

Should Peanut Be Banned in Schools?



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INTRODUCTION

Up to 8% of children report an allergy to 1 or more foods, and as many as 1.4% of children are reported to have peanut allergy.^{1,2} Given these numbers, protecting children with food allergy has become a national concern. The 2 main pillars of food allergy management are allergen avoidance and preparedness to treat allergic reactions. Food-allergic individuals are instructed to completely eliminate the known allergen(s) because even low-dose exposures can trigger severe allergic reactions in certain patients.³ The potential for fatal and near-fatal food-induced anaphylaxis further fuels the intense desire to protect children from any possible exposure.

Because children spend a significant portion of their day in school, there is a keen interest in determining the best strategies for keeping peanut-allergic children safe in the school setting. Banning peanuts in schools has thus been proposed as one strategy to decrease the risk of allergic reactions and prevent poor outcomes for children with allergies to peanut. The campaigns for peanut bans in schools began approximately 20 years ago along with concerns that rates of food allergy were rising and that fatalities due to anaphylaxis were underreported. Whether this approach is necessary and effective has been widely debated ever since, and there are proponents for both sides of the argument. Supporters of peanut restrictions advocate for a community approach to keeping peanut-allergic children safe because schoolwide restrictions would lessen the risk of accidental exposures, as well as reduce anxiety and social stigma for the affected students. However, opponents of bans are concerned

that restrictions are very difficult to enforce and do not completely eliminate the risk of allergen exposure, leading to a false sense of security.

In this article, we explore the 2 sides to the argument whether peanut should be banned in schools and then provide a discussion synthesizing the arguments and available data.

PEANUT SHOULD *NOT* BE BANNED IN SCHOOLS

When considering schoolwide or classroom peanut bans, the first question that arises is whether peanut allergens are in fact detectable in schools, and if so, how much is detected and how great is the risk to children with peanut allergies? One study examined whether peanut allergens could be detected from various surfaces, including at schools.⁴ Cafeteria tabletops, desktops, water faucets, and food preparation areas at 6 preschools and schools were sampled and assessed for Ara h 1, a major peanut allergen, using an ELISA test. Two were schools with peanut-free tables and food preparation areas, 1 was a peanut-free school, and 3 schools had no peanut restrictions. Peanut allergen was not detected in the 36 samples taken from eating or food preparation areas and 22 samples from desks. Detectable Ara h 1 was noted only on 1 of 13 water fountains tested, which was located in a preschool. The level detected was 130 ng/mL, which is unlikely to elicit an allergic reaction, as some studies found that doses in the range of 1000 µg elicit subjective symptoms^{3,5} whereas objective symptoms are triggered by doses in the range of 2 to 50 mg.⁵ The results of this study suggest that conventional cleaning methods are effective for peanut allergen removal such that peanut allergen is generally low in the school setting.

Because it is likely that peanut allergen is found only at very low levels in schools, another important question to consider is the frequency of allergic reactions due to peanut reported in the school setting. A few studies have reported rates of allergic reactions for school-age children. In a study that followed 252 children with allergy to peanut, 29 children reported 35 accidental exposures over 244 patient-years, giving an annual incidence rate of 14.3% (95% CI, 10.0-19.9).⁶ However, most of these exposures occurred in the child's home or at the home of a friend/relative. Of 35 exposures, 1 accidental exposure occurred while the child was in school. Similar results were reported in a study from the United Kingdom.⁷ Of 785 children with allergies to peanut and/or tree nuts who were followed over 3640 patient-years, 114 had an accidental reaction over a median of 48 months of follow-up. This yielded an annual incidence rate of 3.1% (95% CI, 2.5%-3.7%) for accidental reactions to all nuts. Half the reactions occurred in the child's home and 40% were reactions to foods provided by the parent. Only 6 reactions (5%) occurred during school.

