

RECOMMENDATIONS TO PREVENT DISEASE AND INJURY ASSOCIATED WITH PETTING ZOOS IN ONTARIO

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Ministry of Health and Long-Term Care
Copies of this report can be obtained from
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Recommendations to Prevent Disease and Injury Associated with Petting Zoos in Ontario

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Introduction

While petting zoos are popular attractions, they can also be a source of infection and ill health for visitors. Zoonotic infections – those that can be passed from animals to humans – present a small, but real, risk.

All animals, including all domestic, wild and exotic animals can be sources of zoonotic infections.

Recent U.S.A. surveys show that many people visiting petting zoos simply are not aware of the health risks of animal contact and fail to take simple hygienic precautions to minimize their risk of infection.¹ These voluntary recommendations offer effective ways to minimize the risk to human health and safety from contact with animals. They are aimed at all those responsible for ensuring that these events pose the minimum possible threat to public health and safety, such as public health officials, petting zoo operators, farmers and veterinarians. They are intended as an educational tool and will be updated as warranted.

These recommendations primarily focus on human contact with animals at petting zoos. However, the infection control principles may be useful for most situations where the public contacts animals. The supplement for education and childcare services includes ways to reduce the risk of contact with animals temporarily or permanently displayed in schools and childcare centres (Appendix B).

Although these recommendations are not specifically aimed at the general public, the information can be adapted for public education materials.

Background

Animal exhibits have been associated with numerous human disease outbreaks in Canada, the U.S.A., the United Kingdom, Australia and Japan.

In Canada, a 1999 large outbreak of *E. coli* O157:H7 in Ontario's Middlesex-London Health Unit was linked to a petting zoo at a local fair.² In 2003, British Columbia experienced an outbreak of *E. coli* O157:H7 that was linked to school and daycare visits to a petting zoo at a local farm.³

In the U.S.A., more than 25 outbreaks were associated with animal exhibits in the decade 1990-2000.⁴ Pennsylvania, Washington and Minnesota had outbreaks of *E. coli* O157:H7 associated with farm visits between 2000 and 2001. Petting zoos were linked with outbreaks of *E. coli* O157:H7 in North Carolina in 2004 and Florida in 2005.

Wisconsin had a *Salmonella* outbreak associated with swine contact in 2005.^{5,6,7} Not all animal exhibit outbreaks were linked to direct animal contact. For example, a 1996 *Salmonella* outbreak in Colorado was linked to a contaminated wooden barrier at a zoo Komodo dragon exhibit and a 2001 *E. coli* O157:H7 outbreak at a fair in Ohio was linked to contact with an environment in which animals were exhibited the previous

week.⁵ Studies of sporadic cases of *E. coli* O157:H7, *Campylobacter* and *Cryptosporidium* also have identified farm visits as a significant risk factor for infection.⁵

Although intestinal pathogens, such as *Salmonella* and *E. coli*, account for many of the large outbreaks resulting from exposure to animal exhibits, many other zoonotic diseases, such as rabies, psittacosis, Q fever, orf and ringworm, present a risk. (see Appendix A: Index of Zoonoses)⁶

Definitions

Animal area – An area where public contact with animals is encouraged. Visitors may either be comingling with animals, or reaching into corrals to pet the animals.

Immunocompromised – A person with a reduced immune system, such as persons with human immunodeficiency virus/acquired immunodeficiency syndrome, without a functioning spleen, or on immunosuppressive therapy.

Non-animal area – An area where no animals are permitted, except service animals.

Petting zoo – This term is used to encompass all events where contact with animals is encouraged, such as a petting zoo, petting corral or open farm.

Recommendations – Material for informational and educational purposes. Unless otherwise indicated, these are not meant to reflect specific legislative requirements.

Reportable disease – A human disease specified as a reportable disease in Ontario pursuant to Regulation 559/91 (Specification of Reportable Diseases) made under the *Health Protection and Promotion Act (HPPA)* which is available at: http://www.e-laws.gov.on.ca/Download?dDocName=elaws_regs_910559_e

Zoonoses – Infections that can be passed from animals to humans.

Key Recommendations for the Prevention of Illness and Injury

- High-Risk Groups
 - Immunocompromised persons and infants under one should avoid touching or feeding any animals.
 - Children under five should not come in contact with reptiles, amphibians, birds, young ruminants or their immediate environment.
- Visitor Education
 - Petting zoo operators should post signs that are reminders to wash hands at exits from animal areas and in non-animal areas where food is served and consumed.
 - Education materials should be age and language appropriate.
- Operation of the Exhibit

Petting zoo operators should:

 - Assign trained staff in animal areas to monitor public activities and encourage appropriate human-animal contact.
 - Maintain proper visitor flow to avoid overcrowding at hand hygiene facilities or in animal areas.
- Hand Hygiene
 - Hand hygiene facilities (i.e., hand-washing facilities or alcohol-based hand-sanitizers) should be located at every exit from animal areas.
- Petting zoo operators should ensure hand hygiene facilities are accessible to children and persons with disabilities, and are routinely cleaned and restocked.
- Facilities

Petting zoo operators should:

 - Use barriers, gates, and signs to discourage uncontrolled access to animals and animal areas.
 - Establish well-defined and clearly labeled transition areas between animal areas and other areas.
- Cleaning

Petting zoo operators/staff should:

 - Promptly remove manure and soiled bedding from animal enclosures.
 - Where feasible, clean, rinse and disinfect animal areas at least once daily.
 - When disinfection is not possible (i.e., wooden rails, natural flooring), remove fresh organic material regularly to prevent build-up.
 - Thoroughly clean, rinse and disinfect all areas where animals have been displayed before those

areas are used for future public (nonanimal) events.

- Food and Beverage Consumption
 - Food and beverages should be prepared, served and consumed only in non-animal areas. Animal areas should be well-defined, separate areas, with food outside the boundaries of these areas and hand hygiene facilities provided in between.
 - Operators should not allow food, beverages, smoking, toys, pacifiers, spill-proof cups (“sippy-cups”), and baby bottles in animal areas.
- Animal Care and Management
 - Petting zoo operators should work with a veterinarian to develop a preventive care program, including vaccination and parasite control, for displayed animals.
 - All mammals, for which vaccine use has been approved by a veterinarian, should be vaccinated against rabies unless they are

accessible only by those responsible for their care.

