
Impact of ingredient labeling practices on food allergic consumers

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Background: Food allergic consumers depend on ingredient labels for allergen avoidance, and the modality of labeling is changing.

Objective: To investigate current responses to food labels so that the impact of future label changes can be anticipated.

Methods: Adults who attended Food Allergy & Anaphylaxis Network conferences completed a survey regarding their experiences with food labels for their family's most severely affected food allergic individual (FAI).

Results: There were 489 completed surveys (84% participation). Most FAIs were young (41% <4 years of age and 56% 4–18 years of age) and highly atopic (51% had asthma and 69% had atopic dermatitis). Food allergies included the following: peanut, 81%; tree nuts, 53%; milk, 51%; egg, 51%; and soy, 17%. All chocolate products were avoided by 37% of FAIs who were avoiding peanut and 40% who were avoiding tree nuts; 91% of tree nut allergic FAIs avoided all tree nuts. Of FAIs who avoided soy, 41% avoided soybean oil and 38% avoided soy lecithin. Of those who avoided milk, 82% avoided lactose. Allergic reactions were attributed to misunderstanding label terms (16%) and to nonspecific terms (spice, flavor) (22%). Ingredient labels were "always" or "frequently" read before purchase by 99%. Product brand choice was "very much influenced" by the manner of labeling for 86%, and manufacturers were contacted for more information by 86%.

Conclusions: Our results suggest that improved product allergen labeling will reduce allergic reactions and simplify allergy management. However, the new labeling may not indicate the form or source of the allergen, and individuals who do not currently avoid foods with minimal or irrelevant protein content, such as soy oil or soy lecithin, may face additional ambiguity and unnecessary dietary restrictions.

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INTRODUCTION

Food allergies affect nearly 4% of individuals in the United States, and this number appears to be increasing.¹ Until a cure is developed for food allergies, individuals must avoid the food proteins to which they are allergic, a process that requires meticulous reading of food product ingredient labels. Failure to recognize food allergens on an ingredient label can lead to life-threatening allergic reactions, so clarity of product labeling is extremely important.

Food allergic individuals (FAIs) and their families face challenges when they must decipher ingredient labels, as demonstrated by Joshi et al,² who investigated the accuracy of food allergy label reading among parents of food allergic children. Milk and soy caused the greatest problems, with only 7% of parents correctly identifying all 14 labels that indicated milk and 22% of parents correctly identifying all 7 products that contained soy. Five products that contained peanut, 10 products that contained wheat, and 7 products that contained egg were correctly identified by 54%, 88%, and 93% of parents, respectively.

Clearly, there is room for improvement in how manufacturers identify food allergens on their ingredient labels. In

response to the increased prevalence and awareness of food allergies, the modality of food allergen labeling is changing. In the near future, labels will more clearly indicate allergenic ingredients. However, the impact of these label changes on consumers has not been fully elucidated. We undertook this study to gain insight into the current responses of FAIs to food labels so that the impact of future label changes could be anticipated.

METHODS

The Food Allergy & Anaphylaxis Network (FAAN) is a lay organization with more than 27,000 members. Participants at 3 FAAN conferences held in Baltimore, MD, Chicago, IL, and Rye, NY, during 2004 completed an institutional review board–approved anonymous survey directed toward adult FAIs or adult relatives of food allergic children. Participants answered questions about the food allergen avoidance practices and the experiences with ingredient labels of their family's most severely allergic FAI.

RESULTS

Surveys were completed regarding 489 FAIs (84% participation). Forty-one percent of FAIs were younger than 4 years, 56% were 4 to 18 years old, and 3% were older than 18 years; 63% were male. Ninety-six percent were white, 3% were Asian, 2% were African American, 1% was Native American, and 3% were Hispanic. Many FAIs had a history of

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Table 1. Ingredients Avoided According to Allergy

Food allergen avoided	No. (%) of patients avoiding allergen
Peanut	398 (81) 149 (37) avoiding all chocolate
Tree nuts	257 (53) 103 (40) avoiding all chocolate 234 (91) avoiding all tree nuts
Milk	250 (51) 205 (82) avoiding lactose
Egg	250 (51)
Soy	85 (17) 35 (41) avoiding soy oil 32 (38) avoiding soy lecithin
Wheat	76 (16)
Shellfish	82 (17)
Fish	60 (12)

atopy, including 51% with asthma, 69% with atopic dermatitis, and 48% with rhinitis. Their reactions to foods had included “urticaria” (75%) and “anaphylaxis” (60%). The most severe reactions to food experienced by 94% of FAIs required medical treatment, including antihistamines (77%), epinephrine (30%), and emergency department care (45%).

The FAIs were allergic to peanut (81%), tree nuts (53%), milk (51%), egg (51%), soy (17%), wheat (16%), shellfish (17%), and fish (12%), with 19% allergic to 1 food, 21% allergic to 2 foods, and 60% allergic to 3 or more foods (Table 1). All chocolate products were avoided by 37% of FAIs who were avoiding peanut and 40% of those avoiding tree nuts. All tree nut products were avoided by 91% of those allergic to at least 1 tree nut. Of FAIs who were avoiding soy, 41% avoided soybean oil and 38% avoided soy lecithin. Of those avoiding milk, 82% avoided lactose.

