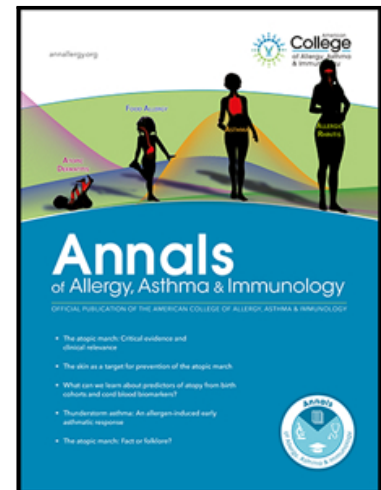


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Factors Influencing Reintroduction of Peanut and Tree Nuts Following Negative Oral Food Challenges in Children

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Title: Factors Influencing Reintroduction of Peanut and Tree Nuts Following Negative Oral Food Challenges in Children.

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Abbreviations: SPT = skin prick test; DBPCFC = double blind placebo-controlled food challenge; OFC = oral food challenge; PAL = Precautionary allergen labelling

Background: Compliance with reintroduction of foods following a negative oral food challenge (OFC) is variable. Ongoing avoidance of tolerated foods is associated with recurrence of allergy and a reduced quality of life.

Objective: To determine the proportion of children who reintroduced peanut and/or tree nuts following a negative OFC and to describe factors that influenced decisions regarding reintroduction or avoidance of non-allergic (negative) nuts.

Methods: Families of children that had undergone an oral food challenge for peanut or tree nuts at Sydney Children's Hospital were invited to participate. Consenting families were sent an online questionnaire.

Results: The response rate to the questionnaire was 64%. Over 85% of respondents had introduced all or some of the negative nuts following the OFC and most had maintained at least some regular exposure in the child's diet at the time of the study. The age at diagnosis of the nut allergy and an awareness of the benefit of introducing foods following a negative OFC were significantly associated with introducing negative nuts. There was improved quality of life in those that introduced negative nuts. **Conclusion:** Most families introduced or attempted to introduce negative nuts following a negative OFC. Educating families on the benefits of introducing foods following a negative OFC is an important factor contributing to successful reintroduction.

Introduction

The prevalence of food allergy is substantial and available evidence points towards an increase in both overall prevalence as well as hospital admission rates for anaphylaxis and fatalities¹⁻³. Food allergy can be diagnosed by the presence of IgE mediated symptoms following allergen exposure or suspected based on sensitisation (positive skin prick test (SPT) or elevated specific-IgE level). While diagnostic cutoffs have been described for various foods^{4,5} the 'gold standard' for the diagnosis of food allergy remains the supervised double blind placebo controlled oral food challenge (DBPCOFC). In clinical practice an open oral food challenge (OFC) is often performed with a dual purpose of either confirming the diagnosis of a food allergy or demonstrating tolerance to that food (negative OFC). The usual advice following a negative OFC is for incorporation of the challenged food into the child's regular diet. It is being increasingly demonstrated that regular oral exposure to food allergens in children at risk of food allergy reduces the risk of food allergy developing and may even lead to tolerance induction in some food allergic children^{6,7}. Furthermore, reintroduction of foods following a negative OFC leads to reduced levels of anxiety and an improved quality of life for the child and family⁸.

On the other hand, the consequences of prolonged and unnecessary elimination diets can be severe. Acute allergic reactions including one fatality have been reported in studies of children with atopic eczema put on prolonged elimination diets of cow's milk and fish, despite previous oral tolerance⁹⁻¹¹.

Despite this, failure of introduction of foods after a negative challenge has been reported in over one quarter of children^{12,13}. In some studies, failure of introduction or infrequent consumption of tolerated foods in previously sensitised individuals has been associated with an increase in risk of re-sensitisation^{12,14} or recurrence of allergy^{14,15}. Failure to incorporate

tolerated food into the regular diet may also result in unnecessary elimination of nutrients and lifestyle restrictions ¹².

In this study we aimed to determine the proportion of children who reintroduced peanut and/or tree nuts following a negative peanut and/or tree nut OFC in a tertiary allergy centre in Sydney, Australia, the rate at which nuts were included in the regular diet and to describe factors that influenced the decision regarding reintroduction or avoidance of non-allergic (negative) nuts.

