



Testing times for professional beer tasters

FOOD CHEMISTRY

Pollution test takes aim at stale ales

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A TEST normally used to detect heavy metal pollution in water could soon be helping ensure the beer you buy is always fresh. By measuring concentrations of the chemicals responsible for the "cardboard" taste of stale beer, it will help to predict which batches are likely to go off before their time. So breweries will be able to ditch batches that could have a short shelf life.

As any home brewer knows, making beer can be a tricky process. Fermentation involves nurturing a warm reaction in which live yeast feasts on a malt liquor. But even under controlled conditions, the resulting brew can vary widely in taste. "Making beer is not like making a car, you don't always get the same product," says Aquiles Barros, an analytical chemist at the University of Porto in Portugal. Minute differences in the beer's composition can create

a beer that lasts 5 months rather than 9 – a huge problem for brewers and drinkers alike.

Today, breweries use human tasters to pick up hints of the "flavour notes" responsible for a beer's potential to spoil. For example, a chemical called (E)-2-nonenal causes the telltale cardboard taste of stale lager. But while beer tasters have hyper-sensitive palates, their views are subjective and variable.

Until now, tests sensitive enough to provide a more objective measure of the minute concentrations of the telltale chemicals have been too laborious and expensive. So Barros and his team developed an indirect test known as voltammetric analysis which is based on a technique used to find trace amounts of heavy metals in polluted water.

In their test, two electrodes dip into a simple vessel holding a concentrated distillate of the beer. By recording the way the current

passing between the electrodes varies in response to a changing voltage, they can measure the concentration of two key chemicals, acetaldehyde – an indicator of the presence of (E)-2-nonenal – and sulphur dioxide. Because both molecules accept electrons at a known rate, the pattern of the current gives a measure of the concentration of the substances.

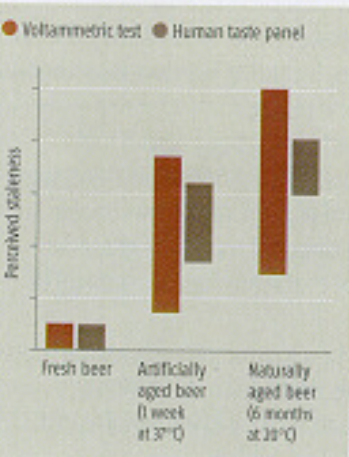
The team's measurements closely matched the flavour ratings of human tasters – and even appear able to detect a broader range of concentrations than human taste buds. But further tests against larger groups of tasters are needed to confirm this.

Barros hopes the technique will provide a cheaper and more reliable way of assessing a beer's flavour stability: "In 20 years, tasting may even be replaced by chemical analysis," he predicts.

But Bill Simpson, technical director at brewing technologist FlavorActiv in Chinnor, UK, doesn't believe beer tasters have anything to worry about. People can still detect certain compounds at super-low concentrations, he says, and the flavour of beer can be as complex as a glass of fine wine. "A typical beer has 500 taste and aroma compounds," Simpson says, noting that the new test looks at only two. ●

DETECTING STALE BEER

The voltammetric test appears to detect a broader range of concentrations than human beer tasters



Shark shocker

Surfers should soon have a safer ride thanks to a newly marketed idea from SeaChange Technology in Australia (03/026410). The surfer straps a cuff to an ankle. The cuff trails a plastic tail with two metal electrodes a metre apart along its length. Every 20 milliseconds a battery and pulse generator in the cuff send 2 millisecond-long pulses of electricity to the electrodes. This creates a pulsing field in the water behind the surfer, which sharks can't stand. SeaChange says this significantly reduces the chances of an attack from the rear.

Inspirational dressing

Swiss rolls hold the key to dressing gaping wounds, says drug giant Johnson & Johnson (GB 2382989). A thin sheet of polyurethane foam is wound into a spiral log, like a Swiss roll cake, before the foam has a chance to cure and set. This makes adjacent turns bond tightly together, holding the roll intact.

The roll is later cut to match the depth of a wound and gently pushed down into the wound cavity. As the foam absorbs the fluid secreted by the damaged tissue, it expands to fill the wound. Antiseptics and other drugs can be spread on the sheet before it is rolled and will seep into the wound as the foam gets wet.

Keep dabs on your mobile

Ordering airline or theatre tickets by keying in your credit card details on a cellphone is open to abuse, says NEC in Japan: the vendor can easily be deceived by a crook with a forged or stolen credit card (US 2003/0094648). They may even have stolen your mobile device, too. So NEC is designing a cellphone with a built-in fingerprint reader that ensures only the rightful owner can use the mobile and verify the purchase was in fact made by them.

Users press a finger on the sensor to inject their fingerprint image into a secure memory chip. When tickets are ordered, the cellphone encrypts the stored fingerprint and sends it down the line along with the credit card details. So when the person who ordered the tickets arrives to collect them, the ticket desk already has a stored fingerprint image that can be checked with a desktop sensor. Barry Fox