

# Allergens

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Food Safety Summit

May 11, 2017

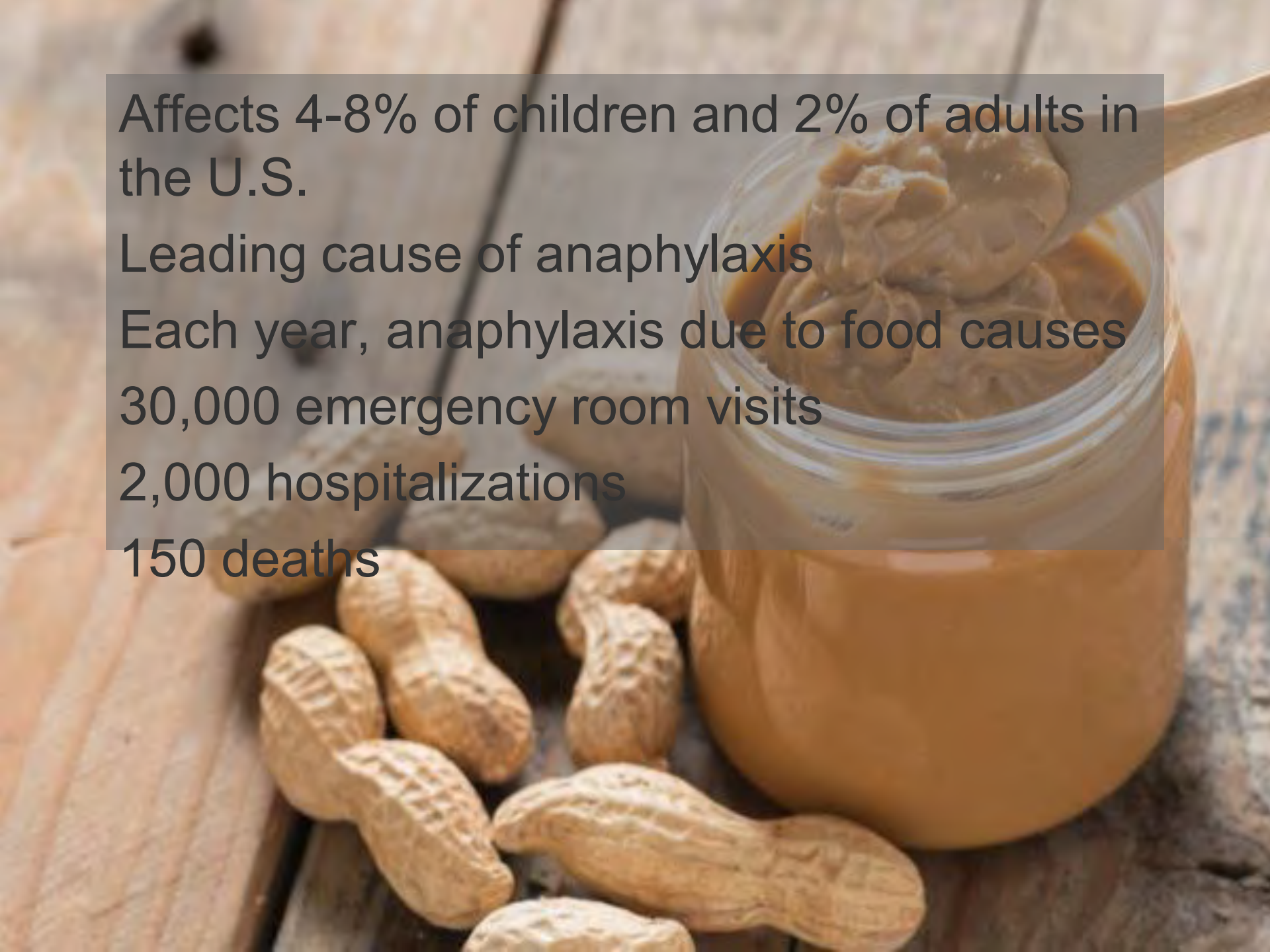
Affects 4-8% of children and 2% of adults in the U.S.