- Develop a process for dealing with ill, injured or distressed animals, which should include isolation from other animals and the public, and appropriate veterinary care.
- Injury Prevention and Control
 - Any animal bite or other animal contact that may result in rabies in persons must, by law, be reported immediately to the local Medical Officer of Health.

Petting zoo operators should:

- Ensure first aid facilities are well stocked and conveniently located to staff and the public.
- Develop written procedures for dealing with injured people and escaping from enclosures
- Train staff in these procedures

Risk Analysis of Disease Transmission

Factors that increase risk – animals and displays

- Animal stress – through factors such as overcrowding – can contribute to increased shedding of disease-causing agents.
- Time of year – animals are more likely to be shedding certain agents (e.g., *Salmonella*, *E. coli* O157:H7) in the summer and fall.

- Animal age – young animals may shed more disease-causing agents than adults. Displays of birds, reptiles and amphibians, because they shed more of certain disease-causing agents than other animals.
- Inadequate staffing and lack of supervision.
- Inadequate hand hygiene facilities.

Factors that increase risk – visitors

- Not washing, or improperly washing, hands after animal contact. Lack of child supervision.
- Touching hands to the mouth – through activities such as thumb-sucking, smoking and eating, and the use of pacifiers – in proximity to animals.
- Lack of knowledge about the risk factors of human-animal contact.

High Risk Groups

- Pregnant women and the elderly, because they may have reduced immunity. Children under five, because they have immature immune systems and may engage in inappropriate behaviour.
- Immunocompromised persons: persons with suppressed immune systems due to immuno-suppressive drugs or disease.
- The cognitively impaired because of potentially high-risk behaviour.

Those at high risk – or those supervising them – should be informed through signs, handouts and/or staff to wash their hands thoroughly and frequently.

IMMUNOCOMPROMISED PERSONS AND INFANTS UNDER ONE HAVE INSUFFICIENT IMMUNE SYSTEMS. IT IS RECOMMENDED THAT THEY AVOID TOUCHING OR FEEDING ANY ANIMALS.

Children under five should not come in contact with reptiles, amphibians (frogs and toads), birds, young ruminants (i.e., under six months old) or their immediate environment, because these animals shed proportionally more disease-causing agents.

- Events that are open to children of all age groups should not display these animals such that they, or their immediate environment, can be contacted.

Recommendations

Before and After the Event

- Public health officials should make available copies of this document, or a similar document incorporating these principles, to petting zoo operators, farmers, veterinarians, education and childcare services, or other interested persons.
- Petting zoo operators should verbally notify the local health unit of the event prior to or upon opening. They should supply the health unit with two methods for contacting them, and this contact information should be valid for at least 30 days after the event.
- Local public health officials, public veterinary officials and/or veterinarians may inspect petting zoos to ensure they do not present a risk to public health.
- Public health officials should encourage physicians to request stool samples for analysis from patients who show signs of intestinal illness following contact with animals at a public event. This will help the health unit during its investigation of the intestinal illness.
- Public health officials should ask about animal exposure when investigating cases of a zoonotic reportable disease.

Visitor Education

Petting zoo operators should:

- Become familiar with the health risks of direct and indirect animal contact and how to reduce these risks. Operators should be able to explain risk-reduction measures to staff and visitors.
- Produce educational materials, such as signs, handouts, and stickers, and make them available to the public prior to visits or before entering the site.
- Provide information in a simple and easy-to-understand format that is age- and language-appropriate. Use pictures or multiple languages as required so the information can be understood by all visitors.
- Consider sending pre-visit information to schools on how to safely interact with animals.
- Post signs that are reminders to wash hands at exits from animal areas and in non-animal areas where food is served and consumed.

Signs, handouts and/or staff should:

- Inform visitors they are entering an animal area.
- Alert high-risk groups: to wash their hands thoroughly and frequently, and that immunocompromised persons and infants under 1 should avoid touching or feeding any animals.
- Instruct visitors not to eat, drink, smoke, or place their fingers in their mouth until they have left all animal areas and washed their hands immediately after leaving these areas.

- Direct visitors to hand hygiene facilities.
- Provide hand hygiene instructions at hand hygiene stations to encourage proper practices.
- Instruct visitors not to take strollers, wheelchairs, food, beverages (including water bottles), toys, pacifiers, spill-proof cups (“sippy-cups”), and baby bottles into animal areas. Operators should establish a holding area for these items.
- Instruct visitors to immediately inform event staff of any injury caused by displayed animals.

(see Appendix C for sign examples)

Additionally, signs/handouts/staff may instruct visitors:

- Not to kiss the animals or wipe hands on clothing.
- To keep their children from placing fingers in mouth until they have left animal areas and washed their hands.
- That objects such as clothing, shoes, and stroller wheels can become soiled and serve as a source of germs after leaving an animal area.
- To visit their doctor as soon as possible and report recent animal exposure if they are injured by a display animal or suffer from diarrhea, nausea, or vomiting within a month of contacting a display animal.
- That in addition to informing event staff, they should inform their local health unit if they have been bitten or scratched by an animal.
- To cover open wounds before entering an animal area.
- To walk calmly and quietly through the animal area.

Operation of the Exhibit

Petting zoo operators should:

Assign trained staff in animal areas to:

- Monitor public activities and encourage appropriate human-animal contact.
- Identify and remove potential risks for visitors (e.g., by promptly cleaning up wastes).
- Process reports of injuries.
- Explain the reasons for the recommendations on signs or in handouts.

Maintain proper visitor flow to avoid overcrowding at hand hygiene facilities or in animal areas. Overcrowding may lead to unwanted animal exposure and injuries.

Instruct caregivers and staff to supervise children to:

- Discourage hand-to-mouth contact.
- Prevent contact with manure or soiled bedding.
- Encourage proper hand hygiene.
- Prevent them from feeding unauthorized food to the animals.

