

Shellfish and food safety – what's new in oysters?

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Things normally move fairly slowly in the world of shellfish but that changed in 2009 with a series of high profile food poisoning outbreaks associated with the consumption of oysters, including the well reported incident at the Fat Duck restaurant in the UK.

This was by no means the only incident that year but received more publicity than most, probably due to the large number of people involved and the celebrity status of the proprietor, Heston Blumenthal.

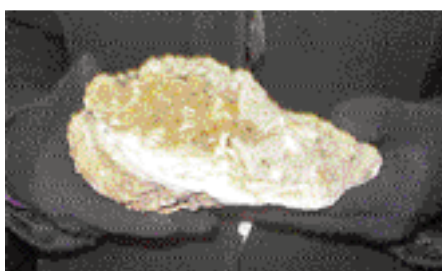
The Fat Duck outbreak, in particular, drew the attention of the regulatory authorities to a number of failings in the shellfish control system which was already very complex due to the inherent risks involved when eating raw, live animals (oysters) which have spent much of their life being bathed in water which may contain the effluent from one or more sewage treatment works. The incident highlighted the fact that although the producer and the retailer may both have well documented HACCP systems in place, serious ill health can still result.

Organism to blame

The organism to blame is norovirus which is the number one cause of gastrointestinal illness in Europe. This is normally spread directly from person to person or from contact with contaminated surfaces or objects but, once a person is infected with it, they will excrete it and it will pass into the sewage stream, into the river and eventually into the oysters feeding on their beds.

The current hygiene control system for live bivalve molluscs consists essentially of three main areas:

- A classification system for the waters from which molluscs may be harvested.
- A rigorous processing regime which may be either controlled cooking or depuration (purification in a stream of sterile water for a period of at least 42 hours). In the case of oysters eaten raw, the cooking option, obviously, is not relevant.



- A detailed traceability system to ensure that, in the event of an outbreak, the exact bed from which the shellfish were harvested can be identified (and closed if necessary).

The peak time for norovirus to be circulating in the general population is at the beginning of the year – January and February – which nicely coincides with the run up to St. Valentine's Day which is when most oysters are sold. Norovirus is not a notifiable disease, so no warning can be given by the Health Authorities of an increasing incidence as they will be unaware of this. The only advanced warning of a problem will be by way of reports in the local press recording the closure of schools or hospital wards due to norovirus.

It is known that high levels of norovirus are noticed in rivers just after incidents of high rainfall, particularly if the ground is frozen so that excess rainfall cannot soak in. These weather conditions are just the sort of thing that is commonly experienced in early February, so things do not look too good for St Valentine's Day – if you had oysters in mind!

Later in the year, when there is more

strength in the UV radiation from the sun, much of the norovirus will be deactivated before it gets too far down the river, but in January and February the sun is too weak to have much effect.

Classification

The water in shellfish harvesting areas is classified A-C (or 'prohibited') based on the results of regular sampling and testing for *E. coli* in the molluscs grown there. This gives a good indication of 'faecal pollution' in the water.

However, it has become apparent in recent years that the levels of *E. coli* present do not relate in any meaningful way to the levels of norovirus present. The sampling results may therefore be quite good but the oysters can still be a significant health risk. The statutory classification regime is set down in European legislation and cannot easily be changed.

There is no reason, of course, why oyster growers cannot take their own samples and submit them for norovirus testing, and some are now doing this.

However, the test is difficult and expensive and until recently there were only a couple of laboratories that could do the test. There is, though, still disagreement between the laboratories involved over the testing proto-

Continued on page 24

Continued from page 23

col and results will be quoted in different ways depending which laboratory you send your oysters to.

A committee is currently hard at work trying to produce a standard agreed protocol and test methods for determining norovirus in live bivalve molluscs which will be applicable across Europe.

But even if the oyster grower knows how much norovirus is in his oysters, he is then faced with another problem. How much is too much?

There is currently no established standard. So is it safe to assume that a low level of virus is acceptable? Or should the grower play safe and not harvest the oysters if there is any sign at all of norovirus in them?

At the moment the grower is left to make this decision for himself, knowing full well that the law prescribes dire penalties for those who place unsafe food on the market.

Depuration

The second line of defence against norovirus is depuration, the purification process molluscs go through, in which the molluscs are placed in tanks and subjected to a continuous stream of sterilised water for a minimum of 42 hours.

The water is sterilised by passing it across UV lamps and the basic principle is that the molluscs will continue to try and feed (but there is no food in the water) and in the process will excrete all the contaminants they initially had within them.

