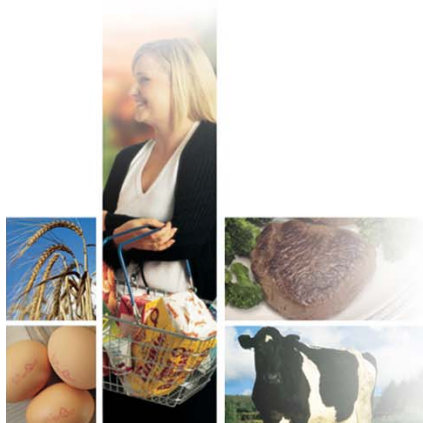




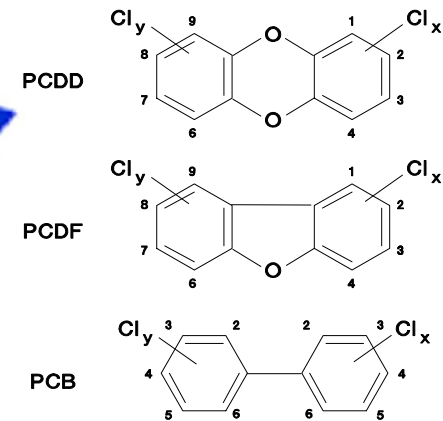
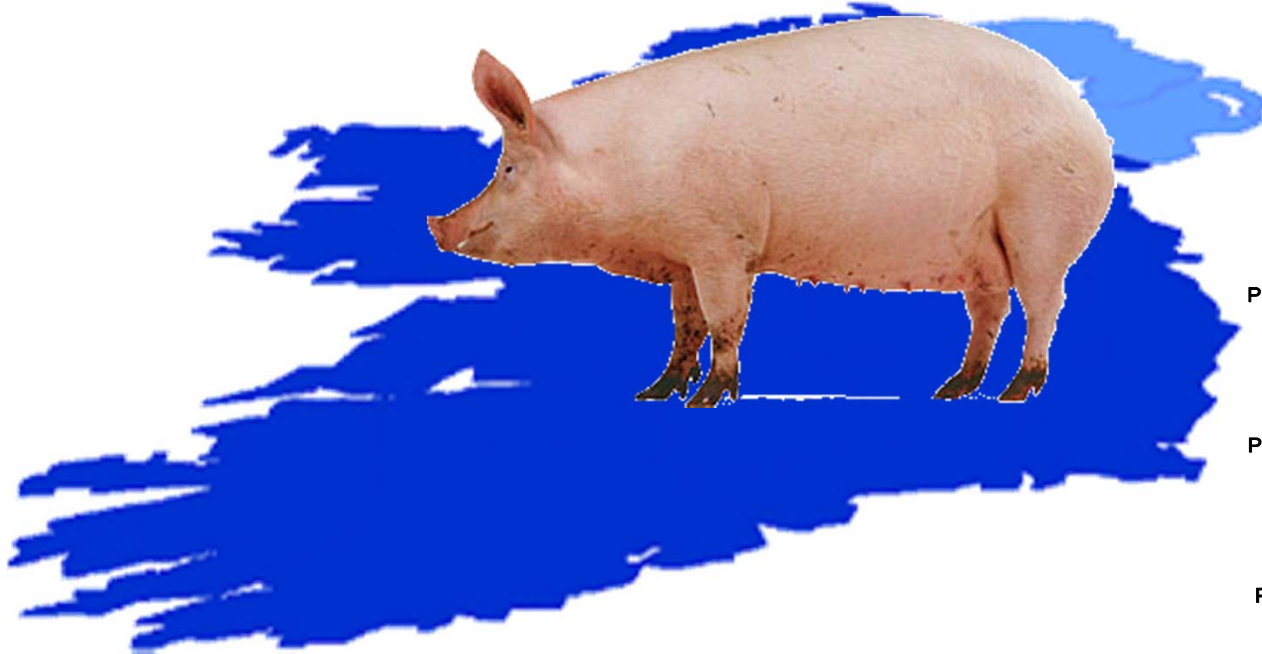
12th Annual Joint FERA/JIFSAN Symposium
Maryland, June 2011

Making Decisions Despite Uncertainty: The Irish dioxin crisis 2008

Dr Wayne Anderson
Food Safety Authority of Ireland



Ireland: December 2008



- **Dioxins and early crisis events**
- **Areas of uncertainty and exposure assessment**
- **Risk communication**



PCDD/PCDFs

- The term “dioxin” covers a group of chemically similar substances:
- 75 polychlorinated dibenzo-p-dioxins (PCDDs) and
- 135 polychlorinated dibenzofurans (PCDFs)
- 17 of toxicological concern



How Did We Find It?

Pesticide Control Service, DAFF



National Residues Monitoring Programme



Time Line 2008

November

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	Pork fat sample taken		19	20	Visit to index farm	
23	24	Preliminary Marker PCB result			28	29
30						

