

IAFP's A 360° Review for Food Safety Training-Perspectives From Trainers and Business Owners

Organized by: The Food Safety Education PDG

Moderator: Wenqing Xu, Chair

Shauna Henley, Vice Chair

Sponsored by the  IAFP
FOUNDATION

Please consider making a contribution

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

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.
- All attendees are muted. 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.
- This webinar is being recorded and will be available for access by IAFP members at www.foodprotection.org within one week.

Today's Moderators



Wenqing Xu, Chair of Food Safety Education PDG
Associate Professor at Louisiana State University.

Wenqing's research and outreach programs focus on consumer related food safety issues.

Shauna Henley, Vice Chair of Food Safety Education PDG
Senior Family & Consumer Sciences Agent and Affiliate Agent in
the Department of Nutrition and Food Science, University of
Maryland Extension, and the University of Maryland, College Park

Shauna's work focuses on food safety from farm-to-fork and
nutrition education.



Today's Panelist



Michael Koch, President & Co-Founder

Firefly Farms, Firefly Farms Market

Mike is a local food advocate and award-winning entrepreneur with a distinguished track record of innovation, who has more than three decades of professional and entrepreneurial experience. As one of the co-founders of FireFly Farms—a successful goat cheese business. FireFly Farms' cheeses have won over 125 national and international awards for excellence in taste, aesthetics and quality. His company was the proud recipient of the United States Chamber of Commerce Dream Big Small Business Award.

Today's Panelist



Thomas Larsen, Food Safety Training Consultant

State Food Safety

Thomas Larsen works as a food safety training consultant through StateFoodSafety helping high profile brands meet their jurisdictional food safety training and certification requirements while reinforcing their brand and culture. StateFoodSafety has developed unique and proprietary processes that allow for both industry-specific customizations to course materials (grocery, quick service, C-store, etc.) and company-specific customizations (custom avatars, uniforms, branding, backgrounds, props, procedures, etc.) while simultaneously maintaining their network of jurisdictional approvals nation-wide. This technology-driven approach combined with reliable data and knowledgeable client support have allowed Thomas and StateFoodSafety to successfully train and certify some of America's most beloved brands.

Today's Panelist



Clint Stevenson

North Carolina State University

Dr. Stevenson leads a research driven food safety education and workforce solutions lab at NC State University. Their multidisciplinary team manages a portfolio of online food safety courses for both industry audiences and college students, collaborate with nonprofits and food companies with their training improvement objectives, and research the effects of instructional design factors on food safety training outcomes.

A 360° Review for Food Safety Training

Perspectives from Trainers & Business Owners

Panelist: **Mike Koch, President & Co-Founder**
FireFly Farms, FireFly Farms Market

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About FireFly Farms



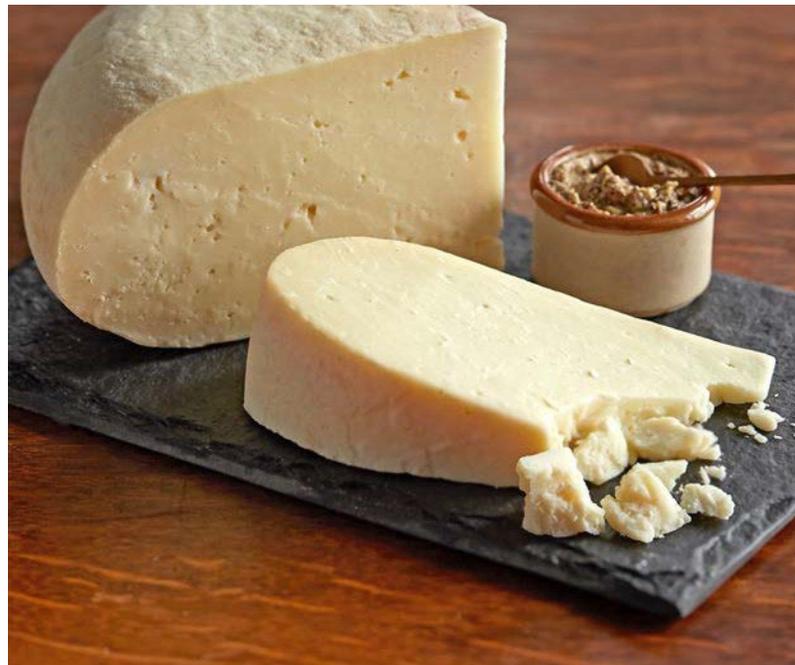
At FireFly Farms, sustainability isn't a buzzword. It's a promise. It's an obsession. It's economic, ethical, and environmental. Our milk is sourced from family farms in our community. Our dedication to humane and fair practices is non-negotiable. Our solar panels don't just power us, they empower us. All these things, and more, are why our all-natural cheeses are more than delicious. They're honest. They're goodness. They're truly life changing.











Overview of our Food Safety Journey

- 2000 – EU passes GFSI
- 2002 – FireFly begins commercial manufacture of cheese
- 2011 – US passes FSMA
- 2014 – First mandated HACCP Audit at FireFly
- 2018 – MIPs grant funds product data project at FireFly
- 2019 – Customer requests GFSI compliant audit
- 2020 – FSMA announces Food Traceability Rule
- 2021 – First SQF Audit at FireFly
- 2022 – MIPs grant phase 2 funds food safety interships



What we thought then...

- Food safety is a necessary nuisance
- A (separate) food safety team is a luxury for the large
- Food safety is about oversight and enforcement
- Food safety has nothing to do with food quality
- Food safety concerns end when product leaves the building



What we think now...

- Food safety is a necessary part of who we are
- Everyone who enters the building is part of the food safety team
- Food safety is about continuous monitoring and improvement
- Food safety and food quality are tightly aligned
- We are one link in a food safe chain that starts with farmers and suppliers and ends with retailers



Our Current State

- All staff are part of food safety team
- More than 50% of production staff are PCQI certified
- CCPs have stimulated development of QCPs
- Production workflow and database system capture all safety, quality and traceability data -- paperless and easily retrievable
- SQF practitioners conduct monthly inspections, non-conformities are reviewed by staff. Training occurs as needed.
- Contested non-conformities are reviewed and dispositioned by management.
- Annual supplier audits ensure we are tightly aligned with up-stream partners
- Delivery temp logs and complaint forms ensure we are tightly aligned with downstream partners – our own retail business especially
- Triggers of food safety plan revision are carefully watched



Technology, Data, and Compliance Management

How to develop and use technology to better track food safety training compliance

Technology

“Knowledge put into practical use to solve problems or invent useful tools.”

Identifying Problems

How do I know my company is in compliance?



Does my training positively affect employee behavior?



Does my training reflect and reinforce my company's brand identity?



How do I track relevant training requirements across jurisdictions?

The Right Tool for the Job

1. Customers

- *Who does this tool serve? What are their current and future needs?*

2. Products and Services

- *What tools are we providing to meet their needs and what should we be providing?*

3. Metrics

- *What are the milestones, opportunity costs, and time-saved targets?*

4. Process

- *Who is doing what, when, and how?*

5. Structure and Resources

- *What human and monetary resources are required? (how much does it cost?)*

Who is the Customer?

- YOU
- Your company
- Your team
- Your employees
- Your customers



Products and Services

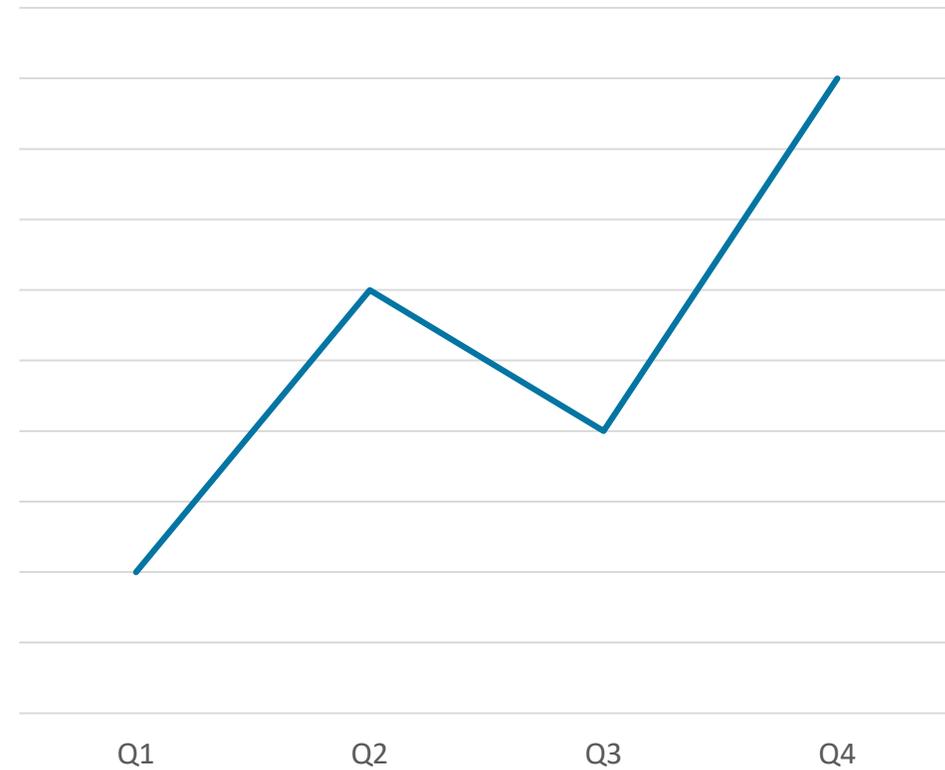
- Currently doing...?
 - Why is this not working?
 - What should be different?
- Should be doing...?
 - How will this be better than what you were doing?
 - Does it solve the main problem?
 - Think Need to haves and Nice to haves



