

Large Animal Medicine

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- Regulatory Veterinary Medicine

In the US, this is a government function; performed by US department of agriculture (USDA) veterinarians, state departments of agriculture (i.e. Colo. Dept. of Ag.) veterinarians, and private practicing veterinarians that are accredited by the U.S. and state departments of agriculture.

- Regulatory Veterinary Medicine is performed by government and accredited private veterinary practitioners; enforcing state and federal regulations regarding domestic animals. Most of these laws involve farm animals but pets are also regulated in many ways regarding interstate and international movement. Wildlife species can also be covered by federal and state laws regarding harvest and use.
- One goal of regulatory medicine is to keep the US livestock herd healthy and free of domestic contagious diseases that affect profitability.
- Examples of economically important domestic diseases that are reportable to the USDA and State Departments of Agriculture are:

- Cattle

- Tuberculosis
- Brucella abortus
- Trichomonas fetus
- Vesicular Stomatitis

- Equine

- Equine Infectious Anemia
- Equine Herpesvirus Type 1 resulting in Myeloencephalitis

- Ovine

- Brucellosis
- Scrapie

- Another goal is the prevention of the introduction of foreign animal diseases into the United States. Foreign animal diseases (also referred to as exotic animal diseases), if introduced into the U.S. can have a dramatic negative effect on animal health. An adverse health issues, such as a reportable disease outbreak, will affect livestock sales, food exports, livestock exports and the profitability of farm animals and food products.

For example; the occurrence of a single case of "Bovine spongiform encephalitis" (BSE) in the U.S. in December of 2003 caused a dramatic reduction of beef exports. U.S. beef exports in in 2003 were 1.3 million metric tons to 65 countries. In 2004 beef exports dropped to only 0.32 million metric tons to only a fraction of the U.S. beef customers. That single animal with BSE was actually imported into the U.S. from Canada.

- Regulations: Federal and state departments of agriculture officials draft regulations that protect the U.S. national livestock herd. Many of these officials are specialists in epidemiology or other infectious disease disciplines. All of the Federal regulations are published in the "[Code of Federal Regulations](#) Title 9 - Animals and Animal Products". State regulations are published in similar state laws and regulations publications
- Accreditation: A licensed veterinarian must become accredited by the USDA prior to performing regulatory functions on behalf of the federal or state government. Accreditation requires that a licensed veterinarian pass an accreditation exam covering domestic and foreign animal disease control issues and also must meet continuing education requirements.
- A partial list of regulatory functions would include:

- Interstate health certificates - The issuing veterinarian must determine that (1) all animals are adequately identified with a permanent ID (cattle and other food animals) or a picture or drawing showing all markings and brands (horses). Food animal identification tags must be approved by the USDA when used for interstate health certificates. (2) that the animals meet all pre-entry requirements for the state of destination, such as brucellosis vaccination, which is required by many states, (3) that the animal is determined to be healthy through a physical exam or visual observation, (4) that suitable results (usually negative) for all required disease tests have been obtained and (5) any treatments or vaccinations required by the state of destination have been administered. Assuming that all entry requirements for the state of destination have been met, the issuing veterinarian can then call the state veterinarians office, in the state of destination, and obtain an entry permit, if one is required. Then a health certificate or "Certificate of Veterinary Inspection" (referred to as a CVI) is completed. The CVI lists the consignor's and the consignee's relevant physical addresses and other contact information. The species, breed and number of animals is noted. The date and method used to transport the animals is noted. The name and address of the person responsible for transportation (usually the person driving the truck) is noted. All animals to be shipped are usually individually listed on the health certificate. All tests performed, including the result, and abnormal health exam findings are listed for each animal. The health certificate should also include a listing of all treatments and vaccinations administered prior to the shipment. The accredited veterinarian who performed the health examinations is responsible for filling out the CVI on the livestock and must sign the health certificate. As soon as possible (certainly within 2 weeks) after the shipment two copies of the CVI must then be mailed to the state veterinarian in the state of origin of the shipment. The state veterinarian then will forward a copy of the certificate to the state veterinarian in the state of destination. Currently electronic CVIs, transmitted via the World Wide Web are being used by many states to streamline interstate movement of livestock. These eCVI documents resemble closely the paper ones and are transmitted as secured unalterable .pdf files.
- International health certificates – An International Health Certificate is often referred to as an IHC. The requirements for an IHC is similar to, though frequently much more complex, to those required for a CVI issued for interstate purposes. The animals for export and animals producing animal products for export (such as semen, embryos, hides, meat, etc.); require proper identification, testing, quarantine and treatments according to protocols that are dictated by the importing country. It is not uncommon for an importing country to require quarantine or isolation of live animals prior to their importation and during the period of time that all export testing, treatments are performed. Also, animals that are producing animal products for exportation usually must be placed into isolation during the testing and production periods of those products. Once testing and other procedures such as quarantine or production of the products to be exported is complete; an IHC can be written, documenting all procedures and then the IHC must be approved and endorsed by a USDA veterinarian. At that time the animals or animal products must be exported, in continued isolation during transport, according to the importing countries requirements.

- Brucellosis vaccination - of heifers only, should be performed prior to the heifer achieving 12 months of age. The heifers should be identified with a proper vaccination tattoo in the right ear's concave area and usually a metal vaccination tag. The tattoo includes an "R" indicating that the RB51 Brucella abortus vaccine strain was used. The tattoo also includes a "US Vaccination Shield" and the last digit of the year of vaccination i.e. "3" for 2013 (and 2003). The tattoo is noted as "RV3" on the vaccination document. The vaccinated heifers are tagged with an orange metal "clip" tag with a number that is unique in the USA. In Colorado, that number begins with 84, then 3 letters and 4 digits. For example 84VAB1234, the 84 means that the tag is a Colorado origin tag. The V stands for "Vaccinate" and is present on all vaccination clip tags. A sequence of tags, ordered by a veterinarian, are registered to that accredited veterinarian so that an animal can be traced back to the veterinarian and from there back to the farm of origin. Keeping an accurate record of the application of these ear tags is important for the purpose of animal trace-back if it is ever necessary. It is required that all Brucella abortus vaccinations be reported to the State Department of Agriculture.