December

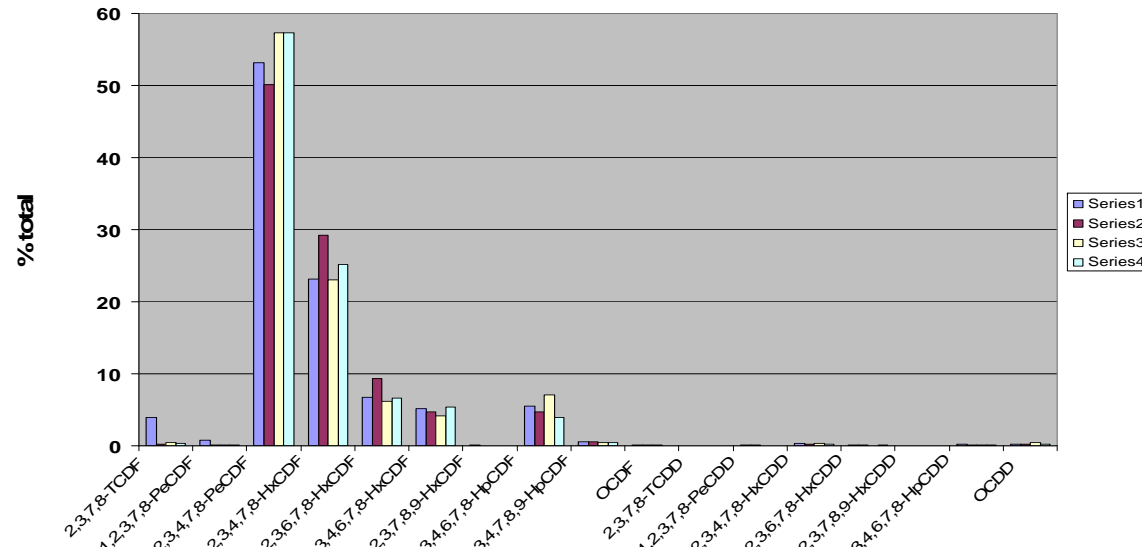
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Further pig restrictions / Press statement			Dutch information provided			
1	2	3	4	5	6	
Confirm marker PCB result Restriction of pig movement Crumb feed sample mPCB positive				11	Dioxins confirmed High level meetings Full recall of Irish pork	
21	22	23	24	25		
28	29	30	31			

Decision: Sat 6th December 2008

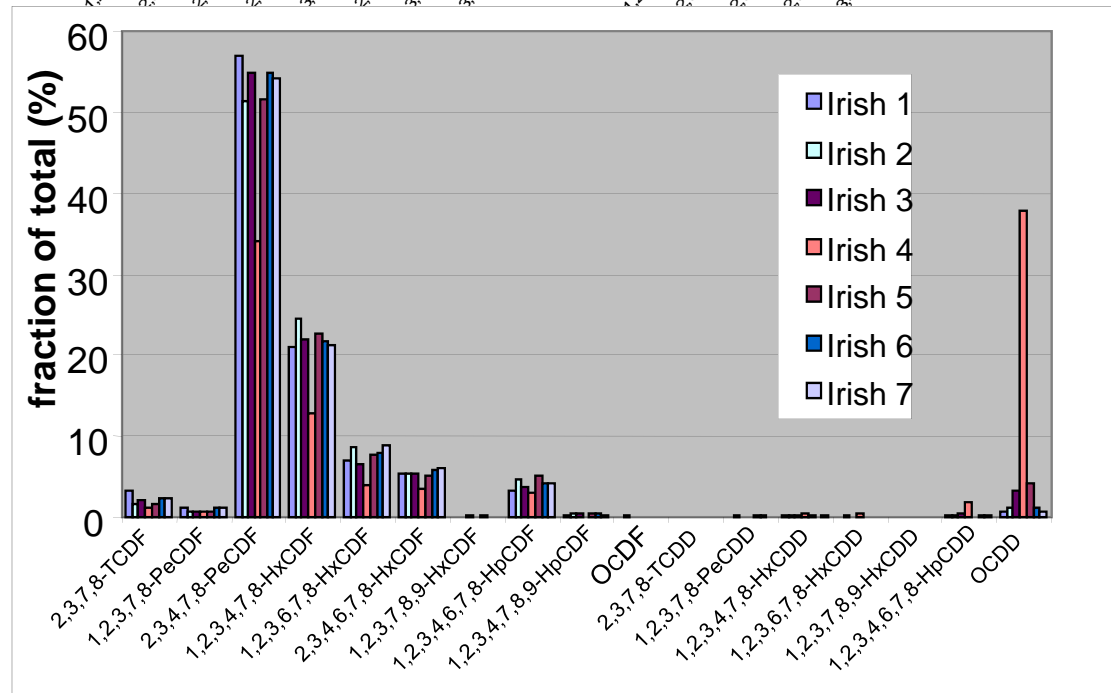


Cooperation: Pattern of dioxins (absolute)

