



Common zoonoses in agriculture

Introduction

All farm animals naturally carry a range of diseases, some of which can also affect humans. These diseases are known as **zoonoses**, and if you work with animals your health may be at risk from them. Although some of these diseases (eg anthrax, brucellosis and rabies) are not common in Great Britain, good occupational hygiene practices will protect against them, as well as other more common zoonoses such as leptospirosis, orf or ringworm.

Diseases transmitted from animals to humans can also affect visitors to farms - especially children or the elderly, who are more vulnerable to infection. These illnesses include those resulting from infection with the organisms *Escherichia coli* O157 (*E coli* O157) and *Cryptosporidium parvum*.

If you open your farm to the public you should take special precautions to make sure that they are not made ill by zoonoses. Advice on those precautions is in Agriculture Information Sheet AIS23 (revised) *Avoiding ill health at open farms - Advice to farmers (with teachers' supplement)*.¹

This information sheet advises on:

- legal requirements to control the risk of zoonoses in humans;
- husbandry practices which may reduce the risk;
- good occupational hygiene practices to control the spread of zoonoses, including using personal protective equipment (PPE); and
- some of the most common zoonoses.

If you think that you are ill because you have contracted a disease from an animal, you should consult a doctor quickly. Tell your doctor if you work in agriculture or come into contact with farm livestock. Consider carrying the HSE *Agriculture - your health carry card*² which gives useful information for you and your doctor.

Brucellosis, anthrax, bovine tuberculosis and BSE are notifiable or reportable diseases and subject to animal health legislation. Suspected cases must be reported to the Divisional Veterinary Manager of DEFRA.

Legal requirements

Zoonoses are caused by micro-organisms, which are subject to the Control of Substances Hazardous to Health Regulations (COSHH) 2002 (as amended).

Agriculture Information Sheet No 2 (revised)

COSHH requires employers and self-employed people to:

- assess the risks to health from work activities which involve a hazardous substance (eg a micro-organism);
- prevent or, where this is not reasonably practicable, adequately control exposure to the hazardous substances;
- introduce and maintain control measures;
- inform, instruct and train employees about the risks and precautions to be taken;
- regularly review risk assessments and the effectiveness of control measures.

Involve employees, especially safety representatives, in making the assessment - they often have personal experience of the work and the risk and may be able to offer common-sense ways of controlling it.

If you are an employer, you should ask employees, and people you are considering employing, about any existing health or other conditions they have which may worsen the effects of contracting a zoonosis, or which may mean that they are more likely to contract one. For example:

- people without a spleen are very vulnerable to infection, and employers should consider carefully whether they allow such people to work with animals;
- people with transplanted organs may be more at risk from all zoonoses;
- pregnant women risk abortion if they are infected with *Chlamydia*, the organism causing enzootic abortion of ewes.

Precautions

This section advises on general precautions to reduce the risk of contracting zoonoses. The sections dealing with individual zoonoses advise on extra, specific steps where necessary.

Remember that, if you bring stock in from outside the farm, you can reduce the risk of zoonotic infections by thoroughly checking them for disease, with help from your veterinary advisor. As well as taking these steps, if you are an employer, make sure that staff understand

the importance of taking the precautions and check that they do so.

Control the disease in the animal

In some cases it is possible to reduce the risk of contracting a zoonosis by controlling the disease in the animal, for example, vaccinating cattle against *Leptospira hardjo* or using salmonella-free feed for pigs and poultry. Consult your vet and:

- find out whether there are such controls available. There are widely available controls for *Leptospira hardjo* and enzootic abortion of ewes;
- consider the benefits to human health of controlling the disease in the animal, remembering that there are also economic benefits from improved animal health;
- take action where human health benefits can be achieved at reasonable cost. Remember that not all medicines will prevent the animal passing the disease on to humans. Check with your vet whether, after treating the animal, there are remaining risks to humans.

Some of the diseases described in this information sheet are passed to humans through contact with animal dung or urine. In some cases the risks to humans can be controlled if you follow good husbandry practices to help prevent animals carrying or excreting large numbers of the disease-causing organisms. These practices include the following:

- ensure good standards of hygiene in young-stock housing;
- avoid contaminating animal drinking water with dung;
- keep animals, especially young, as stress-free as possible - particularly important on farms that open to the public;
- have regular stock health checks by a vet.

It is unlikely that you will completely eliminate the risk of contracting a zoonosis. You must also follow the principles of good occupational hygiene to protect against the remaining risk. These fall into three categories - safe working practices, using personal protective equipment and good personal hygiene.

