

## **Fact sheet No 125: Escherichia Coli O157:H7 - July 1996 (WHO, 1996, 4 p.)**

*(introduction...)*

### **Escherichia Coli O157:H7**

- 1. What is Escherichia coli O157:H7?**
- 2. What illnesses does E. coli O157:H7 cause?**
- 3. Sources of infection**
- 4. Control and Prevention Methods**

### **The WHO Golden Rules for Safe Food Preparation**

- 1. Choose foods processed for safety**
- 2. Cook food thoroughly**
- 3. Eat cooked foods immediately**
- 4. Store cooked foods carefully**
- 5. Reheat cooked foods thoroughly**
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- 7. Wash hands repeatedly**
- 8. Keep all kitchen surfaces meticulously clean**
- 9. Protect foods from insects, rodents, and other animals**
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### July 1996

**The World health Organization regards illness due to contaminated food as one of the most widespread health problems in the contemporary world. In infants and the elderly, the consequences can be fatal. Protect your family by following these simple rules. They will reduce the risk of foodborne disease significantly.**

**For further information please contact the Food Safety Unit, World Health Organization, 1211 Geneva 27, Switzerland.**

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## Escherichia Coli O157:H7

### 1. What is Escherichia coli O157:H7?

***Escherichia coli* is a bacterium that is a common inhabitant of the gut of warm blooded animals, including man. Most strains of *E.coli* are harmless, however, some strains, such as *E. coli* O157:H7, can cause severe foodborne disease and are referred to as enterohaemorrhagic *E .coli* (EHEC). This pathogen produces toxins, known as verotoxins or Shiga-like toxins because of their similarity to the toxins produced by *Shigella dysenteriae*. The organism can grow from around 7-10C to 50C, with an optimum temperature of 37C. Some EHEC can grow in acidic foods, down to a pH of 4.4, and in foods with a minimum water activity (Aw) of 0.95. It is destroyed by thorough cooking of foods until all parts reach a temperature of 70C or higher. The designation "O157:H7" in the name of this bacterium refers to specific chemical compounds that are found on its surface that distinguishes it**

**from other strains of *E. coli*.**

## **2. What illnesses does *E. coli* O157:H7 cause?**

**Symptoms of the illness caused by *E. coli* O157:H7 include abdominal cramps and watery diarrhoea that can develop into bloody diarrhoea (haemorrhagic colitis ). Fever and vomiting may also occur and most patients recover within 10 days. However, in a small proportion of patients, particularly young children and the elderly, the infection can result in life-threatening complications, such as haemolytic uraemic syndrome (HUS), for example.**

**HUS is characterized by acute renal failure, haemolytic anaemia and thrombocytopenia. It is estimated that up to 10% of patients with EHEC infection may develop HUS, with a case-fatality rate ranging from 3% to 5%. The incubation period for the illness can range from 3 to 8 days, with a median of 3-4 days.**

## **3. Sources of infection**

**The reservoir of this pathogen appears to be mainly cattle. It is transmitted to man principally through consumption of contaminated foods, such as raw or undercooked ground meat products and raw milk. Faecal contamination of water and other foods, as well as cross-contamination during food preparation will also lead to infection. Examples of foods implicated in outbreaks of *E. coli* O157:H7 include hamburgers, fresh-pressed apple cider, yogurt, cheese, dried cured salami, and cooked maize. EHEC can survive and grow on salad vegetables.**

**Waterborne transmission has been reported, both from contaminated drinking water and from recreational waters. Person-to-person contact is an important**

**mode of transmission through the oral-faecal route. An asymptomatic carrier state has been reported, where individuals show no clinical signs of disease but are capable of infecting others. The duration of excretion of EHEC is about one week or less in adults, but can be longer in children**

#### **4. Control and Prevention Methods**

**The prevention of infection requires control measures at all stages of the food chain, from agricultural production on the farm, to processing, manufacturing and preparation of foods in both commercial establishments and the domestic environment.**

**There are insufficient data to recommend specific intervention methods on the farm in order to reduce the incidence of EHEC in cattle. Good hygienic slaughtering practices will reduce contamination of carcasses by faeces but will not guarantee the absence of EHEC from products. Education in hygienic handling of foods for abattoir workers and those involved in the production of raw meat is essential to keep microbiological contamination to a minimum. Similarly, prevention of contamination of raw milk on the farm is virtually not feasible but education of farm workers in principles of good hygienic practice is necessary in order to keep contamination to a minimum. The only effective method of eliminating EHEC from foods is to introduce a bactericidal treatment, such as heating (e.g. cooking or pasteurization) or irradiation.**

**Preventive measures for of *E.coli* O157:H7 infection are similar to other foodborne diseases. However, some of the measures may need to be reinforced for this infection, particularly because of the importance of EHEC infection in vulnerable**

**groups such as children and elderly.**

***Recommendations to the public and travellers***

- **Make sure your food, particularly foods made with ground beef (e.g. hamburger) are properly cooked and are still hot when served;**
- **Avoid raw milk and products made from raw milk. Drink only pasteurized or boiled milk;**
- **Wash hands thoroughly and frequently using soap, in particular after having been to the toilet, or after contact with farm animals;**
- **Wash fruits and vegetables carefully, particularly if they are eaten raw. If possible, vegetables and fruits should be peeled;**
- **When the safety of drinking water is doubtful, boil it or if this is not possible, disinfect it with a reliable, slow release disinfectant agent. These are usually available at pharmacies.**

