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Perceptions of Instituting Nut Bans for Allergy Avoidance

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Abstract

The purpose of this study was to assess where nut bans have been implemented (e.g., schools, workplaces, etc.). Using an online survey of around 1,000 respondents throughout Arkansas, Kansas, Oklahoma, and Texas, we examine which tree nuts have been banned in various locations. Results indicated schools were the most prevalent place nuts were banned, followed by work, then other locations. Further, even though peanuts are most often perceived as the major nut that is banned, respondents reporting bans indicated that all nuts were more likely to be banned than individual nuts.

Keywords: nut allergies, nut bans, nuts in schools, peanuts, tree nuts, food allergies

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Introduction

American consumption of nuts and seeds has been slowly increasing since the USDA began tracking nut consumption in 1970 (Dewey, 2016). Although nut consumption has been increasing since 1970, the pace of growth has increased drastically over the last two decades, especially for almonds and peanuts (Dewey, 2016). Tree nut consumption per capita was only 2.61 pounds in 2000, but it nearly doubled by 2016, rising to 4.7 pounds per capita (Statista, 2016). Meanwhile, peanuts have continued to be the most consumed nut in America, with per capita consumption growing from 6.6 pounds in 2012 to an estimated 7.4 pounds in 2016 (National Peanut Board, 2016).

However, as nut consumption has increased, nut allergies have gained significant public and media attention in recent decades, likely due to an increase in the number of reported allergies as a result of growing consumption. According to the Asthma and Allergy Foundation of America (2018), more Americans are allergic to peanuts than any other food product, which explains why peanut allergens are the leading cause of death by anaphylaxis (Berggren et al., 2017; Asthma and Allergy Foundation of America, 2018). In addition to peanuts, tree nuts—which include almonds, pecans, and cashews, among others—are one of the eight food allergens that account for 90% of all food-allergic reactions (Food Allergy Research and Education, 2018).

Of the estimated 15 million Americans that suffer from food allergies, 5.9 million are children under the age of 18 (Food Allergy Research and Education, 2018), which means that, on average, 1 in 13 children suffers from a food allergy (Food Allergy Research and Education, 2018). The Centers for Disease Control and Prevention reported that food allergies in children increased in prevalence by 50% from 1997 to 2011, while the prevalence of peanut and tree nut allergies appears to have more than tripled from 1997 to 2008 (Food Allergy Research and Education, 2018). In fact, recent research presented by the American College of Allergy, Asthma, and Immunology (2017) suggests that peanut allergies in children have increased by 21% since 2010, while tree nut allergies increased 18% over the same period (American College of Allergy, Asthma, and Immunology, 2017). As noted by Warren et al. (2021), peanut allergies impacted 4.6 million adults in the United States in 2020.

The recent increase in the prevalence of nut allergies has resulted in nut bans in many public places like schools and airplanes. Allergic reactions caused by nuts, especially peanuts, have serious symptoms such as throat tightness and shortness of breath, which can often lead to anaphylactic shock. In many cases, these reactions have been triggered by mere exposure or proximity to nut products, not just personal consumption. Because these symptoms are so severe and the reactions can occur from proximity alone, many schools have completely banned peanut products from being distributed in school cafeterias or brought in students' lunches from home.

The intent of this study is to identify who (e.g., individuals, family, society, schools, local governments, federal government, etc.) should have responsibility for allergy avoidance as well as to improve understanding of trends involving nut bans in public places like schools, workplaces, and airplanes and gauge the public perception of those bans. Notably, we assess where nut products

are most often banned, which types of nuts are targeted most, and how the public perceives restrictions on public nut consumption. Results can help inform nut producers, retailers, and policymakers on making policy decisions based on public sentiment.

Literature Review

The growing public concern over food allergies, especially those in school-aged children, has led to many scientific and observational studies on the issue. For instance, Nowak-Wegrzyn, Conover-Walker, and Wood (2001) conducted a telephone survey of parents with food-allergic children, asking a series of questions about their child's history of allergic reactions in school. The schools were then contacted so that the person responsible for treating allergic reactions could be surveyed as well. Of the children surveyed with allergies, 75% had a peanut allergy, 46% had a tree nut allergy, and 75% suffered from two or more food allergies, implying there is considerable overlap between those who are allergic to peanuts and those who are allergic to tree nuts (Nowak-Wegrzyn, Conover-Walker, and Wood, 2001). Furthermore, peanuts were the most common cause of reactions in school-aged children, with 24% of the reactions occurring in schools that made special accommodations to prevent allergic reactions, highlighting the difficulty involved with completely eliminating the threat of food-allergic reactions in schools (Conover-Walker, Nowak-Wegrzyn, & Wood, 2001).