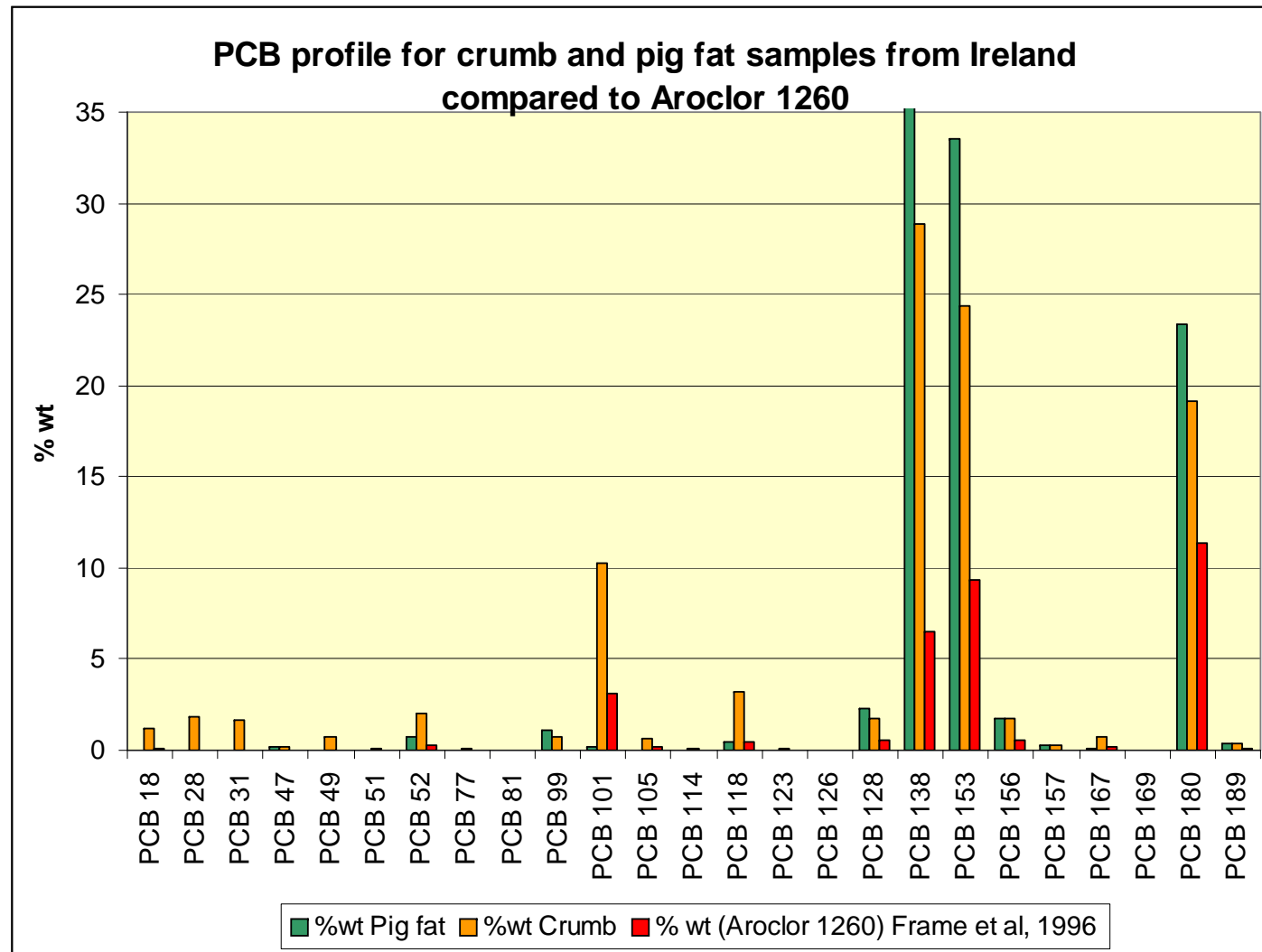
Irish Samples



Dutch Samples



Science can help focus investigations



Data summary

- **Same dioxin and PCB profiles in pork meat samples in IRL / NL / FR**
- **NDL-PCBs in pork 500-3000ppb**
- **Ratio NDL-PCBs / dioxin-TEQ was low compared to previous incidents like Belgium**
- **Dioxins almost exclusively PCDFs**
- **Data suggests – Aroclor 1260 contamination (transformer oil)**

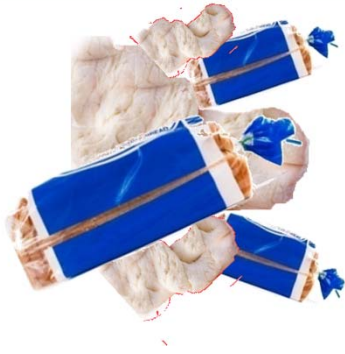


Main Areas of Uncertainty for Exposure

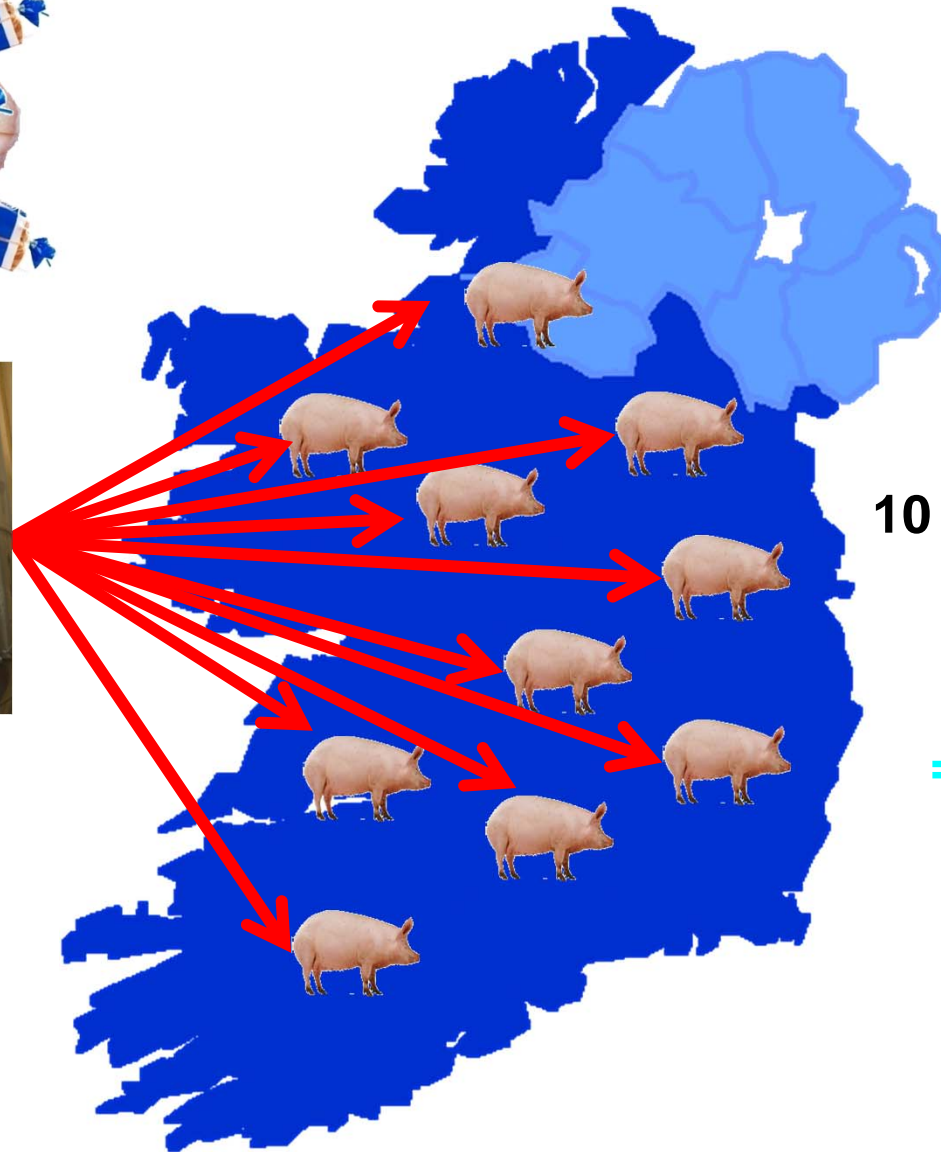
- U1: Percentage of pig herd exposed to feed
- U2: Time exposure to contaminated feed and pork
- U3: Subsequent level of contamination in pork fat
- U4: Consumption of pork and pork products in Ireland