No studies have systematically examined whether rates of peanut exposures were lower in schools that had implemented policies to restrict peanuts. However, data can be gleaned from

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studies reporting peanut exposures in general. Nguyen-Luu et al⁸ prospectively followed 1411 children (mean age, 7.1 years) diagnosed with peanut allergy to monitor for accidental exposures. Over the course of 2227 patient-years, 221 children (15%) were reported to have had 266 accidental exposures, yielding an annual incidence rate of 11.9% (95% CI, 10.6-13.5). Similar to other studies, the child's home or the home of a friend or relative was the most common location for accidental exposures (39.5% in child's home; 16.5% at home of friend/relative). Only 17 exposures (6.4%) occurred in the school setting. Most of these ($n = 12$) occurred in schools that prohibited peanuts, whereas 5 exposures occurred in schools that did not restrict peanuts. Although most participants attended schools with peanut restrictions (87.2%), these results indicate that peanut restriction policies do not completely protect children from peanut exposures. This research team extended its study and subsequently presented data for a larger cohort of children ($n = 1941$).⁹ The findings showed that 567 accidental exposures occurred for 429 children (mean age, 6.9 years) over 4589 patient-years, with an annual incidence rate of 12.4% (95% CI, 11.4-13.4). In fact, this study showed that accidental peanut exposures were greater in schools with peanut restrictions than in those allowing peanut: 4.9% in schools with peanut restrictions versus 3.0% in schools allowing peanut.

Furthermore, rates of epinephrine administration are not lower in schools with restrictions compared with those permitting peanut.¹⁰ School nurses were surveyed from 2006 to 2011, and 1.5% of schools reported epinephrine administration for peanut or tree nut exposure during the study time frame. Although fewer epinephrine administrations were reported by schools with designated peanut-free tables as compared with schools without peanut-free tables, the authors reported that schools with more restrictive schoolwide peanut bans had higher rates of epinephrine administration compared with schools without peanut restrictions (incidence rate of epinephrine for peanut or tree nut was 1.1/10,000 students vs 0.2/10,000 students; $P < .05$), indicating that policies for peanut restrictions in schools do not result in lower rates of allergic reactions due to peanuts.

One study examined the efficacy of imposing peanut restrictions in curtailing the packing of peanuts into school lunches by families of elementary school children (kindergarten to grade 3).¹¹ The researchers disclosed to families the purpose of the study and participating families signed a written consent. Lunches of participating families were randomly inspected for food visibly containing peanut or labeled as containing peanut (items with advisory labels for peanut were deemed acceptable). These inspections occurred at a mean of 94.5 days after consent was obtained. In classes with peanut-free guidelines, 5 of 861 (0.6%) lunches contained peanut whereas 84 of 845 (9.9%) lunches from classes without peanut-free guidelines were found to contain peanut. Although it is not surprising that schools with guidelines restricting peanut did result in fewer lunches containing peanut, it is notable that these schools were not entirely free of peanut. These results indicate that enforcing such policies may be difficult and families can make mistakes when packing lunches. The risk in these situations is that there may be a false sense of security, potentially leading to less vigilance on the part of students, families, and school staff for preventing exposures and addressing reactions. Thus, allergic reactions to peanuts can occur in both schools that impose bans and in those without restrictions. In addition,

imposing policies to restrict peanuts from schools does not guarantee a peanut-free environment.

A concern often driving the ban of peanuts in schools is the potential for food-allergic reactions to lead to poor outcomes because fatal and near-fatal anaphylaxis in children has been reported to occur in the school setting.¹² However, there is currently no evidence that banning peanuts in schools will prevent these unfortunate outcomes. In a case series of fatal anaphylactic reactions to foods, 2 of 21 cases with complete information occurred in the school setting.¹³ These 2 cases involved teenagers who ate candy containing the known allergen, and both did not receive epinephrine in a timely manner. Another 4 fatalities occurred at college, 2 of which were noted to occur in the dormitory. Among the 11 with incomplete information, some younger children were affected. The triggers in these cases were fish and milk, allergens that are not the focus of most school food allergen restriction policies. An additional 3 cases occurred in colleges; however, proponents for restrictions on peanuts in schools have historically not focused on college campuses; rather, elementary schools are their main area of concern.

