Join us for these free Webinars!

Organized by the Food Safety Culture PDG
Sponsored by the IAFP Foundation

Food Safety Culture - Part 1 of 6: How to get Buy-In, Develop Metrics, and Properly Implement
May 26, 11:00am (EST)

Food Safety Culture – Part 2 of 6: Food Safety Culture & Communication - It’s about People
June 8, 11:00am (EST)

Food Safety Culture - Part 3 of 6: Latest Food Safety Culture Research From Four Doctoral Researchers
June 22, 11:00am (EST)

Food Safety Culture - Part 4 of 6: SQF and Culture Improvements - Hear Practical Learnings From Two Companies
July 6, 11:00am (EST)

Food Safety Culture - Part 5 of 6: Evolving the Retailer Stand on Food Safety Audits; Culture and Behavioral Assessments
July 13, 11:00am (EST)

Food Safety Culture - Part 6 of 6: Dynamic Leadership by Supervisors = Strong Organizational Cultures
July 22, 11:00am (EST)

http://www.foodprotection.org/events-meetings/webinars/
Webinar Housekeeping

• For best viewing of the presentation material, please click on ‘maximize’ in the upper right corner of the ‘Slide’ window, then ‘restore’ to return to normal view.

• **Audio is being transmitted over the computer**, so please have your speakers ‘on’ and volume turned up in order to hear. A telephone connection is not available.

• Questions should be submitted to the presenters during the presentation via the **Questions section** at the right of the screen. Questions will be answered at the end of the presentations.
Webinar Housekeeping

• It is important to note that all opinions and statements are those of the individual making the presentation and not necessarily the opinion or view of IAFP.

• This webinar is being recorded and will be available for access by IAFP members at www.foodprotection.org within one week.
Food Safety Culture - Part 3 of 6: Latest Food Safety Culture Research From Four Doctoral Researchers

**Moderator:** Lone Jespersen  
Cultivate, Switzerland

Please consider making a contribution

This webinar is being recorded and will be available to IAFP members within one week.
Today’s Presenters

Emma Samuel
Emma is assessing hand hygiene compliance and food safety culture influences in food manufacturing. Only mid-way into her PhD, this novel project facilitates access to an operational multi-site business for the entire project duration.

Rounaq Nayak
Dr. Rounaq Nayak is a Lecturer in Food Policy at Harper Adams University, Shropshire, UK. His research interests lie in the areas of modern slavery (within local and global food systems), food safety culture, food system resilience, and applying human factors methods to investigate the above areas. He was admitted to the degree of Doctor of Philosophy at Loughborough University (2018) in Human Factors and Complex Systems, and his thesis was titled, “Food Safety Culture: A Systems Approach”.

Sophie Tongyu Wu
Sophie Tongyu Wu just graduated with her PhD from Purdue University USA, her research interest being food safety behavior, climate, and culture in Listeria monocytogenes control in retail environments. She is active in advocating health sciences in the realm of human rights, which is reflected in her concurrent study with the Human Rights Program and a summer study abroad program in Central European University in Budapest, Hungary.

Shingai Nyarugwe
Shingai recently obtained her PhD from Wageningen University where she researched the influence of food safety culture on food safety behavior and food safety performance, including the role of the company environment. She is a member of the food safety culture science group (SALUS)
APPLYING THE GFSI FOOD SAFETY CULTURE FRAMEWORK TO HAND HYGIENE COMPLIANCE IN FOOD MANUFACTURING

Emma Samuel, KESS2 PhD Candidate (Year 2)
Supervisors: Dr Elizabeth C. Redmond and Dr Ellen W. Evans
ZERO2FIVE Food Industry Centre, Cardiff Metropolitan University
MY PROJECT: Hand hygiene compliance in food manufacturing

• 3 Year PhD Scholarship
• Supported by the European Social Fund through Welsh Government and the business partner
• Administered by the pan-Wales Knowledge Economy Skills Scholarship (KESS2) from Bangor University
• **Purpose:** To partner industry with higher education academic skills
PROBLEM AND AIMS

“Hand hygiene practices were carried out adequately on 31% of required occasions and were not even attempted on 55% of occasions... Clayton and Griffiths (2004)

