UNLOCKING WELLNESS: ENSURING FOOD SAFETY & TRANSPARENCY ACROSS THE SUPPLY CHAIN

Presented by:

Bharti Siraskar, Nandini Singh,
Pravalika Koneru, Vidhi Bahety

EXECUTIVE SUMMARY

TARGET AUDIENCE

FDA (Food and Drug Administration)
CDC (Centers for Disease Control and Prevention)
USDA (US Department of Agriculture)

CHALLENGES

Unclear regulations which are difficult to navigate, complexity of supply chain, poor traceability, data security and privacy and lack of awareness among consumers about the hazards of foodborne illnesses.

RECOMMENDATIONS

1- Block Chain Technology for enabling traceability in food supply chain

2- Initiating public awareness campaigns to promote food safety education for empowering consumers to make safer food choices.

PRESENTATION OVERVIEW

- ❑ Introduction to healthcare problems related to food safety
- ❑ Importance of ensuring food safety & transparency across the supply chain
- ❑ Background information
- ❑ Success & Failure of past food safety programs
- ❑ Barriers to transparency
- ❑ Examples & Illustrations
- ❑ Our recommendations

INTRODUCTION TO HEALTHCARE PROBLEMS RELATED TO FOOD SAFETY

- **Microbial Contamination of foods** - Studies have identified different disease causing bacteria (mainly *Salmonella* spp.), fungus (Blastomyces, *Fusarium* spp. etc.) and viruses from different food items from food stores which affect millions of people each year.
- **Chemical Foodborne Illness** - Food risks are also related to chemicals, whether they are natural (e.g., allergens) or contaminants (e.g., they are not expected to be present in foods). Example- polychlorinated biphenyls
- **Food Fraud and Mislabeling** - Intentional misrepresentation or adulteration of food products. Common forms - genetically modified food products and substitution of inferior ingredients which leads to various diseases like hypertension, diabetes, obesity .etc.