In a follow-up study by the same investigators, 31 cases of fatal anaphylaxis were reported, and 3 occurred in schools.¹⁴ One occurred in a cooking class, which is notably a high-risk situation, another occurred during a school outing, and the third case occurred at college. In all 3 cases, it is uncertain whether timely administration of epinephrine occurred. Additional cases have been reported in the media in recent years, and in several of those cases, the issue of quick epinephrine access has been in question. Thus, there is currently a paucity of data to support that food restrictions would result in a reduction in the frequency of allergic reactions in schools. In addition, not all cases of reported fatal anaphylaxis involved peanut as the allergen, and in most fatal or near-fatal anaphylaxis cases, delayed use of epinephrine was a major issue.

Banning peanut in schools is not a simple matter. Once allergen restriction policies are implemented, the question of how to promote and enforce the policies arises. This would necessitate time and resources to ensure that all members of the school community are aware and reminded of the policies, guidelines for how to check foods brought into the school, plans for removing the allergen if it is brought to school, and possibly the provision of replacement foods to ensure that affected school children do not go hungry. One can argue whether having such allergen restriction policies will provide a false sense of security because human error may occur. This could also lead to what some term a "slippery slope" as families of children with allergies to other foods such as milk, egg, or wheat may advocate for wider allergen restrictions because these foods can trigger severe reactions in allergic individuals as well.

It remains unclear whether enacting bans on peanut in schools would be the best use of the limited school resources available. Perhaps it would be better to promote education about food allergy and anaphylaxis, and ensure that quick access to life-saving epinephrine is available. Prompt treatment of allergic reactions in the school setting may make a bigger difference given the logistic difficulties of implementing school bans for peanut or a wider variety of allergens.

PEANUT SHOULD BE BANNED IN SCHOOLS

Well-conducted, nationally representative surveys indicate that nearly 6 million children in the United States are reported to

TABLE I. Strategies for consideration of food allergy management for preschools/daycares by risk factor

Risk factor	Possible management approach
Allergen exposure via meals or snacks	• Restriction of nonessential foods such as peanut/tree nuts • Provision of food only by parents/guardians • Organizing allergy-friendly cafeteria seating and increased supervision
Allergen exposure via sharing of toys, pacifiers, bottles/drinks, etc	• Careful, routine cleaning of toys with soap and water or commercial wipes • Limiting use of pacifiers • Proper labeling of all bottles with name of child
Allergen exposure via crafts or other school projects	• Avoid use of food allergens such as peanut/tree nuts in crafts, science, or cooking projects • Provide safe alternative ingredients for project or alternate activity
Frequent staff turnover or lack of formal food allergy management plans	• Regular, such as biannual, training for all staff on allergic reaction recognition and management, including use of epinephrine autoinjectors • Emergency action management plans with photos for all students • Documented standard policy for food allergy management in the facility

Adapted from Ford et al²³ and Vale et al.²⁹

have a food allergy, which equates to 1 in 13 or approximately 2 children in every classroom.² Studies show that allergic reactions due to unintentional ingestions at school are not uncommon, reportedly occurring in 16% to 18% of children.^{15,16} Among known peanut-allergic children, 55% had a reported unintentional ingestion over a 5.5-year period, with a reported mean of 2 accidental ingestions per patient.¹⁷ More disconcerting is that in a Massachusetts study, 24% of 115 allergic reactions requiring epinephrine during a 2-year reporting period occurred in children who were not aware they had potentially life-threatening allergy or were at risk.¹⁸ Although not all these reactions were food-induced, the potential for a fatal or near-fatal event occurring at school is very real. Reducing the risk of exposure to peanut by bans could arguably reduce the chance of an ingestion in both those already diagnosed and those not yet diagnosed, while at school.