Metrics

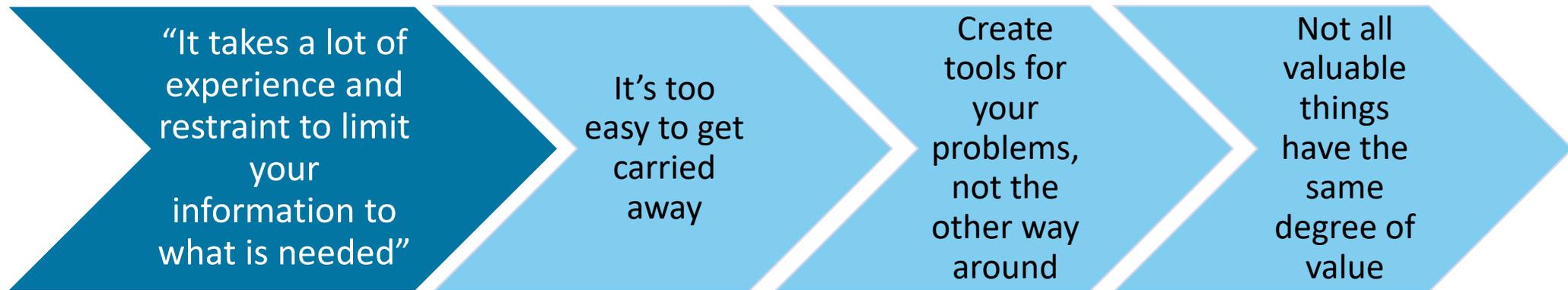
- How will I know if this works?
- What does this need to do?
- What does it NOT need to do?
 - BEWARE OF SCOPE CREEP

Measuring Success





Scope Creep

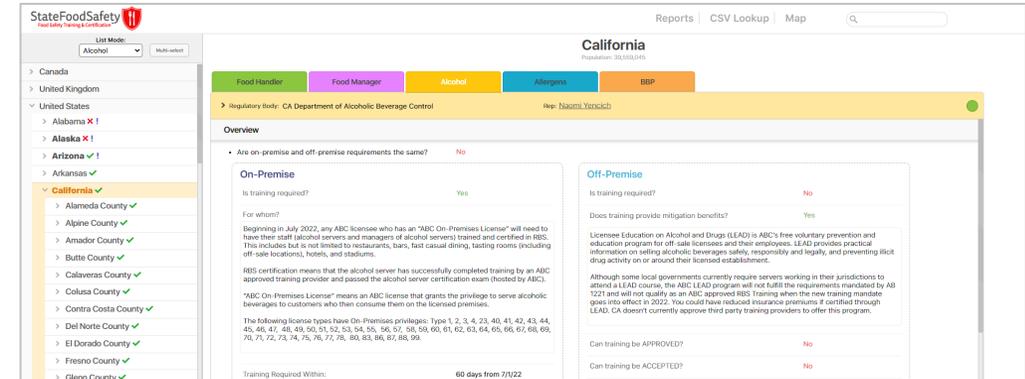


Process

- Define who does what, how they are going to do it, and when they are going to do it.
- Can this be done in existing tools?
 - If yes, assign someone to figure out how to use those tools
 - If no, determine who will be creating these new tools
 - This may be a third-party vendor
- Does this require extra training to be able to do?
 - Do you have a developer who can build these tools?
 - Does your developer need extra training to be able to do so?

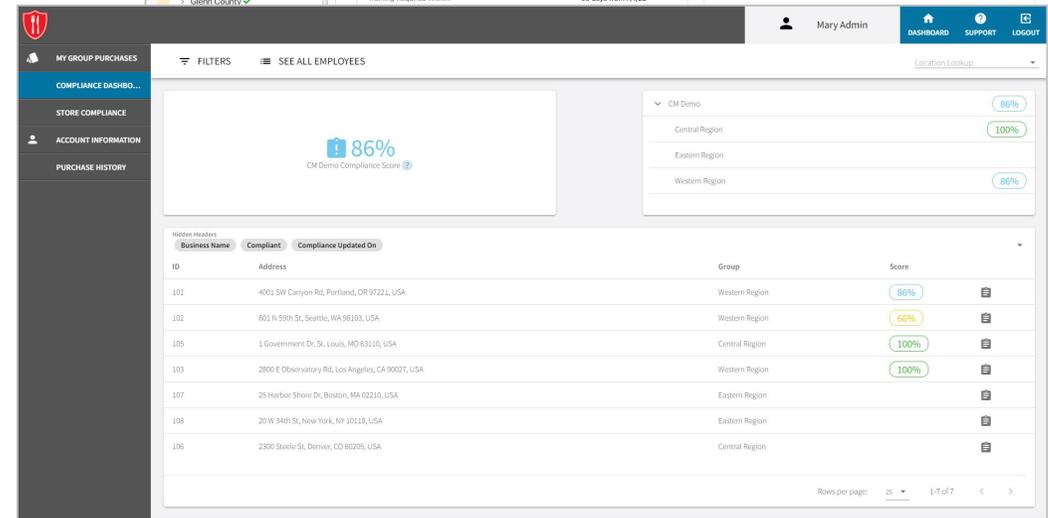
Examples

- How do we track regulations across the country?



The screenshot shows the StateFoodSafety website interface for California. The page is titled "California" with a population of 39,550,045. It features a navigation menu with categories: Food Handler, Food Manager, Alcohol, Allergens, and BBP. The main content area is titled "Regulatory Body: CA Department of Alcoholic Beverage Control" and includes an "Overview" section with the following details:

- Are on-premise and off-premise requirements the same? No
- On-Premise**
 - Is training required? Yes
 - For whom? Beginning in July 2022, any ABC licensee who has an "ABC On-Premises Licensor" will need to have their staff (alcohol servers and managers of alcohol servers) trained and certified in RBS. This includes but is not limited to restaurants, bars, fast casual dining, tasting rooms (including off-sale locations), hotels, and stadiums. RBS certification means that the alcohol server has successfully completed training by an ABC approved training provider and passed the alcohol server certification exam (hosted by ABC). "ABC On-Premises Licensor" means an ABC license that grants the privilege to serve alcoholic beverages to customers who then consume them on the licensed premises. The following license types have On-Premises privileges: Type 1, 2, 3, 4, 23, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 80, 83, 86, 87, 88, 89.
 - Training Required Within: 60 days from 7/1/22
- Off-Premise**
 - Is training required? No
 - Does training provide mitigation benefits? Yes
 - License Education on Alcohol and Drugs (LEAD) is ABC's free voluntary prevention and education program for off-sale licensees and their employees. LEAD provides practical information on selling alcoholic beverages safely, responsibly and legally, and preventing illicit drug activity on or around their licensed establishment. Although some local governments currently require servers working in their jurisdictions to attend a LEAD course, the ABC LEAD program will not fulfill the requirements mandated by AB 1221 and will not qualify as an ABC approved RBS training when the new training mandate goes into effect in 2022. You could have reduced insurance premiums if certified through LEAD. CA doesn't currently approve third party training providers to offer this program.
 - Can training be APPROVED? No
 - Can training be ACCEPTED? No



The screenshot shows the StateFoodSafety dashboard for Mary Admin. The dashboard includes a navigation menu with options: MY GROUP PURCHASES, COMPLIANCE DASHBOARD, STORE COMPLIANCE, ACCOUNT INFORMATION, and PURCHASE HISTORY. The main content area displays a "COMPLIANCE DASHBOARD" with a large "86%" compliance score for "CM Demo". A "Location Lookup" dropdown menu is visible, showing compliance scores for different regions:

- CM Demo: 86%
- Central Region: 100%
- Eastern Region: 100%
- Western Region: 86%

Below the dashboard, there is a table listing business units with their compliance status and update dates:

ID	Address	Group	Score
101	4001 SW Canyon Rd, Portland, OR 97221, USA	Western Region	86%
102	601 N 59th St, Seattle, WA 98103, USA	Western Region	66%
105	1 Governemre Dr, St. Louis, MO 63110, USA	Central Region	100%
103	2800 E Observatory Rd, Los Angeles, CA 90027, USA	Western Region	100%
107	25 Harbor Shore Dr, Boston, MA 02210, USA	Eastern Region	100%
108	20 W 34th St, New York, NY 10118, USA	Eastern Region	100%
106	2300 Steele St, Denver, CO 80205, USA	Central Region	100%

The dashboard also includes a "Filters" section and a "SEE ALL EMPLOYEES" link. The bottom right corner shows "Rows per page: 25" and "1-7 of 7".