Methods

Study group

In 2017 a retrospective audit of a database of the Allergy Clinic at Sydney Children's Hospital, Randwick was conducted spanning a 6-year period from 2010 to 2015. In total, 2078 oral food challenges conducted on 817 children were identified as having met the inclusion criteria of having a negative result to peanut and/ or tree nuts. All children had been referred for a clinically indicated OFC by their treating allergist. At the conclusion of the OFC the supervising allergist and specialist allergy nurses provided verbal advice and a written discharge summary containing advice about whether the nut should be continued at home including dosing and frequency of exposure, or avoided. The 817 eligible patient families were sent patient information and consent forms (PICF) by postal and electronic mail. Of the 817 families identified we confirmed that 406 families received the PICF. No response was received from the remainder of families and it was assumed that invitations did not reach the families due to a change of postal address or email. Families who wished to participate were requested to sign and return the consent form in a reply-paid envelope or by

electronic mail. A follow-up phone call was made to families from whom an initial response was not received. Patient families who consented to participate were emailed a link to an online questionnaire. Families were requested to complete one questionnaire for each child and responses from the parent, child or both parent and child combined were accepted. Families who had not yet done so were emailed a reminder to complete the questionnaire four weeks after they initially consented.

Questionnaire and data collection

The online questionnaire was developed by the study team. The first part of the questionnaire consisted of 21 questions, to be completed by all participants. Data on demographics and co-existing atopic conditions were requested. With the use of a rating scale, information on attitudes towards the OFC in addition to perceptions towards quality of life and level of anxiety both before and after the OFC were obtained. Participants were then directed to complete separate questionnaire sections for nuts which were successfully reintroduced (8 questions), and for nuts which were not reintroduced (5 questions). Participants who had reintroduced some, but not all nuts, were requested to complete both sections for the respective nut(s). For successfully reintroduced nuts, details on consumption patterns and reasons for reintroduction were asked. For nuts which were not reintroduced, participants were asked reasons behind the decision. Open ended responses were allowed wherever possible as the intent was to understand the perceived risks, benefits and barriers to introduction of negative nuts following an OFC from the perspective of the respondents. For other questions rating scales or response options were provided (see eFigure 1).

Ethical Considerations

Prior to commencing approval for this study was obtained from the Sydney Children's Hospitals Network (SCHN) HREC. Approval number 2019/ETH05732.

Statistical Analysis

Statistical analysis was performed with the SPSS (Statistical Package for Social Sciences, Version 26 edition) software. Demographic variables are reported for all respondents using descriptive statistics. Respondents were then divided into 3 groups for further analysis; Group 1 (Introduced all nuts), Group 2 (Introduced some nuts) and Group 3 (Introduced none). Initially univariate multinomial logistic regression analysis was used to compare outcomes between groups and Group 3 was used as the reference group. Multivariate multinomial logistic regression was then performed in a backward stepwise fashion. Initial analysis included all variables from the univariate analysis with a p value < 0.25. Where appropriate χ^2 analysis was also used to compare categorical outcomes between groups. A p value < 0.05 was considered significant for all analysis.

Results

Cohort Demographics

Of the 406 patient families that were successfully contacted, 385 returned signed consent forms, however, only 260 questionnaires were returned to give a response rate of 260/406 (64%).

Participant ages at the time of the study ranged from 3 to 19 years (mean 9.7; SD 3.523). The age at the first negative food challenge ranged from 4 months to 16 years (mean 68.95 months; SD 41.145) and the age at which nut allergy was diagnosed ranged from 1 month to 14 years (mean 22.7 months; SD 20.197). One hundred and fifty-four (59.2%) participants were male. Ninety-one (35%) participants had a food allergy other than to nuts at the time of the study and 221 (85%) had been prescribed an adrenaline autoinjector.

Factors Associated with Introducing Nuts

Overall, 170 (65.38%) participants introduced all non-allergic nuts following the OFCs while 46 (17.69%) chose to introduce only some non-allergic nuts and 44 (16.92%) did not introduce any. Among those that introduced all or some nuts only 53% did so within a week of the challenge. The demographics by group are shown in Table 1.

