

LYMPHOCYTIC CHORIOMENINGITIS THREAT IN OHIO PET RODENTS
DIRECTOR'S JOURNAL ENTRY REPORT
January 12, 2006

Background

In May, 2005 the Centers for Disease Control and Prevention (CDC) received reports of severe illness in four organ recipients who received either lungs, kidneys or a liver from a common donor ([Appendix 1](#)). Three of the recipients died and one recovered. The transplant recipients were later found to be infected with lymphocytic choriomeningitis virus (LCMV). Two other patients received corneas from the donor, but were asymptomatic. The organ donor was a Rhode Island woman who died of a stroke. She owned a hamster which tested positive for LCMV, the same strain as that found in the organ recipients. A person in the donor's home who cared for the hamster was also positive for LCMV, although he did not become ill. Organs for donation are not routinely screened for LCMV.

The organ donor's hamster was purchased at a local PetSmart in Rhode Island. Fifty-six hamsters and eight guinea pigs were collected from the store. Because testing on live animals is not reliable, the animals were humanely euthanized and tested by CDC for LCMV. Three of the 56 hamsters were LCMV positive. One of these was the donor's black-bear hamster. Of the eight guinea pigs, one was LCMV positive.

LCMV is naturally occurring and has been found in wild mouse populations. Prevalence in wild mice in the U.S. is approximately 5% ([Appendix 2](#)). Pet rodents can become infected when they have contact with infected wild rodents. People who are exposed to infected pets or wild rodents, their waste or their bedding can become infected. LCMV does not usually affect healthy individuals. However, pregnant women and immunocompromised individuals may be at risk. Pregnant women may also transfer the virus to their fetuses, resulting in miscarriage or birth defects ([Appendix 3](#)). Signs and symptoms of LCMV infection may include: mild febrile illness, headache, chills, muscle aches, aseptic meningitis, and encephalitis. Asymptomatic infections are common in healthy individuals. There is no specific treatment.

The Ohio Department of Health (ODH) became involved in this investigation June 1, 2005 when it was determined that all the rodents at the Rhode Island PetSmart were supplied by one distributor, Mid-South Distributors. Their facility is located at 7524 East Pike near Zanesville in Muskingum County, Ohio. Mid-South operates not only the distribution facility in Ohio but also a large breeding facility in Arkansas. Rodents from the Arkansas facility, along with rodents from other small breeding facilities, converge at Mid-South Ohio for distribution to pet shops in several northeastern and midwestern states. CDC wanted to identify the source of the LCMV by testing animals from both Mid-South facilities.

Because the ability to investigate Mid-South in Arkansas was limited, CDC requested permission to begin the investigation in Ohio. Pursuant to Ohio Revised Code 3701.14,

on June 16, 2005, the Director of Health determined an investigation was needed and filed a Director's Journal Entry. This entry declared LCMV a risk to public health and authorized an investigation to evaluate the presence of LCMV in the Mid-South Ohio facility and to take prompt action to control and suppress it ([Appendix 4](#)). ODH requested the assistance of the Ohio Department of Agriculture (ODA) because ODA enforces rules regarding the health of animals coming into Ohio. ODA declared LCMV a dangerously contagious and infectious disease ([Appendix 5](#)) which gave them authority to test animals and to quarantine facilities.

In addition to ODH, ODA, CDC, and the United States Department of Agriculture, Animal Plant Health and Inspection Service, Animal Care (USDA) was involved in an ongoing investigation of animal care violations. Also, OSHA had recently completed an investigation as a result of worker complaints.

Findings

An unannounced inspection was made very at the Mid-South Ohio facility on July 18, 2005 ([Appendix 6](#)). Ten staff representing ODH, ODA, CDC, USDA, and the Muskingum County Health Department and Sheriff's office were present. The premises were immediately placed under quarantine and no animals were permitted to enter or leave the facility.

Based on CDC recommendations for a statistically significant sample, 100 rodents from the general population were collected and euthanized for LCMV testing. Of these, 30 were black bear hamsters and 70 were short-haired hamsters. An additional 28 animals that were considered sick, were dead, or had escaped from their cages were also collected for testing. These animals included hamsters, mice and a guinea pig.

The night before the inspection, several vans brought shipments of young rodents from the Mid-South Arkansas breeding facility. These animals were placed in containers in the Mid-South Ohio general population room, separate from the existing population. Twenty-four animals were sampled from this room. At the time of the inspection, these vans had already left Mid-South Ohio loaded with pet rodents bound for pet shops in six states: Connecticut, New York, New Jersey, Pennsylvania, Massachusetts, and Vermont. Because these vans were affected by the quarantine, ODH and ODA contacted their counterparts in those states to inform them that animals from a facility under quarantine were about to enter their state. Each state had to determine which agency, agriculture or health, had primary authority and had to decide how to handle the animals once they arrived. Some states quarantined or euthanized the entire shipment. Others chose to allow the pet shops to keep the animals alive but off the sales floor until CDC completed testing of the 100 Mid-South rodents. If all the tested animals at CDC were negative, this would indicate that the animals at the pet shop were probably not infected.

Because human health was the primary focus of ODH's investigation, ODH, with assistance from CDC, developed an extensive questionnaire for workers in the event that there was a need to pursue this further ([Appendix 7](#)). Mid-South workers were asked if

they felt ill or had been sick since working there. All who were asked claimed they had no health problems and had not been sick since working at Mid-South.

ODH was later contacted by two former Mid-South workers regarding their belief that their current illnesses might be the result of LCMV. Both were directed to their private physicians for evaluation and blood testing. One of the workers, who had not worked for Mid-South in over a year, reported back to ODH. This worker's serology was compatible with a past exposure but not current infection with LCMV. This does not necessarily mean that the person was exposed at Mid-South, because other environmental exposures to LCMV during a lifetime are possible.