**A WHO Guide on Safe Food for Travellers is available from the Sales and Distribution Office, Geneva, Switzerland, that gives practical advice for safeguarding health when travelling.**

***Recommendations to professional and domestic food handlers:***

- **As food handlers, you should be vigilant during the preparation of food and observe hygienic rules of food preparation (see the attached WHO**

## **Golden Rules for Safe Food Preparation).**

- **Professional food handlers who suffer from a foodborne illness, including *E.coli* O157 infection, should report to their employer immediately.**

**More information for food handlers is given in the WHO Guide on Hygiene in Food Service and Mass Catering Establishments.**

**Further information of Food Safety can be obtained at the WHO WWW Site (<http://www.who.ch/programmes/fnu/fos/gldnrIs.htm>) or E-mail at [foodsafety@who.ch](mailto:foodsafety@who.ch).**

**For further information please contact Valery Abramov, Health Communications and Public Relations, WHO, Geneva. Tel. (41 22) 791 2543, or Fax (41 22) 791 4858.**

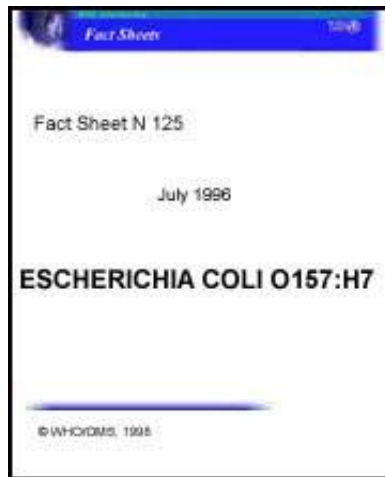
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## **The WHO Golden Rules for Safe Food Preparation**

### **1. Choose foods processed for safety**

**While many foods, such as fruits and vegetables, are best in their natural state, others simply are not safe unless they have been processed. For example, always buy pasteurized as opposed to raw milk and, if you have the choice, select fresh or frozen poultry treated with ionizing radiation. When shopping, keep in mind that food processing was invented to improve safety as well as to prolong shelf-life. Certain foods eaten raw, such as lettuce, need thorough washing.**

### **2. Cook food thoroughly**



**Many raw foods, most notably poultry, meats, and unpasteurized milk, are very often contaminated with disease-causing pathogens. Thorough cooking will kill the pathogens, but remember that the temperature of all parts of the food must reach at least 70C. If cooked chicken is still raw near the bone, put it back in the oven until it's done -- all the way through. Frozen meat, fish, and poultry must be thoroughly thawed before cooking.**

### **3. Eat cooked foods immediately**

**When cooked foods cool to room temperature, microbes begin to proliferate. The longer the wait, the greater the risk. To be on the safe side, eat cooked foods just as soon as they come off the heat.**

### **4. Store cooked foods carefully**

**If you must prepare foods in advance or want to keep leftovers, be sure to store them under either hot (near or above 60C) conditions. This rule is of vital importance if you plan to store foods for more than four or five hours. Foods for infants should preferably not be stored at all. A common error, responsible for countless cases of foodborne disease, is putting too large a quantity of warm food in the refrigerator. In an overburdened refrigerator, cooked foods cannot cool to the core as quickly as they must. When the centre of food remains warm (above 10C) too long, microbes thrive, quickly proliferating to disease-producing levels.**

### **5. Reheat cooked foods thoroughly**

**This is your best protection against microbes that may have developed during storage (proper storage slows down microbial growth but does not kill the**

**organisms). Once again, thorough reheating means that all parts of the food must reach at least 70C.**

## **6. Avoid contact between raw foods and cooked foods**

**Safely cooked food can become contaminated through even the slightest contact with raw food. This cross-contamination can be direct, as when raw poultry meat comes into contact with cooked foods. It can also be more subtle. For example, don't prepare a raw chicken and then use the same unwashed cutting board and knife to carve the cooked bird. Doing so can reintroduce all the potential risks for microbial growth and subsequent illness present prior to cooking.**

## **7. Wash hands repeatedly**

**Wash hands thoroughly before you start preparing food and after every interruption -- especially if you have to change the baby or have been to the toilet. After preparing raw foods such as fish, meat or poultry, wash again before you start handling other foods. And if you have an infection on your hand, be sure to bandage or cover it before preparing food. Remember too, that household pets -- dogs, birds, and especially turtles -- often harbour dangerous pathogens that can pass from your hands into food.**

## **8. Keep all kitchen surfaces meticulously clean**

**Since foods are so easily contaminated, any surface used for food preparation must be kept absolutely clean. Think of every food scrap, crumb or spot as a potential reservoir of germs. Cloths that come into contact with dishes and utensils should be changed every day and boiled before reuse. Separate cloths for**

**cleaning the floor also require, frequent washing.**

## **9. Protect foods from insects, rodents, and other animals**

**Animals frequently carry pathogenic microorganisms which cause foodborne disease. Storing foods in tightly sealed containers is your best protection.**

## **10. Use pure water**

**Pure water is just as important for food preparation as for drinking. If you have any doubts about the water supply, boil water before adding it to food or making ice for drinks. Be especially careful with any water used to prepare an infant's meal.**