

Irradiation improves food safety and security but faces regulatory restrictions

Global Harmonization Initiative

Heidi Kotilainen



Food safety and security at risk.

1 in 10 people
fall ill after
eating
contaminated
food.

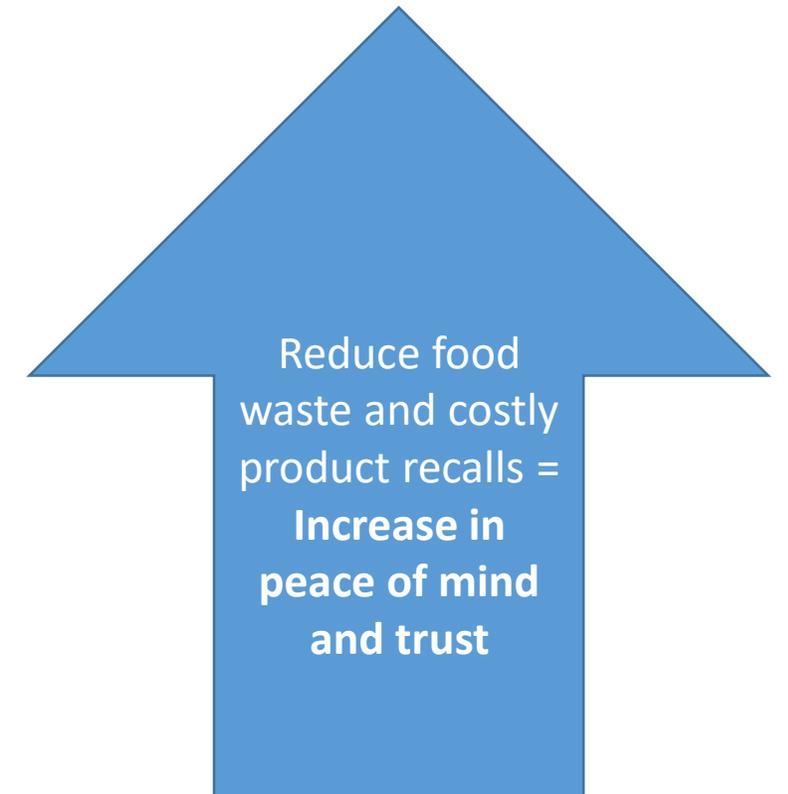
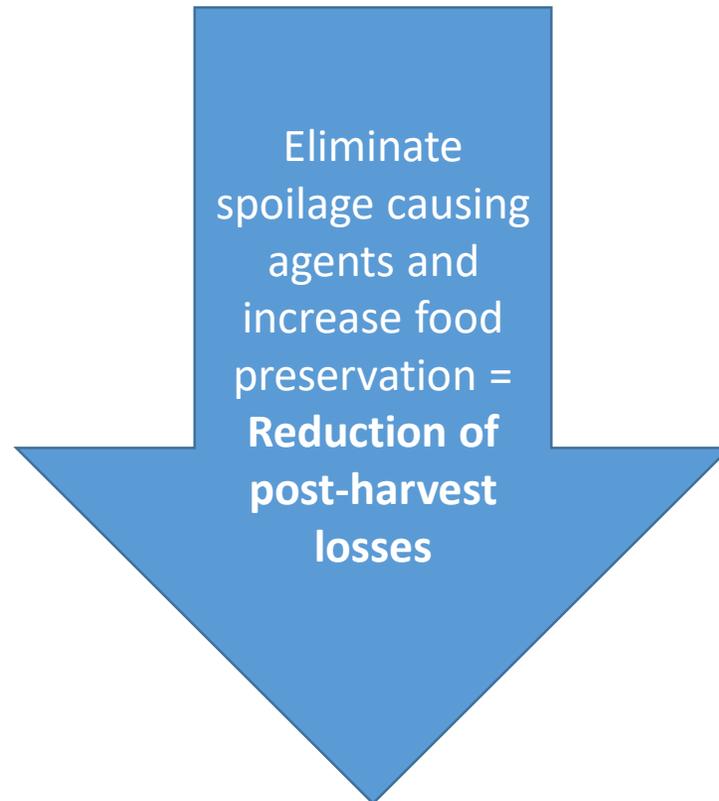
1/3 of food is
wasted.

Costly recalls.

