

# Are Dietetics and Hospitality Management Students Prepared for Serving Customers with Food Allergies?

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# Thank you, FSMEC!

For financial support and helping  
with student recruitment!

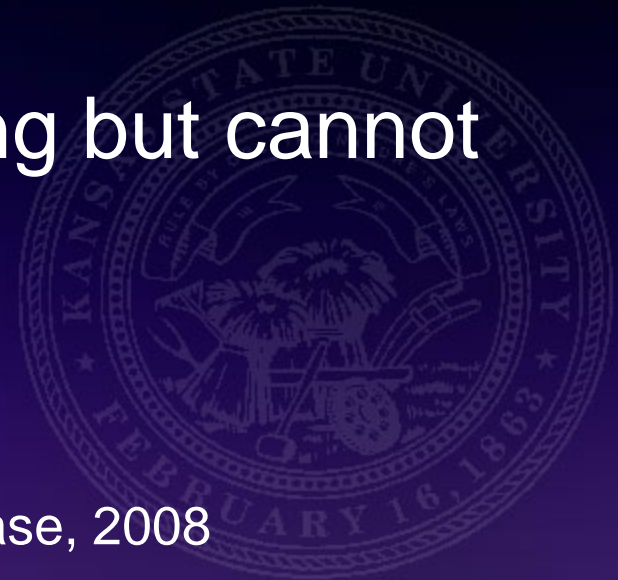


# Food Allergy in the U.S.

- 12 million Americans (1 in 25)<sup>1</sup>
- 3 million children <18 years old (1 in 17)<sup>1</sup>
- Approx. 30,000 food-induced anaphylaxis<sup>2</sup>
- 100 – 200 deaths<sup>2</sup>
- The number seems increasing but cannot confirm

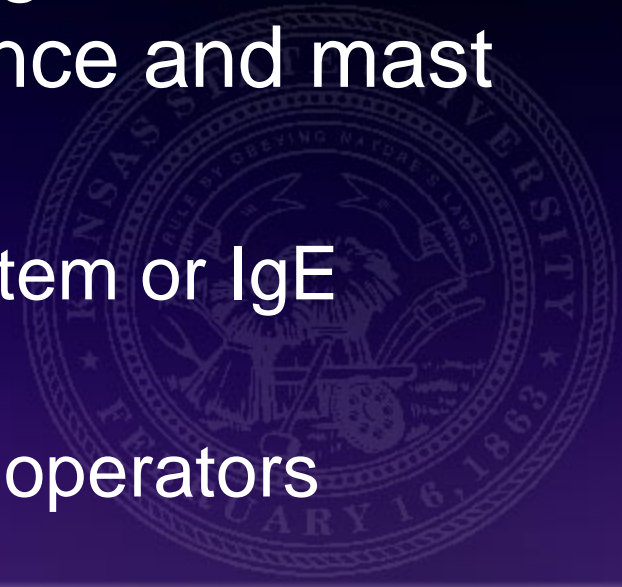
<sup>1</sup> Food Allergy and Anaphylaxis Network, 2010

<sup>2</sup> National Institute of Allergy and Infectious Disease, 2008



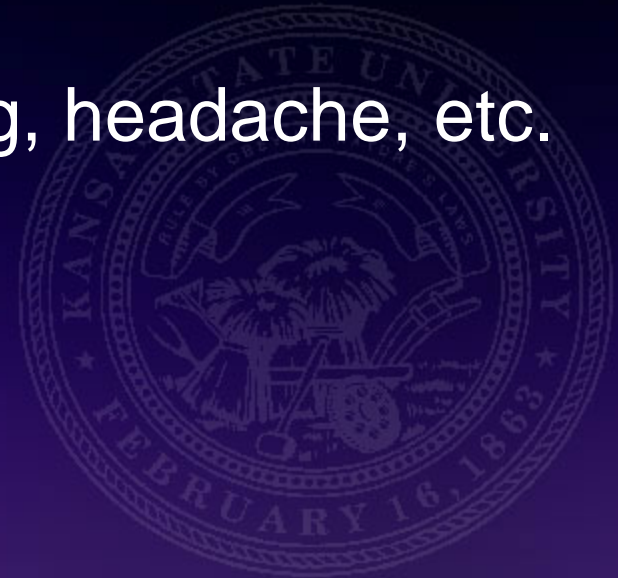
# Food Allergy in the U.S. (Cont.)

