



**Safety  
Quality  
Traceability**

# ISO-FOOD ERA Chair

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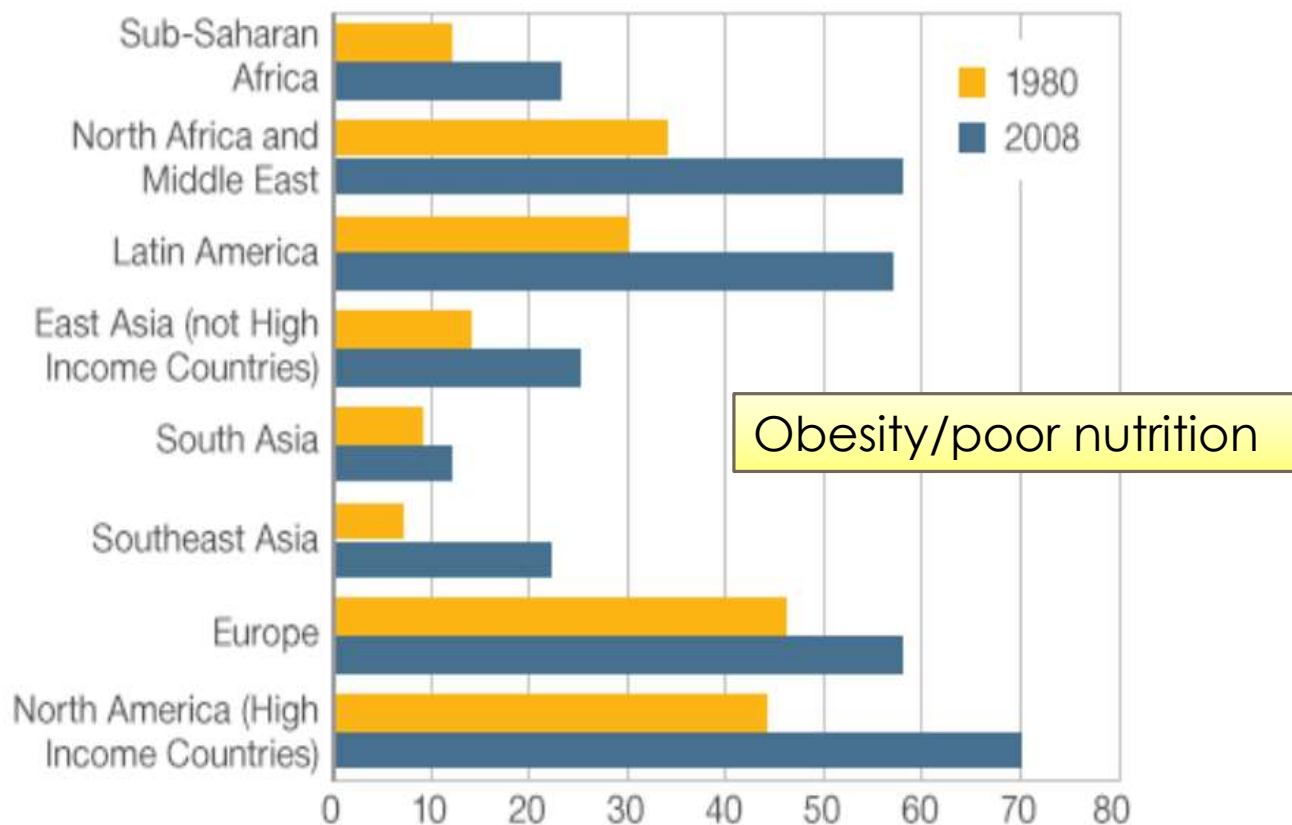


# Why the need for ISO-FOOD?



- Food is essential for life
- But most people no longer grow their own food
- Becoming increasingly removed from its source
- We are reliant on the Food Industry
- Eating habits have changed
- More of the food we eat is processed

## Percentage of Processed Food in the Average Diet



Source: Overseas Development Institute

# Consumers



As consumers we demand...