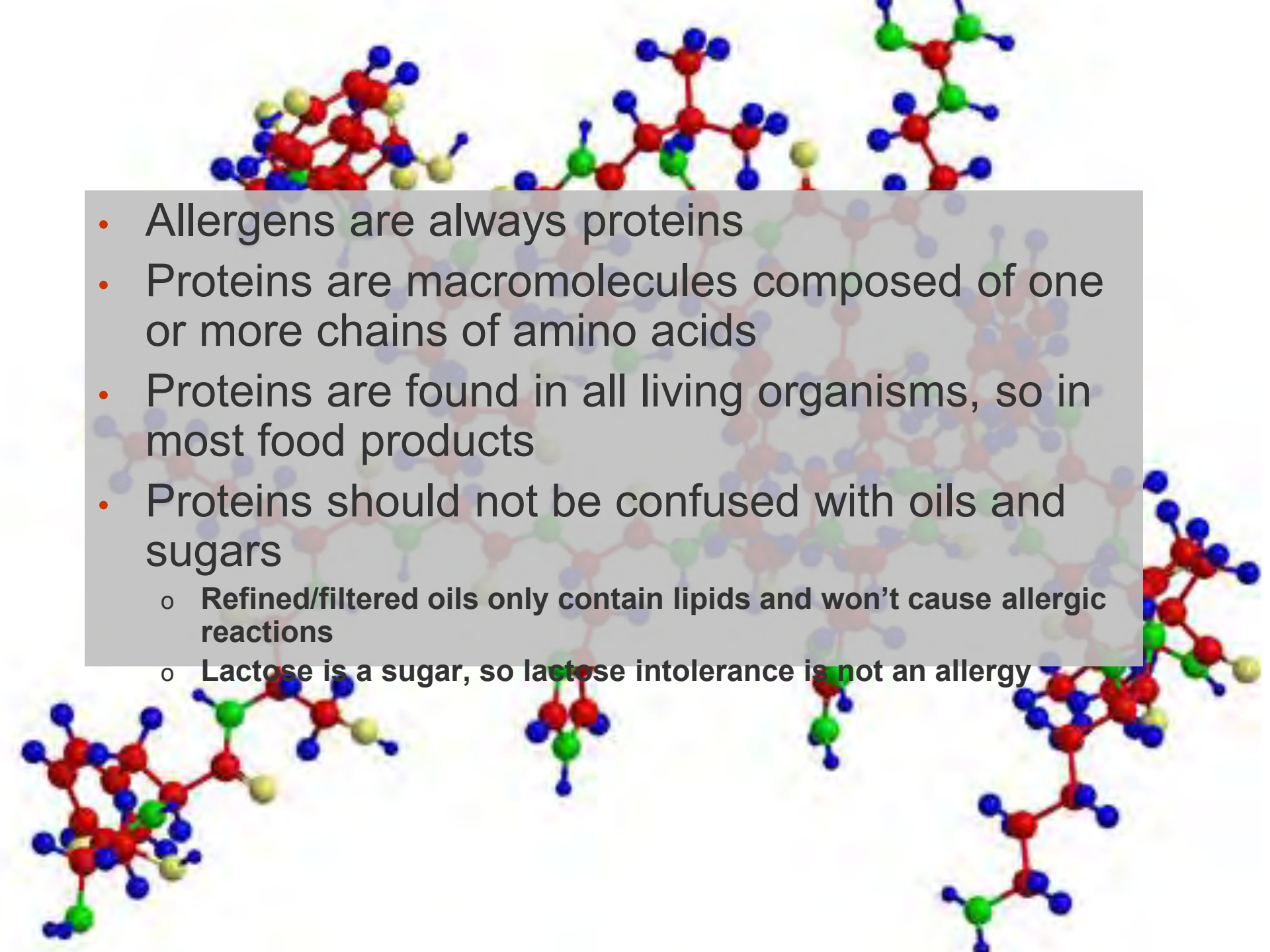
Leading cause of anaphylaxis

Each year, anaphylaxis due to food causes 30,000 emergency room visits

2,000 hospitalizations

150 deaths



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- Allergens are always proteins
  - Proteins are macromolecules composed of one or more chains of amino acids
  - Proteins are found in all living organisms, so in most food products
  - Proteins should not be confused with oils and sugars
    - Refined/filtered oils only contain lipids and won't cause allergic reactions
    - Lactose is a sugar, so lactose intolerance is not an allergy

# Top 8 Allergens (90%)

- Eggs
- Milk
- Soy
- Wheat
- Peanuts
- Tree nuts (almonds, walnuts, pecans, etc.)
- Fin fish
- Shellfish (crab, shrimp, lobster, etc.)



