

## Food Allergy

### Oral Food Challenges in Children with a Diagnosis of Food Allergy

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Link to full text: [http://www.jpeds.com/article/S0022-3476\(10\)00787-0/fulltext](http://www.jpeds.com/article/S0022-3476(10)00787-0/fulltext)

**Significance:** Oral food challenges may be indicated to confirm food allergy status.

This retrospective chart review of 125 children aged 1-19 years assessed the outcome of oral food challenges (OFC) in patients placed on elimination diets based primarily on positive serum immunoglobulin E (IgE) immunoassay results. Subjects were evaluated for IgE-mediated food allergy and underwent an OFC. Clinical history, prick skin test results, and serum allergen-specific IgE test results were obtained. The data were summarized for food avoidance and OFC results. Depending on the reason for avoidance, 84%-93% of the foods being avoided were returned to the diet after an OFC, indicating that the vast majority of foods that had been restricted could be tolerated at discharge. In the absence of anaphylaxis, the primary reliance on serum food-specific IgE testing to determine the need for a food elimination diet is not sufficient, especially in children with atopic dermatitis.

## Caffeine

### Caffeinated Coffee Does Not Acutely Affect Energy Intake, Appetite, or Inflammation but Prevents Serum Cortisol Concentrations from Falling in Healthy Men

A. Gavrieli, M. Yannakoulia, E. Fragopoulou, D. Margaritopoulos, J.P. Chamberland, P. Kaisari, et al.

*Journal of Nutrition*, Vol. 141, No. 4; pp. 703-707, 2011

Link to full text: <http://jn.nutrition.org/content/141/4/703.full>

**Significance:** The usually consumed amount of caffeinated coffee does not have short-term effects on appetite, energy intake, glucose metabolism, and inflammatory markers, but it increases circulating cortisol concentrations in healthy men.

This study investigated the acute effects of caffeinated and decaffeinated coffee consumption on appetite feelings, energy intake, and appetite-, inflammation-, stress-, and glucose metabolism-related markers. Sixteen healthy men received in a random order on 3 separate occasions a standard breakfast snack with 200 mL of either caffeinated coffee (3 mg caffeine/kg body weight), decaffeinated coffee, or water (control). Before intervention (-15 min) and at standard time points following breakfast consumption, participants recorded their appetite feelings and blood samples were collected for measurements of circulating glucose, insulin, cortisol, and appetite- and inflammation-

related markers. The appetite-related ratings, the appetite plasma hormonal responses as well as the plasma glucose, serum insulin, and plasma and serum inflammatory marker responses did not show an overall intervention effect or a time x intervention interaction. However, a significant intervention effect ( $P = 0.04$ ) and a time x intervention interaction ( $P$ -interaction = 0.02) were found for serum cortisol; cortisol concentrations were significantly higher following the caffeinated coffee intervention, compared to control.

### **An Oral Lipid Challenge and Acute Intake of Caffeinated Coffee Additively Decrease Glucose Tolerance in Healthy Men**

M-S. Beaudoin, L.E. Robinson, T.E. Graham

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Link to full text: <http://jn.nutrition.org/content/141/4/574.full>

**Significance:** Oral consumption of lipids and caffeinated coffee can independently and additively decrease glucose tolerance.

This study determined whether an oral lipid challenge and caffeinated coffee would disrupt glucose homeostasis and characterized their respective incretin responses. Ten young, healthy males participated in 5 trials in a randomized, cross-over design. At time 0 h, they underwent an oral fat tolerance test (OFTT: 1 g lipid/kg body weight) or consumed water, followed 5 h later by caffeinated (5 mg/kg) coffee, decaffeinated coffee, or water. At 6 h, volunteers underwent an oral glucose tolerance test (OGTT). Consumption of the OFTT increased glucose concentrations ( $P < 0.05$ ) after a subsequent OGTT. At 7 h, caffeinated coffee produced the highest glucose concentrations ( $P < 0.05$ ). Glucagon-like peptide-1 active (GLP-1a) and glucose-dependent insulinotropic polypeptide (GIP) were both increased for up to 6 h in all OFTT trials ( $P < 0.05$ ). Compared to all other treatments, caffeinated and decaffeinated coffee produced higher GLP-1a response at 6.25 h ( $P < 0.05$ ), whereas only caffeinated coffee increased GIP secretion ( $P < 0.05$ ).

## **Salmonella**

### **Toward Better Control of *Salmonella* Contamination by Taking Advantage of the Egg's Self-Defense**

#### **System: A Review**

W. Zhang, J-X. Zheng, G-Y. Xu

*Journal of Food Science*, Vol. 76, No. 3; pp. R76–R81, 2011

Link to full text: <http://onlinelibrary.wiley.com/doi/10.1111/j.1750-3841.2011.02053.x/full>

**Significance:** This review highlights a comprehensive strategy toward *Salmonella* control in a process from egg production and handling to human consumption.

