Food Safety Disruptors - Emerging Technologies and the Baking Industry

Regulations and customer requirements are moving targets that cause greater complexity in defining what is considered successful food safety. Emerging technologies like Blockchain and IoT solutions can help hold other departments and companies accountable, thus ensuring food safe product and ingredients.

Blockchain is a new and powerful tool for traceability. Blockchain can be used for tracing specific batches as they move through the production process. While it is currently used in the Produce and Seafood industries, its use in bakeries and other grain based industries has not yet been proven. Where does the technology currently stand and where is it heading?

How suitable is IoT for baking environments? IoT is a proven means of providing real time data for immediate decision making. IoT is simple, low cost, and provides immediate results that are useful across all departments.

Ultimately, these emerging technologies have the power to completely transform traditional Food Safety.

Learning Objectives

- Define Food Safety Success in a New Era
- Understand how Blockchain Fits into Bakeries
- Decide IoT's Place in their Food Safety Program

Presenter
Robert Burgh, Nexcor Food Safety Technologies

Presentation Time
Monday, February 25, 2019
2:10 pm - 2:45 pm

Session
Breakout 1
Food Safety Disruptors
Emerging Technologies & the Baking Industry

Robert Burgh
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Food Safety Disruptors

• **The Good:** Useful Technologies and Protocols
• **The Bad:** Getting Compliance Buy-In from Everyone in the Company
• **The Ugly:** Misunderstanding, Poor Science, Transparency Gone Wrong

DISRUPTOR | definition in the Cambridge English Dictionary
https://dictionary.cambridge.org/us/dictionary/english/disruptor

disruptor, noun [C] uk /dɪˈsɜːtər/ us /-tər/ a person or thing that prevents something, especially a system, process, or event, from continuing as usual or as expected: endocrine/hormone disruptors.
Defining Food Safety in a New Era

- Food Safety has changed significantly in the past 2-3 decades
- Regulations
- Current Practices and Trends
- Customers and Social Media
- Technological Innovations

The State of Food Safety: Outside Pushbacks

What is “Food Safe”?

Regulations

Social Media

Burnt Seeds = Insects
Old Dough = A Mouse or Droppings

Consumer Perceptions
The State of Food Safety: Outside Pushbacks

Increased regulations and outside requirements
- Document what didn’t used to require documenting
- Allergens – Who tracks them past “make-up”? (It's coming)
- Sesame Seeds – Future allergen (~300,000 people in USA)

Social Media
- Increased scrutiny
- Uninformed have impactful opinions
  - “Pink Slime”
  - I’ve Been Poisoned . Com
  - “1 in 10 young adults wants to see dihydrogen monoxide banned from foods and beverages.”
- Scope and causes of actual outbreaks
Then vs. Now

Jack in the Box (1992):
Consequences –

- Children experienced brain damage, coma, hemorrhaging, and death.
- National attention until newspapers and local stations stopped running the story.
- People died

Chipotle: (2015)
Consequences –

- No deaths

The State of Food Safety:
Inside Pushbacks

Loss of Talent, Decreased Stability

- The age of people retiring from the jobs they started at is ending.
  - Trained people are hard to come by
  - After training people are hard to keep
The State of Food Safety: Inside Pushbacks

What is the purpose of your company? TO MAKE MONEY

- **Poor Communication** across Departments and Job Roles
  - Importance of setting and following protocols
  - Resources required for protocols
  - Consequences:
    - of poorly defined protocols
    - of not following protocols
  - Inconsistent Enforcement
  - Lack of “Buy-In”

The State of Food Safety: Inside Pushbacks

- Not Understood by the C-Suite
- Food Safety is not considered by most lean transformation teams
- Assumption that Food Safety does not make money
- Assumption that Food Safety is an all or nothing approach

= Food Safety | Food Safety =
The Good Disruptors

Moving Food Safety Forward:
• Communication
• KPIs (Key Performance Indicators)
• Technologies
  • Record Keeping and Execution
  • IoT (Internet of Things)
  • Blockchain

Communicating Risk Mitigation

• What are the Risks? What causes them?
• What is needed to mitigate the Risks? (This cannot be based on wild estimates)
• Teach all departments to value Food Safety the same

Food Safety and Maintenance are needless costs! No value!

I never miss an oil change for my car! Duh!
Approaching KPIs

- Simple is best – as few KPIs that can get the job done
  - Definitions that are short and clear
  - Measurements that match actions and requirements
- Prioritize:
  - Risk Mitigation
  - Continuous Improvement
  - Resource Planning
- The KPIs must be as auditable as everything else in the Food Safety plan

Risk Mitigation: Use KPIs to Demonstrate...

Plant Actions to Reduce Complaints

- Being Proactive
- Training (just because you can’t see it doesn’t mean it’s not there)
- Execution of Food Safety Plan
- Verification and Validation of Food Safety Plan
- Continuous Improvement
- Employee Empowerment
Technological Innovations

Blockchain:
• Why is it so important?
• What does it take to fit into Food Safety and Baking?

By design, a blockchain is resistant to modification of the data. It is “an open, distributed ledger that can record transactions between two parties efficiently and in a verifiable and permanent way”

Blockchain in Practice - Tuna Fish
• From boat to catch to processing to package
• “An RFID Tag is attached to each fish when it is brought on board”
Blockchain

Blockchain in Practice: Bakery

Issues to Overcome:
- “Lot vs Batch”
- Mixing of “Lots”
- Bulk vs Minor vs Micro Lots
- Clean “Lot Breaks”

Example Whole Wheat Bread
- Whole Wheat Flour
- Water
- Sugar
- Oil
- Wheat Gluten
- Molasses
- Cultured Whole Wheat
- Salt
- Yeast
- Vinegar
IoT-More Than Just Sensors!

Then:
• Equipment
• Sensors
• Devices
• Anything

Now:
• Real-Time Data
• Real-Time Actions

IoT-Sensors

Receiving – What Does It Mean?
IoT-Sensors

Wrapping – What Does It Mean?

One Last Thought

The **OODA** Loop

– OBSERVE
– ORIENT
– DECIDE
– ACT

Food Safety for Modern Times.