Adverse reactions to labeled products were attributed to misunderstanding of a label term by 79 FAIs (16%) and to ingredients not declared in a spice or natural flavor by 110 FAIs (22%). One hundred forty-eight FAIs (30%) had reacted to a food served or provided by a restaurant, 37% on 1 occasion, 51% 2 to 5 times, 7% 6 to 10 times, and 5% more than 10 times.

Ingredient labels were “always” or “frequently” read before product purchase by 99% of consumers who were shopping for food for an FAI and while cooking by 94%. Eighty-six percent of consumers reported contacting a manufacturer for more information about a product ingredient, and 41% were “very satisfied” with the contact. Overall, 86% of responders indicated that their product brand choice was “very much influenced” by the manner of labeling.

DISCUSSION

The survey of FAAN conference attendees summarized experiences of FAIs and their caregivers regarding current labeling of allergenic ingredients. The FAAN members, especially those who attend national conferences, likely repre-

sent a highly motivated subgroup of FAIs, who may also have more numerous food allergies or be sensitive to smaller amounts of allergenic protein than the general population of FAIs. Although our sample may not be representative of all FAIs, knowledge of their responses to food allergen labeling may suggest areas where future changes to allergen labeling will have the greatest impact.

Most FAIs relied on food package labeling and further information from manufacturers to determine if a food was safe to eat. Although some of the reactions attributed to unlabeled ingredients in spices or flavors may have been caused by unlabeled cross-contamination due to shared equipment, the numbers of FAIs who attributed reactions to misunderstanding a label term (16%) or an unlabeled allergen (22%) were consistent with previous observations of reactions attributed to labeling problems. Altschul et al³ found that 32% of the 221 ingredient label issues reported to FAAN for more than 2 years were associated with reactions caused by unintentional ingestions, most often cross-contamination by an unlabeled allergen (28%) or a visible allergen not disclosed on the package label (26%). In 1999, the US Food and Drug Administration recalled 236 products, such as candies (37%), bakery items (15%), and deli foods (12%), because they contained undeclared food allergens.⁴ Our data also suggest that greater clarity of product labeling would prevent many reactions to food allergens and improve consumer satisfaction.

Changing requirements of food product labeling have demanded increasingly detailed description and disclosure of the potential allergens. By late 2005, the European Union will require common food allergens to be clearly labeled on all products, including alcoholic beverages, processing aids or mediums, and components of processed foods.^{5,6} In the United States, The Food Allergen Labeling and Consumer Protection Act requires food manufacturers to identify, in simple language, the presence of common food allergens in their products by January 1, 2006, including those present in spices or flavorings.⁷ These new regulations will be helpful to FAIs, who must now interpret the meaning of terms such as *casein* or *albumin* and avoid all products that contain *flavoring* unless they can obtain further information from the manufacturers.

However, our results suggest that changes in food labeling may also result in new problems or fail to resolve current ones. Although most studies indicate that individuals with soy allergy are at little risk of reacting to ingestions of soy oil or soy lecithin,^{8,9} we found that approximately 40% of soy allergic FAIs avoid these ingredients. The FAIs who are not currently avoiding these ingredients may experience further dietary restrictions under the new labeling rules, because the form of the ingredient may not be specified. For example, they may not know that “contains soy” refers to soy lecithin that they would otherwise not avoid. In addition, the new law requires labeling of previously exempt processing aids, such as soy lecithin used as an antistick agent, so that more products likely tolerated by soy allergic FAIs may now indi-

cate soy ingredients. Increased identification of these allergen-derived ingredients, without indication of the potential allergenicity, may mean that FAIs will have to guess regarding the form of the allergen. The only safe choice for FAIs may be to avoid a large number of foods that they previously tolerated. Tolerance to lactose has also been demonstrated among milk allergic individuals,¹⁰ and yet 80% of the study participants with cow's milk allergy avoid lactose. To give more precise advice to manufacturers and consumers, more studies are needed regarding the threshold levels and clinical relevance of residual allergenic proteins present in ingredients derived from allergens, such as soy oil and lactose.^{5,11,12} This study indicates that many FAIs unnecessarily avoid products because of ingredients that may not contain relevant amounts of allergenic proteins, and the simplified labeling may increase this number.

Our data suggest that clearer labeling of allergenic foods achieved by displaying the common name of the food protein, such as soy or milk, should reduce the complexity of label reading and the frequency of unintentional ingestions due to misunderstanding of label terms. However, our results also suggest that some FAIs may have a more restricted diet under the new labeling laws, if products are labeled as allergenic when the form of potential allergens with minimal or irrelevant protein content, such as soy lecithin or lactose, is unclear. Future studies to determine the threshold doses of food allergens that elicit reactions may help to determine an appropriate balance between simplicity and completeness of allergen labeling.

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