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## Cold-pressed peanut oils may contain peanut allergen

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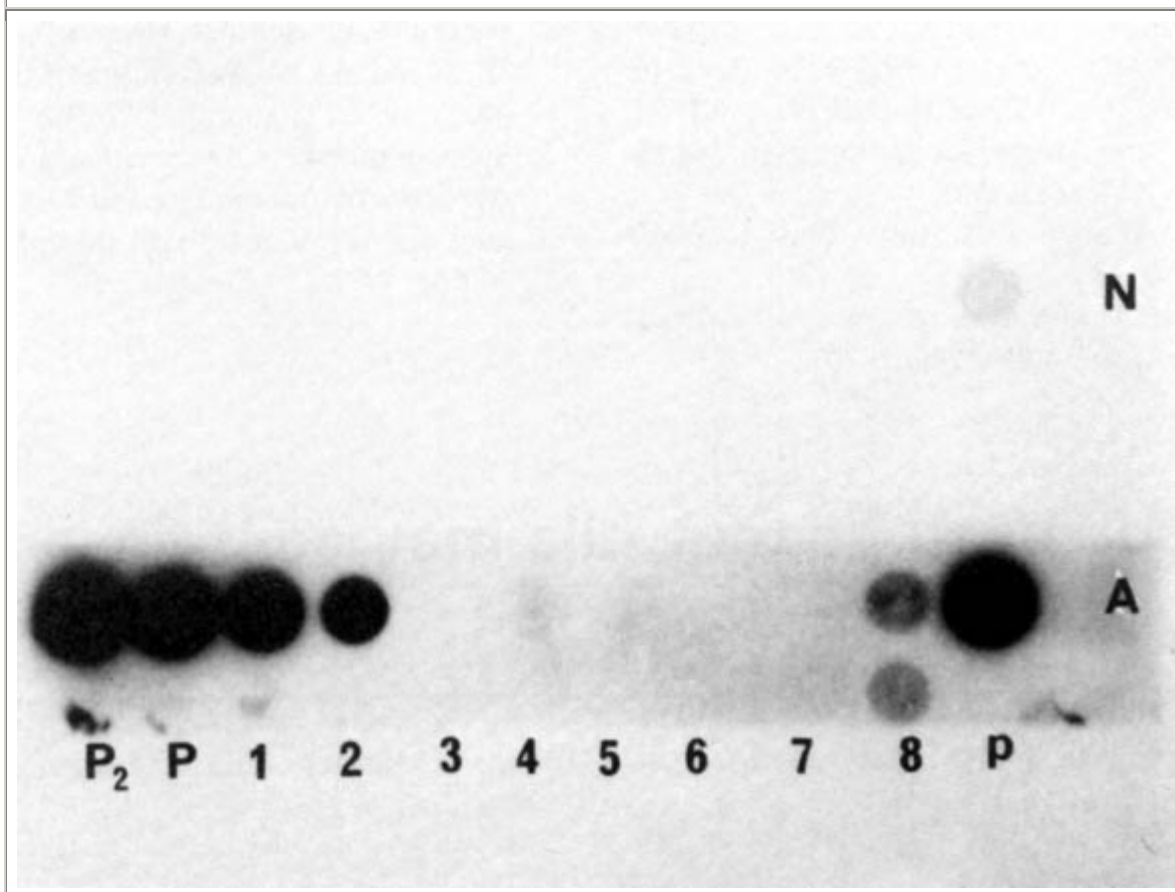
In pursuing forensic investigations to determine the cause of anaphylactic death in individuals with food allergy, we found that cooking oils could contain significant amounts of food allergens. Although it has been reported that hot-pressed processed peanut oils do not contain detectable amounts of peanut allergen,<sup>1,2</sup> there is evidence that some peanut oils may contain traces of allergen.<sup>3</sup>

