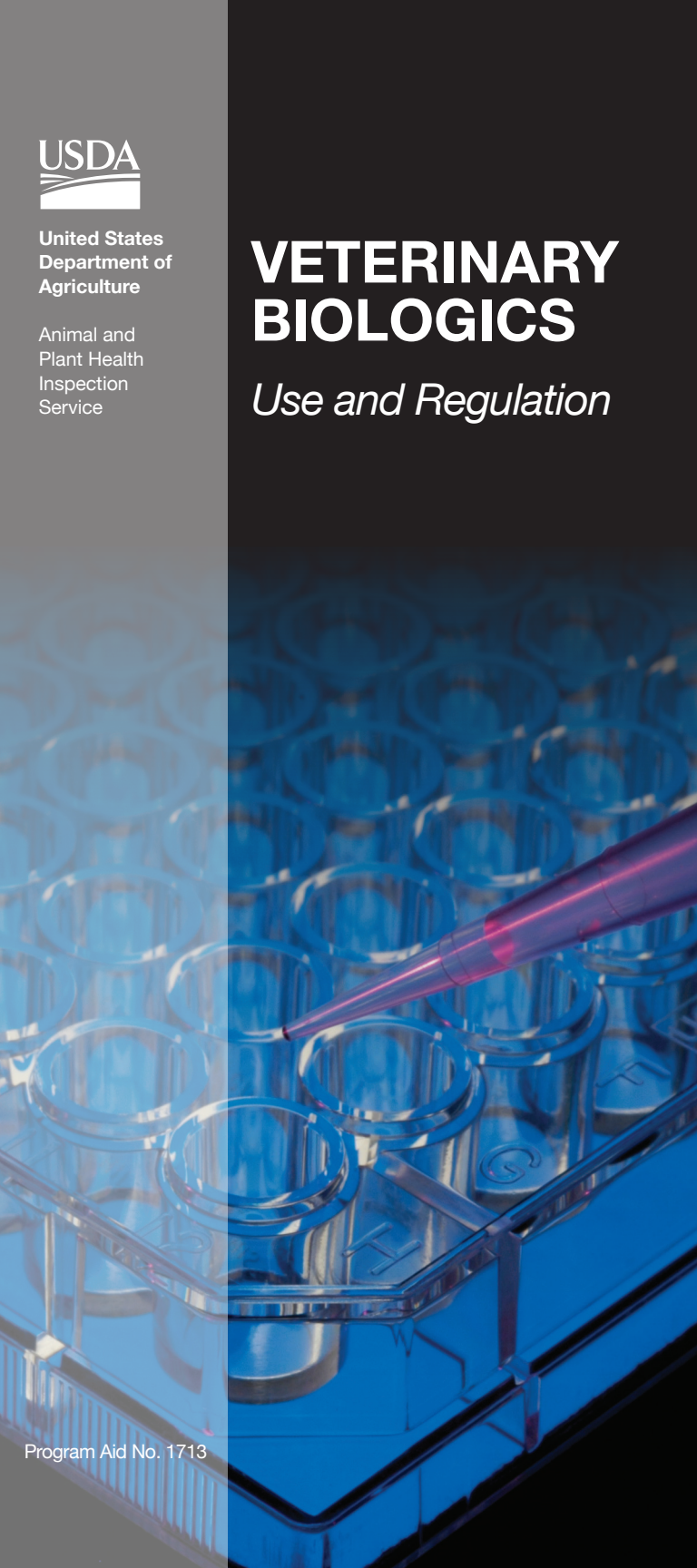
USDA

United States Department of Agriculture

Animal and Plant Health Inspection Service

VETERINARY BIOLOGICS

Use and Regulation



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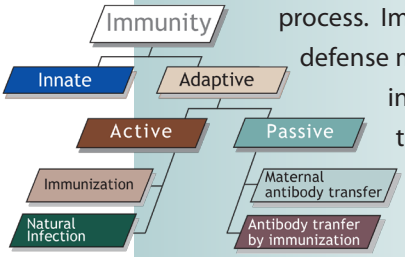
VETERINARY BIOLOGICS

Veterinary biologics are products derived from living organisms and biological processes. They are used to prevent, diagnose, or treat animal diseases and function through an immunological process. Immunity is a biological defense mechanism to avoid infection or disease that involves innate and adaptive components.