Young, Munoz-Furlong, and Sicherer (2009) explored the potential of casual skin contacts and inhalation exposures to cause life-threatening reactions. There is a widespread public fear that peanut allergies can be so severe that anaphylaxis can occur simply from skin contact or airborne exposure. The study concludes that peanuts and peanut butter at room temperature have a distinct aroma but have no significant vapor phase that contains a peanut protein capable of causing a reaction. Food allergy reactions are immunologic responses to food protein allergens and not just the odors of the food, so there is no threat of anaphylaxis due to airborne exposure to peanuts (Young, Munoz-Furlong, and Sicherer, 2009). Ma et al. (2003) performed a double-blind, placebo-controlled study to test for the possibility of reaction to peanuts from skin contact. They concluded with 95% confidence that the possibility of anaphylaxis was remote for 90% of children with a peanut allergy who were exposed to peanut butter through skin contact or inhalation.

The results of these studies seem to discount the necessity for any kind of schoolwide bans on peanut products. However, there are no studies that directly examine the incidence of allergic reactions to peanuts in schools with peanut bans versus schools without bans and no studies that look at the possibility of reactions due to airborne or skin contact with tree nuts. Therefore, whether or not peanut and tree nut consumption bans should be imposed in schools and other public places remains a relevant issue and one that is largely debated by the public.

Another key point of debate with the issue of food allergies in schools is how responsibility for management of the allergies should be shared between parties, including parents, children, teachers, and school nurses. Young, Munoz-Furlong, and Sicherer (2009) identified deficiencies in the prevention and treatment of food allergies in schools and discussed the responsibilities of families, schools, and students to better manage and prevent allergic reactions. A 1992 study on fatal and

near-fatal food-induced anaphylaxis in children found that 4 out of 6 fatal reactions that occurred in schools were associated with significant delays in treatment with epinephrine; the mean treatment time for epinephrine was 75 minutes and none of the students received epinephrine sooner than 22 minutes after the show of symptoms (Mendelson, Rosen, and Sampson, 1992). Young, Munoz-Furlong, and Sicherer (2009) referenced this 1992 study as the driving force prompting investigation of food allergy management plans and policies in schools. These investigative studies primarily identified two main deficiencies in food allergy care in schools and childcare settings: inadequate food allergy management plans and deficiencies in recognizing reactions and treating them promptly.

Allergy management plans include a written emergency action plan, which outlines a general or individualized plan for reaction prevention and delineates medical treatment for an allergic reaction for that specific individual. An earlier study by Sicherer et al. (2001) found that out of 100 randomly selected children registered in the U.S. Peanut and Tree Nut Allergy Registry, an emergency action plan was in place in only 33% of the cases. Ensuring that each child with food allergies has an emergency action plan on file with the school should be the responsibility of the child's parents. However, in cases when there was an emergency action plan in place and the student suffered a reaction, the plan was followed only 73% of the time (Young, Munoz-Furlong, and Sicherer, 2009). Another referenced study of 47 schools in Indianapolis found that 53% of the schools had no policy for management of anaphylaxis and the other 47% had a policy that consisted only of calling 911 (Young, Munoz-Furlong, and Sicherer, 2009). Sicherer et al. (2001) also found that for children in the U.S. Peanut and Tree Nut Allergy Registry, school personnel failed to recognize the symptoms of an allergic reaction in 32% of the cases. These findings highlight the lack of responsible health and safety management practices in many schools throughout the United States. These results also raise an important question regarding the share of responsibility between involved parties in preventing and treating allergic reactions, which will be explored further in this paper.