Safe working practices

Consider the following:

- avoid or minimise the use of equipment or tools likely to cause cuts, abrasions or puncture wounds, and use safe working practices and PPE where appropriate;

- when taking blood samples, use vacuum tubes rather than syringes and put all used needles into a sharps box to BS 7320: 1990. Label and dispose of the box safely, but not in your domestic waste;
- do not use mouth-to-mouth resuscitation on newborn animals - use traditional husbandry methods of resuscitation such as massaging or clearing nostrils with straw;
- avoid handling birth fluids or afterbirths with bare hands and bury or burn them;
- control or eliminate rats, and use a fork or shovel, or wear gloves, to move dead rats.

Personal protective equipment (PPE)

Your COSHH assessment will help you decide whether PPE is needed. Remember that you should only consider using PPE after you have considered other steps such as not doing the task or avoiding contact with infected animals. However, the nature of your work with animals may mean that PPE is your only practicable option. Consider whether you need to:

- wear PPE when helping animals to give birth, handling afterbirths, working with obviously infected stock (eg with orf or ringworm), examining mouths or during rectal examinations. Suitable PPE will include a waterproof apron or parturition gown, obstetric gauntlets for calving/lambing etc and plastic or synthetic rubber gloves for oral or rectal examinations;
- use face protection (for eyes and mouth) if there is a risk of splashing from urine or placental fluids. Suitable protection will include a faceshield to BS EN 166: 2002.

Make sure that whatever PPE you use is suitable, properly maintained, cleaned after use, stored in a clean area and that new PPE is CE marked.

Personal hygiene

Any work with animals inevitably involves contact with dung and urine, which contain disease-causing organisms. Personal hygiene is therefore vitally important. If you are an employer, provide washing facilities wherever staff or visitors work with animals (at least, clean running water and paper towels). Make sure that you and your staff:

- wash cuts and grazes immediately with soap and running water;
- cover new and existing wounds with a waterproof dressing before beginning work - some organisms enter the body through open wounds. Consider whether you or your staff need first-aid training;

- wash hands and arms before eating, drinking or smoking after contacting animals, or working in areas with animal dung.

Symptoms and specific controls for some common zoonoses

Escherichia coli O157 (E coli O157)

E coli O157 is a bacterium that lives in the gut of animals, including cattle, sheep, deer and goats. It is also carried by pets and wild birds. Simply carrying the bacteria will not normally cause an animal any harm or illness. In humans, however, the toxins it produces can cause illness ranging from diarrhoea to kidney failure. In some cases the illness can be fatal.

E coli O157 is unusual in that very few individual organisms are needed to infect humans. Infection can be caused by contacting animal dung, and then putting hands or fingers in the mouth, or eating food without washing hands. It is vital that anyone who works with or touches animals thoroughly washes their hands and arms before eating, drinking or smoking.

Workwear should be left at the workplace for cleaning so that the families of those working on the farm cannot contract the disease by contact with soiled clothing.

Cryptosporidiosis

This disease, which may cause diarrhoea and abdominal pain with 'flu-like symptoms for up to six weeks, especially in the young and the old, is caused by a protozoa called *Cryptosporidium parvum*. It is carried by calves, lambs, deer and goats and may be transmitted to humans by contact with animal dung or drinking water contaminated with dung.

Assume that all your cattle, sheep, deer and goats carry *E coli O157* and cryptosporidium. Follow the advice in the 'Precautions' section and remember that visitors to farms, eg school parties, may also be exposed to these organisms. Young children may be more affected than other people by the diseases that may result, so follow the advice in Agriculture Information Sheet AIS23 (revised) *Avoiding ill health at open farms - Advice to farmers (with teachers' supplement)*. In particular:

- provide proper washing etc facilities for visitors, including warm running water, soap and clean towels adjacent to all areas where they may contact animals;
- erect signs advising visitors to wash before eating, drinking or smoking, and advising parents to check that their children do not put dirty hands or fingers in their mouths;
- provide separate eating areas, close to washing facilities.

Leptospirosis

There are two main forms of leptospirosis that may affect those working in agriculture: Weil's disease, from the bacterium *Leptospira icterohaemorrhagiae*, and cattle-associated leptospirosis, from the bacterium *Leptospira hardjo*.

Weil's disease is usually contracted from infected rat's urine or watercourses contaminated with it. Most rats probably carry the bacteria at some point in their lives. It is most commonly passed to humans through cuts and grazes, especially on the hands. It may result in fever, headache, vomiting and muscle pain, and can lead to jaundice, meningitis and kidney failure. In rare cases it can be fatal. Follow the advice in the 'Precautions' section.

