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Session **S16: Revisiting the FDA 2022 *Food Code* Definition of Time/Temperature Control for Safety (TCS) Foods**

May 14, 2026

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FDA U.S. FOOD & DRUG ADMINISTRATION

Revisiting the FDA 2022 Food Code Definition of TCS Food

Food Safety Summit • Session S16 • May 14, 2026

Time/Temperature Control for Safety (TCS) Food

The TCS Challenge in Today's Food Landscape

New Products
Cold brew, plant-based, MAP produce

New Processes
Sous vide, HPP, fermentation

New Questions
Classification and consistency

Food has changed. Has our definition kept pace?

What We're Hearing

Regulators	Industry	Science
Need for clearer, consistent classification approaches	Products do not align neatly with existing categories	Emerging data raises new questions

Stakeholders across the system are asking for clarity

Why This Review Was Initiated

CFP Activity
Increase in TCS-related Issues

Jurisdictions
Requests for clarification

Innovation
Advances in food science & tech

FDA initiated a comprehensive review of the TCS definition

Current TCS Framework

🦠 Pathogen Support	🌡️ Food Characteristics	🥫 pH & Water Activity
Supports growth or toxin formation	Animal origin & specific plant foods	Interaction per Food Code Tables A & B

2022 FDA Food Code (Tables A & B)

2022 FDA Food Code TCS Food Definition in ¶1-201.10(B) Time/Temperature Control for Safety Food

Time/Temperature Control for Safety Food (formerly "potentially hazardous food" (PHF)).

(1) **"Time/temperature control for safety food"** means a FOOD that requires time/temperature control for safety (TCS) to limit pathogenic microorganism growth or toxin formation.

(2) **"Time/temperature control for safety food"** includes:

(a) An animal FOOD that is raw or heat-treated; a plant FOOD that is heat-treated or consists of raw seed sprouts, cut melons, cut leafy greens, cut tomatoes or mixtures of cut tomatoes that are not modified in a way so that they are unable to support pathogenic microorganism growth or toxin formation, or garlic-in-oil mixtures that are not modified in a way so that they are unable to support pathogenic microorganism growth or toxin formation; and

(b) Except as specified in Subparagraph (3)(d) of this definition, a food that because of the interaction of its aw and pH values is designated as Product Assessment Required (PA) in Table A or B of this definition:

Table A. Interaction of pH and A_w for control of spores in FOOD heat-treated to destroy vegetative cells and subsequently PACKAGED

A_w VALUES	pH: 4.6 OR LESS	pH: > 4.6 - 5.6	pH: > 5.6
≤0.92	Non-TCS food*	non-TCS food	non-TCS food
> 0.92 - 0.95	non-TCS food	non-TCS food	PA**
> 0.95	non-TCS food	PA	PA

* TCS FOOD means TIME/TEMPERATURE CONTROL FOR SAFETY FOOD

** PA means Product Assessment required

Table B. Interaction of pH and A_w for control of vegetative cells and spores in FOOD not heat-treated or heat-treated but not PACKAGED

A_w VALUES	pH: < 4.2	pH: 4.2 - 4.6	pH: > 4.6 - 5.0	pH: > 5.0
< 0.88	Non-TCS food*	Non-TCS food	non-TCS food	non-TCS food
0.88 – 0.90	Non-TCS food	Non-TCS food	non-TCS food	PA**
> 0.90 – 0.92	Non-TCS food	Non-TCS food	PA	PA
> 0.92	Non-TCS food	PA	PA	PA

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Source: www.fda.gov/foodcode, Paragraph 1-201.10(B) Time/Temperature Control for Safety Food (formerly "potentially hazardous food" (PHF)).

2022 FDA Food Code TCS Food Definition in ¶1-201.10(B) Time/ Temperature Control for Safety Food

(3) ***"Time/temperature control for safety food"*** *does not include:*

(a) An air-cooled hard-boiled egg with shell intact, or an egg with shell intact that is not hard-boiled, but has been pasteurized to destroy all viable salmonellae;

(b) A FOOD in an unopened HERMETICALLY SEALED CONTAINER that is commercially processed to achieve and maintain commercial sterility under conditions of non-refrigerated storage and distribution;

(c) A FOOD that because of its pH or A_W value, or interaction of A_W and pH values, is designated as a non-TCS FOOD in Table A or B of this definition;

