Management of Contaminated Food: Application to the Irish Dairy Sector

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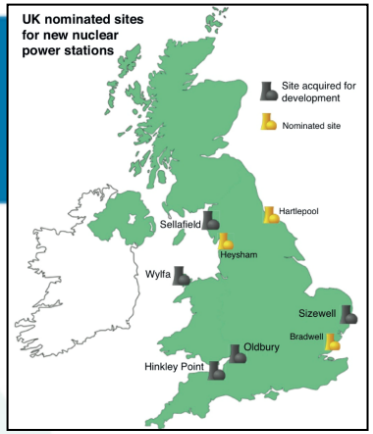
Coordinated Mechanisms

- National emergency plan for nuclear accidents (NEPNA)
  - for a widely dispersed radiation emergency
  - framework for a coordinated national response to an event where the response is beyond the resources or capabilities of any individual Government Department or public authority arising within or outside of Ireland
- Covers and defines
  - Alerting mechanisms
  - Roles and responsibilities
  - Procedures to mobilise expertise and resources
  - Effective coordination at both political and official levels
  - Arrangements for effective communication with the public

Under NEPNA…

- Decision-making by National Coordination Group (officials from key Government Departments and other public authorities) responsible for providing advice on countermeasures and for co-ordinating their implementation
- EPA: radioactivity monitoring and provision of advice on potential consequences of any accident, and on measures to be taken
- Other Government Depts (and statutory organisations): advise on and establish appropriate procedures to implement measures within their particular fields of competence e.g. food production (DAFM)

Hazard assessment(s)

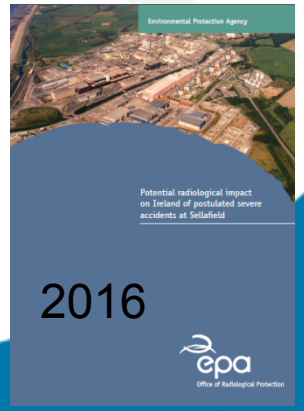


- **RADIOLOGICAL IMPACT** in Ireland as a result of a nuclear or radiological accident abroad

Ingestion of contaminated foodstuffs most likely significant radiation dose pathway (> 90% of total dose)

due to distance to closest nuclear power plants (UK) & prevailing wind direction

- **Food controls or agricultural protective measures would be required** to mitigate **long term impact**
- Only potential **short term measure**: sheltering/staying indoors → evacuation not recommended



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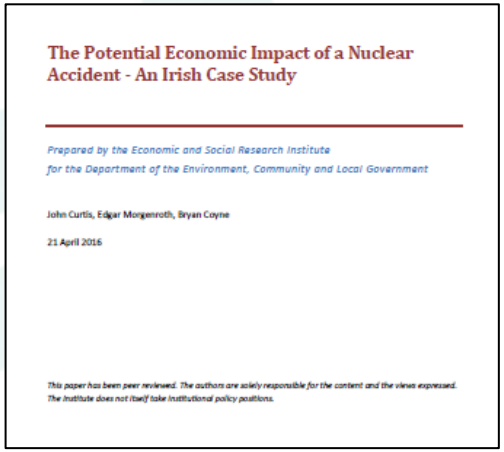
Other assessment of relevance

- Assessment of the economic vulnerabilities can help inform emergency management and mitigation policies
- **ECONOMIC IMPACT** in Ireland as a result of a nuclear or radiological accident abroad
  - Economic and Social Research Institute (ESRI) commissioned by DoE
  - Only direct & indirect costs from
    - Tourism
    - **Agrifood**
    - **Exports**
  - Not costs from health, waste, migration/wealth flows
  - **4 postulated scenarios**
  - February and April


The Potential Economic Impact of a Nuclear Accident - An Irish Case Study

Prepared by the Economic and Social Research Institute
for the Department of the Environment, Community and Local Government

John Curtis, Edgar Morgenroth, Bryan Coyne

21 April 2016

This paper has been peer reviewed. The authors are solely responsible for the content and the views expressed. The Institute does not itself take institutional policy positions.

