

APPLICATION NOTE

Positive Result in Enrichment



Warning of problems in product quality

Growth of bacteria, yeasts or molds in routine control are advanced notice of product quality problems. But what is the damage potential? This is the essential question. Some bacteria or yeasts are proliferating in enrichment media while they are not able to grow in the beverage itself. So is this just a false alarm? Not at all – and not something you should ignore.....



The Problem

In the case of product contamination, prompt assessment of the actual risk is necessary to avoid an invasion of other batches. The best hint to localize its source is given by identification of the product spoilers followed by their specific back-tracing through the production line.

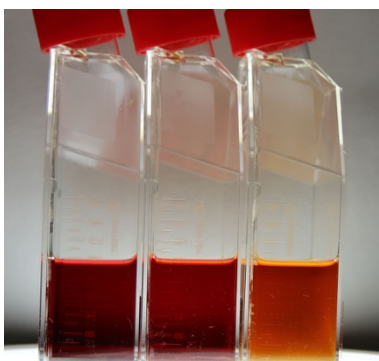
The Solution - Beer

In a brewery, positives are generally detected in enrichments. But from his experience the brewmaster knows that in enrichments some bacteria may grow up to detectable numbers more or less frequently, but there is no danger at any time for the product beer – the beer stays clean. Why?

In the closed container there are different conditions than in enrichment: There are barely no available nutrients in beer, there is no oxygen and usually storage is in a cool place.

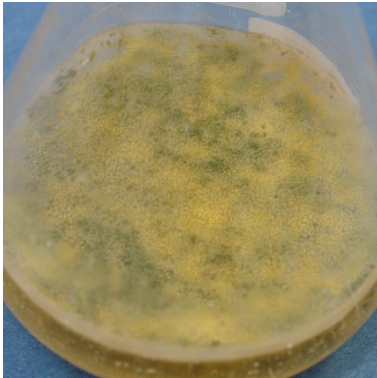
In contrast, beer spoilers find an optimized supply of nutrients in enrichment, and they are incubated at convenient temperature. The aim is to bring all potentially present microorganisms to proliferation within a short time to be able to reliably detect them. Therefore, you can always expect – provided that the analysis covers a representative volume – a higher detection rate of contaminations in enrichments than in the finished beer.

The results from routine control in a brewery are used to maintain the optimal hygiene status and to prevent growth of problem bacteria even within the production process. But nevertheless, the real beer spoiling bacteria should always be differentiated because only this type of result gives you knowledge about the actual product risk.



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Samples from routine control are controlled for beer spoilers by use of FastOrange® B media – positives are clearly detectable after 3-7 days by color change from violet to yellow. By PCR analysis, beer spoilers are detected at an even earlier stage – 3 days after sampling. Besides, positives in all types of enrichments as *lactobacilli* and *pediococci* can be further differentiated.

To us, it is especially important that we detect the real beer spoiling *Lactobacillus* species only which are covered with our PCR analyses and Detection Kits. A false positive result would do more harm than good to the brewer.

An example from practice is *Lactobacillus paracasei*, a non- beer spoiling bacterium which is regarded as part of the accompanying flora in breweries. Although *Lactobacillus paracasei* usually does not grow even in lightly hopped beers, this species is proliferating fast in different enrichment media and shows a similar appearance as *Lactobacillus casei*. These two species are hardly distinguishable, even in microscopic examination. Here the PCR analysis is really helpful: With our PCR Kits and the PCR analysis, a simple and precise differentiation between *L. casei* and *L. paracasei* is available. We can clearly determine from a sample if there is harmless accompanying flora or beer spoiling bacteria.

The Solution - Juice, Soft Drinks, Water

If bacteria, yeasts or molds occur in a product or during production, those must be differentiated as specifically as possible to allow causal research. As those are often microorganisms which are brought in with raw materials or from the production area, a broad spectrum of species may occur, and not all of those isolates can be tested by simple identification or screening analyses. The products often provide a rich nutrient supply so the growth limiting factors are only the lack of oxygen and – if applied – heat treatment.

Heat resistant bacteria as Alicyclobacillus or heat resistant molds are classified with our PCR Detection kits much easier and faster than with the traditional enrichment methods. The best way to identify isolates from the diversity of microorganisms which may occur in the periphery of a production line is the use of molecular biology analysis as DNA sequencing.

As a result of identification, our lab delivers besides the name of the microorganism also a history about its usual habitat together with data about appropriate destroying measures. This information is your fundamental base for risk assessment and for specific back-tracing actions through the production line. We also give advice about further steps to eliminate the spoilers and about suitable prevention measures for further batches.

In addition to the name of the product pests, our lab will provide you with a history of their occurrence and data on appropriate measures to kill them. We compare earlier findings from your plant with the current result and can thus create a history of the occurrence. This information provides you with a sound basis for risk assessment and specific traceability to the source of contamination. We also advise you on further steps to kill the pests and recommend prevention measures for future batches.