February 25, 2011

Rift Valley Fever Fact Sheet

1. **What is Rift Valley Fever? -** Rift Valley fever (RVF) is an insect-transmitted, acute, febrile, viral disease of sheep, cattle, goats and humans. Fatal disease is common when infection occurs in young animals, and abortion is frequent in infected pregnant animals. Rift Valley Fever virus (RVFV) is highly contagious to humans producing fever, and flu–like symptoms Visual disturbances during the infection can be a clue to the diagnosis of RVF. Human RVF can be fatal. Sheep and cattle are the primary hosts and the amplifiers of this virus. Goats and dogs are also highly susceptible. Horses and pigs are resistant to this disease.

2. **Where is RVFV found? -** RVFV is found throughout most of Africa. Until recently, the disease was only acquired in Africa, but in the last few years the virus has jumped to the Arabian Peninsula and produced disease outbreaks in Saudi Arabia and Yemen.

3. **How is RVFV spread?** RVFV is spread between hosts by infected mosquito vectors. *Aedes* mosquitoes are the reservoir for the virus. In endemic regions, outbreaks often occur in five to fifteen year cycles, and are typically seen after periods of heavy rainfall in normally dry areas. Between outbreaks, the virus may be present in the dried and dormant eggs of the mosquito *Aedes lineatopinnus* in the dry soil of the grasslands.

   a. Heavy rainfall allows water to pool and gives the eggs a place to hatch. These infected mosquitoes develop, and transmit the virus to an animal amplifying host. Other types of mosquitoes can then become infected and rapidly spread the disease. If susceptible animal species are present, there are likely to be many human clinical cases. In many areas of Africa, the disease is ever present and sentinel animals are used to monitor for outbreaks.

   b. The RVFV can also spread, by aerosols, to humans who handle infected tissues (as when performing field necropsies). This virus can survive up to 4 months at 39.2°F, and 8 years at temperatures below 32°F. It can also survive for over one hour in aerosols.

4. **What are the Signs and Symptoms in Animals? -** RVF is often fatal in young lambs, calves, and kids. In lambs less than one week of age, the mortality rate can be 90% or higher. In calves it is 10–70%. The mortality rate is about 20% in adult sheep, especially ewes that have aborted, and 10% in adult cattle. Abortion rates are high; up to 100% of infected sheep, cattle and dogs may abort. The incubation period for Rift Valley fever is up to 3 days in sheep, cattle, goats, and dogs. In newborn animals, it can be as short as 12 hours.

5. **How Susceptible are People to RVFV? -** Humans are highly susceptible to infection by mosquitoes and/or by exposure to infected aerosols. In humans, the incubation period is four to six days. The initial symptoms are flu–like and may include fever, weakness, muscle pain, headache, nausea, and aversion to light. Recovery generally occurs after four to seven days. Occasionally, a viral hemorrhagic fever develops two to four days after the fever appears

with jaundice, vomiting of blood, pinpoint rash, and death. Some patients may have meningoencephalitis and others a visual disturbance, including blindness, that develops five to fifteen days after the onset of fever. Vaccination is available for those at high risk of exposure.

6. **What Control Measures are Available? -** An attempt should be made to identify all people in close contact with infected individuals, including people living with or caring for the infected or laboratory workers handling specimens. Those contacts should receive body temperature checks for at least three weeks. Immediate hospital isolation should be enacted for any contacts with fever at or above 101°F during this period. The antiviral drug Ribavirin has been studied for treatment and prophylaxis if RVF.

7. **What Preventive Measures are Available?** When caring for patients with Viral Hemorrhagic Fevers, further transmission of the disease through person-to-person contact or nosocomial routes can be avoided by taking preventive precautions against contact with patient secretions (together called VHF isolation precautions or barrier nursing methods). Such precautions include wearing protective clothing, such as masks, gloves, gowns, and goggles; using infection control measures, such as complete equipment sterilization; and isolating infected patients from contact with unprotected persons until the disease has run its course.

8. **What can I do to Protect Myself? -** The best way to protect yourself in areas where RVF is discovered to be present is to keep infected mosquitoes from biting you. Therefore, the Pennsylvania Department of Health (DOH) recommends that children and adults routinely wear mosquito repellent while outdoors during the April–October mosquito season, especially during dusk and dawn when many mosquito species are actively feeding. Further, the insect repellent should contain DEET, and be applied following the manufacturer's written directions.

9. **What Can I Do to Reduce the Number of Mosquitoes around My Home? -** Remember mosquitoes will lay eggs in any standing water that may remain for more than four days, and that the adult mosquitoes that emerge from any water near your home will probably seek out your family for their first blood meal. Here are some simple protective steps you can take:

   a. Maintain good screens on your windows and doors to keep infected mosquitoes out.

   b. Regularly empty any outside containers, or drill drainage holes in their bottoms.

   c. Turn over plastic wading pools and wheelbarrows when not in use.

   d. Clean clogged roof gutters that may allow the pooling of rain water.

   e. Do not allow water to stagnate in either bird baths or ornamental ponds.

   f. Clean and chlorinate swimming pools and remove standing water from pool covers.

g. Use landscaping to eliminate standing water that routinely collects on your property.

h. Remove discarded tires from your property as they make an excellent larva habitat.

i. For standing water that can't be eliminated, residents can buy either *Bacillus thuringiensis israelensis* (Bti), or *Bacillus sphaericus* (Bsp) tablets at any lawn and garden store. After such a tablet is thrown into the water the bacteria will infect and kill any mosquito larvae present, but the water will remain safe for people, pets, aquatic life and plants.

