

EXPLAINER: WHAT WE'RE TESTING FOR

The water quality samples that are collected weekly by the Regulator are then analysed for two types of bacteria, known as faecal indicator organisms (FIOs). These are *Escherichia coli* (*E. coli*) and **intestinal enterococci**. The samples collected throughout the bathing season are used to calculate a bathing water classification of 'excellent', 'good', 'sufficient' or 'poor'. This classification is an indication of the quality of the water.

E. coli and coliforms

E. coli is a species of bacteria of the genus *Escherichia*. It is a broad species, with many different strains, some of which can be harmful to human health. Many species of *Escherichia* are part of the gut microflora, and constitute of a wider group of microorganisms known as coliforms. Coliforms are commonly associated with the intestinal tracts of warm-blooded animals, and are therefore useful indicator organisms for the presence of untreated sewage in rivers. Specifically, *E. coli* are readily culturable under laboratory conditions. All *E. coli* are coliforms, however there are many other types of coliforms that are not *E. coli*.

Intestinal Enterococci

Enterococcus (plural Enterococci) is a large genus of bacteria containing many different species. They are also found in very high numbers in untreated sewage, and like *E. coli* are easy to culture in a laboratory. We test for the whole genus here, rather than one specific species like *E. coli*, because many genera of Enterococcus can be found in sewage.

We monitor both, rather than just one, of these bacteria as they represent two very functionally different types of bacteria. As such, they thrive under different conditions, and vary in factors such as time to disperse through the water column, time taken to die after entering the water from a sewage source, etc., depending on the conditions of the receiving water body. It is therefore useful to measure both so that we can be as accurate as possible when determining the presence of sewage through FIO contamination.

How are the water samples monitored

FIOs are analysed in a laboratory after sample collection. Water from the sample is filtered through a membrane filter, which allows the water to pass through but retains bacterial cells. The membrane is then placed on an agar plate (using MLGA media), containing food to encourage the cells to multiply and form colonies, which can then be counted and used to determine the number of cells in the sample. This gives a measurement expressed in Colony Forming Units (CFU) per 100 mL of filtered sample.

At SAS we use a UKAS accredited laboratory.

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