- Ensure they do not hit, torment, chase or otherwise harass the animals.
- Consider having staff vaccinated against rabies.

It is recommended that operators maintain a logbook of critical areas, such as: how secure enclosures are, when areas were last cleaned, when supplies were replenished, any animal-visitor incidents, and overall animal health.

Petting zoo operators are required to comply with applicable provisions of the *Occupational Health and Safety Act* and its Regulations. Contact your local Ministry of Labour office for more information. A list of offices may be found at:

http://www.labour.gov.on.ca/english/about/reg_offices.php

Hand Hygiene

Proper hand-washing

- Wet your hands with warm running water.
- Lather your hands with soap for 15 to 20 seconds.
- Rinse hands thoroughly and pat dry with a paper towel.
- Use the paper towel to turn off tap.

Additionally, petting zoo operators should:

- Train staff in proper hand-washing technique.
- Request staff/adult visitors to supervise/assist children to ensure their hands are washed properly.

Proper use of alcohol-based hand-sanitizers

- Ensure hands are visibly clean. Alcohol-based hand-sanitizers are not as effective if visible dirt is on the hands.
- Apply a loonie-sized amount (1-2 pumps) onto one palm.
- Spread over all surfaces of hands.
- Rub hands until product is dry (at least 15-20 seconds).
- Do not smoke while applying the product and until hands are dry because alcohol-based handsanitizers are flammable.
- Alcohol-based hand-sanitizers must contain at least 60% alcohol to be effective.
- Baby wipes can be used to remove visible contamination and dirt, but do not contain enough alcohol to be effective disinfectants.
- Wet wipes can be used but note that not all wet wipes have the 60% alcohol content necessary to be effective disinfectants.

- Caregivers should supervise children using hand-sanitizers, and store the hand-sanitizer out of children's reach.

Hand hygiene facilities

Hand hygiene facilities (i.e., hand-washing facilities or alcohol-based hand-sanitizers) should be located at every exit from animal areas.

Petting zoo operators should:

- Provide sufficient hand hygiene facilities for the maximum anticipated attendance.
- Position staff near exits to encourage compliance with hand hygiene.
- Ensure hand hygiene facilities:
 - Are accessible to children and persons with disabilities.
 - Are routinely cleaned and restocked.
 - Display a hand hygiene sign (see Appendix C for example).
- Equip hand-washing facilities with:
 - Potable running water
 - Liquid soap dispensers
 - Paper towels
 - An adequate waste container
- Ensure hand-washing facilities:
 - Have sufficient water volume and pressure to remove soil from hands.
 - Have faucets that allow both hands to be free for washing by having automatic shut-off faucets that flow for at least 20 seconds per cycle, or faucets operated by a foot-pump system.
 - Have hot water, if available. If this is not possible, provide a soap that lathers easily in cold water.
 - Employ a waste-water retention and disposal system that cannot be accessed by the public.
 - Do not use communal hand-washing basins.

In cold weather if mittens/gloves are worn during animal contact, operators should instruct visitors to wash them as soon as possible and apply hand-sanitizer or thoroughly wash their hands after removing the gloves and before eating.

Facilities

Petting zoo operators should:

- Use barriers, gates, and signs to discourage uncontrolled access to animals and animal areas.

- The design of facilities might include double barriers, with 3 ft (1 metre) between each barrier, to discourage contact with animals or contaminated surfaces except for specified interaction areas.
- Clearly designate entrances and exits of animal areas.
 - Establish transition areas between animal areas and other areas.
 - Transition areas should be well-defined and clearly labeled. One way visitor flow is preferred with separate entrance and exit.
 - Equip entrance areas with information on preventing infection or injury (see 'Visitor Education' section), and equip exit areas with hand hygiene instructions and facilities.
- Ensure drinking water is safe:
 - Install back-flow prevention devices on all faucet/hose connections and between livestock area outlets and other water lines.
 - Maintain an air gap between the hose/faucet and container to prevent back-flow when filling troughs and buckets.
 - Label hoses accessible by the public as: "*Not fit for human drinking*".
 - These recommendations do not include the drinking water requirements outlined in Ontario Regulation 170/03 (Drinking-Water Systems) or 252/05 (Non-Residential and Non-Municipal Seasonal Residential Systems that Do Not Serve Designated Facilities) made under the *Safe Drinking Water Act, 2002*. Please refer to the Ministry of the Environment and Climate Change website at <https://www.ontario.ca/page/drinking-water> for more information regarding drinking water requirements.

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- Restrict public access to animal feed and water (except that supplied specifically for visitors to feed to the animals).
- Where possible, design floors for adequate drainage, to eliminate puddles. When working with existing facilities, puddles on the floor should be controlled using sawdust, mopping or sweeping.
- Provide adequate ventilation for both animals and humans.⁸
- Provide adequate garbage containers for visitor use.
- Establish isolation areas for the removal of sick, injured, distressed or potentially dangerous animals.

Cleaning

Cleaning procedures should be tailored to the specific situation.

Petting zoo operators/staff should:

- Promptly remove manure and soiled animal bedding from animal areas.
- Avoid transporting manure or soiled bedding through non-animal areas. If this is not possible, operators/staff should place the manure or soiled bedding in an enclosed container to avoid spillage or aerosolization – the creation of a fine mist or spray containing minute particles.
- Clean all surfaces thoroughly to remove organic matter before disinfection.
- Where feasible, clean, rinse and disinfect animal areas (e.g., flooring and rails) at least once daily.
- When disinfection is not possible (i.e., wooden rails, outdoor exhibits with natural flooring or during freezing weather), remove fresh organic material regularly to prevent build-up.
- Keep visitors away from:
 - Wastewater runoff and animal waste.
 - Animal areas that are being cleaned and disinfected.
 - Tools used for cleaning, disinfection and waste removal.
 - Manure storage areas.
- Thoroughly clean, rinse and disinfect all areas where animals have been displayed before those areas are used for future public (non-animal) events, such as weddings and dances.