- Big 8 Allergens (~90% of food allergens)
  - Peanuts, tree nuts, wheat, soy, fish, shellfish, egg, & milk
- Not include: Celiac disease (gluten intolerance), lactose intolerance and mast cell diseases
  - Either not involve immune system or IgE response
  - Require same precautions for operators



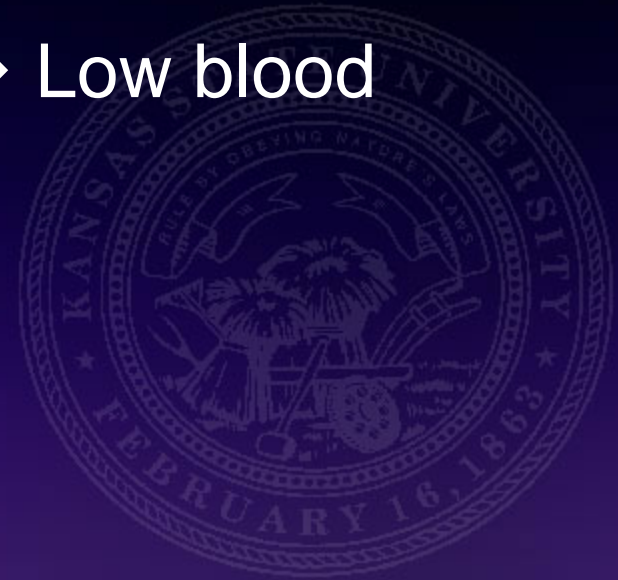
# Food Allergy Symptoms

- Symptoms vary from hives to anaphylaxis
  - Skin
  - Eye, ear, nose, and throat
  - Gastrointestinal
  - Cardiovascular
  - Other: Anxiety, uterine cramping, headache, etc.



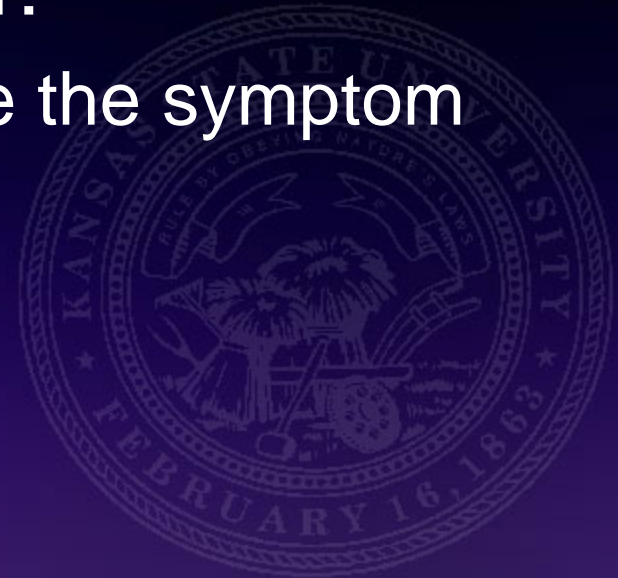
# Anaphylaxis

- The most serious form of allergic reaction
  - Serious, rapid-onset allergic reaction
  - Involves many organs
  - Involves multiple symptoms
  - Mainly due to vasodilatation → Low blood pressure



# Treatment for Allergy

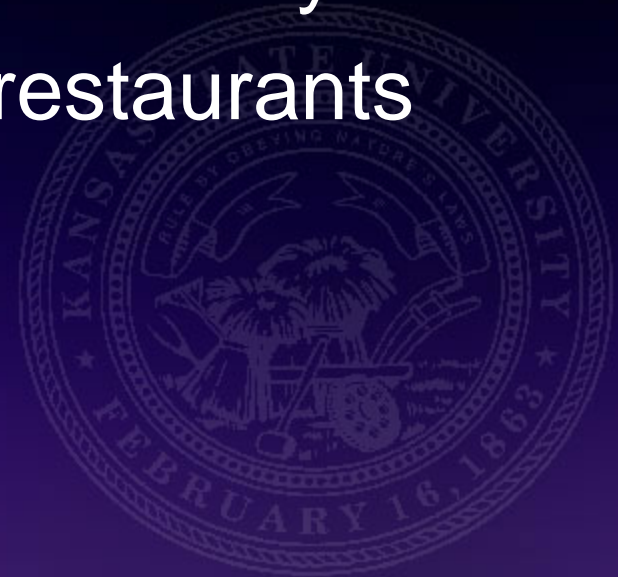
- No treatment except avoidance
- Cross-reactivity – may be allergic to more than one type
- When severe reactions occur:
  - Epinephrine shot may alleviate the symptom