Approximately $\frac{3}{4}$ of those families that did not successfully introduce all negative nuts to the child's regular diet (Group 2 and Group 3) did at least attempt to introduce (answered "Yes" to question 2B of Group 2 of the questionnaire; see eFigure 1) the negative nuts immediately following the food challenge. Furthermore, the slightly higher rate of attempted reintroduction of negative nuts for those in Group 2 (75.6%) compared to Group 3 (73.2%) was not significant ($p=0.800$).

Univariate analysis was performed using multinomial logistic regression and the results are also shown in Table 1. These results show that families were more likely to introduce all negative nuts (Group 1) compared with not introducing any (Group 3) if subjects were younger at the time of the survey (current age; $p=0.048$) or when the nut allergy was first diagnosed (age at 1st diagnosis; $p=0.019$). Families were also more likely to introduce all or some (Group 1 and Group 2) negative nuts compared with not introducing any (Group 3) if they were aware of any benefits associated with introducing nuts (aware of benefit to introducing nuts; $p=0.002$). The remaining variables did not reach statistical significance for differentiating between the groups.

After 4 iterations of multivariate multinomial logistic regression that initially included all variables from the univariate analysis with a p value < 0.25 , 'Age at 1st diagnosis' remained significant for Group 1 compared with Group 3 ($p=0.026$; aOR 0.982) but not for Group 2 compared with Group 3 ($p=0.505$). 'Aware of Benefit to Introducing Nuts' remained

significant for both Group 1 ($p=0.002$; aOR 0.343) and Group 2 ($p=0.002$; aOR 0.241) compared with Group 3. Therefore, for each month of increasing age at diagnosis of nut allergy participants were approximately 2% less likely to introduce all nuts compared with introducing none. Furthermore, participants who were unaware of the benefit of introducing nuts following a negative oral food challenge were between 66% and 76% less likely to introduce all or some nuts compared with those who were aware.

In terms of the timing of introduction of the non-allergic nuts that were successfully reintroduced following the oral food challenge there was a significant difference between Group 1 where 89.3% introduced the non-allergic nuts in the first week compared to 73.9% in Group 2 (χ^2 ; $p=0.007$).

Introduction or Avoidance of Negative Nuts

As shown in Table 2 the 260 participants in the study had undergone a total of 694 challenges prior to enrolment. The ten nuts to which participants had demonstrated tolerance during their oral challenges included peanut, cashew, pistachio, pecan, walnut, Brazil nut, hazelnut, macadamia, almond and pine nut. The three most frequently challenged nuts included almond ($n=119$), walnut ($n=82$) and hazelnut ($n=77$). We then analysed the proportion of individual nuts that were either successfully introduced or not introduced. The most introduced nut was almond (96%) while over 80% of participants introduced all other nuts except walnut, pecan and peanut that were only introduced by between 71% and 77% of participants.

Participants were also asked to indicate which types of nut products were consumed at the time of completing the questionnaire. While most participants reported consuming a mix of different products ranging from foods with nuts as a minor ingredient (e.g. cake or ice-cream) to foods with nuts as a major ingredient (e.g. nut butters) to whole nuts, 16% of those that introduced all or some nuts reported that they currently exclusively consumed foods with

precautionary allergen labelling (PAL) statements ('May contain traces' etc). The breakdown of the type of nut products being consumed by those participants that introduced peanut only versus those that introduced peanut and/or tree nuts are shown in Table 3. Tree nuts were given more as whole nuts than as pastes or ingredients in other foods while peanuts were more frequently given as paste or ingredients in other foods. There were no significant differences in the products consumed between peanut and tree nuts as a group (Table 3). In terms of the frequency with which negative nuts were eaten over 50% of respondents reporting that the child was consuming a nut or nut product either daily, 2 to 3 times per week or weekly. A further 18% each reported that negative nuts were consumed either fortnightly or monthly.

Reasons for Introducing or Not Introducing Negative Nuts

The three primary reasons provided for *introducing* the non-allergic nuts, in order of frequency, were the prevention of allergy recurrence, reducing dietary restrictions, and improving nutrition (Table 4). It was very unusual that participants chose to introduce nuts because the child enjoyed eating them.