Apollo

- List Mode: Alcohol Multi-select
- > Canada
 - > United Kingdom
 - ▼ United States
 - > Alabama ❌ !
 - > Alaska ❌ !
 - > Arizona ✔️ !
 - > Arkansas ✔️
 - ▼ California ✔️
 - > Alameda County ✔️
 - > Alpine County ✔️
 - > Amador County ✔️
 - > Butte County ✔️
 - > Calaveras County ✔️
 - > Colusa County ✔️
 - > Contra Costa County ✔️
 - > Del Norte County ✔️
 - > El Dorado County ✔️
 - > Fresno County ✔️
 - > Glenn County ✔️
 - > Humboldt County ✔️
 - > Imperial County ✔️
 - > Inyo County ✔️
 - > Kern County ✔️
 - > Kings County ✔️
 - > Lake County ✔️
 - > Lassen County ✔️

California

Population: 39,559,045

Food Handler
Food Manager
Alcohol
Allergens
BBP

Regulatory Body: CA Department of Alcoholic Beverage Control Rep: [Naomi Yencich](#)

Overview

- Are on-premise and off-premise requirements the same? No

On-Premise

Is training required? Yes

For whom?

Beginning in July 2022, any ABC licensee who has an "ABC On-Premises License" will need to have their staff (alcohol servers and managers of alcohol servers) trained and certified in RBS. This includes but is not limited to restaurants, bars, fast casual dining, tasting rooms (including off-sale locations), hotels, and stadiums.

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Training Required Within: 60 days from 7/1/22

Can training be APPROVED? Yes

Is SFS APPROVED? Yes

Does SFS offer this training? Yes

Off-Premise

Is training required? No

Does training provide mitigation benefits? Yes

Licensee Education on Alcohol and Drugs (LEAD) is ABC's free voluntary prevention and education program for off-sale licensees and their employees. LEAD provides practical information on selling alcoholic beverages safely, responsibly and legally, and preventing illicit drug activity on or around their licensed establishment.

Although some local governments currently require servers working in their jurisdictions to attend a LEAD course, the ABC LEAD program will not fulfill the requirements mandated by AB 1221 and will not qualify as an ABC approved RBS Training when the new training mandate goes into effect in 2022. You could have reduced insurance premiums if certified through LEAD. CA doesn't currently approve third party training providers to offer this program.

Can training be APPROVED? No

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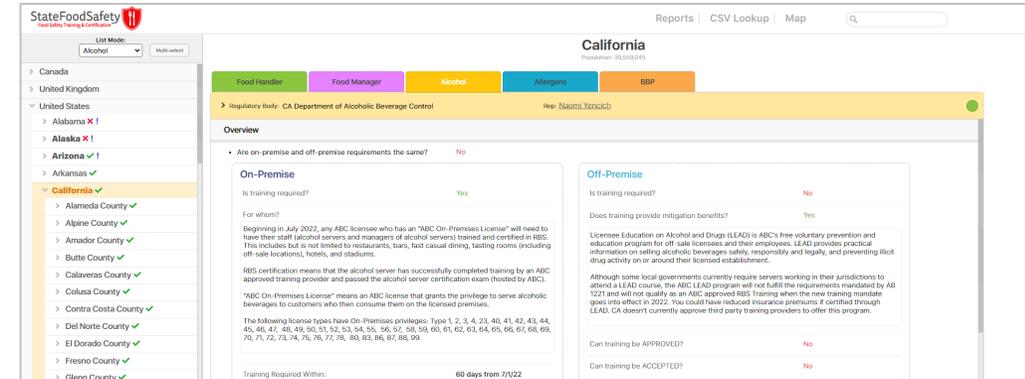
Does SFS offer this training?

- Are any upcoming changes rumored? Yes

Set Relevant Reg To No For Lower Entities
Edit
Expand All

Examples

- How do we track regulations across the country?
 - Apollo
- How do we keep track of a company's internal compliance?



StateFoodSafety California
Population: 39,550,045

Regulatory Body: CA Department of Alcoholic Beverage Control

Overview

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Training Required Within: 60 days from 7/1/22

Off-Premise

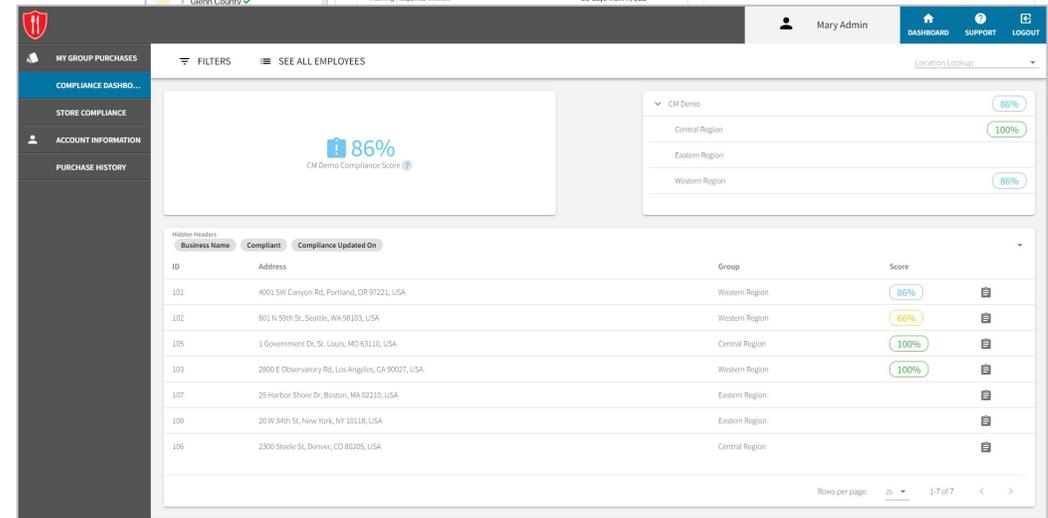
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Can training be APPROVED? No

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MY GROUP PURCHASES
COMPLIANCE DASHBO...
STORE COMPLIANCE
ACCOUNT INFORMATION
PURCHASE HISTORY

FILTERS SEE ALL EMPLOYEES

CM Demo Compliance Score: 86%

Region Breakdown:

- CM Demo: 86%
- Central Region: 100%
- Eastern Region: 100%
- Western Region: 86%

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106	2300 Steele St, Denver, CO 80205, USA	Central Region	100%

Rows per page: 25 1-7 of 7

Compliance Manager

StateFoodSafety

Mary Admin
DASHBOARD
SUPPORT
LOGOUT

MY GROUP PURCHASES

COMPLIANCE DASHBO...

STORE COMPLIANCE

ACCOUNT INFORMATION

PURCHASE HISTORY

FILTERS
SEE ALL EMPLOYEES
Location Lookup ▼

86%

CM Demo Compliance Score ?

▼ CM Demo
86%

Central Region
100%

Eastern Region

Western Region
86%

Hidden Headers

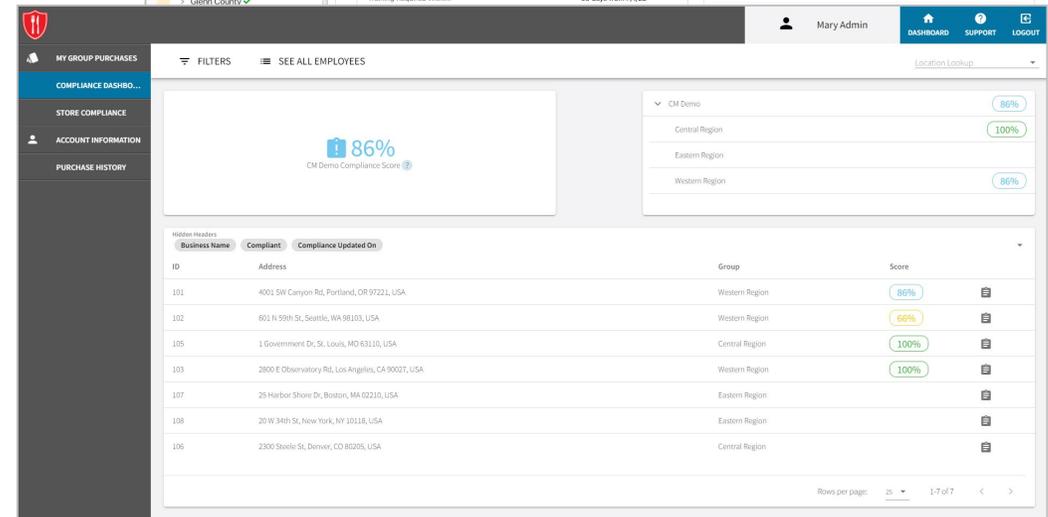
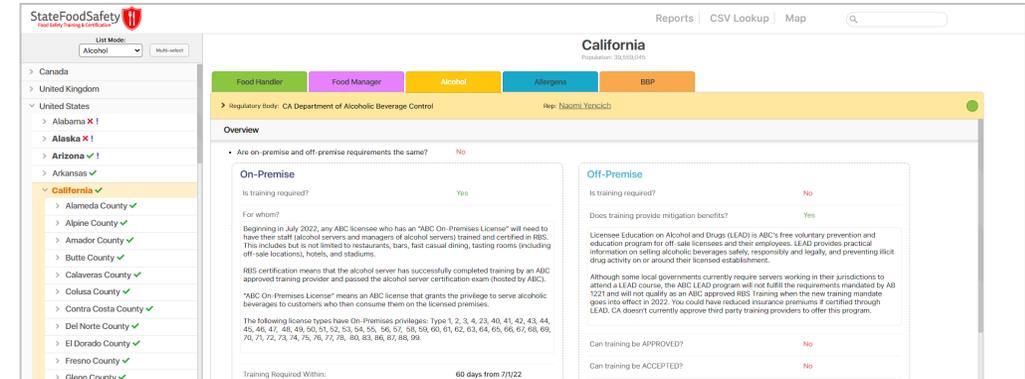
Business Name
Compliant
Compliance Updated On