“...out of 494 (48.1%) actions categorized as behaviors to be followed by hand sanitation, only four (0.8%) were followed by hand sanitation practices.” Her et al (2019)

“...604 attempts... only 2.2% (13 attempts) were determined to be compliant with the company protocol” Evans and Redmond (2019)

“...knowledge-based training alone was not enough to improve employees’ handwashing performance...” Yu et al (2018)

AIMS:

- Assess hand hygiene compliance before production entry and inside production departments.
- Assess the food safety culture dimensions influencing hand hygiene behaviour.
BUSINESS PARTNER AND GFSI FRAMEWORK

CUSTOMER: hospitality and catering, schools, hospitals and nursing provisions, food service

PROJECT DESIGN

Preliminary:

- Management interviews
- Company policy and procedure review
- Micro/Hygiene assessments
- Hand hygiene observations
- All staff survey

DATA SYNTHESISED TO INFORM BESPOKE INTERVENTION DESIGN

CROSS-SITE FOCUS GROUP FEEDBACK & REFINEMENT

INTERVENTION IMPLEMENTATION

EVALUATION: IMMEDIATE AND LONGER TERM

Repeated measures
Emma Samuel, Hand Hygiene Compliance in Food Manufacturing, IAFP Food Safety Culture Webinar Series, 22 June 2020
“...we've developed a business around a culture of looking after the customer. Because we want their order tomorrow. And the day after. And next week and so on.”

P004, Board Member

“...customer care is paramount. That probably is the number one priority.”

P003, Board Member

“It’s not a mission statement or set of goals which are written down ... But they’re embedded and ingrained into everyone that works here.”

P005, Board Member

“...biggest driver is customer service. And it's all about getting the product to the customer in a timely manner...”

P002, Site 3

“...fundamentally customer service. I think that’s what they see as being above everything else ... fulfilling a customer’s needs ...”

P001, Site 1

“The focus is the customer. The customer is, is king. Supply the customer. Do whatever we can, bend over backwards, to make sure you supply the customers, keep the customer’s happy. That is the main priority.”

P004, Site 1
COMPANY POLICY (Hand Hygiene)

... when do I wash my hands ...?

GLOVE POLICY
Hands are to be washed and sanitized before putting on blue gloves.

Gloves must be changed in-between every product produced, but can be changed sooner than this if required.

PERSONAL HYGIENE POLICY
Hands should be washed frequently before especially:
Before handling food in the food production areas.
Between food handling operations.
After using the toilet and before leaving the washroom.
After handling waste food or refuse.

ALLERGEN POLICY
Staff must change disposable PPE (gloves, sleeves, aprons) and wash their hands before changing to the next activity.

STAFF HYGIENE RULES
• Hands must be washed regularly as procedure, and in addition, after handling waste products, rubbish bags, picking items up from the floor, etc.
• Avoid touching your face, nose and mouth with your hands, if you do so, wash and sanitise your hands immediately afterwards.
• If you need to cough or sneeze, please push your mouth into your shoulder before you cough/sneeze. Do not use your hands.
• If you blow your nose, please do so outside of the production area. Wash and sanitise your hands immediately afterwards.

Emma Samuel, Hand Hygiene Compliance in Food Manufacturing, IAFP Food Safety Culture Webinar Series, 22 June 2020
A FOOD HANDLER JOB DESCRIPTION (Extract)

- Preparing and producing products in a controlled environment, in line with the high standards required by ourselves, our customers and our audit partners.

- Responsible for maintaining a high standard of Personal Hygiene and Food Hygiene practices.

- Report all hazards to supervisors.

The job will also include all other reasonable related and administrative duties / tasks as may be required from time to time.

Q: Why should outdoor clothing be kept out of the food preparation area?
Q: The principal role of a supervisor in a catering business is to...
Q: An adequate handwashing duration is...
Q: Hands should be washed [choose]...
Q: The correct procedure for washing hands is...

People  Consistency  Hazard & Risk Aware  Adaptability
"...it’s a move in the right direction. I do think in order for us to improve our food safety culture then it is going to require a hell of a lot more effort than a notice board!"