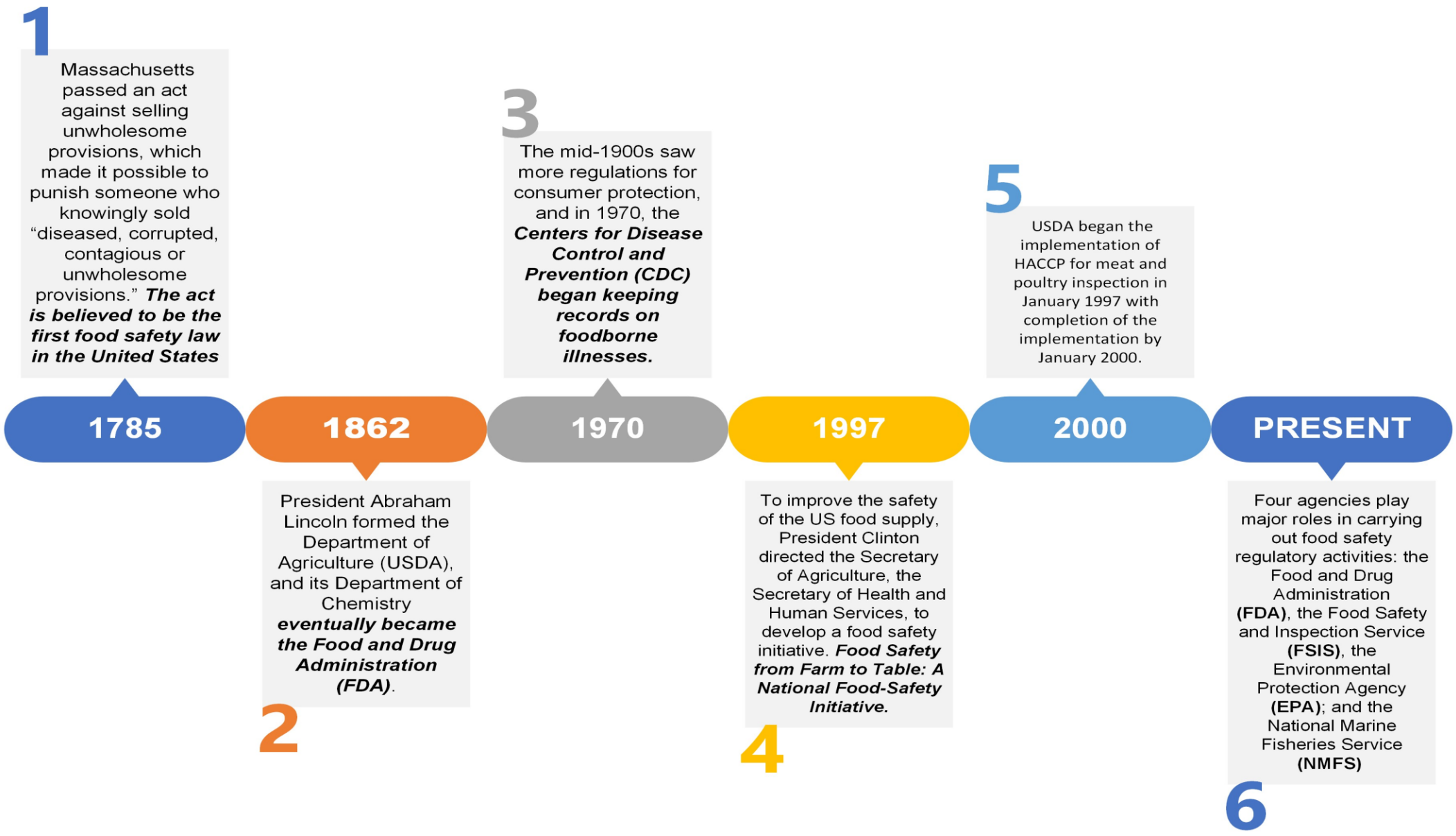
IMPORTANCE OF FOOD SAFETY AND TRANSPARENCY ACROSS THE SUPPLY CHAIN

Incorporating supply chain transparency into food safety strategies is crucial for:

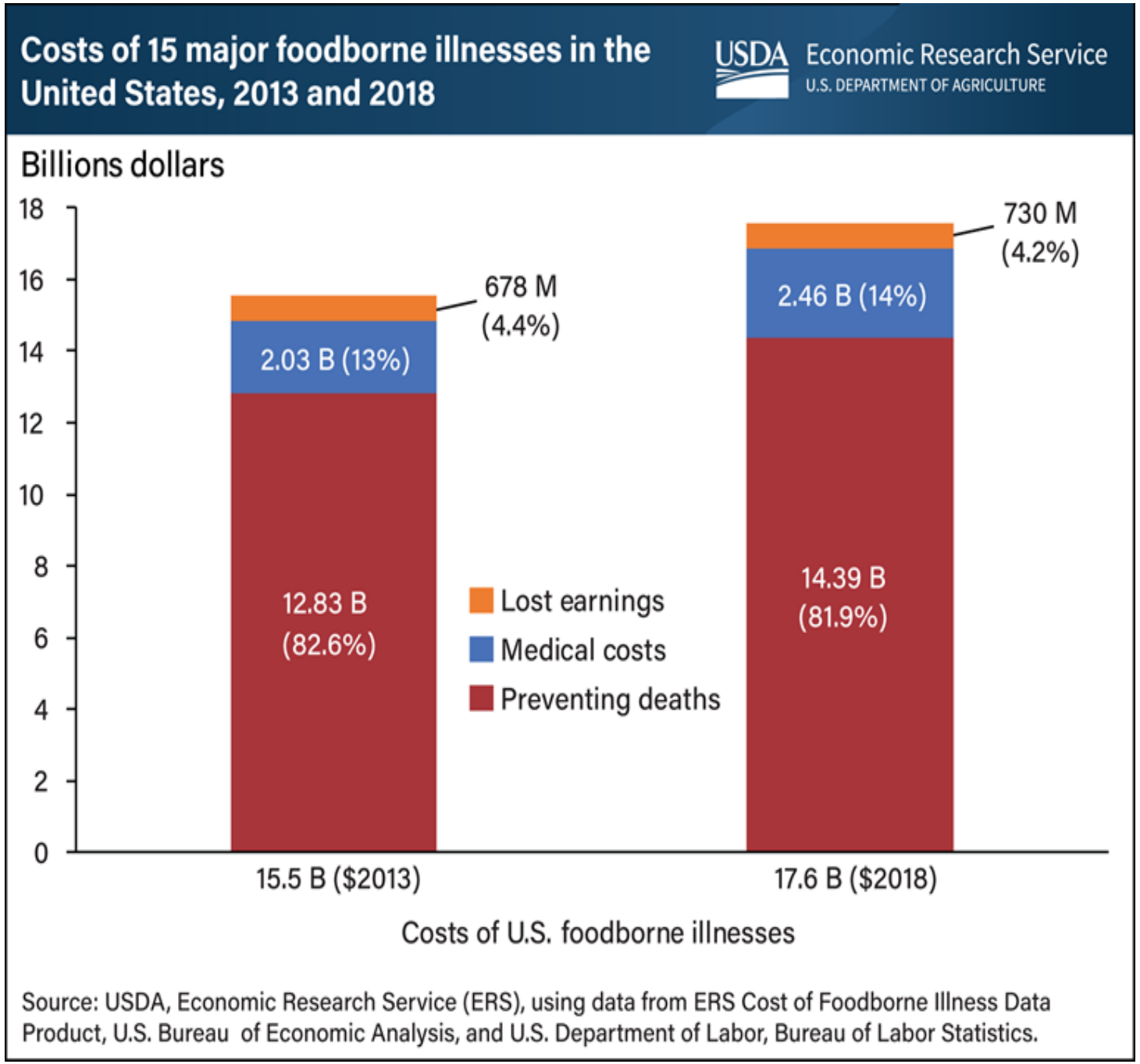
- **Safeguarding public health**
- **Mitigating risks**
- **Promoting regulatory compliance**
- **Fostering trust among consumers**