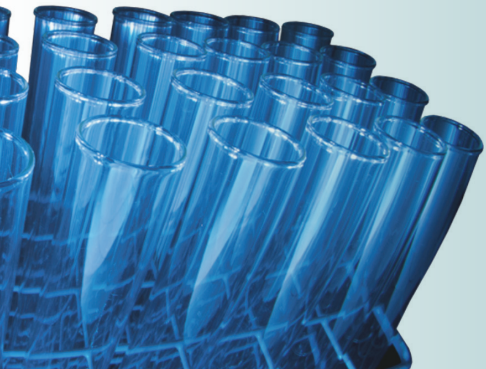


Innate immunity is a nonspecific first line of defense against disease-causing organisms that includes physical, chemical, and cellular functions. Adaptive immunity is a specific cellular response that provides long-lasting protective immunity. Biologics generally function through the adaptive immune response, which is further differentiated into two types: active immunity and passive immunity. *Active* immunity is acquired when the body is exposed by natural infection or vaccination to a disease-causing agent or its derivatives, while *passive* immunity involves the transfer of protective antibodies from an immune animal to a susceptible or nonimmune animal.

VETERINARY HEALTH— SAFETY AND OVERSIGHT

The U.S. Government regulates biologics, pharmaceuticals, and pesticides for use in animals. Three Federal agencies work to ensure that these products are pure, safe, potent, and effective to protect the health and enhance the well-being of animals in the United States.

- The **Center for Veterinary Biologics (CVB)** of the U.S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS) regulates the manufacturing and distribution of veterinary biological products to prevent, diagnose, and treat animal diseases.
- The U.S. Food and Drug Administration's **Center for Veterinary Medicine** regulates the manufacturing and distribution of animal feed additives, drugs, and pharmaceuticals.
- The **U.S. Environmental Protection Agency** registers and licenses pesticides and ensures that all pesticides sold in the United States do not cause unreasonable risk when used according to label directions and precautions.



TYPES OF VETERINARY BIOLOGICS

Veterinary biologics are used in a variety of animals, including livestock, pets, fish, birds, and wildlife. There are many types of biologics available, each with a different function and purpose.

Vaccines, bacterins, bacterial extracts, and **toxoids** are made from viruses, bacteria, spores, or other disease-causing organisms. These products may contain whole organisms or selected portions of an organism to elicit active immunity. Whole organisms in vaccines may be live or killed. Living organisms in products are modified by cell culture, natural selection, or other processes so that they do not cause disease in animals.

Antiserums and **antitoxins** are products containing protective antibodies against a particular organism or a toxic substance that the organism produces. Administering an antibody product to an animal provides passive immunity.

Diagnostics are products used to determine the health status of an animal.

Immunomodulators are products used to stimulate or suppress the immune system and to treat certain types of tumors or infections.

Allergenic extracts are used to diagnose or treat animal allergies to substances like pollen, dust, fleas, and feed ingredients.

About 70 years ago, there were perhaps a half-dozen products available. Today, there are nearly 2,000 licensed veterinary biological products designed to prevent, diagnose, or treat more than 200 different diseases in over 35 animal species. This ever-expanding array of veterinary biologics leads to better animal health care and reinforces the need for strict regulation so that animal and human health and our environment are protected.

ORIGINS OF VETERINARY BIOLOGICS REGULATION

The regulation of veterinary biologics began soon after the turn of the 20th century because farmers and animal health officials did not have reliable biologics to treat hog cholera, a devastating disease. Many products were ineffective or contaminated with disease-causing organisms. A costly example was an outbreak of foot-and-mouth disease in 1909, caused by a contaminated vaccinia virus imported into the United States to produce a smallpox vaccine.

In response to these problems, Congress passed the Virus-Serum-Toxin Act (VSTA) in 1913. VSTA gave the Secretary of Agriculture authority to license and regulate the production and trade of veterinary biologics. After seven decades, Congress amended VSTA in the Food Security Act of 1985, broadening the Secretary's authority to issue regulations, enhancing the Secretary's enforcement powers, and allowing USDA-APHIS to regulate all movement of veterinary biological products within or imported into the United States. In an effort to enhance security at our Nation's borders, the Homeland Security Act of 2002 transferred some import duties to the U.S. Department of Homeland Security. However, USDA continues to have jurisdiction over VSTA regulations and policies. Regulatory activity mandated by these acts is accomplished by CVB in Ames, IA, and Riverdale, MD.