# Restaurant Industry in U.S.

- 70 billion meals and snacks served in the U.S.
  - About 250 times per person per year
- 130 million Americans dining out daily
- 49% of food dollars spent in restaurants
- Generates \$580 billion
  - 4.1% of U.S. GDP
- 12.7 million employees hired





# Dining Out

- An essential part of Americans' Lives
- For those with food allergies, dining out may be serious health risks
- Food allergies occur the most in the restaurants
- 13.7% with nut allergies<sup>3</sup> & 41.5% with seafood allergies<sup>4</sup> experienced allergic reactions after eating at a restaurant

<sup>3</sup> Furlong et al., 2001

<sup>4</sup> Furlong et al., 2006



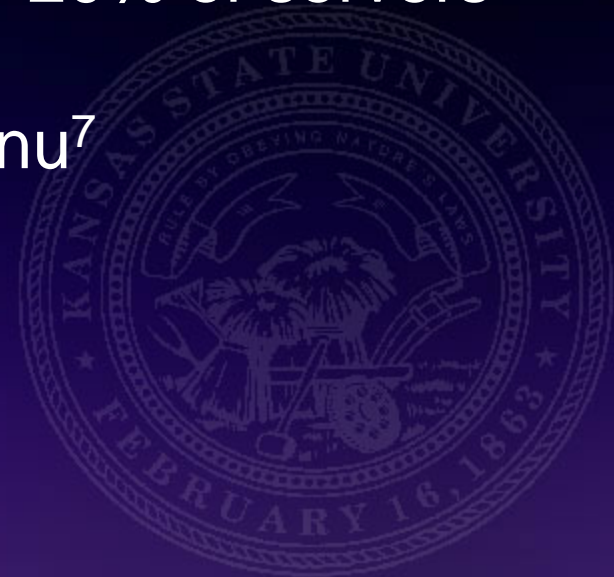
# Causes of Food Allergic Reactions in Restaurants

- Poor communication
  - Customers not informing servers – assume based on menu or past experience<sup>5</sup>
  - Staff not communicating with other staff<sup>5</sup>
  - Even after making requests, only 20% of servers made a note<sup>6</sup>
  - Allergens not declared in the menu<sup>7</sup>