(d) A FOOD that is designated as Product Assessment Required (PA) in Table A or B of this definition and has undergone a Product Assessment showing that the growth or toxin formation of pathogenic microorganisms that are reasonably likely to occur in that FOOD is precluded due to:

(i) Intrinsic factors including added or natural characteristics of the FOOD such as preservatives, antimicrobials, humectants, acidulants, or nutrients,

(ii) Extrinsic factors including environmental or operational factors that affect the food such as packaging, modified atmosphere such as reduced oxygen packaging, shelf life and use, or temperature range of storage and use, or

(iii) A combination of intrinsic and extrinsic factors; or

(e) A FOOD that does not support the growth or toxin formation of pathogenic microorganisms in accordance with one of the Subparagraphs (3)(a) - (3)(d) of this definition even though the FOOD may contain a pathogenic microorganism or chemical or physical contaminant at a level sufficient to cause illness or injury.

Why TCS Matters

Certain foods support rapid pathogen growth

Time and temperature control reduces risk

Non-TCS foods have limiting factors

Real-World Application

Clearly TCS	Clearly Non-TCS	Gray Areas
e.g., chicken salad	e.g., crackers	e.g., certain beverages, fresh-cut produce

Gray areas / borderline foods can drive inconsistency

Evolution of the Definition

1957
Readily Perishable

1962
PHF introduced

2001
IFT review

2013
TCS adopted

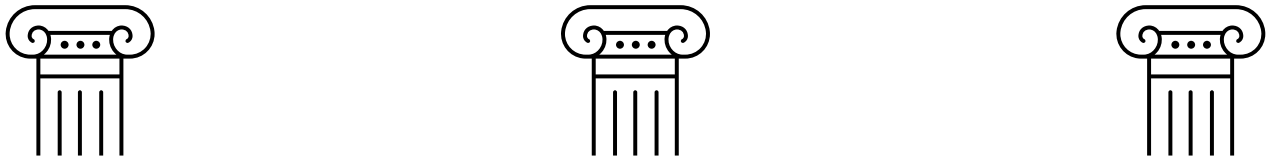
2026
Ongoing review

📋 1957 → Readily Perishable Food
📋 1962 → PHF introduced
🔬 2001 → IFT Report
🔄 2005 → PHF/TCS
✓ 2013 → TCS adopted
📈 2025 → 10 CFP Issues
🎯 2026 → Review underway

Continuous evolution based on science and practice

Project Principles

🔬 Science-based	🤝 Stakeholder-informed	⚙️ Practical & 🌍 Forward-looking
Grounded in current research	Reflects real-world application	Implementable; anticipates innovation



PUBLIC HEALTH PRINCIPLES

Project Approach

Engagement

Stakeholder sessions & outreach

Analysis

Literature & comparative review

Considerations

Assessment & development

Scope Clarifications

What We're NOT Doing

❌ Not reassessing pH and water activity tables

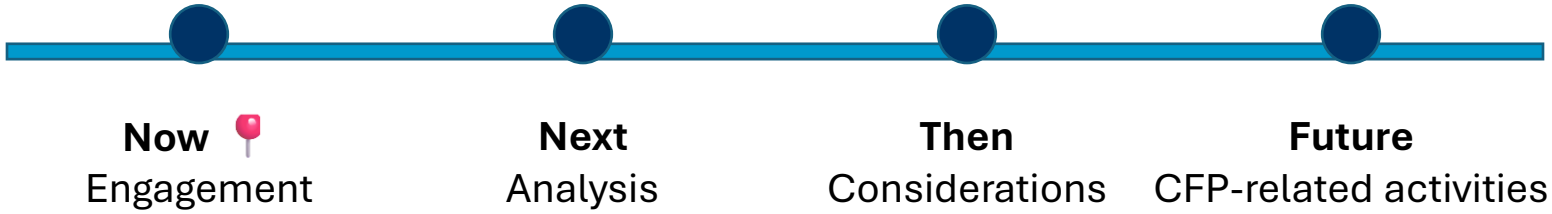
❌ Not conducting new laboratory research

❌ Not implementing immediate regulatory changes

✅ Focus: Interpretation and application of the definition

✅ Stakeholder-informed process

Project Timeline



Phase 1: Engagement (Now)

