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Strengthening your HACCP Plans: 2020 and Beyond

Prof Carol Wallace

Where opportunity creates success

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Agenda

1. HACCP to 2020 and Beyond
2. HACCP Challenges
3. HACCP Teams as Food Safety Culture Champions
4. Strengthening HACCP Plans


HACCP to
2020…
and Beyond

Global HACCP Evolution

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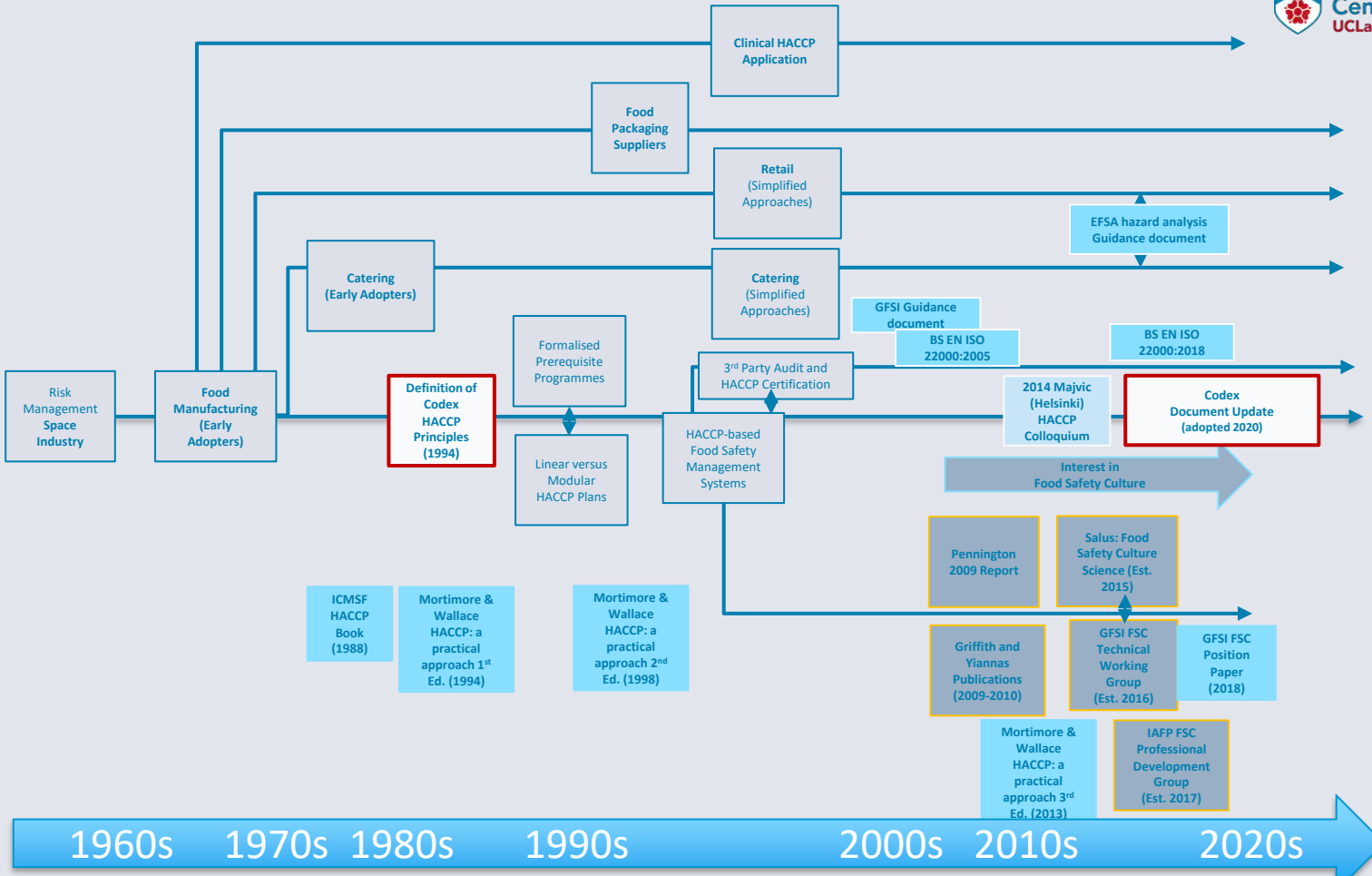

Codex Alimentarius General Principles of Food Hygiene CXC 1-1969, 2020.

