

Food Safety and E.coli

A caterer's guide to preventing E.coli
food poisoning



E.coli

- The facts

This Blue Paper written by food safety expert, David Clarke, provides practical advice about the E.coli bug, where it comes from and how to control it.

What is E.coli?

Escherichia coli is just one of many bacteria that normally live in the digestive system of man and other animals. E.coli has been known for many years and most types of E.coli are quite harmless and may even be beneficial. But from time to time some strains cause illness and in the last ten years or so we have begun to recognise the particularly dangerous 'VTEC' strain. This stands for Verocytotoxin-producing E.coli after the toxin (poison) that makes it so dangerous. You may also see it referred to as E.coli O157.H7, which is the most common of the VTEC strains. For most people in Britain, VTEC first came to notice with the tragic outbreak in central Scotland in late 1996, but some were warning about it several years before.

Why should we worry about VTEC?

VTEC is still very rare. Other bugs like Salmonella and Campylobacter make tens of thousands of people ill every year. VTEC still only affects a few hundred. But three things mean that we can't ignore it:

1. It seems to be getting more common. No one really knows why, but the same is true all around the world.
2. It's very virulent. It needs only a small dose to make you ill.
3. It's dangerous. A VTEC attack is much more likely to have serious results. VTEC's toxin (poison) causes very unpleasant diarrhoea, but it can also progress to more serious conditions. Around 5% of cases and sometimes more develop a condition known as HUS, a life-threatening kidney disease.

What is especially tragic is that VTEC tends to attack the elderly or young children. HUS can condemn some children to dependence on kidney dialysis for the rest of their lives.

In the Scottish outbreak almost 500 were ill

- 127 so ill they were admitted to hospital
- 13 required kidney dialysis
- over 20 died

Many of those who ate the contaminated food were very elderly. Those who died ranged from 69 to 93 years. It must serve as a special warning to anyone involved in catering in residential homes for the elderly.

How does VTEC infect people

VTEC usually starts in the intestines of man and other animals, especially cattle and sheep. It can get into food through a number of routes. The most common contamination occurs in the slaughterhouse when careless dressing of the carcass splits the guts and contaminates the meat. Another factor may be dirty animals arriving at the abattoir covered in faeces due to overcrowding and stress during transport and in the holding pens. Most experts believe that a lot can be done in the slaughterhouse to reduce the amount of E.coli that gets into raw meat.

Even if meat is contaminated, it should still be safe if properly cooked. But many cases have resulted from under-cooking of foods especially meat products such as burgers. What's more, it's very easy to recontaminate meat after cooking. This appears to have happened in the Scottish outbreak where scientists found E.coli on equipment used for cooked meat. This included a boiler and a vacuum packing machine. The basic rule is to keep all raw meat away from ready-to-eat food.

So we should avoid butcher's shops?

Wrong! Other outbreaks in the UK and around the world have involved a wide range of foods. Foodservice establishments have often been at the centre of VTEC scares and several outbreaks haven't involved meat at all.

- In the USA 66 were ill and 1 child died after drinking apple juice. The juice producer picked some apples from the ground and cattle had been grazing in the orchard.
- In Birmingham, August 1997, dozens were affected after a wedding attended by several hundred guests. Lamb kebab was the cause of infection. Some surveys show more VTEC in lamb than beef.
- Several incidents in the UK have involved unpasteurised milk. Poor hygiene in the dairy allows contamination during milking. It's not just the meat of cattle that can become contaminated.
- 9 revellers at the 1997 Glastonbury Festival contracted E.coli from cattle that were grazing in the fields until shortly before the event.
- In Japan in 1996 nearly 10,000 were ill in a series of outbreaks. Early cases came from school meals catering. The food involved was a type of beansprout or radish sprout. So VTEC is not just a problem for meat eaters.

What about restaurants?

For many experts, the outbreak that put VTEC on the map happened in a chain of hamburger restaurants in America's Northwest. In 1993 VTEC struck diners in the "Jack in the Box" chain in Washington State. 500 were ill and 4 children died. It was usual to cook burgers medium-rare, which allowed some VTEC to survive cooking. US regulations now demand thorough cooking of burgers. The sight of children being killed by America's favourite food shocked the government into a radical overhaul of food safety controls. We have seen much the same in Britain after the Scottish outbreak.

So how can we control it?

Some of the answers remain a mystery. We don't really know how VTEC is getting into animals, and we don't know why it appears to be getting more common. The UK expert advisory committee (ACMSF) produced a detailed report on VTEC in 1995. The Pennington Report into the Scottish outbreak simply repeated some of the recommendations and both called for more scientific research into these questions. In the short term, both wanted tougher action to improve practices in abattoirs.

The US authorities have taken more drastic steps, making it illegal to sell raw meat containing VTEC. In 1997 one hamburger producer, Hudson Meats of Columbus, Nebraska was forced to withdraw one billion burgers. The UK Government hasn't gone that far, but since January 1998 DEFRA publishes a monthly report on the hygiene scores from every abattoir and meat cutting plant in Britain.