P002, Site 3
“Well we don't have a mission statement which is something that I have been trying to push for.”

“...they will have pages of stuff about their processes, the culture, the mission statement but actually what I felt was that they were just bits of paper.”

P005, Board Member

“I think it's something that we need...I think it sets a focus for all of our employees to know where the company's heading and where we want to be.”

P006, Head Office

“Food safety culture is ... to me, what is actually happening... It's kind of, people’s opinions and actions surrounding food safety culture which is important... you can, you can have all the procedures and processes and theory you like, but if, if it's not actually being applied and understood then it won't be effective.”

P002, Site 3
TAKE HOME MESSAGES

• Food safety culture dimensional aspects weave their way through *all* organisational characteristics.

• Developing and documenting the business vision and mission would establish food safety expectations company-wide.

• Food safety culture is not a lone warrior endeavour! Working together is key and the GFSI position paper provides a comprehensive framework to guide the way.

*Thank you!*
ACKNOWLEDGEMENTS

• The project business partner for their continued support and involvement in this study.

• KESS2 Knowledge Economy Skill Scholarships for enabling this collaborative project.

• International Association for Food Protection and Dr Lone Jespersen for the opportunity to present today.

• Audience.

REFERENCES


Her, E. et al. (2019) ‘Assessment of food safety at university food courts using surveys, observations, and microbial testing’.


Food Safety Culture Assessment: The Regulators’ Perspective

Dr Rounaq Nayak MCIEH
Lecturer in Food Policy
Overview

Aim:

• To examine the utility of the concept of food safety culture (FSC) as a means of improving food safety in the UK by identifying regulators’ perspectives towards the construct of FSC.

• The secondary aim was to assess the novelty of applying a human factors and complex systems approach to food safety.

“A range of attitudes, values, perceptions and behaviours which food safety stakeholders…share with regards to risks and hazards associated with food safety and its impact on the wider general public.”

- Nayak & Waterson, 2018
Study 1 – Exploring the complexity

Accimap diagram of the 2005 E. coli O157 Outbreak

Source: Nayak & Waterson, 2016
Study 2 – Regulators’ Perspectives

Changes in the industry
• Emphasis used to be on basic hygiene, cleanliness & structural conditions.

Food Safety Culture
• Appropriate concept.
• Everybody (Food Business Operator) has a different approach.
• Sometimes receives far less attention.
• Small businesses have opportunity for owners to be involved (but doesn’t happen).

Tools used
• FSA toolkit just adds on to existing tools.
• Various attempts to provide food safety awards have mixed successes.
  ➢ Scoring is crude
• Boosts food safety practices

Source: (Nayak & Waterson, 2017)
Study 2 – Perception of existing FSA toolkit

“Too wordy”

“No time to do this”

“33 pages is too much!”

“Might be something for private auditors”

“Repetitive levels”

“Looks fairly complicated!”

“Did not have the time to read this…sorry!”

“This is so subjective!”

Source: (Nayak & Waterson, 2017)
Future work – Efficacy of managing change within local food systems

Source: Nayak & Waterson, 2019
Take-home points

• Unless stakeholders take ownership, and are involved in the design of a toolkit, improving FCS will never be a serious goal within food systems.

• Think about the complex system and practicality before designing interventions.

• Food systems are people-centred systems.
  ➢ Non-technical skills are key for enabling positive food safety behaviours.
References


Exploring food safety management and socioeconomic dynamics of *Listeria monocytogenes* control at retail

Sophie Tongyu Wu
PI: Dr. Haley F. Oliver
June 22, 2020
Listeria monocytogenes at retail (Etter et al., 2017)

- 3 U.S. states, 30 retail delis
- Monthly environmental sampling for 6 months
- Deep clean intervention did not reduce *L. monocytogenes* prevalence in retail delis
Handwashing compliance

- Measured against *Food Code* recommendations...
- **Study I (2008):** in 9 retail delis
  - Ranging from 5% to 33% (Strohbehn et al., 2008)
- **Study II (2010):** in 16 retail food service facilities
  - Chain store employees: compliance rate was 17%
  - Individual store employees: compliance rate was 2% (Lubran et al., 2010)
Socioeconomics of health

Socioeconomics is correlated with health status

- Education (Gathmann et al., 2015)
- Income (van Kippersluis et al., 2009; van Kippersluis et al., 2010)
- Wealth indices (Suk, 2009)

Lower socioeconomic status → more prone to *L. monocytogenes* infection

- Among pregnant women in England and Wales (Mook et al., 2010)
- Among listeriosis patients in England (Gillespie et al., 2010)
Knowledge gaps

Part I. Why does deep clean intervention have limited effect on controlling *L. monocytogenes* prevalence?