<sup>5</sup> Knoblaugh et al., 2007

<sup>6</sup> Wanich et al., 2008

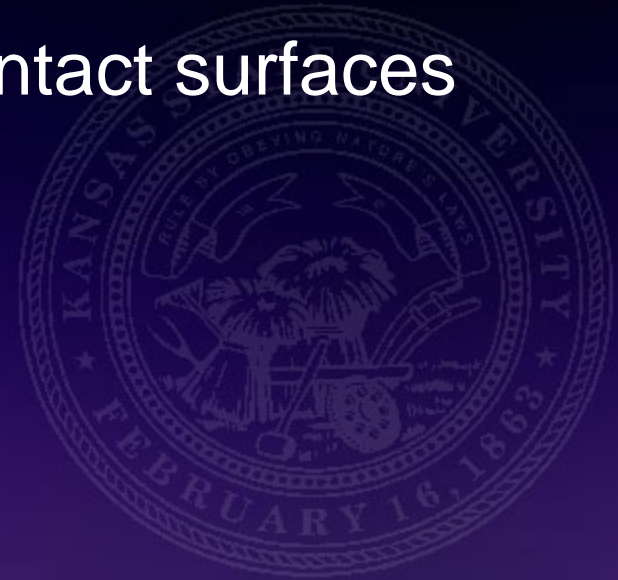
<sup>7</sup> Furlong et al., 2008



# Causes (Cont.)

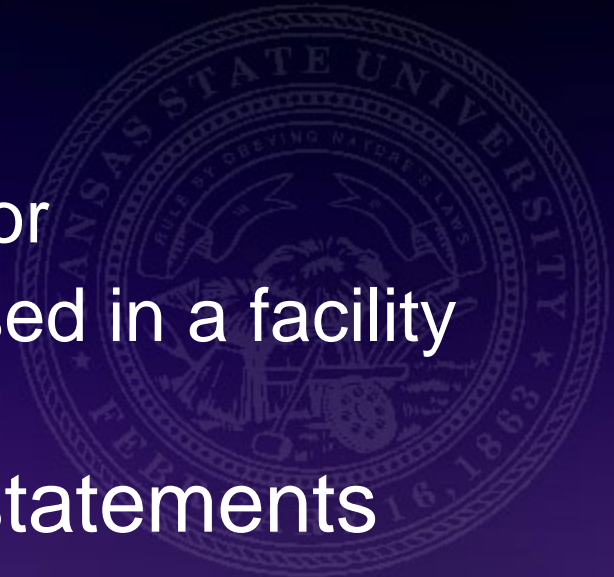
- Hidden Ingredients <sup>8</sup>
  - Sauces and mixed dishes – need to review manufacturer's information
- Cross-contact with allergens
  - Via food handlers and food contact surfaces

<sup>8</sup> Anibarro et al., 2007



# Food Labeling in the U.S.

- Food Allergen Labeling and Consumer Protection Act of 2006
  - Mandated food allergens to be listed (Big 8 only)
  - List in the ingredient with parenthesis what common allergens exist
    - E.g., Albumin (egg)
  - Must say “contains” message or
  - States “may contain”, “processed in a facility where....”
- More confusion by catch all statements



artificial flavor, lactic acid, calcium  
acid, disodium phosphate, annatto  
or, turmeric oleoresin for color, soy

**CONTAINS WHEAT, MILK AND SOY**

**Distributed by Sunshine Bisc**

**Elmhurst, IL 60126**

**® , © 2005 Kellogg NA**

Visit **Cheez-it.com** for information on p

Total Carbohydrate	300g	375g
Dietary Fiber	25g	30g

**MADE FROM:** UNBLEACHED ENRICHED **WHEAT** FLOUR [FLOUR, NIACIN, REDUCED IRON, THIAMIN MONONITRATE (VITAMIN B1), RIBOFLAVIN (VITAMIN B2), FOLIC ACID], SUGAR, BUTTER, STRAWBERRIES, CORN SYRUP, HIGH FRUCTOSE CORN SYRUP, **PECANS**, CORNSTARCH, WHOLE **EGGS**, CONTAINS 2 PERCENT OR LESS OF: NONFAT **MILK** LEAVENING (BAKING SODA, CREAM OF TARTAR), CITRIC ACID AND PECTIN.

PEPPERIDGE FARM, INC. NORWALK, CT 06856  
7464-11-11



# NON-DAIRY CREAMER®

**INGREDIENTS:** Corn Syrup Solids, Partially Hydrogenated Soybean Oil, Contains 2% or less of each of the following: Sodium Caseinate (a milk derivative), Dipotassium Phosphate, Mono- and Diglycerides, Sodium Aluminosilicate, Sodium Tripolyphosphate, Diacetyl Tartaric Acid Esters of Mono- and Diglycerides, Artificial flavors, Colored with (Beta-Carotene, Riboflavin, Titanium Dioxide).

**CONTAINS: MILK.**

Diplomat Coffee

This Unit Not Labeled For Retail Sale.

Carnauba wax.

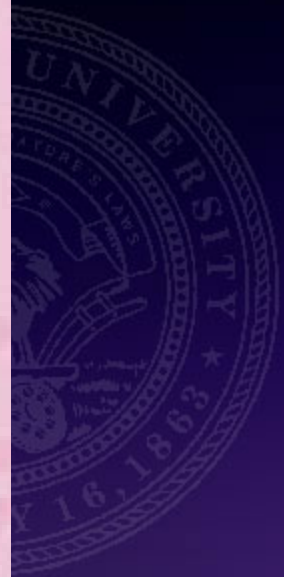
**ALLERGY INFORMATION:**

**Consumers with food allergies or other sensitivities, please review the ingredients carefully.**

All ingredients are wheat free, gluten free, nut free, peanut free, and trans-fat free. All mixes are packaged on equipment that process wheat, milk, egg, soy, and sulfiting agents. May contain traces of peanuts and tree nuts.

