LightCycler **food**proof Beer Screening Kit

A New LightCycler Kit for the Detection of Beer-Spoilage Bacteria

Background Information

Breweries make continuous efforts to ensure the highest quality of their goods. To guarantee the consistency of product quality, the different stages of beer production are monitored for the presence of spoilage microorganisms. A spoiled beer can be identified by cloudiness due to organisms or precipitated proteins, or by off flavors.

In general, beer is a very difficult medium for microorganisms to grow in. It contains alcohol, carbon dioxide, bitter substances, and a low amount of oxygen – conditions that prevent growth or even survival of most organisms. Nevertheless, some microorganisms have adapted to these conditions.

Lactobacillus, *Pediococcus*, *Pectinatus* and *Megasphaera* are the most troublesome bacteria. From these genera, only a few species cause real damage to beer. Breweries have established many different methods to check for and to reduce potential contamination.

Most microbiological laboratories use conventional culture methods to detect the contamination. Beer samples are filtrated, and the filtrate is then transferred into a liquid and/or solid enrichment medium and finally incubated for several days (3 – 7 days). In case of a positive result, the laboratories perform additional analyses to identify the potentially harmful microorganism. The production needs to be kept on hold until the microbiological analysis is completed, which can take up to 14 days.

Table: Beer-spoilage bacteria detected by the LightCycler foodproof Beer Screening Kit

Lactobacillus	**Pediococcus**
Lactobacillus brevis	*Pediococcus damnosus*
Lactobacillus lindneri	*Pediococcus inopinatus*
Lactobacillus casei	*Pediococcus parvulus*
Lactobacillus paracasei	*Pediococcus claussenii*
Lactobacillus buchneri	*Pediococcus pentosaceus*
Lactobacillus parabuchneri	*Pediococcus acidilactici*
Lactobacillus coryniformis ssp. *coryniformis*	**Pectinatus**
Lactobacillus coryniformis ssp. *torquens*	*Pectinatus cerevisiiphilus*
Lactobacillus collinoides	*Pectinatus frisingensis*
Lactobacillus pentosus	**Megasphaera**
Lactobacillus plantarum	*Megasphaera cerevisiae*
Lactobacillus paraplantarum	
Lactobacillus perolens	

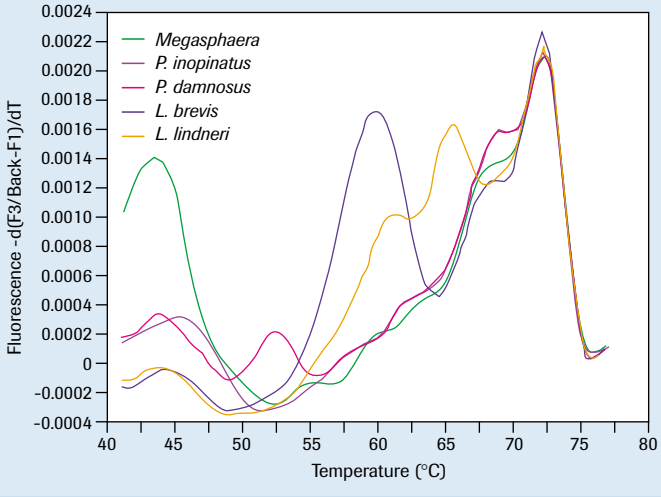

Figure 1: Identification of beer-spoilage bacteria via melting-curve analysis

As this time-consuming conventional procedure has negative economic consequences, there is a great demand for rapid tests. Such a test must detect all relevant beer-spoilage bacteria in a sensitive, specific, and convenient way. All these criteria are met by the recently introduced LightCycler **food**proof Beer Screening Kit.