Cattle-associated leptospirosis (CAL) is usually contracted after cattle urine has splashed into the eyes, nose or mouth, after urine or placental products have entered the body through broken skin, or after inhaling droplets of urine. More than 60% of herds of cattle in the UK are thought to be affected.

In humans the symptoms are 'flu-like with a severe and protracted headache. Without treatment they can persist for up to six weeks and in some cases meningitis, jaundice and kidney failure can occur.

Follow the advice in the 'Precautions' section and:

- avoid being splashed with urine or inhaling its aerosol when you work with cattle. If you are developing a new parlour, consider having a wide pit in a herringbone parlour, which allows a low-splash zone in the centre, or floor grids behind cows in parlours to reduce urine splash;
- reduce the risk of infection in your herd by checking the disease status of shared or hired bulls; allowing a two-month gap before grazing cattle on land last grazed by sheep; providing clean, non-infected, drinking water; not mixing normally separated stock; and avoiding the use of rented keep unless other animals there are disease free;
- consider using PPE - for example, during milking wear a water-resistant garment which covers the body and arms; when assisting in calving wear a parturition gown and obstetric gauntlets; and when handling foetal, placental or other contaminated material wear obstetric gauntlets. Thin gloves that may rip are not suitable.

The risk to human health is greater if a herd has recently been infected - consult your vet for information on this. If this is the case, consider wearing a face shield if your face or eyes are likely to be splashed with urine, or using a powered respirator to reduce the risk of inhaling any aerosol.

Note that vaccinating cattle against CAL does not prevent them shedding the organism and possibly passing the disease on to humans.

Bovine tuberculosis

Bovine TB is most commonly carried by cattle, badgers and deer, and can infect humans by inhalation or hand-to-mouth contact. People handling infected cattle are at risk, especially if they become contaminated with mucus from the respiratory tract (eg by holding the animal's nose) and then do not follow the basic rules of good personal hygiene.

Many people will have been immunised against TB in childhood (the 'BCG' immunisation). This gives substantial but not complete protection. If you are in an area where infection in cattle is common, consider whether you should contact your doctor to check your immunisation status. Do not rely on the BCG immunisation to prevent infection - always follow good practice.

If you suspect your cattle have TB you must report it to the State Veterinary Service, a police constable or the local authority. All cattle failing the tuberculin test used by the State Veterinary Service will be slaughtered. To control the risk of contracting the disease direct from cattle, follow the advice in the 'Precautions' section, and:

- ensure that your cattle are routinely tuberculin tested by the State Veterinary Service and do not delay this routine test;
- monitor your cattle for signs of TB - typical signs include violent coughing, a 'snore' or rattling in the throat during breathing, loss of weight, and lumps in the udder. None of these signs are exclusive to cattle TB, however, and so you should not rely on them for diagnosis, nor the lack of them to indicate that your cattle do not carry TB;
- do not lead cattle by the nose - you will be contaminated with mucus, and it is not good stockmanship.

Salmonella

The salmonella bacterium may be carried by most types of farm animal, and can result in diarrhoea, fever and abdominal pains in humans. Occasionally more serious illness will result from contact with the organism.

Although salmonella is usually thought of as resulting from eating contaminated food, it may frequently result from contact with farm animal dung. Humans may be infected when the salmonella organism gets into the gut - usually when you put your hands contaminated with dung in or close to your mouth, eg during eating, drinking or smoking. Hand-to-hand contact is also an important source of infection.

To control the risk follow the advice in the 'Precautions' section, and:

- control infection in livestock, in consultation with your vet.

Streptococcus suis (S suis)

S suis is a bacterial infection carried by pigs, often without any symptoms in the animal. It can be contracted by humans through cuts and grazes, or possibly by inhalation, and may result in meningitis or death. To control the risk follow the advice in the 'Precautions' section, and:

- use good husbandry to eliminate the disease in stock.

Orf

Orf is caused by a virus carried by sheep and goats - lambs often show most symptoms - and may cause face, hand or arm ulcers if you contact lesions on animals or infected wool, fencing or hedges. Treatment is not usually needed as the lesions heal within six to eight weeks. To control the risk follow the steps in the 'Precautions' section, and:

- consult your vet on how to control the disease in your flock;
- consider using a live vaccine for flocks with an orf problem. This has the added advantage of minimising economic losses from orf infection in lambs, but you need to adopt a safe system of work to avoid self-injection.

Ovine chlamydiosis (enzootic abortion of ewes - EAE)

EAE is caused by the organism *Chlamydia psittaci*, carried by sheep and possibly goats. In humans it may cause abortion or 'flu-like illnesses. It is normally passed to humans during handling or contact with an infected afterbirth, but may also be contracted by contact with soiled workwear that has been contaminated with afterbirths etc.