Major allergens: milk and egg.

May contain soy.



Sell By Sep 02, 06

Total Price

Tare Net Wt/Ct Unit Price

\$2.99

## CARROT CAKE SLICE

SUGAR, ENRICHED WHEAT FLOUR BLEACHED (FLOUR, MALTED BARLEY FLOUR, NIACIN, REDUCED IRON, THIAMINE MONONITRATE, RIBOFLAVIN, FOLIC ACID), CARROTS, PARTIALLY HYDROGENATED VEGETABLE OIL (SOYBEAN OIL), WHOLE EGGS, BUTTERMILK, WALNUTS, RAISINS, PINEAPPLE (PINEAPPLE AND PINEAPPLE JUICE), LEAVENING (BAKING SODA, SODIUM ALUMINUM PHOSPHATE, ALUMINUM SULFATE), MOLASSES, NATURAL AND ARTIFICIAL FLAVOR, SALT, FOOD STARCH-MODIFIED, CELLULOSE GUM, PUMPKIN PIE SPICE (CINNAMON, GINGER, CLOVES), PROPYLENE GLYCOL MONOSTEARATE, SPICE, DEXTROSE, MONO & DIGLYCERIDES, CARAMEL COLOR, SODIUM STEAROYL LACTYLATE, ALLSPICE, CORN STARCH, PROPYLENE GLYCOL, CITRIC ACID, SUGAR, CREAM CHEESE (PASTEURIZED MILK AND CREAM), CHEESE CULTURES, SALT, STABILIZERS (CAROB BEAN GUM AND/OR GUAR GUM AND/OR XANTHUM GUM), MARGARINE (PARTIALLY HYDROGENATED SOY AND COTTONSEED OILS, WATER,



UNIVERSITY

DIGLYCERIDES, CARAMEL COLOR, SODIUM STEAROYL LACTYLATE, ALLSPICE, CORN STARCH, PROPYLENE GLYCOL, CITRIC ACID, SUGAR, CREAM CHEESE (PASTEURIZED MILK AND CREAM), CHEESE CULTURES, SALT, STABILIZERS (CAROB BEAN GUM AND/OR GUAR GUM AND/OR XANTHUM GUM), MARGARINE (PARTIALLY HYDROGENATED SOY AND COTTONSEED OILS, WATER, SALT, MONO AND DIGLYCERIDES, SOY LECITHIN, SODIUM BENZOATE, CITRIC ACID (PRESERVATIVES), ARTIFICIAL FLAVOR, ARTIFICIAL COLOR (VITAMIN A PALMITATE), VEGETABLE OIL (PARTIALLY HYDROGENATED SOYBEAN AND COTTONSEED), MALTODEXTRINE, CORN STARCH, WATER, NATURAL AND ARTIFICIAL FLAVOR, CORN STARCH, FOOD STARCH-MODIFIED, MONO AND DIGLYCERIDES, SALT, GLUCONO DELTO LACTONE, SOY OIL, BENZOIC ACID (PRESERVATIVE), POLYISORBATE 60, PROPYL GALLATE (ANTIOXIDANT), ARTIFICIAL COLOR, SUGAR, VEGETABLE SHORTENING (PARTIALLY HYDROGENATED SOYBEAN AND/OR COTTONSEED OILS, PROPYLENE GLYCOL MONOESTERS, MONO DIGLYCERIDES, LECITHIN, SODIUM STEAROYL LACTYLATE), WATER, BUTTER, WHEAT STARCH, MONO DIGLYCERIDES, SALT, ARTIFICIAL FLAVOR, POLYISORBATE 60, ARTIFICIAL COLOR (MAY CONTAIN THE FOLLOWING: BLUE 1, BLUE 2, RED 3, RED 40, YELLOW 5 OR 6, YELLOW 5 OR 6 LAKE). \*\*CONTAINS: WHEAT, EGGS, SOY, MILK AND WALNUTS.\*\*



WWW.OLDDOMINIONPEANUT.COM

MANUFACTURED ON EQUIPMENT THAT PROCESSES PEANUTS &  
OTHER TREE NUTS. MAY CONTAIN PEANUTS,  
TREE NUTS, MILK, WHEAT, EGG & SOYBEANS.