- Greater choice
  - Different varieties
  - Out of season fruit & vegetables
  - Exotic foods
  - Religious foods
- Convenience
- Higher quality
- Lower prices
- Honest/safe

# Food Industry



- Largest industrial manufacturing sector
- 4.8 trillion (USD) - 10% global GDP
- Leading Employer (Europe 4.25 M)
- Demand for food is increasing 4.4% (CAGR)
- Increasingly globalised
- 2050 World population will increase 50% & food supply will need to increase by 100%

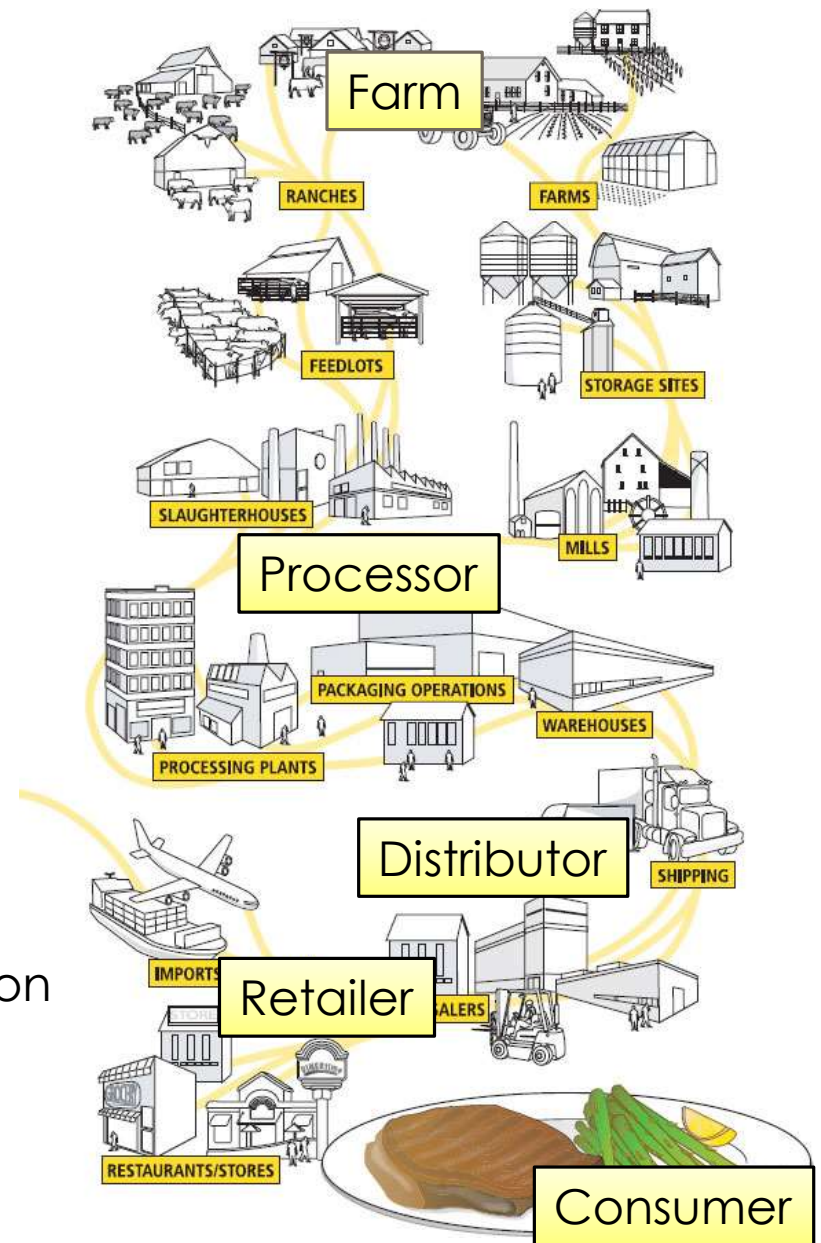
# Food supply chain (farm to fork)

- Includes all steps in the chain
- Complex and global
- Tighter profit margins
- Food prices rising

(Cost fertilizer, fuel, increasing demand, poor harvests)

## Significance for ISO-FOOD...

- 1) Added value (differentiation)
- 2) Encourages adulteration & mislabelling – food fraud!
- 3) Multiple points for contamination





# Food supply chain (farm to fork)

- Includes all steps in the chain
- Complex and global
- Tighter profit margins
- Food prices rising

(Costs  
harvested)