Part II. What human behaviors and socioeconomic factors strongly associate with *L. monocytogenes* prevalence and contamination risk?

Conclusions: How could these behaviors be mitigated and improved?
Part I.
Retail studies: produce & deli

**Hypothesis:** management strategies, infrastructure designs, and food safety climate impact L. monocytogenes prevalence in retail produce & deli environments.
Approach

Retail Produce (30 stores, 7 U.S. states)  
*L. monocytogenes* prevalence  
Survey: management, infrastructure, sanitation

Retail Deli (50 stores, 6 U.S. states)  
*L. monocytogenes* risk  
Food safety climate & culture survey
**L. monocytogenes** control at retail

- Retail deli managers and associates have better food safety culture in stores with lower *Listeria monocytogenes* contamination. *Food Control, 110.*
- Infrastructure, sanitation, and management practices impact *Listeria monocytogenes* prevalence in retail grocery produce environments. *Food Control, 109.*

**SSOP execution**

- **Hand hygiene**
  - Food safety climate
    - Commitment
    - Training
  - Infrastructure
    - Prevent cross-contamination

**Occupation differences**

**Deep clean intervention**
Part II. Socioeconomics and *L. monocytogenes*

**Hypothesis:** Lower socioeconomic status is correlated with greater *L. monocytogenes* contamination at retail.
Approach

Longitudinal *L. monocytogenes* environmental data from 100 retail delis in 9 U.S. states (Jul 2010 – Jan 2013)

Correlated environmental *L. monocytogenes* prevalence to demographic data from 2010 US Census Bureau at tract level (e.g. education, employment status, race, income per capita, etc.)

Collaborated with School of Economic Sciences at Washington State University
Results

Increased *L. monocytogenes* prevalence was significantly correlated with decreased income of the area.

Race, education, level of urbanization and population density were not significant.

SSOP execution

Hand hygiene

Food safety climate
- Commitment
- Training

Infrastructure
- Prevent cross-contamination

Socioeconomic factors
- Race
- Education
- Urbanization
- Population density

Income
Take-home messages

1. **Verification**: hand hygiene + SSOP

2. **Infrastructure**: minimize cross-contamination + maximize cleanability

3. **Resources** should be directed to build / verify food safety behaviors and training programs, and assess investments in retail stores in lower income quartiles that may be at greater risk for high *L. monocytogenes* contamination
References


Further readings...


• **Email**: SophieWu11@gmail.com
• **Tel**: 469-766-7825
Food safety culture and food handler behaviour

IAFP, 2020

Shingai Nyarugwe (PhD)
Introduction

Professional Interests
- Food safety culture
- Food safety management systems
- Behavior-based approaches to food safety
- Food safety policy and regulation

- Aim: developing industry-based solutions for continuous improvement and for optimizing food safety performance

PhD - Food Safety Culture
MSc - Food quality management
Research Background

• Research objective: to investigate the influence of food safety culture on food handler behaviour, and ultimately food safety performance
• 29 companies in 5 countries (China, Greece, Tanzania, Zambia, Zimbabwe)
• Focus on food handlers
Research framework

EXTERNAL COMPANY ENVIRONMENT
- National values
  - e.g. power distance, individualism/collectivism, long/short-term orientation
- Food safety governance approach
  - e.g. legal framework, public/private standards, enforcement practices

INTERNAL COMPANY ENVIRONMENT
- Company characteristics e.g. size
- Food safety vision
- Organisational conditions
  - e.g. vision, commitment, communication style, training
- Technological conditions
  - e.g. equipment maintenance, sanitation program, protective clothing, hand-washing facilities
- Employee characteristics
  - e.g. attitude, risk perceptions
- Formal food safety program
  - e.g. design, implementation, verification, modification, improvement