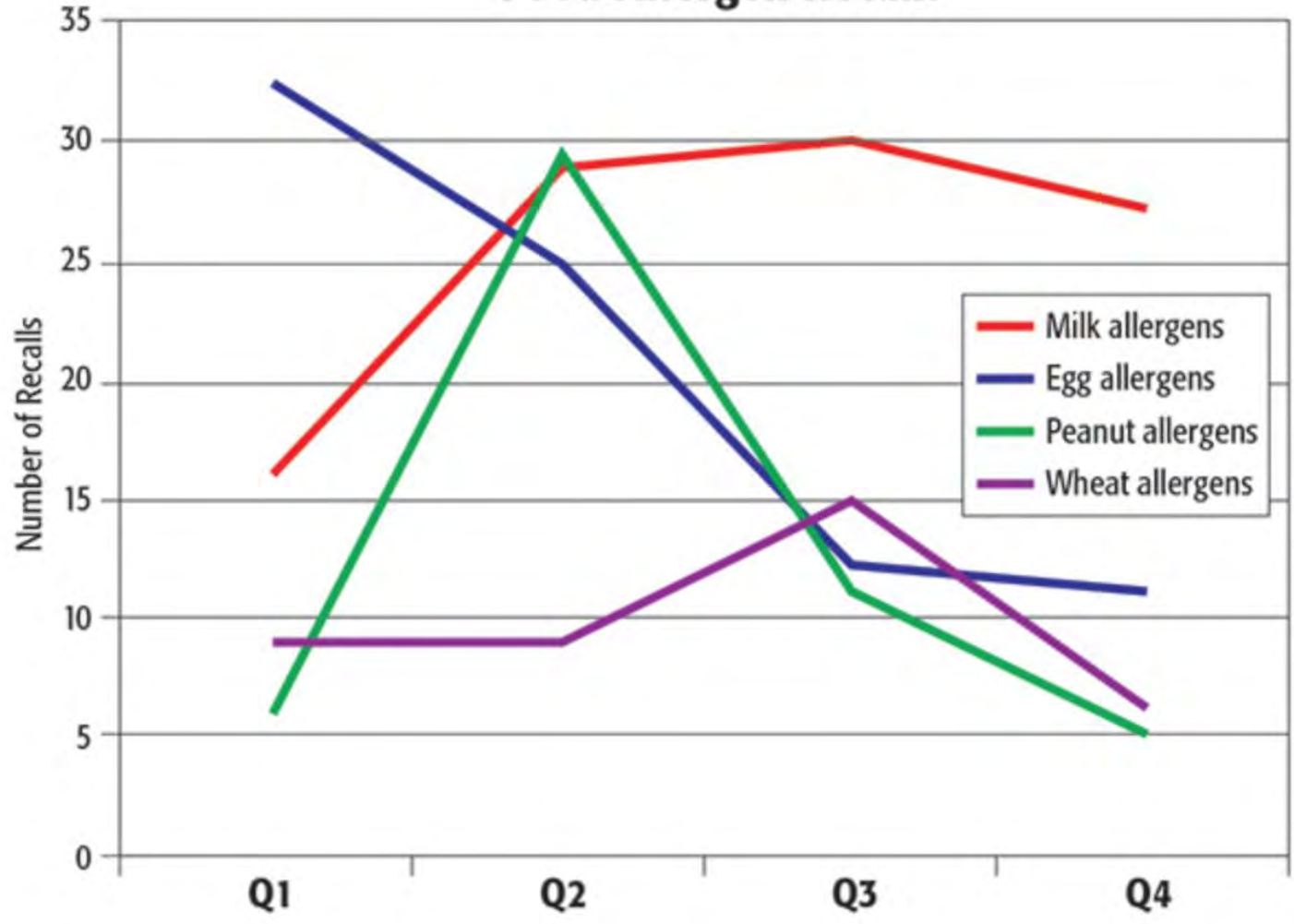


## More food recalls than any other form of contamination: 305

- **Milk - 101 recalls in 2016 vs. 82 recalls in 2015**
- **Eggs - 82 recalls in 2016 vs. 42 recalls in 2015**
- **Peanuts - 51 recalls in 2016 vs. 49 recalls in 2015**
- **Wheat - 40 recalls in 2016 vs. 34 recalls in 2015**