Sign

“the deliberate substitution, addition, tampering or misrepresentation of food, food ingredients or food packaging, or false or misleading statements made about a product for economic gain,”

- 1) Added value(differentiation)
- 2) Encourages adulteration & mislabelling – food fraud!
- 3) Multiple points for contamination

Only 2% of imported food is tested



# Adding value (ORIGIN)

- Value-added agricultural production based on origin

## Protected Designation of Origin

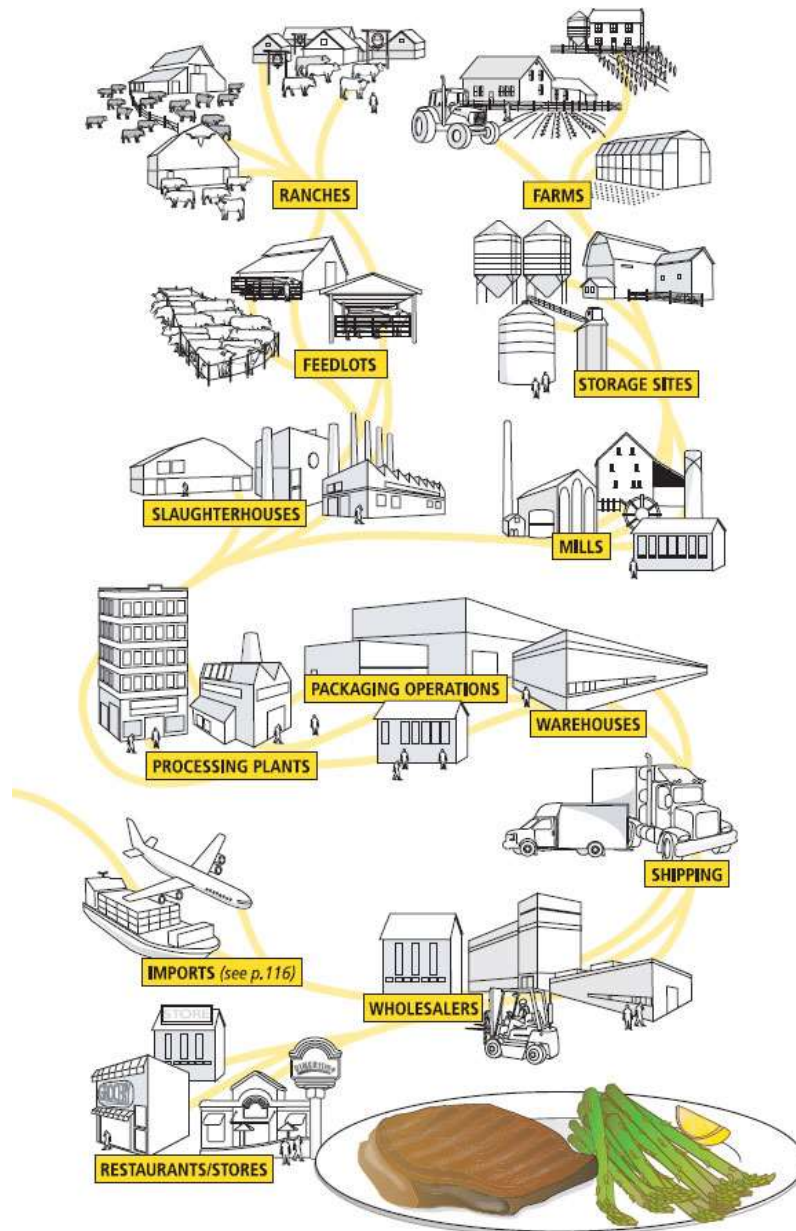
Produced, processed and prepared in a specific region using traditional production methods (EU 582, Slovenia 7)