Food safety and hygiene-related behaviour
- Perceived Supportiveness
- Intended behaviour
- Appropriateness

Food production system
- Product riskiness and vulnerability
- Receiving and storage → Processing → Storage and distribution

Performance
- Product safety

Setting boundaries

Nyarugwe et al., 2020
Mixed-method approach

- Interviews + Questionnaires
- Storytelling
- Observations
- Microbial analysis + Documents analysis

Nyarugwe et al., 2018
**Mixed-method approach**

<table>
<thead>
<tr>
<th>Element</th>
<th>Data collection method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microbiological safety performance</td>
<td>- <strong>Microbiological</strong> sampling and analysis&lt;br&gt;  - <strong>Document analysis</strong> - microbiological criteria, hygiene &amp; pathogen related complaints</td>
</tr>
<tr>
<td>Actual food handler behaviour</td>
<td>- <strong>Participatory observations</strong> - actual behaviour, facility layout and equipment&lt;br&gt;  - Document analysis - equipment maintenance, sanitation, CP/CCP records</td>
</tr>
<tr>
<td>Enabling conditions</td>
<td>- <strong>Card-aided interviews</strong>&lt;br&gt;  - Document analysis - equipment maintenance</td>
</tr>
<tr>
<td>Employee characteristics</td>
<td>- <strong>Structured questionnaire</strong> for knowledge&lt;br&gt;  - <strong>Open-ended questionnaire</strong> for perceptions&lt;br&gt;  - Card-aided <strong>storytelling</strong> for attitudes</td>
</tr>
</tbody>
</table>
Interpretation of results

Negative food safety culture

Positive food safety culture

Nyarugwe et al., 2018
Study 1: Mixed-methods approach

• complexity and the multidimensionality of food safety culture necessitates method triangulation
• permits assessment of different aspects using different methods
• comprehensive evaluation
• elaborates findings
• uncovers underlying issues
• improves robustness
• internal consistency
Study 2: Does product riskiness matter?

• Companies exhibited different food safety cultures regardless of product riskiness
• Companies with less vulnerable production systems do not necessarily have a reactive food safety culture

Nyarugwe et al, 2020
Study 3: An intercontinental analysis

- Food safety governance and national values reflected in food safety priorities, food safety programs, prevailing food safety culture, and behaviour
Overall findings

• Inconsistencies in enforcement practices
• Complacency
• Subcultures
• Inadequate food handler support e.g. inadequate verification of understanding of food safety communication
  - Inadequate food handler practices e.g. poor hand washing practices
  - Temporary personnel did not get training, protective clothing, incentives
Food handler perspective

- Visible commitment
- Resources
- Involvement
- Incentives and rewards
- Consistency
- Transparency and communication
- Food safety expectations
Key takeaways

• Mixed-methods approach allows for a more solid insight into food safety culture.
• Food safety culture influences food handler behavior.
• Understanding your food handlers could be beneficial for correct and appropriate interventions.
• Regardless of product riskiness, all companies need to have a proactive food safety culture.
Thank you

List of publications


Questions?

Questions should be submitted via the Questions section at the right of the screen.
This webinar is being recorded and will be available for access by **IAFP members** at www.foodprotection.org within one week.

**Not a Member?** We encourage you to join today. For more information go to: www.FoodProtection.org/membership/

All **IAFP webinars** are supported by the IAFP Foundation with no charge to participants. Please consider making a donation to the **IAFP Foundation** so we can continue to provide quality information to food safety professionals.
Contact information for presenters

• Sophie Tongyu Wu        Purdue University, USA        sophiewu11@gmail.com
• Emma Samuel              Cardiff Metropolitan University, United Kingdom  emsamuel@cardiffmet.ac.uk
• Rounaq Nayak             Harper Adams University University, United Kingdom  RNayak@harper-adams.ac.uk
• Shingai Nyarugwe        Wageningen University & Research, The Netherlands  shingainyarugwe@gmail.com