### Food Allergen Recalls



Undeclared Allergens led to 34 recalls (28%  
of all recalls)

Resulting in 843,536 lbs.



# What's in the literature?

- General knowledge of allergen control and severity within restaurant food handlers
- Majority of food handlers reported that they were not confident in the safety of food, allergy wise, in their own restaurant
  - **(Lessa et al., 2016)**





In one paper, 70% of restaurant managers self-report that they have provided specialized training for food handlers but identified a lack of time and a lack of commitment as barriers to implement good allergen practices.

- **(Ming Lee & Xu, 2015)**



# What the literature says about processing

- Investigation of artisanal cheese processors in PA showed a self-reported perception of good cleaning and sanitation practices did not match audit and inspection results
  - **(Machado et al., 2017)**
- Observations at 24 small food processors, cleaning, storage control and hazard analysis were identified as highest non-conformances (Dzwolak, 2016).



# NATURAL TREATMENT for **FOOD ALLERGIES**



## Digestive enzymes (follow package instructions)

- **Enzymes aid the digestive system in fully breaking down food particles, and it's a vital food allergy remedy.**

## Probiotics (50 billion organisms daily)

- **Good bacteria can help the immune system deal with food more favorably.**

## MSM (1000 mg 2x daily)

- **Can keep allergens from moving into the bloodstream.**

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The End



# Teaching Food Employees the Importance of Allergen Management

Natalie Seymour  
Extension Associate  
NC State University

Food Safety Summit | May 11, 2017

# Allergen Management at Retail

- Everything can go right up until preparation and service
- One tiny mistake can have tragic consequences



# Taking Allergens Seriously

- Food allergies can drastically change lives and experiences
- Why manage allergens:
  - Part of food safety
  - Legal requirements
  - Care about public's safety and experiences



# Understanding Severity

- True food allergies are different from intolerances, sensitivities and dietary preferences
- Every report must be taken seriously
- Trends and difficult customers shouldn't dictate our level of care



# Approaching Allergens

- Allergen control is similar to, yet different from control of biological hazards
- Allergens are sometimes “hidden” in foods at retail
- Allergen management plans must be extremely thorough
- Communication with cooks and staff



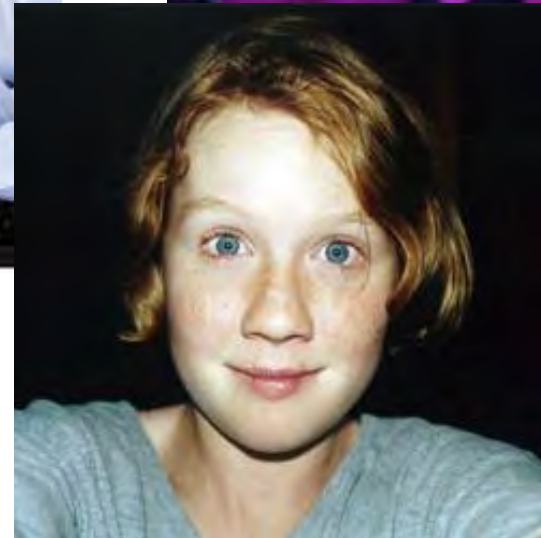
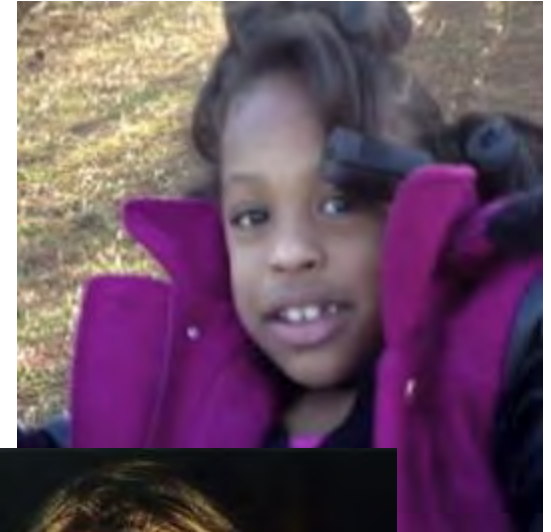
# Strategies to Improve Allergen Management