Materials with smooth, impervious surfaces (e.g., steel, plastic, and sealed concrete) are easier to clean than other materials (e.g., wood or dirt floors). Metal railings are recommended; however, disinfection of wooden rails can be aided by painting them with two coats of marine-quality varnish.⁹

Most disinfectants require at least 10 minutes of contact with a surface to work.

The chart below gives examples of the dilution of disinfectants. For disinfection when a particular organism has been identified, additional guidance is available at <http://www.cfsph.iastate.edu/Disinfection/>

Table 1 Dilution of Disinfectants

	Bleach		Quaternary Ammonium	
	Metric	Imperial	Metric	Imperial
Disinfectant	10 mL	2 ½ tbsp	1 mL	¾ tsp
Water	1 L	1 gallon	1 L	1 gallon

Under Ontario Regulation 267/03 (General) made under the *Nutrient Management Act, 2002*, manure storage areas must be placed at least:

- 45 m (49.2 yards) from a drilled well with a depth of at least 15 m (16.4 yards) and a water-tight casing to a depth of at least 6 m (6.56 yards) below ground level.
- 90 m (98.4 yards) from any other type of well (except a municipal well).
- 100 m (109.4 yards) from a municipal well.
- 100 m (109.4 yards) from a single residence.
- 250 m (273.4 yards) from a residential area.

Human Food and Beverage Consumption

- Food and beverages should be prepared, served and consumed only in non-animal areas. Animal areas should be well-defined, separate areas, with food outside the boundaries of these areas and hand hygiene facilities provided in between.
- Provide hand hygiene facilities and display hand hygiene signs where food or beverages are served.
- Operators should not allow food, beverages (including water bottles), spill-proof cups (“sippy-cups”), and baby bottles in animal areas.
- Food that is being stored, prepared, displayed or transported in the site should be protected from dust, insects, and other contamination.
- Operators must not provide unpasteurized milk.
- Operators must not provide ungraded eggs. This does not apply to ungraded eggs sold on a producer’s own farm to consumers for their own consumption.
- Animals, including event animals, wild birds, free-roaming animals and domestic animals, must not be permitted in eating areas or food preparation areas where they may shed disease-causing agents. Service dogs may be permitted in those areas of the food premises where food is served, sold or offered for sale. See s.60 of Regulation 562 (Food Premises) made under the *HPPA*.

These recommendations do not include all of the food safety requirements outlined in Regulation 562 (Food Premises). You should contact your local Public Health Inspector before opening to discuss specific food safety requirements.

Animal Care and Management

Petting zoo operators should work with a veterinarian to develop a preventive care program appropriate for the species, including vaccination and parasite control. They should have up-to-date vaccination/health certificates for individual animals or herd/flock health certificates, signed by a licensed veterinarian, available upon request by public health officials.

Rabies prevention

Regulation 567 (Rabies Immunization) made under the *HPPA* specifies that all cats and dogs that are three months of age or over must be vaccinated against rabies and that this vaccination must be kept up-to-date according to the veterinary recommendations relating to the specific animal. Consult your local Public Health Inspector for information on these requirements.

Petting zoo operators should:

- Consult a veterinarian about vaccination of other mammals, in addition to those required by the *HPPA*. All mammals, for which vaccine use has been approved by a veterinarian, should be vaccinated against rabies unless they are accessible only by those responsible for their care.
- Prevent public access to unvaccinated mammals with solid (glass/plastic) or double barriers.
- Not allow public contact with mammals too young to be vaccinated for rabies, unless restrictive measures are available to reduce risks. For example, by using only animals that were born to vaccinated mothers and housed to avoid rabies exposure.
- Administer rabies vaccine to unvaccinated mammals and mammals not up-to date on their rabies vaccination at least 1 month prior to contact with the public because of the extended incubation period for rabies.
- House animals to reduce potential exposures from wild animals that are common sources of rabies, such as skunks, raccoons, foxes, and bats.

Psittacosis/Ornithosis

Since psittacosis/ornithosis can be spread when a person inhales dust and bacteria from the dried droppings of any type of bird, operators/staff should:

- Use cage cleaning and feeding methods that minimize air circulation of feathers, dust and droppings.
- Ensure cages are not cleaned when the public is present.
- Wear a disposable NIOSH-approved N95 mask when cleaning cages if you believe there is a risk of generating airborne dust and particulate. Masks should be tested for fit according to the manufacturer's recommendations. In addition, masks should be checked for fit each time the mask is put on. To check the mask, the wearer takes a quick, forceful inspiration to determine if the mask seals tightly to the face. For instructions on how to best use the N95 mask or equivalent, refer to the handout provided by the manufacturer, or follow your provincial regulations.¹⁰
- Prevent the public from contacting psittacine birds (including parrots, parakeets and cockatiels) or their environment. The majority of human cases of psittacosis/ornithosis are due to contact with psittacine birds.

Animal Health

Petting zoo operators should:

- Not exhibit ill animals, animals known to be infected with a zoonotic agent, and animals from herds/flocks with a recent history of suspected infectious abortion or diarrhea.
- Monitor animals daily for signs of illness, injury and stress, such as diarrhea, failure to eat or drink, inability to rise or walk, and nasal or other discharge.
- Develop a process for dealing with ill, injured or distressed animals, which should include isolation from other animals and the public, and appropriate veterinary care. It is recommended that operators have a list of local veterinarians and their phone numbers on hand.
- Remove the ill, injured or distressed animal (on veterinary advice) from the facility for the appropriate treatment/euthanasia.
- If an animal is ill and a zoonotic disease is suspected, restrict public access to the contaminated area and the animals within until the area has been cleaned and disinfected. Veterinary and public health personnel should be promptly consulted to determine whether there has been any potential exposure of people or other animals, and whether any other measures need to be taken.
- Provide species-specific housing for animals, following the Recommended Codes of Practice for the Care and Handling of Farm Animals for livestock (<http://www.nfacc.ca/codes-of-practice>) and the Canadian Council on Animal Care guidelines for exotics (http://www.ccac.ca/en/_standards/guidelines).
- Try to prevent nose-to-nose contact among animals from different farms or premises.
- Avoid sharing equipment used for other animals, especially if it is contaminated with manure, urine or saliva.
- Screen elephants, cervids, such as deer, moose, elk, and caribou, and non-human primates for tuberculosis by, or under the guidance of, a Canadian Food Inspection Agency (CFIA) veterinarian.