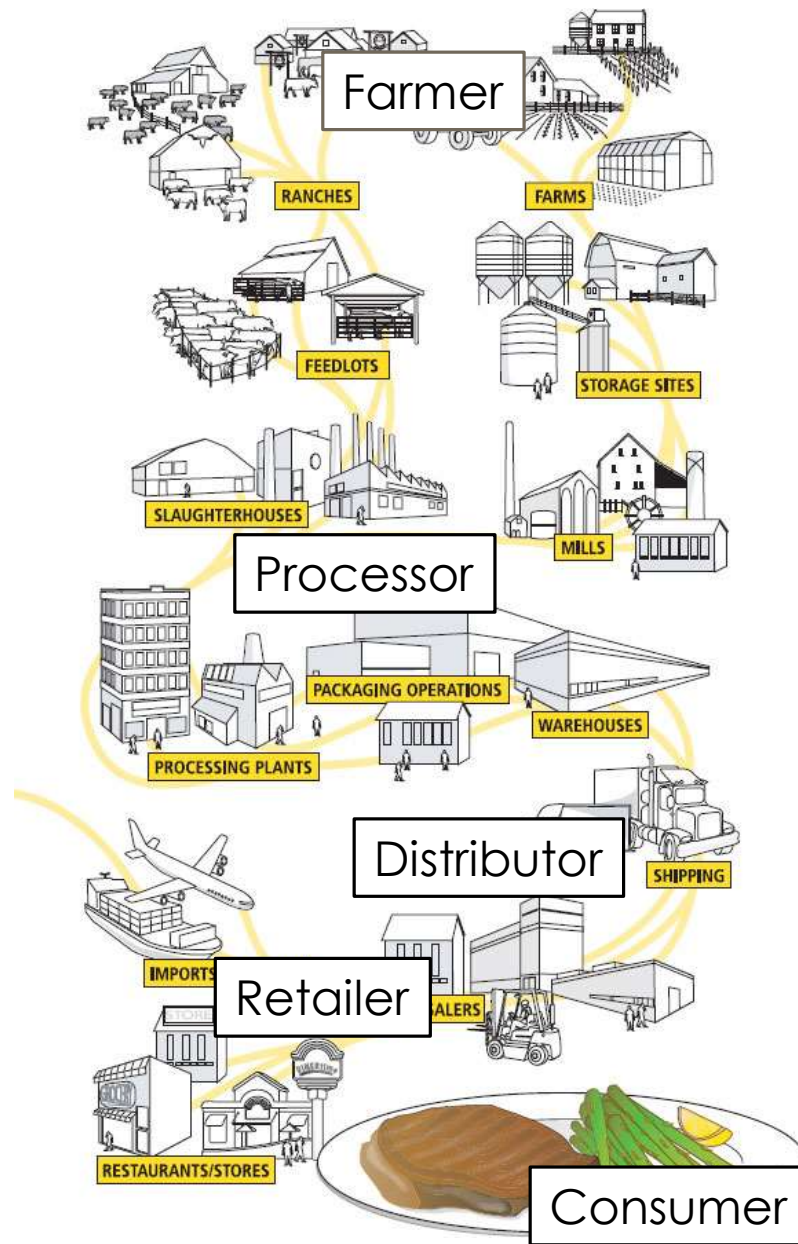
Mohant sir, Kraški med, Ekstra deviško oljčno olje Slovenske Istre