Cost to Irish economy = EUR 4 – 161 billion

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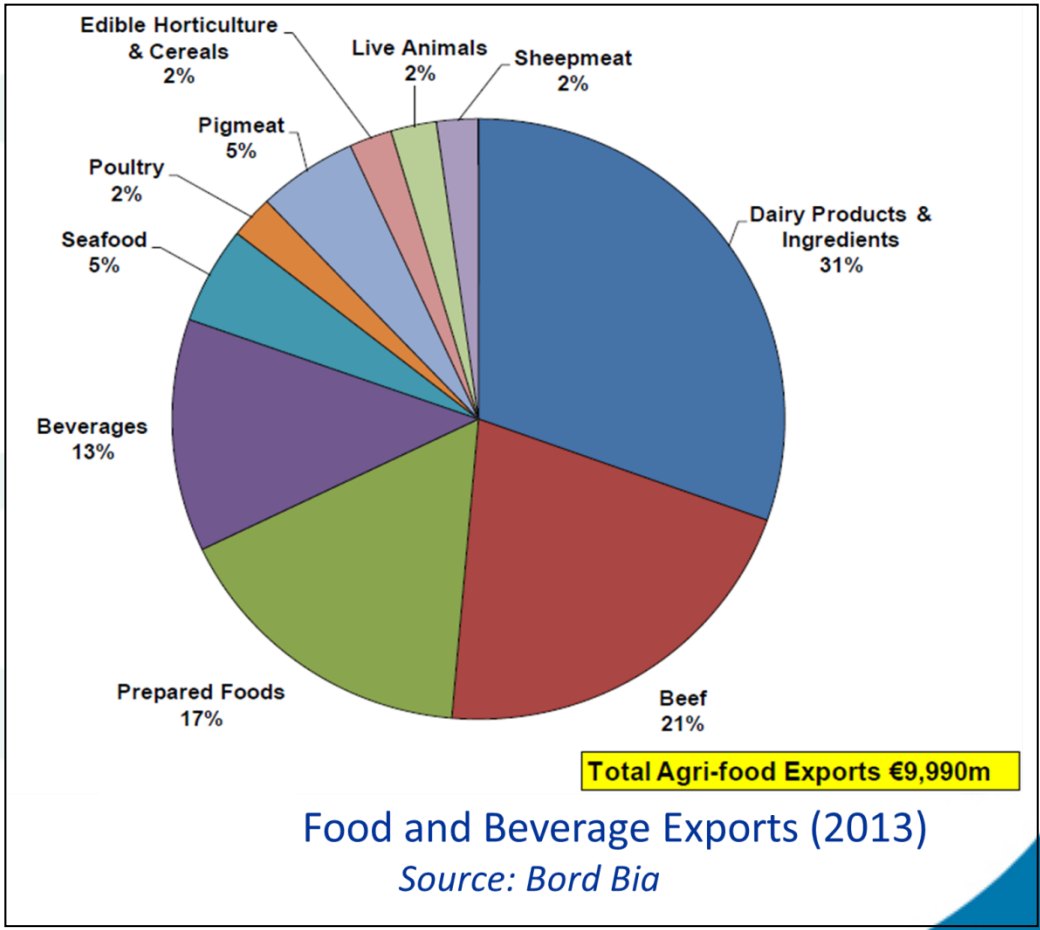
Irish dairy industry