U1:Percentage of the Pig Herd



One Recycling Plant

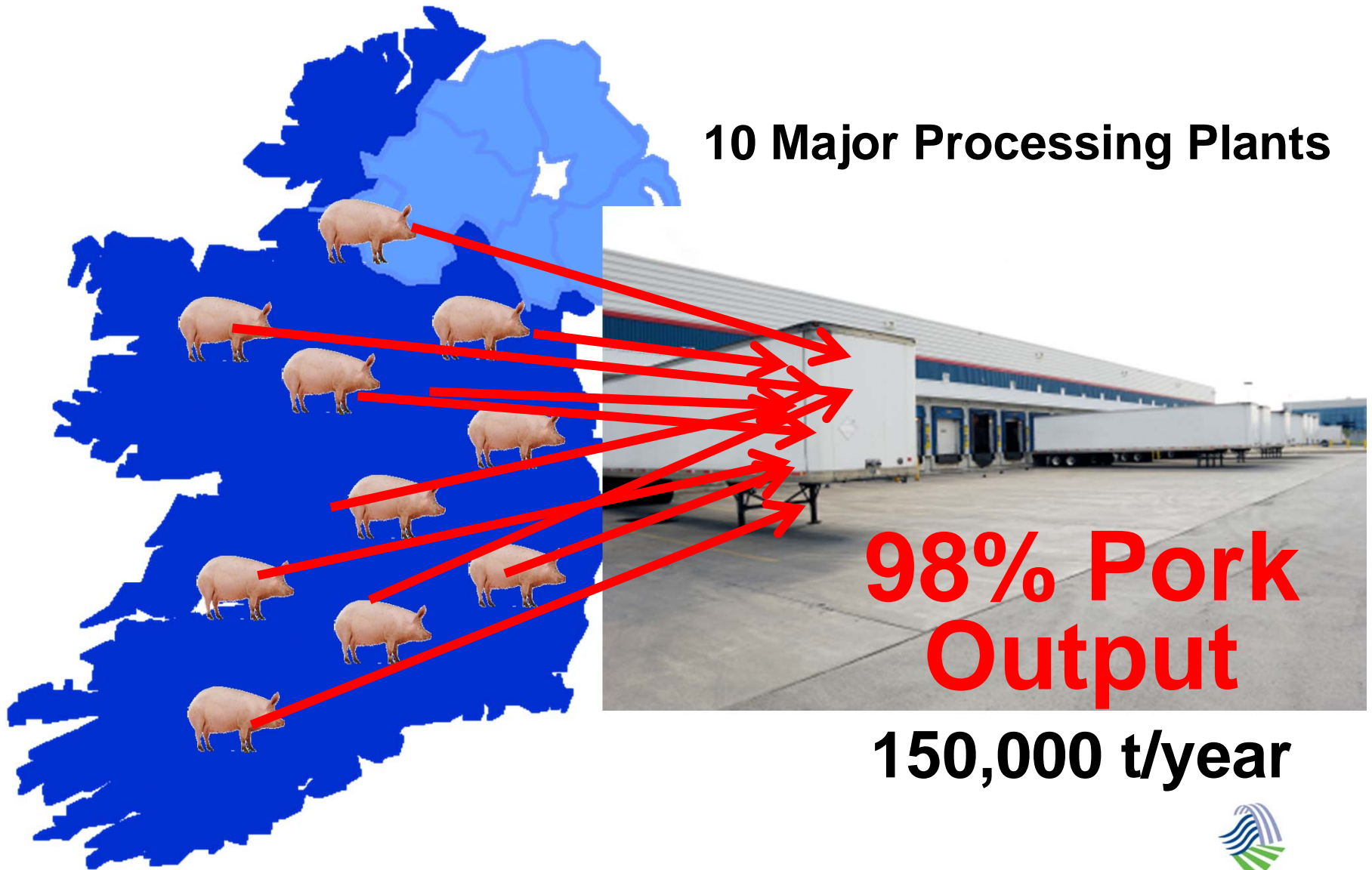


10 Pig Production Farms

= 8% National Pork Output

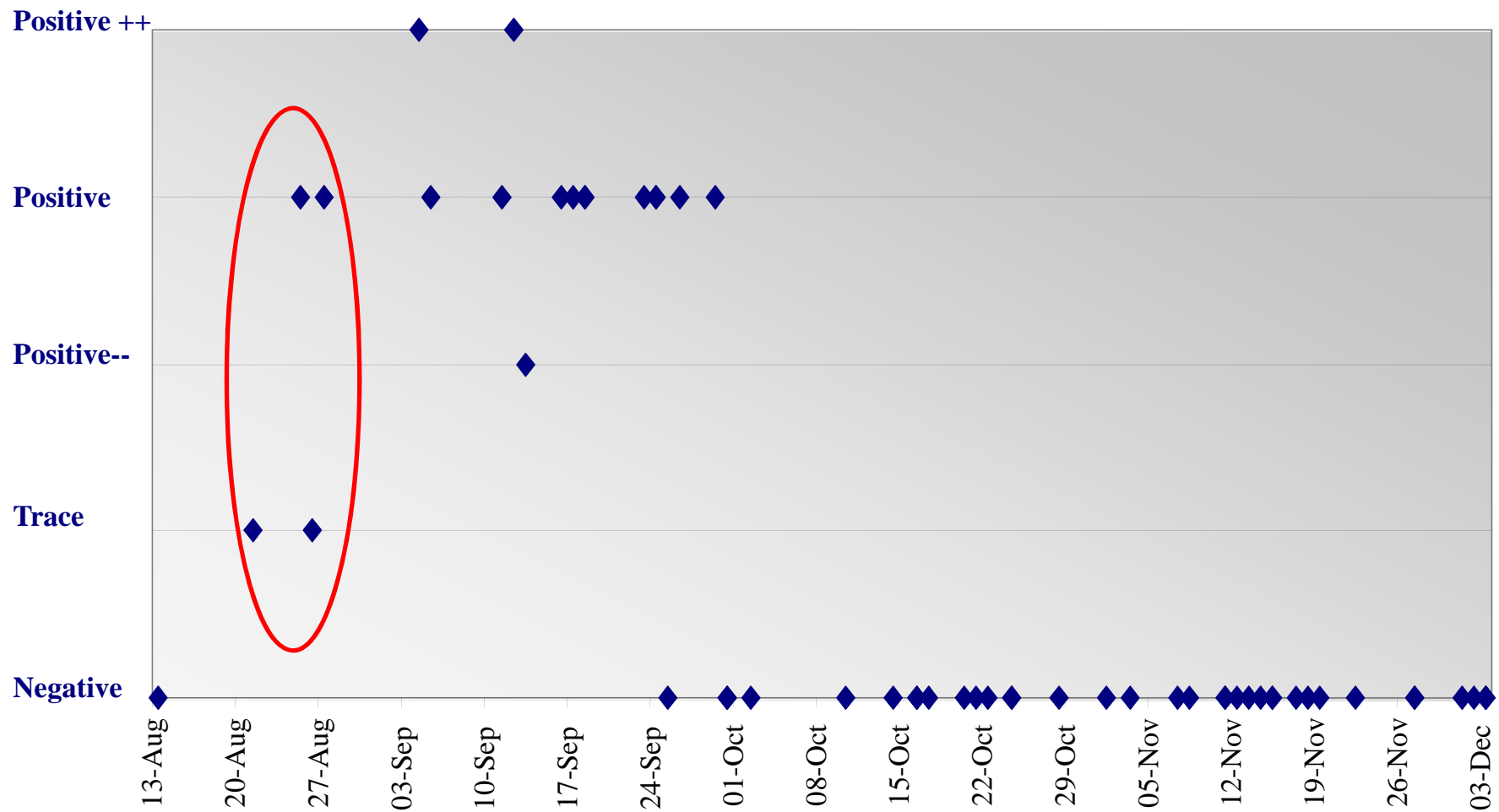


Why Recall Everything?

