What Is Honey? A Comparison of Honey from Iowa Beekeepers vs. National Store Brand Honey Using Pollen and Chemical Analyses

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Honey is a natural sweetener used for health and medicinal purposes, but it is considered one of the most adulterated food products in the world. Recent studies have yielded conflicting results on the levels of adulteration of imported honey in the United States. I collected 31 honey samples from 21 different Iowa counties and 20 honey samples from various national retailers and analyzed pH, water content, glucose content, and pollen density and pollen identification. The two honey groups (Iowa vs national brand) were different in pH, water, and pollen density ($P<0.05$), but not significantly different in glucose content. Only twenty percent of the national brand honey had detectable levels of pollen, with only a subset of the USDA certified organic honey products containing pollen. All Iowa honey samples contained pollen, with clover, soybean, locust tree, and basswood tree pollen being most common. Of specific interest was the finding that all Iowa honey samples contained soybean pollen, making up an average of 28% of the total pollen grains found in each sample. This research indicates that national brand honey often lacks pollen, an important component of honey that may be useful for allergies or other health benefits, and helps to identify the geographic origin of the honey. Additionally, the finding that all Iowa honey samples contained soybean pollen indicates that honey bee exposure to industrialized agriculture in Iowa (and other parts of the Midwest United States) is likely very high and merits further investigation. Lastly, more research on the chemical composition or contamination of honey is needed to determine levels of food adulteration and the best practices that should be used to detect adulteration or contamination.

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