ID	Address	Group	Score	
101	4001 SW Canyon Rd, Portland, OR 97221, USA	Western Region	86%	📄
102	601 N 59th St, Seattle, WA 98103, USA	Western Region	66%	📄
105	1 Government Dr, St. Louis, MO 63110, USA	Central Region	100%	📄
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Rows per page: 25 1-7 of 7 < >

Examples

- How do we track regulations across the country?
 - Apollo
- How do we keep track of a company's internal compliance?
 - Compliance Manager
- How do we support strong brands while maintaining ANSI and jurisdictional approvals?

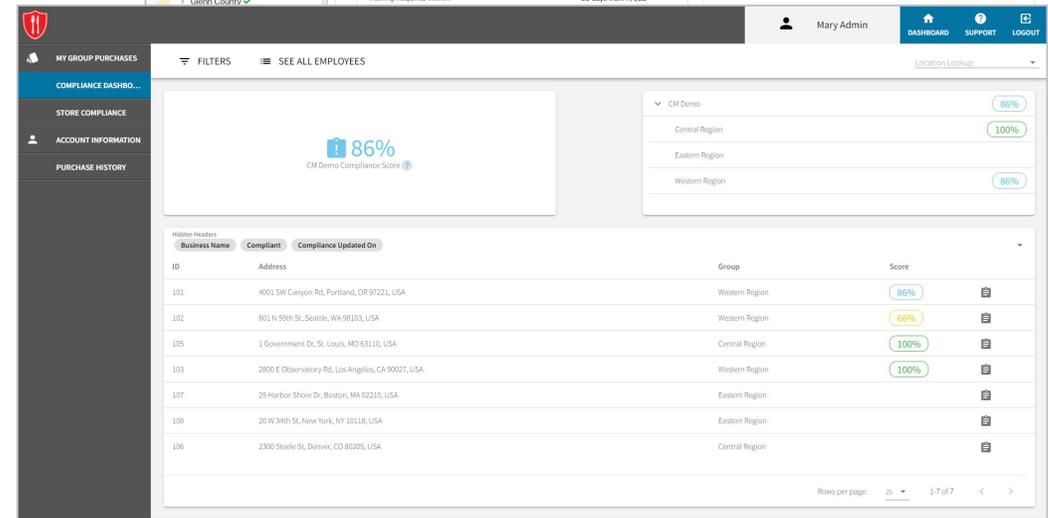
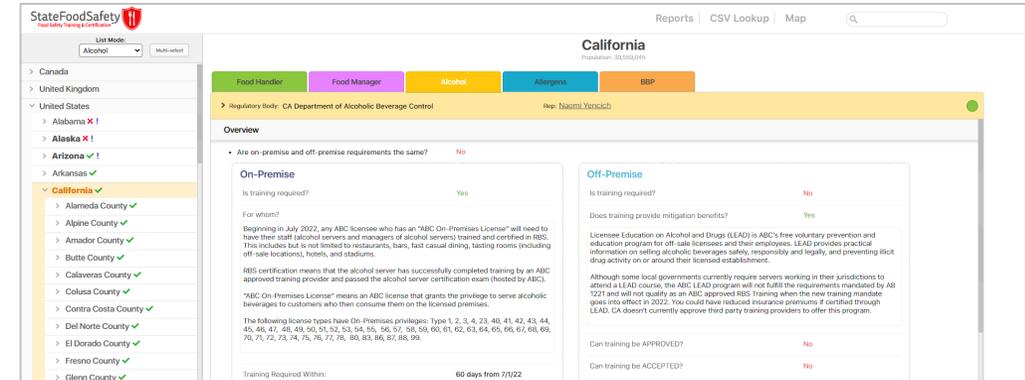


Quick Custom Courses



Examples

- How do we track regulations across the country?
 - Apollo
- How do we keep track of a company's internal compliance?
 - Compliance Manager
- How do we support strong brands while maintaining ANSI and jurisdictional approvals?
 - Quick Custom Courses



In Summary

- Know your customer and their needs (what do YOU need?)
- Analyze your current solution and imagine the ideal
- Determine how you will know you are successful
- Figure out who will and can do what
- Calculate the cost (both monetary and temporal)



Thank You!



Food Safety Training, Instructional Design and Costs of Quality

Clint Stevenson, Ph.D.

Associate Professor

Department of Food, Bioprocessing and Nutrition Sciences

NC State University

Objectives

1. Identify the role of food safety training in the costs of quality
2. Identify the association between training interactivity levels and food safety outcomes



Our Program: Research-Driven Food Safety Education Solutions

- Approximately 2,000 participants/year
- 10 online courses (e.g. HACCP, GMPs, Environmental Monitoring, and more)
- Capable of providing custom training solutions (HACCP, GMPs, etc.)
- Self-paced, rolling enrollment, mostly asynchronous learning experiences
- We are a team of subject matter experts, learning designers, developers, customer service specialists, and students
- In addition to managing our portfolio of online food safety courses, we study the effects of instructional design strategies on food safety outcomes

foodsafety.ncsu.edu



**NC STATE
UNIVERSITY**

FOOD, BIOPROCESSING AND NUTRITION SCIENCES

Food Safety Education And Training

foodsafety.ncsu.edu

"Relevant and Focused Online Training"

We support food and bioprocessing teams in their food quality and food safety operations by offering online active learning experiences and self-paced training.

Costs of Quality – Where Does Food Safety Training Fit?

Total Cost of Quality

Costs of Bad Quality | Costs of Good Quality

Internal Failure Costs

Rework, scrap, failure analysis, etc.

For example, rework can add \$1,000 for one mistake

External Failure Costs

Recalls, consumer complaints

Average recall costs \$10 million*

*From *Capturing Recall Costs: Measuring and Recovering the Losses* (GMA, Covington & Burling LLP, and Ernst & Young, 2011)

Appraisal Costs

Verification, audits, supplier approval programs

For example, audits range \$13-24K (including labor, auditor fees, travel, etc.)*

*From Viator et al (2017). *Journal of Food Science* 82(2): 260-269

Prevention Costs

Training, quality assurance, quality management, process validation

Training costs can range from \$120-2,500 per employee*

Costs of Food Safety Training Depend

Type of Training	Number of Hours to Create 1 Hour of Training
Instructor Led – Simple content (e.g. GMPs for new hires)	22:1
Instructor Led – Average project (e.g. PCQI)	43:1
Instructor Led – Complex subject matter	82:1 (< \$10K)
Level 1 e-Learning (e.g. PowerPoint to e-learning)	from 49:1 to 125:1 (~\$10K)
Level 2 e-Learning (Level 1 e-learning plus scenario based activities)	from 127:1 to 267:1 (~\$18K)
Level 3 e-Learning (highly interactive, simulations, etc.)	from 217:1 to 716:1 (~\$50K)

Research Project

EFFECTS OF LEVEL OF INTERACTIVITY ON *LISTERIA* MONITORING PROGRAMS FOR DAIRY PROCESSORS

Hypothesis

A higher:

1. **Level of interactivity**
2. **Learners perceived interactivity**
 - a. (i.e., small transactional distance)
3. **Direct measure of Interactivity**
 - a. (i.e., screen time)

... will have greater **knowledge gains/retention, self-efficacy gains/retention, and change in intentions and behaviors.**

Modules in the Environmental Monitoring in the Dairy Industry Course

1. Introduction to Environmental Monitoring
2. Zones
3. Scheduling
4. Organisms
5. Sampling Tools
6. Corrective Actions
7. Trends



Acknowledgements

- Paul Hill, Dean Foods
- Brian Kraus, Wells Enterprises
- Dennis D'Amico, University of Connecticut
- Chad Galer, Tim Stubbs, National Dairy Council
- Stephanie Maggio, Julie Yamamoto, Nathaniel Powers
- Distance Technology and Learning Applications (DELTA)

