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# Is the Low Prevalence of Peanut Allergy in Israel Due to Hypoallergenic Peanut Products?

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### 139 Is the Low Prevalence of Peanut Allergy in Israel Due to Hypoallergenic Peanut Products?

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**RATIONALE:** In Israel the majority of infants less than 12 months old regularly consume peanut products in contrast to the UK where infants avoid peanut products. Previous studies suggest a low prevalence of peanut allergy in Israel and raise the possibility that the processing of Israeli peanut snacks renders them hypoallergenic. Therefore, the allergen content and allergenicity of the most popular peanut products consumed by children and infants in the UK and Israel were compared to determine if such differences could explain the variation in the prevalence of peanut allergy.

**METHODS:** The total protein content of whole snack products was determined using LECO analysis and various immunoassays were utilized to determine the percentage of peanut protein in each product. The products were all normalized according to peanut protein content and subjected to SDS-PAGE, Western blot and Slot blot analysis with anti-peanut, anti-Ara h 1, 2 and 3 antibodies and pooled serum from peanut allergic individuals.

**RESULTS:** Peanut protein levels from Israeli and U.K. products were found to be between 68-100%. The Ara h 1, Ara h 2 and Ara h 3 proteins in each peanut product were intact and the levels were comparable. Similarly, IgE binding analysis with pooled serum from 9 allergic individuals was nearly identical when the same amount of peanut protein was used for each product.

**CONCLUSIONS:** The contents of peanut protein, individual major allergens and IgE binding capacity of the popular snacks from Israel cannot explain the large discrepancies in the prevalence of peanut allergy among the two countries.

**Funding:** National Peanut Board and the USDA

### 140 Effects of ImmuSoy as a Food Supplement for Altering Peanut Allergic Reactions

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**RATIONALE:** ImmuSoy is a koji fungus (*Aspergillus oryzae*) and lactobacteria soybean fermentation product, based on traditional Japanese fermentation technology. It is believed that this unique food supplement is beneficial for the immune system. We hypothesized that ImmuSoy may be effective for treating peanut allergy.

**METHODS:** Peanut allergic mice (C3H/HeJ, n=8-10/group) were fed ImmuSoy containing chow (0.5 % and 1 %), or regular chow (control) for 4 weeks beginning week 10 following peanut sensitization, and then were challenged with peanut. Anaphylactic scores, plasma histamine, serum peanut specific-IgE levels and splenocyte cytokine production to peanut-stimulation were determined.

**RESULTS:** All control mice developed anaphylaxis (median score 3.3) following peanut challenge, in contrast, 50% and 25% of low and high doses of ImmuSoy treated-mice developed anaphylaxis (median scores 1.0 and 0.33 respectively). The low and high dose ImmuSoy treated-mice showed 50.4 % and 80.7% reduction respectively in plasma histamine, and 47.1% and 73.9% reduction respectively in serum IgE levels as compared to untreated mice (p<0.05). Furthermore, IL-4 and IL-5 production by splenocytes of high dose ImmuSoy-treated mice were reduced by 74.1% and 77.0% whereas IFN- $\gamma$  production was increased by 34.8% compared to control splenocytes.

**CONCLUSIONS:** ImmuSoy used as a food supplement protects against peanut-induced anaphylaxis in this model, which is associated with down-

regulation of Th2 responses. This approach might be a potential novel therapy for peanut allergy.

**Funding:** Nichimo Co., Ltd., Tokyo, Japan

### 141 Eliciting Doses (ED) for Peanut in Children With and Without Previous Reactions to Peanut

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**RATIONALE:** In ED studies patients with serious reactions to peanut are usually not included. In this study we included all children with peanut sensitization independent of their history.

**METHODS:** Thirty two children (10 girls, 22 boys; aged 3.0-15.0 years) were included based on sensitization to peanut. During elimination, twenty of them experienced an allergic reaction to peanut, of which 8 had serious respiratory symptoms. Double blind placebo controlled food challenge (DBPCFC) with peanut was performed using the new international consensus protocol (Taylor et al, Clin Exp Allergy 2004; 34(5):689-695). Defatted peanut flour was given in 9 gradually increasing steps ranging from 10 $\mu$ g to 3g. Upon negative challenge an open challenge with 10g peanuts was performed.

**RESULTS:** Sensitization to peanut was confirmed in all patients by specific IgE (<0.35-100 kU/L, mean 24.9) and/or SPT (0-18.4mm, mean 8.6). From the group without a previous reaction (n=12) 6 (50%) had a positive DBPCFC. Eliciting doses were 1g (n=3) and 3g (n=3). From the previously reacting group (n=20), 16 children (75%) developed a reaction during challenge, including 7 of 8 (88%) children with serious respiratory reaction to peanut in their history. Eliciting doses in 13 of these 16 children consisted of 10mg (n=2), 100mg (n=2), 300mg (n=3), 1g (n=5) and 3g (n=1), whereas 3/16 children reacted after the open challenge. Sensitization between both groups did not significantly differ.

**CONCLUSIONS:** Children with previous reaction to peanut are more likely to react during DBPCFC. The ED in this group is up to 100-fold lower than in patients without previous reactions.

### 142 Patients Find Low Dose Threshold Challenges Useful in the Management of Their Peanut Allergy

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**RATIONALE:** In a changing clinical environment, Institutional Review Boards are uncertain about the clinical benefit that accrues to volunteers, especially children, from research involving double blind food challenge (DBPCFC). We examined how much detail volunteers in a low dose DBPCFC study could recall and its impact on their daily life.

**METHODS:** A retrospective telephone survey of 40 subjects in a low dose DBPCFC study of peanut allergy. Subjects had been told at challenge about the peanut dose that elicited their reaction, both in mg of peanut protein and the equivalent amount of peanut kernel.

**RESULTS:** 31 subjects (76%) were traced. Median interval since challenge was 26 months (range 12-32). 6 subjects could recall their threshold dose in mg and 5/6 were correct. 11/16 subjects (4 adults, 7 parent proxies) who could recall the equivalent peanut were correct. The remaining five subjects (all parent proxies) only erred by one dose (4 reported a dose lower than the documented dose and 1 a dose higher). 19/27 subjects who commented felt the challenge had a positive effect on their life, 3 felt it had a negative effect (all 3 reported heightened awareness, which could be a protective, positive effect) and 5 reported no effect.

**CONCLUSIONS:** A food challenge is an important life event and any recall of detail is usually accurate, but only half the group could recall the estimated threshold dose of peanut kernel. Most subjects considered the low dose DBPCFC outcome as having a positive effect on their life.