Animal Births

Petting zoo operators should:

- Prevent public contact with animal birthing by-products.
- Preferably, hold such events outside. If held indoors, ventilation should be maximized. Animals may shed zoonotic agents during birthing, which may be spread by airborne transmission.
- Thoroughly clean the environment after each birth. Double-bag and promptly remove all birthing by-products, aborted fetuses, stillborn animals, and any contaminated bedding material.

Dangerous Animals

Animals not recommended for contact with the public:

- Non-human primates – such as monkeys and apes.
- Large carnivores – meat eaters such as wolves, lions and tigers.
- Venomous or toxin-producing animals – some spiders, snakes and frogs.
- Mammals with a higher risk of transmitting rabies – such as bats, foxes, skunks and raccoons.
- Prairie dogs, which can transmit plague.
- Aggressive or unpredictable animals – wild or domestic.
- Animals with nursing young – the mother may display unpredictable and protective behaviour, and the young are susceptible to infection and stress.

Injury Prevention and Control

Petting zoo operators should:

- Ensure first aid facilities are well stocked and conveniently located to staff and the public.
- Develop written procedures for dealing with injured people and escaping from enclosures. Train staff in these procedures.
- Establish an isolation area for aggressive/ill/distressed animals.
- Make animals individually identifiable to the public and staff. For example, if a visitor is injured by a goat in an enclosure full of goats, they should be able to identify the offending animal by some individual marker (e.g., ear tags or collars).
- Assign trained staff in animal areas to reduce risk by:
 - Encouraging appropriate human-animal contact.
 - Preventing/rectifying situations that could lead to injuries or aggressive exhibit animal behaviour.
 - Processing reports of visitor injuries.
- Instruct staff and appropriate volunteers/teachers how to:
 - Identify aggressive and distressed animal behaviour.
 - Prevent visitors from harming or provoking animals.
 - Fully document all witnessed or reported incidents, and notify event operators.
 - Locate first aid facilities/resources and treat injuries.
 - Deal with escaped animals.
 - Maintain proper visitor flow to avoid overcrowding in the animal area, since overcrowding may lead to unwanted animal exposure and injuries.
 - Keep walkways clear and free of hazards.

- Instruct visitors to immediately report bites and scratches to event staff.
- Retain incident reports for at least six months for public health investigation.

Any animal bite or other animal contact that may result in rabies in persons (such as scratches that break a person's skin, or contamination of a wound with saliva) must, by law, be reported immediately to the local Medical Officer of Health. If a person is bitten or scratched, advise the person to contact their local health unit (see Appendix D for Health Unit contact information).

All employers who are subject to the *Occupational Health and Safety Act* must comply with the First Aid Requirements of Regulation 1101 under Section 3 of the *Workplace Safety and Insurance Act*. Contact your local Workplace Safety and Insurance Board (WSIB) office or online at <http://www.wsib.on.ca/> for more information about first aid program requirements

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Appendix A: Indices of Zoonoses

Table 2 Gastrointestinal Zoonoses

Disease	Animal Reservoir	Transmission	Clinical Signs in Humans	Prevention
<i>Campylobacter</i> infection	Cattle, sheep, goats, poultry, wildlife, rodents, puppies, kittens	Fecal-oral route	Diarrhea, mild fever, stomach cramps; may include nausea, vomiting	Proper hand washing and personal hygiene; consume only pasteurized milk
Cryptosporidiosis	Cattle, other domestic animals, especially calves, lambs	Fecal-oral route	Watery diarrhea, cramps; sometimes fever, vomiting, anorexia	Proper hand washing and personal hygiene
Giardiasis	Cattle, sheep, horses, pigs, dogs, cats; mostly young animals	Fecal-oral route	Diarrhea, stomach cramps, gas	Proper hand washing and personal hygiene
Salmonellosis	Reptiles, amphibians, cattle, sheep, goats, horses, pigs, poultry, other birds	Fecal-oral route	Diarrhea, fever, stomach cramps, nausea, vomiting	Proper hand washing and personal hygiene; consume only pasteurized milk
Verotoxin-producing <i>E. coli</i>	Cattle, sheep, goats	Fecal-oral route	Diarrhea, sometimes bloody; severe cases: kidney failure, brain damage	Proper hand washing and personal hygiene; consume only pasteurized milk
Yersiniosis	Pigs, dogs, cats	Fecal-oral route	Watery diarrhea, sometimes bloody; abdominal cramps	Proper hand washing and personal hygiene; consume only pasteurized milk

Table 3 Dermal (Skin) Zoonoses

Disease	Animal Reservoir	Transmission	Clinical Signs in Humans	Prevention
Cellulitis (multiple organisms)	Many	Animal bites, scratches	Wound infection	Proper wound care
Erysipeloid	Pigs, fish, crustaceans, mollusks	Contamination of wounds and skin abrasions while handling animals and animal products	Skin lesion on hands and fingers with violet coloration around wound; can cause septicemia and endocarditis	Proper wound care; proper hand washing and personal hygiene; vaccination of swine
Mange	Dogs, cats, horses, cattle, goats, sheep, pigs	Skin-to-skin contact with infected animals	Self-healing skin lesions; intense itching	Treatment of animals; protective equipment
Methicillin-resistant <i>Staphylococcus aureus</i> (MRSA)	Horses, pigs, other domestic animals	Skin-to-skin contact or contact with contaminated surfaces	Skin or wound infection; can become systemic	Proper hand washing and personal hygiene
Parapoxvirus infection (orf, papular stomatitis, pseudocowpox)	Sheep, goats, cattle	Direct contact with mucous membranes/udder of infected animals	Lesion on hands, arms or face	Good personal hygiene and washing the exposed area with soap and water
Ringworm	Cattle, horses, sheep, goats, cats, dogs, rabbits, rodents	Skin-to-skin contact with lesions of animals or indirect contact with hair from infected animals	Flat, spreading, ring-shaped lesions	Avoid contact with animals; proper hand washing and personal hygiene