6 Large eggs.

### Allergy advice

- Contains egg.

### Storage

- Keep refrigerated after purchase.  
Packed in Ireland for Tesco Ireland Ltd.,  
Gresham House, Marine Road, Dun Laoghaire,  
Co. Dublin. © Tesco 2006. SC4106

### Additional info

- Carton: 100% recycled board.
- Eggs from caged hens. Packing cert no. IE-18-09
- See inside pack for nutrition.
- For guideline daily amounts, please visit: [www.tesco.com](http://www.tesco.com)





**WHITE SUGAR**

**INGREDIENTS**

Sugar.

**CAUTION**

May contain milk.

**NUTRITION**

**INFORMATION**

Per 100g as sold:

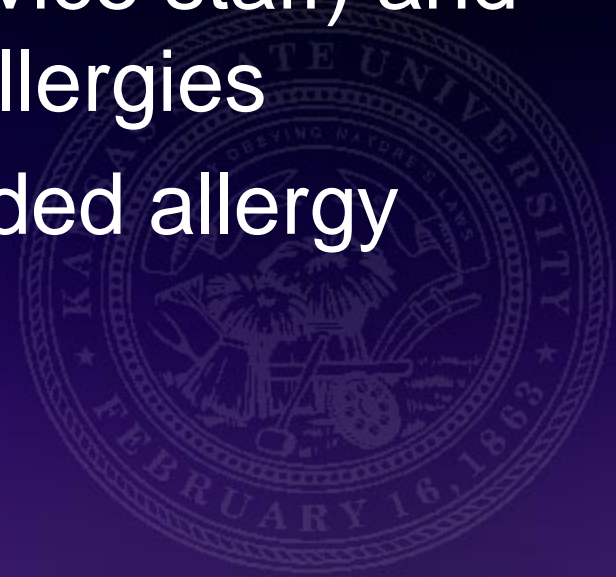
Energy 1700kJ, Energy  
400kcal, Protein Nil,

Carbohydrate 100.0g,  
Fat Nil

# Research limited about preparedness for food allergy

- Diners assume presence of food allergen from menu
- Not many people ask about allergens
- Employees (cooking and service staff) and managers unaware of food allergies
- Only 1/3 of restaurants provided allergy training<sup>9</sup>

<sup>9</sup> Mandabach et al., 2005



# Study Purpose

- To assess knowledge and attitudes related to food allergies and allergic reactions in restaurants by surveying students majoring in hospitality management and dietetics
  - To make recommendations for hospitality management and dietetics educators



# Methodology

- Participants: Students in hospitality management and dietetics programs
  - Stratified random sample of 70 program directors (~10% of programs) received invitation emails
  - Followed up with ICHRIE and FSMEC listserv
  - Invitations to the survey forwarded to their students
  - Unknown how many actually invited their students

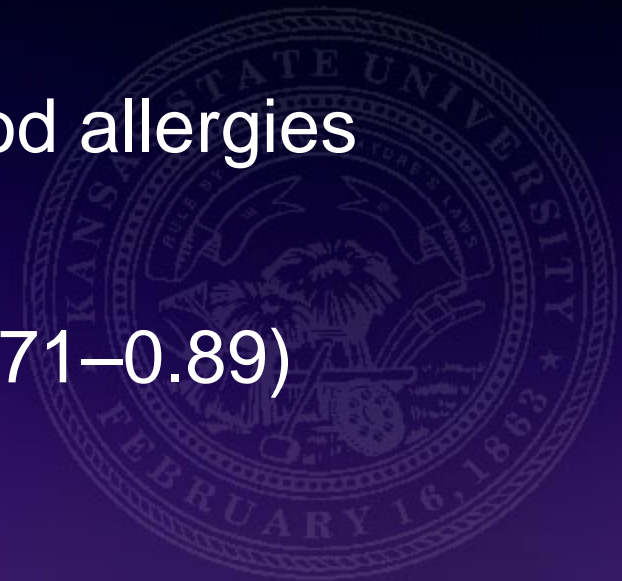


# Instrument Development

- Focus groups
  - 4 focus groups with total 19 participants
- Questions included:
  - Demographic questions
  - 32 knowledge questions RE food allergy
    - Food allergy in general, common allergens, food allergen handling behaviors, & prevention
  - Attitude questions
    - Likely causes of food allergic reactions, high/low risk restaurants, expectations from restaurants staff