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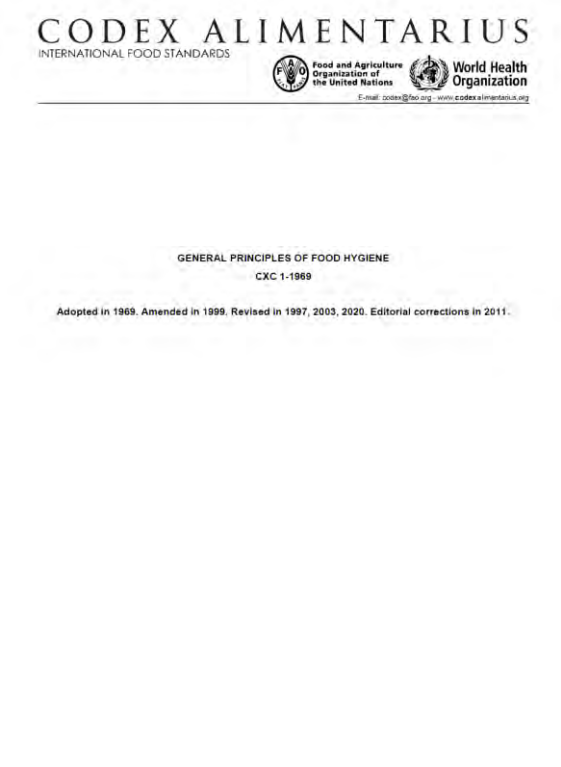


CODEX ALIMENTARIUS
INTERNATIONAL FOOD STANDARDS

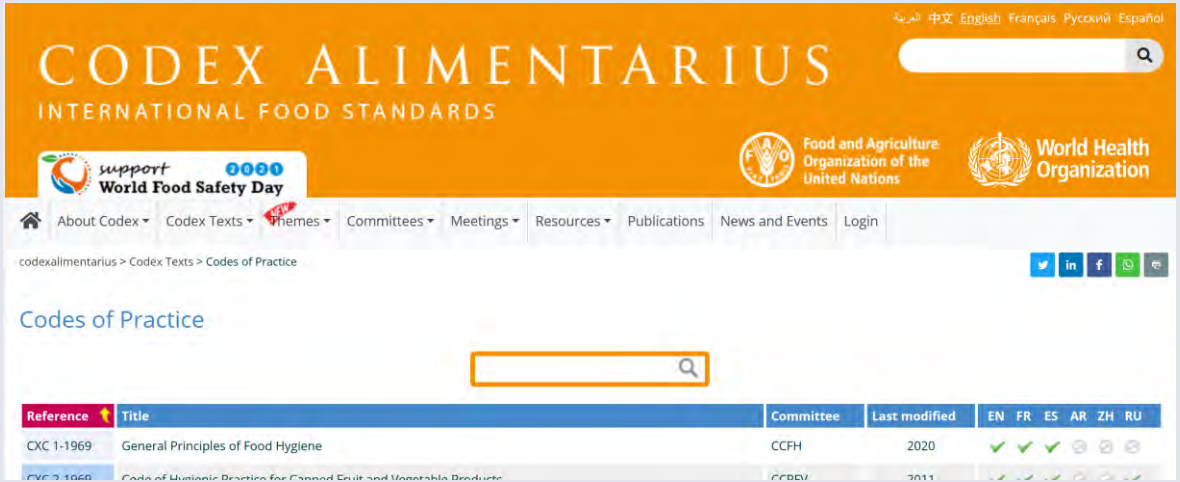
Food and Agriculture Organization of the United Nations
World Health Organization

E-mail: codex@fao.org - www.codexalimentarius.org

GENERAL PRINCIPLES OF FOOD HYGIENE
CXC 1-1969

Adopted in 1969. Amended in 1999. Revised in 1997, 2003, 2020. Editorial corrections in 2011.

- Document available on FAO website: http://www.fao.org/fao-who-codexalimentarius/codex-texts/codes-of-practice/en/



New Codex – Notable changes

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- Extended Introduction brings out key responsibilities and concepts
  - Food Safety Culture is mentioned for the first time
- Definitions
  - all definitions moved forward to the General Principles section (previously some here and some in HACCP Annex)
  - Some definition updates
- Chapter One Hygiene Practices – a range of updates throughout the document so worth reviewing as part of your strengthening PRPs
- Chapter Two HACCP System and Guidelines
  - Changes in Principles and clarifications
  - No decision tree (currently!)