Peanut oils from six different manufacturers were purchased at retail stores in Canada. Mazola corn oil (Best Foods Canada, Inc., Etobicoke, Ontario) and Canada Packers bulk hot-pressed soybean oils (Canada Packers Ltd., Toronto, Ontario) were used as controls, and a commercial peanut oil available only in bulk was obtained from Canada Packers Ltd. The peanut oil brands Flora (Flora Manufacturing, Burnaby, British Columbia), Hain (Hain Pure Food Co., Los Angeles, Calif.), Lifestream (Lifestream Natural Foods Ltd., Richmond, British Columbia), and Spectrum (Spectrum Marketing, Petaluma, Calif.) were cold-pressed; whereas Happy Home (Grain Process Enterprises Ltd., Scarborough, Ontario), Planter's (Hershey Canada Inc., Etobicoke, Ontario), and Canada Packers peanut oils were hot-pressed. A 35 ml sample of each oil was extracted by rotating rapidly for 48 hours with 7 ml of 0.2 mol/L ammonium bicarbonate, pH 7.8. The extraction tubes were centrifuged, and the clear aqueous layers were collected. Dot blots were prepared by filtering 0.2 ml of each extract and of a 1:4000 dilution of peanut scratch test extract, purchased from Hollister-Stier Laboratories (Spokane, Wash.), onto a Western polyvinylidene difluoride membrane (Schleicher and Schuell, Keene, N.H.). The membrane was blocked with 5% bovine serum albumin for 4 hours, and then replicates were incubated in either a 1:20 dilution of a pool of atopic sera obtained from subjects without peanut allergy or a 1:20 dilution of a pool of sera from patients with peanut allergy for 16 hours. The membrane was then washed four times with buffer containing 0.1% Tween 20 and incubated for 6.5 hours with iodine 125-labeled anti-IgE. The membranes were washed and dried, and autoradiographs were prepared.

The autoradiographs are shown in ■Fig. 1. The upper strip shows trace binding to the three peanut extract dots by the nonpeanut-allergic serum pool. The lower strip shows very strong binding to the peanut extract dots, strong binding to the extract of Flora cold-pressed peanut oil, and moderate binding to the extract of Hain cold-pressed peanut oil by the peanut-allergic serum pool. Trace binding to the extract of Spectrum cold-pressed peanut oil and weak binding to the extract of Mazola corn oil were observed. No binding was detected to extracts of Lifestream cold-pressed peanut oil or to any of the hot-pressed peanut oils, even with

extended exposures of the autoradiographs. In further control experiments the peanut-allergic serum pool used was shown to be unreactive with extracts of hot-pressed soybean oils. Peanut protein added to protein-free oil was recovered with a yield of about 60%. Protein was measured in the peanut oil extracts by use of the Coomassie dye binding method (Pierce Chemical Company, Rockford, Ill.).<sup>4</sup> In two different extractions the Flora oil contained 3.3 and 3.3 µg/ml of protein, the Hain oil contained 0.6 and 0.2 µg/ml, and the Mazola oil contained 0.8 µg/ml. Extracts of the other oils did not contain detectable amounts of protein as determined by the Coomassie blue binding method. IgE binding to the extracts of both Flora and Hain cold-pressed peanut oils was found to be positive and was inhibited by preincubation of the allergic serum pool with soluble peanut extract. The serum pool contained a specimen from a patient who was known to be highly allergic to grass and demonstrated a moderate reactivity with corn and other cereal allergens by RAST, confirming the blot results.

**FIG. 1.** Autoradiograph of dot immunoblots prepared from extracts of peanut oil. The upper blot (N) was incubated with a pool prepared with sera from atopic individuals without peanut allergy. The lower blot (A) was incubated with a pool of sera from individuals highly allergic to peanut. The dots are P<sub>2</sub>, 0.2 ml of 1:4000 peanut extract; p, 0.1 ml of peanut extract; 1, Flora cold-pressed peanut oil extract; 2, Hain cold-pressed peanut oil extract; 3, Lifestream cold-pressed peanut oil extract; 4, Spectrum cold-pressed peanut oil extract; 5, Happy Home peanut oil extract; 6, Planter's hot-pressed peanut oil extract; 7, Canada Packer's hot-pressed peanut oil extract; and 8, Mazola corn oil extract.



These studies confirm the previous reports<sup>1,2</sup> of the absence of detectable amounts of peanut allergen in high-temperature processed peanut oils. Bush et al.<sup>5</sup> demonstrated, by challenge testing with 1 ml doses, that soybean-sensitive patients could tolerate ingestion of a single brand of hot-pressed soybean oil and a single brand of cold-pressed soybean oil. However, in this study highly significant amounts of peanut allergen were found in two brands of cold-pressed peanut oil, and a trace amount was present in a third. A fourth brand appeared to be free of detectable allergen. Ingestion of the amount of allergen found in some of the cold-pressed oils could lead to anaphylactic reactions in highly sensitive individuals. Highly reactive individuals should avoid foods prepared in or with peanut oils, especially "health foods," which may be prepared with cold-pressed or unrefined peanut oil that may be contaminated with peanut protein.

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## Publishing and Reprint Information

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