Materials and Methods

The purpose of this study was to gauge which nut products are being banned in order to reduce the risk of allergic reactions and in which public places they are banned most often. In addition, the study will determine the general public's perception of how the responsibility of allergy avoidance should be shared by involved parties. It is hypothesized that nuts will be banned in school settings more often than in workplaces and other locations and that peanuts will be banned more frequently than any other type of nut.

An online survey was constructed and distributed in November 2019 to panelists in the Toluna, Inc. database. Toluna, Inc. is an online panel provider that has millions of panelists within their database. The survey focused on a wide variety of nut topics, including drivers of purchasing nut products, previous nut purchases, as well as experience with nut bans and responsibility for avoiding foods causing allergies. The survey received around 800 responses from both buyers and nonbuyers of nut products in Arkansas, Kansas, Oklahoma, and Texas. These states were chosen given the interests of the grant entity (a producer/retailer that predominately markets products in

the states surveyed), notably to assess respondents' valuation of local labels on various nut products, usage and barriers to nut consumption, and policies associated with nuts. Survey participants had to be at least 18 years of age with both buyers and non-buyers of nut products sampled.

Overall, the sample was fairly representative of the states in terms of demographics (see Table 1). Respondents had a lower median household income ($35,000) compared to the 2019 Census estimate for the states surveyed ($59,684) (United States Census Bureau, 2021b). The median age of individuals in the states surveyed was 36 in 2019 according to Census data, while the median age of respondents was 49 (United States Census Bureau, 2021c); the slightly higher sample median can be attributed to the fact that minors were ineligible to complete the survey. Females were oversampled (72% to Census estimate of 50%) (United States Census Bureau, 2021b), given they have been shown to be the primary food shoppers in a majority of households (Zepeda, 2009; Flagg et al., 2013; Wolfe, 2013;). In terms of race, the sample was composed of 82% Caucasian, which is comparable to the Census estimate of 79% Caucasian in the states sampled (United States Census Bureau, 2021b). From an education standpoint, the highest percentage of respondents had received some college credit (39.1%), followed by a high school diploma or less (31.3%), a bachelor's degree (19.3%), and education beyond a bachelor's degree (10.3%). Census estimates for 2019 indicate 39% having an education level of high school or less, 27% having some college or associate's degree, 22% having a bachelor's degree, and 13% having higher than a bachelor's degree (United States Census Bureau, 2021a). As a caveat, results can only be generalized to populations insomuch as the sample is comparable to the demographics, nut ban experiences, and views on allergy responsibility of populations outside the sample. There is no way to definitively state that our sample meets these criteria to generalize outside of the sample.

With respect to the questions of interest, the survey first asked about allergies in the household, then whether nuts were banned in any of the following places that the respondent or his/her family frequented, with the response options being "your child's school," "where you work," "other," or "nuts are not banned." If the respondent selected any option other than "nuts are not banned," they were directed to a follow-up question that asked which types of nuts were the targets of the ban: all nuts, cashews, almonds, peanuts, walnuts, pecans, hazelnuts, or other. All respondents were then asked if airlines should ban nuts on their flights, with the response options being "only domestic flights," "only international flights," "all flights," "only if someone on the plane has indicated they have a nut allergy," and "airlines should not ban nuts on flights." Lastly, respondents were asked, on a scale of 0 = "no responsibility" to 100 = "full responsibility," how much responsibility the following groups should have in helping allergy sufferers avoid the allergy: "person with the allergy," "family of person with the allergy," "society as a whole," "school," "workplace," "restaurant," "city/local governments," "playgrounds," "federal government," and "other public locations."

Table 1. Demographic Composition of Sample

Demographic	Mean	Std. Dev.
Age (mean)	49.0	17.7
Age (median)	49	
Household income (mean) $	$50,469	$41,341
Household income (median) $	$35,000	
Children in household	0.7	1.1
Adults in household	2.2	1.0
BMI	29.7	8.6
Primary or equal shopper?		
Yes	95%	
No	5%	
Gender		
Male	28%	
Female	72%	
Race		
White	81.5%	
Other	18.5%	
Community type		
Rural	41%	
Suburban	39%	
Urban	20%	
Education		
High school or less	31.3%	
Some college	39.1%	
Bachelors	19.3%	
Graduate/Prof.	10.3%	
Age by generation		
Older (Baby Boomers+)	49%	
Gen X	32%	
Younger (Millennials & Gen Z)	19%	