- Tell stories
- Find problem areas
- Present simple solutions



# Stories and Case Studies

- Sabrina
- Landon
- Natalie
- Ammaria



# Family sues Publix for wrongful death of 11-year-old boy

Tavia D. Green, The (Clarksville, Tenn.) Leaf-Chronicle 2:22 p.m. ET March 24, 2015

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(Photo: Scott Iskowitz, AP)

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CLARKSVILLE, Tenn. — An Alabama family has filed a wrongful death lawsuit against Publix Super Markets Inc. because of their 11-year-old son's death after eating a cookie they say was mislabeled from a store in Clarksville.

Derek "Landon" Wood, 11, of Sterrett, Ala., died of anaphylactic shock on June 3, 2014, after eating a cookie from the local Publix, which the family says had not been marked as containing a food allergen.

Since he was 4, Landon suffered from a food allergy. His mother, Beth Cline, carried an epinephrine pen for him.

The family was in Clarksville to visit Landon's aunt.

"The purpose of the lawsuit is to raise the awareness of food allergens that are potentially fatal in children."

Edlie Schmidt, family's attorney

At a bakery counter that displayed ready-to-eat desserts such as cookies, brownies, pastries and muffins, there were no signs at or behind-the-counter warning of allergens or cross-contamination with allergens, the lawsuit said.

According to the lawsuit, before purchasing the cookie, Cline was told by a supermarket associate that a chocolate cookie, called a "Chocolate Chew," did not contain any tree nut allergens.

No label on the cookie disclosed the presence of allergens or a list of ingredients, the lawsuit said.

When the family returned home, Cline took a bite of the cookie, saw there were no nuts, and gave the rest to her son. Landon had three bites of the cookie and was sure there was something in it because his mouth was burning, the lawsuit said.



# Case Study

## What Happened



Landon and his mom asked the right questions

## What They Found



Staff member didn't know walnuts were in cookie, label didn't declare allergen

# Case Study

## What Went Wrong



Landon ate a few bites of the cookie and reacted

Medications were not enough to save him

## Prevention

**Ingredients:** Granola (whole grain rolled oats, brown grain rolled wheat, soybean oil, whole wheat flour, rice crisp (whole grain brown rice, sugar, malted barley syrup, semisweet chocolate chips (sugar, chocolate (sugar, palm kernel and palm oil, partially defatted salt, vanillin [artificial flavor]), oligofructose, polydextrose), sugar, calcium carbonate, salt, soybean oil, natural flavors), **CONTAINS WHEAT, PEANUT, SOY AND MILK INGREDIENTS. MAY CONTAIN TRACES OF TREE NUTS.**

\*Sugar Content (on 40 gram basis): Regular Peanut Butter Chocolate Chip

Label allergens in products for sale, know where to find allergen information for ingredients



# Identifying Potential Problem Areas

- Storage, preparation, cooking and serving
- Personal hygiene and contamination
  - Big data and employee hygiene
  - Hands can be a vector for allergens too
- Addressing one area may improve others

# Prevent Cross Contact

Cross-contact is similar to cross contamination, but cooking doesn't eliminate the risk.

