

Thoughts on Meat Industry Needs and Challenges

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Science

● IS IT SAFE?

YES

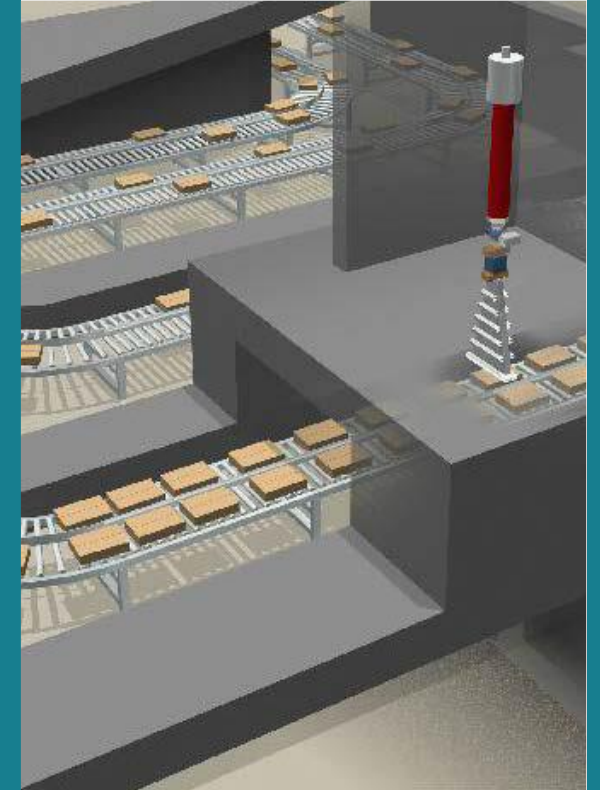
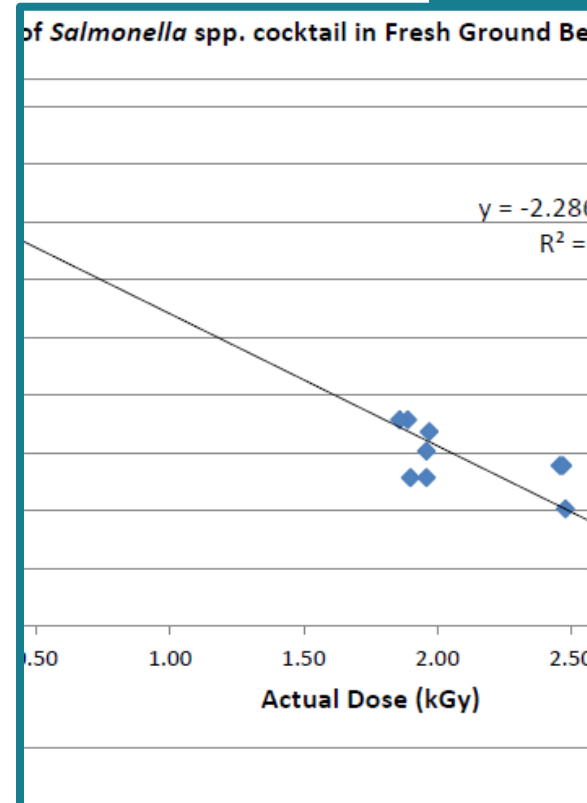
● DOES IT INACTIVATE MICROORGANISMS?

YES



We do not have a
SCIENCE challenge

We have an
APPLICATION challenge



Challenges of Application

Challenge One

Belief that consumers will not accept Irradiated meat.
Labeling requirements (U.S.)

Challenge Three

Product and packaging characteristics are highly variable. Slow logistics.

Challenge Two

Quality attributes can be impacted.

Challenge Four

Viable alternatives are available.



Challenge One

Consumer perception.

Consumer studies have shown that once irradiation is explained, consumers are more open to purchasing product. This has not necessarily been shown in shopping behavior changes.



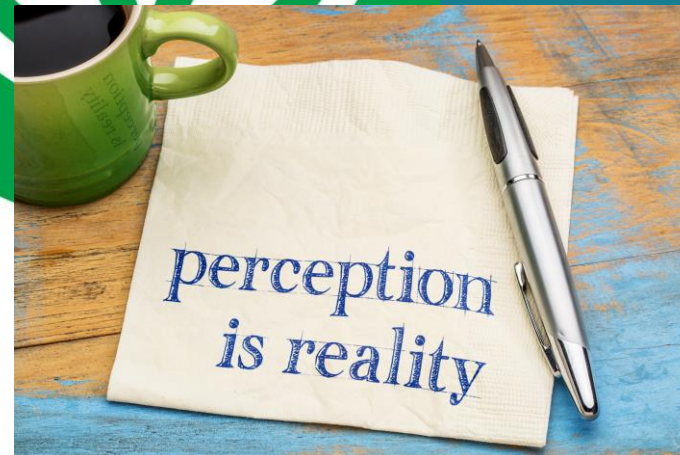
Consumer Acceptance

- Anti-irradiation voices strong
- Marketing and information has had limited success



U.S. Labeling Requirements

- Radura and “Treated by irradiation”
- Historic perception(s) stay with label



Challenge Two

Quality Attributes.

Since first introduction of irradiation, it has been recognized that detrimental effects on odor, flavor and color are possible which has become major roadblocks for effective use of this technology.



Treatment Causes Chemical Changes

- Highly variable
- Must be studied for each product



Sensory Impacts can be Minimized

- Understand the Product and Packaging
- Right Size the Dose



Factors that Affect Quality Outcome

- ✓ Amino Acid Content
- ✓ Fat Content
- ✓ Lipid Type
- ✓ Irradiation Dose
- ✓ Oxygen presence
- ✓ Temperature
- ✓ pH
- ✓ Antioxidants
- ✓ Shelf-life

Challenge Three

Product, Packaging, & Logistics.