Egg-associated salmonellosis is a major problem for food safety. Environmental hygiene, bacteria vectors such as birds, rodent, flies, and beetles along with feed and water contamination are the most frequently reported causes of

*Salmonella* colonization in hens, and finally to eggs. In addition, inappropriate egg handling will cause eggs to lose their self-protection ability, thus resulting in the survival and multiplication of *Salmonella* in an egg's contents, which contributes to the horizontal dissemination. The routes of *Salmonella* contamination were discussed, and the effectiveness and shortcomings of different decontamination methods were evaluated in this review. Various studies on egg storage indicated that the low-temperature storage without temperature fluctuation was beneficial for the control of *Salmonella*.

#### **Dynamic Predictive Model for the Growth of *Salmonella* spp. in Liquid Whole Egg**

A. Singh, N.R. Korasapati, V.K. Juneja, J. Subbiah, G. Froning, H. Thippareddi

*Journal of Food Science*, Vol. 76, No. 3; pp. M225–M232, 2011

Link to full text: <http://onlinelibrary.wiley.com/doi/10.1111/j.1750-3841.2011.02074.x/full>

**Significance:** The developed dynamic model can be used to predict the growth of *Salmonella* spp. in liquid whole egg under varying temperature conditions.

A dynamic model for the growth of *Salmonella* spp. in liquid whole egg (LWE) under continuously varying temperature was developed. LWE adjusted to pH 7.8 was inoculated with approximately 2.5–3.0 log CFU/mL of *Salmonella* spp., and the growth data at several isothermal conditions was collected. A primary model (Baranyi model) was fitted for each temperature growth data and corresponding maximum growth rates were estimated. Pseudo- $R^2$  values were greater than 0.97 for primary models. Modified Ratkowsky model was used to fit the secondary model. The pseudo- $R^2$  and root mean square error were 0.99 and 0.06 log CFU/mL, respectively, for the secondary model. A dynamic model for the prediction of *Salmonella* spp. growth under varying temperature conditions was developed using 4th-order Runge–Kutta method. The developed dynamic model was validated for 2 sinusoidal temperature profiles, 5–15 °C (for 600 h) and 10–40 °C (for 52 h) with corresponding root mean squared error values of 0.28 and 0.23 log CFU/mL, respectively, between predicted and observed *Salmonella* spp. populations.

#### **Inactivation of *Salmonella* on In-Shell Pecans during Conditioning Treatments Preceding Cracking and Shelling**

L.R. Beuchat, D.A. Mann

*Journal of Food Protection*, Vol. 74, No. 4; pp. 588–602, 2011

Link to full text: <http://www.ingentaconnect.com/content/iafp/jfp/2011/00000074/00000004/art00011>

**Significance:** Response of *Salmonella* to conditioning treatments varied, depending on the method of inoculation and whether nuts were dried and stored between the time of inoculation and treatment.

Studies were done to determine the effectiveness of conditioning treatments for killing *Salmonella* in and on immersion-inoculated and surface-inoculated in-shell pecans. Treatment of immersion-inoculated, dried, stored pecans in chlorinated water (400 mg/ml) reduced *Salmonella* by not more than 1.6 log CFU/g. Treatment of

immersion-inoculated, dried, stored pecans in chlorinated water (200 mg/ml, 1 min) followed by soaking in water for 2 h at 21°C and treating for 10 min in water at 85-95°C reduced *Salmonella* by >5.12 log CFU/g. Reductions of ≥6.42 log CFU/g were achieved by treating surface-inoculated nuts in water at 90 or 95°C for 80 s. *Salmonella* on surface-inoculated in-shell pecans (kernel moisture, 4.75%; water activity, 0.62) that had been dried and stored at 4°C for 3-5 weeks was more resistant to conditioning treatments than was *Salmonella* on surface-inoculated pecans (kernel moisture, 5.60%; water activity, 0.73) that were not thoroughly dried. Conditioning treatments were less effective for killing *Salmonella* on immersion-inoculated pecans than on surface-inoculated pecans.

## E. Coli

### Survival of *Escherichia coli* O157:H7 in Cucumber Fermentation Brines

F. Breidt, Jr., J.M. Caldwell

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Link to full text: <http://onlinelibrary.wiley.com/doi/10.1111/j.1750-3841.2011.02045.x/full>

**Significance:** Manufacturers of fermented vegetable products may use this data to determine safe production practices based on fermentation pH and temperature.