This process works very well for bacteria and it is easy to achieve *E. coli* counts of zero after depuration.

However, it does not work so well for viruses. Although some norovirus may be eliminated from the gut it is believed that some virus particles bind to the flesh of the oyster and are much more difficult to shift.

Strict control of the depuration process must be maintained for it to be effective at all. If the salinity of the water in the tanks is significantly different to that in the harvesting areas, the molluscs may go into shock and not feed.

If the water is too cold they will not feed. And if they do not feed, they will not excrete and purify themselves. If the water is disturbed, the material excreted by the molluscs may be resuspended and may recontaminate them. If the water is too turbid, the suspended particles may shield the bacteria and viruses from the UV and the water will not be adequately sterilised.

Since the Fat Duck incident various working groups have met with a view to advising growers, processors and retailers of the best ways to minimise the potential problems from norovirus in oysters which will be eaten raw.

As far as depuration is concerned, it is suggested that more norovirus would be eliminated if the oysters are depurated for considerably longer than the minimum time



and at elevated temperatures. Four to five days at about 18°C has been suggested.

This would have significant implications for the processor if this regime were to be adopted. Not only would it reduce the number of batches that could be processed per week, but it would also reduce the quality and viability of the oysters (remember, there is no food in these tanks so they would be slowly starving – they would no longer be the fat, juicy oyster the customer would expect).

The use of ozone as a water steriliser has also been suggested. This may overcome the shielding problem experienced with UV lamps, but it must not be allowed to come into contact with the oysters so, although it would effectively sterilise the water, it would not have any effect on the viruses which have bound to the oyster.

Skimmers or protein fractionators are another option. These will separate and skim off any suspended organic matter in the water to eliminate the risk of it recontaminating the oysters on the next cycle.

Whilst any or all of these innovations may help to reduce the viral load of the oysters, they are unlikely to eliminate the problem completely.

Minimising the problem

So what can be done at the retail or catering level to minimise the problem? The obvious answer is to cook the oysters. Thorough cooking will destroy the virus, but most people choose to eat their oysters raw. Where they are cooked this is often only a light grilling and norovirus has been observed to survive this process.

The oysters should be opened and maintained as individual oysters. That way any virus contamination is contained within the individual oyster concerned.

The practice in some restaurants is to shuck a batch of oysters into a bucket and then to return oysters to a shell for serving. With this technique there is the serious risk that if only one oyster is contaminated originally it will contaminate the whole batch and many more people are potentially put at risk.

Traceability is of vital importance in dealing with a problem before it becomes a major issue. Each container of oysters must be

accompanied by an indelible label stating the approval number of the dispatch establishment it has come from and a batch code.

This information, combined with records held at the dispatch establishment, should be sufficient to identify the individual bed the oysters were harvested from so, if necessary, the bed can be temporarily closed.

By law, these labels must be kept by the retailer for at least 60 days after package. This fact, however, does not seem to be widely known, and many labels are unavailable when an investigation is carried out, thus making it very difficult to take prompt action to prevent a small problem becoming larger.

Impossible traceability

Another practice which makes traceability impossible is that of some restaurants offering an 'oyster platter' consisting of two oysters from each of three different sources (for example two Cornish oysters, two Mersea oysters and two Irish oysters).

If the customer who eats this platter is subsequently ill, follow-up is virtually impossible, even if the labels have been retained.

Restaurants who offer a choice of oyster should therefore ensure that the customer chooses one or the other, not a mixed plate. A case has recently come to light of a supplier supplying oysters with no label in the package. In this case there is no guarantee that the oysters have been through a depuration plant at all. They should not be used as there is likely to be a significant risk of causing illness.

Effective and regular hand-washing by staff handling oysters is essential. The oysters should be handled as little as possible and kept separate from other foods and hands should be washed after handling the oysters before handling any other food.

As the Fat Duck incident highlighted, it is essential also to ensure that any staff who are ill themselves do not handle food until at least 48 hours after last showing symptoms.

Finally, if your customers complain that they have been ill after eating oysters, you must let your Local Authority know immediately. Tell them the approval number and batch number on the relevant label and they will immediately be able to contact the Local Authority for the dispatch/depuration centre. A temporary stop can then be put on using oysters from the implicated harvesting bed. Any delay puts more people at risk.

Some restaurants, when they become aware of a problem, engage private food safety consultants to carry out an investigation. This is fine, but the Local Authority must be informed as well so that action can be taken at the other end of the chain. The supply chain of oysters from growing beds to restaurant involves many links and it is rare that a norovirus problem can be successfully dealt with by tackling only one of those links. ■

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