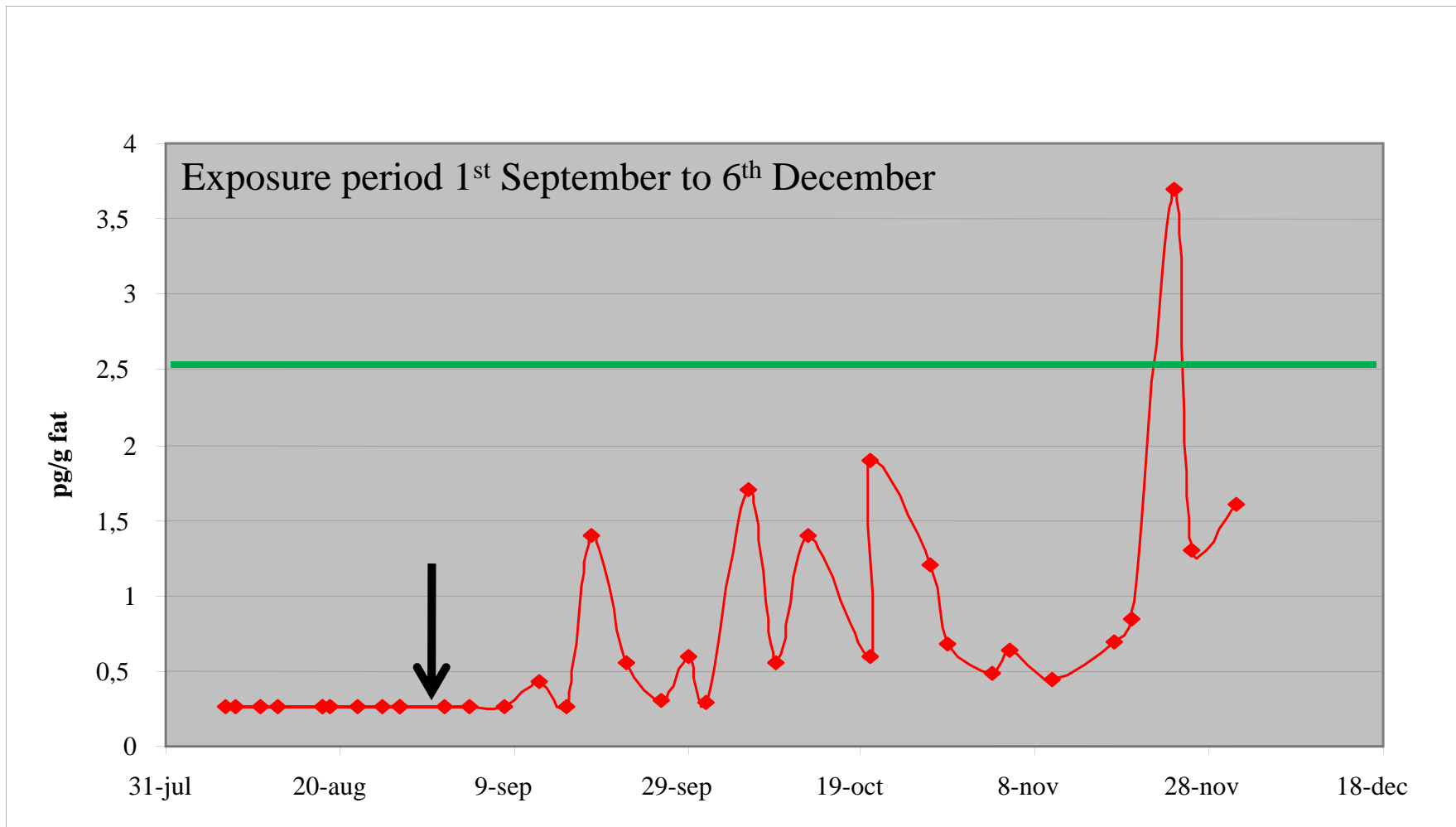


U2: Feed Exposure Period

Crumb Screening Results 13 Aug – 3 Dec, 2008



U2: exposure period for Pork Dioxin levels at rendering plant in Belgium



U3: Dioxins Levels in Feed and Pork Fat

- **Crumb Product:** **E.U. Limit Feed** **0.75pg/g**

- **Levels detected in Feed:** **5200pg/g**

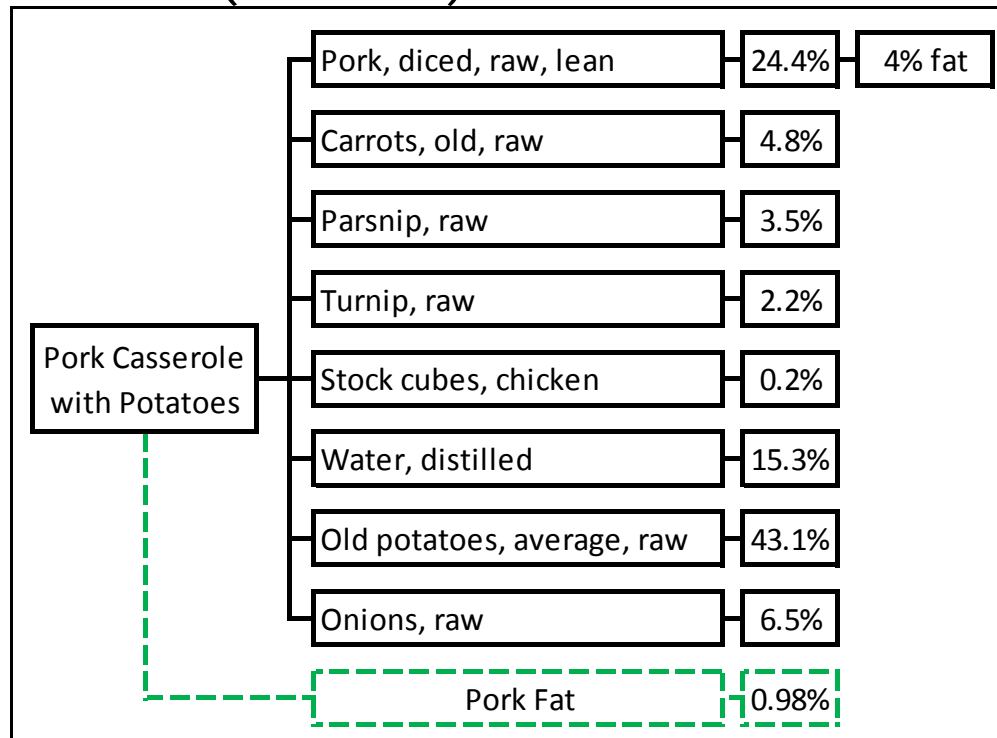
- **Pig Fat:** **E.U. Legal Limit** **1pg/g**

- **Levels detected:** **80 – 200 pg/g**



U4: Pork Fat Consumption Data

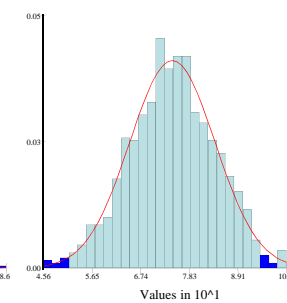
