

OCCUPATIONAL SAFETY INSTRUCTIONS FOR PREVENTING CRYPTOSPORIDIOSIS

It is important to adopt the approach that all animals may carry a contagious disease or a hazardous microbe and that preparations must be made for the potential risk of infection. The *cryptosporidium* protozoan causes gastrointestinal inflammation (cryptosporidiosis) both in humans and in animals. The fact that the disease has become more common among calves constitutes a work-related risk factor on dairy farms and calf raising facilities. These occupational safety instructions include actions to prevent the infection.

SHORT INSTRUCTIONS

Before entering animal facilities

- Do not enter animal facilities in non-work clothes; instead, wear work clothes and headgear
- Change your shoes
- Put protective gloves on before touching animal excretions and manure
- Protect your mouth, eyes and face from spatter
- Use respiratory protective equipment in dusty conditions and when liquids that are harmful to health might be spattered

- Wash your shoes
- Discard disposable protective equipment and clean other protective equipment
- Take off your work clothes
- Wash at least your hands
- Put clean clothes and shoes on

Protective equipment

When working with animals, you should use dedicated work clothes that can be washed in the washing machine and that are resistant to high temperatures ($\geq 60^{\circ}\text{C}$). The trouser legs and long sleeves of work clothes must be tight-fitting so that they can be easily tucked into footwear and gloves. Loose garments get dirty easily and may spread pathogens. Long hair should be tied back and hair must be protected with headgear or a hood. The use of a protective coat, overalls or apron is necessary when other clothes need to be protected from becoming dirty and the spreading of microbe infections via work clothes needs to be prevented.

Work clothes must be taken off and changed to non-work clothes before leaving the animal facilities for other locations, such as car or residential premises. Work clothes should be washed when they become dirty and especially if animal excretions have spattered on them. Work clothes must also be washed before it is used on another farm with animals.

When tending cattle, disposable protective gloves should be used especially when touching animals' hind quarters, mucous membranes or excretions. Disposable protective gloves should be worn for the entire duration of contact with ill animals or other exposure to manure (e.g. in cleaning work). Protective gloves must have a CE marking and an ID indicating compliance with the medical glove standard EN 455, at the minimum. The above-mentioned protective gloves may not be washed or disinfected. If tasks involve the use of disinfectants or pharmaceutical substances, for instance, gloves with the ID for the EN 374 standard are more leak-tight and thicker and, as a result, provide better protection against pathogens and chemicals than gloves with the ID for the EN 455 standard.

If there is risk of spatter, it is necessary to protect your mouth, eyes and face with a face shield or with a mouth-nose protector and safety goggles, for instance. Respiratory protective equipment should be used in tasks where a risk of airborne infectious microbe is suspected or other airborne aerosol that is harmful to health is generated (e.g. from disinfectants) or there is a lot of dust. Thus far, there is no certainty about if cryptosporidiosis can be caught via air by swallowing dust or liquid aerosol.

Disposable protective clothing, footwear protection, protective gloves and other spatter protection and respiratory protective equipment are always disposed of immediately after use. Protective equipment must be taken off by turning the dirty surface inside and only touching clean surfaces to avoid getting dirt on hands, other parts of skin or clothes under the protective equipment. Footwear protection should not be used under normal circumstances as they break down easily and may be slippery. Work footwear must be safe, sturdy and easy to clean.

Good hand hygiene

Protective gloves and other protective equipment are not a replacement for good hand hygiene. Hands must be washed even after using protective gloves.

Rings, wristwatches, bracelets and mobile devices are not suitable for use in animal facilities as they gather microbes and are difficult to clean appropriately. Mobile devices can be protected with a disposable plastic bag, for instance, in which case they can be used by operating them through the plastic bag.

In work related to tending animals, nails must be kept short and may not be bitten. A good rule of thumb regarding nails is that when looking at your fingers from the palm side of the hand, nails should not be visible. Gel or other artificial nails or nail polish should not be used as they gather microbes like jewellery does.

A good care must be taken of skin on hands and also of other areas of skin. Skin with wounds or rash must heal or at least must be protected carefully before working in animal facilities.

Hand washing

Hands must be washed with water and ordinary liquid soap whenever they are visibly dirty or feel dirty as well as after handling excretions. They must also be washed after going to the toilet, before meals, smoking or using snus and when coming to work and leaving work.

Hands must be washed for a minimum of 20 seconds. This is approximately the time that it takes to hum two verses of "The Wheels on the Bus". Hands are washed with warm water. Liquid soap is rubbed on hands so that also thumbs and the skin between the fingers are washed properly (see the hand washing image). If necessary, fingertips and undersides of nails must be cleaned with a nail brush. Disposable towels are used for drying the hands and turning the tap off after washing.

Disinfecting hands with alcohol-containing hand sanitiser reduces the amount of many microbes on skin but it is not effective against protozoans. Any visible dirt must always be removed by washing hands with soap and water. After that, the effect of washing can be boosted by removing other microbes with disinfectant. In addition, hand sanitisers have skin-care substances, such as glycerol, that remain on the skin after the alcohol evaporates and maintains moisture balance in the skin.

Washing of work clothes

It is recommended to use work clothes that can be washed either at the workplace or in a laundry to avoid taking work clothes home for washing. Clothes used in animal facilities are taken off and placed in a separate, marked laundry bag so that the personnel handling laundry know that there is a potential risk of infection. A washing machine degradable washing bag intended for infection-risk laundry can also be used to minimise the need to handle laundry. If it is necessary to move laundry from the bag to the washing machine, the handler of the laundry must wear protective equipment, such as disposable protective gloves, and wash hands after handling the dirty laundry. Infection-risk laundry must always be washed separately from other laundry at a minimum temperature of 60°C with a normal-length washing programme.

Washing of footwear and tools

Footwear and tools must be made of material that endures washing with as hot water as possible and detergent. After washing, footwear and other equipment must be left to dry for a minimum of four hours before they are used again.

Use of disinfectants

The alcohol-containing disinfectants that are relatively safe for the employee are ineffective against the protozoan causing cryptosporidiosis. Laboratory tests have indicated that cresol-based disinfectants, for instance, are effective against this parasite. However, they are not suitable for disinfecting hands but are used in the disinfection of surfaces. These substances are so potent chemicals that employees must protect themselves according to the instructions provided in the product safety data sheet. Usually this means that the entire skin, eyes and respiratory organs must be protected. In addition, the need of employees to protect themselves is increased by the fact that, before using a disinfectant, any visible dirt must be removed from surfaces with a high-pressure cleaner, for instance, which creates risk of spatter. The disinfectant must also have long enough, at least 1–2 hours, to take effect so that it eliminates cryptosporidiosis pathogens.

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