Chapter Two: HACCP Principles

P	Previous (Codex Food Hygiene Basic Texts 4th Ed.)
1	Conduct a hazard analysis
2	Determine the Critical Control Points (CCPs).
3	Establish critical limit(s)
4	Establish a system to monitor control of the CCP
5	Establish the corrective action to be taken when monitoring indicates that a particular CCP is not under control.
6	Establish procedures for verification to confirm that the HACCP system is working effectively.
7	Establish documentation concerning all procedures and records appropriate to these principles and their application.

P	New (CXC 1-1969, 2020)
1	Conduct a hazard analysis and identify control measures
2	Determine the Critical Control Points (CCPs).
3	Establish validated critical limits.
4	Establish a system to monitor control of CCPs.
5	Establish the corrective actions to be taken when monitoring indicates a deviation from a critical limit at a CCP has occurred.
6	Validate the HACCP plan and then establish procedures for verification to confirm that the HACCP system is working as intended.
7	Establish documentation concerning all procedures and records appropriate to these principles and their application.

Other recent HACCP Guidance

- European Commission, 2016, Notice on the implementation of food safety management systems covering prerequisite programs (PRPs) and procedures based on the HACCP principles, including the facilitation/flexibility of the implementation in certain food businesses, *Official Journal of the European Union*, 59, (2016/C278/01)
- EFSA, 2017. Hazard analysis approaches for certain small retail establishments in view of the application of their food safety management systems, Adopted January 2017, *EFSA Journal*, 2017;15(3):4697
- EFSA, 2018. Hazard analysis approaches for certain small retail establishments and food donations: second scientific opinion. *EFSA Journal* 2018;16(11):5432
- European Commission 2021, amendment to 852/2004 on the hygiene of foodstuffs via Regulation 2021/382: Includes new Chapter XIa on Food Safety Culture to tie in with Codex (2020)


EUROPEAN COMMISSION

COMMISSION NOTICE

on the implementation of food safety management systems covering prerequisite programs (PRPs) and procedures based on the HACCP principles, including the facilitation/flexibility of the implementation in certain food businesses

(2016/C 278/01)

I. INTRODUCTION


SCIENTIFIC OPINION

EFSA Journal

ADOPTED: 18 January 2017

doi: 10.2903/j.efsa.2017.4697

Hazard analysis approaches for certain small retail establishments in view of the application of their food safety management systems

EFSA Panel on Biological Hazards (BIOHAZ),


SCIENTIFIC OPINION

EFSA Journal

ADOPTED: 27 September 2018

doi: 10.2903/j.efsa.2018.5432

Hazard analysis approaches for certain small retail establishments and food donations: second scientific opinion

EFSA Panel on Biological Hazards (BIOHAZ),


30.4.2004 EN Official Journal of the European Union L 139/1

I

(Acts whose publication is obligatory)

REGULATION (EC) No 852/2004 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

of 29 April 2004

on the hygiene of foodstuffs


HACCP
Challenges

Food Safety Paradox: HACCP-based FSMS use increases but…..