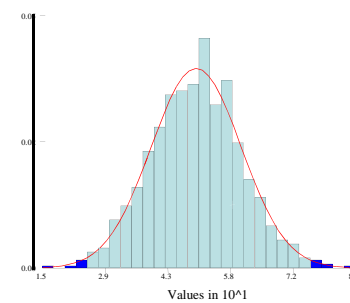
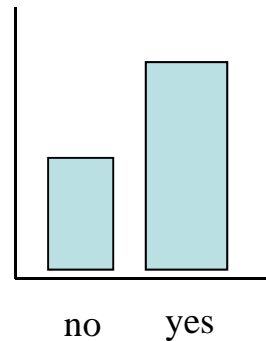
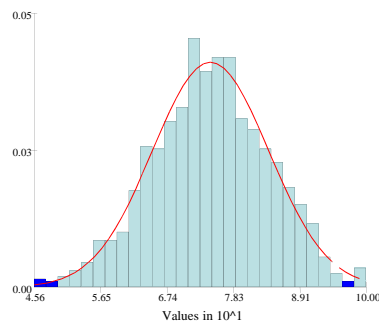
- Food Consumption Survey (<http://www.iuna.net/>) - 7 day dietary records of 958 adults, aged 18-65, from Republic of Ireland during 1997-1999
- Database containing information for each individual and each eating occasion – split into ingredients for purposes of Total Diet Study – further manipulated for the purposes of estimating exposure to lipophilic substances (i.e. POPs)