On the other hand Table 5 shows that the most prevalent reason for *not introducing* non-allergic nuts overall was the child refusing the nuts (51.1%), followed by a difficulty in incorporating the nuts into the child's diet (25.6%). Looking further into the 4 individual non-allergic nuts that were least likely to be introduced by participants (peanut, walnut, pecan, Brazil nut; Table 2), peanut was reported as the nut most likely to be refused by the child (25%), with pecan being reported as the most difficult to incorporate into the diet (17.2%). Parental fear of reacting to the nut at home, parental perception that a reaction occurred at home when a particular nut was reintroduced and parental perception that despite the negative food challenge they were not advised to introduce the nuts at home accounted

for 12.2% each of the reasons for not introducing the non-allergic nut. Having a nut allergic sibling at home and having an allergy to other nuts respectively accounted for only 5.6% and 2.2% of all reasons.

Quality of Life and Anxiety

For qualitative analysis the responses from participants in Group 1(Introduced all) and Group 2 (Introduced some) were combined (Combined Group) and compared to Group 3 (Introduced none). Ninety-four percent of those participants in the 'Combined Group' rated their level of confidence in the accuracy of the OFC as 'Confident', or 'Very confident' whereas 68% of Group 3 rated their level of confidence in the accuracy of OFC as 'Confident', or 'Very confident'.

Participants were asked to rate their fear/anxiety of an allergic reaction due to accidental exposure before and after the negative food challenge(s) (Figure 1). Prior to the food challenge(s) 54% of the 'Combined Group' had rated their anxiety/fear as either a 4 or 5 on a 5-point Likert scale where 0 was 'Not at all anxious' and 5 was 'Extremely anxious' (mean score 3.5) whereas after the food challenge(s) only 18% of this group rated their anxiety/fear as either a 4 or 5 (mean score 2). By comparison, 44% of Group 3 rated their anxiety before the food challenge(s) either as a 4 or 5 (mean score 3.1) and 37% of this group still rated their anxiety/fear as either a 4 or 5 (mean 2.6) after the food challenge(s).

Despite choosing not to introduce any negative nuts after the food challenge(s) only a very small proportion of Group 3 felt that the QOL of the child or family had been worsened by the experience of the food challenge(s) (Figures 2 and 3). In fact, approximately $\frac{2}{3}$ of the participants in Group 3 felt that their QOL was unchanged by the negative outcome of the food challenge(s) and almost $\frac{1}{3}$ felt that their QOL had improved. While in the 'Combined Group' around $\frac{2}{3}$ of participants felt that the child and families' QOL had improved since the

food challenge(s) and the remainder mostly reported that there was no change. Only around 2% in this 'Combined group' reported a decrease in QOL.

Discussion

Reintroduction of foods following a negative OFC is recommended and failure to reintroduce foods is associated with re-sensitisation and recurrence of food allergy in general and peanut allergy specifically^{14,16}. Furthermore, the risk of delaying the introduction of allergenic foods in high risk, sensitised infants has been studied and over the last few years and has led to changes in infant feeding guidelines worldwide^{6,7}. It seems plausible that this risk may extend to older children regarding the ongoing avoidance of foods once tolerance has developed. This study examined the rates of reintroduction of non-allergic nuts following a negative OFC at a tertiary allergy clinic in Sydney, Australia. We found that overall, just over 83% of participants introduced some or all negative nuts into their child's diet following the negative OFC and the majority of those were consuming nuts or nut products regularly. It must be noted that 16% reported that their children were only consuming food with PAL statements at the time of the study. As a result these children may not actually be ingesting nuts on a regular basis but regardless these parents intended to introduce the negative nuts and their perception is that their children are being exposed to nuts, although any clinical benefit due to regular exposure to negative nuts is unlikely to be relevant to this group. Furthermore, 73% of those participants who did not keep the negative nuts in their child's diet still attempted to introduce them in the days following the OFC. Other studies have shown similarly high rates of initial reintroduction of foods including peanut and tree nuts following a negative OFC with rates declining significantly over time following the OFC