Given the central goal of this paper was to better understand the public perception of how responsibility should be shared by various parties in avoiding allergic reactions due to the public consumption of nut products, the responsibility variable was assigned by each respondent on a 0-100 scale, where responses were observed as not responsible at all (0), full responsibility (100), or anywhere in between. Given the censoring of the scale on both ends, the two-limit Tobit model developed by Rossett and Nelson (1975) was used. The model can be represented as:

$$y^*_i = \beta' x_i + \varepsilon_i \ (i = 1, \ldots, n) \quad (1)$$

$$y_i = \begin{cases} 0 & if\ y_i^* \leq 0 \\ y_i^* & if\ 0 < y_i^* < 100 \\ 100 & if\ y_i^* \geq 100 \end{cases} \qquad (i = 1, \ldots, n)$$

where y_i* is an unobserved latent variable for values below 0 and above 100, x is a demographics, nut purchasing, a health indicator, and a food neophobia index, β represents a vector of coefficients, and ε is an independently and normally distributed error term with zero mean and variance σ^2. Coefficients can be obtained by maximizing the likelihood function in equation two (Davidson and McKinnon, 1993, p. 541):

$$\sum_{y_i^L \leq y_i^* \leq y_i^U} log\left(\frac{1}{\sigma}\emptyset\left(\frac{1}{\sigma}(y_i - x_i\beta)\right)\right) + \sum_{y_i^* < y_i^L} log\left(\phi\left(\frac{1}{\sigma}(y_i^L - x_i\beta)\right)\right) +$$

$$\sum_{y_i^* > y_i^U} log\left(\phi\left(-\frac{1}{\sigma}(y_i^U - x_i\beta)\right)\right) \quad (2)$$

where *i* is the respondent, *L* represents the lower bound, *U* represents the upper bound, and "the first term corresponds to nonlimit observations, the second term to observations at the lower limit y_t^L, and the third to observations at the upper limit y_t^U." (Davidson and McKinnon, 1993, p. 541). As noted by Gould, Saupe, and Lemme (1989), the β coefficients are not interpretable as the marginal effects of a change in an independent variable. Utilizing the McDonald and Moffitt decomposition extension for 2-limit censoring, we calculate and discuss the marginal effects conditional on being uncensored.

Analysis and Results

Nut Allergy Prevalence and Purchasing Patterns

In order to most accurately gauge respondents' perceptions of public nut consumption bans, survey respondents included both purchasers and non-purchasers of nut products, as well as individuals with and without nut allergies. A majority (93%) of respondents did not report any personal nut allergies or allergies within their households, while 3.8% reported that they had an allergy themselves, and 3.2% noted that someone else in their household was allergic to nuts (see Table 2). Compared to the U.S. population, estimates for peanut and tree nut allergies in the United States range from 1% to 3% (Gupta et al., 1999; Sicherer et al., 1999). A majority (84.4%) of the respondents were nut purchasers who did not have allergies within their households. Only 8.6% of respondents did not purchase nut products even though no one in the house was allergic, and 1.7% did not purchase and someone in the household was allergic. Interestingly, 5.3% of respondents purchased nut products even though there was an individual living in the house who had a nut allergy.

Of the respondents who indicated there was someone with a nut allergy in their household, 43% indicated the individual was allergic to all nut types (see Table 2). Selecting the "all" response automatically selected the response for each individual nut type as well. The individual nut types included as response options were cashews, almonds, peanuts, walnuts, pecans, hazelnuts, and a write-in "other" option. As expected, peanuts had the highest rate of reported allergies with 38%. Almonds had the next highest percentage of allergies with 24%, followed closely by walnuts with 22%. Those respondents who had a nut allergy (19%) indicated pecans as the culprit, while 16% were allergic to cashews, 15% were allergic to hazelnuts, and 7% indicated "other" nuts.