- **Storage** – separate allergens
- **Handling** – sanitize utensils and surfaces after contact with allergens
- **Cooking surfaces** – heat doesn't eliminate allergens. Clean or use designated areas
- **Food contact surfaces** – clean in between allergen and non allergen foods
- **Handwashing** – both preparation and service
- **Buffet service** – label service utensils and communicate with customers



# Present Simple Solutions

- Physical and temporal separation
- Allergen menus
- Color-coding
- Reminders to cooks and servers
- Labels



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**QUESTIONS?**

Allergen control  
Top 5 count down  
Food Safety Summit  
May 11, 2017

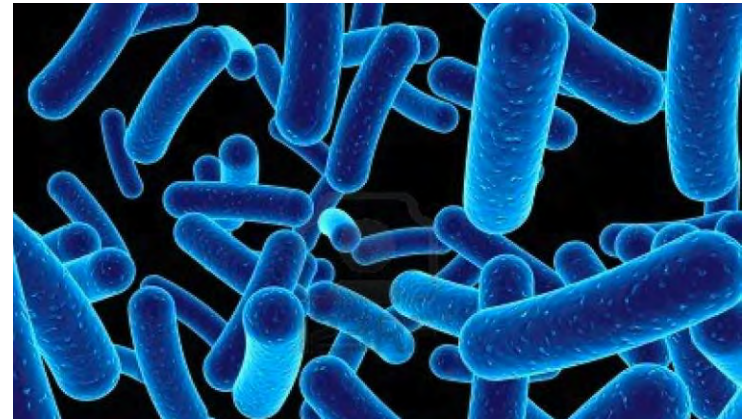
Dale A. Grinstead, Ph.D.  
Sealed Air



# Top 5 Allergen control count down

## 5. Allergens are not bacteria

- You cannot sanitize them away.
- You cannot degrade, denature, heat, oxidize, or otherwise inactivate allergens.



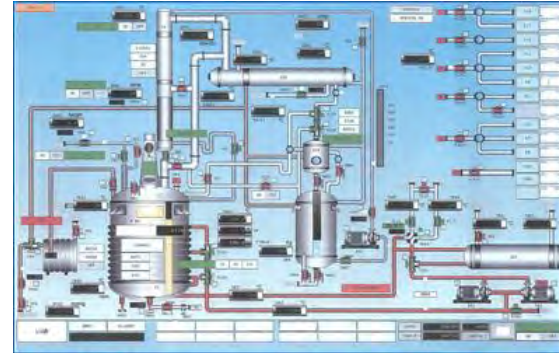
## 4: Process control is important

- Separation of equipment/facilities are best
- Don't forget mobile equipment like bins and totes, flex hoses etc.
  - Use covered containers
  - Segregated storage
  - Dedicated pallets
  - Segregate staging areas
  - CLEARLY mark, tag, or color code allergen containers



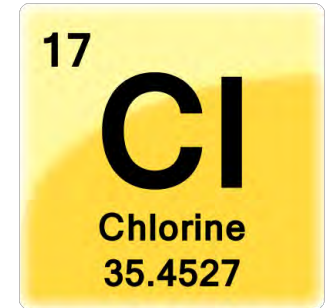
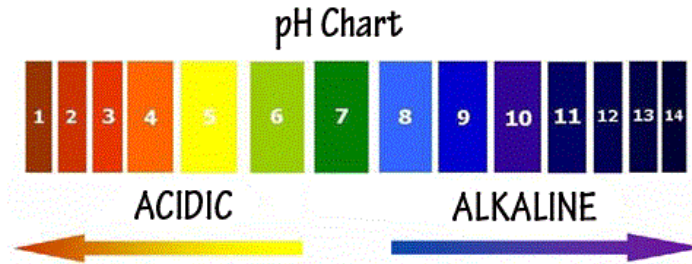
## 2: Process control is important

- Process separation
  - Look out for cross contamination
    - Look for crossover points in lines
    - Watch for aerosols
    - Build physical barriers
    - Don't forget employee movement
- Separate in time. Make the allergen containing products after those without allergens
- Separate WITHIN a process. Add the allergen at the end of a process.