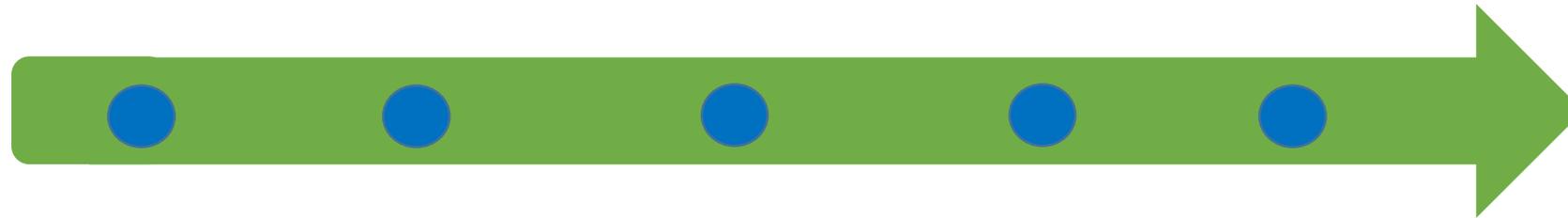
What is food irradiation?

- A form of food processing that employs ionizing energy to control and eliminate harmful bacteria, fungi, parasites, and insects to protect consumer safety and reduce food waste
 - Absorbed dose is the energy absorbed per unit weight of the target material (J/kg or Gy)
- Food irradiation can be
 - Gamma-rays (Cobalt-60 or Cesium-137)
 - X-rays < 5 MeV
 - Electron beams < 10 MeV

How food irradiation can improve food security and safety?



Safety of irradiated foods is supported by several international and national organizations.



Irradiated foods are safe!

JECFI (1981)
Report on the safety and wholesomeness of irradiated foods



IAEA

Codex General Standard for Irradiated Foods (1983)

JSGHDI (1999)
“Foods treated with any irradiation dose are both safe to consume and nutritionally adequate”

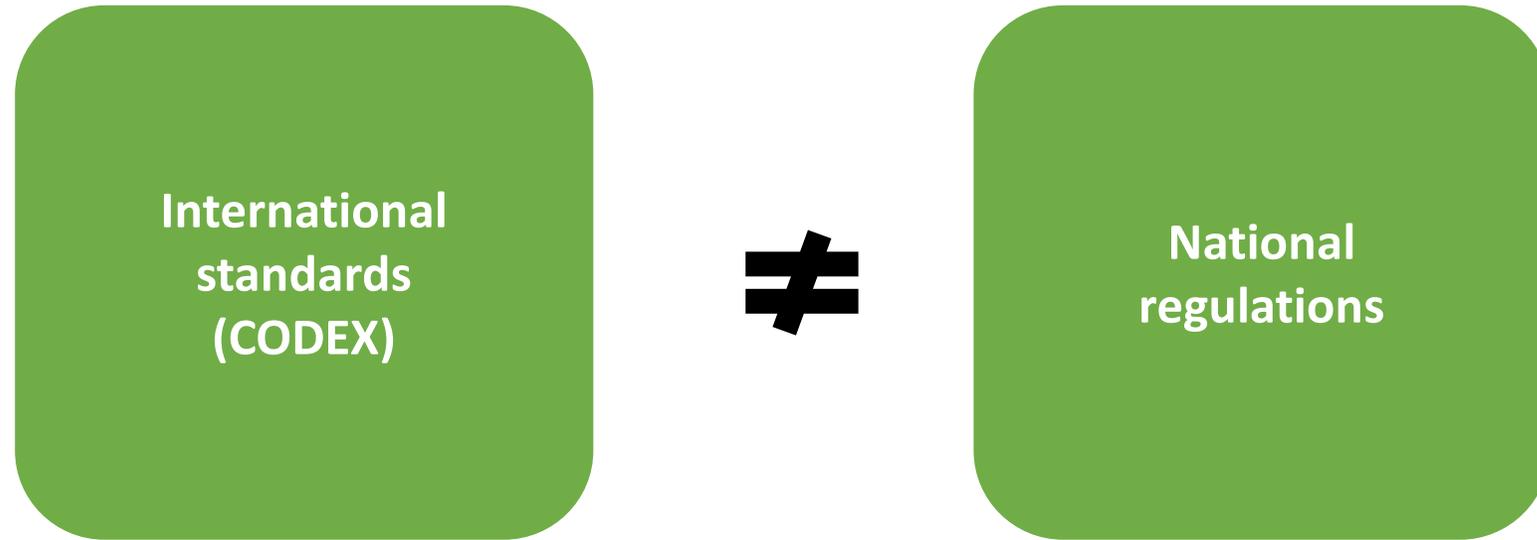


Revised Codex General Standard for Irradiated Foods (2003)

EFSA (2011)
“Irradiation is safe and should be considered as one of the approaches to reduce pathogens in food”



Lack of harmonized regulations to set barriers.