A number of previous studies have suggested that peanut and tree nuts are introduced less often than other foods but most have not looked specifically at peanut versus tree nuts^{13,18}. In this study, peanut, walnut and pecan were among the nuts least likely to be introduced following the negative OFC. Other studies have reported higher rates of introduction of peanut compared to tree nuts as a group¹⁷. Similar to previous reports^{13,18-20}, in the current study refusal by the child was given as the main reason for not introducing nuts overall and peanut specifically. Many previously allergic children may find it difficult to tolerate peanut butter due to the taste or texture^{17,19} while the tree nuts that were more successfully introduced, such as almond and cashew, might be more readily incorporated into everyday foods in the form of nut 'flour' or ground nuts that are perhaps easier for children to eat. It is likely that many of the participants in this study who reported introducing whole nuts (Table 3) were incorporating crushed or ground nuts into their child's food rather than giving the nuts as a stand-alone food. Whereas our results suggest that peanut was frequently given as a paste. Secondly, it is possible that participants in this study were less reluctant to introduce tree nuts simply because they are consumed more often in Australia compared with other countries where peanut is more popular than tree nuts¹⁷.

In this study a fear of reactions and anxiety was cited as a reason for not introducing nuts by only approximately 12% of participants. This has been cited as a reason for not introducing foods following a negative OFC in other studies^{12,17,18} and is in contrast to studies of adults and adolescents where fear of reactions and continuing old dietary habits were more significant reasons for reintroduction failure²¹. The child's willingness to try new foods and to expand their diet is an important factor contributing to the successful reintroduction of foods following a negative OFC²². A component of this fear may be due to perceived reactions when nuts were introduced at home. It is therefore relevant that a similar proportion of participants gave perceived reactions on ingestion of the negative nuts at home as a reason

for not reintroducing the negative nuts although, severe reactions were not reported. In terms of why reactions might have occurred at home in children with negative OFC results it seems unlikely that they would have ingested a higher dose at home than during the OFC, however, perhaps some participants may have lost their tolerance to the nuts due to delaying the introduction at home following the negative OFC ^{14,16}.

Literature suggests that younger children are more likely to reintroduce a negative food than older children at the time of the challenge ^{13,17,23}. In this study children who were younger at the time of the study were more likely to have introduced all nuts but this result was not statistically significant on multivariate analysis. While the age at which the first OFC occurred did not seem to influence the likelihood of introducing negative nuts, the age at which the nut allergy was diagnosed did reach significance suggesting that earlier diagnosis and therefore perhaps a younger age at the time when negative nuts are introduced following the OFC may be of benefit.

Previously allergic or sensitised children who continue to avoid tolerated foods are of concern due to the risk of food allergy recurrence or of severe or fatal reactions ^{9-12,14-16}.

Currently no controlled trials accurately demonstrate how high this risk might be and few if any reports specifically discuss tree nuts. Therefore, while this risk may vary between foods there are other important practical issues of concern. Families of children with food allergy already report reduced access to healthcare compared to children without food allergy ²⁴.

With the rising prevalence of allergies, there has been a concurrent increase in the demand on allergy services to carry out oral food challenges (OFC) which further adds to the existing burden on allergy services. Furthermore, food challenges are an expensive and resource-intensive service. It is therefore important that scarce healthcare resources such as access to specialist allergist services and supervised OFCs are used appropriately to prevent delays in

diagnosing tolerance in those children where there may be an opportunity to introduce negative nuts at a younger age, thereby making it more likely that they will continue to consume those nuts regularly and thus prevent recurrences of food allergies ^{15,16}.

An awareness of the benefit of introducing nuts stood out as a significant difference between those that introduced all or some nuts and those that did not. This question asked whether participants perceived there to be a benefit to introducing negative nuts based on advice from the medical team. Furthermore, almost 84% of participants cited 'Prevent allergy recurrence' as a reason for introducing the negative nuts. These findings indicate that families of allergic children are increasingly aware of the results of studies indicating that introduction of foods may be beneficial for preventing food allergies ^{6,7} and understand that avoidance of negative nuts may be detrimental. Norman et al. ²⁵ found that the rate of introduction of negative nuts following either an in hospital or at home OFC remained low despite providing written guidance on how to introduce negative nuts. We suggest that educating parents about options in terms of the form of nut that they introduce, the dose required to maintain tolerance ²⁶ and the benefit of introducing negative nuts in terms of the risk of recurrence of allergy may help increase rates of compliance with reintroduction of foods following a negative OFC.