Interactivity	Limited	Moderate	High
Course Narrative <ul style="list-style-type: none"> Learning w/ Ginger & Walter Addressing Student by their Name 			
Standard Learning Activities <ul style="list-style-type: none"> Flashcards Standard videos from external resources (ex: FDA video) 			
Standard Practice Problems <ul style="list-style-type: none"> Drag & Drop, Multiple Choice, Fill-in-the-Blank, & Short Answer 			
Complex Practice Problems <ul style="list-style-type: none"> Scenario-based Questions 			
Feedback & Adaptivity <ul style="list-style-type: none"> Words of Encouragement Acknowledgement of Correct Answers Explanation of Incorrect Answers Remedial Pathways 			
Custom Animations to Enhance Learning & Practice <ul style="list-style-type: none"> Custom Animated Videos 			
Virtual Reality to Enhance Learning & Practice <ul style="list-style-type: none"> Interactive 3D Video Simulations Interactive Simulation-based Practice 			

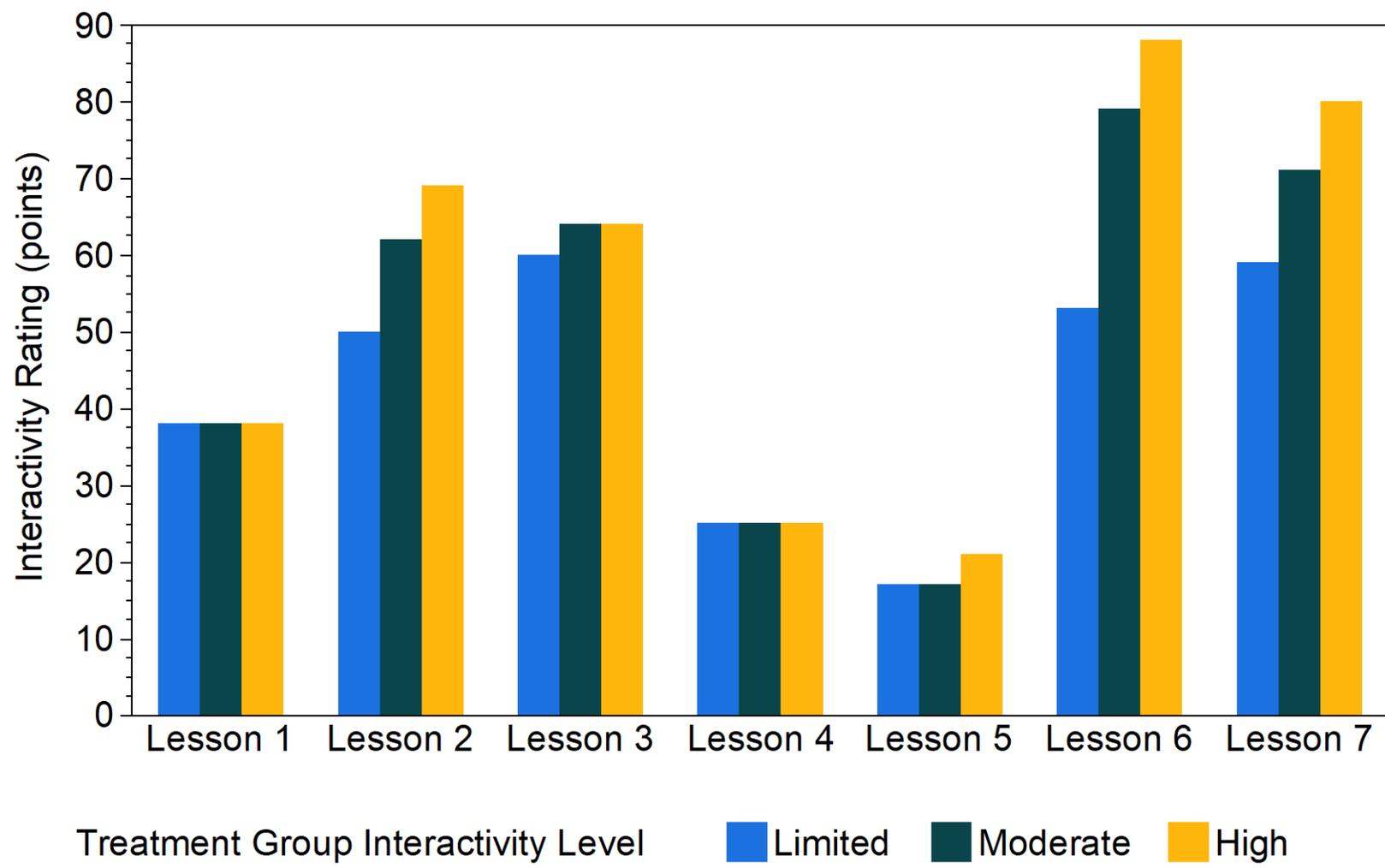
Interactivity Rating of Lesson 7

Lesson 7 Learning Objectives:	<ol style="list-style-type: none"> 1. Identify appropriate corrective actions 2. Apply root cause analysis 3. Choose appropriate sites for intensified sampling
-------------------------------	--

Lesson 7 Count of Interactive Components in Each Version of the Course

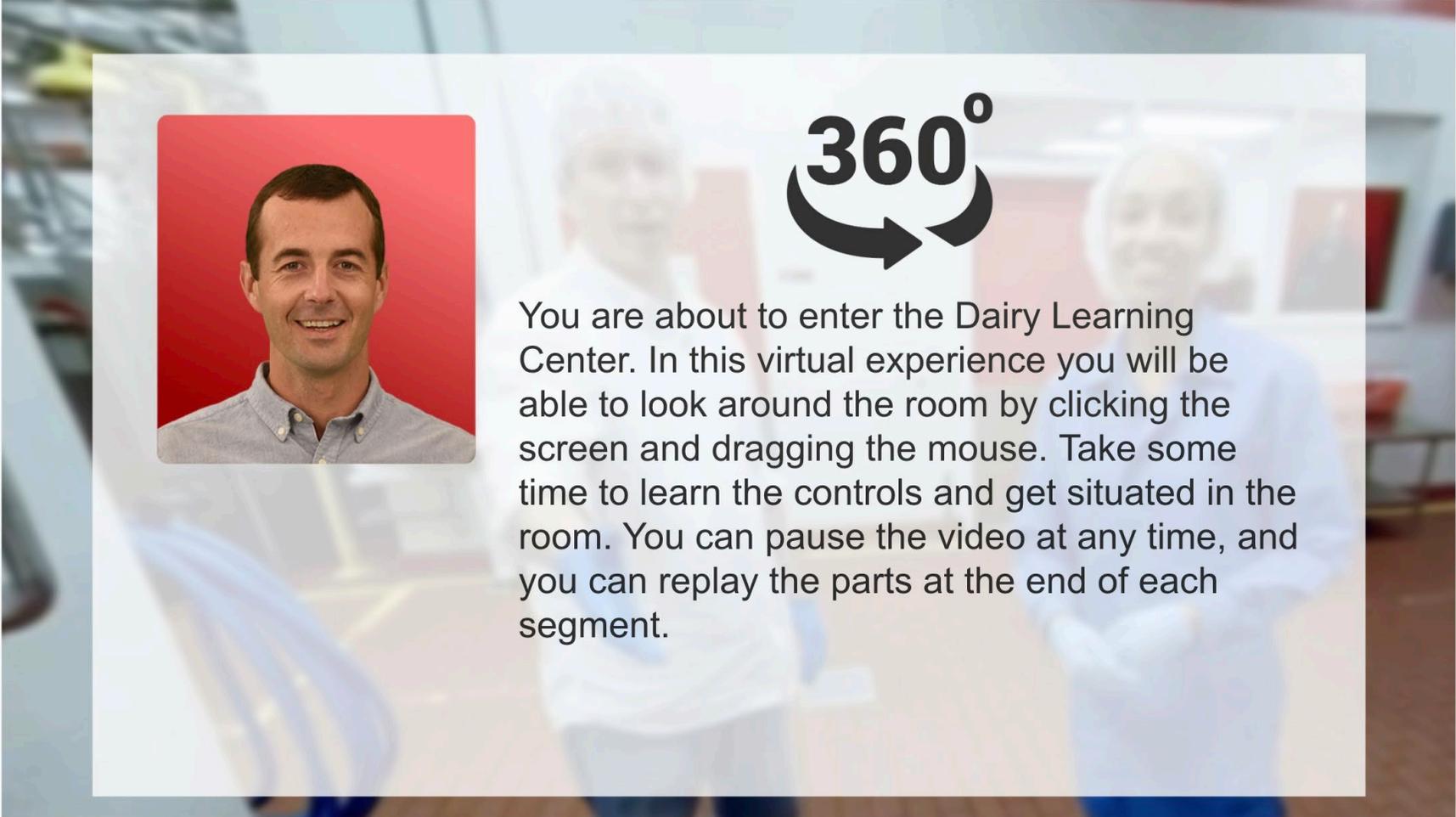
	Low Interactivity	Moderate Interactivity	High Interactivity
Interactions with Virtual Dairy Processors (1pt/interaction)	8	8	8
Addressing Student by Name (1pt/interaction)	3	3	3
Flashcards (1pt/interaction)	9	9	9
Link to External Sites (1pt/interaction)	9	9	9
Video from External Site (1pt/interaction)	0	0	0
Standard Practice Problems (Drag & Drop, Multiple Choice, Fill-in-the-Blank, & Short Answer) (1pt/interaction)	14	8	8
Feedback (Words of Encouragement, Acknowledgement of Correct Answers, Explanation of Incorrect Answers) (1pt/interaction)	7	7	7
Adaptivity (Remedial or Alternative Learning Pathways) (1pt/interaction)	3	3	3
Custom Audio (1pt/interaction)	6	6	6
Scenario-based Practice Problems with 2D Images (2pts/interaction)	0	3x2pts = 6	3x2pts = 6
Custom Animated Video (2pts/interaction)	0	6x2pts = 12	6x2pts = 12
Interactive 3D Video Simulations (3pts/interaction)	0	0	0
Scenario-based Practice Problem with VR for Added Context (3pts/interaction)	0	0	3x3pts = 9
OVERALL INTERACTIVITY RATING FOR LESSON 7	59	71	80