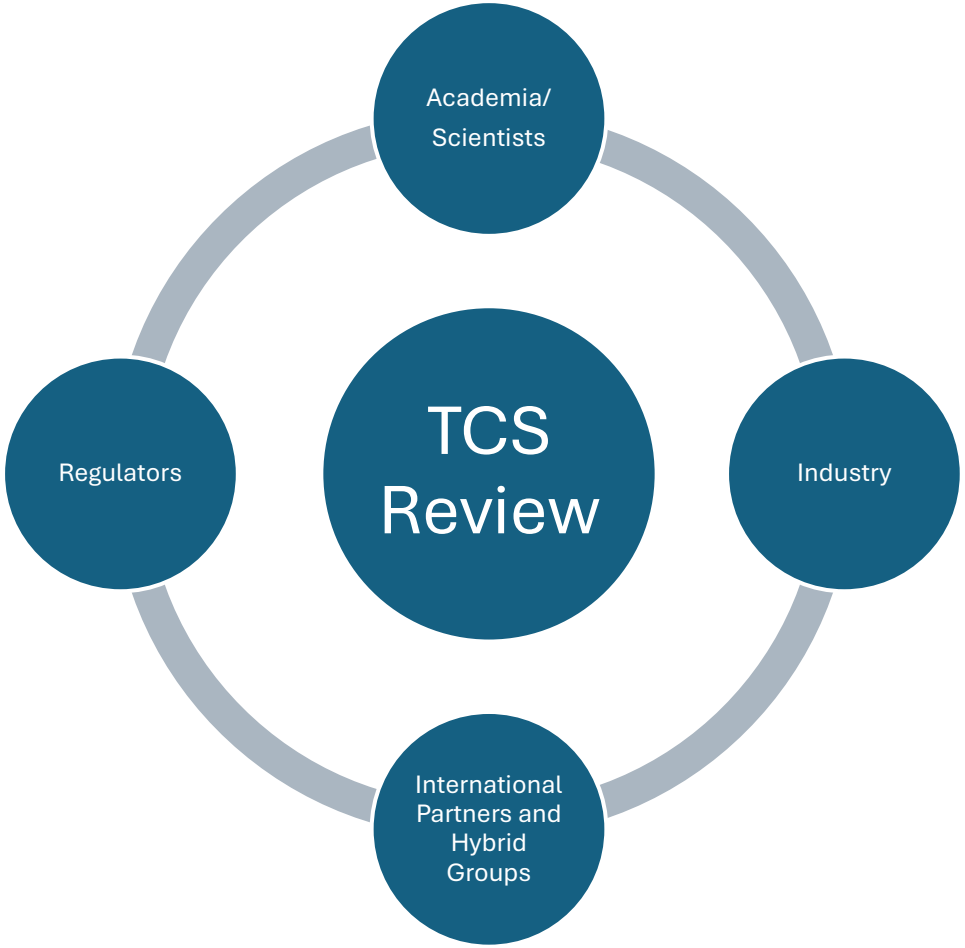
Phase 2: Analysis

Phase 3: Recommendations

Phase 4: CFP Issue

📍 We are here (FSS 2026)

Stakeholder Perspectives



Your perspectives help inform understanding of real-world application

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TCS Food Definition: An Industry Perspective

Steven A. Lyon, PhD

TCS Food Reflection Topics

1. Current 2022 FDA Food Code TCS Definition & Product Assessment Job Aid
2. Foods or situations where TCS foods classification has been unclear
3. Enforcement challenges or inconsistent interpretations
4. Tools or resources that would be most helpful for regulatory application
5. Potential solutions
6. Consensus building with the TCS foods definition

Why this Matters

Relations with local regulators

- Want to stay in good standing
- Challenge is for clarity

Disruption

- Operational Impact
- Space constraints
- More complexity

Financial Impact

- Waste
- More Equipment
- More maintenance

Supply Chain

- Supplier Labels
- Supplier Specs
- Letter of Guarantee

Current 2022 FDA Food Code TCS Definition

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(b) Except as specified in Subparagraph (3)(d) of this definition, a food that because of the interaction of its aw and pH values is designat(b)ed as Product Assessment Required (PA) in Table A or B of this definition:

Current 2022 FDA Food Code Product Assessment Job Aid

JOB AID: Time and Temperature Control for Safety Foods

This job aid is intended to be used in conjunction with the FDA Food Code. It will help the user determine if a food is considered a Time/Temperature Control for Safety Food, according to the definition provided in the FDA Food Code.

