

Brand preference may be in the drink, not in the head

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Those social drinkers who order super-premium vodka in every martini or vodka-and-cranberry, and disdain that default "well" liquor. Are they just vodka snobs, who pay \$60 for a bottle of a "tasteless" beverage that can't possibly taste much different than its \$6 counterpart? Or is there really a scientific basis for the differences that drinkers claim to taste in America's favorite hard liquor?

Scientists are reporting the first identification of a chemical basis for people's preference for certain brands of vodka, which outsells rum, gin, whiskey, and tequila. They found that vodka differs from simple water-ethanol solutions in ways that could alter vodka's perceived taste. Their findings appear in the American Chemical Society (ACS) [Journal of Agricultural and Food Chemistry](#).

Dale Schaefer and colleagues, who conducted the study, note that vodka has a long-standing reputation as a colorless, tasteless solution of 40 percent pure ethyl alcohol, or ethanol, and 60 percent pure water. All such beverages should have the same faint or undetectable taste. But sales of premium vodka brands have surged in recent years. Schaefer's group at the University of Cincinnati worked with colleagues from Moscow State University in Russia to find an answer.

They knew that famed Russian chemist Dmitri Mendeleev, noted for work on the Periodic Table of the Elements, made a key observation on alcohol solutions in his 1865 doctoral dissertation. Mendeleev believed that a solution of 40 percent ethanol and 60 percent water would develop

peculiar clusters of molecules, called hydrates. That solution became the global standard for vodka, which usually is sold as an 80-proof, or 40 percent alcohol, beverage.

A century later Nobel Prize-winning chemist Linus Pauling speculated that the hydrate clusters might consist of an ethanol molecule sequestered by a hydrogen-bonded framework of [water molecules](#).

The scientists used high tech instruments to analyze the composition of five popular vodka brands. They found that each vodka [brand](#) differed in its concentration of ethanol hydrates. Vodka drinkers could express preference for a particular structure. Drinkers actually may be perceiving this internal structure or structurability of vodka, rather than taste in a traditional sense, as the scientists note in their report:

"We began this discussion with the statement that vodka is a colorless, tasteless water-ethanol solution. So how do vodka drinkers develop brand preference? Our answer is structure. Beverages with low structurability are likely to be perceived as watery, because the fraction of water clusters is higher than in brands with high structurability. Beverages with high structurability, on the other hand, harbor transient cage-like entities where the ethanol molecule is sequestered by surrounding water molecules. At high alcohol content, clusters of alcohol molecules appear. . . These [ethanol](#) clusters undoubtedly stimulate the palate differently from either water or the $E \cdot 5.3H_2O$ cage structure. Even in the absence of 'taste' in the traditional sense, [vodka](#) drinkers could express preference for a particular structure."

More information: "Structurability: A Collective Measure of the Structural Differences in Vodkas", *Journal of Agricultural and Food Chemistry*.

Provided by American Chemical Society

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