Table 4 Respiratory Zoonoses

Disease	Animal Reservoir	Transmission	Clinical Signs in Humans	Prevention
Hantavirus	Rodents	Inhaling dust contaminated with dried rodent droppings	Fever, chills, headache, abdominal pain, coughing, respiratory insufficiency	Rodent control; personal protective equipment
Psittacosis	Birds	Inhaling dried droppings, secretions and dust from feathers of infected birds	Fever, headache, rash, myalgia, chills, respiratory disease	Personal protective equipment; avoid disturbing birds in their enclosures; keep cages clean; reduce stress on birds
Q Fever	Cattle, sheep, goats	Inhaling droplets from infected animal birth products; inhaling dust from wool, hides or straw; consuming unpasteurized milk or milk products	Sudden onset fever, chills, profuse sweating, severe headache, fatigue, nausea	Avoid inhaling droplets/dust from contaminated products or secretions; consume only pasteurized milk
Tuberculosis	Cattle, deer, elk, primates, elephants	Inhaling droplets from infected respiratory secretions, dust contaminated by secretions, fecal material; consuming unpasteurized milk or milk products	Prolonged cough of over 3 weeks, night sweats, weight loss	Avoid inhaling droplets/dust from contaminated products or secretions; consume only pasteurized milk

Table 5 Neuromuscular Zoonoses

Disease	Animal Reservoir	Transmission	Clinical Signs in Humans	Prevention
Cryptococcosis	Cats, birds	Inhaling dust contaminated by fecal material	Headache, visual disturbances, meningitis, sometimes fever, cough, chest pain	Avoid build-up of feces; avoid inhaling contaminated dust
Rabies	Bats, skunks, foxes, raccoons, domestic animals	Animal bites, scratches; contamination of mucous membranes or wounds with infectious saliva	Loss of brain function, encephalitis, death	Human vaccination; avoid contact with bats, skunks, foxes, raccoons
Simian Herpesvirus B	Macaque monkeys	Animal bites, scratches; contamination of mucous membranes or wounds with infectious saliva	Fever, headache, nausea, diarrhea, muscle pain, difficulty swallowing, encephalitis, flaccid paralysis, death	Avoid contact with monkeys
Tetanus (not a zoonosis, but may be acquired through animal bites)	Many	Animal bites, scratches	Lockjaw, painful muscular contractions	Human vaccination

Table 6 Other Zoonoses

Disease	Animal Reservoir	Transmission	Clinical Signs in Humans	Prevention
Brucellosis	Cattle, sheep, goats, pigs, dogs, horses	Direct contact with or inhaling droplets from infected animal birth products; consuming unpasteurized milk or milk products	Fever, headache, weakness, chills, weight loss, generalized aching	Avoid inhaling or touching contaminated materials; consume only pasteurized milk
Hydatids	Wolves, foxes, other wild canids	Ingestion of infectious eggs in material contaminated with carnivore feces	Slowly enlarging fluid-filled cysts, mainly on liver or lungs	Avoid touching material contaminated with wolf feces; proper hand washing and personal hygiene

Disease	Animal Reservoir	Transmission	Clinical Signs in Humans	Prevention
Leptospirosis	Wild carnivores (raccoons, skunks, red foxes), dogs, cattle, pigs	Direct or indirect contact of mucous membrane or skin with urine from infected animal	Fever, muscle aches, conjunctivitis, stiff neck, nausea, sometimes a rash, jaundice, renal insufficiency	Protective clothing; proper hand washing and personal hygiene; vaccinate animals
Plague	Rodents (incl. prairie dogs), rabbits, cats	Fleas; animal bites, scratches	Fever, chills, headache, nausea, swollen lymph nodes, shock; sometimes encephalitis	Flea control
Roundworms (Toxocariasis / Baylisascariasis)	Dogs, cats, raccoons	Ingestion of infectious eggs in environment contaminated by feces	Larva migrans: flu-like illness with rash and wheezing; blindness	De-worm animals; proper hand washing and personal hygiene
Toxoplasmosis	Cats	Fecal-oral route	May be asymptomatic or acute with fever and swollen lymph glands; blindness; birth defects in fetus	Proper hand washing and personal hygiene
Tularemia	Rodents, rabbits, sheep	Animal bites or licks, handling/cleaning animal or environment, inhalation of contaminated air/dust, ingestion of contaminated food/water	Ulcers, swollen glands, fever, chills, headache, vomiting, diarrhea, sore throat, weakness, joint pain, swollen eyes	Protective clothing; proper hand washing and personal hygiene

Sources: Government of South Australia. Petting Zoo Infection Control Guideline: for Petting Zoo Operators, Education and Childcare Services and Environmental Health Officers, 2002. Available at: <http://www.sahealth.sa.gov.au/>

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Appendix B: Supplement for Education and Childcare Services

These voluntary recommendations offer effective ways to minimize the risk to human health and safety from contact with animals.

IMMUNOCOMPROMISED PERSONS AND INFANTS UNDER ONE HAVE INSUFFICIENT IMMUNE SYSTEMS. IT IS RECOMMENDED THAT THEY AVOID TOUCHING OR FEEDING ANY ANIMALS.

Children under five should not come in contact with reptiles, amphibians, birds, young ruminants (i.e., under six months old) or their immediate environment, because these animals shed proportionally more disease-causing agents.

Proper hand-washing

- Wet your hands with warm running water.
- Lather your hands with soap for 15 to 20 seconds.
- Rinse hands thoroughly and pat dry with a paper towel.
- Use the paper towel to turn off tap.

Additionally, you should:

- Train caregivers in proper hand-washing technique.
- Request caregivers to supervise/assist children to ensure their hands are washed properly.

Proper use of alcohol-based hand-sanitizers

- Ensure hands are visibly clean. Alcohol-based hand-sanitizers are not as effective if visible dirt is on the hands.
- Apply a loonie-sized amount (1-2 pumps) onto one palm.
- Spread over all surfaces of hands.
- Rub hands until product is dry (at least 15-20 seconds).
- Alcohol-based hand-sanitizers must contain at least 60% alcohol to be effective.