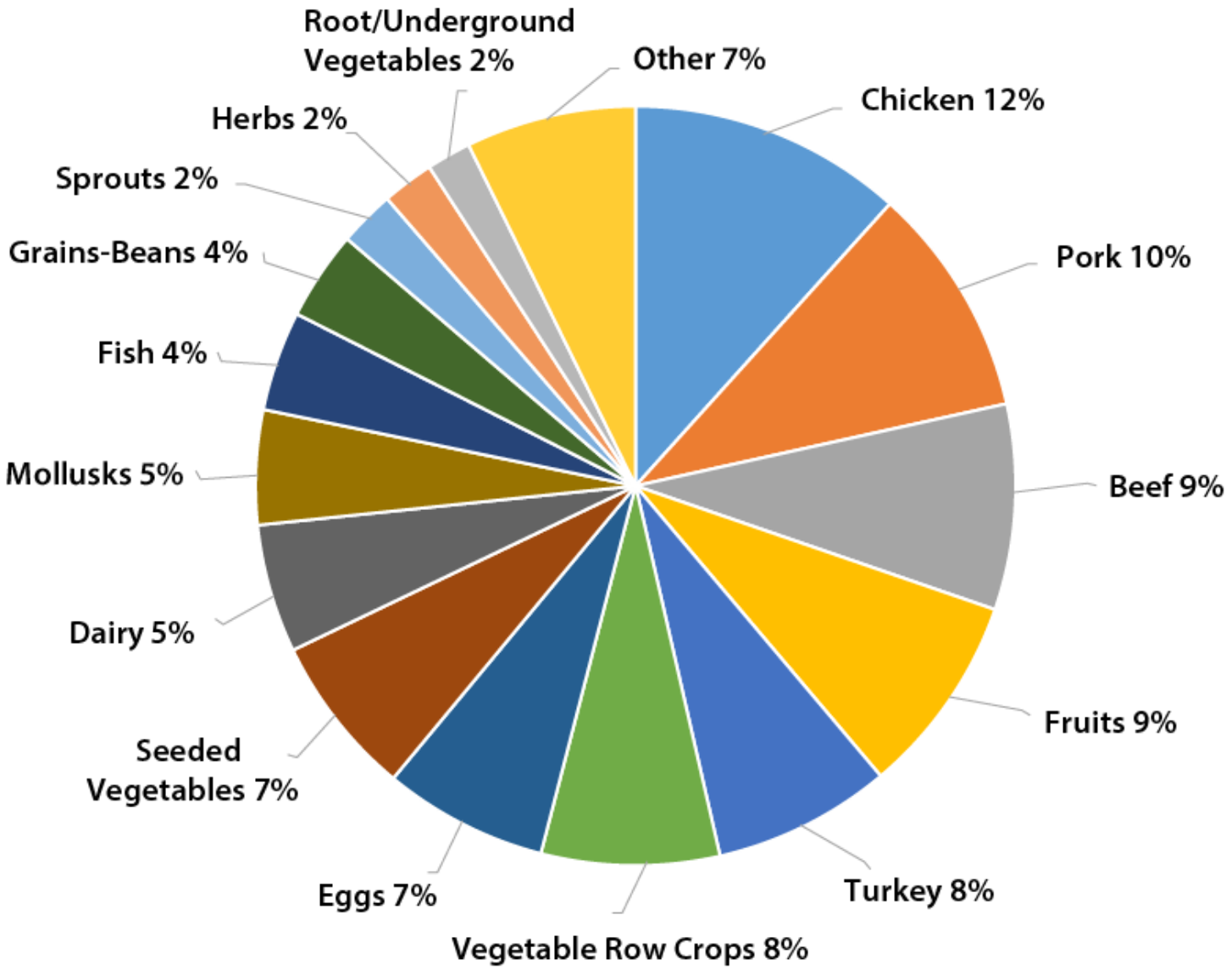
It ensures that the journey of food products is well documented, monitored and optimized to meet the highest safety standards at every step. Collaboration among stakeholders, adoption of best practices, and investment in technology and infrastructure are key to achieving these goals and creating a safer, more transparent food supply chain.