# 3: At some point you have to clean

- Wet cleaning
  - Allergens are proteins so a cleaner that is well suited to cleaning high protein soil is often a good choice.
    - Chlorinated alkali detergent is a standard and effective choice

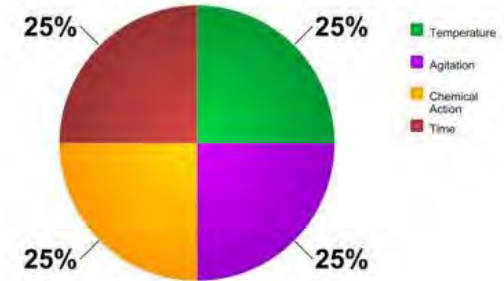




# 3: At some point you have to clean

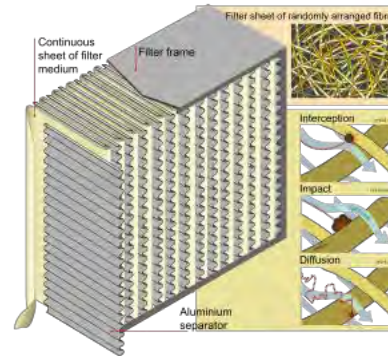
- Wet cleaning
  - Cleaning is about more than chemistry so make sure that:
    - You give the cleaner Time to work
    - You use sufficient mechanical Action
    - You use the chemical at the right Concentration
    - You clean at the correct Temperature
    - TACT
  - You also need to be sure that the cleaner fits the rest of your process, equipment, and other factors

T.A.C.T. Fundamentals:  
temperature, agitation,  
chemical action & time



# 3: At some point you have to clean

- Dry cleaning
  - Tools (brushes, brooms, cloths, etc) can cross contaminate. Consider color coding and have a plan to maintain them.
  - Vacuums are often used but be sure to use HEPA filters.
  - Single use wipes with water or alcohol may be useful.





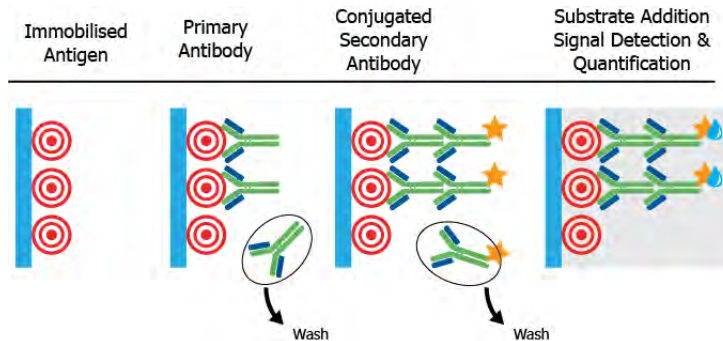
# 3: At some point you have to clean

- Dry cleaning
  - Consider microfiber cloths
  - Be careful of compressed air as it can cross contaminate
  - Ice blasting can be used but it too just moves soil around and can damage surfaces.



# 2. Validation and Verification

- Validation is demonstration that a control process CAN work. Verification is demonstration that a control process IS working.
- There are several methods to achieve this:
  - Visual inspection:
    - Advantage: Easy and fast and cheap
    - Disadvantage: not very sensitive, subjective, only works on accessible surfaces, non specific.
  - ELISA:
    - Advantages: Sensitive, specific, fast
    - Disadvantage: Complex, lab often needed, not available for all allergens, subject to interference



## 2. Validation and Verification

- There are several methods to achieve this:
  - Protein swabs:
    - Advantage: Sensitive, cheap, may not need equipment, fast
    - Disadvantage: May measure non-allergen protein, not available for all allergens, often qualitative rather than quantitative, subject to interference
  - ATP:
    - Advantages: Easy, fast
    - Disadvantage: Not specific for allergens
  - Lateral flow devices
    - Advantages: Rapid, Specific, Sensitive
    - Disadvantage: Not available for all allergens, sample may need some processing, subject to interference





## 2. Validation and Verification

- General comments
  - These can all suffer from “Sample error”, I.E. if you don’t sample where the allergen is you will not see it.
  - Consider collecting rinse water (esp. from CIP systems) and test that.





# How was that again?

1. Supplier control
2. Validation and verification
3. At some point you have to clean
  - Sometimes wet
  - Sometimes dry
4. Process control is important
  - Separation equipment/facilities are best
  - Separate in time. Make the allergen containing products after those without allergens
  - Separate WITHIN a process. Add the allergen at the end of a process.
5. Allergens are not bacteria



# Don't take it from me...

Jackson, L.S., Et. al. 2008. Cleaning and Other Control and Validation Strategies To Prevent Allergen Cross-Contact in Food-Processing Operations. J. Food Prot. 71:2 445-458