# Instrument Development (Conti.)

- For those who has experience working in restaurants:
  - If and how much food allergy training has been given
- For those with food allergies:
  - Dining behaviors related to food allergies
- Pilot-tested
  - Cronbach's alpha all  $>0.70$  (0.71–0.89)





# Data Collection & Analyses

- Data Collection
  - Aug 31-Sep 9, 2010
  - Attempted to reach about 47,000 students
  - Goal: 300 completed responses
  - \$5.00 gift card for each participant
- Analyses
  - Descriptive statistics
  - T-tests, ANOVA with post hoc



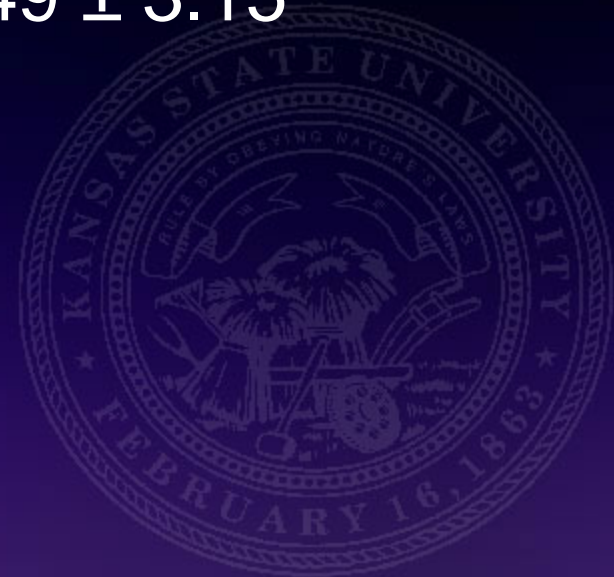
# Results - Participants

- A total of 385 accessed survey
- 365 provided usable data
  - 292 female
  - 118 Hospitality management or related
  - 159 Dietetics
  - 88 Other: Multiple majors, public health, etc.
  - 17 had allergies; 4 had a child w/ food allergies
  - 215 Junior or senior
  - 186 worked at a restaurant



# Knowledge

- 32 knowledge questions
- Range: 6.0 – 29.0
- Mean  $\pm$  SD = 21.47  $\pm$  3.09 (67%)
  - Hospitality mgmt (n=118): 20.49  $\pm$  3.15
  - DPD (n=69): 22.75  $\pm$  2.50
  - CP (n=42): 22.25  $\pm$  2.78
  - DI (n=48): 22.22  $\pm$  2.64(F = 8.63, P<0.001)



# Attitudes: Reasons for food allergic reaction

Ingredients not fully reported on menus	5.62 ± 1.54
Cross-contact with allergens	5.59 ± 1.40
Restaurant servers not communicating with other staff about food allergy precautions informed by consumers	5.36 ± 1.72
Restaurant employees' lack of knowledge about consequences of a food allergic reaction	5.20 ± 1.65
Restaurant servers not taking special food requests seriously	5.18 ± 1.81
Customers not informing restaurant servers about their food allergies	5.16 ± 1.81

7 – strongly agree, 1 – strongly disagree

# Attitudes: Effectiveness to prevent food allergic reactions

Visit the restaurants which you have established a good relationship	4.47 ± 0.89
Communicate with the chef about your food allergy	4.33 ± 0.96
Communicate with the server and/or host about your food allergy	4.22 ± 0.90
Always carry an Epi-pen in case of an allergic reaction	4.12 ± 1.09
Ask for a new meal if there are any doubts of allergenic food being present	4.12 ± 1.03
Confirm with server after receiving food if the meal was prepared as requested	4.10 ± 1.00
Order menu items that you have eaten previously and had no previous allergenic reaction	4.04 ± 0.98



# Attitudes: Likelihood of suggesting restaurants for customers with food allergies

Casual (table service), non ethnic-chain	4.96 ± 1.44
Casual (table service), ethnic-chain	4.85 ± 1.47
Casual (table service), non ethnic, independent	4.73 ± 1.42
Casual (table service), ethnic independent	4.44 ± 1.45
Quick service restaurant, non-ethnic	3.34 ± 1.67
Buffet, non-ethnic-chain	3.17 ± 1.75
Quick service restaurants, ethnic	3.11 ± 1.74
Buffet, non-ethnic independent	3.01 ± 1.68



