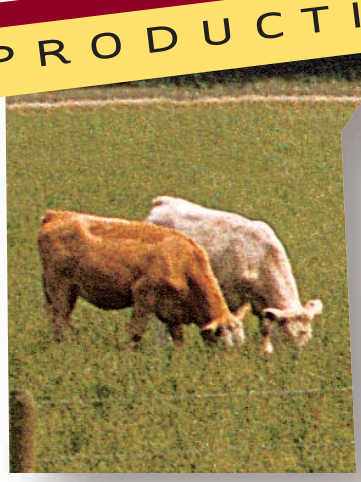
Livestock Pathogens: a Natural Occurrence

Living WITH Livestock PRODUCTION

SPRING 2004 FACT SHEET #10



All animals including pets, livestock, wildlife and humans, are hosts to various microorganisms (germs), some of which may cause disease. Producers can manage these germs and minimize their introduction into the food chain and environment by using good animal care and sound manure management practices. However, there are no animal production systems that can guarantee zero risk to both the environment and the public.

Question:

Are all germs from livestock hazardous to humans and other animals?

Answer:

No. Most of the germs found in animals are considered normal and do not cause harm. Many types of bacteria, parasites, protozoa and viruses are found in humans and animals, as well as in soil and water. Only a few strains have the potential to cause illness. Germs that make people ill are referred to as pathogens. Just because a pathogen is present in the environment does not automatically mean that a person will contract a disease. In the same way, one sick animal does not mean that all of the animals in a herd or flock will become ill. For example, *Salmonella*, *Campylobacter* and *E. coli* O157 are common bacteria that can exist in the intestines of various animals, without the animals showing any signs of disease. These bacteria can also be present in manure and are potential causes of food borne illness in humans.

Question:

How are pathogens transferred from animals to people?

Answer:

The transmission of pathogens from animals to people is possible. The most common way is through direct contact such as touching an animal, animal manure, animal products or drinking contaminated water. Animal scratches, bites and saliva, can transmit pathogens. Rodents, birds, insects, contaminated feed or equipment may also spread pathogens. Zoonoses are animal diseases that can be transmitted to humans. Most cases of zoonotic illness are found among people working with animals or via eating contaminated food. Activities that could increase this risk include working on farms with livestock, treating a sick animal, the processing of animal products for food, hunting or petting a companion animal.

Question:

How long do pathogens survive in the environment after being shed by a host?

Answer:

Pathogens can survive for varying amounts of time once they are shed or excreted by their host. Most have adapted to life inside a specific host and the external environment is quite hostile for them. Some pathogens develop a spore or cyst that has the ability to survive once it is excreted or shed by the host. Others are able to survive freezing or low temperatures for extended periods of time (Table 1). For example, *E. coli* 0157:H7 and *Salmonella* can survive for long periods in frozen soil. However, the pathogens

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Table 1. Survival Times for Various Pathogens*							
Material	**Temperature**	***Giardia***	***Crypto-sporidium***	***Salmonella***	***Campylo-bacter***	***E. coli* 0157:H7**	***Yersinia entercoliticia***
Water	Frozen	< 7	> 84	> 182	14-56	> 300	> 365
	Cold (5C)	77	> 84	> 182	8-120	> 91	> 365
	Warm (30C)	14	70	45-152	< 2	49-84	10
Soil	Frozen	< 7	> 84	> 84	14-56	> 300	> 365
	Cold (5C)	49	56	63	20	99	> 365
	Warm (30C)	7	28	> 45	10	56	10
Cattle Manure	Frozen	< 7	> 84	> 196	14-56	> 100	> 365
	Cold (5C)	7	56	84-196	7-21	> 70	30-100
	Warm (30C)	7	28	48	3	49-56	10-30
Liquid Pig Manure		365	> 365	13-75	> 112	10-100	12-28
Compost		14	28	7-14	7	7	7
Dry Surfaces		1	1	1-7	1	1	1

*Days required until the pathogen can no longer be detected (adapted from M. Olson, University of Calgary, 2001 and Guan & Holley, 2003).

survive for a much shorter period in warm soil temperatures. In Manitoba, wide ranges of temperatures occur during the year. This allows the natural weather cycle in Manitoba to act as a cleanser to destroy animal germs and prevent their spread to the environment.

Storing or composting manure before it is used as a fertilizer (applied to the land) will reduce the number of pathogens. Once manure is applied to the land, soil microbes readily destroy most pathogens. Furthermore, most bacteria are sensitive to air and all viruses are sensitive to sunlight. Both bacteria and viruses die when dried out.

Question:

Can germs or pathogens be transmitted through the air?

Answer:

Disease causing germs may be transported through the air on dust particles. However, dust particles settle rapidly. Even though a person may smell odours at long distances from livestock facilities, pathogens are not carried with odours. There is no evidence to show animal disease is transferred to people over long distances through the air.

Question:

What are some other ways that germs can be transferred from animals to humans?

Answer:

Various vectors can transfer germs. A vector is an organism or thing, such as dirty boots that pick up a pathogen and carry it from place to place or from one host to another host. For example, if a flying insect, a rodent or a bird comes in contact with germs, there is the possibility that some of the germs could be spread to other livestock or humans either at the same farm or on different farms. That is why it is important to prevent a build up of insects and rodents near livestock and people and to discourage interactions between birds and livestock. The easiest way to do this is to keep the livestock facilities clean, sanitary and secure.

Question:

How can I prevent the transmission of germs from animals to people?

Answer:

There are three steps in the transmission of animal germs to humans, which may lead to an illness. The control of any one of these steps will protect people from infection.

1. The germs must be excreted or shed by the animal.

2. The germs must remain alive until reaching and getting into a susceptible human.

3. The number of germs that get into the human must be great enough to cause an infection or reaction.

When any one of these steps is eliminated, the transmission of germs from animals to people can be significantly reduced or completely

stopped. Simple ways to do this include:

- washing your hands before eating and smoking;
- washing your hands after visiting a farm or handling animals;
- proper handling and cooking of food;
- proper siting and maintenance of your water well;
- disinfecting your drinking water when camping and
- keeping your animals healthy.

Summary

Animal germs are a natural occurrence that tends to stay within livestock populations. Most of the germs carried by animals are harmless to people. To minimize the transfer of pathogens from animals to people, proper food handling, sound manure management practices and good personal hygiene should be followed and observed.

For further information about livestock production refer to other titles in the series: "Living with Livestock Production" available from Manitoba Agriculture, Food and Rural Initiatives offices.

- *Health Issues and Livestock Production*
- *Livestock Odours – Sources, Concerns & Solutions*
- *Surface Water Issues*
- *Nitrates in Soil and Water*
- *Land Application of Manure*
- *Siting Livestock Production Operations*
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More detailed information can be found on the Internet at www.gov.mb.ca/agriculture/livestock and from Agriculture Publications at 8th floor, 401 York Avenue, Winnipeg, MB. R3C 0P8 (Fax: 204-948-2498)