Lesson-by-Lesson Interactivity Rating





[link](#)



360°

You are about to enter the Dairy Learning Center. In this virtual experience you will be able to look around the room by clicking the screen and dragging the mouse. Take some time to learn the controls and get situated in the room. You can pause the video at any time, and you can replay the parts at the end of each segment.

< >

🕒 HISTORY

PLAY

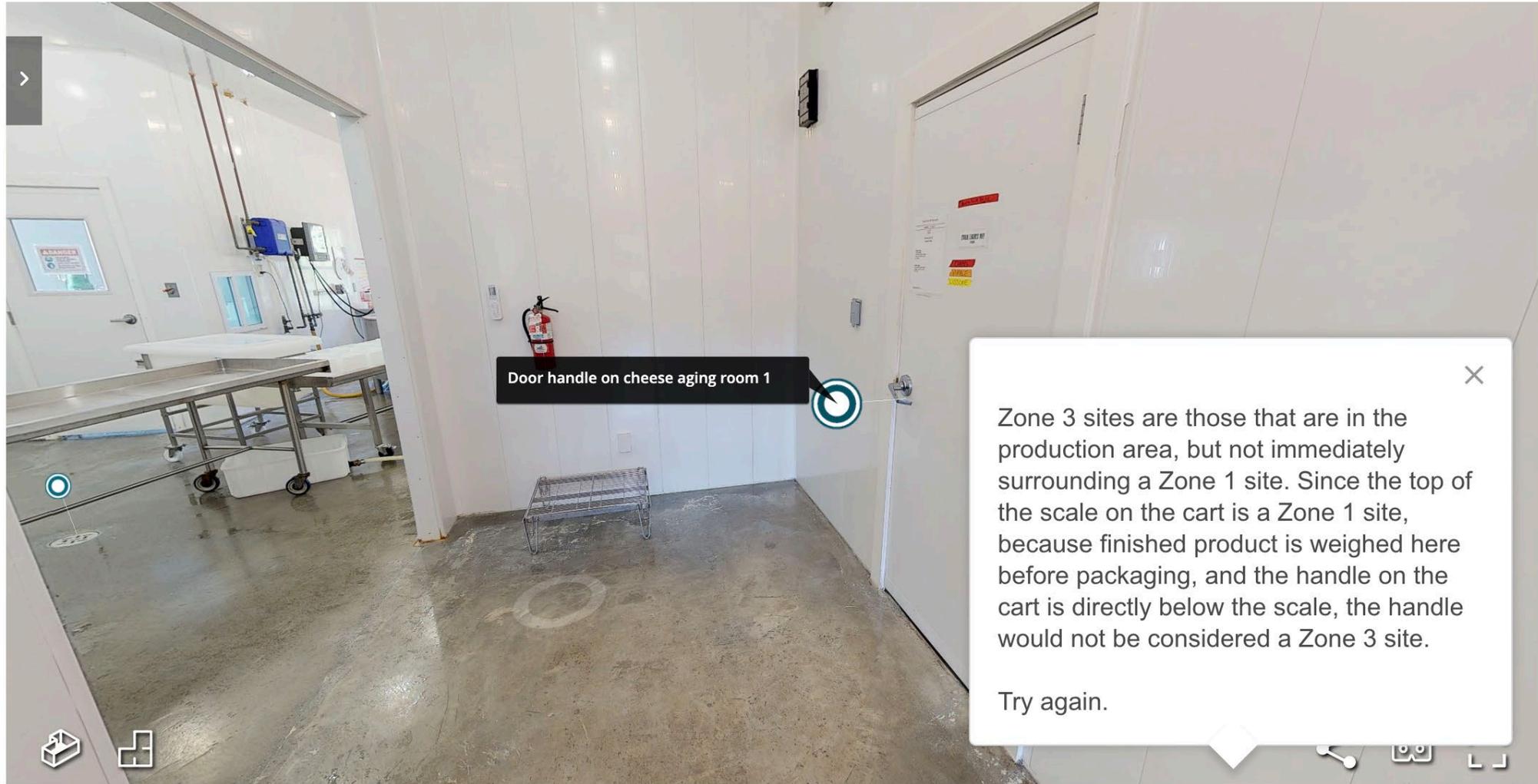
[link](#)

Slide 19 in Zones Lesson: [Click Here](#)

Find the scale in Walter & Ginger's "cheese packaging" area. Notice that it is sitting on a small cart.

Given what you have learned about zones, what zone would you assign to the *handle on the drawer of the cart*?

