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Foot and Mouth Disease

Preventing Disease
in Animals

Foot and Mouth Disease

Many of you have already received information directly from the CDFA, your creamery, or dairy association regarding Foot and Mouth Disease (FMD). Because the disease can have devastating economic and emotional impacts to local dairy and livestock farmers, I am including information on the disease in this newsletter (even if you've seen it before). Knowledge is power. Take actions now to protect your farm and your livelihood.

FMD virus can survive for several days on clothing and other personal articles that have been contaminated. It also survives in the respiratory tract of humans for 24 to 36 hours. For these reasons, you should know where people have been before you allow them to visit your farm. Travelers who have had contact with livestock overseas should not visit your farm for at least 10 days after their return. You should control who visits your farm and when.

Clinical Signs of Foot and Mouth Disease

- Initial signs include dullness, anorexia (off feed) , fall in milk production, fever of 103 to 105 degrees F.
- Latter signs include excessive salivation (drooling), serous (resembling serum) nasal discharge, and shaking or kicking of the feet, or lameness.
- Vesicles (blisters) form, especially on the tongue, dental pad, gums, soft palate, nostrils, muzzle, interdigital space (between toes), coronary band, and teats.
- After vesicle formation, salivation may be more marked, and nasal discharge and/or lameness may increase.
- Pregnant cows may abort. Young calves may die without showing any clinical sign of FMD.

Report any of these symptoms to your veterinarian immediately - the sooner action is taken, the better your chance of minimizing potential disease impacts to the whole ag community.

The organism that causes Foot and Mouth Disease is classed by microbiologists as belonging to the large and diverse family of viruses called Picornaviruses (which also includes the causes of diseases as different as the common cold, hepatitis A and SVD). Picornaviruses are all extremely small viruses (just 20 millionths of a millimeter across) which do not have DNA as their genetic

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material, but the related RNA. Their small size means that they settle out of air very slowly, if at all, and can therefore be carried by wind for considerable distances. They are also resistant to drying out, and can easily be carried on clothing or, indeed, by almost anything transported from an infected site. To a virologist, that the genes of FMDV are composed of RNA rather than DNA has two important consequences. First, it makes the virus very susceptible to genetic change (mutation). Specifically, the virus does not possess any means of correcting for damage to its genes which is commonly incurred as the virus multiplies in the infected animal. This rapid rate of genetic change means that the way the virus 'looks' to the immune system of infected animals is also constantly changing. In turn, this means that any vaccine becomes useless after a time. (Possession of an RNA 'genome' rather than DNA is the reason that vaccines against the common cold and HIV have proved so elusive.)

This variation is reflected in the fact that in excess of 17 so-called "strains" of FMDV are currently recognized worldwide.

It was identification of the particular variant responsible for the present British outbreak of FMD that allowed its original source to be identified as an animal or animal product imported from Asia, almost certainly illegally.

However, this technical classification of the virus into particular strains, although useful for diagnostic purposes, is somewhat misleading. Each of these strains comprises an ever-changing number of sub-strains, some of which are capable of evading the immune system, and hence evading the vaccine in use. New vaccines can (usually) be made against each sub-strain, but not until the sub-strain arises. Consequently, vaccination against FMDV can only be a temporary measure in protecting against this disease.

This information is from the USDA APHIS website Training Module on Foreign Animal Diseases. The website is http://www.aphis.usda.gov/vs/ep/fad_training/VESVOL7.