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THE POLICY-MAKER'S DILEMMA: WHAT HAPPENS WHEN YOU FIND FLAME RETARDANTS IN FOOD?

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Michigan Incident, 1973

- Magnesium oxide accidentally replaced by HBB
- Unknown quantity involved – estimated half a ton, possibly more
- Severe ill health in dairy cattle after 4 months
- Cause only identified after 11 months
- Widespread distribution throughout the feed and food chain
- Adverse health effects seen in farmers and consumers
- Series of cover-ups by companies and authorities
- Slaughter of 1.5m chickens, 30,000 cattle, 6,000 pigs
- Final cost estimated at over $200m (>$750m equivalent today)

So

1.BFRs in food is not a new problem

2. Feed contamination led to a major incident

3. Regulators very limited in knowledge and tools

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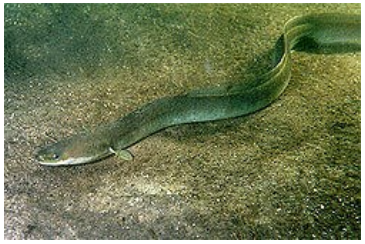
FSA work on BFRs – from 2002

- Trout and eels in the Skerne-Tees river system (Great Lakes BFR manufacturing plant at Newton Aycliffe, County Durham)
  - Very high levels locally. Plant closed.
- Total Diet Study (2001 TDS samples)
  - Inconclusive (limits of detection too high)
- Farmed and wild fish and shellfish survey
  - 48 composite samples plus 10 fish oils
  - PBDEs > HBCDDs >>PBBs
  - BDE-47 & BDE-100 in all samples (BDE-99 in all but one)
  - No immediate toxicological concerns (COT)



	µg/kg whole weight								
BDE-	*28*	*47*	*49*	*66*	*99*	*100*	*153*	*154*	*ΣBDE*
Farmed Salmon	0.11	2.01	0.48	0.11	0.48	0.4	0.07	0.17	3.85
Wild (Atlantic) Salmon	0.05	0.93	0.18	0.06	0.24	0.2	0.04	0.11	1.82

BDE-209
0.41
0.06

	µg/kg whole weight			
	α-HBCDD	*β-HBCDD*	*γ-HBCDD*	*ΣHBCDD*
Farmed Salmon	1.13	0.12	0.09	1.34
Wild (Atlantic) Salmon	0.56	<0.06	<0.09	0.71

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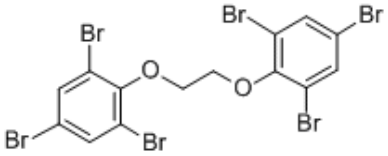
FSA work on BFRs

- Total Diet Study (2003 TDS samples)
  - Good detection limits achieved
  - PBDE exposures highest, but no immediate safety concerns (COT)
- Food survey
  - PBDEs found most frequently
  - Levels generally low
  - Evidence for HBCDD metabolism
  - Novel BFRs included



Bis-(tribromophenoxy)ethane (BTBPE)

Detected in 5/17 meat samples, 5/20 offal, 1/7 eggs

	Number of detections			
Congener	Offal (n=20)	Meat (n=17)	Eggs (n=7)	Milk & dairy (n=10)
BDE-47	19	15	6	10
BDE-49	1	2	5	1
BDE-66	1	2	1	1
BDE-85	1	0	2	0
BDE-99	19	16	7	10
BDE-100	15	12	7	8
BDE-138	1	3	3	0
BDE-153	17	16	7	10
BDE-154	9	11	5	3
BDE-183	15	12	6	1
BDE-209	6	1	5	3

	Offal (20)	Meat (17)	Eggs (7)	Milk & dairy (10)
α-HBCDD	2	6	1	1
β-HBCDD	0	1	1	0
γ-HBCDD	0	0	0	0

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EU and EFSA involvement

Began to appear on Dioxin Expert Committee agenda 2005

Submission From Commission to EFSA, 16 June 2009

> In order to assess the need for regulatory measures as regards BFR in food, EFSA is requested to assess the risks related to the presence of BFR in food.

Opinions to cover PBBs, PBDEs, HBCDDs, TBBPA, Br-phenols, emerging BFRs

Outcomes

- **PBBs**: levels in food very low and falling; no further interest
- **PBDEs**: manufacture and use phased out BUT still widely present; concern over BDE-99 exposure; gaps in toxicology

  => Monitoring should continue
- **HBCDDs**: no concerns identified but manufacture and use increasing

  => Monitoring should continue
- **TBBPA**: lack of data; metabolism expected
- **Brominated phenols**: some naturally occurring; absence of data
- **Emerging BFRs**: very little information available about production, usage, safety, toxicology, environmental impact, long-term fate

NB: EFSA only considered dietary exposure.

Other routes of exposure NOT taken into account

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So what's the dilemma?

- Long term impacts of BFRs
- Some meet the criteria for Persistent Organic Pollutants (POPs)
  - **P**ersistent: widespread environmental contamination
  - **B**ioaccumulative: found in fatty tissue & human milk
  - **T**oxic: range of adverse health effects in experimental animals
- Although not generally dioxin-like, many similarities particularly to PCBs in terms of history
  - PBB use and manufacture banned in the 1970s
  - PBDE manufacture banned in mid-2000s
  - PBDEs listed under the Stockholm Convention in 2009
  - Deca-BDE phased out after ECJ judgment
  - HBCDDs under consideration for listing

All of these actions are retrospective
What does the future hold and how do we prepare?

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Questions to consider

- How do we respond to the EFSA recommendations (given the large number)?
- How do we prioritize research funding (between flame retardants; against other POPs; against other chemical safety issues; and against other food safety concerns?
- Do we actually know where they enter the food chain?
- What do we do about novel and emerging BFRs, in view of the large information gap?
- How would we respond to a major incident?
- How do we provide reassurance to consumers if flame retardants become a major media story (in the UK/Europe)?
- How do we bring non-dietary exposures into assessment of risk to consumers?
- Do we need to consider setting limits in food?
- How can we contribute to the wider process of addressing this problem to protect future consumers?

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Thank you

Questions?

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