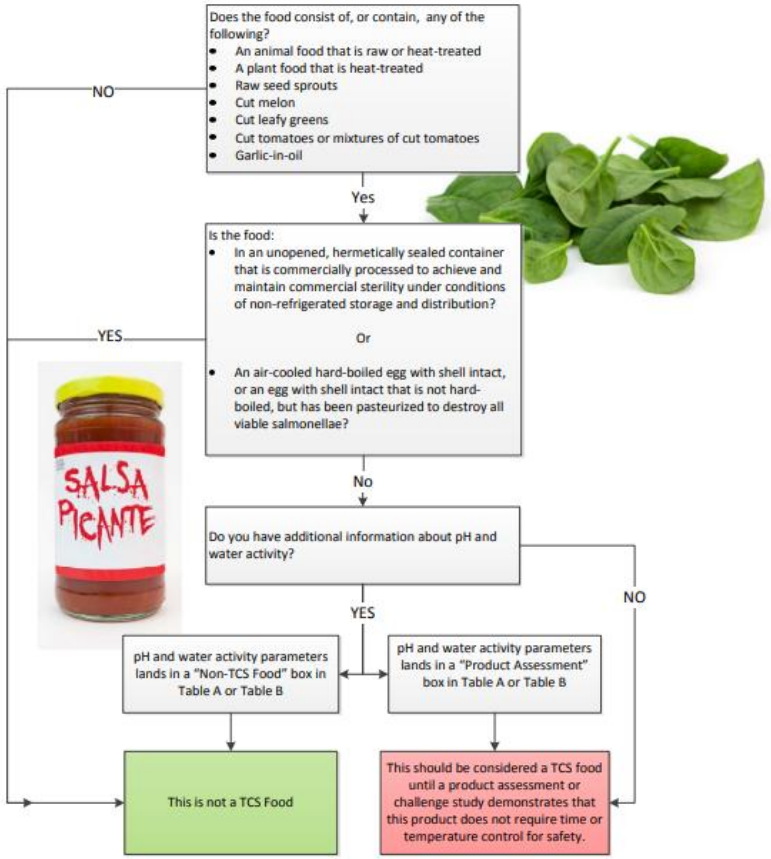

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Table B. Interaction of pH and A_w for control of vegetative cells and spores in FOOD not heat-treated or heat-treated and not PACKAGED.

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<0.88	Non-TCS Food*	Non-TCS Food	Non-TCS Food	Non-TCS Food
0.88 – 0.90	Non-TCS Food	Non-TCS Food	Non-TCS Food	PA**
>0.90 – 0.92	Non-TCS Food	Non-TCS Food	PA	PA
>0.92	Non-TCS Food	PA	PA	PA

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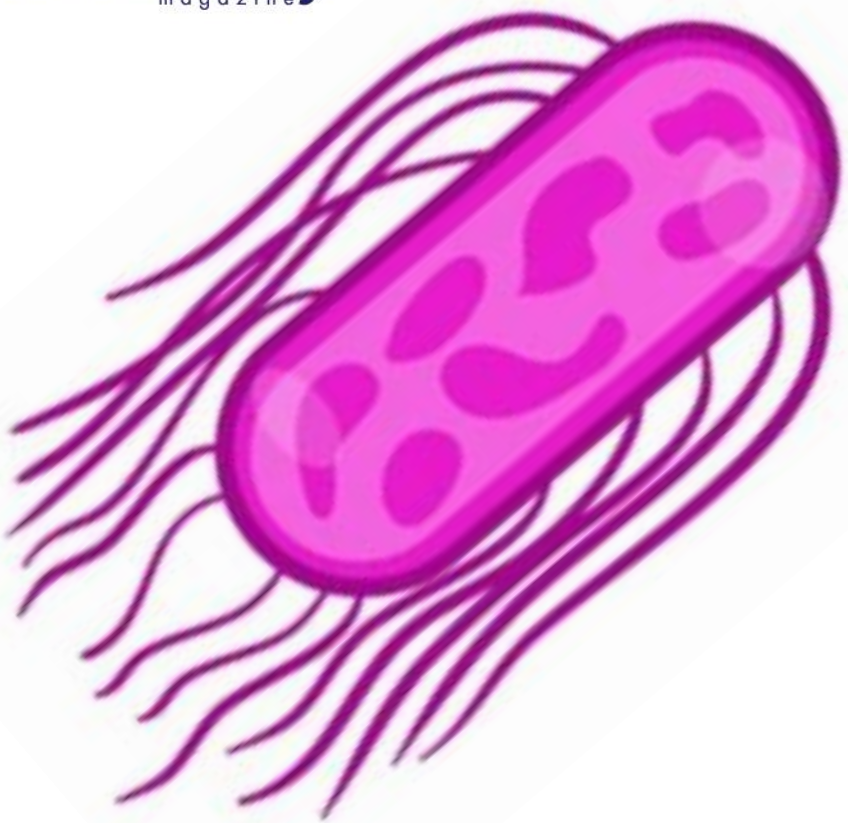
Intrinsic Growth Factors