Exposure Assessment

- Databases uploaded into commercial probabilistic software program Crème Food

$$\text{Food intake} \times \text{Presence probability} \times \text{Chemical concentration} = \text{Exposure}$$



FSAI Probabilistic modelling of exposure

- **Total Population Intakes of Total WHO TEQ from all sources (including ingredients) assuming that 10% of the pork consumed contains a level of between 80-200 pg WHO TEQ/g fat and 90% of pork consumed contain usual background levels (as determined in previous surveys)**
- **All other intakes are calculated based on background levels determined in previous surveys. All intake calculations are based on ranges of data and the results presented are based on a run of 300 iterations**

FSAI Probabilistic Exposure Assessment				
Total TEQ pg/kg bw/day (upper-bound)				
	Background exposure		Background & Incident Exposure	
Food Group	Mean	P97.5	Mean	P97.5
Total Exposure	0.40	1.62	2.13	11.14
Pork Only	0.03	0.12	1.58	10.56



EFSA deterministic modelling of exposure

EFSA POINT ESTIMATE INTAKE FOR PORK

Country	Average fat intake (g/kg bw/d)	TEQ exposure (pg/day per kg.b.w.)								
		50 pg TEQ/g fat			100 pg TEQ/g fat			200 pg/g fat		
		% fat from contaminated pork			% fat from contaminated pork			% fat from contaminated pork		
		100%	10%	1%	100%	10%	1%	100%	10%	1%
Ireland	0.25	12.3	1.2	0.1	24.6	2.5	0.2	49.3	4.9	0.5

Country	97.5% fat intake (g/kg bw/d)	TEQ exposure (pg/day per kg.b.w.)								
		50 pg TEQ/g fat			100 pg TEQ/g fat			200 pg/g fat		
		% fat from contaminated pork			% fat from contaminated pork			% fat from contaminated pork		
		100%	10%	1%	100%	10%	1%	100%	10%	1%
Ireland	0.44	22	2.2	0.2	44	4.4	0.4	88	8.8	0.9



EFSA Pork risk assessment

- Uncertainty in exposure estimate
 - 10% of pork contaminated
 - 90 day exposure
 - 200pg/g dioxin
- **Conclusion**
 - 10% increase in body burden
 - No concern to human health from this single exposure event

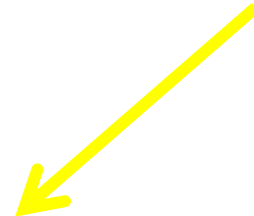
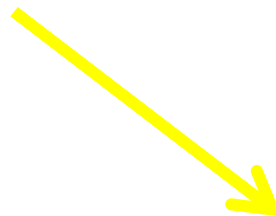


It's About Food Safety...



Risk Assessment

Risk Assessment



Agreement



Body Burden of Dioxins in Ireland

- 2002 breast milk study, which has a mean of 11.9 pg/g fat
 - Assuming 60 kg body weight and 20% fat content, this gives an estimated body burden of 2.4 ng/kg over the 4 Irish populations studied
 - Lower than the 4ng/kg European average
- 2010 breast milk study (pooled samples 109 first time mothers)
 - Dioxin levels down ~20%
 - No appreciable exposure impact of the 2008 dioxin crisis
 - Publication submitted to Chemosphere



Communicating the message



We Have Identified Contamination

We Have Received Your Feedback

We Are Working on the Cause

We Will Keep You Informed

Simple



No Matter How Strong the Message...



It Can Sink in



Maybe Not Simple...

385 Articles in National Press

200 Articles in P

800+ Journalists Delivering the Message?

17 Television Programmes

200 Internet News Items



Did They Deliver The Simple Message?

