



## Application Note 4

# Rapid Microbiological Analysis and Hygiene Monitoring of Beer

Microbial spoilage of food and beverages results from the failure of hygiene procedures in production. It is often associated with an inability to monitor microorganisms at one or more stages in the food chain, from raw material production to consumption of the final product.

Quality Control procedures are important in the process of brewing to ensure that final product is of high quality (i.e. no spoilage, right flavour and consistent appearance of a brew associated with the brand) and safe for consumption (no contaminants of health concern).

Whilst microbial activity of brewing yeast is essential in the process there are a number of key organisms that are associated with contamination in the industry:

- **Lactic Acid Bacteria** (Lactobacillus, Pediococcus)
- **Acetic Acid Bacteria** (Acetobacter, Gluconobacter)
- **Gram Negative Anaerobic Bacteria** (Pectinatus, Megaspheera)
- **Wild Yeasts**

Every stage in the brewing process has a cost attached to it and brewers follow SOP's to ensure that the operating environment is clean and sterile. However, it is difficult to control microbial contamination as it's a slow process and can occur at any stage.

Identifying the microbial contamination is time consuming and expensive for the business. The time required for conventional tests can lead to substantial delays (anywhere from 7-10 days up to 3 weeks) in product release to the market. This leaves a manufacturer in a dilemma of either shipping the product before receiving results (with a risk of product recall should the results be returned as positive) or withholding stock until results are received (with an implication on cash flow).



Breweries are also affected by the downtime expense caused during the decontamination process of the equipment. Therefore a technology that has potential to save time, minimize costs and speed up microbial detection process is of great interest. A rapid detection would allow the brewer to take more immediate corrective actions.

Speedy Breedy® helps manufacturers to monitor microbial contamination faster throughout the manufacturing process complying with HCAPP procedures.

Speedy Breedy® is a highly sensitive, precision respirometer that is suitable for simple and safe screening of raw ingredients, process water and finished products. It provides contamination detection results in-house and significantly faster than standard laboratory techniques.

Speedy Breedy® from BACTEST®, St John's Innovation Centre, Cowley Road, Cambridge, CB4 0WS,  
UK [www.speedybreedy.com](http://www.speedybreedy.com) +44 01223 422312



Speedy Breedy® can be inoculated with a sample the moment it is taken from the source and testing can begin immediately, meaning there is no loss of time in transport of samples to a laboratory. Speedy Breedy® is a portable two chamber instrument which can test single or dual samples. The disposable culture vessels are engineered to maintain optimal microbial growth conditions and are pre-filled with general culture medium to detect a broad range of organisms or selective culture media to detect specific microbes.



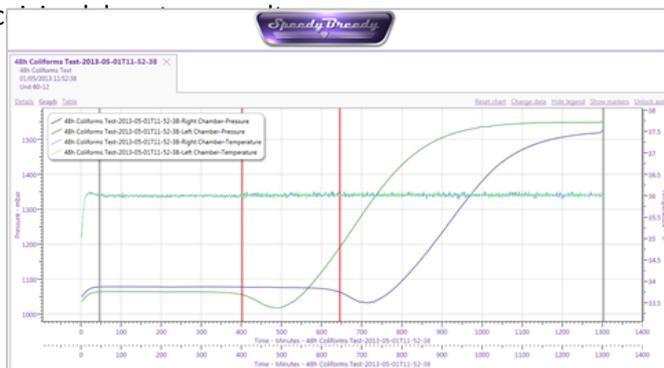
Tests can be performed on liquids, macerated solids or swabbed samples. In the event of a positive result (microbial contamination), Speedy Breedy® alerts the operator and corrective action such as decontamination and sterilisation procedures can commence immediately.

In confirming a negative result, where micro-organisms are either absent or if present are present within acceptable limits, Speedy Breedy® can provide confidence in the quality of the product to be shipped days in advance of receipt.

Speedy Breedy® can be used independently or connected to a PC. Using the PC, Quality Assurance managers can design and download pre-determined protocols to Speedy Breedy® and upload experimental results for analysis.

Speedy Breedy® also has a removable 16GB SD card for onsite work and can be operated by anyone.

Connecting Speedy Breedy® to a PC enables data visualization should there be a need to monitor tests in near real time.



Compact and weighing just 2.75kg, Speedy Breedy® is highly portable, easily stored and operates from a 12V DC mains adapter that is provided. All that is required is a flat surface on which Speedy Breedy® can sit.

#### You should use Speedy Breedy® if

- You test raw ingredients and finished products for contamination
- You test drinking water and process water for contamination
- You test for environmental sterility
- Waiting for test results means delays in shipping finished goods and ties up working capital

#### Benefits of using Speedy Breedy®

- Saves time and working capital
- Can be used by non-expert staff
- Test results are days faster than sending samples to a lab
- Can be used at the point where the sample is taken, even on the production lines [HCAPP procedures]
- Enables visualisation of microbial activity in near real time
- Technical support is available through out

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