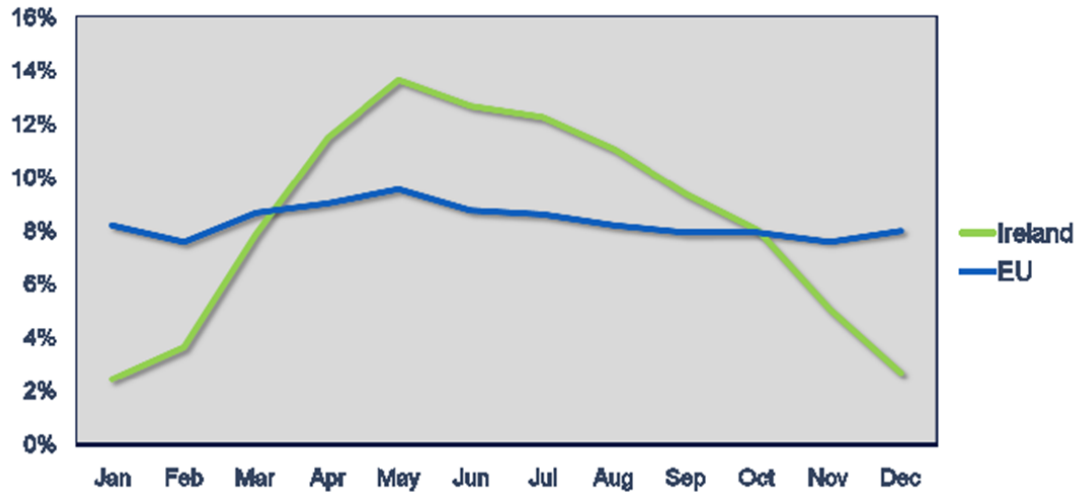
- Milk accounted for the **second largest share of Ireland's gross agriculture output** in 2011 (second only to cattle/ calves
- **Export driven sector**: 85% of Irish milk production and 80-85% of dairy products exported
- In 2011, estimated value of dairy exports was in excess of €2.66 billion



Food and Beverage Exports (2013)

Source: Bord Bia

- Irish milk production is **grass-based** system, with farmers matching calving date to grass growth; hence its **seasonality**
- Over 80% of Irish dairy cows calve in the spring, with most of the remainder calving in the autumn
- **Irish milk supply differs from the EU average:** Ireland has a 7:1 peak to trough ratio which differs from the EU supply which is generally flat
- Irish milk production peaks in May/June
- Milk is **particularly vulnerable to nuclear fallout / contamination**



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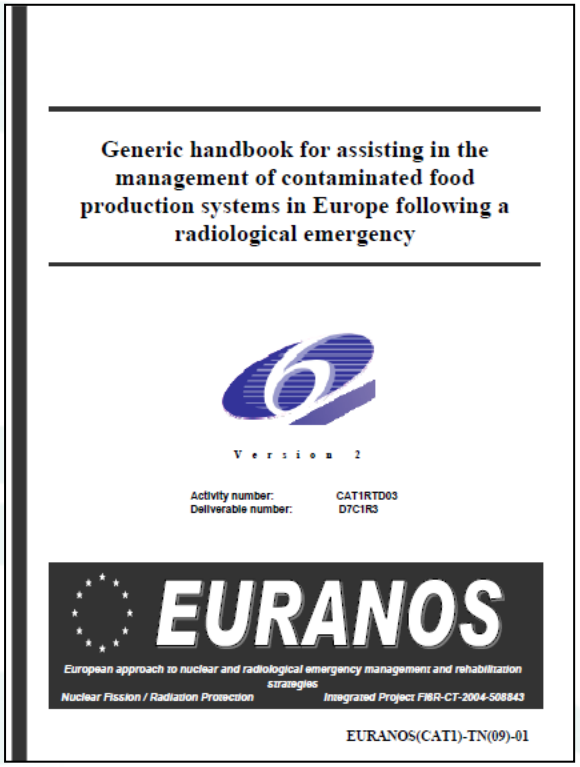
The Irish Food Handbook

- Project initiated in **2008**
- Multi-agency expert group set up: DAFM (Chair), RPII/EPA, FSAI, SFPA
- DAFM experts in dairy, horticulture and plant health, animal feed and crops, meat sector/veterinary science, animal by-products and food safety
- Mandate to develop a Food Handbook, primarily focused on the early phase of an emergency
- **Overall objective**: develop and agree **strategies for Ireland** to
  - Avoid or minimise damage to Irish economy (food exports)
  - Develop reflex actions (key to influence long term strategies)
- Food production **sectors** considered
  - Dairy, meat, crops (vegetables, cereals, feedstuff), horticulture (fruits)
  - Other aspects covered: waste, legislation, communication, monitoring/ certification

