

Quick bacteria test for breweries, dairy bottlers

January 6 2015

To guarantee a high quality of their beer, breweries monitor the production process very closely. With a new polymer powder, this monitoring will be able to be faster and simpler in the future. Manufacturers can also test drinks such as milk, juice, cola and red wine with the quick check.

It tastes full-bodied and spicy, is tasty and is a welcome refreshment, especially in the hot summer months – Beer is very popular throughout the world. For brewers, a consistently high quality of the drink is essential. To ensure this, the companies try to keep the product free from harmful microorganisms. This is because pathogens that enter into the beer during the brewing process can spoil the pleasure of the drink. They not only provide strong variations in taste and smell; the beer can also become cloudy, sour and unwholesome.

Therefore, ongoing quality controls accompany the [production process](#). However, conventional microbiological methods require five to seven days to detect beverage-spoiling organisms, such as bacteria and yeasts. It is often too late at that point to take corrective action. In collaboration with the company GEN-IAL from Troisdorf, researchers at the Fraunhofer Institute for Applied Polymer Research IAP in Potsdam have developed a polymer powder that significantly simplifies these tests and shortens the time that they require. The company supplies breweries with analysis tools for [quality control](#).

From the test to the reliable result takes two to three days. The reason:

Until recently, beer has been filtered in special equipment. In this process, the bacteria remain on a membrane and are then elaborately cultivated in a special culture medium before they can be examined microscopically. The new polymer powder from the IAP replaces this process: The powder is added to the liquid sample. The powder's functionalized surface binds the bacteria efficiently. The pathogens adhere to the 100 to 200 micron powder particles. These can be easily removed along with the microbes in a specially developed system and analyzed directly using various microbiological methods. The time-consuming enrichment in a nutrient medium is no longer necessary.

Quality control of large quantities of beverages possible

With the new method, food experts can investigate beer and other beverages for infection by pathogens, which was hardly or not at all possible with the traditional membrane filtration method. "Membrane filtration is not suitable for the quality control of beverages such as fruit juices, milk, cola and [red wine](#). They contain so much solid or suspended matter that the filter clogs quickly," explains Dr. Andreas Holländer, scientist at the IAP. Breweries have also only been able to examine small sample volumes of up to one liter via membrane filtration. With the polymer powder, tests with 30 liters or more are possible. "Wherever a small amount of microbes has to be extracted from a large amount of liquid, the new technique can be useful," adds Holländer. "Through the use of the powder, food safety is increased, since it is more likely to find trace contaminants in large volumes of the beverages," says Dr. Jutta Schönling, managing director of Gen-IAL.

Also the equipment with which the surface of the powder particles is functionalized has been developed by Dr. Holländer and his team from the IAP. This equipment will now be used by the company GEN-IAL for

the pilot production. The launch is planned for 2015, and interested users will already be able to buy the powder in the spring of this year.

Provided by Fraunhofer-Gesellschaft

Citation: Quick bacteria test for breweries, dairy bottlers (2015, January 6) retrieved 6 May 2024 from <https://phys.org/news/2015-01-quick-bacteria-breweries-dairy-bottlers.html>

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