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Year	Place	Incident	Known/suspected cause and effect	Likely HACCP/FSMS Weakness	Reference(s)
2009	USA	Salmonella Typhimurium in peanut butter	- Leaking roof - Unsanitary process conditions - Inadequate segregation between raw/roasted peanuts. 700 ill; 9 deaths	Substantial weaknesses in prerequisite programs; lack of control measures, lack of corrective action following monitoring, lack of management commitment and possibly lack of knowledge of consequences (although as a criminal offence it is likely that those involved may have gone ahead anyway).	FDA (2009)
2011	Germany, France	Enteroaggregative E. coli O104:H4 in sprouted seeds (fenugreek)	Fenugreek seeds from Egypt found to be contaminated with the organism. No controls in sprouting process. 3816 cases; 54 deaths	Weakness in prerequisite programs and verification of suppliers. Lack of knowledge of risks.	Frank et al (2011); Food Safety Magazine Newsdesk (2015)
2011	United States	Listeria monocytogenes in canteloupe	Environmental cross-contamination 147 illnesses; 33 deaths.	Weaknesses in prerequisite programs, lack of knowledge and technical expertise	CDC (2012)
2015	United States	Listeria monocytogenes in icecream	Contaminated ingredients and environmental contamination in factory. Product used to make milk shakes. Traced back multiple years. 10 ill, all of whom were hospitalised, and 3 deaths.	Weakness in prerequisite programs and verification of suppliers; lack of knowledge and technical expertise regarding customer use and storage of products.	FDA (2015)
2016, 2017, 2018.	Europe	Listeria monocytogenes in frozen corn and possibly other frozen vegetables.	Cross-contamination at freezing plant in Hungary. Outbreak strain may have persisted in the plant environment after standard cleaning and disinfection procedures between crop rotations and during non-production periods. 47 cases and 9 deaths as of 15 June 2018.	Weaknesses in sanitary design and verification of prerequisite programs.	EFSA and ECDC, 2018

Source: Motarjemi, Wallace and Mortimore, forthcoming 2021.

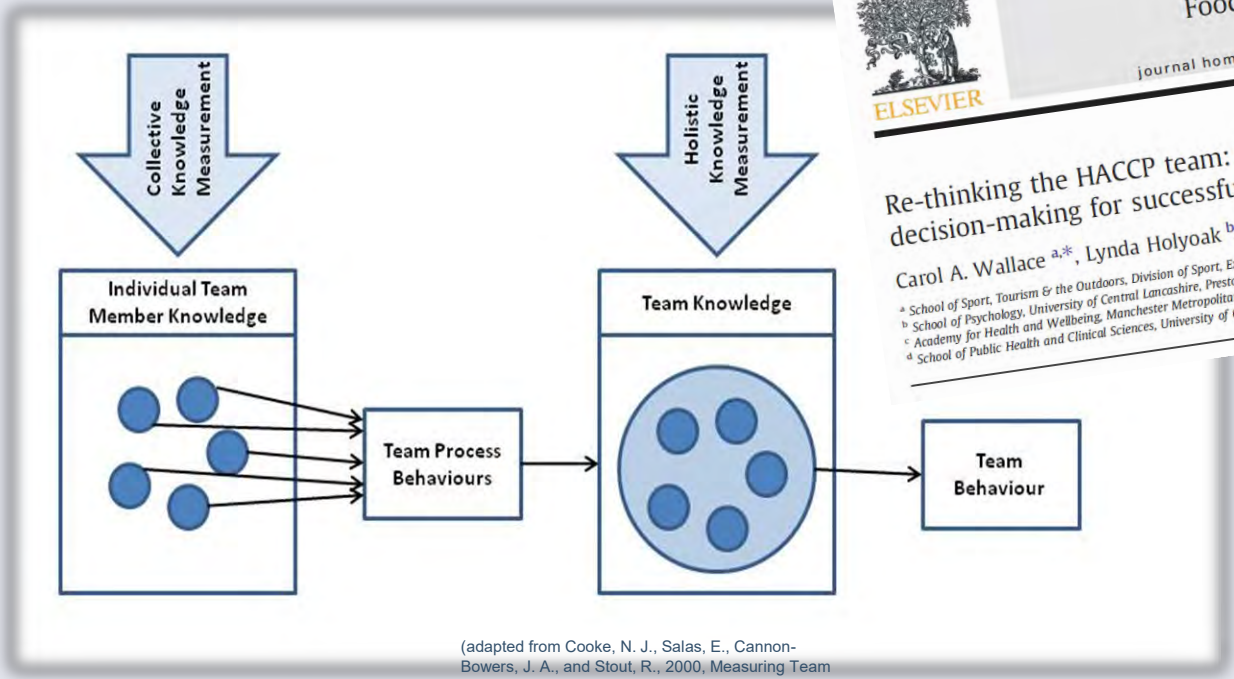
- We still experience major food safety incidents
- HACCP can only control identified hazards
- Many outbreaks associated with business issues
  - Lack of knowledge, expertise, awareness & commitment
  - management/leadership failures
  - Prerequisite programme failures
  - Failure to provide resources, etc.
  - Failure to properly implement, verify and maintain the system
- These are not HACCP system failures per se, but something is not working….
- Has HACCP been oversold?
- Do we need to rip it up and start again?

