



CCPA

CID Lines

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## Spread of viral and bacterial diseases

As there is much common ground with the spread of these two groups of infectious agents we will consider them together. For spread to occur they must first leave the infected animal, then be transmitted to another where they must enter and establish infection. The exit routes from the animal have already been considered.

### Between animal spread

Several factors come into play to maximise the success of bacterial/viral shed. These include:

- The number of viruses/bacteria shed by the animal.
- The number of animals shedding.
- The infectious dose – the number of viruses/bacteria required to establish infection in the recipient animal.
- The proximity of susceptible animals. If we consider the shedding of viruses from the respiratory tract, the infected microdroplets move away from the animal in a cone shaped plume. Therefore, as the distance from the animal increases, the number of infectious particles per litre of air decreases.
- The environment. For example, the number of viruses or fungal spores per litre of air is higher in an under-ventilated animal house. Hence, under-ventilation predisposes to respiratory disease.
- The ability of the virus/bacteria to survive outside the host.
- The ability of the virus/bacteria to survive during transmission. For example, with viruses in aerosols generated by coughing or sneezing, the destruction of the microdroplets is much quicker in conditions of high temperature, low humidity and direct sunshine. Thus, the environment in many enclosed housing situations favours bacterial and viral spread.

### The role of fomites

A fomite is something which carries disease-causing micro-organisms from one animal to another. The efficiency with which they can do this influences disease spread. Thus, fomites which have actual contact with the animal or its faeces are more likely to become contaminated and transfer disease. Do not let fomites go any nearer to the animals (either shedders or recipients), than is absolutely necessary.

The risk of a fomite transmitting disease between houses or farms is time related. The longer a contaminated fomite remains away from the recipient animal the less likely it is to transmit disease. Also, it greatly helps if we can put the fomite through a decontamination process between houses or farms. Better still, remove the fomite all together. For example, if we need to move some partitions between two farms disinfect them off the farm and disinfect them back on to the recipient farm. However, it is much better to have both farms self-sufficient in partitions, then nothing need move between them and nothing can become a fomite.