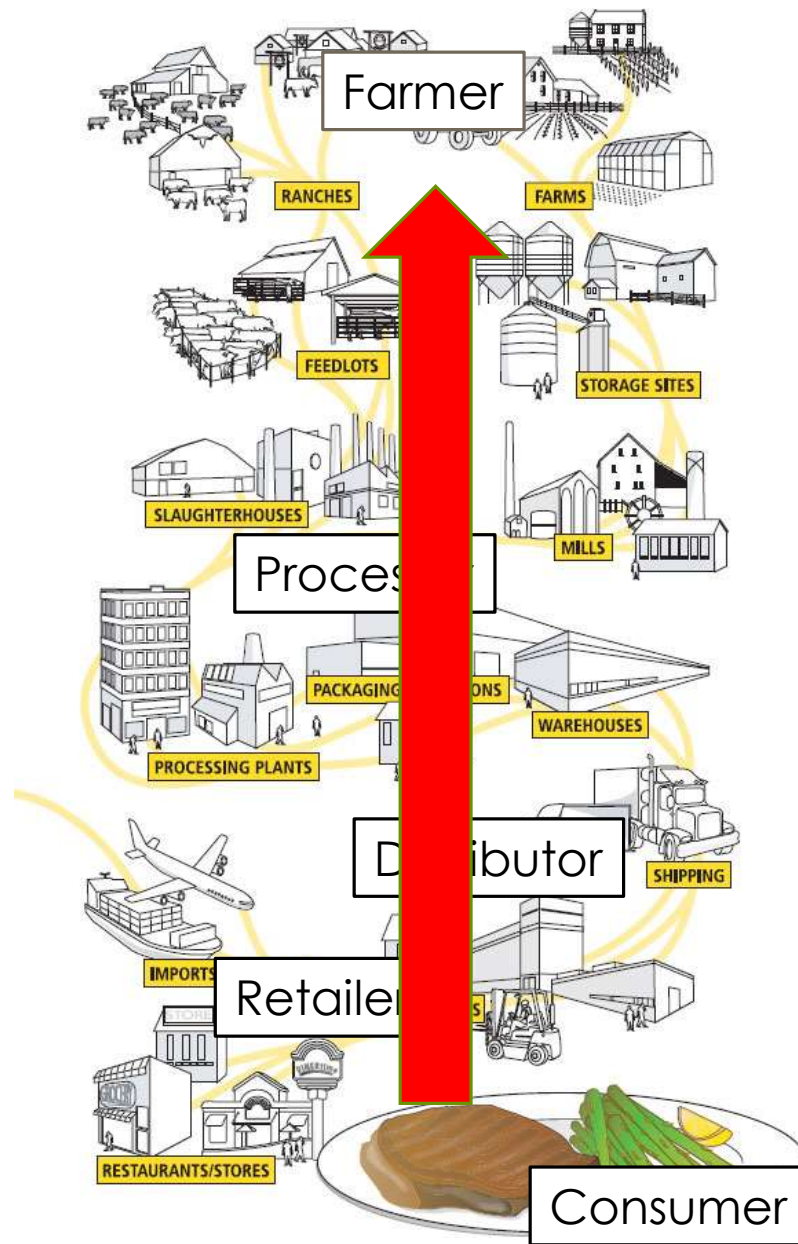
- Increasing market power
  - positive spill-over effects
- Protect consumers & producers from food fraud - Brand protection

