

An app knows if a beer has gone stale

May 19 2016



The team from the Complutense University of Madrid has developed a simple and inexpensive method to measure if the beer is stale. Credit: Orse

Chemists at the Complutense University of Madrid have developed a method that allows brewers to measure the freshness of beer using a polymer sensor that changes colour upon detecting furfural, a compound that gives aged beer a stale flavour. The sensor can be controlled via a smartphone app also created by the team.

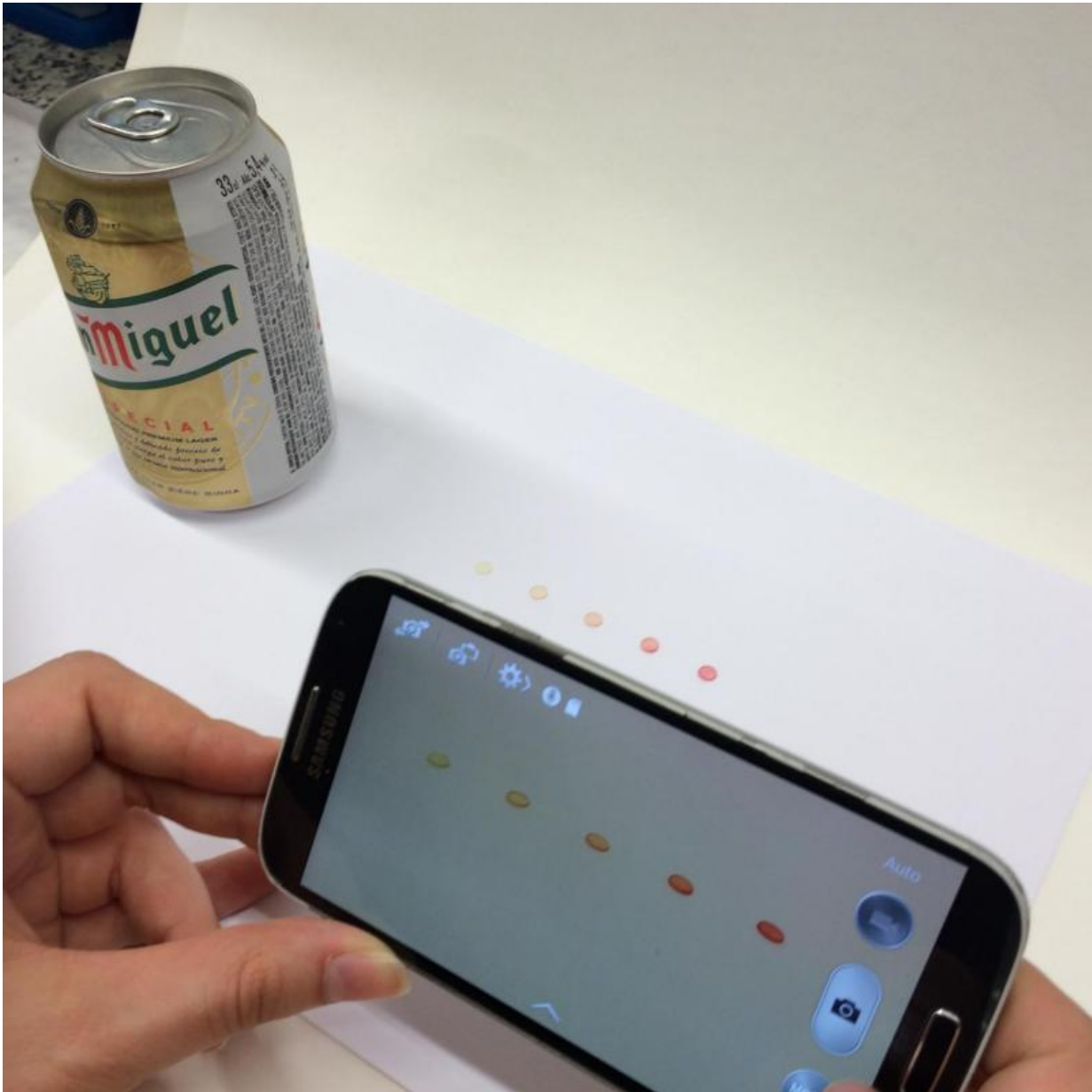
Beer is one of the most widely consumed alcoholic beverages in the world. The flavour of each brand is one of its most relevant quality standards. However, depending on the [beer](#) type and its storage conditions, flavour may be altered as a result of changes in the chemical composition produced during beer with a negative effect on the quality of the flavour.

Now, a team of chemists led by the researchers Elena Benito-Peña and María Cruz Moreno-Bondi from the Complutense University of Madrid (UCM) has developed a simple, low-cost method capable of measuring whether or not beer has gone stale, simply by using a sensor and a [smartphone app](#). The results of the study have been published in the journal *Analytical Chemistry*.

The researchers point out that up until now, brewers have measured furfural and other freshness indicators using methods based on chromatography techniques. "But these methods involve the use of expensive equipment and sample preparation is very time-consuming," Benito-Peña says.

Sensor discs

The system developed by the researchers consists of sensor discs that detect the presence of furfural in beer. These [sensors](#), made from a polymer similar to the one used to manufacture contact lenses, have been designed to change colour (from yellow to pink) when they come into contact with a beer containing furfural.



The team from the Complutense University of Madrid has developed a simple and inexpensive method to measure if the beer is stale. Credit: Orse

"We have incorporated an aniline derivative into the sensor material which reacts with the furfural and produces a pink cyanine derivative that allows us to identify the presence of the marker in the sample. The

intensity of the colour increases as the concentration of furfural in the beer rises and, thus, as more time passes since the beer was produced," explains the chemist.

The team has also created a mobile app for Android smartphones that, by analyzing a photo of the sensor disc, identifies the amount of furfural present in the beer. With this data, the degree of freshness can be determined.

The application is available as open source, meaning that any programmer can utilise and modify it to be used on other platforms. In the future, it will also be available for Apple IOS.

Results comparable to more sophisticated methods

Benito-Peña recounts that the idea of developing the new method came about following a meeting with Mahou-San Miguel in which the company spoke about the technical difficulties they were having in detecting furfural directly at the production facilities.

The results of the tests on the new system "have been very satisfactory," says the co-author. "The measurements have been taken using samples sent directly from the brewing company with different production dates and distinct degrees of aging. These same samples were also sent to a laboratory where they were analysed using gas chromatography coupled with mass spectrometry. The results we obtained were completely comparable," she says.

The method was initially developed for brewing companies. "The global market for this product is huge. But it can also be used with other food products such as honey, milk, coffee, etc.," says the researcher.

More information: Alberto Rico-Yuste et al. Furfural Determination

with Disposable Polymer Films and Smartphone-Based Colorimetry for Beer Freshness Assessment, *Analytical Chemistry* (2016). [DOI: 10.1021/acs.analchem.6b00167](https://doi.org/10.1021/acs.analchem.6b00167)

Provided by Plataforma SINC

Citation: An app knows if a beer has gone stale (2016, May 19) retrieved 12 May 2024 from <https://phys.org/news/2016-05-app-beer-stale.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.