

Classification of bivalve harvesting and production areas

Background

Bivalve molluscan shellfish may be gathered from natural shellfish beds or cultivated in our coastal waters. Bivalves are a good source of protein and have been shown to have many [health benefits](#). For example, they provide a valuable source of omega-3 fatty acids and essential nutrients, such as selenium and zinc. They are considered to be very healthy foods.

The issue of food security has risen up the UK political agenda. To help meet the increasing demand for food, bivalve mollusc production from managed natural fisheries and cultivation, provides a good [sustainable form of food for us to eat](#), with very low impacts and increasingly recognised benefits to the wider environment.



Legislation to protect human health

Water quality, in terms of the bacteria and viruses present, affects the incidence of microbial contamination in shellfish. These bacterial and viral contaminants are derived usually from land-based sources, whose magnitude varies according to factors many of which are weather-related. Heavy rainfall tends to wash bacteria and viruses into rivers and estuaries, both from the land surface and, in particular, from Combined Sewer Overflows (CSOs). They may also be remobilised from deposited sediment during turbulent flow periods following rainfall.



Mussels filter feeding (© T. Strohmeier & Ø Strand)

As bivalve molluscs filter feed on planktonic marine algae from the water column, they will also filter bacteria and viruses, some of which may present a risk to human health. There is therefore legislation in place to protect shellfish consumers that ensures the shellfish sold into the supply chain meet strict food safety (health and hygiene) standards and that they are obtained from classified harvesting areas and production sites.

Classification of shellfish beds

Harvesting areas and production sites are classified on the basis of regular monitoring of *Escherichia coli* (*E.coli*) levels in the bivalve mollusc flesh. Because *E.coli* occurs naturally in the digestive tract of humans and animals, it is used as an indicator organism for the presence of faecal contamination. The classification awarded dictates any the post-harvest treatment that might be required.

Class	<i>E.coli</i> concentration threshold in bivalves	Sampling, assessment and required treatment
A	80% of sample results must be less than or equal to 230 <i>E.coli</i> per 100g flesh; AND no results may exceed 700 <i>E.coli</i> per 100g flesh.	<ul style="list-style-type: none"> • minimum of 10 samples required per year Shellfish can be harvested for direct human consumption.
B	90% of samples must be ≤ 4600 <i>E.coli</i> per 100g flesh; AND all samples must be less than 46000 <i>E.coli</i> per 100g flesh using a five-tube, three dilution.	<ul style="list-style-type: none"> • minimum of 8 samples required per year Shellfish can be supplied for human consumption after one of three processes: <ul style="list-style-type: none"> • purification in an approved establishment • relaying for at least one month in a classified Class A relaying area • an EC approved heat treatment process
C	≤ 46000 <i>E.coli</i> per 100g flesh	<ul style="list-style-type: none"> • minimum of 8 samples required per year Shellfish can only be sold for human consumption after completing one of three possible processes: <ul style="list-style-type: none"> • relaying for at least two months in an approved class B relaying area followed by treatment in an approved purification centre • relaying for at least two months in an approved class A relaying area • after an EC approved heat treatment process
Prohibited	>46000 <i>E.coli</i> per 100g flesh	Shellfish from areas with consistently prohibited level results must not be subject to production or harvested.

Further information on the annual classifications of shellfish harvesting areas can be found on the Food Standards Agency ([FSA](#)) and Food Standards Scotland ([FSS](#)) websites.

Who is involved in the classification process?

Centre for Environmental, Fisheries and Aquaculture Science (Cefas) provide a coordinating role for the microbiological and biotoxin monitoring programme on behalf of the FSA and FSS. It is usually the Local Authority Environmental Health Officer (EHO) who collects the official control monitoring samples, although in some circumstances, the samples can be collected in industry.

The samples are tested for their levels of *E coli* by designated [Official Control laboratories](#). Results are passed to CEFAS who then advise the FSA for England, Wales and Northern Ireland or Food Standards Scotland (FSS) for Scotland on the appropriate classification for a shellfish bed.

The FSA and FSS makes the final decision on the relevant classification on an annual basis using the previous 3 years of data. Once a site has been classified, rolling assessments are also undertaken that enable within year changes if required.

Marketing molluscan shellfish



Porthilly Pacific oysters (© Simply Oysters)

As a Food Business Operator (FBO) you have a legal duty to ensure the food you place on the market is safe. In order to protect human health, all molluscan shellfish must meet an end product standard of less than 230 *E coli* per 100g of flesh.

End Product Testing (EPT) helps demonstrate compliance with legal obligations, can add value to the product and may provide additional control over when bivalves are harvested and sold. Animals from Class B or C classified areas must be purified prior to human consumption through depuration, relaying to cleaner Class A water or cooking the bivalves. Animals that have been through an approved depuration unit should achieve a microbiological level of 40 *E.coli* or less per 100g of flesh.

It is worth noting that many businesses harvesting molluscan bivalve shellfish from Class A areas also hold them in a depuration unit before selling them into the food supply chain as a matter of 'due diligence'.

Always remember - If there is a risk of shellfish becoming contaminated, you must take appropriate steps to ensure that any placed on the market are safe. Effective end-product testing to ensure food safety is absolutely essential.