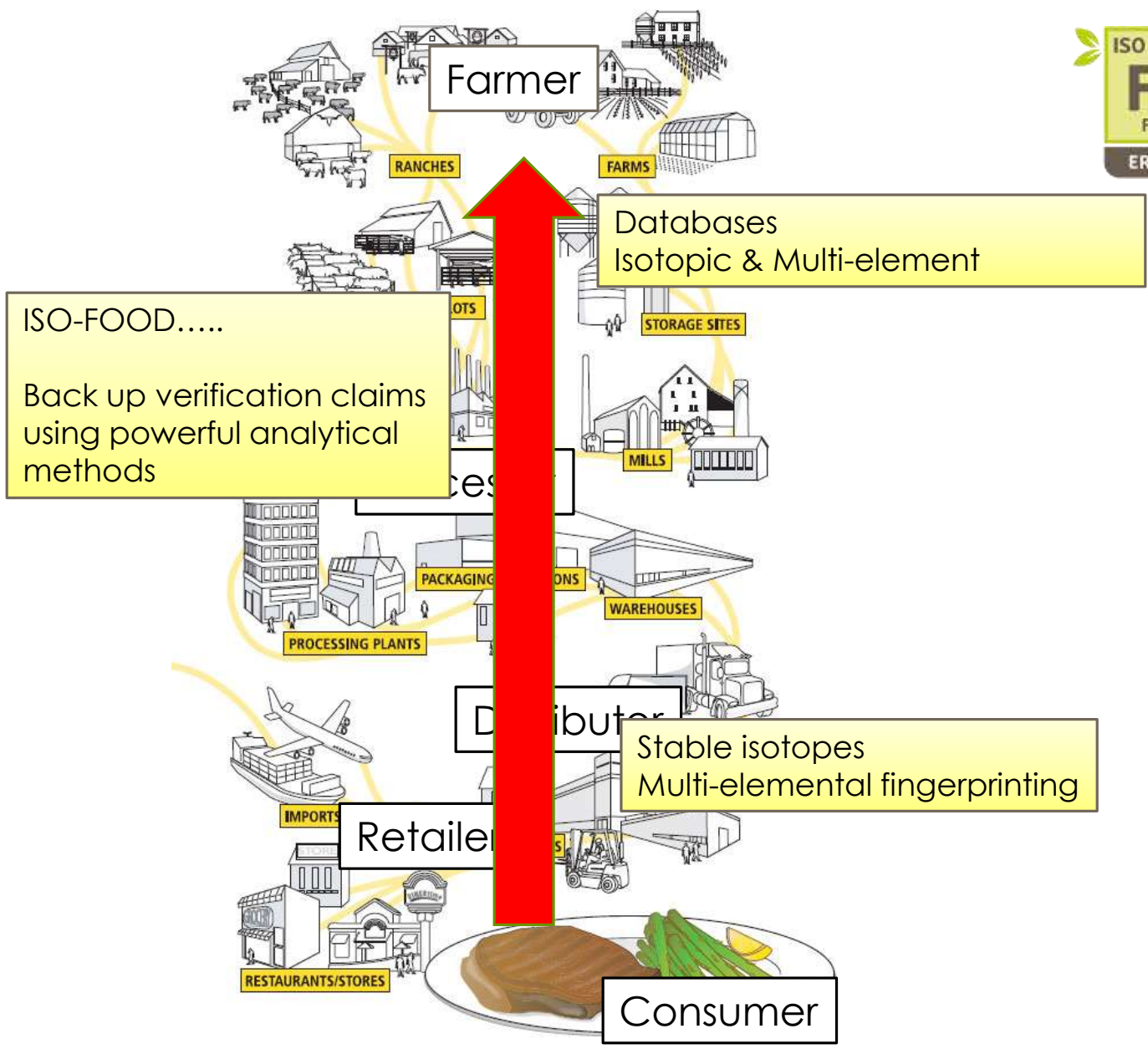












# Adulteration

“Act of **intentionally** debasing the quality of

food  
**sub** Consumers and businesses benefit from honest information about food authenticity



LUC (saf  
 Potent  
 To enforce the law, regulators need to have access the best analytical methods available to verify food safety and food descriptions

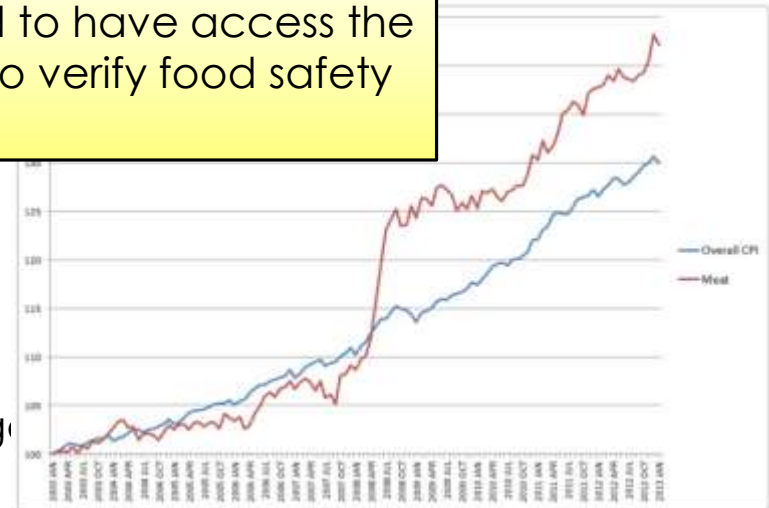
Potent  
 mean  
 risk!

1958 Bradford sweets poisoning

- Adulterating sugar ( $As_2O_3$ )
- 1860 Food Adulteration Act

201 Global problem (Horsegr

\$10 - \$15 billion per year  
 (10% of all products)





# Adulteration

“Act of **intentionally** debasing the quality of food offered for sale either by the **admixture** or **substitution** of **inferior** substances”

Lucrative frauds: olive oil, milk, honey, spices (saffron), juices, coffee, tea, fish