REGULATORY REQUIREMENTS

Federal law prohibits the distribution of veterinary biologics unless they are manufactured in compliance with the regulations. Veterinary biologics for commercial use must be produced at a USDA-approved establishment and proven to be pure, safe, potent, and efficacious. APHIS issues an establishment license to acceptable manufacturing facilities and an individual product license for each veterinary biologic that the establishment markets. In addition, APHIS issues permits for importing veterinary biologics for research, transit shipment, or distribution and sale in the United States.

APHIS inspects all licensed and permitted manufacturers' facilities to be sure that they are adequate and properly maintained. Agency officials examine production methods and records to ensure that each biological product is made in a consistent manner according to approved methods. Manufacturers test each batch of a biologic, commonly referred to as a serial, to ensure that quality is maintained. APHIS may elect to test selected serials as an independent verification of the test results obtained by the manufacturer. All required quality control tests must be satisfactorily concluded prior to any licensed or permitted veterinary biological product being

released to the market. In addition, APHIS works with industry to develop reference standards and validate test methods to improve product evaluation and quality control, and it participates in international efforts to align U.S. regulatory testing requirements with other countries' requirements to facilitate exports.

VETERINARY BIOLOGICS INNOVATIONS

1913 First U.S. veterinary biologics license issued

1916 First license for an avian product issued

1941 First licenses issued for inactivated hog cholera vaccines

1943 First modified live veterinary vaccine licensed

1954 First viral combination product licensed

1976 First aquaculture vaccine licensed

1977 First pseudorabies vaccine licensed

1979 First use of a monoclonal antibody in a diagnostic test kit

1986 First gene-deleted viral vaccine licensed

1990 First recombinant viral product licensed

1994 First live-vectored product licensed

2004 First needle-free transdermal-delivered product licensed

2005 First deoxyribonucleic acid (DNA)-mediated product licensed

2005 First invertebrate virus-vectored product licensed

2006 First plant cell-derived product licensed

2006 First live-vectored chimera vaccine licensed

2007 First veterinary cancer vaccine licensed

2009 First collaborative effort between USDA and industry to expedite vaccine manufacturing for an emerging disease outbreak (pandemic H1N1 influenza)

2012 First veterinary ribonucleic acid (RNA) vaccine licensed

YOUR ROLE IN KEEPING VETERINARY BIOLOGICS SAFE AND EFFECTIVE

Look for the U.S. establishment number on the product label when selecting veterinary biologics. This assures that the product has been manufactured and tested under Federal standards and that the information on the label and in accompanying literature is approved by APHIS. Product labeling includes the product's name, the serial number, the name and address of the manufacturer, the license or permit number, complete directions for use, the number of doses and the quantity of contents, storage instructions, precautions, and the expiration date.

Wholesalers and retailers must carefully handle biological products to ensure product potency and effectiveness, so only purchase veterinary biologics from a reputable outlet. In addition, buy as much product as needed for a specific job; an oversupply kept beyond the expiration date can lose potency and become worthless. Never use

a biological product after the expiration date on the label. Also, use care in storing veterinary biologics. Most products must be kept chilled throughout shipment and stored in a refrigerated area between 35 degrees and 45 degrees Fahrenheit.

Consult with your veterinarian before beginning an immunization program. Only someone with specialized training, knowledge of animal disease, and experience using veterinary biologics should provide advice on which products to use. In addition, make sure animals are healthy before vaccinating them; stress, exposure to inclement weather, and lack of proper feed and water may interfere with an animal's ability to develop protective immunity.

GENERAL GUIDELINES FOR ADMINISTERING VETERINARY BIOLOGICS

- Read and follow product label directions.
- Follow your veterinarian's recommendations.
- Use sanitary procedures when administering a biological product to an animal. Clean and disinfect the injection site and use sterile instruments for dispensing all biological products.
- Administer the full recommended dose.

- Mix veterinary biologics only if the product instructions specify to do so.
- Observe withholding times when administering products to meat- and milk-producing animals.
- Do not save unused contents of multiple-dose containers.
- An unexpected, unfavorable reaction associated with the use of a veterinary biologic is called an adverse event. Report adverse events directly to the manufacturer. When reporting an adverse event, have vaccination information available, including the date it was administered, the name and serial number of the product, a description of the adverse event, and details about the animal(s) involved.

FOR MORE INFORMATION

For more information about APHIS' role in regulating veterinary biologics, please visit CVB's Web site at www.aphis.usda.gov/animal_health/vet_biologics or contact CVB directly using the following information:

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