- Baby wipes can be used to remove visible contamination and dirt, but do not contain enough alcohol to be effective disinfectants.
- Wet wipes can be used but note that not all wet wipes have the 60% alcohol content necessary to be effective disinfectants.
- Caregivers should supervise children using hand-sanitizers, and store the hand-sanitizer out of children's reach.

In cold weather if mittens/gloves are worn during animal contact, you should apply hand-sanitizer – or thoroughly wash children's hands – after removing the gloves and before eating, and instruct parents to wash the mittens/gloves as soon as possible.

Before animal contact

Teachers and caregivers should:

- Consult with parents to determine if there are children in the school who have allergies/asthma, phobias, or are immunocompromised.
- Find out which animals are being displayed at the event, which may be touched, what hand hygiene facilities are available, and whether the hand hygiene facilities are accessible to small children or students with disabilities.
- Discuss supervision with accompanying caregivers, to ensure these recommendations are followed.
- Instruct children not to tease, hit or chase the animals, not to get too close to or get between an animal and its food or its young, not to make loud noises or sudden movements.

During animal contact

Teachers and caregivers should:

- Supervise human-animal contact, particularly for children under 5. Risks can be reduced if young children are closely supervised or if adults carry them when in animal areas.
- Ensure children wash their hands – under adult supervision – after contact with animals, animal products, or animal environments, and before eating or drinking.
- Cover children's open wounds to avoid contamination of the wound with disease-causing agents.
- Wash pacifiers, toys or other objects that have fallen to the ground, or have been in contact with animals, with soap and running water before giving them back to children.
- Discourage children from: sucking fingers or objects, kissing the animals, touching own mouth with hands, eating any food, including food intended for animals, or wiping their hands on clothing when in animal areas.

- Immediately report any injuries from displayed animals to event staff.

After animal contact

- Children who are injured by a display animal or begin to suffer from diarrhea, nausea, or vomiting within a month of contacting a display animal should be taken to their doctor as soon as possible. Tell the doctor about recent exposure to animals.
- Inform event staff and your local health unit if children have been bitten or scratched by displayed animals.

Temporary and Resident Animals in Schools/Childcare Centres

Teachers and staff should:

- Inform parents of the benefits and potential risks associated with animals in school classrooms.
- Consult with parents to determine special considerations needed for children in the school who have allergies/asthma, phobias, or are immunocompromised.
- Ensure animals are displayed in enclosed cages or under appropriate restraint.
- Designate specific areas for animal contact.
- Not allow food in animal contact areas.
- Not allow display animals to roam or fly freely.
- Follow expert advice on how to handle/house animals humanely.
- Obtain appropriate veterinary care.
- Keep animals clean and free of intestinal parasites, fleas, ticks, mites, and lice.
- Clean and disinfect all areas where animals have been present. Only children 5 and older should be allowed to assist with this task:
 - Under adult supervision.
 - When children under 5 are not present.
- Use disposable gloves when cleaning aquariums or cages. Thoroughly wash hands after.
- Clean cages or dispose of aquarium water in sinks which are not used for food preparation or for obtaining drinking water.
- Ensure animals and animal products (e.g., animal pelts and owl pellets) are not brought into school/childcare lunch rooms and cafeterias.

- Follow the recommendations for before/during/after animal contact as described above.

Animals not recommended in school/childcare settings:

- Non-human primates – such as monkeys and apes.
- Large carnivores – meat eaters such as wolves, lions and tigers.
- Venomous or toxin-producing animals – some spiders, snakes and frogs.
- Mammals with a higher risk of transmitting rabies – such as bats, foxes, skunks and raccoons.
- Prairie dogs, which can transmit plague.
- Aggressive or unpredictable animals – wild or domestic.
- Stray animals with unknown health and vaccination history.

Appendix C: Example Signs

Example Sign 1

This is an example of instructions for hand-washing and the use of alcohol sanitizer. Hand hygiene instructions should be available at every hand hygiene facility.

Handwashing

To wash hands properly, rub all parts of the hands and wrists with soap and water or an alcohol-based hand rub. Wash hands for at least 15 seconds or more. Pay special attention to fingertips, between fingers, backs of hands and base of the thumbs.

- Keep nails short
- Remove watches, rings and bracelets
- Do not use artificial nails
- Avoid chipped nail varnish
- Wash wrists and forearms if they are likely to have been contaminated
- Make sure that sleeves are rolled up and do not get wet during washing

If you have any questions regarding cuts, sores, allergies or pre-existing skin conditions, call Telehealth Ontario at 1-866-797-0000, TTY 1-866-797-0007.

Handwashing with soap and water

- 1 Remove jewellery and wet hands and wrists with warm water.
- 2 Use 1 or 2 squirts of liquid or foam soap.
- 3 Lather soap and scrub hands well, palm to palm.
- 4 Scrub in between and around fingers.
- 5 Scrub back of each hand with palm of other hand.
- 6 Scrub fingertips of each hand in opposite palm.
- 7 Scrub each thumb clasped in opposite hand.
- 8 Scrub each wrist clasped in opposite hand.
- 9 Rinse thoroughly under running water.
- 10 Pat hands dry with paper towel.
- 11 Turn off water using same paper towel.