What can we do in foodservice operations?

Good basic food hygiene will control VTEC. This should include a 'hazard analysis' of your own range of foods and your own way of doing things. But the following controls are likely to emerge as the critical ones.

- Buy your food from reliable sources. The Meat Hygiene 'league tables' may help you to check on your meat suppliers. It may be even more important to check on your suppliers of ready-to-eat foods such as cooked meats and soft cheeses
- Cook food well, especially chopped meat products like burgers and kebabs. If you have a thermometer, they should reach about 75°C in the centre. There should certainly be no pink bits left in the middle.
- Keep food at the correct temperature. Either in a good chiller below 5°C or hot holding above 65°C. VTEC can strike with a very low dose, but it is even more dangerous if you let it multiply.

What about keeping raw and cooked foods separate?

There's no point in cooking food well if you're going to contaminate it again soon afterwards. You must protect all ready-to-eat food.

- Keep it away from direct contact with raw meat. For example, it would be best to store them in separate chillers. If you use the same chiller, keep them well apart
- Don't use the same work surfaces or equipment for raw and ready-to-eat foods, they will transmit bacteria. Always clean and disinfect equipment before you use it for ready-to-eat food
- Staff must not handle raw, then ready-to-eat food for the same reason. They must wash their hands, put on gloves, or use tools to handle ready-to-eat foods
- Never, never, allow staff to handle food if they are suffering from sickness or diarrhoea

Will we see tougher food laws?

Maybe. After the Scottish outbreak, independent expert advisors (ACMSF) told the Government that they already had enough controls in the existing legislation. What they needed to do was make sure that they were enforced. With the change in Government in May 1997 EHOs began to take a tougher line, and some 'higher risk' businesses are already being inspected more frequently. Government has put extra funds into enforcement and especially into accelerating the introduction of hazard

analysis, first in butcher's shops but later in other premises. Foodservice establishments are likely to be next on the list.

What about licensing?

The Pennington Report suggested one extra measure, the licensing of food premises. A business will not be allowed to operate without a licence, but you will only get a licence if you meet the hygiene conditions. And if standards slip, the EHO can withdraw the licence and stop you from operating.

Licensing of butcher's shops was introduced in 2000, and it looks certain to follow for all other food premises. This gives EHOs much stronger powers over food businesses, and what's more, you have to pay for the privilege through a licence fee. One licensing condition is to have your staff properly trained in food hygiene. Again, this is already a legal requirement.



What is hazard analysis?

Hazard analysis has been a legal requirement since September 1995. It recognises that every food business is different, and the law cannot tell you everything that you need to do to produce food safely. It is **your** responsibility to take a systematic look at **your** business and work out the controls that are important.

- Break your operation down into the individual steps from delivery of raw materials to service of the food
- Identify any hazards that can occur at each step
- Decide on ways to control them
- Set target for the controls
- Check that you achieve the targets whenever you prepare the food item

For example, to control cross-contamination your target may be to use colour-coded equipment for different foods, or to reserve separate parts of the storage chiller. Once everyone knows the targets, it only needs a quick visual check by a supervisor to monitor that they are being followed.

VTEC- key controls

- Buy your food, especially meat, from reliable sources.
- Cook meat properly. Cook burgers and other chopped meat products to about 75°C. There should be no pink bits in the centre.
- Keep food at the correct temperatures:
 - Chill- below 5°C
 - Hot- above 65°C
- Keep raw and ready-to-eat foods strictly separate:
 - Separate the storage areas, better still use separate chillers.
- Use different work surfaces and equipment.
- Don't let staff handle raw and then cooked foods. Either wash hands thoroughly in between, or use gloves, tongs or other tools.
- Always use clean equipment for ready-to-eat foods. And not just clean, but disinfected as well.
- Never allow sick staff to handle food.

David Clarke

David Clarke has worked in the catering industry for 25 years, most of that time spent in the Forte Group. He chaired the Food Technical Committee of the British Hospitality Association for nearly 10 years until 1997 and has also provided a food service viewpoint into a number of Government Advisory Committee, asked to report on the Salmonella and Listeria 'crisis'. And in 1994 he joined the Advisory Committee on the Microbiological Safety of Food (ACMSF) where he continues to this day. Recently he was invited to join the Department of Health's new Hazard Analysis Steering Group. He has contributed to several food safety guides for the industry, writes regularly in the trade press and is a frequent speaker at conferences and training courses.

For more information

On VTEC- see the ACMSF report on VTEC, ISBN 0-11-321909-1 from the Stationary Office. Tel: 0870 600 5522.

On Hygiene Regulations- Industry Guide to Food Hygiene Practice: Catering guide. From Chadwick House Group. Tel: 0207 827 6319. On hazard analysis in food service- S.A.F.E. from the British Hospitality Association. Tel: 0845 880 7744.

Other Foster Blue papers include:

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