- Based on the *Generic Handbook For Assisting in the Management of Contaminated Food Production Systems in Europe Following a Radiological Emergency = EURANOS Handbook*

  (Nisbet *et al.*, 2009)
- Originally developed as a tool to prepare and guide decision-makers through the available recovery options following a nuclear incident
- Also contains valuable advice on techniques for involving stakeholders and for the **customisation** of the Handbook at local and national level



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- Need for **customisation**
- Define **each sector' objectives and challenges** *e.g.* for dairy sector
  - Produce clean milk
  - Dispose of milk unfit for consumption
  - Provide advice to **farmers and producers, processors, distributors** and other competent authorities e.g. FSAI

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Dairy Management Strategy

- Many considerations influence the decision-making process in an emergency
- For the dairy industry these include:
  - How long it would take to reach the maximum permitted levels in milk and dairy products
  - Type and amount of radionuclides deposited
  - Which radionuclides are the most important
  - The time of the year when contamination occurs

→ **Seasonal approach** (risk based)

Worst time of the year for accident to happen?

Between April and July, because the transfer of radionuclides to milk per unit of activity deposited is much greater when:

A. Cows grazing outdoors

B. 45-50% of total milk is produced between April and May

C. Clean feed stocks at their lowest after the winter

→ **Factors influencing decision-making / decision-framing**

Month	*Lactation period*	*Milk production*	*Feeding system*	*Availability of uncontaminated feed*	*Availability of on-farm storage*	*Comments*
January	End of drying off season / Dry period / calving		Housed / at grass by day, housed at night	Likely	Unlikely	Calving starts late January
February	Calving / early lactation		Housed / at grass by day, housed at night / Grass	Likely	Unlikely	Peak calving
March	Calving/ early lactation		Housed / at grass by day, housed at night/ Grass	Likely	Moderately Likely	All calving completed by late March
April	Mid lactation		Grass	Unlikely	Likely	
May	Mid lactation		Grass	Unlikely	Likely	
June	Mid lactation		Grass	Unlikely	Likely	
July	Mid lactation		Grass	Moderately Likely	Likely	
August	Mid lactation		Grass	Moderately Likely	Likely	
September	Late lactation		Grass	Likely	Likely	
October	Late lactation		Grass / at grass by day, housed at night/ Grass	Likely	Likely	Start drying off cows late October
November	Late lactation / drying off		At grass by day, housed at night /housed	Likely	Moderately Likely	
December	Late lactation / drying off		Housed	Likely	Unlikely	

Results

- Tables of actions for the dairy sector for each season
- Each table contains foreseen actions required by
  - Farmers
  - Processors
  - Competent authority

- Similar strategies for other agrifood sectors to be developed

Identify Suitable protective options

- **PREPARE Project** → Stakeholders Engagement Workshops
  - Food Handbook working group extended to including farming industry, large retailers, food processors, distributors, consumer groups

- Discuss and identify **technically** feasible options
  - AFCF in ration: Available? Cost? Consumer acceptance? How to provide to animals (free-range)?
  - Clean feeding: Available? Where to source? Cost? Waste from local feed? Changes to farming practice? Organic certification of farm?
  - Decontamination of milk: Consumer acceptance? Food processors acceptance? Costs and set-up time? Resins to be disposed of – how/ where?

Conclusions and next steps

- Long process requiring regular and frequent engagement with a lot of and various stakeholders
- PREPARE project was a significant and valuable help to that process
- *Exercise – Exercise – Exercise* are needed to validate the options, test communication channels, etc.
  - Use ARGOS AgriCP as support tool
- More work in following areas
  - Communication, incl. developing key messages *e.g.* bring livestock indoor, close ventilation intake, provide clean feed
  - Legislation (food bans, compensation)
  - Waste