There were several limitations to the current study. To ensure that respondents felt comfortable providing honest responses the questionnaires were de-identified and were not re-identifiable by the study team. As such, the corresponding medical records of the participants could not be reviewed and certain aspects of the clinical history including the indication for the OFC, allergy test results, or whether the participant had previously reacted to the nut in question prior to the OFC were unknown. We felt respondents would likely find it difficult to accurately recall this information. Therefore, it was not possible to determine how often OFCs were performed to diagnose allergy or to determine that existing allergy had

resolved and differences between the rates of reintroduction, or the reasons for reintroducing or not reintroducing negative nuts, between these groups, could not be determined. Similarly, as the questionnaire pertained to both peanut and tree nuts as a group, we were not able to determine if there were differences in responses for specific nuts. This may impact on the generalisability of our findings to other cohorts or different settings.

In conclusion we have found that most families undergoing OFCs for peanuts and tree nuts do attempt to reintroduce the negative nuts following the OFC but only a proportion successfully maintain the negative nuts in their child's diet. Educating families on the benefits of maintaining exposure to negative nuts following an OFC, addressing concerns about reactions occurring at home following a negative OFC and providing advice on strategies for maintaining negative nuts in the child's diet may be beneficial. Furthermore, the potential benefits of understanding what motivates families to introduce foods following a negative OFC include the ability to improve counselling prior to and following food challenges. It may also assist in identification of families who are unlikely to reintroduce foods despite a negative OFC. In these situations, it may be advantageous to discuss the utility of a food challenge with patients and their families to enable better rationalisation of health care resources.

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Table 1: Group Demographics and Univariate Analysis.

	Introduced All (Grp 1; n=170)		Introduced Some (Grp 2; n=46)		Introduced None (Grp 3; n=44)
Current Age (yrs)	9.39	p=0.048 **	10	p=0.454	10.57
Age at 1st Diagnosis (mths)	20.54	p=0.019 **	24.63	p=0.427	28.89
Age at 1st Negative OFC (mths)	68.82	p=0.955	69.18	p=0.997	69.22
Interval from Diagnosis to OFC (mths)	48.74	p=0.220	45.07	p=0.553	40.37
Male (%)	56.5 %	p=0.967	71.7 %	p=0.142	56.8%
Autoinjector Prescribed*	84.7 %	p=0.641	89.1 %	p=0.329	81.8%
Special Diet[^]	1.2%	p=0.998	6.5%	p=0.577	2.3%
Other Food Allergy[¶]	38.8 %	p=0.564	21.7 %	p=0.194	34.1%
Aware of Benefit to Introducing Nuts[†]	68.8 %	p=0.002 **	76.1 %	p=0.002 **	43.2%
Attempted Introduction[‡]	N/A	-	75.6 %	p=0.800	73.2%

* Before first OFC.

[^] Vegetarian or 'Other'.[¶] Other than nuts.[†] Aware of benefit for maintaining tolerance.[‡] Proportion attempting any introduction following negative nut OFC (χ^2 analysis).

** Compared with Group 3.

Table 2. Nut Challenges and Rates of Introduction

Nut	No. Challenges*	Group		Total			
		Intro All [†]	Intro Some		Intro None [¶]	Introduced n (%)	Not Introduced n (%)
			Introduced [†]	Not Introduced [¶]			
Peanut	76	43	13	5	15	56 (74)	20 (26)
Cashew	73	48	15	4	6	63 (86)	10 (14)
Pistachio	41	28	6	5	2	34 (83)	7 (17)
Pecan	58	38	3	11	6	41 (71)	17 (29)
Walnut	82	52	11	10	9	63 (77)	19 (23)
Brazil Nut	54	38	5	8	3	43 (80)	11 (20)
Hazelnut	77	58	10	4	5	68 (88)	9 (12)
Macadamia	61	44	10	2	5	54 (88)	7 (12)
Almond	119	87	27	1	4	114 (96)	5 (4)
Pine Nut	53	32	15	3	3	47 (89)	6 (11)

* Performed with each nut.

[†] Number of cases where the nut was introduced.

[¶] Number of cases where the nut was not introduced.

Sesame and Chestnut were excluded from this analysis as there were only 1 and 4 cases respectively.

Table 3. Type of Nut Products Consumed by Participants Introducing Peanut and/or Tree Nuts.