One could argue that reducing the risk of peanut ingestion at school is particularly important because the facility may not be well prepared to recognize and manage reactions. Sicherer et al¹⁵ reported that symptoms of an allergic reaction failed to be recognized in 32% of cases of peanut- and tree nut-allergic reactions in children at schools. Nowak-Węgrzyn et al¹⁶ found that 16% of schools surveyed had no medications available to treat allergic reactions, and 14% did not have orders from physicians to use them.¹⁶ Greenhawt et al¹⁹ reported that about 40% of peanut- and tree nut-allergic individuals attended school without either an epinephrine autoinjector or an action plan. In a 2012 survey of 237 primary school teachers, Ercan et al²⁰ noted only 52% knew which of their students in their class had a food allergy. When these teachers were asked to treat anaphylaxis if it occurred, 24% said that they would give first aid, 40% would notify the school nurse, and 20% would call emergency services. Only 10% knew where the epinephrine autoinjectors were stored, and only 4% knew how to properly use one.²⁰

The banning of peanut in schools is a practical approach to allergen avoidance, especially for children who are not developmentally capable of self-management, for example, preschool-aged children. Food allergy and allergic reactions occur most commonly in children younger than 5 years: among peanut- or tree nut-allergic reactions in US schools, 64% occurred in the daycare or preschool setting¹⁵; in Australia, 72% of food-induced

anaphylaxis presentations to the emergency room occurred in this age group²¹; and in the United Kingdom, the age-standardized rate of hospital admissions due to food-induced anaphylaxis was highest among 0- to 4-year-olds, 6 per 100,000 population, which was about twice as high as any other age group.²² Indeed, infants and young children in particular present unique challenges for food allergy management, because they are dependent on their teachers and childcare providers for most activities, including eating and hand hygiene, and they are notoriously messy eaters who do not comprehend the idea of not sharing foods or not touching what is not theirs. As a normal part of development, young infants explore their world using their mouths, resulting in mouthing of toys that can potentially have residual allergen. Preschool settings may have higher staff turnover, making staff education to prevent allergen ingestion and identify reactions difficult to maintain.²³ Therefore, allergen-reducing strategies, specifically suggested and implemented in some preschool settings, may include the ban of nonessential foods such as peanut and tree nuts.

Some of the arguments against banning discussed previously are potentially weak or biased. Although a “slippery slope” argument is proposed, peanut is not as common or essential a part of the diet as are many other foods. Therefore, the impact of a ban of peanut on nutrition and diet diversity is less. Data about relative reactions in schools with and without bans suggesting the bans are not effective could be biased by different risk groups and reporting biases because the schools’ approaches are not randomized.^{8,9} Although a study showed that parents may not have completely adhered to banning instructions,¹¹ there was still an overall decrease in their sending peanut to school, which, in concert with “no food sharing” policies, could be argued as worthwhile to reduce the risk that any food taken unintentionally would be less likely to have peanut allergen. One may also argue that having community involvement to reduce allergen exposure can raise awareness and compassion regarding food allergy. Having a ban in place may also help reduce anxiety for the children with peanut allergy and their parents.

SYNTHESIZING THE ARGUMENTS

The above arguments focus on widespread bans, such as classroom or schoolwide bans. The discussions do not delve into

many other important aspects of food allergy management, some of which are summarized in Table I. Widespread peanut bans are not a sole or common management strategy. Although a widespread ban might be assumed to be a preference of families with a child with peanut allergy, a poll by Greenhawt et al²⁴ suggested that such measures are not necessarily the majority opinion of those with peanut/tree nut–allergic children.