Table 2. Nut Allergy Prevalence and Purchase Information

Prevalence of Nut Allergies among Respondents	
Response Option	**% of Respondents**
No allergy	93.0
Personal allergy	3.8
Allergy in household	3.2
Purchasing Patterns in Allergic and Non-Allergic Households	
Response Option	**% of Respondents**
Purchased, no allergy	84.4
Purchased, allergy	5.3
Not purchased, allergy	1.7
Not purchased, no allergy	8.6
Allergies by Type of Nut in Respondents Indicating an Allergy	
	% of Respondents with an Allergy that are Allergic to Specific Nut Type*
Nut Type	
All types of nuts	43
Cashews	16
Almonds	24
Peanuts	38
Walnuts	22
Pecans	19
Hazelnuts	15
Other	7

*These do not sum to 100% due to the inclusion of "All" and "Other" response options.

Location of Nut Bans

A majority of respondents (82%) indicated they had not encountered nut bans (see Table 3). However, 14% indicated they had encountered nut bans at their child's school, with another 3% at work, and 2% at some other location. Though 14% does not seem like a huge percentage, in 2019 that amount would have meant that 1 million students in the four states surveyed were impacted by school nut bans (United States Census Bureau, 2021b).

Table 3. Bans by Location

Location of Ban	% Encountering Ban
No bans encountered	82
School	14
Work	3
Other	2

Airline Nut Bans

For decades a main snack available on airplanes has been nuts, particularly peanuts. As nut allergies have increased, airlines have changed what they serve as snacks. For instance, American Airlines, JetBlue Airways, and United do not serve peanuts in flight, and Delta Air Lines and Southwest will not serve peanuts if notified in advance of the flight. American Airlines and JetBlue Airways serve non-peanut nut alternatives, with none of the five major airlines noted above guaranteeing no nuts or cross-contamination of any of their snacks or meals (Bradley, 2020).

These proactive measures by airlines are contrary to what respondents in our sample indicated should happen. A majority (58%) of sample respondents indicated there should be no nut ban on flights, with another 27% indicating nut bans should only be enacted on a given flight if an allergy was indicated by a passenger (see Table 4). Only 11% of respondents noted nut bans should be on all flights.

Table 4. Perceptions of Airline Flight Bans

Response Option	% of Respondents
No flight bans	58
Allergy indicated	27
All flights	11
Only domestic	2
Only international	1

Responsibility Levels Assigned to Parties Involved with Allergy Avoidance

Having acquired a general understanding of the prevalence and types of nut allergies present in the sample, we sought to develop a more thorough understanding of how the public perceives nut bans by asking the amount of responsibility certain groups should have in preventing public allergic reactions. Respondents were instructed to assign a responsibility rating to each party in a list of those with potential involvement in allergy avoidance (i.e., individual, family, society, school, workplace, restaurants, local government, playgrounds, federal government, and other). The parameters for the rating were 0 (no responsibility) to 100 (full responsibility), and respondents could assign a rating of any number in between. The average responsibility rating assigned for each group by the sample as a whole was calculated and recorded in Table 4.

Individuals were noted as "should be taking the highest responsibility for allergy avoidance" (91.2), followed by "family" (86.7). All other groups had lower mean scores with schools (69.5) and restaurants (68.0) in the next grouping, with all other groups at 52.3 or less on the responsibility scale. Given the disparity in mean scores, it seems clear that respondents value individuals and their families taking the lead in avoiding allergies with other groups having lower responsibility levels.

Tobit Model, Conditional on Being Uncensored

Though the means provided in Table 4 are interesting, other factors such as demographics, nut purchasing levels, etc., are likely to play a role in whom a respondent feels should be responsible.

Nongovernmental Entities

The results for nongovernmental entities (i.e., individuals, family, society, schools, workplace, restaurants) are interesting (see Table 5). For instance, Millennial/younger respondents had responsibility ratings 2.9% and 8% lower than Baby Boomers and older respondents for individuals and family, respectively. However, Millennial/younger respondents had 4.3% higher ratings for a restaurant's responsibility for allergy avoidance.

Table 5. Responsibility Level of Allergy Avoidance by Varying Entities

Group	Mean	Std. Dev.
Individual	91.2	19.1
Family	86.7	21.9
Society	52.3	30.5
School	69.5	28.4
Workplace	52.0	31.5
Restaurant	68.0	28.2
Local govt	47.3	31.3
Playgrounds	47.9	33.1
Federal govt	48.2	32.3
Other	47.4	31.3

Males (compared to females) had lower ratings for both individual and family responsibility, though households with a greater number of adults had higher ratings. Caucasian respondents had higher ratings for individual responsibility, but lower scores for society and the workplace. Respondents with lower education levels (high school or less) rated individual responsibly lower, but had higher ratings for society, workplaces, restaurants, and other.