# Results – Food Allergy Training

- Of 186 who worked at a restaurants,
  - 114 never received food allergy training
  - 57 received once at the beginning of the work
  - 13 received about once a year
  - 14 received  $\geq 2$  times a year
  - Multiple answers possible



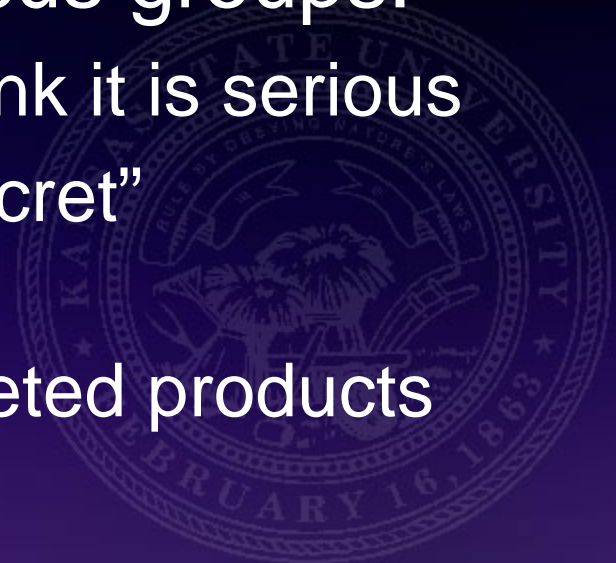
# Discussion

- Who is responsible for initiating communication?
- Lack of knowledge & awareness
- Not as positive about prevention methods
- Lack of training at restaurants



# Discussion

- Another study with customers with food allergies showed that
  - Customers have low expectations
  - Proactive but ready to react
- Feedback from consumer focus groups:
  - Cooks don't care – or don't think it is serious
  - Cooks refuse to reveal the “secret” ingredients
  - Took off allergens from completed products
  - Ignore customer requests



# Discussion (Cont.)

- Seniors/Juniors of hospitality management and dietetics students reported an average of 2 hours of food allergy education
- Only 18.3% of students identified all eight major allergens (Kwon et al, 2011)



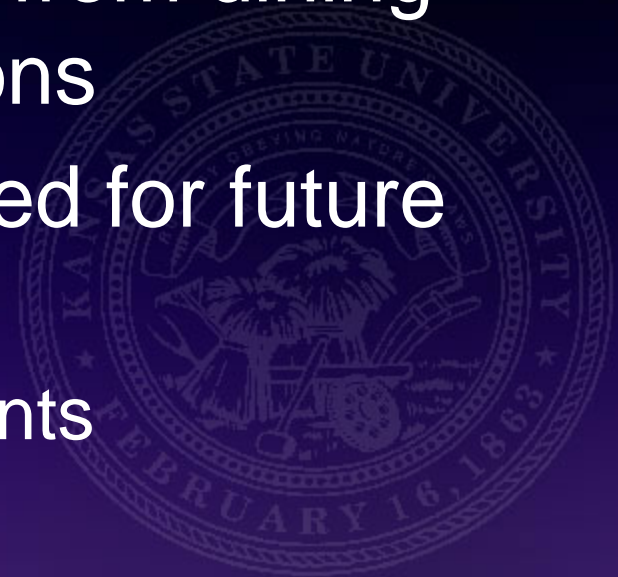
# Discussion

- Understanding mutual expectations may assist restaurateurs to be aware of training needs
- Further studies needed
  - To identify barriers to training on food allergy
  - To motivate students to learn more about food allergies



# Summary & Conclusion

- Food allergies increasing
  - Adults – seafood allergies (fish, shellfish)
  - Children – milk and peanut allergies
- Customers will not shy away from dining out even after allergic reactions
- Food allergy education needed for future foodservice managers
  - How to motivate today's students





# Limitations

- Sampling difficulty
  - No database for current restaurant managers or hospitality management/dietetics students
  - Students from West & East coasts not well represented
- Proxy measures of future restaurant managers



