

## Transportation and Transfer of Biological Agents and Arthropod Vectors

**T**RANSPORTATION REFERS to the packaging and shipping of materials by air, land, or sea, generally by a commercial conveyance. Transfer refers to the formal process of exchanging these materials between facilities.

Biological agents include infectious agents of humans, plants, and animals as well as the toxins that may be produced by microbes and by genetic material potentially hazardous by itself or when introduced into a suitable gene delivery agent. Etiologic agents and infectious substances are closely related terms that are found in the transfer and transportation regulations. Biological agents may exist as purified and concentrated cultures but may also be present in a variety of materials such as body fluids, tissues, soil samples, etc. Arthropod vectors are organisms such as mosquitoes, ticks, and fleas that may transmit infectious agents to animals or humans. Biological agents and materials and vectors that are known or suspected to contain them are recognized by federal and state governments as hazardous materials, and their transportation and transfer is subject to regulatory control. Transport and transfer of live, uninfected vectors may also be subject to federal and state regulatory control.

### TRANSPORTATION

Regulations on the transportation of biological agents and live vectors are aimed at ensuring that the public and the workers in the transportation chain are protected from exposure to any agent that might be in the package, and that the package prevent escape of the agent or live vector. Protection is achieved through (a) the requirements for rigorous packaging that will withstand rough handling and contain all liquid material within the package without leakage to the outside; (b) appropriate labeling of the package with the biohazard symbol and other labels to alert the workers in the transportation chain to the hazardous contents of the package; (c) documentation of the hazardous contents of the package should such information be necessary in an emergency situation; and (d) training of workers in the transportation chain to be able to respond appropriately to emergency situations. Regardless, non-motile forms such as eggs or non-flying stages should be shipped if possible.

### REGULATIONS

*Public Health Service. 42 CFR Part 72. Interstate Transportation of Etiologic Agents.*

This regulation is in revision to harmonize it with the other U.S. and international regulations (see Federal Register 64(208) p. 58022 at <http://www.access.gpo.gov>). A copy of the current regulation may be obtained from the Internet: [http://www.access.gpo.gov/nara/cfr/waisidx\\_99/42cfr72\\_99.html](http://www.access.gpo.gov/nara/cfr/waisidx_99/42cfr72_99.html). The revisions are expected to have little if any effect on the recommendations below.

*Department of Transportation. 49 CFR Parts 171-178. Hazardous Materials Regulations.*

Applies to the shipment of both biological agents and clinical specimens. Information may be obtained from the Internet: [http://www.access.gpo.gov/nara/cfr/waisidx\\_99/49cfrv2\\_99.html](http://www.access.gpo.gov/nara/cfr/waisidx_99/49cfrv2_99.html).

*United States Postal Service. 39 CFR Part 111. Mailability of Etiologic Agents.*

Codified in the Domestic Mail Manual 124.38: Etiologic Agents Preparations. A copy of the Domestic Mail Manual may be obtained from the Government Printing Office by calling 1-202-512-1800 or from the Internet: <http://bookstore.gpo.gov>.

*Occupational Health and Safety Administration (OSHA). 29 CFR Part 1910.1030. Occupational Exposure to Blood-borne Pathogens.*

Provides minimal packaging and labeling requirements for transport of blood and body fluids within the laboratory and outside of it. Information may be obtained from your local OSHA office or from the Internet: [http://www.access.gpo.gov/nara/cfr/waisidx\\_99/29cfr1910a\\_99.html](http://www.access.gpo.gov/nara/cfr/waisidx_99/29cfr1910a_99.html).

*Dangerous Goods Regulations (DGR). International Air Transport Association (IATA).*

These regulations provide packaging and labeling requirements for infectious substances, materials, clinical specimens that have a low probability of containing an infectious substance, and live vectors. These are the regulations followed by the airlines and are therefore of particular relevance for express shipment of arthropods. These regulations are derived from the Committee of Experts on the Transport of Dangerous Goods, United Nations Secretariat, and the Technical Instructions for the Transport of Dangerous Good that is provided by the International Civil Aviation Organization (ICAO). A copy of the DGR may be obtained by calling 1-800-716-6326 or through the Internet: <http://www.iata.org/dangerousgoods/index>.

## **GENERAL PACKAGING REQUIREMENTS FOR TRANSPORT OF LIVE ARTHROPOD VECTORS**

Transport of live arthropod vectors requires packaging that prevents the escape of the arthropods and agents, maintains their viability, and protects personnel in the transportation chain from exposure to the contents. This is true regardless of whether or not the arthropods are infected. Fortunately, unlike many larger animals, most arthropod vectors do not require large containers, ventilation, feeding, or added water during their transport. Most are shipped without free water so the possibility of leaking is rare, and the container temperatures normally maintained during shipments are adequate. This means that appropriate physical packaging of vector arthropods is fairly simple and, for infected arthropods, can be similar to that which is appropriate for the agents they contain.