1. List of authorized commodities
2. Dose measurement and allowances
3. Labelling rules

1. Regulations on authorized list.

- Codex: Any food can be treated once the technological purpose is met and wholesomeness not compromised
 - Only in few countries, i.e. Brazil, Singapore, Mexico
- Most national regulations on case-by-case basis
 - i.e.: USA: 14 food categories, Canada: 6 food categories
 - EU: only 1 category is allowed (spices, herbs, vegetable seasonings)
- The number of irradiated food products is increasing especially in Asia
- Spices is the most widely authorized commodity for irradiation in the world

2. Regulations on dosimetry

- Codex: “the minimum absorbed dose should be sufficient to achieve the technological purpose and the maximum absorbed dose should not compromise safety, wholesomeness, or adversely affect structural integrity, functional properties, or sensory attributes of the food”
- Definition of absorbed dose differs
 - **Maximum overall average absorbed dose** (Codex, 1983) vs. **maximum absorbed dose** (Codex, 2003)
- “Maximum overall average absorbed dose” cannot be measured directly

	Codex Standard for Irradiated foods	USA	Canada	AU & NZ	EU	China	India
Maximum absorbed dose (kGy)	10 (unless necessary for technology purpose).	30		2 - 30			6 - 14
Maximum overall average absorbed dose (kGy)			10		10	10	

Example: Dose allowances and measurement for spices

3. Differences in labelling regulations.

- Consumer's right-to-know
- Labelling of ingredients
 - US FDA: i.e. spices - no upper limit
 - i.e. Canada, Malaysia: certain percentage
 - i.e. EU – all ingredients must be labelled
- Wording
 - Specified vs suggested
 - Radura-logo



Radura

Consumer acceptance.

- Public awareness remains low
- Informed choice?
 - Misconceptions about radioactivity
 - Labelling of other technologies i.e. chemicals?
- Information is key!
 - Indonesia: wording + benefit/purpose of the treatment
 - Balatsas-Lekkas *et al.* 2020
 - A statement of the benefit/purpose next to the label
 - Removal of confusion by consumers and other groups involved in the food chain