The vaccination tattoo is applied to the concave skin surface of the right ear.
An orange official identification clip tag is also applied to the right ear.
There are also official electronic ID (EID) tags that can be used.

- Brucellosis testing of infection suspects and cattle to be sold or moved interstate or internationally may be required. All tested animals must have acceptable identification or else they must be ear tagged with a unique, shiny metal, "bright" clip tag. Like the vaccination tag, in Colorado, the test tag begins with 84, then 3 letters and 4 digits, for example 84ABC1234.
 - A blood test is used for routine testing of beef and dairy individual animals prior to sale, interstate movement or international movement. A blood test can also be used on all animals on a beef or dairy farm for certification of the farm as "Certified Brucellosis Free". A blood sample is also used for diagnostic purposes, usually after a cow has aborted.

- All tested individual animals must have acceptable official identification or else they will be ear tagged with a unique "bright" test tag with the 84ABC1234 pattern.
- A Brucellosis "Milk Ring Test" on a milk sample from the milk bulk tank allows a dairy farm to test the entire herd for Brucellosis with a single test. This is for food safety purposes as well as for simple periodic survey testing of the dairy cattle for maintenance of the dairy farms certification as "Certified Brucellosis Free".
- The brucellosis eradication program also requires all cattle sent to slaughter at registered slaughter plant to be tested for Brucellosis.
- Tuberculosis testing is required for all dairy cattle periodically, usually every other year, to meet FDA and USDA health standard. TB suspects, cattle to be shipped interstate and cattle to be shipped internationally may also be required to be tested for TB.
 - The routine survey test used for tuberculosis is the "Caudal Fold Intradermal Skin Test". Any suspicious reactions to this survey test will require that the animal be tested with the "Comparative Cervical Test" within 2 weeks of the caudal fold test.
 - All tested animals must have acceptable official identification or else they will be ear tagged with a unique "bright" test tag with the 84ABC1234 pattern.
 - The primary method for routine survey of US cattle for tuberculosis is the post mortem exam that all cattle receive at the time of slaughter in registered slaughter plants.
- Trichomonas fetus testing, required for all sale bulls, bulls moving interstate, and bulls used on public lands for breeding purposes. Virgin bulls under 18 months of age may be exempt. "Trich" testing is routinely done primarily on bulls, using a prepuccial scraping and aspiration technique to obtain the sample for culture and PCR test for Trichomonas fetus DNA. Trichomonas culture and PCR testing is done primarily on bulls because bulls will become persistently infected, within the prepuccial cavity, after venereal exposure to an infected cow. It is bulls that maintain the infection within the herd. After a non-immune cow becomes infected she will develop an endometritis and will abort or not become pregnant. She will continue to cycle and transmit the infection to other bulls when she is in estrus. Trichomonas fetus infection in a cow will result in an immune response and eventual clearance of the infection. Once the cow has cleared the infection she is no longer infectious and may go on to conceive and carry a calf to term. Clinically she will have a very late calf, or is simply diagnosed as not pregnant.
- Equine Infectious Anemia (EIA) testing; Testing for EIA requires serum for a serologic AGID "Coggins Test" or an EIA ELISA test. EIA testing is required by all states for interstate movement of horses into their state. An EIA test is also required by most horse shows and competitive events prior to admittance to the event.
- Testing for or diagnosis of any other disease that must be identified and prevented from being introduced into an importer's state or country by animals or animal products from our clients. These are usually diseases of concern by the importing entity and are spelled out by the state or countries importation requirements.
- Prevention of the introduction of exotic (foreign) animal diseases into the U.S.
 - Probably the most important regulatory functions of the USDA and all veterinarians
 - The USDA has developed and enforces import requirements for animals and animal products originating in foreign countries that are to be imported into the U.S.

These entry requirements are country of origin specific. They are based on knowledge of the exporting country's status with respect to contagious diseases of concern.

Diagnostics, testing, and quarantine of animals both prior to importation and after importation can assure identification and prevent the importation of exotic animal diseases.

One other concern is the possibility of foreign animal diseases being brought into the U.S. on the clothes and shoes of international visitors. These travelers may have been exposed to contagious animals on farms and food markets in foreign countries. U.S. Immigration and Customs Enforcement and the USDA are addressing this issue during customs inspections upon arrival in the U.S. Any prohibited agricultural product are identified through declarations, interviews and inspections of baggage and shipment arriving in the U.S. Any prohibited or suspicious foodstuffs arriving from foreign countries are confiscated and destroyed. This is particularly important with arrivals from countries that are infected with animal (or plant) diseases and parasites of concern.

The USDA monitors the health status of foreign countries through membership in the World Organization for Animal Health (OIE – French for 'Office International des Epizooties'), along with 178 other countries. All members are required to report epidemiologically significant disease occurrences in their country so that OIE members are aware of international disease status.

- Prevention of contamination of the United States food supply by government employees of the "Animal and Plant Health Inspection Service" (APHIS) of the USDA. APHIS veterinarians and technicians are responsible for meat inspection at slaughter and the prevention of infectious disease, drug residues, pesticide residues or any other condition affecting the wholesomeness of animal origin food.