The following section is intended to provide specific instructions for determining the type of container and labeling required for shipment of vector arthropods:

*IATA Live Animal Regulations* 26th Edition (LARs) describes containers that are appropriate for the shipment of arthropods including insects and arachnids. The design of these, while not as demanding, is consistent with containers used to ship etiologic agents (See Container Requirement 62 of LARs). It is therefore possible to select containers that satisfy the requirements of LARs, DOT 49 CFR Part 173.196—Transportation of Etiologic

Agents, and USPHS 42 CFR Part 72—Interstate Shipment of Etiologic Agents. (NOTE TO READER: At this time, IATA Dangerous Goods Regulations prohibition against air shipment of “infected live animals” prevents air transport of any of the infected classes below. Because the regulations allow shipping of select agents, we believe this prohibition should be exempted for vector arthropods packaged according to the recommendations below. Although additional hazard is presented by infected arthropods, the increased hazard does not exceed that of agents presently allowed.)

Three cases will be considered:

- Arthropods free of infection by specific pathogens.
- Domestic and exotic arthropods containing a non-select agent.
- Domestic and exotic arthropods containing a select agent.

*Definitions:*

Domestic arthropods: Those that are extant in the 49 continental United States. Note that this differs from the definition used in Risk Assessment and Containment Levels.

Exotic arthropods: All others

Select agent: Etiological agents listed in 42 CFR Part 72

Non-select agent: Agents other than those above that are known to cause disease in humans.

- Non-infected exotic and domestic arthropods that vector disease are packaged consistently with the minimum packaging requirements of 42 CFR 72.2. This requires that the container must prevent “leakage (i.e., escape, note added) of the contents, shocks, pressure changes, and other conditions incident to ordinary handling in transportation.” We recommend that this consist of three levels of containment including: a primary receptacle consisting of a sealed plastic bag or tube surrounded by padding, a secondary container such as an insulated chest whose lid is sealed with tape, and a durable fiberboard, wood, plastic or wooden outer container. The container may bear the “live animal” label naming the species within. If aquatic stages are shipped, the container should also contain sufficient absorptive material to absorb and contain all of the water.
- Domestic and exotic arthropods containing a non-select agent are packaged as above. The outer container bears a ‘biohazard’ label as described in CFR 72.3. An itemized description of the contents is placed between the outer and inner containers.
- Domestic and exotic arthropods containing a select agent are packaged, labeled and tracked as required for the agent they are known or suspected to contain. This includes all attendant regulations required for the agent alone including notice of delivery and failure to receive, laboratory registration etc.

## TRANSFER

Regulations on the transfer of biological agents and live vectors are aimed at ensuring that the change in possession of biological materials is within the best interests of the public and the nation. These regulations require documentation of the personnel, facilities, and justification of need for the biological agent in the transfer process and subsequent approval of the transfer process by a federal authority. The following regulations fit in this category:

**IMPORTATION OF ETIOLOGIC AGENTS OF  
HUMAN DISEASE AND LIVE VECTORS**

*42 CFR Part 71 Foreign Quarantine. Part 71.54 Etiologic Agents, Hosts and Vectors.*

This regulation requires an import permit from the Centers for Disease Control and Prevention (CDC) for importing etiologic agents of human disease, any materials that may contain etiologic agents including live animals and live vectors. This regulation also requires that an import permit be obtained by the recipient for transfer from the original permit-holder of an imported etiologic agent or live vector within the United States. An application and information on importation permits may be obtained by calling 1-888-CDC-FAXX and enter document number 101000 or on the Internet: <http://www.cdc.gov/od/ohs/biosfty/imprrtper.htm>. Interstate transfer of biological agents and live vectors may also be restricted by state regulations. Shippers and recipients of these materials may obtain additional information directly from state health or agriculture departments.

**IMPORTATION OF ETIOLOGIC AGENTS OF LIVESTOCK,  
POULTRY AND OTHER ANIMAL DISEASES**

*9 CFR Parts 92, 94, 95, 96, 122 and 130.*

These regulations require an import permit from the United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Veterinary Services to import or domestically transfer etiologic agents of livestock, poultry, other animals, and any materials that might contain these etiologic agents. Information may be obtained at (301) 734-3277, or from the Internet: [http://cofcs66.aphis.usda.gov/vs/import\\_export/htm](http://cofcs66.aphis.usda.gov/vs/import_export/htm).

**TRANSFER OF SELECT BIOLOGICAL AGENTS OF HUMAN DISEASE**

*42 CFR Part 72.6 Additional Requirements for Facilities Transferring or Receiving Select Agents.*

Facilities transferring or receiving select agents must be registered with the CDC and each transfer of a select agent must be documented. Information may be obtained on the Internet: <http://www.cdc.gov/od/ohs/lrsat.htm>.

**EXPORT OF ETIOLOGIC AGENTS OF HUMANS, ANIMALS,  
PLANTS AND RELATED MATERIALS**

*Department of Commerce. 15 CFR Parts 730 to 799.*

This regulation requires that exporters of a wide variety of etiologic agents of human, plant and animal diseases, including genetic material, live vectors, and products that might be used for culture of large amounts of agents, must obtain an export license. Information can be obtained by calling the DoC Bureau of Export Administration at 202-482-4811 or through the Internet: <http://bxa.fedworld.gov>, or <http://www.bxa.doc.gov>.

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