

# Nutrition researchers develop the healthy beverage index

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A new Healthy Beverage Index developed at Virginia Tech may allow consumers to make more conscientious decisions about their daily drinking habits. Credit: Jim Stroup/Virginia Tech

Researchers at Virginia Tech have developed a new scoring method for assessing beverage intake, the Healthy Beverage Index (HBI). In a report published in the *Journal of the Academy of Nutrition and Dietetics* they describe how this tool can be used to more accurately evaluate dietary consumption of all types of fluids. They found that higher HBI scores

were associated with more favorable lipid profiles, decreased risk of hypertension; and, among men, better C-reactive protein (CRP) levels.

Water consumption is associated with numerous health benefits and beverage recommendations exist, but few have evaluated overall [beverage intake](#) quality. Beverage intake guidelines have been suggested and although the 2010 US Dietary Guidelines recommend "drinking water instead of sugary drinks," no tools existed that measure overall beverage intake quality.

"A Healthy Beverage Index (HBI), similar to the Healthy Eating Index, could be used to evaluate overall beverage intake quality and to determine if improvements in beverage intake patterns are associated with improvements in health," explained Kiyah J. Duffey, PhD, of the Department of Human Nutrition, Foods and Exercise, Virginia Tech University, Blacksburg VA. "A great deal of attention has been directed at sugar-sweetened beverage (SSB) intake, and a broader focus beyond just SSBs is needed."

Duffey and co-investigator Brenda M. Davy, PhD, developed the HBI, a 10-item scoring index that captures total energy from beverages, total fluid requirements, and recommended limits for beverage subgroups, such as low-fat milk, fruit juice, and alcohol. They weighted some components of the HBI more heavily because of their recognized contributions to good health, such as water contributing at least 20% of total fluid intake, and others less heavily, for example, consuming no more than 8 oz. of fruit juice.

Using dietary and health data from over 16,000 adults who participated in the nationally representative National Health and Nutrition Examination Surveys (2005-2010), Duffey and Davy calculated HBIs and correlated those with cardiometabolic risk factors such as obesity/overweight, hypertension, high fasting insulin, high fasting

glucose, high low-density lipoprotein (LDL) cholesterol, and high CRP. The HBI score ranges from 0 to 100, with a higher score indicating better adherence to beverage guidelines and a healthier beverage intake pattern in both men and women.

The average HBI score was  $63 \pm 16$  out of 100 for the sampled population. Their analysis considered age, sex, race/ethnicity, level of education completed, marital status, household size, total daily energy intake, and physical activity as possible confounding factors.

Duffey and Davy found that people with better HBI scores had more favorable cardiometabolic outcomes. Among normal weight males, a 10-point higher HBI score was associated with an average 36% lower odds of having a high waist circumference and 7% lower odds of having high CRP levels. For overweight/obese males, each 10-point increment higher in HBI score was associated with 4% lower odds of having high fasting insulin and high LDL cholesterol levels and 3% lower odds of having high total cholesterol. The odds of having high CRP were also lower with each 10-point higher in HBI score in this group. Irrespective of weight status, each 10-point higher HBI score was associated with 4% lower odds of having hypertension.

Among all females, regardless of weight status, each 10-point higher HBI score was associated with an average 4% lower odds of having high fasting insulin levels, an average 3% lower odds of high LDL cholesterol, an average 5% lower odds of having low high-density lipoprotein cholesterol, and an average 3% lower odds of having [hypertension](#).

For the "typical" person, there are three factors that lower the HBI score. SSB consumption of, for example, soda or a vanilla latte, deducted 15 points. More than 10% of daily energy requirements coming from beverages reduced the score by another 20 points. Finally, failure to

meet total fluid requirements lost another 3 points for the typical person.

Davy emphasized that, "There is flexibility in the system, and there are some beverage categories that an individual could choose not to consume at all, for example, diet sodas or alcohol, yet they would still receive the maximum number of points for that category."

The authors would like this technique to be developed into a rapid assessment tool that might be used online to provide patients, doctors, and dietetics practitioners with accurate consumption information that could be used to encourage better eating behaviors. Also, they will continue to refine the index over time as new information about healthy beverage choices becomes available.

**More information:** "The Healthy Beverage Index is associated with reduced cardio-metabolic risk in US Adults: A preliminary analysis," by Kiyah J. Duffey, PhD; and Brenda M. Davy, PhD ( DOI: 1010.1016/j.jand.2015.05.005 ), published online in the *Journal of the Academy of Nutrition and Dietetics*. [www.andjnl.org/article/S2212-... \(15\)00542-0/abstract](http://www.andjnl.org/article/S2212-... (15)00542-0/abstract)

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