

EXPERT OPINION STATEMENT
FOOD ALLERGY RESEARCH AND RESOURCE PROGRAM
UNIVERSITY OF NEBRASKA

Lack of Allergenicity of Shea Nut Butter

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Summary

While shea nuts are indeed tree nuts, shea nut butter, also known as shea nut oil, is not known to be allergenic. Allergic reactions to shea nuts have not been described either. Although they are not widely eaten in North America, they are consumed in native Africa where Shea (*Vitellaria paradoxa*) trees grow. Refined shea nut butter does not contain any detectable protein residues and does not contain detectable residues of proteins from peanut or various known allergenic tree nuts (walnut, almond, pecan, hazelnut).

Conclusion

Thus, refined shea nut butter does not pose any known or likely allergenic risk to consumers including individuals with pre-existing peanut or tree nut allergies. Products containing refined shea butter can be safely used by all consumers.

Shea Nut as a Tree Nut

Shea nuts are obtained from the shea tree (*Butyrospermum parkii*, also known as *Vitellaria paradoxa*). This tree is indigenous to many parts of Africa. The shea nut is the seed of the fruit of the shea tree. The fruit portion is typically removed to retrieve the hard-shelled nut. Shea nut is a very oil-rich seed. Shea provides fruits for direct consumption and shea seeds/kernels (nuts) from the fruit can be further processed into shea butter used in cooking, skincare and medicine (Seidu Jasaw G et al., 2014).

In 2004, the U.S. Congress passed the Food Allergen Labeling & Consumer Protection Act (FALCPA). This Act defined the most common allergenic foods in the U.S. The list included tree nuts as a group but did not define specifically what was considered as a tree nut. FALCPA requires, among other provisions, that commonly allergenic foods should be listed on the ingredient statement by their common or usual name and that ingredients derived from commonly allergenic foods should

be identified by their source (Taylor and Hefle, 2006). FALCPA further requires that tree nuts be declared specifically e.g. almonds or walnuts and not collectively e.g. tree nuts.

Tree nuts were not defined within FALCPA which created some uncertainty. In October, 2006, the U.S. Food & Drug Administration (FDA), which is charged with enforcement of FALCPA, clarified Section 201(qq) of the FALCPA by defining tree nuts on a web site posting questions and answers related to FALCPA. Several nuts including shea nuts that had not previously been considered as commonly allergenic were on this list.

Shea nuts are definitely tree nuts. However, shea nuts have not historically been considered as commonly allergenic tree nuts. In fact, in other countries such as Canada that offer specific information on commonly allergenic tree nuts, shea nuts are not included.

Shea Nut Butter

Shea nuts are not consumed as human food (as the whole nut) in most countries. The primary article of commerce is shea nut butter (oil). Refined shea nut butter (also known as shea nut oil) has been classified by the U.S. FDA as a GRAS (Generally Recognized as Safe) food ingredient. Its primary use in foods is in confectionery products as a cocoa butter substitute. Shea nut butter is also used in various cosmetic applications where the primary exposure would be skin contact. Shea nut oil or shea nut butter is primarily the fat fraction of this nut.

Shea nut butter is cooked and expeller pressed (cold-pressed) with filtration. The crude oil is refined by alkali treatment at 80 - 100°C to neutralize free fatty acids, washed and dried. The refined shea nut butter is then bleached by filtration through organic clays to remove color and odor. Finally, the shea nut butter is deodorized by the injection of steam at 100 - 150°C to remove volatile odors. The resulting product is cooled and commercially distributed as shea nut butter.

Shea Nut and Shea Nut Butter/Oil Are Not Known Allergens

No reports exist of allergic reactions to shea nuts or shea nut products. An exhaustive search of the medical literature was conducted to confirm that no cases of shea nut or shea nut butter (oil) allergy had ever been reported in the medical literature.

Extracts prepared from raw shea nuts and white and yellow shea nut butters contain extremely low levels of water/salt soluble protein with undetectable IgE binding by Western blot and ELISA analysis suggesting minimal availability of proteins in commercial shea nut products (Chawla et al., 2011).

Tree nut allergens, like the vast majority of all food allergens, are proteins. Shea nut butter is primarily composed of fat. Expeller pressing would leave most of the protein residues behind in the press cake. Bleaching is another important step because any residual protein could be removed by the filtration process.

The lack of protein in shea nut butter contributes to the extremely low likelihood that this ingredient would be allergenic.

FARRP/Procter & Gamble Allergenicity Assessment

At the behest of Procter & Gamble, a company that uses shea nut butter for consumer products (not food products), FARRP collaborated with company scientists to conduct an allergenicity assessment on the shea nut butter ingredient used in their products. We believe that this ingredient is representative of all shea nut butter in commercial use.

The first step in this risk assessment was to determine if shea nut butter posed any risk to tree nut- or peanut-allergic consumers. Most tree nut-allergic consumers would be allergic to walnuts, almonds, pecans, and/or hazelnuts with no known exposure to shea nuts with the possible exception of some products containing shea nut butter.

Analyses conducted in the FARRP laboratory revealed that the shea nut butter ingredient did not contain detectable residues of proteins from walnut, almond, pecan or hazelnut using highly sensitive and specific enzyme-linked immunosorbent assays (ELISAs). Furthermore, the FARRP laboratory also determined that the shea nut butter ingredient did not contain detectable residues of peanut protein using a highly specific and sensitive ELISA. Further, Procter & Gamble received assurances from their supplier that shea nut butter was not processed on any equipment that was shared with other tree nuts.

Thus, shea nut butter does not apparently contain any proteins that might elicit allergic reactions in individuals with peanut or tree nut allergies.

Based upon the method of manufacturing and the fact that shea nut butter is basically the fat component of the nut, further experiments were conducted by Procter & Gamble scientists to determine if shea nut butter contained any detectable protein residues. Several different lots of shea nut butter were extracted and subjected to gel electrophoresis methods that would concentrate any protein residues that would then be visible by staining of the gel. The crude oil revealed several areas of staining that were not very apparent with the refined oil. Mass spectrometry analysis was done on any material present in the areas where staining was seen with the crude oil. Mass spectrometry is a sensitive technique for the detection of protein. No protein was detectable by mass spectrometry in the refined, bleached, and deodorized shea nut butter even at extremely low levels of sensitivity.

To further examine the possibility that shea nut butter might contain protein residues, the extracts of the different lots of shea nut butter were concentrated by evaporation and subjected to amino acid analysis, another very sensitive technique that would detect the presence of any proteins, peptides or amino acids; amino acids are the building blocks for proteins. No detectable amino acid residues were found by this method.

Thus, refined shea nut butter does not contain any detectable protein from the shea nut itself.

References:

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