, Exposure goes with use!



# Risk Reduction: Exposures for a 70 kg rat with 1000x safety factor

✓ Decaf coffee

- Non-Alcohol beer
- Tooth brightner
- Potatoes

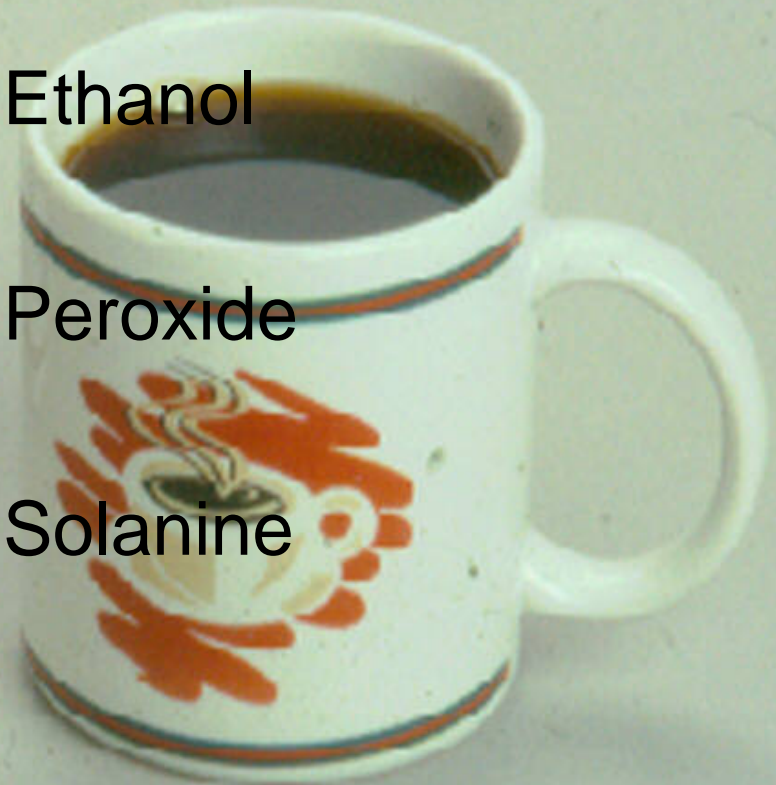
- Caffeine

- Ethanol

- Peroxide

- Solanine

**Just how crazy is this?**





# Look at Safety Record

**Does Safety Evaluation work? Yes, if *you* do!**

## **Biomonitoring:** How much is *really* OK?

- Capture your exposures:  $A \rightarrow B + C$
- **Pesticide Biomarkers** only
- FedEx studies are feasible in many cases
- **You** and only you *get*- 1. your level, 2. avg. study level, 3. regulatory safe level
- **Your industry** *gets* credit for safe use!
- **Regulators and public** *get* better data!