- Zone 1
- Zone 2
- Zone 3
- Zone 4



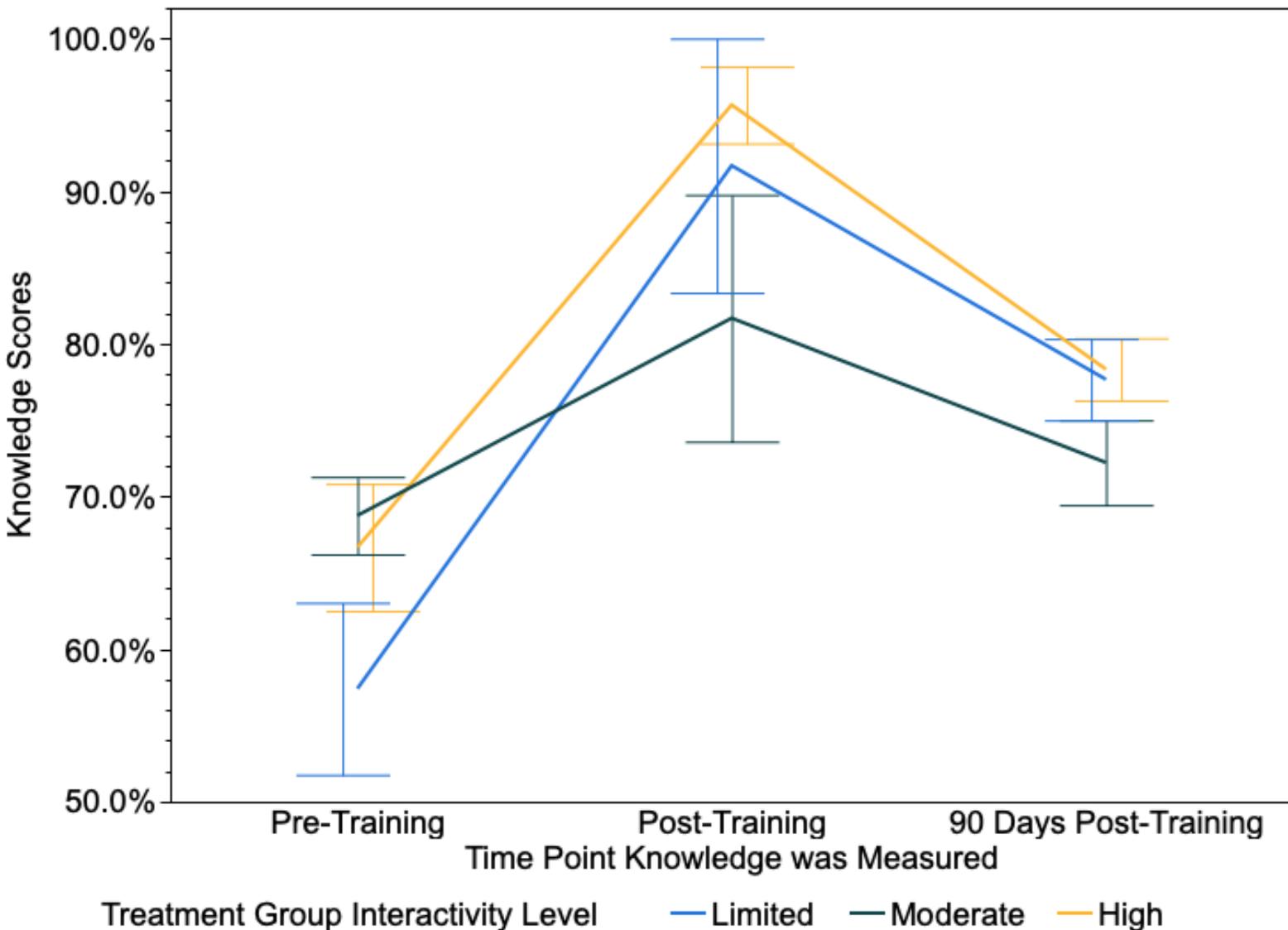
HISTORY

TRY AGAIN



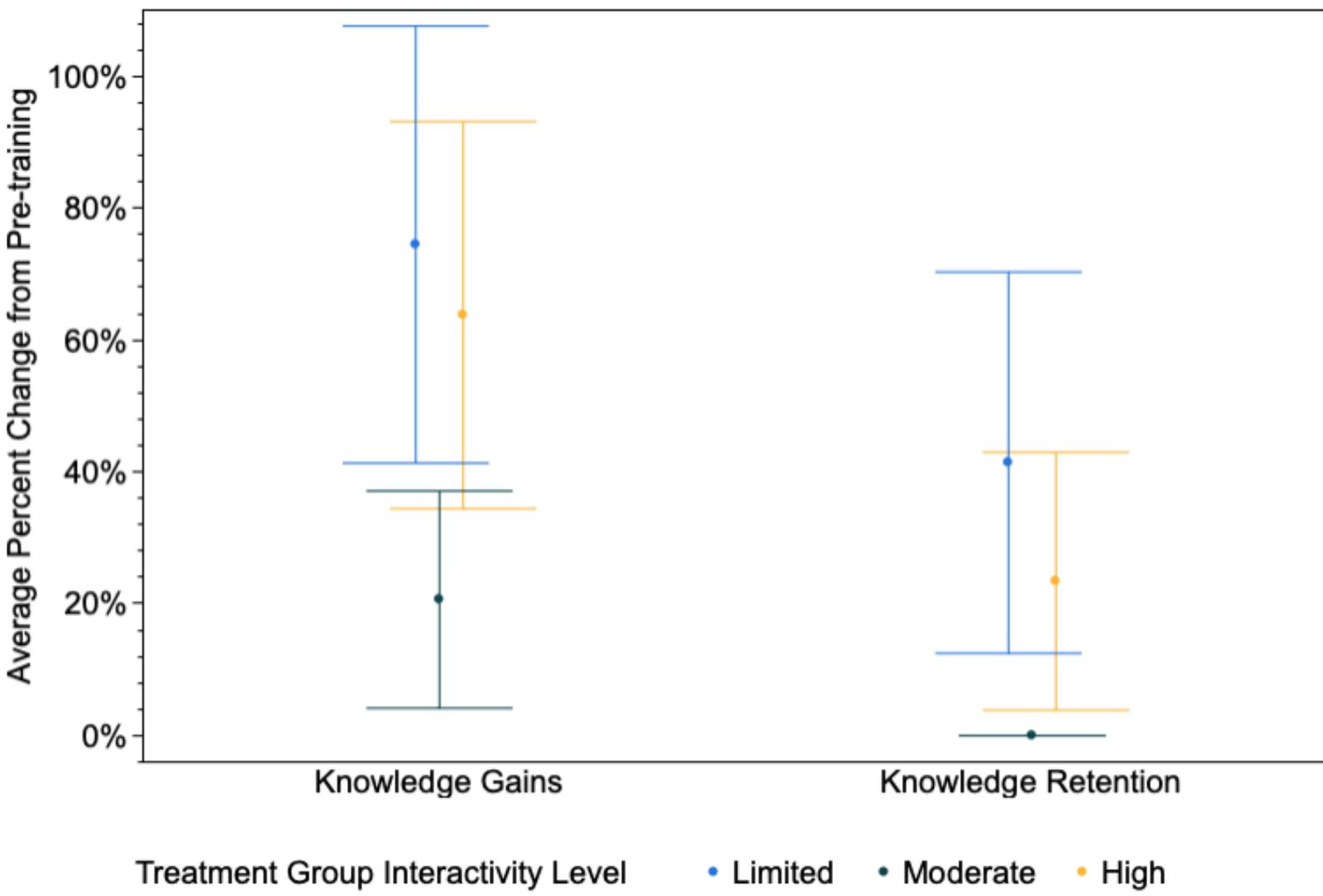
[link](#)

Significant Change in Knowledge Score between Pre- and Post-training Time points



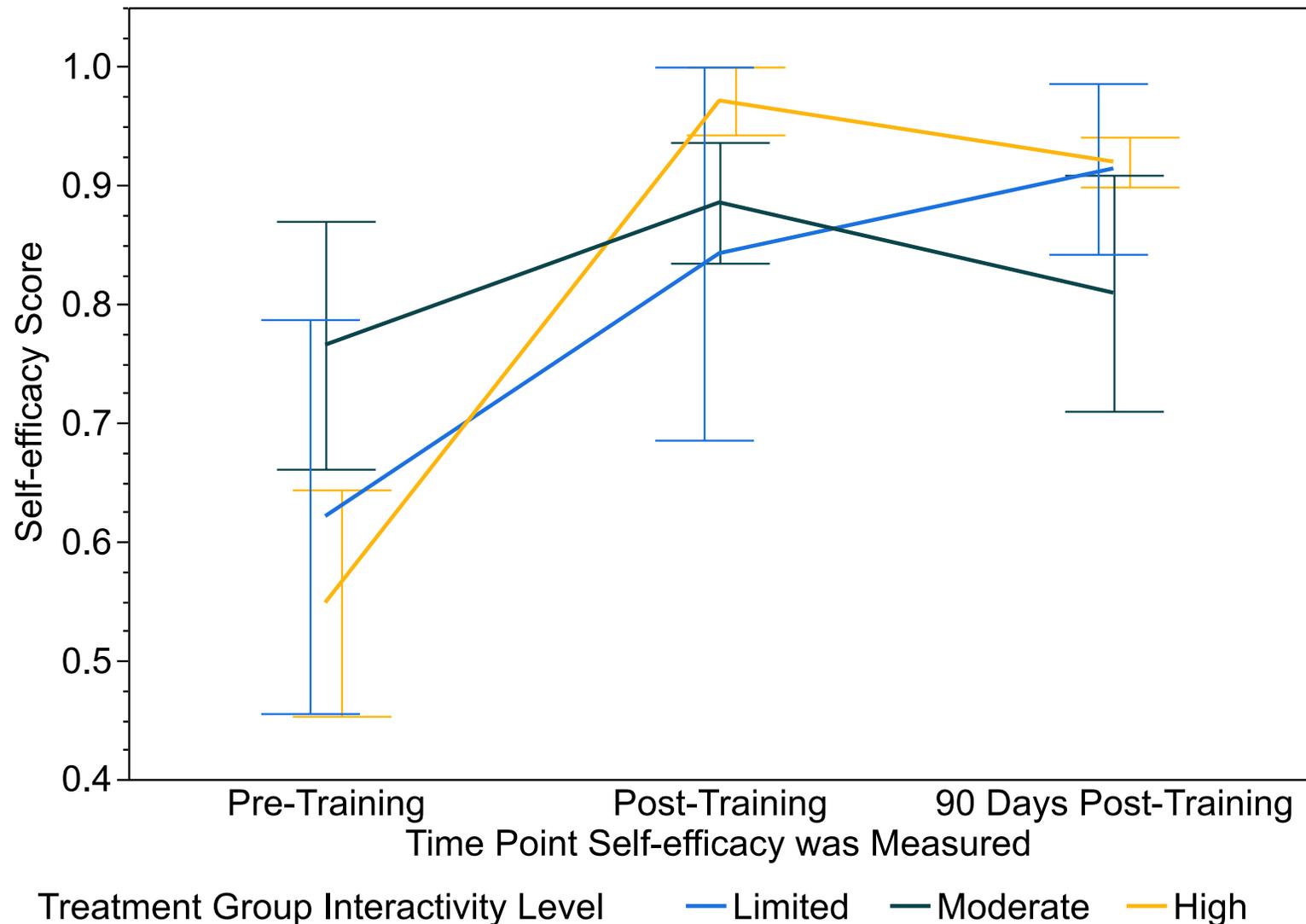
- Overall, post-training & 90 days post-training knowledge scores were sig. greater than pre-training
- Low & High treatment groups had sig. increase in knowledge scores after training