Why do we need to strengthen HACCP Plans?

- Links between company performance and food safety are clear
- But often HACCP is taken as a given
  - Reduced to focusing on administrative tasks[1]
  - Becomes stagnant and compliance driven[2,3]
  - Lack of meaningful HACCP review leads to risks of normalization of deviance[4]

Can we use HACCP to enhance food safety capability and behaviours and positively impact culture?

HACCP Team Knowledge and Decisions



(adapted from Cooke, N. J., Salas, E., Cannon-Bowers, J. A., and Stout, R., 2000, Measuring Team Knowledge, *Human Factors*, 42, pp 151-173)

Food Research International 47 (2012) 236–245

Contents lists available at ScienceDirect

Food Research International

journal homepage: www.elsevier.com/locate/foodres

Re-thinking the HACCP team: An investigation into HACCP team knowledge and decision-making for successful HACCP development

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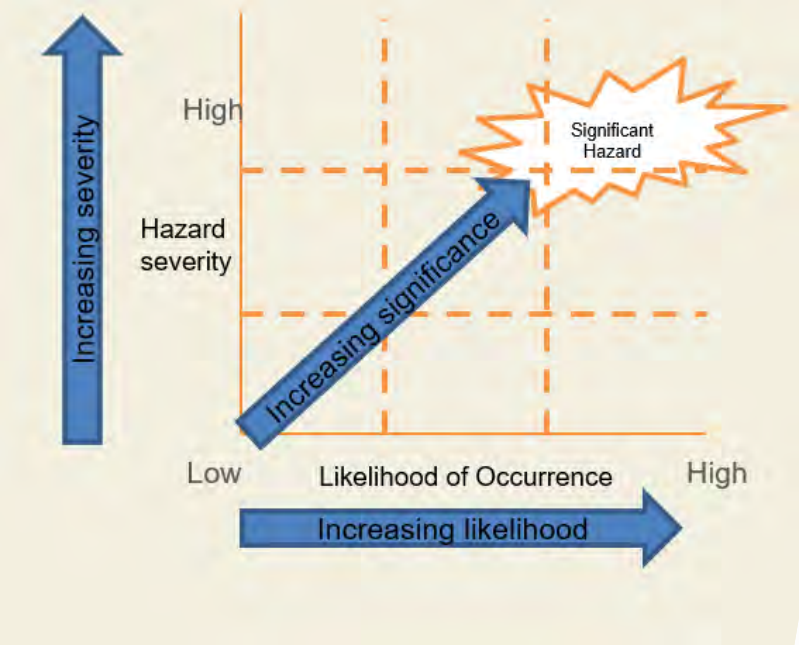
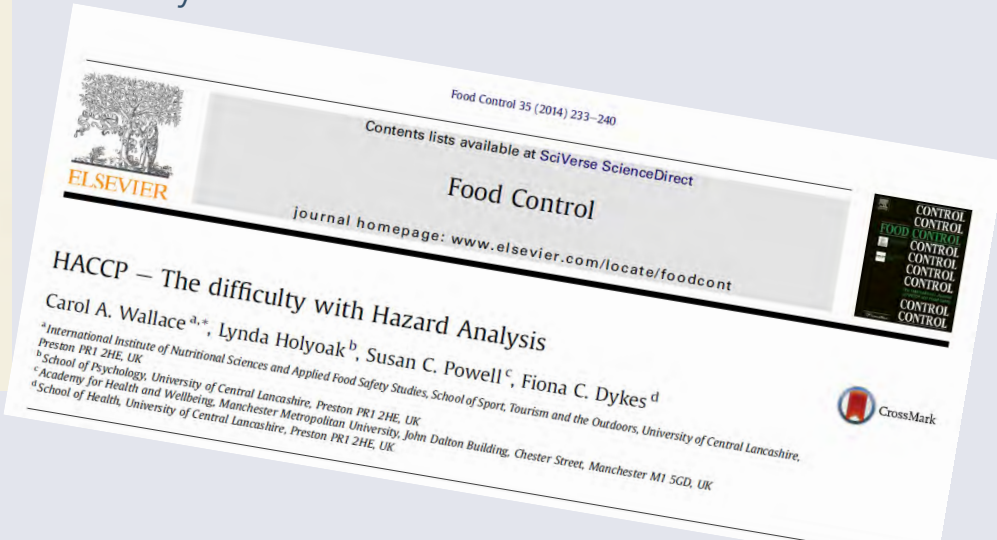
Hazard analysis difficulties