Carbon Source: Main source of energy

- **N, Fe++**

Moisture Content: Metabolic Reactions

- **Water Activity (aW) – water available for metabolism. Growth ceases <0.88**

Neutral pH: presence of H+ ions

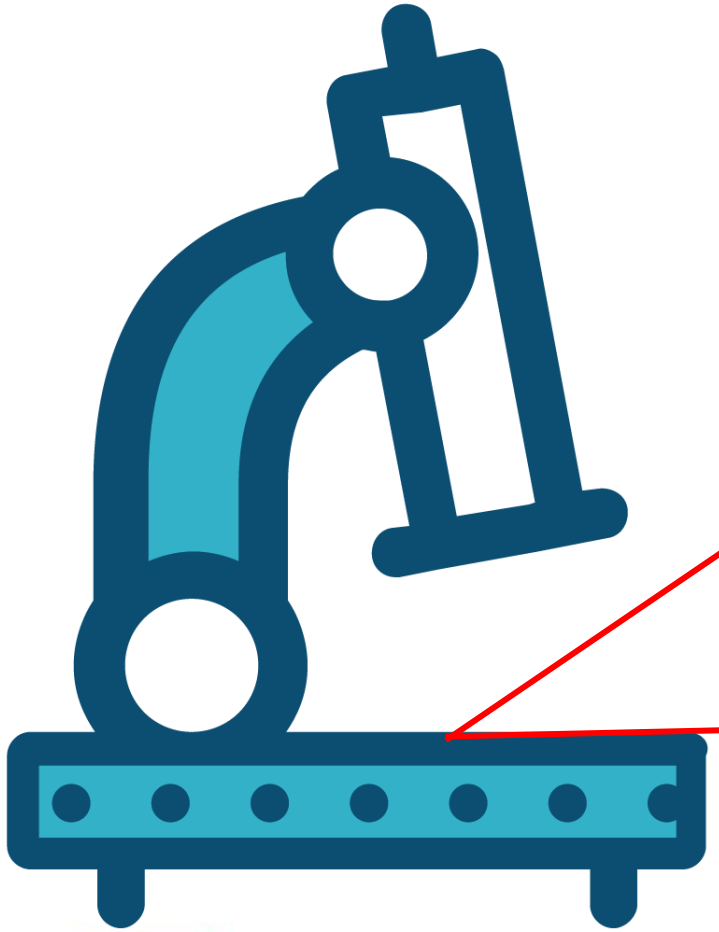
- **Acidic environments lethal or induce stress and injury to cell membrane and transport enzymes (pH < 4.0)**

- **Oxidation-Reduction Potential**

- **Antimicrobials: NaCl and CHO effect aW**

- **Temperature – growth speed or cease**

Menu Ingredient Risk Assessment



- Intrinsic Growth Factors (TCS?)
- Biological Hazard Associations
- Historical Trends with Commodity
- Outbreak and Epidemiological History
- Competing Flora
- Supplier HACCP and FSMS Programs
- Shelf Life/Operational Life
- Supplier Letter

Foods or situations where TCS foods classification has been unclear or needing clarification

Reason: Cooked Meat

PA: Merieux Labs
- **aW = 0.74**
- pH = 6.1

Reason: cut cucumber

PA: Merieux Labs
- aW = 0.98
- **pH = 3.2**

Reason: Cut Fruit

PA: Merieux Labs
- aW = 0.97
- **pH = 2.3**

Reason: Fruit

PA: Merieux Labs
- aW = 0.96
- **pH = 3.3**

Reason: Sauce

PA: Merieux Labs
- **aW = 0.83**
- pH = 5.3

Enforcement challenges or inconsistent interpretations

"Any cooked meat is a TCS"