TIMELINE OF HISTORICAL CONTEXT OF REGULATORY MEASURES AND GUIDELINES



- The CDC estimates indicate that 17% of the U.S. population (i.e., 48 million people) get sick because of these illnesses every year, resulting in 128,000 hospitalizations and 3000 deaths.
- The healthcare costs associated with foodborne illnesses are enormous, with the USDA estimating it to be almost USD 17.6 billion annually.





Top 15 Foods That Caused Outbreak-Associated Illnesses, 2009–2018

- **2006- Spinach E. coli Outbreak:** This outbreak was traced back to contaminated spinach grown in California. Over 200 people were affected and 3people died.
- **2010- Peanut Butter Salmonella Outbreak:** This outbreak was linked to peanut butter produced by a single company. It sickened over 700 people and caused 9 deaths.
- **2018- Romaine Lettuce E. coli Outbreak:** This outbreak was traced back to contaminated romaine lettuce grown in California, infecting over 160 people and causing five deaths.
- **2024- Chicken Salmonella Outbreak:** California chicken producer 'Foster Farms' was suspected of infecting a total of 634 people with *Salmonella*. Incidents spread across 29 states.

Successes of Previous Programs

Farm-to-Table Programs:

- Farmers selling their products directly to consumers, such as through farmers markets or community supported agriculture (CSA) programs.

- **Benefits**:

Freshness:
Sustainability:
Community Support:

- **Ensure food safety by**:

Shorten Food Travel: Minimize contamination risk by reducing farm-to-fork distance.
Foster Relationships: Enable consumer-farmer interaction for food production transparency.

Hazard Analysis and Critical Control Points (HACCP)

HACCP is a systematic approach to preventing foodborne illness that was developed by NASA in the 1960s. HACCP involves identifying and controlling potential hazards throughout the food supply chain, from farm to fork.

Benefits:

- ❑ Proactive Approach:
- ❑ Compliance:
- ❑ Risk Reduction:
- ❑ Reputation:

Some examples of successful implementations of HACCP in recent years:

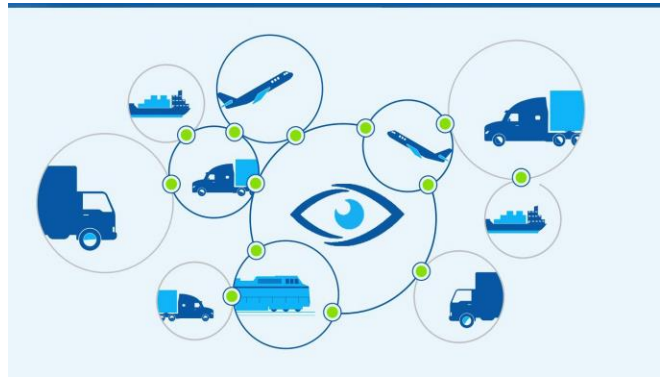
- ❑ 2019 - Tyson Foods:
- ❑ 2020 - McDonald's:
- ❑ 2021 - Nestlé:
- ❑ 2022 - Kroger:

7 Principles of HACCP

1. Conduct a hazard analysis
2. Identify critical control points (CCPs)
3. Establish critical limits
4. Establish monitoring procedures
5. Establish corrective actions
6. Establish verification procedures
7. Establish record-keeping procedures

BARRIERS TO TRANSPARENCY

❑ LACK OF VISIBILITY :



- It is difficult to know what is happening in the supply chain due to the sheer size and complexity of the system
- Before the ingredients even cross over to the convoluted world of logistics, they've been grown, harvested, transported, cleaned, processed, and packaged
- Tradelink is your boots on the ground to manage these details and mitigate your risk

❑UNCLEAR REGULATIONS:

"You're going to have to announce the new food safety regulations . . . the boss is out sick with salmonella poisoning."

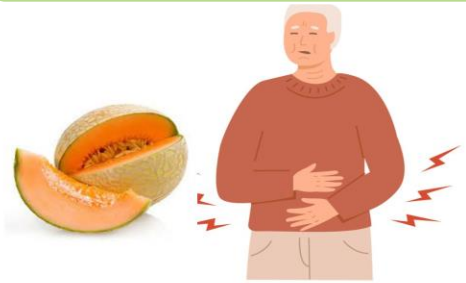
- Different countries have different regulations, and these can be difficult to navigate
- This makes it difficult to ensure that all supply chain participants follow the same standards
- Our deep understanding of QA regulations and international auditing bodies allows us to openly and provide all of the information you need.

BARRIERS TO TRANSPARENCY

❑ DATA SECURITY AND PRIVACY:

- One of the Major issue with supply chain transparency
- Sensitive information exchange and gathering increases the possibility of data breaches and unauthorized access.
- It's crucial to strike a balance between openness and safeguarding private information. Access controls, encryption, and strong cybersecurity measures can all assist protect sensitive data, ensuring that transparency initiatives don't jeopardize the ecosystem's security and integrity.

STORY OF THE US CANTALOUPE OUTBREAK

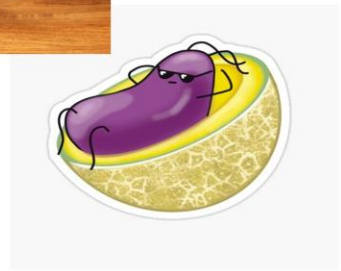


Mike Hauser consumed fresh cantaloupe in Colorado in August 2011 and within days, he became horribly sick, and died.

As more cases from other states were reported, investigators did scientific detective work to find what was causing the sudden,deadly food outbreak, collected samples of blood and samples of fruit still sitting in refrigerators, stores and warehouses.

The trail of evidence, the cantaloupes, eventually led to a remote part of eastern Colorado, known as Jensen Farms.

FDA team found out that the contact surfaces at the packing house of Jensen Farms had the exact same, genetically matched strain of Listeria which was found in samples collected from ill patients, proving that was the source of contamination.



The contaminated melons were shipped out and distributed across the country that took them to hundreds of supermarkets and retailers, and then into people's homes.

Just days before the Listeria outbreak, Jensen Farms paid a private food inspection company called Primus Labs to audit their operation. The auditor gave Jensen Farms a 96% score, and a "superior" grade. The entire system was found to be a patchwork of unregulated guidelines with no national standards or actual regulations.

The investigators found, water was pooling on the floor; samples taken from the pooled water were positive for the Listeria, a second-hand washing machine designed for cleaning potatoes had been substituted to clean the melons and the farmers had also removed their antimicrobial wash.

HOW COULD THE OUTBREAK HAVE BEEN PREVENTED?

1.

Farmers adopted safe practices during growing and harvesting.

2.

Changes to the sanitary practices at the plant could have gone a long way towards preventing an outbreak.