WARNING

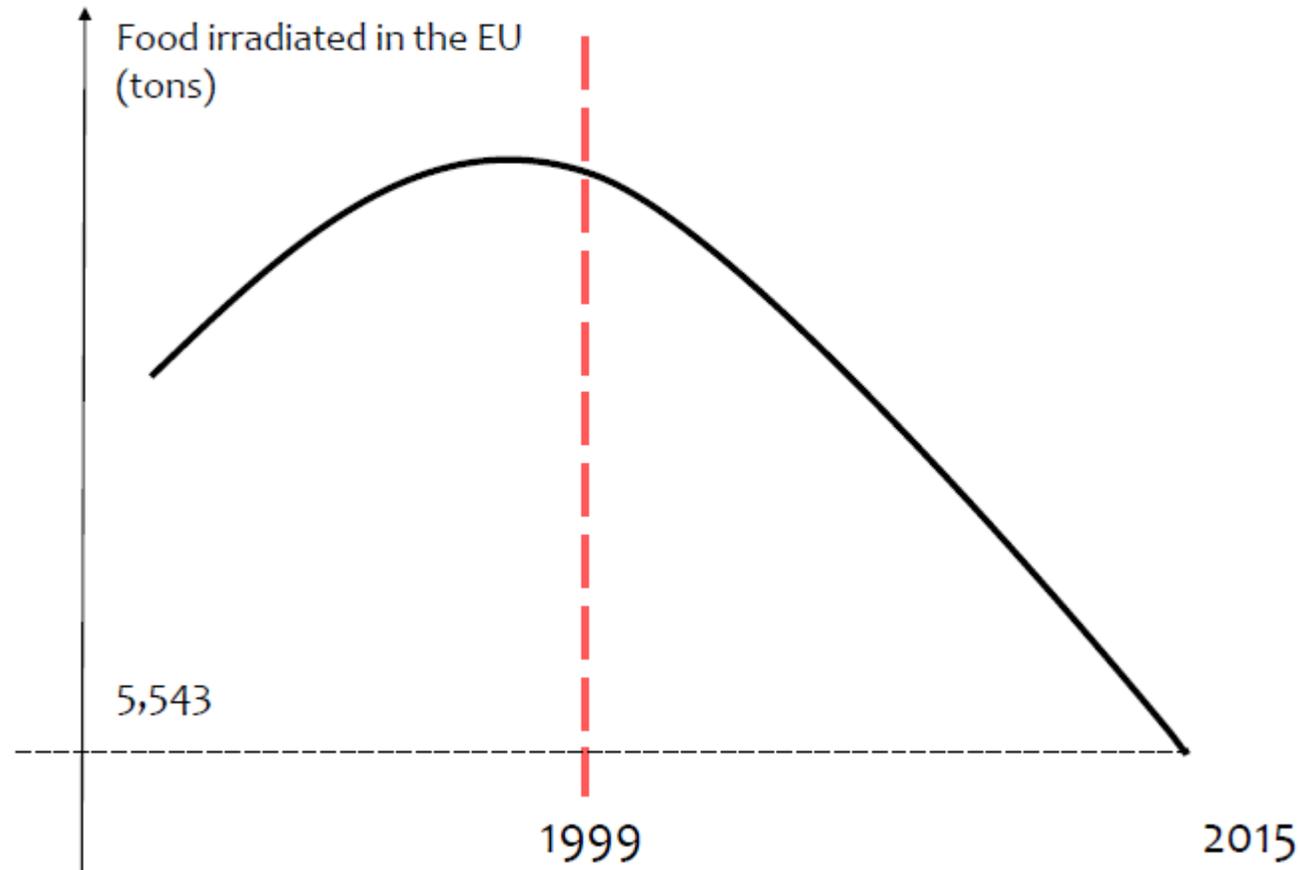
IRRADIATED



SAFE

often perceived as **warning**

EU: Decrease in food irradiation since 1999 Labelling of ingredients.

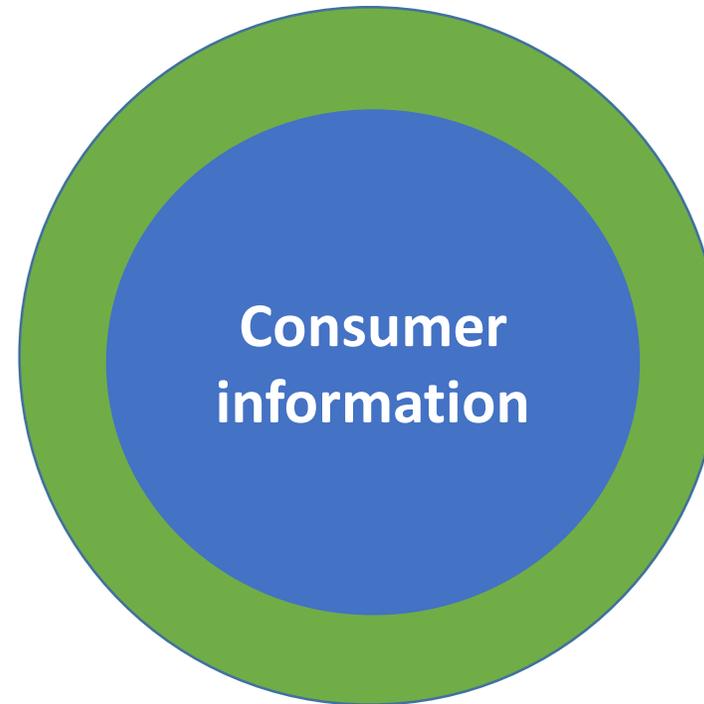


Future of irradiated foods.

How can we improve food security and safety?

Labelling

Authorized list



Dosimetry

**New technology
developments**

EU: Evaluation of Food Irradiation Directives on-going.



Ref. Ares(2017)4196327 - 28/08/2017

EVALUATION AND FITNESS CHECK (FC) ROADMAP			
TITLE OF THE EVALUATION/FC	Evaluation of legislation related to the irradiation of food and food ingredients		
LEAD DG RESPONSIBLE UNIT	DG SANTE G4	DATE OF THIS ROADMAP	03/2017
TYPE OF EVALUATION	Evaluation Mixed	PLANNED START DATE	Q4/2017
		PLANNED COMPLETION DATE	Q4/2018
		PLANNING CALENDAR	http://ec.europa.eu/smart-regulation/evaluation/index_en.htm
This indicative roadmap is provided for information purposes only and is subject to change.			

Global Harmonization Initiative (GHI)

Consensus Document on Food Irradiation.

- “Discordant international regulations of food irradiation are a public health impediment and a barrier to global trade”

- **Publication date October 2018**

- **Recommendation:**

“National authorities around the world shall recognize and enforce the findings from JEFCEI and JSGHDI reports that have been reflected in the Codex General Standard for Irradiated Foods. Therefore, any food should be allowed to be treated with irradiation with a dose necessary to achieve the technological purpose and without compromising wholesomeness, safety or sensory attributes of the food”
(GHI, 2018)

Wrap-up.

- Food security and safety at risk
- Food irradiation protects safety of foods and reduces losses and waste
- The safety of irradiated foods has been endorsed by international and national organizations
- Harmonization of national regulations and consumer information is key



Thank you for your attention