"Any cut produce or fruit is a TCS"

"The packaging says needs refrigeration"

Provide Letter from Supplier that food is not TCS:

- Processing & HACCP
- aW and pH
- Antimicrobials/Inhibitors
- Case label: Refrigeration is for quality not safety

Provide 3rd party lab data:

- aW
- pH
- APC (depending on product)

Tools or resources that would be most helpful for application by stakeholder sector (regulatory application)

More robust training:

- FDA Job Aid
- aW and pH
- High Risk Products vs Low RIsk
- Grace with Product Assessment
- Understanding Supplier Letters
- Better awareness of quality vs. safety

Leverage State Labs to conduct:

- aW
- pH
- Create library of non-TCS foods

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Time/Temperature Control for Safety (TCS) Foods

Also known as Potentially Hazardous Foods, or PHFs

StateFoodSafety
Food Safety Training & Certification

TO GROW, BACTERIA NEED:

FOOD WARMTH MOISTURE

TO STOP BACTERIA FROM GROWING:

- Control food temperature
- Control the amount of time food spends in the Temperature Danger Zone (41°F-135°F)

Potential Solutions

Library or Repository of Foods that are TCS and Non-TCS:

- Led by Academia
- Approved Methodology
- Test commodities for aW and pH in cut/sliced/chopped state
- Acceptance by Regulatory Agencies and Industry

FDA Food Code lists:

- Specific items that are TCS
- Revaluate lists
- Specific job aids with pictures and bilingual

Consensus building with the TCS foods definition

- Keep it Science Based with Intrinsic Growth Factors
- aW and pH are easy to test and inexpensive
- Discuss how organic acids keep foods non-TCS
- Constant collaboration between reg, industry and academia
- Be product specific…not label all commodities
- Do not take a blanket approach – guilty until proven innocent

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Transition to Discussion: Think – Pair - Share

We invite you to reflect on your observations, perspectives, or experiences

Consider how TCS is applied in practice

We will facilitate a brief discussion segment

Reflection Moment 1: Your TCS Experience
Reflection Moment 2: What Would Help?

Reflection Areas

Current* definition application	Food classification challenges (real-world practice)	Interpretation/ enforcement/ application considerations
Tools and resources	Potential solutions or approaches	Approaches to collaboration / Areas of alignment

**** The current TCS definition in the 2022 Food Code www.fda.gov/foodcode and the TCS Job Aid*** https://www.fda.gov/media/101004/download

Discussion Instructions: Think-Pair-Share

You have three colored cards:

🟦 BLUE CARD – Challenges

Discuss a TCS-related challenge you face

🟩 GREEN CARD – Questions

List questions you have

🟨 YELLOW CARD - Solutions

Describe solutions or ideas you'd like FDA to consider

Instructions:
- Write one insight per card (use as many as you like)
- No need to include your name (optional)
- Leave on your chair or drop off at presenter table as you exit

Discussion Prompt 1: Think-Pair-Share

THINK: Consider a situation where either using the TCS definition or TCS classification of ONE food product was unclear or challenging

PAIR: What factors, if any, contributed to the challenge?

SHARE: Discuss briefly with a neighbor

Reflection Moment 1: Your TCS Experience

Discussion Prompt 2: Think-Pair-Share

THINK: Consider what would support clearer application, interpretation, or enforcement

PAIR: Think about tools, guidance, or approaches

SHARE: Discuss briefly with a neighbor

Reflection Moment 2: What Would Help?

Opportunities for Continued Engagement / Next Steps

Reflect on challenges and questions

Consider areas for further discussion and 6 Reflection Areas

FDA encourages ongoing engagement

Multiple Upcoming Stakeholder Engagement Opportunities

- *@ Conference for Food Protection (CFP) Educational Workshop (Virtual) (June 18) (for CFP membership)*
- *@ 2026 IAFP meeting (July26-29) (Roundtable on July 29th,New Orleans, LA*
- *@ 2026 NEHA meeting (August 3-6) in Kansas City, MO*
- *@ 2026 Retail Food Safety Seminar (Sept. 16-18) in Philadelphia, PA (TCS on 9/18)*

Continued review and analysis

Thank You

We appreciate your participation

Continued engagement supports this review

Let’s continue to engage together

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