

## ***Large Animal Diseases: Protecting Our Large Animal Livestock and Horses*** **by Dr. Ann Weigers**

The importance of the “large animals” to our national economy, standard of living, and general well-being is incalculable. In the National Geographic broadcast “Guns, Germs, and Steel,” Jared Diamond states that it was the ability to keep livestock that enabled humankind to create the technological advances that support our lives today. Large animal livestock and livestock products are a major U.S. industry. According to the National Cattlemen’s Beef Association, the 2012 U.S. cattle inventory was 89.3 million head (742,000 herds), with an economic impact of 44 billion dollars. Beef exports totaled 5.51 billion dollars. The American Horse Council estimates that horse related activities have a direct impact on the U.S. economy of over 39 billion dollars; when indirect spending is considered, the impact of horse related activities is over 102 billion dollars. According to the Food and Agriculture Organization, there are an estimated  $\geq 10.15$  million horses in the U.S. High quality veterinary vaccines and other veterinary biologics are essential for the well-being of these industries, of individual farmers, ranchers, and owners, and of our large animals themselves.

Since the creation of the Virus-Serum-Toxin Act 100 years ago, there have been many significant advances in the number and quality of large animal vaccines and other large animal veterinary biologics, advances that would astonish veterinarians at the time the act was implemented: Large animal vaccines now include not only conventional live and killed products, but also genetically modified live vaccines, including vectored vaccines and “chimeras”; vaccines with DIVA systems (vaccines developed along with tests that can distinguish vaccinated from non-vaccinated animals, important for trade and disease control), and DNA and RNA vaccines. There are now many licensed diagnostic products (e.g., “test kits”, used to determine animal or herd disease status), antibody products for treatment or prevention of disease, immunostimulants, and immunomodulators.

As of May, 2013, there are 97 licensed U.S. manufacturers making animal biologics. There are over 700 different licensed biologics for large animals, covering over 100 disease-causing antigens; most of these products are made by more than one manufacturer. As an example, veterinary biologics now available for horses include those providing protection from tetanus, equine influenza, Eastern, Western, and Venezuelan encephalitis, equine herpesvirus Types 1 and 4 (equine rhinopneumonitis), rabies, equine arteritis virus, West Nile virus, *Streptococcus equi*, *Escherichia coli*, *Rhodococcus equi*, equine rhinitis A, and equine rotavirus. Test kits licensed for horses include those for the detection of *Babesia equi*, *Babesia caballi*, equine arteritis, and equine infectious anemia.

U.S. veterinary biologics for large animal livestock enjoy a reputation for high quality worldwide. Many manufacturers export their licensed products, further strengthening the U.S. economy and supporting large animal health. The improvement of large animal health abroad also benefits the U.S. by decreasing the risk of domestic disease outbreaks (e.g., decreasing import risks).

The Center for Veterinary Biologics (CVB) stays well-informed regarding current scientific and technological developments that can increase the scope and quality of large animal disease protection; as expected, discoveries and advances appear with increasing frequency. To ensure timely licensure of new products, the CVB evaluates, modifies, and creates new policy on an ongoing basis to facilitate licensure while maintaining high standards for safety and efficacy.

The CVB has collaborated with other Veterinary Services programs such as the National Veterinary Stockpile, industry, and the Department of Homeland Security, to ensure that the U.S. has safe, effective large animal vaccines banked for national emergencies. The CVB also stays current on the latest developments concerning emerging and exotic (foreign) animal diseases. Should these pose a potential threat, the CVB has policies and standards in place to ensure the timely evaluation and licensure of products needed to safeguard our large animals.

A wealth of information on this subject can be obtained free on our website, at [http://www.aphis.usda.gov/animal\\_health/vet\\_biologics](http://www.aphis.usda.gov/animal_health/vet_biologics). This information includes a list of all licensed firms and licensed products. We hope the next 100 years will bring advances which would amaze us.

#### References:

“Beef Industry Statistics,” National Cattlemen’s Beef Association, accessed June 2013, <http://www.beefusa.org/beefindustrystatistics.aspx>

“National Economic Impact of the U.S. Horse Industry,” American Horse Council, accessed June 2013, <http://www.horsecouncil.org/national-economic-impact-us-horse-industry>

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