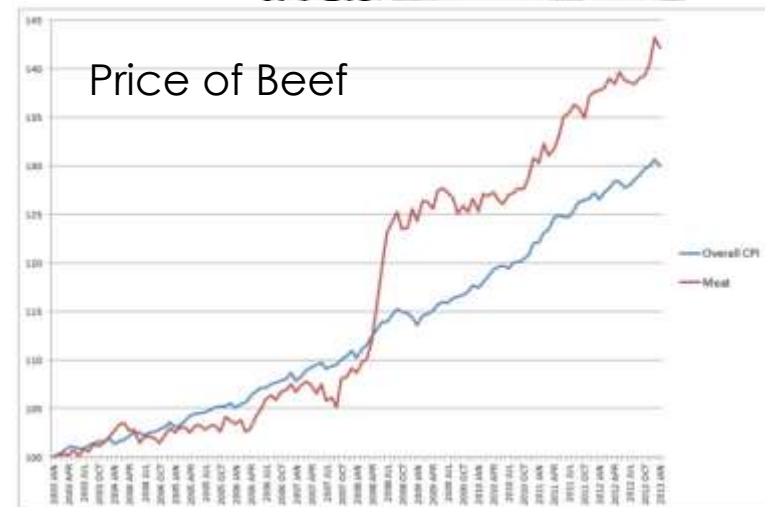
Potential health risk!

1958 Bradford sweets poisoning

- Adulterating sugar ( $As_2O_3$ )
- 1860 Food Adulteration Act

2013 Meat adulteration scandal (Horsegate)

- phenylbutazone “bute”





# Contamination

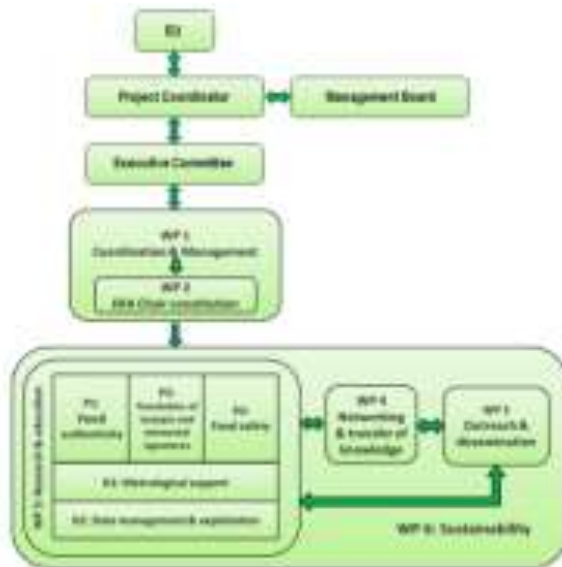
- Many points along the food supply chain
  - Environment, during processing, packaging
  
- Essential and Toxic elements (Speciation!)
  - Hg, Cd, Se, Cr, Pb...  
(1932-38 Minamata / Chisso disease)
  
- Radionuclides
- Organic contaminants:
  - PAH, Pharma (antibiotics), BPA (packaging)
  
- New technologies (nanotechnology)
  - Nanoparticles in food
    - Food additives
    - Contact with food (cooking, labelling, storage)

# Key research areas

- Compound specific stable isotope analysis
  - Using isotope signatures
    - Understand where compounds are from
    - Transformation processes
- Fingerprinting
  - Combining multi-elemental analysis and isotopic analysis
- Toxic and essential elements
  - Speciation of essential and toxic elements (including radionuclides) to understand toxicity and bioavailability
- Organic compounds and nanoparticles
  - Occurrence and fate during production, processing, packaging and storage

## Our mission....

... to establish ourselves within the **ERA** as **leading centre**, able to **respond** to the **needs** of our stakeholders (society, governmental agencies, & food industry) through **research** and development of **analytical methods** for use in the field of **food safety, quality and traceability**.



**We do not  
compete or  
duplicate**

**but  
COMPLEMENT!**

## Objectives of the chair

- Establish permanency of the chair (> 5yrs)
- Achieve scientific excellence
- Working closely with partners and stakeholders
- Widening participation
- To become a centre of knowledge and innovation
- Contribute to growth in the economy

## Objectives of the chair

- Establish permanency of the chair (> 5yrs)
- Achieve scientific excellence
- Working closely with partners and stakeholders
- Widening participation
- To become an innovative and leading research center
- Contributing to the development of the JSI
  - Unlocking the capacities of the JSI
  - Workshops
  - Summer schools
  - Training courses
  - Conferences
  - Publishing in quality journals
  - Doctoral course at IPS
  - Applying for national, European & international funding