



Introduction

DNA sequencing is a molecular technique which can be used to identify bacteria and fungi (both yeasts and moulds). Knowledge of the identity of an isolate can provide insights into potential safety issues (e.g. whether the species has been involved in outbreaks) or spoilage issues (e.g. resistance to heat treatments or acid based preservatives), as well as possible sources of contamination. **Our sequencing service can provide an identification of a yeast or bacterial isolate in 6 hours for urgent isolates.**



Test details

All organisms contain deoxyribonucleic acid (DNA), a complex molecule which encodes all proteins necessary for that organism to function. DNA is made up of subunits (bases known as A, C, T and G) and it is the order of these subunits that carry the code for making proteins. DNA sequencing is a multi-stage analysis which determines the order of bases in a short fragment (300-500 subunits) of the DNA of an unknown organism. The analysis uses a conserved region of DNA (ribosomal DNA) found in all bacteria or yeasts which can be compared to a validated reference database to generate a percentage match with known organisms. A summary of the workflow for sequence analysis is shown below.

Extraction	DNA is extracted from cells
Gene Amplification	The target fragment to be sequenced is amplified to create many copies
Labelling	The bases along these fragments are labelled with fluorescent dyes
Automatic Sequencing	DNA is run on a capillary sequencer, which detects the fluorescent signals and determines the sequence of the DNA fragment
	Sequence is compared to a database to obtain an identification



Format of results

An example of the results format is shown in Table 1. This identification was of an organism isolated from a contaminated canned product.

Table 1. Example of 16S rDNA sequencing results

Analysis type	Test Details	Identification	Comment
16S rDNA Sequencing	Applied Biosystems 16S rDNA sequencing	<i>Geobacillus stearothermophilus</i>	Sequence for isolate gave 99.80% match with entry in the Applied Biosystems library.

The isolate in this example produced a 99.80% top match with *Geobacillus stearothermophilus*. This species is known to be resistant to heat treatments and produce acid, which indicates that the isolated organism is the most likely cause of product souring.



Contacts

For further information on this service please contact:

Dr. Suzanne Jordan tel 01386 842013
email s.jordan@campden.co.uk

Dr. Chris Baylis tel 01386 842073
email c.baylis@campden.co.uk

For more information and other services visit our website: www.campden.co.uk