Ground beef products are the focus of treatments. However, the products are the most diverse and require the most set-up.



Highly variable product type, pack size and packaging impacting set-up



Timeliness

- Case Ready Just-in-Time delivery is norm
- 2 week forecast / order changes up to 24 hr prior to shipment



Characteristics Impacting Set-up

- ✓ Amount of product
- ✓ Product weight
- ✓ Lean point (fat content)
- ✓ Stacks per layer
- ✓ Box length, width & height
- ✓ Product form (chub, patties, or loaves)
- ✓ Packaging (Films / Trays)
- ✓ Tray pack (Air volume)

Retail Product Set-up for One Customer

Product Description	Box Dimensions, in	Product Weight, lb	Amount of Product	Stacks / Layers
95/5 1/3# patties	19.75 x 11.25 x 10.50	7.98	6 trays / 4 patties ea	3 / 2
90/10 1/3# patties	19.75 x 11.25 x 10.50	7.98	6 trays / 4 patties ea	3 / 2
80/20 ¼# patties	19.75 x 11.25 x 10.50	9.00	9 trays / 4 patties ea	3 / 3
95/5 1# loaves	15.50 x 11.75 x 10.75	12.00	4 sleeves / 3 loaves ea	2 / 2
80/20 5# loaves	20.75 x 13.00 x 8.00	10.00	2 trays / 1 loaf ea	2 / 1
80/20 ¼# patties (5#)	20.75 x 13.00 x 8.00	10.00	2 trays / 20 patties ea	2 / 1
1/3# Loaf Mix	17.50 x 13.50 x 8.25	10.64	8 trays / 1 loaf ea	4 / 2
1.33# Patty Trays / Sleeves	23.5 x 19.25 x 8.5	15.96	6 sleeves / 2 trays per slv / 4 patties ea	3 / 2
1# Loaf Trays / Sleeves	23 x 15.25 x 12	16.00	4 sleeves / 4 trays per slv / 1 loaf ea	2 / 2

Retail case ready set-up is complex. Each product variation includes review and creates complexity with small quantities each day.

Challenge Four

Viabile Alternatives.

For *E. coli* control in beef, all ideas were considered including irradiation. Irradiation treatments were developed for ground beef but others focused on harvest line and beef trim. In US, beef trim is the traded commodity.



Harvest Line Focus

- The best objective is not to contaminate the carcass during harvest

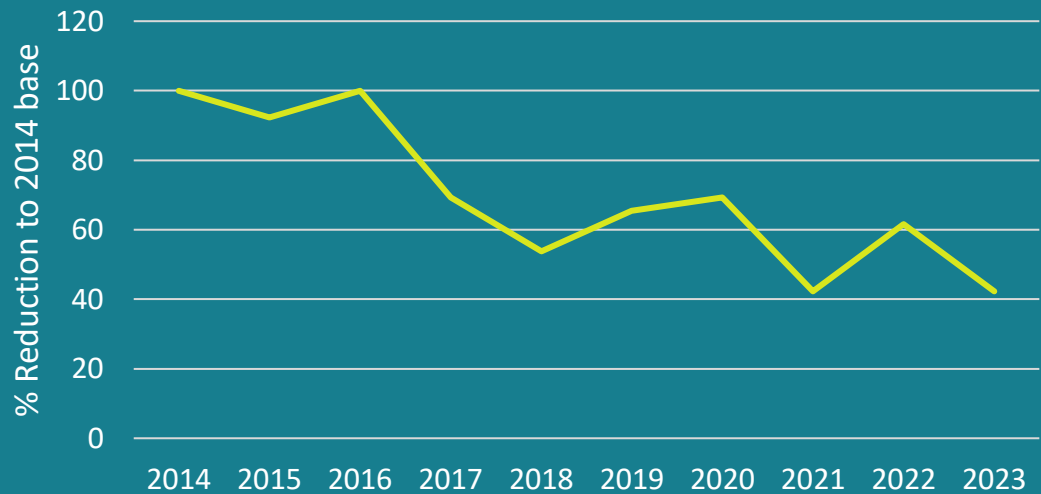


Grinder Supplier Program Requirements

- Appropriately forced control upstream
- Included harvest line interventions and beef trim testing



Reduction of Industry *E. coli* O157:H7 Presumptive Positive Results of Beef Trim Combos July Results



Improvements Have Occurred

- ✓ Best Practices Developed & Shared (www.bifsc.org/resources)
- ✓ In-Plant Intervention Improvement
- ✓ Detection System Improvements
- ✓ Verification Test & Hold Programs



Data collected in US Beef Harvest facilities as HACCP verification checks. All product with presumptive positive results are removed from the raw beef product stream. Historically, July has been recognized as part of the high shedding season. Each year represents 129,019 to 184,289 samples.



Opportunity

Salmonella Control.

Salmonella differs from *E. coli*

- *Salmonella* is intrinsic to poultry and meat carcasses (organs, tissue, synovial fluid, lymph nodes)
- Traditional interventions cannot reach the bacteria
- Only need reduction due to dose response
- On-farm interventions will compete
- Need continued research



Summary

Work Continues

- **Ionizing Processing is a safe and effective intervention**
- **Adoption Challenges**
 - Consumer perception
 - Quality attributes
 - Product, Packaging and Logistics
 - Viable Alternatives
- **Opportunities continue to exist**
 - *Salmonella* control
 - Supply chains of the immuno-compromised



Thanks.

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