To control the risk follow the advice in the 'Precautions' section, and:

- avoid contact between pregnant women and pregnant ewes;
- leave soiled workwear at the workplace for cleaning so that wives/partners of those working with sheep cannot contract the disease by contacting it. Provide suitable separate accommodation for clean non-work clothing and contaminated workwear;
- vaccinate breeding sheep if enzootic abortion is confirmed in the flock and seek veterinary advice about treating ewes which have yet to lamb.

Visitors to farms may also be exposed to the disease; ensure they are aware of the risk and, if reasonably practicable, prevent access to risk areas.

Psittacosis (Ornithosis)

This disease is also caused by the organism *Chlamydia psittaci*, often carried by ducks and other poultry (including turkeys) as well as caged, wild and exotic birds. In humans, a 'flu-like illness may lead to pneumonia and in severe cases endocarditis (inflammation of the heart chambers), hepatitis and death. It is usually transmitted to humans by inhaling dust or aerosol from dung or a nasal discharge from infected birds.

To control the risk follow the advice in the 'Precautions' section, and also consider:

- controlling the disease in animals. A high standard of flock husbandry is important - birds under stress will shed more of the organism;
- screening flocks for the organism;
- how to avoid producing dust, eg by not dry sweeping areas where the birds are kept, and maintaining good ventilation;
- for on-farm slaughter of poultry, using local exhaust ventilation in evisceration areas if reasonably practicable; if not, using a respirator that has an assigned protection factor of at least 20.

Q fever

This disease, caused by the *Coxiella burnetii* organism, is carried by sheep and cattle, and usually causes mild general illness, chill and headache in humans. In rare cases it can cause pneumonia, liver and heart valve damage or death. It is transmitted by contacting animals or their products, transferring raw milk to the mouth, eg on the hand, or inhaling dust contaminated with birth products, urine or dung.

To control the risk follow the advice in the 'Precautions' section and also:

- avoid creating dusts when moving bedding contaminated with birth products, urine or dung;
- dispose safely of animal waste, in particular afterbirths and bedding soaked in birth products;
- avoid contact with raw milk from infected animals.

Ringworm

Ringworm is a fungus which may infect cattle, pigs, sheep, horses and dogs. In humans, inflamed, swollen, crusty skin lesions form on the hands, forearms, head and neck. These are caused by fungal spores entering the skin through cuts and abrasions; spores may be transmitted to the skin from handling infected livestock or equipment such as gates etc that animals, especially cattle, have rubbed against.

To control the risk follow the advice in the 'Precautions' section, and also consider:

- preventing disease in animals by maintaining high standards of cleanliness in buildings, in particular calf pens, cattle crushes etc;
- treating any infected cattle in accordance with veterinary advice.

Bovine spongiform encephalopathy (BSE)/variant Creutzfeldt Jacob Disease (vCJD)

BSE is widely regarded as a food-borne zoonosis. The joint Department of Health/Health and Safety Executive and Department for the Environment, Food and Rural Affairs Advisory Committee on Dangerous Pathogens (ACDP) working group on Transmissible Spongiform Encephalopathy agents (TSE Working Group) acknowledge that there have been no confirmed cases of vCJD (the human form of BSE) linked to occupational exposure. To date there has been no evidence of:

- vCJD being transmitted occupationally, for example to farm workers during contact with live cattle or when handling intact carcasses; or
- scrapie (a disease similar to BSE found in sheep and goats and which has been recognised for over 200 years) being transmitted to humans through direct contact with affected animals (including placental material).

However, the TSE Working Group feels that it is still prudent to take a precautionary approach when considering the risks to people who may be exposed to the BSE agent at work. Where there is a risk of exposure to the BSE agent as a result of work activities (eg slaughtering), then the ACDP's guidance *BSE (Bovine Spongiform Encephalopathy): Background and general occupational guidance*³ will help you select the appropriate control measures. These control measures should include the sensible occupational hygiene precautions previously outlined.

References

- 1 *Avoiding ill health at open farms - Advice to farmers (with teachers' supplement)* AIS23(rev1) HSE Books 2000
- 2 *Agriculture - Your health carry card* IACL102 HSE Books 1997
- 3 *BSE (Bovine Spongiform Encephalopathy): Background and general occupational guidance* HSE Books 1996 ISBN 0 7176 1212 0 (This is due to be replaced in late 2005 by new ACDP guidance on HSE's website: www.hse.gov.uk/biosafety/information.htm.)

Further information

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