	Peanut	Tree Nuts	
Precautionary labelling*	88.9%	87.2%	p=0.808
Nuts a minor ingredient[^]	74.1%	59.0%	p=0.134
Nuts a main ingredient[¶]	66.7%	53.2%	p=0.188
Whole nuts[†]	77.8%	65.4%	p=0.202

* PAL statement e.g. 'May contain traces'.

[^] Example - ice cream, cake, chocolate.

[¶] Example - nut spread, nut cookie.

[†] In an age-appropriate form e.g. whole, crushed, ground.

Table 4. Reasons for Not Introducing Nuts

Reason for Not Introducing	Peanut	Pecan	Walnut	Brazil Nut	Overall
Not Advised to Introduce	6.6%	6.9%	6.1%	3.7%	12.2%
Felt Less Anxious Not Introducing	0.0%	3.4%	2.4%	0.0%	3.3%
Did Not Believe it Necessary	0.0%	0.0%	1.2%	1.9%	3.3%
Not Confident in Accuracy of OFC	2.6%	1.7%	1.2%	0.0%	6.7%
Allergic Reaction at home	5.3%	5.2%	6.1%	1.9%	12.2%
Fear of Reaction at Home	3.9%	3.4%	3.7%	0.0%	12.2%
Child Refused Nuts	25.0%	13.8%	18.3%	16.7%	51.1%
Difficulty Incorporating Into Diet	5.3%	17.2%	13.4%	11.1%	25.6%
Nut Allergic Sibling at Home	5.3%	1.7%	1.2%	0.0%	5.6%
Do Not Remember Result of OFC	2.6%	1.7%	0.0%	1.9%	2.2%
Nuts Not Part of Family Diet	1.3%	3.4%	0.0%	3.7%	5.6%
Allergy to Other Nuts	1.3%	1.7%	2.4%	1.9%	2.2%

Table 5. Reasons for Introducing Nuts

Reason for Introducing	Overall
Keen to Stop Dietary Restrictions	54.6%
Improvement in Nutrition	43.1%
Prevent Allergy Recurrence	83.8%
Nuts Important in Family Diet	25.9%
Child Likes Nuts	2.8%
Medical Advice to Introduce	2.3%

Figure 1 – Level of Anxiety Before and After Food Challenge by Nut Introduction Group. Numbers indicate % of participants. Rating scale 0 = completely not anxious; 5 = extremely anxious.