- What constitutes low medium and high?
- Knowledge and training to take decisions
- No internationally accepted tool
- Companies develop their own but staff can't always use them


Food Control 35 (2014) 233–240
Contents lists available at SciVerse ScienceDirect
Food Control
journal homepage: www.elsevier.com/locate/foodcont

HACCP – The difficulty with Hazard Analysis

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Recent HACCP interview study with SMEs (2020)

Goodburn, 2020, Doctoral Thesis, UCLan

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	A	**B**	**C**	**D**	**E**
Products Manufactured	Food to Go	Ambient Snacks	Ready Meals	Meat Processing	Hot and Cold Pastry Products
Number of People on Site	Approx. 200	Approx. 110 people	Approx. 300	Approx. 300	400-500
Type of Customers	Food service and convenience stores	Branded	Retailers	Retailers and Food Service	Retailers
Participants Position	Technical Manager	Senior Food Technologist	Technical Manager	Technical Manager	Technical Compliance Manger
Length of Service in Food Manufacture	20 years	14 years	24 years	13 years	20 years
HACCP Qualification	Level 3 HACCP	Level 3 HACCP	Level 4 HACCP	Level 3 HACCP	Level 3 HACCP
Role in HACCP Team	Team Leader	HACCP Co-coordinator	Team Leader	Team Leader	Team Leader

HACCP Maintenance Processes - HACCP review and re-validation

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Linking HACCP and Food Safety Culture

HACCP Teams as Food Safety Culture Champions

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Can a food business change from a compliance culture to risk management culture through HACCP proficiency improvements?

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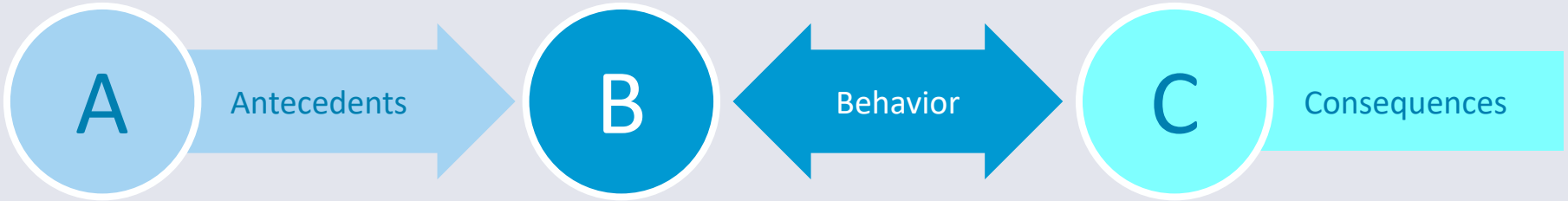
Approach

- HACCP Proficiency Testing
- Novel HACCP Training and Learning Program
- Post-training HACCP Proficiency Testing
- …..Linking to Food Safety Culture Maturity



Deriving the HACCP proficiency scale

Why?

- Research on impact of training on effective HACCP implementation [6,7,8]
- Understand HACCP capability within HACCP teams
- Potential to predict effectiveness of HACCP plans

How?

- 5 HACCP capability areas
- 22 short answer questions
- Based on expert knowledge
- Mapped to Codex HACCP principles[9] and UK HACCP Training Standard[10]

The research Study

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- 3 manufacturing sites of 1 US Food Company (2 in USA; 1 in Europe)
- April to December 2020
- HACCP Proficiency scale administered online via Qualtrics
  - 27 HACCP Team members
- Team members segmented into 3 groups based on initial proficiency results
  - Foundation (<50%)
  - Practitioners (51-70%)
  - Coaches (>71%)
- Learning Program developed to improve capability for foundation and practitioner levels
  - Online learning delivered via Moodle
  - Combined with in-plant homework and team learning