10. **When is Mosquito Larviciding Required?** – Mosquito larva control activities are an important part of any integrated pest management program. The larvicides used by the Department of Environmental Protection (DEP) include Bti, Bsp, and Methoprene®. Both Bti and Bsp are naturally occurring bacterial mosquito pathogens that have a very low environmental impact. Methoprene® interferes with the normal development of mosquito larvae, but is relatively harmless to non-target organisms. Hand application, truck-mounted, and/or aerial equipment is used to distribute larvicides.

11. **When is Adult Mosquito Spraying Required?** - If the Commonwealth of Pennsylvania's Mosquito Surveillance Program laboratory test results document significant numbers of adult mosquitoes infected with either a mosquito-borne virus (e.g. Eastern Equine Encephalitis Virus, LaCrosse Virus, Rift Valley Fever Virus, Saint Louis Encephalitis Virus, or West Nile fever Virus) or significant clusters of animal or human disease is found, adult mosquito spraying will be used to protect the public health. Allergic individuals; pregnant women; and caregivers for either the elderly, the ill or young children should comply with announced precautionary recommendations. Any person experiencing an adverse health effect should immediately consult with their health care provider.

a. Most adult mosquito spraying scenarios involve certified pesticide applicators using truck mounted pesticide spraying equipment to spray from roads. They spray neighborhoods when adult mosquitoes are most active, usually in the early evening. The manufacturer's instructions are followed to formulate a pesticide mist that will kill flying mosquitoes upon contact and then either evaporate before reaching the ground, or degrade rapidly in sunlight. Residents should close windows and doors and turn off air conditioners before the spraying period begins, and remain inside. Residents should reopen windows and doors, and turn on air conditioners 30 minutes after the spraying period ends.

b. The next most common adult mosquito spraying scenario involves certified pesticide applicators using all-terrain-vehicle mounted spraying equipment to spray off-road areas. These application methods and precautions are the same as 6.a.

c. Rarely a larger area will require aerial spraying by a certified contractor using either a fixed wing aircraft or a helicopter. DEP will choose a pesticide that has been mutually agreed upon by the DOH and the county mosquito control partners where the spraying is taking place. Application methods and precautions are the same as 6.a. and 6.b.

(1) The aircraft application is controlled by an onboard computer as the aircraft flies parallel grid lines. Constantly factoring in aircraft location and changing wind speeds and directions, the computer directs the pilot where to fly, and then controls the spraying equipment so that the invisible pesticide mist ends up in the designated treatment area. Aircraft spraying software discontinue spraying over bodies of water. For these reasons, an aircraft flying over your house may be accurately applying pesticide to a targeted area more than half a mile away.

(2) In 2008, **Scourge®** was used for the aircraft spraying in South East Pennsylvania, however, prior to that **Pyrocide 7596®** was used for aircraft applications.

12. **What Pesticides are used in Pennsylvania for Adult Mosquito Spraying?** A variety of commercial pesticides (Please see http://wsprod.colostate.edu/cwis79/mosq/entire.cfm for more product information.) are used in these Ultra Low Volume (ULV) applications:

(1) **Anvil 10+10®**

(2) **AquaReslin®**

(3) **Biomist 3+15®**

(4) **Duet®**

(5) **Permanone®**

(6) **Pyrocide 7596®**

(7) **Scourge®**

(8) **Zenivex E20®**

13. **Is Any Pesticide Exposure Risk Free**? No. As a general rule pesticide products are considered inherently toxic, therefore, all pesticide applicators must be trained and certified. Since the likelihood of a person or pet experiencing any adverse health effects from exposure to any pesticide application mostly depends on the concentration and duration of exposure, the best safety advice is to carefully follow announced recommendations.

14. **What Planned Spraying Notifications are Required? -** Registered hypersensitive persons (http://www.agriculture.state.pa.us/agriculture/lib/agriculture/plantindustryfiles/pesticidehyperreginfo.pdf) residing in the impacted area must be notified in advance of any planned pesticide spraying, so that appropriate self-protective measures may be taken during and after the planned spraying event. As a courtesy, The Department of Environmental Protection also notifies registered beekeepers in the application area.

15. **Should I Touch Pesticide Exposed Surfaces (e. g. grass or soil)?**

b. In general, adverse health effects are not expected from such limited skin exposure.

b. These types of pesticides are rapidly degraded by exposure to sunlight or water.

16. **Can Pets go Outside during Spraying? -** If possible, keep your pet inside during the announced spraying period and for about 30 minutes afterwards to minimize their exposure.

17. **Should I be Concerned about Pesticide in My Swimming Pool?** – Since these types of pesticides break down quickly in either water or sunlight, no special precautions are needed to protect swimming pools.

18. **What Steps can I take to Protect My Family and Myself?**

    a. Residents should close windows and doors and turn off air conditioners before the spraying period begins, and remain inside during spraying.

    b. Bring children's toys indoors before spraying begins, or rinse them off after.

    c. As usual always wash fresh produce before food preparation or eating. However, you may wish to pick any ripe homegrown fruits and vegetables before the scheduled spraying begins.

    d. Bring pets, food and water dishes indoors, and cover ornamental fish ponds.

    e. Residents should reopen windows and doors, and turn on air conditioners 30 minutes after the spraying period ends.

    f. As always, if you experience any adverse health effects you should immediately consult with your health care provider.

19. **For more information about Adult Mosquito Spraying**:
    http://www.cdc.gov/ncidod/dvbid/westnile/resources/wnv_ReportOverview.htm#youcando

20. **For more RIFT Valley Fever information:**
    http://www.cdc.gov/ncidod/dvrd/spb/mnpages/dispages/rvf.htm

This fact sheet provides general information. Please contact your physician and/or veterinarian for specific clinical information related to you or your animal.