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Office of
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Security

MSDS

MATERIAL SAFETY DATA SHEET - INFECTIOUS SUBSTANCES**SECTION I - INFECTIOUS AGENT****NAME:** *Escherichia coli*, enterohemorrhagic**SYNONYM OR CROSS REFERENCE:** Enterohemorrhagic *Escherichia coli* (EHEC), Verotoxin producing *Escherichia coli* (VTEC), Shiga toxin producing *Escherichia coli* (STEC)**CHARACTERISTICS:** Gram negative rod; motile, aerobic; produce Vero / Shiga toxins (VT/STx), 2 types, VT1/Stx1 and VT2/Stx2; serotyping to determine somatic and flagellar antigens**SECTION II - HEALTH HAZARD****PATHOGENICITY:** Hemorrhagic colitis, intestinal disease accompanied by cramps and abdominal pain; initially watery, followed by bloody diarrhea; low grade fever; last about 8 days; 5-10% of hemorrhagic colitis victims may develop hemolytic uremic syndrome (HUS); affects all ages, higher death rates occur in elderly and young; can cause thrombocytopenic purpura (TTP) in elderly**EPIDEMIOLOGY:** Sporadic and in outbreaks of bloody diarrhea; associated with 15-30% of patients where no other pathogen has been identified; main EHEC serotype in North America from infections is *E. coli* O157:H7**HOST RANGE:** Humans; animals (O157:H7 - piglets, calves and cattle)**INFECTIOUS DOSE:** Appears to have low infectious dose, may be similar to that of *Shigella* spp., 10 organisms by ingestion**MODE OF TRANSMISSION:** Ingestion of contaminated food (undercooked hamburger meat, unpasteurized milk); fecal-oral transmission; person-to-person transmission (extremely high)**INCUBATION PERIOD:** 2-8 days (median of 3-4 days)**COMMUNICABILITY:** Communicable for duration of fecal excretion (7-9 days); 3 weeks in one third of children**SECTION III - DISSEMINATION****RESERVOIR:** Infected persons, animals (sheep, goats, pigs, poultry, calves, cattle)**ZOONOSIS:** Yes - direct or indirect contact with infected animal and waste**VECTORS:** birds may be a vector

SECTION IV - VIABILITY

DRUG SUSCEPTIBILITY: Sensitive to a wide spectrum of antibiotics

SUSCEPTIBILITY TO DISINFECTANTS: Susceptible to many disinfectants - 1% sodium hypochlorite, 70% ethanol, phenolics, glutaraldehyde, iodines, formaldehyde

PHYSICAL INACTIVATION: Heat sensitive, inactivated by moist heat (121° C for at least 15 min) and dry heat (160-170° C for at least 1 hour)

SURVIVAL OUTSIDE HOST: Butter - up to 50 min; cream - 10 days; hamburger meat - survives well; does not survive long in slurry systems (innoculum of 10⁸ cfu/mL became undetectable after 9 days); survives well in contaminated feces and soil, only small reduction in organism number over 2 months

SECTION V - MEDICAL

SURVEILLANCE: Monitor for symptoms; confirm bacteriologically, DNA probe to detect Verotoxins VT1 and VT2

FIRST AID/TREATMENT: Electrolyte fluid therapy; antibiotics may be administered in very severe cases

IMMUNIZATION: None

PROPHYLAXIS: Not usually administered

SECTION VI - LABORATORY HAZARDS

LABORATORY-ACQUIRED INFECTIONS: 4 reported cases of laboratory infections with *E. coli* since 1981

SOURCES/SPECIMENS: Contaminated food (raw milk, hamburger, apple juice and water); feces

PRIMARY HAZARDS: Ingestion

SPECIAL HAZARDS: None

SECTION VII - RECOMMENDED PRECAUTIONS

CONTAINMENT REQUIREMENTS: Biosafety level 2 practices, containment equipment and facilities for activities involving cultures and infected clinical materials

PROTECTIVE CLOTHING: Laboratory coat; gloves when contact with infectious materials is unavoidable

OTHER PRECAUTIONS: Good personal hygiene and frequent handwashing essential

SECTION VIII - HANDLING INFORMATION

SPILLS: Allow aerosols to settle; wearing protective clothing, gently cover spill with absorbent paper towel and apply 1% sodium hypochlorite, starting at

perimeter and working towards the centre; allow sufficient contact time (30 min) before clean up

DISPOSAL: Decontaminate before disposal; steam sterilization, chemical disinfection

STORAGE: In sealed containers that are appropriately labelled

SECTION IX - MISCELLANEOUS INFORMATION

Date prepared: January, 2001

Prepared by: Office of Laboratory Security, PHAC

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Last Updated: 2001-09-27



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