Ten different cucumber fermentation brines at different stages of fermentation were obtained from 5 domestic commercial plants. The 5-log reduction times for *E. coli* O157:H7 strains in the commercial brines were found to be positively correlated with brine pH, and ranged from 3 to 24 d for pH values of 3.2 to 4.6, respectively. In a laboratory cucumber juice medium that had been previously fermented with *Lactobacillus plantarum* or *Leuconostoc mesenteroides* (pH 3.9), a 5-log reduction was achieved within 1 to 16 d depending on pH, acid concentration, and temperature. During competitive growth at 30°C in the presence of *L. plantarum* or *L. mesenteroides* in cucumber juice, *E. coli* O157:H7 cell numbers were reduced to below the level of detection within 2 to 3 d.

### Effects of Salt, Sodium Pyrophosphate, and Sodium Lactate on the Probability of Growth of *Escherichia coli* O157:H7 in Ground Beef

C-A. Hwang, V. Juneja

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Link to full text: <http://www.ingentaconnect.com/content/iafp/jfp/2011/00000074/00000004/art00015>

**Significance:** The model can be used to improve the microbial food safety of ground beef products.

This study examined the effect of salt, sodium pyrophosphate (SPP), and sodium lactate on the probability of growth of *Escherichia coli* O157:H7 in ground beef under a temperature abuse condition. Ground beef containing 0 to 2.25% salt, 0 to 0.5% SPP, and 0 to 3% lactate was inoculated with a four-strain mixture of *E. coli* O157:H7, vacuum packaged, and stored at 10°C for 15 days. A total of 25 combinations of the three additives, each with 20

samples, were tested. The resultant probability model indicated that lactate at higher concentrations decreased the probability of growth of *E. coli* O157:H7 in ground beef, and the effect was more pronounced at higher salt concentrations. At salt concentrations <1.3%, the increase of SPP concentration marginally increased the growth probabilities of *E. coli* O157:H7. The model illustrated the effect of salt, SPP, and lactate on the growth probabilities and growth or no-growth behavior of *E. coli* O157:H7 in ground beef.

## Foodborne Pathogens

### **Chlorine Stabilizer T-128 Enhances Efficacy of Chlorine against Cross-Contamination by *E. coli* O157:H7 and *Salmonella* in Fresh-Cut Lettuce Processing**

X. Nou, Y. Luo, L. Hollar, Y. Yang, H. Feng, P. Millner, et al.

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Link to full text: <http://onlinelibrary.wiley.com/doi/10.1111/j.1750-3841.2011.02046.x/full>

**Significance:** The quality and shelf life of iceberg lettuce were not negatively impacted by washing fresh-cut lettuce in a chlorine stabilizer.

The ability of T-128, a chlorine stabilizer, to stabilize free chlorine in wash solutions in the presence of high organic loads generated by the addition of lettuce extract or soil was evaluated. Under conditions used in this study, T-128 significantly ( $P<0.001$ ) decreased the rate of free chlorine depletion at the presence of soil. T-128 also slightly decreased the rate of free chlorine depletion caused by the addition of lettuce extract in wash solution. Application of T-128 significantly reduced the survival of bacterial pathogens in wash solutions with high organic loads and significantly reduced the potential of cross-contamination, when contaminated and uncontaminated produce were washed together. Evaluation of several produce quality parameters, including overall visual appearance, package headspace O<sub>2</sub> and CO<sub>2</sub> composition, and lettuce electrolyte leakage, during 15 d of storage indicated that iceberg lettuce quality and shelf life were not negatively impacted by washing fresh-cut lettuce in chlorine solutions containing 0.1% T-128.

### **Radiation Inactivation of Foodborne Pathogens on Frozen Seafood Products**

C.H. Sommers, K.T. Rajkowski

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The radiation dose needed to inactivate these foodborne pathogens on frozen seafood is significantly lower than that for frozen meat or frozen vegetables.

The ability of gamma irradiation to inactivate foodborne pathogens surface inoculated onto frozen seafood (scallops, lobster meat, blue crab, swordfish, octopus, and squid) was investigated. The radiation  $D_{10}$ -values (the radiation

dose needed to inactivate 1 log unit of a microorganism) for *Listeria monocytogenes*, *Staphylococcus aureus*, and *Salmonella* inoculated onto seafood samples that were then frozen and irradiated in the frozen state (-20°C) were 0.43 to 0.66, 0.48 to 0.71, and 0.47 to 0.70 kGy, respectively. In contrast, the radiation  $D_{10}$ -value for the same pathogens suspended on frozen pork were 1.26, 0.98, and 1.18 kGy for *L. monocytogenes*, *S. aureus*, and *Salmonella*, respectively.