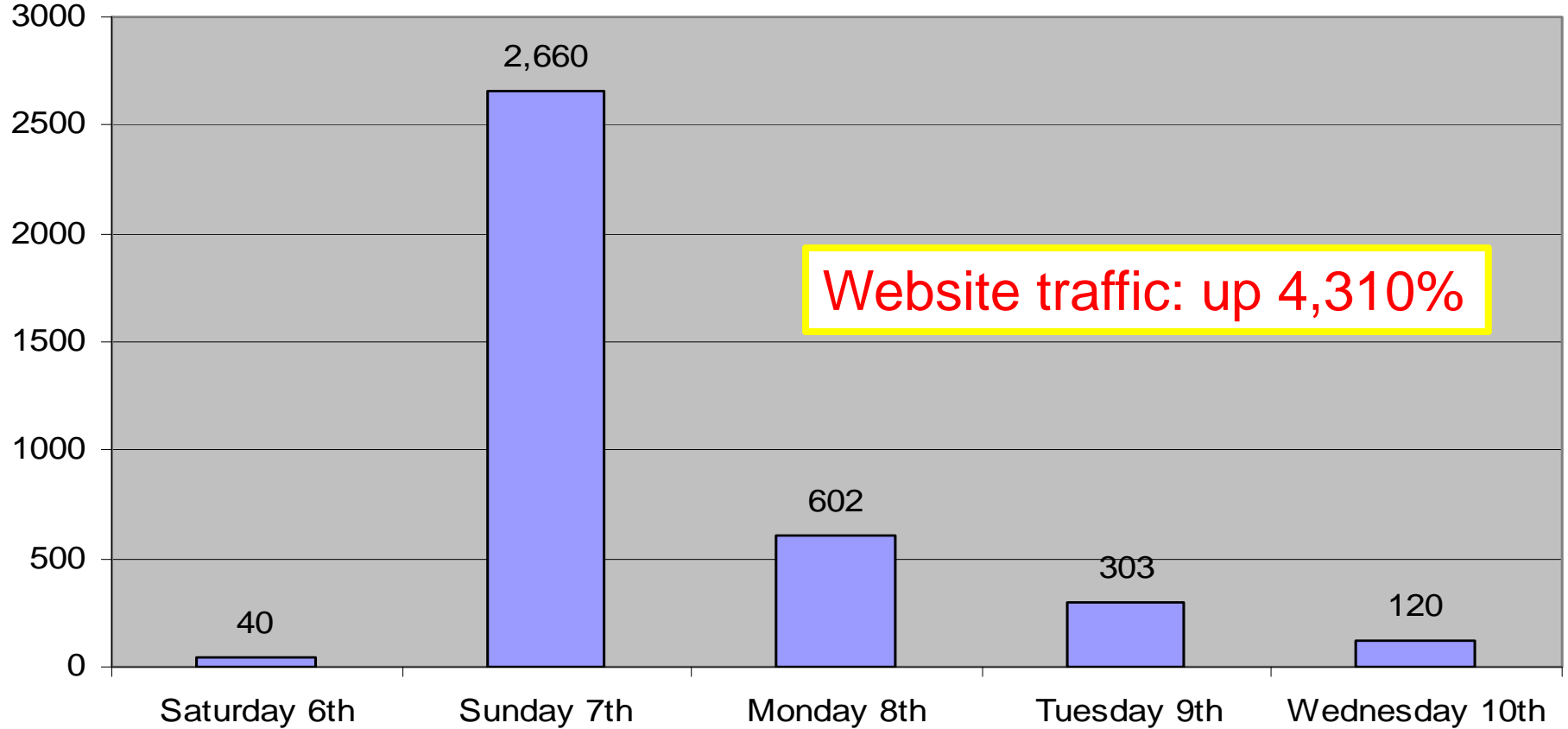


Competition in the “news” media



Advice Line Calls (3,725)

Calls to advice-line on pork recall

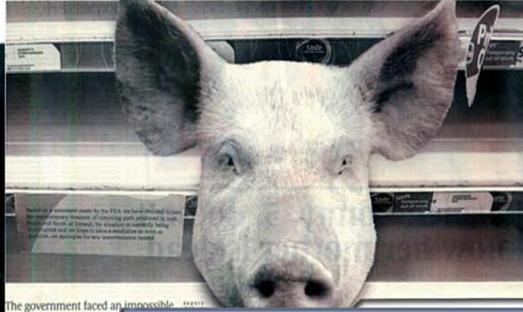




Food safety body took 'correct' action to manage dioxin crisis

They would have to be heated at levels of 200 degrees centigrade plus and this would have turned the fat into toxic. The source was transformer oil," he said. Mr Kelly was asked by members of the committee that pork was back on the shelves within a week, he said of all products in about 90 per cent of the national pork throughput. Reminding the committee that pork was back on the shelves within a week, he said of all products in about 90 per cent of the national pork throughput. Reminding the committee that pork was back on the shelves within a week, he said of all products in about 90 per cent of the national pork throughput.

PIGGY IN THE MIDDLE



The government faced an impossible choice on contaminated... Sarah McInerney and M...

YOU'VE SAVED OUR BACON



Punters pigging out on pork after butchers and their shelves with sausages and rashers as the supermarkets restock pigmeat gets all-clear

IRISH PORK & BACON APPROVED

The Department of Agriculture, Fisheries and Food

Bord Bia

Irish Food Board

Butchers back in business after health alert



SHOPPERS JOY AS PORK GOES BACK ON SHELVES

...but pig farmers face uncertainty as bail-out promised

Irish consumers were a nervous without reassurance and confidence in the industry...

Shoppers see pork and bacon get all-clear



ALL PORK & BACON APPROVED TO CUMMINS & BROS... IRELAND'S BACON & PORK... IRELAND'S BACON & PORK... IRELAND'S BACON & PORK...

Cowen says 'immediate and clear action' was taken



Japan praises Irish handling of pork scare

HARRY MCGEE
THE JAPANESE government praised the Irish Government for its handling of the discovery of dioxin in Irish pork products... which pork products, mostly frozen, are worth more than €20 million. He said that following the meeting, there were many opportunities for increasing agricultural exports," Mr Smith said. The possibility of the Japanese market being reopened for Irish beef was also raised during meetings the Minister held with the minister of health and agriculture.



ALL PORK & BACON APPROVED TO CUMMINS & BROS... IRELAND'S BACON & PORK... IRELAND'S BACON & PORK... IRELAND'S BACON & PORK...

A tale of two crises: the Belgian and Irish dioxin contamination incidents

Donal K. Casey and James S. Lawless

School of Law, University College Dublin, Dublin, Ireland, and

Patrick G. Wall

School of Public Health and Population Sciences, University College Dublin, Dublin, Ireland

A tale of two
crises

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Government management of two media-facilitated crises involving dioxin contamination of food



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But in any crisis co-operation is vital...

- **FERA, York**
- **RIKILT, NL**
- **VWA, NL**
- **Food Standards Agency (NI and London)**
- **European Commission**
- **European Food Safety Authority**



Particular thanks to Christina
Tlustos and Rhodri Evans for
helping in the preparation of
this talk

