Adjusting pH levels in drinking water may be key to combating the obesity crisis

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Obesity and health problems caused by high sugar content in drinks can be tackled by increasing the pH level and reducing the quantity of total dissolved solids (TDS) in water, according to research from the University of Sheffield, Innovate UK, De Montfort University and WET Global Ltd.

The research, which was conducted by academics from the University of Sheffield's Department of Materials Science and Engineering along with colleagues at De Montfort University, demonstrates that the standard method of cleaning water from a source creates an acidic medium for it with a pH of 6.1, and that sugar is mostly added to drinks to counteract the resulting salty and bitter taste.

Testing found that water becomes even more acidic when flavors, carbon and sugar are added—creating soft drinks with a pH level of 2.5. Existing techniques are unable to adjust the pH value of reverse osmosis water, so WET Global created its patented Activated Enhancement System (AES) technology.

This uses a proprietary process to mimic nature in order to create high pH/low TDS water. The AES produced alkaline water which doesn't fall below a pH of 9 after flavorings have been added, so added sugar isn't needed to counteract acidity.

The process has been found to have applications for soda soft drinks, zero alcohol beverages, Cannabidiol (CBD)-infused water and fermented drinks, with the AES technology available to drinks manufacturers, restaurants and other businesses that serve water or drink products to consumers.

Through testing performed by the University of Sheffield and De Montfort University, water created using the AES technology was found to have a stable pH of 10.5 and retain a pH greater than 9 when flavours were added. The drinks created maintained the higher pH and showed no microbial growth when exposed to 12 weeks of accelerated shelf-life testing at ambient and abusive temperatures of 20C and 30C. These drinks also contained less than 0.1g of sugar per 100ml.

Dr. Hajime Kinoshita from the University of Sheffield's Department of

Materials Science and Engineering conducted some of the testing alongside Dr. Theodore Hanein, a Research Associate in Materials Chemistry. Dr. Kinoshita said: "With 29 percent of adults classified as obese and thousands of children undergoing preventable tooth extractions, drinks manufacturers are looking to reduce the amount of sugar they use.

"WET Global had an interesting idea to achieve this, and we conducted research to gain scientific insight into the process in terms of materials interactions. Dr. Theodore Hanein and I looked at how materials interact with each other to make water more alkaline, and how we can sustainably repeat that process.

"We are pleased that WET has been able to develop this AES technology, which we hope will support the drinks industry to use less sugar."

Dr. Ahmed Abbas Mohamed, Director of Research and Development at WET Global, said: "We carried out the research to develop a method that creates drinks which do not need sugar or additives. To do this, we needed to find out why we add sugar in the first place. Realising that sugar is not used for flavor, but to cover up the loss of flavoring due to extreme acidity, was a big step—which set us on the path to developing the AES machine to solve the issue.

"Our research shows that the key to reducing sugar and additives from drinks and helping ease the global obesity crisis is producing drinks in the non-acidic environment. Providing a water source with a higher pH and lower TDS. The AES technology from WET Global has been designed to achieve this. Even after flavorings, carbon or even CBD is added, it maintains a higher, stable pH level and this technology is now being implemented by brands in the UK and abroad."

Kathryn Miller, Innovation Lead—Food and Nutrition, Innovate UK, said: "This research is a product of the Sustainable Agriculture and Food Innovation Platform (SAF-IP) in which Innovate UK, working in partnership with the Department for the Environment, Food and Rural Affairs and the Biotechnology and Biological Sciences Research Council, invested £90 million in innovation projects.

"With a rapidly growing global population, there is an increasing need for innovation if we are to meet the demand for more efficiently produced, healthier and traceable food. This competition sought to fund projects that enhance nutritional value and optimize food composition by reducing sugar, salt and fat, and increasing fiber. The publication of this research is a valuable output from this competition."

Provided by University of Sheffield