Product Description

The LightCycler **food**proof Beer Screening Kit is supplied in a ready-to-use format. It includes all reagents necessary for the amplification and detection of DNA of the most relevant beer-spoilage bacteria (Table). Additionally, the LightCycler **food**proof Beer Screening Kit enables the identification of five of the most troublesome beer-spoilage bacteria via melting-curve analysis: *Lactobacillus brevis*, *Lactobacillus lindneri*, *Pediococcus*

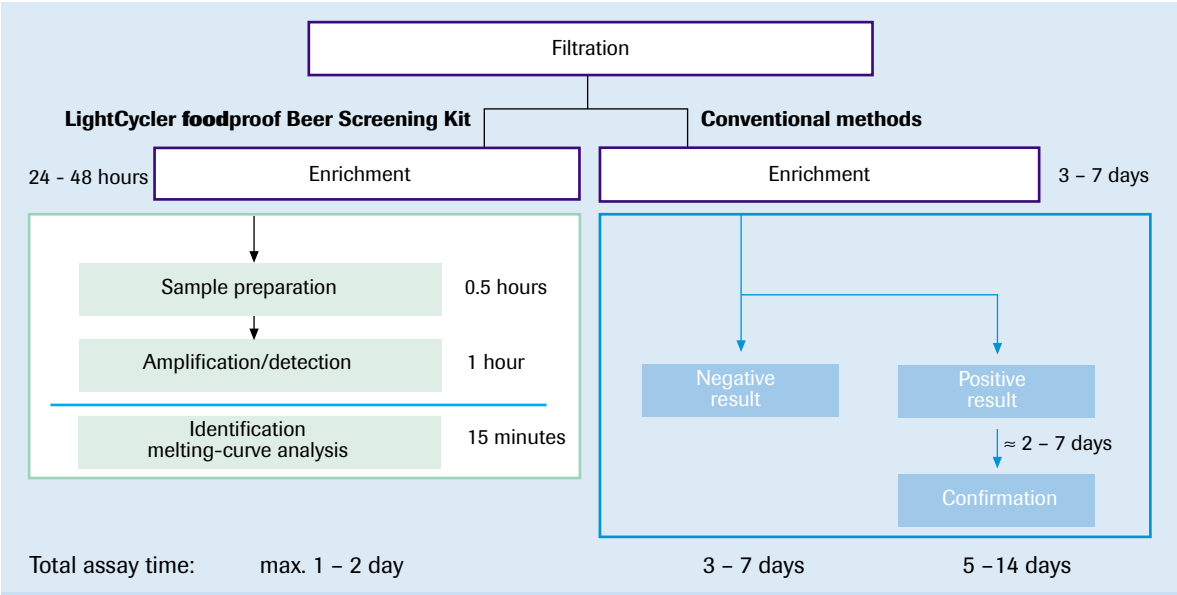

Figure 2: Detection of beer-spoilage bacteria using LightCycler real-time PCR is much faster than conventional methods.

damnosus, *Pediococcus inopinatus,* and *Megasphaera cerevisiae* (Figure 1).

Assay Procedure

The beer sample is filtrated and the filtrate is transferred into an enrichment broth to allow the contaminants to multiply up to approximately 1,000 cells/ml. Thus, false-positive signals from dead cells are omitted (for yeast and yeast-containing samples, an aliquot of the sample is transferred directly into the broth). Finally, the culture is centrifuged and the cell pellet is lysed using one of the three recommended sample preparation kits:

- ShortPrep **food**proof III Kit,
- High Pure **food**proof II Kit, or
- MagNA Pure LC DNA III Kit.

The isolated DNA and the LightCycler **food**proof Beer Screening PCR-Master Mix are mixed and transferred into the capillary. The LightCycler **food**proof Beer Screening PCR-Master Mix is a premixed and ready-to-use reagent which contains all components required for the amplification and the detection of the bacterial target DNAs.

Using conventional methods, screening results are obtained after at least 3 days when samples are free of contaminants, and after up to 14 days in cases where a positive result needs to be confirmed. In contrast, the whole procedure takes only 1–2 days using the LightCycler System. This includes the identification of the most important beer-spoilage bacteria, which requires only 15 minutes with the melting-curve analysis (Figure 2).

Summary

The demand for rapid detection of contaminants in beer is fully met by the LightCycler Instrument and the dedicated LightCycler **food**proof Beer Screening Kit. Beside the enormous time-savings compared with conventional methods, it offers highest specificity, sensitivity and ease-of-use. ■

Order INFO

Product	Pack Size	Cat. No.
LightCycler foodproof Beer Screening Kit	96 reactions	03 610 888 001
Short Prep foodproof III Kit	100 isolations	03 755 304 001
High Pure foodproof II Kit	100 isolations	03 358 054 001
MagNA Pure LC DNA Isolation Kit III	96 reactions	03 264 785 001