CDC confirmed that about 3% of the Ohio Mid-South hamsters were positive for LCMV. Some of these animals had arrived directly from the Arkansas breeding facility just hours before they were collected for testing in Ohio. The fact that these animals tested positive indicates that they were infected at the breeding facility.

Conclusions

- Mid-South Ohio was the distributor of the hamster purchased in Rhode Island that was linked to the infection and death of several organ transplant recipients.
- Mid-South Ohio harbored animals that carried LCMV.
- At least some of the infected animals at Mid-South Ohio were infected at the breeding facility at Mid-South Arkansas.
- Because LCMV easily spreads among rodents, infected animals were probably transmitting the infection amongst themselves at Mid-South Ohio.
- Pet rodents potentially infected with LCMV should not be sold to the public.
- Pet rodents that are already in homes are of minimal risk to owners and should not be tested for LCMV, but precautions should be taken to minimize risk to humans ([Appendix 8](#)).
- There were no verifiable reports of any people in Ohio with active LCM infections linked to this facility.

Recommendations

To stop the spread of LCMV infection in rodents:

- All animals at Mid-South Ohio should be humanely euthanized immediately and the facility cleaned and sanitized before allowing any more animals back into the building.
- Mid-South should abide by importation rules and get appropriate permits and veterinary certificates in the future before shipping any animals out of state.
- Mid-South should develop and implement animal biosecurity measures to prevent infection of animals with LCMV. Paramount is keeping wild rodents from mixing with domestic pet stock.

- To get the quarantine removed from the facility, Mid-South Ohio must prove that they are keeping good records and they are testing a certain percentage of their animals for disease.

To prevent LCMV infection in humans:

CDC issued interim guidelines to prevent the spread of LCMV to humans ([Appendix 9](#)).

- Stop rodent infestations in or around your home by sealing entry holes, trapping and killing wild rodents, and removing rodent food sources and nesting areas. ([Appendix 10](#)).
- Purchase only healthy rodents as pets.
- Do not kiss pet rodents or put them against your face.
- Always wash your hands after handling a pet rodent, cleaning its cage.
- If you are pregnant or immunocompromised, you should not own or care for pet rodents.
- Pet stores should provide educational materials to new pet rodent owners on preventing LCMV and other zoonotic diseases from rodents.

If people feel they may have been exposed to LCMV, or feel they show symptoms of LCM, they should consult with their doctor. Only a blood test can show if someone is infected with LCMV.

Industry Control Measures

As a result of these events, the nation's two largest pet retailers, PetSmart and PetCo, voluntarily stopped the sale of all pet rodents received from Mid-South over the six months preceding the positive test results. Four states - Vermont, Massachusetts, New Jersey and Michigan - issued stop-sale or quarantine orders for pet rodents supplied by Mid-South. Both PetSmart and PetCo ceased doing business with Mid-South. The Pet Industry Joint Advisory Council (PIJAC) issued a warning to all pet stores about the potential for LCMV infection in rodents ([Appendix 11](#)).

The CDC issued recommendations related to pets supplied by Mid-South ([Appendix 12](#)). Three options were provided: 1) stop sale or distribution of all rodents originating from Mid-South; 2) stop sale or distribution of hamsters and guinea pigs from Mid-South; or 3) Allow sale or adoption of rodents provided appropriate educational material is given to the purchaser.

All animals at the Mid-South Ohio facility were humanely euthanized. In accordance with the ODA Proclamation ([Appendix 13](#)), the facility was cleaned and sanitized and the quarantine was lifted on November 29, 2005 ([Appendix 14](#)). The facility has not reopened.

The Mid-South breeding facility in Arkansas was quarantined by Arkansas state authorities in August. The owner voluntarily euthanized all hamsters and guinea pigs. Approximately 450 animals from Arkansas were sent to CDC for LCMV testing. Results may be available by late January 2006. USDA also suspended the breeder's license.

CDC is working with the medical community to disseminate information on LCMV, especially to those who serve pregnant and immunocompromised patients. CDC is also finalizing MOU's with PETCO, one of the largest pet distributors in the U.S., and the Pet Industry Joint Advisory Council (PIJAC) to create educational material on zoonotic diseases related to the pet industry. This partnership will allow CDC and PIJAC to combine efforts in educating a large audience of pet industry stakeholders including, but not limited to: breeders, distributors, retail establishments and owners.

Appendices

- 1) [MMWR LCMV Infection in Organ Transplant Recipients, May 2005](#)
- 2) [CDC LCMV Fact Sheet](#)
- 3) [CDC LCMV, Pregnancy and Birth Defects: October, 2005](#)
- 4) [ODH Director's Journal Entry: June 16, 2005](#)
- 5) [ODA Executive Order 2005-158: June 13, 2005](#)
- 6) [Mid-South Distribution Facility Inspection Report: July 18, 2005](#)
- 7) [LCMV worker survey: July 2005](#)
- 8) [CDC Information for Pet Owners](#)
- 9) [MMWR Interim Guidance for Minimizing Risk for Human LCMV Infection Associated with Rodents July, 2005](#)
- 10) [CDC Prevent LCM from Wild Rodents](#)
- 11) [PIJAC warning](#)
- 12) [MMWR Update Interim Guidance for Minimizing Risk for Human LCMV Infection Associated with Pet Rodents August, 2005](#)
- 13) [ODA Proclamation: August 12, 2005](#)
- 14) [ODA Quarantine removed Nov 29, 2005](#)