For reasons described above, school or classroom bans may be more relevant for the youngest-aged children in schools and childcare settings. Although older school-aged children do not require the same level of supervision as preschool and younger-age children because they are able to state their food allergies, better express subtle allergic symptoms, and know and follow rules to better avoid accidental exposures, they are still not ready to completely manage their food allergies on their own, supporting the need to address allergen avoidance in a myriad of ways, for example, with allergen-friendly seating in the cafeteria or increased supervision.²⁵ Because only 9% to 12% of allergic reactions may occur in the school cafeteria,^{15,18} steps to minimize allergen exposure outside the cafeteria may be considered. These may include not using allergenic foods such as peanut in projects or at special events such as parties or cultural events and having appropriate alternative ingredients other than peanut (or the allergen in question). Alternatives to entirely banning peanut may also include having allergen-safe zones in all classrooms, libraries, and on the school bus.²⁵

One factor that might be a concern when a child with peanut allergy is attending a school without widespread bans regards noningestion exposures. We argue that whether or not there are bans, avoidance efforts to prevent food-induced allergic reactions should focus on averting accidental food allergen *ingestion* rather than focusing on concerns of *contact or inhalation exposures*. Although skin contact, such as touching the allergen on a surface, may cause a localized reaction including itching or swelling, this has not been shown to cause a systemic reaction. Simonte et al²⁶ showed that “highly peanut-allergic” children did not develop a systemic-respiratory reaction from casual exposure to peanut butter, either placed on their skin or from the vapors inhaled within a foot of their nose. Furthermore, as noted above, Perry et al⁴ demonstrated that simple personal hand washing and good surface cleaning with soap, water, and a clean cloth result in appropriate means of diminishing skin contact to peanut. Brough et al^{27,28} also redemonstrated that peanut residue can be effectively abated as part of ancillary investigations as part of the Learning Early About Peanut (LEAP) allergy study. As discussed previously, the youngest children, those who are exploring with oral exposure of toys and surfaces, may be at more risk of transferring surface exposure to their mouths and may be more likely to benefit from having a ban in place, but never as a sole course of management.

Based on the above arguments and in line with Centers for Disease Control and Prevention recommendations,²⁵ there are numerous effective steps that can be taken to achieve appropriate food allergy management in schools, involving the student and numerous stakeholders, without bans. In supporting a ban of peanut in selective situations, the biggest concern would be to ignore the many other aspects needed to avoid, recognize, and manage food-induced allergic and anaphylactic reactions. Indeed, should bans be used, there is the concern of a “false sense of security,” and removal of any food allergen from a venue does not absolve educational institutions of the responsibility to be trained and prepared to assess and manage an allergic reaction.

Such training is widely available, as are detailed guidelines and many other resources.^{25,29-34} We would argue that particularly for older children who must take increasing responsibility for self-management, it is crucial to focus on their developing many necessary food allergy management skills (no food sharing, alerting others to reactions/allergy symptoms, label reading, carrying medications, etc, all according to age-appropriate stages). Reliance on unproven widespread bans should never be a primary approach.

SUMMARY AND CONCLUSIONS

It is imperative to ensure safe learning environments for food-allergic children. Early recognition of food-allergic reactions and timely administration of epinephrine are essential for optimal outcomes, but far too much variation in how this is handled exists. Although there are no large-scale studies providing definitive evidence supporting or refuting the efficacy of peanut bans in schools, management of food allergies requires consideration of the individual child as well as available school staff and resources. Allergen restriction may be more beneficial and appropriate in specific situations, such as for very young students, but may not present the most efficient use of resources when considering older students. There should be a concerted focus on making recognition and management of an allergic reaction a basic health tenet that we teach children, parents, and school staff as opposed to focus on unlikely scenarios and rare circumstances of how and where a student may have a reaction (eg, inhalation and casual contact). Schools, health care providers, and families should work together to ensure evidence-based practices regarding avoidance and environmental abatement. Energy can also be directed toward educational campaigns that have long-lasting returns on investment in terms of preparing food-allergic and non–food-allergic students and school staff to have awareness, empathy, and a common-sense management plan in the event that a reaction does occur. These and other necessary approaches to ensure the safety of children with food allergies will require a multipronged, collaborative approach, with efforts from national and international pediatric and allergy professional societies, advocacy groups, and departments of education, and importantly from respective local and national governing agencies to provide the legal impetus to enforce such programs.³⁵

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