With respect to purchasing, respondents that had not purchased and were not allergic in the household rated individuals, family, workplaces, restaurants, and other entities lower than respondents who had purchased but were not allergic. Respondents that had purchased and were allergic perceived individual responsibility as lower while viewing workplaces as having more responsibility.

Governmental Entities

When examining governmental entities (local governments, playgrounds, federal government, schools), education, race, and purchasing had effects across multiple entities (see Table 6). Caucasian respondents were less likely to place responsibility on local governments, playgrounds, and the federal government. However, less educated (high school or less) respondents placed more responsibility on all of the governmental entities evaluated. Respondents who had purchased but were allergic were more likely to place responsibility on local governments, playgrounds, and the federal government, while non-purchaser/non-allergic respondents were less likely to place responsibility on local governments, the federal government, and schools.

Table 6. Marginal Effects from the Tobit Models for Non-Governmental Entities

	Conditional on being Uncensored											
	Individual		Family		Society		Workplace		Restaurant		Other	
	dy/dx	p-value	dy/dx	p-value	dy/dx	p-value	dy/dx	p-value	dy/dx	p-value	dy/dx	p-value
State												
Oklahoma	**3.978**	**0.004**	2.461	0.106	0.885	0.881	-1.719	0.435	**3.523**	**0.083**	0.731	0.747
Kansas	2.017	0.272	2.372	0.244	-1.285	0.669	-3.545	0.225	0.036	0.989	-2.488	0.413
Arkansas	**3.768**	**0.049**	1.797	0.384	-0.031	0.992	-4.237	0.154	4.275	0.120	2.155	0.483
Texas	--	--	--	--	--	--	--	--	--	--	--	--
Generation												
Older (baby boomer and older)	--	--	--	--	--	--	--	--	--	--	--	--
Gen X	-1.893	0.127	**-5.700**	**0.000**	-0.293	0.881	3.048	0.113	1.245	0.481	-0.104	0.959
Younger (millennial and younger)	**-2.863**	**0.045**	**-8.027**	**0.000**	-1.046	0.649	2.754	0.217	**4.264**	**0.041**	1.907	0.418
Gender												
Male	**-2.170**	**0.057**	**-2.806**	**0.023**	-1.206	0.516	-1.720	0.341	-0.280	0.867	-0.960	0.609
Female	--	--	--	--	--	--	--	--	--	--		--
Primary or equal shopper?												
Yes	-3.060	0.216	0.398	0.876	-5.386	0.182	-3.820	0.314	-1.198	0.736	-1.239	0.753
No	--	--	--	--	--	--	--	--	--	--	--	--
FNS	**-0.105**	**0.019**	**-0.128**	**0.007**	0.045	0.526	-0.001	0.988	-0.090	0.157	0.091	0.199
Community Type												
Rural	0.899	0.490	0.227	0.872	**-4.689**	**0.027**	-2.770	0.188	**-3.674**	**0.056**	**-4.758**	**0.030**
Suburban	2.041	0.119	**2.335**	**0.097**	-2.586	0.219	-1.985	0.338	-0.327	0.864	**-4.178**	**0.051**
Urban	--	--	--	--	--	--	--	--	--	--	--	--
Adults in household	**1.040**	**0.045**	**1.349**	**0.015**	0.125	0.875	-0.818	0.299	0.107	0.882	-0.039	0.961
Children in household	0.551	0.297	0.863	0.125	0.728	0.382	-0.831	0.314	-0.424	0.568	0.897	0.290
Race												
Caucasian	**3.949**	**0.002**	1.019	0.458	**-3.846**	**0.061**	**-4.583**	**0.023**	-0.660	0.723	-3.770	0.075
Other	--	--	--	--	--	--	--	--	--	--	--	--

Table 6. (cont)