Installation of cantaloupe washing station that sprays fruits with clean water and sanitizer before they are sent to a cooling room. Also, adding a process of rapidly chilling melons to further inhibit the growth of any bacteria that might have survived the bath.

4.

Consumers should wash cantaloupes before consuming them, even if they would be throwing the rind away because the deadly bacteria wouldn't penetrate the fruit until consumers cut into it, pushing listeria from the outer rind into the flesh they would eat.

Do not eat cut melon left out for more than 2 hours orthat's kept in the refrigerator for more than a week.

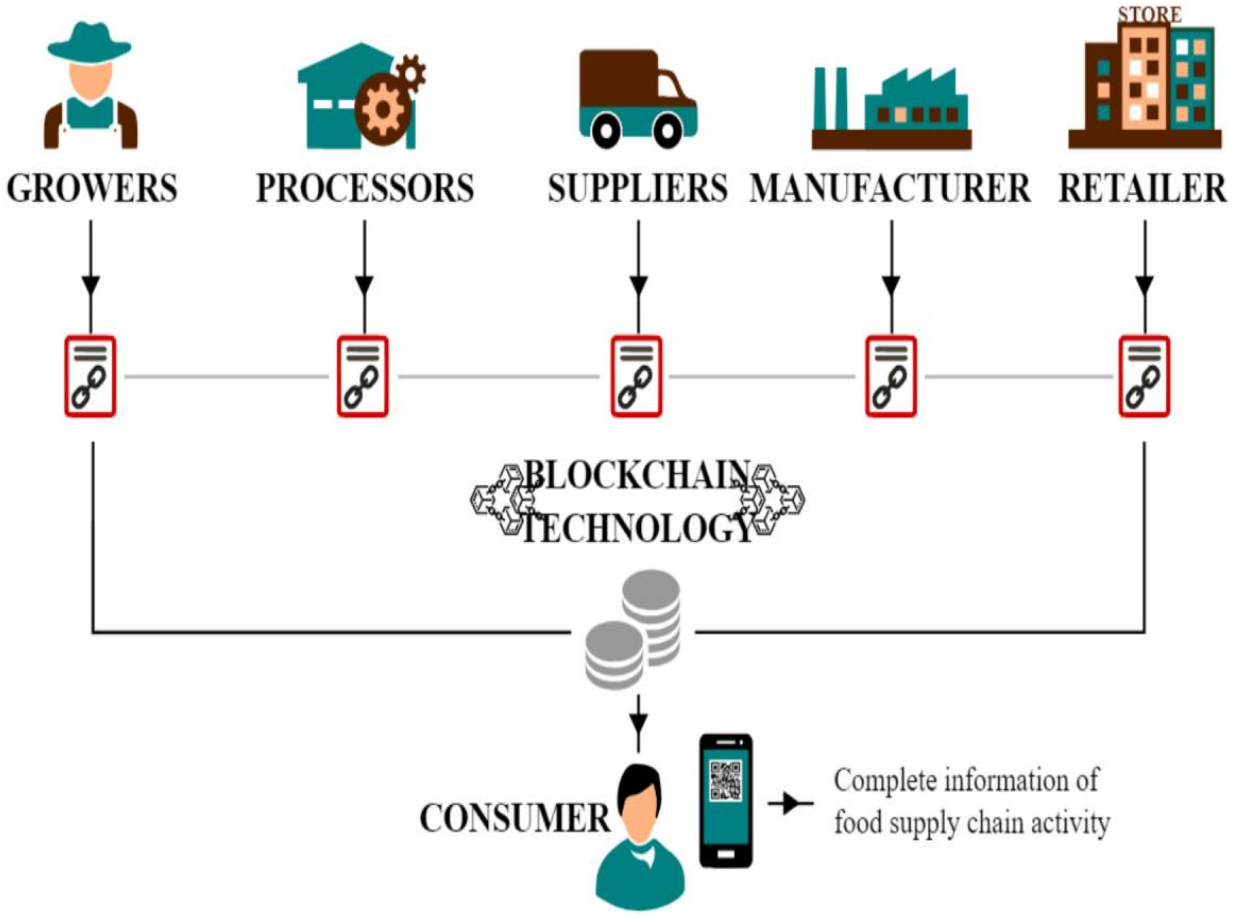
3.