Knowledge Gains & Retention Achieved



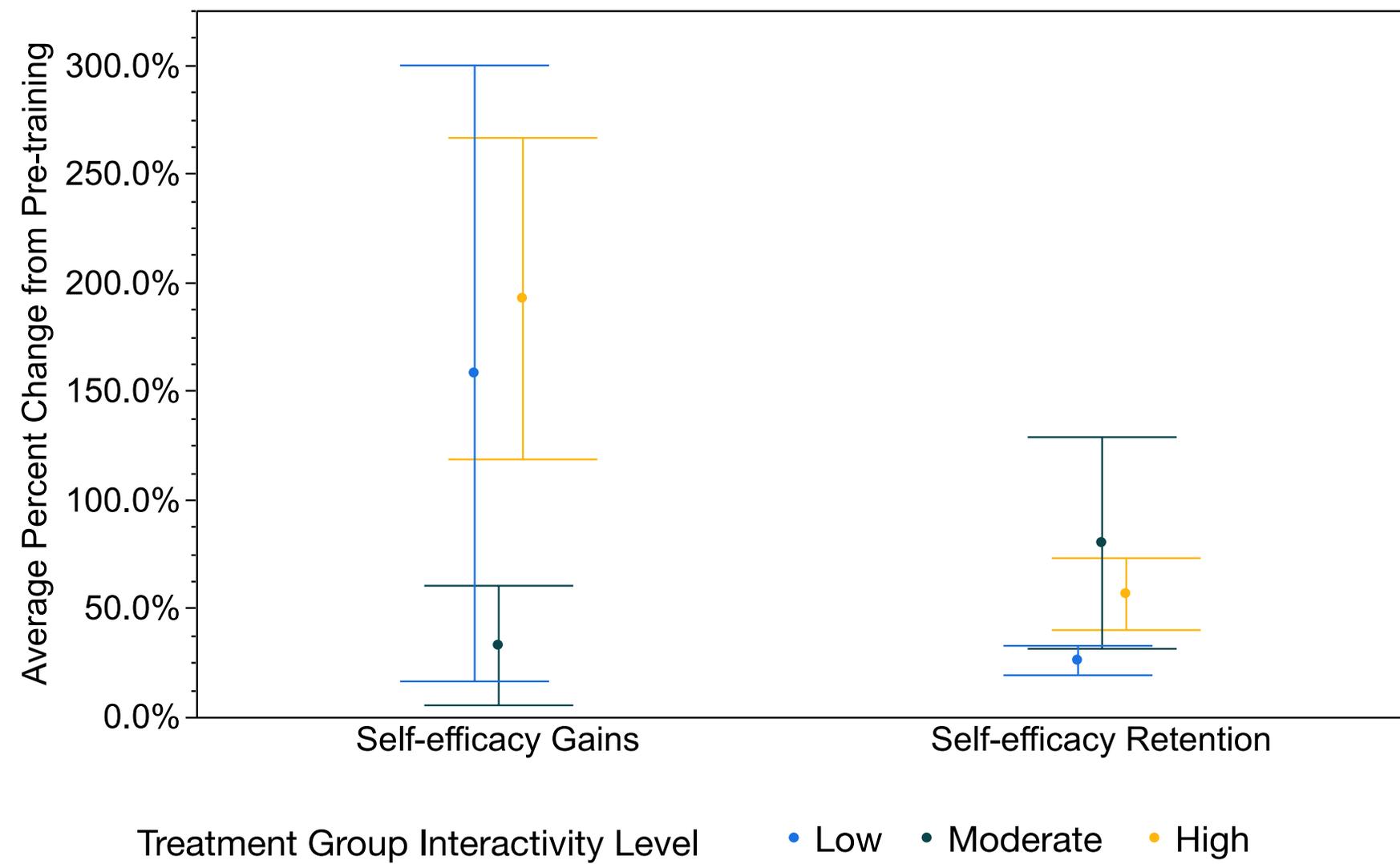
- Overall ~50% knowledge gains & ~20% knowledge retention
- Low & High treatment groups had similar gains & retention
- Moderate group had lowest gains and almost no retention

Significant Change in Self-Efficacy Score between Pre- and Post-training Time points



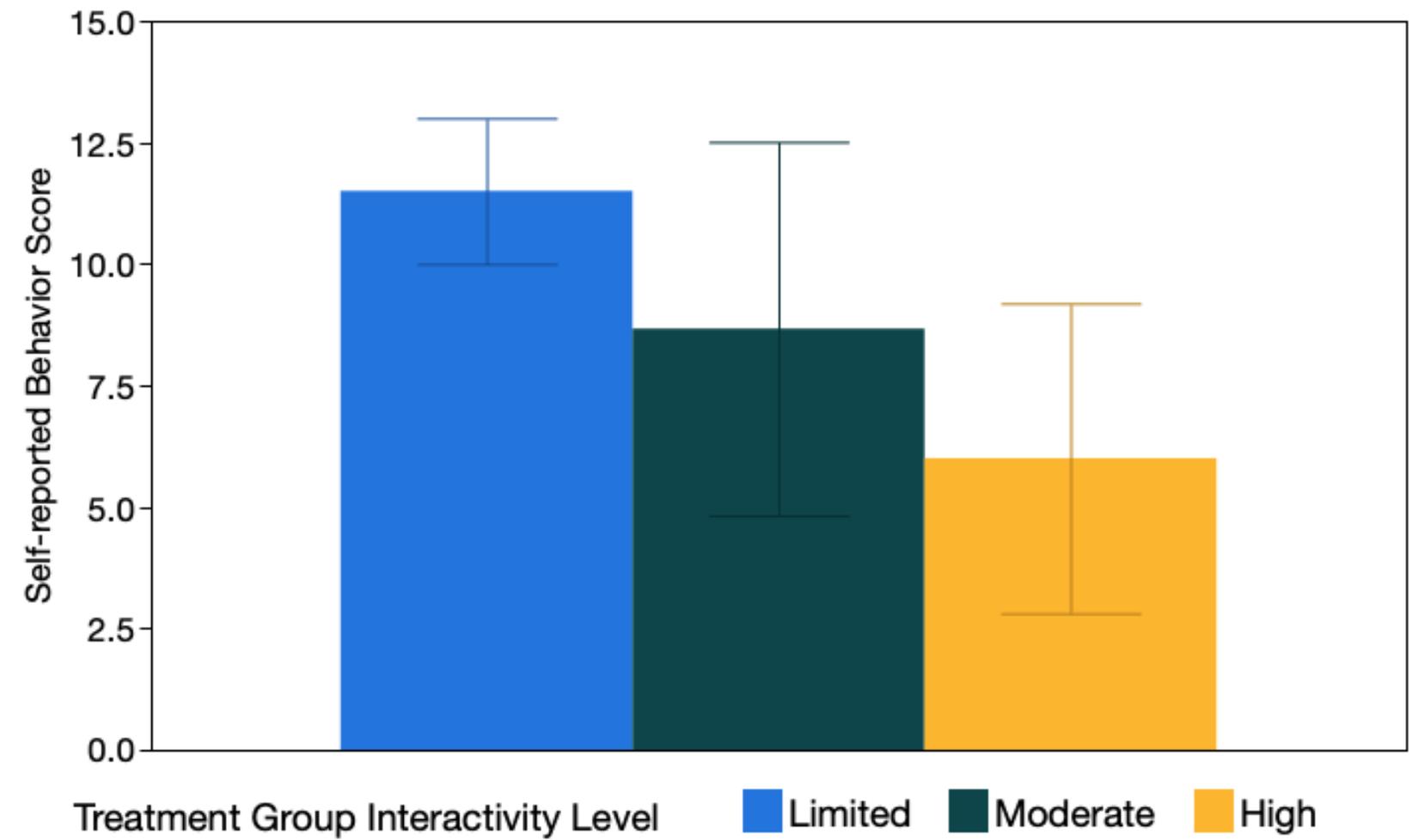
- Overall, post-training & 90 days post-training self-efficacy scores were sig. greater than pre-training
- High interactivity treatment groups had sig. increase in self-efficacy gains and retention

Self-Efficacy Gains & Retention Achieved



Behavior Change Achieved

Average Self-reported Behavior Score of Study Participants



Average Lesson Time Negative Correlation with Knowledge Gains

	Average Lesson Time	Overall TD Score	TD Learner-Content	TD Learner-Feedback	TD Learner-Interface
Knowledge Gains	--	--	--	--	--
Knowledge Retention	--	--	--	--	--

Learner-Content Interaction Positive Correlation with Knowledge Gains & Retention

	Average Lesson Time	Overall TD Score	TD Learner-Content	TD Learner-Feedback	TD Learner-Interface
Knowledge Gains	$r = -.5609$ $p = .0726$	--	--	--	--
Knowledge Retention	$r = -.2381$ $p = .5077$	--	--	--	--

Learner-Content Interaction Positive Correlation with Knowledge Gains & Retention

	Average Lesson Time	Overall TD Score	TD Learner-Content	TD Learner-Feedback	TD Learner-Interface
Knowledge Gains	$r = -.5609$ $p = .0726$	$r = .6450$ $p = .1177$	$r = .7328$ $p = .0610$	$r = .4660$ $p = .2920$	$r = .3780$ $p = .4031$
Knowledge Retention	$r = -.2381$ $p = .5077$	$r = .7408$ $p = .1521$	$r = .8145$ $p = .0932$	$r = .5067$ $p = .3836$	$r = .4011$ $p = .5033$

Summary

- Managers/supervisors play an important role in implementing food safety training programs
- Well crafted content in food safety training programs is a driver for training effectiveness
- Interactivity for interactivity-sake is costly and not always worth it

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What questions do you have?

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