	Conditional on being Uncensored											
	Individual		**Family**		**Society**		**Workplace**		**Restaurant**		**Other**	
	dy/dx	*p*-value	dy/dx	*p*-value	dy/dx	*p*-value	dy/dx	*p*-value	dy/dx	*p*-value	dy/dx	*p*-value
Education												
High school or less	**-2.674**	**0.078**	-2.346	0.147	**5.820**	**0.014**	**5.567**	**0.017**	**6.114**	**0.004**	**5.722**	**0.020**
Some college	-0.616	0.660	-0.159	0.915	2.090	0.338	0.030	0.989	**4.170**	**0.033**	0.609	0.785
Bachelors	--	--	--	--	--	--	--	--	--	--	--	--
Grad/prof	-2.026	0.313	-0.122	0.955	**7.810**	**0.015**	0.883	0.776	4.617	0.106	4.703	0.144
Household income	0.000	0.903	-0.000	0.358	-0.000	0.575	-0.000	0.313	-0.000	0.252	-0.000	0.436
BMI	0.026	0.634	0.034	0.559	0.024	0.779	-0.057	0.496	0.001	0.993	0.007	0.938
Purchased, allergic	**-7.216**	**0.001**	-3.390	0.161	5.565	0.145	**6.744**	**0.071**	4.360	0.222	6.121	0.112
Not purchased, allergic	2.535	0.545	-0.952	0.816	-5.022	0.385	4.176	0.531	-3.314	0.571	-3.980	0.550
Not purchased, not allergic	**-3.426**	**0.035**	**-4.385**	**0.013**	-4.417	0.121	**-4.984**	**0.065**	**-6.039**	**0.013**	**-4.905**	**0.087**
Purchased, not allergic	--	--	--	--	--	--	--	--	--	--	--	--
Observations	625		621		589		586		614		547.000	
LR Chi square	66.74		74.24		29.40		35.31		39.06		36.010	
Prob. > Chi square	0.0000		0.0000		0.1047		0.0261		0.0096		0.022	
Log likelihood	-1266.86		-1768.22		-2635.562		-2579.655		-2502.044		-2460.013	
Pseudo R square	0.0257		0.0206		0.0055		0.0068		0.0077		0.007	

Note: Bold indicates significance at the 0.10 level or less.

Implications and Conclusions

The move to address nut allergies throughout the population has led some workplaces, airlines, and schools to embrace nut bans. As such, understanding the prevalence of these bans and how people view responsibility for avoiding allergens is essential. We found that a large portion of respondents who have a nut ban are allergic to all nuts, with peanuts being the most cited nut causing an allergic reaction. Furthermore, we found that only 18% of our sample had encountered a nut ban, with 14% of those respondents having encountered the ban in schools. These findings show that nut bans are not prevalent (though they do impact a large number of people) or have not been noticed by our survey respondents.

With respect to airlines, 58% of respondents noted nuts should not be banned in flights. This is different from the approach that three (American Airlines, JetBlue Airways, and United) of the five biggest airlines (American Airlines, JetBlue Airways, United, Delta Air Lines, and Southwest) have taken to ban nuts. Notably, only 14% of respondents want a complete or partial ban (domestic or international flights), which is the approach that American Airlines, JetBlue Airways, and United have taken. As firms make and/or modify their policies surrounding banning nuts, they must examine the impact the ban has on their finances as well as the risk of allowing nuts on planes.

With respect to responsibility, overall, survey respondents indicated individuals and families should be the primary entities responsible for allergy avoidance. Schools and restaurants score in the higher responsibility for allergy avoidance realm, though lower than individuals and families. However, there is a disparity in which demographics view whom should be responsible for allergy avoidance. Notably, younger respondents felt less strongly that individuals and families should be responsible for avoiding allergies than Baby Boomers.

Given these findings, it is clear that nut bans are a divisive issue in terms of where they should be enacted. As such, when considering whether to enact a nut ban, firms and policymakers should weigh the impacts of nut bans on allergic individuals against the impacts on agricultural producers and the finances of enacting a ban. From the producer perspective, the results indicate that nut bans may not be widespread because many respondents had not encountered a nut ban. Policy makers and retailers' decisions about enacting nut bans may be contrary to what the general public perceives as needed, given self-responsibility was the primary entity viewed as responsible for allergy avoidance.

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