Cleaning with alcohol-based hand rub

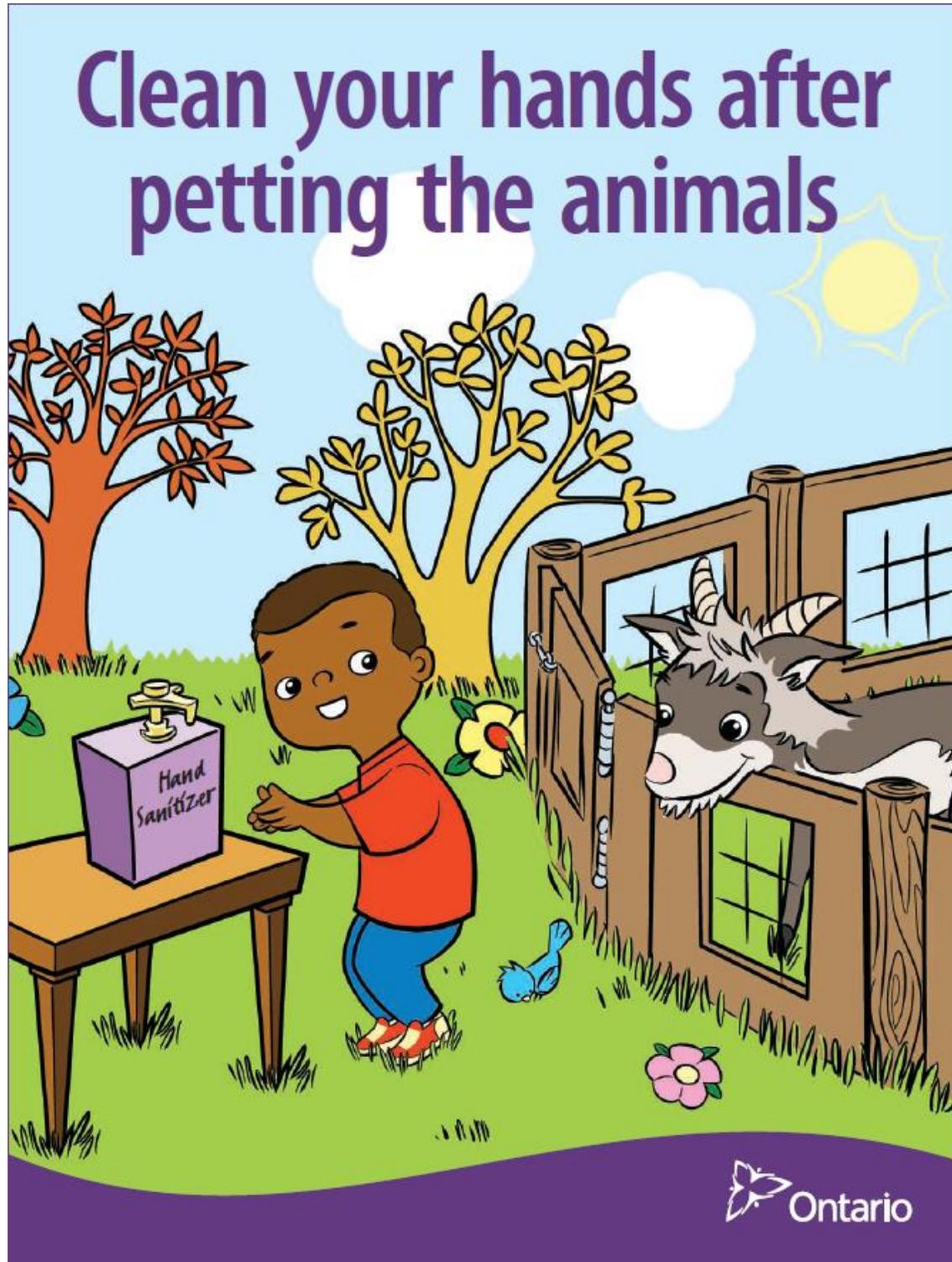
- 1 Apply 1 to 2 pumps of product to palms of dry hands.
- 2 Rub hands together, palm to palm.
- 3 Rub in between and around fingers.
- 4 Rub back of each hand with palm of other hand.
- 5 Rub fingertips of each hand in opposite palm.
- 6 Rub each thumb clasped in opposite hand.
- 7 Rub each wrist clasped in opposite hand.
- 8 Rub hands until product is dry. Do not use paper towels.

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Example Sign 2

Place this type of sign at all entrances and exits of animal areas.



Appendix D: Public Health Units in Ontario

Table 7 Public Health Units in Ontario

Public Health Unit	Telephone	Toll Free
Algoma District	705-759-5287	1-866-892-0172
Brant County Health Unit	519-753-4937	
Chatham-Kent Health Unit	519-352-7270	
Durham Region Health Department	905-668-7711	1-800-841-2729
Eastern Ontario Health Unit	613-933-1375	1-800-267-7120
Elgin-St. Thomas Health Unit	519-631-9900	1-800-922-0096
Grey Bruce Health Unit	519-376-9420	1-800-263-3456
Haldimand-Norfolk Health Unit	519-426-6170	
Haliburton, Kawartha, Pine Ridge District Health Unit	905-885-9100	1-866-888-4577
Halton Region Health Department	905-825-6000	1-866-442-5866
City of Hamilton Public Health & Community Services Department	905-546-3500	
Hastings and Prince Edward Counties Health Unit	613-966-5500	
Huron County Health Unit	519-482-3416	
Kingston, Frontenac and Lennox & Addington Health Unit	613-549-1232	1-800-267-7875
Lambton Health Unit	519-383-8331	1-800-667-1839
Leeds, Grenville and Lanark District Health Unit	613-345-5685	
Middlesex-London Health Unit	519-663-5317	
Niagara Region Public Health Department	905-688-3762	1-800-263-7248
North Bay Parry Sound District Health Unit	705-474-1400	
Northwestern Health Unit	807-468-3147	1-800-830-5978
Ottawa Public Health	613-580-6744	1-866-426-8885

Public Health Unit	Telephone	Toll Free
Oxford County – Public Health & Emergency Services	519-539-9800	1-800-755-0394
Peel Public Health	905-799-7700	
Perth District Health Unit	519-271-7600	
Peterborough County-City Health Unit	705-743-1000	
Porcupine Health Unit	705-267-1181	
Renfrew County and District Health Unit	613-735-8653	1-800-267-1097
Simcoe Muskoka District Health Unit	705-721-7520	1-877-721-7520
Sudbury and District Health Unit	705-522-9200	
Thunder Bay District Health Unit	807-625-5900	1-888-294-6630
Timiskaming Health Unit	705-647-4305	
Toronto Public Health	416-392-7401	
Waterloo Region Public Health	519-883-2000	
Wellington-Dufferin-Guelph Health Unit	519-843-2460	1-800-265-7293
Windsor-Essex County Health Unit	519-258-2146	
York Region Public Health Services	905-895-4511	1-800-361-5653