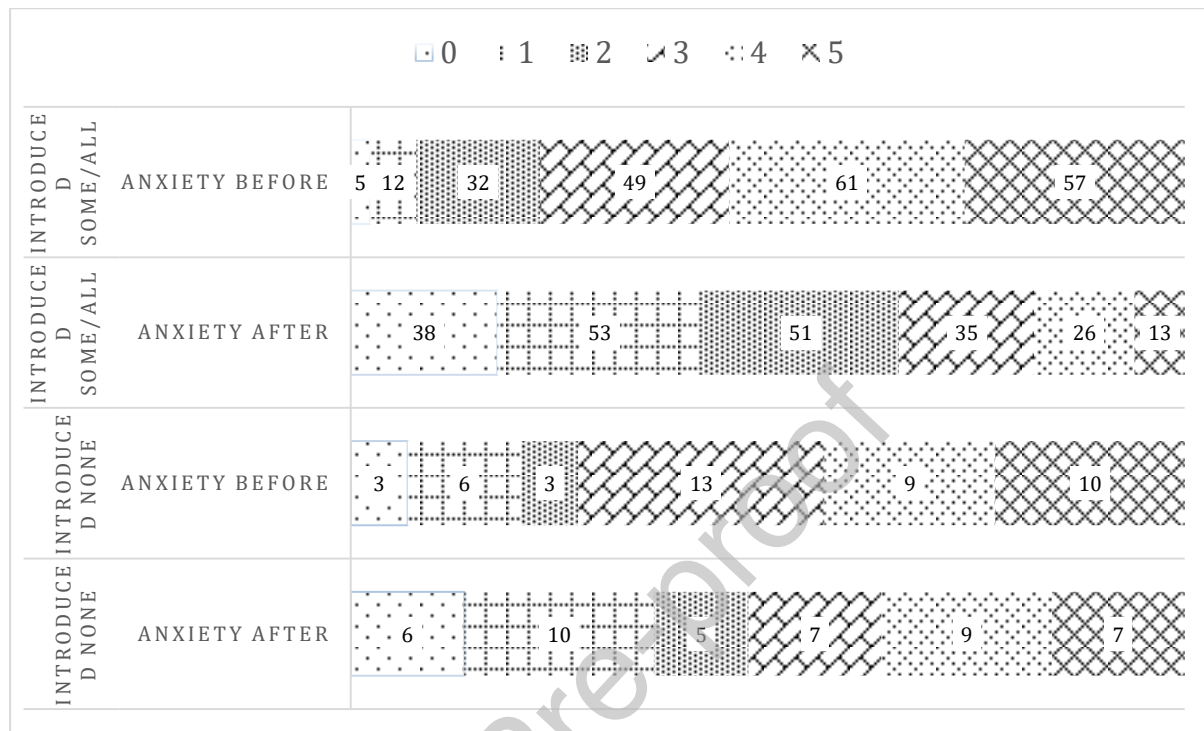


Figure 2 – Change in Child Quality of Life Following Food Challenge by Nut Introduction Group.

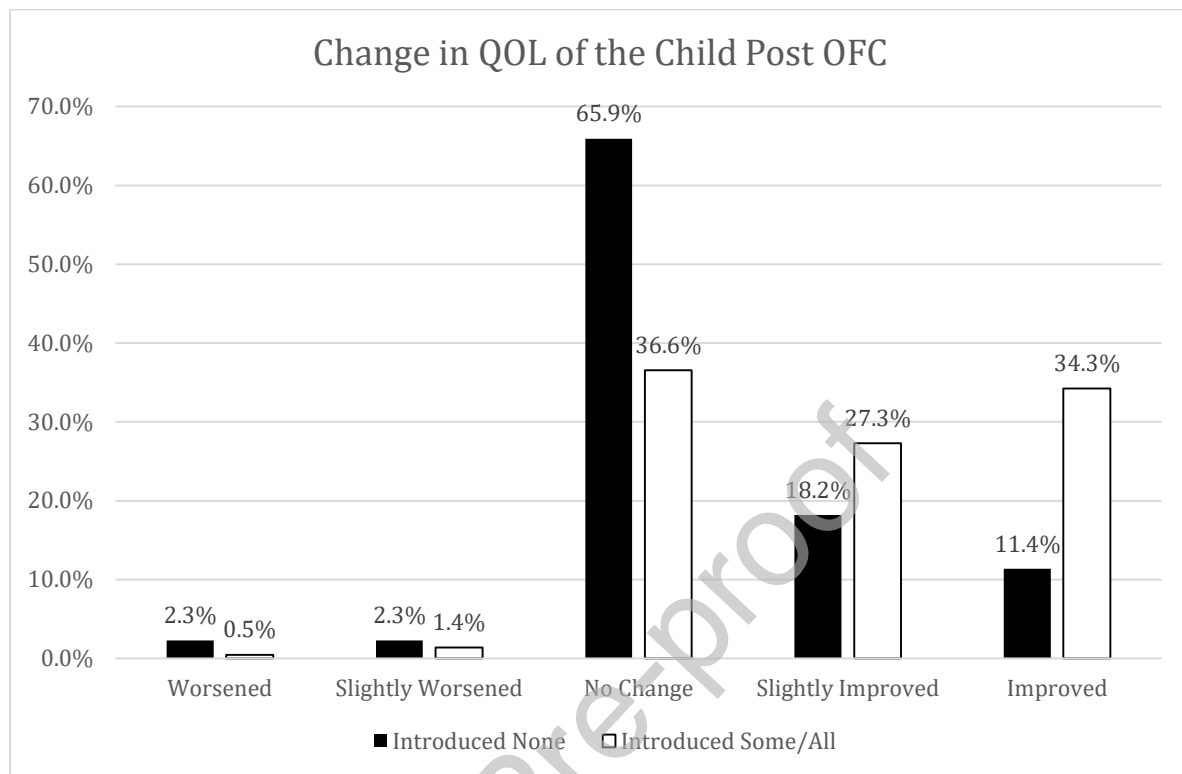


Figure 3 - Change in Family Quality of Life Following Food Challenge by Nut Introduction Group.