Produce transported with consistent temperature control.

RECOMMENDATION: 1

CURRENT BARRIER: Poor traceability across the supply chain.

RECOMMENDATION: Blockchain technology is a shared digital platform where users can store and share information across the network. This system enables users to look at all transactions simultaneously and in real-time. This technology can deliver transparency, traceability and trust that has eluded the food industry for a long time.



RECOMMENDATION: 2

CURRENT BARRIER: Need for consumer empowerment

RECOMMENDATION: Initiating public awareness campaigns to promote food safety education for empowering consumers to make safer food choices.
Some key elements for food safety education can be :
-Hygiene practices
-Safe food handling
-Label Reading
To effectively educate consumers, the F&B industry must collaborate with government agencies, non-profit organizations, and educational institutions to include public awareness campaigns, workshops, seminars and online resources.

REFERENCES

1. Asaad, J. (2022, June 13). Fixing the 5 big problems in the food supply chain. The Network Effect. https://supplychainbeyond.com/5-big-problems-in-the-food-supply-chain/
2. CDC and Food Safety | CDC. (n.d.). https://www.cdc.gov/foodsafety/cdc-and-food-safety.html
3. Costs of major foodborne illnesses in the United States increased to $17.6 billion in 2018. (n.d.). https://www.ers.usda.gov/data-products/chart-gallery/gallery/chart-detail/?chartId=101488
4. Gizaw, Z. (2019). Public health risks related to food safety issues in the food market: a systematic literature review. Environmental Health and Preventive Medicine, 24(1). https://doi.org/10.1186/s12199-019-0825-5
5. Hussain, M. A., & Dawson, C. O. (2013). Economic Impact of Food Safety Outbreaks on Food Businesses. Foods (Basel, Switzerland), 2(4), 585–589. https://doi.org/10.3390/foods2040585
6. Mj, S. P. (2024, February 22). 10 of the Worst Food Safety Scandals in Recent History. Xtalks. https://xtalks.com/10-of-the-worst-food-safety-scandals-in-recent-history-
7. Multistate Outbreak of Listeriosis Linked to Whole Cantaloupes from Jensen Farms, Colorado | Listeria | CDC. (n.d.). https://www.cdc.gov/listeria/outbreaks/cantaloupes-jensen-farms/index.html
8. National Academies Press (US). (1998). Introduction and background. Ensuring Safe Food - NCBI Bookshelf. https://www.ncbi.nlm.nih.gov/books/NBK209124/

9. Nesheim, M. C., Oria, M., Yih, P. T., Board, F. a. N., & Resources, B. O. a. a. N. (2015, June 17). Health effects of the U.S. food system. A Framework for Assessing Effects of the Food System - NCBI Bookshelf. https://www.ncbi.nlm.nih.gov/books/NBK305175/
10. Steele, M. (2023, August 14). The importance of transparency in the food supply chain. Tradelink International. https://tradelinkinternational.com/the-importance-of-transparency-in-the-food-supply-chain/
11. Tete, F., Brown, L., Gerding, J., Food Safety Program, Environmental Health Services Branch, Centers for Disease Control and Prevention, & Oak Ridge Institute for Science and Education. (2018). Successes in providing the 10 essential environmental public health services. In Journal (Vol. 80, Issue 5, p. 52). https://www.cdc.gov/nceh/ehs/docs/jeh/2017/dec-food-safety-program-success-508.pdf
12. The Healthline Editorial Team. (2018, October 5). Worst foodborne illness outbreaks in recent U.S. history. Healthline. https://www.healthline.com/health/worst-foodborne-illness-outbreaks#emsalmonellaem
13. Timeline of Events: Multistate Outbreak of Listeriosis Linked to Whole Cantaloupes from Jensen Farms, Colorado | Listeria | CDC. (n.d.). https://www.cdc.gov/listeria/outbreaks/cantaloupes-jensen-farms/timeline.html
14. Tracextech, & Tracextech. (2023a, June 27). The 5 step approach to Food Traceability. Blockchain for Food Safety, Traceability and Supplychain Transparency. https://tracextech.com/5-step-approach-food-traceability/