Training Program:
Antecedents triggering desired behaviors

Virtual 4 week learning program

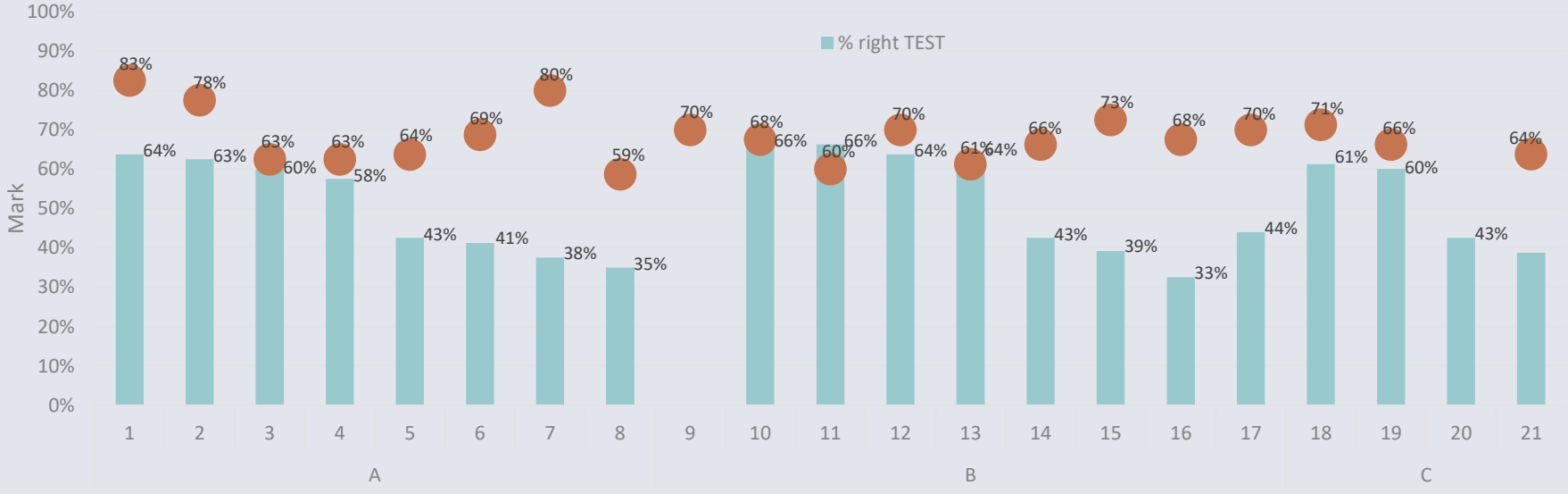
30-minute sessions with in-plant homework

Team learning

Norms focus

Source: Cultivate SA

HACCP Proficiency Results



(Test) HACCP Team overall proficiency range 33–66%

- (Retest) HACCP team proficiency range 59–83%

Source: Wallace and Jespersen, (Submission in process)

Additional work and next steps

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- Reporting on the strengths and weaknesses on HACCP capability across the HACCP knowledge areas
- Comparison with data from Wallace et al studies of HACCP teams
- Integration with plant-level food safety culture assessment data
- Submission of research article September 2022.


Strengthen your
HACCP Plans

Strengthening HACCP, some closing thoughts…

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- HACCP team leaders – review Codex 2020 document and provide appropriate training to team members.
- May need to review HACCP team expertise and skills make up
- Revisit your HACCP Plans – really challenge the validity
  - Hazard analysis
  - CCPs and their control
  - Supporting prerequisite programmes
- Make sure HACCP review becomes a continuous improvement event, not just a tick-box exercise
- Look at how you can link HACCP activities to your food safety culture improvement plans

References

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2. Motarjemi, Y., Wallace, C.A., and Mortimore, S., 2014, HACCP Misconceptions, in Motarjemi, Y., and Lelieveld, H. (Eds.), *Food Safety Management: a practical guide for the food industry*, London, Elsevier.

3. Wallace and Jespersen, submitting 2022.

4. Braksick, 2007, Unlock Behavior, Unleash Profits: Developing Leadership Behavior That Drives Profitability in Your Organization, McGraw Hill

5. Wallace, C. A., Powell, S. C., and Holyoak, L., 2005, Post-training assessment of HACCP Knowledge: its use as a predictor of effective HACCP development, implementation and maintenance in food manufacturing. *British Food Journal*, 107, 10, pp743-759

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Questions

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Image courtesy of zillion designs https://www.zilliondesigns.com/blog/graphic-design-project-questions/

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