Veterinary vaccine development and immunoprophylactics

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Infectious disease continues to be one of the most important constraints on the efficient production of farm livestock in both developing and developed countries. While vaccination and the therapeutic or prophylactic use of drugs both play an important role in animal disease control, vaccination is increasingly being viewed as the more sustainable option. This view is influenced not only by the potential that vaccination offers for greater economic efficiency but also by the concerns that have been raised about the selection of drug-resistant pathogens and the potential harmful effects of drug residues in animal products and the environment. The criteria for successful animal or veterinary vaccines can be very different from those for human vaccines depending on the animal groups under consideration. Vaccination has had a major impact on the control of epidemic viral diseases of livestock such as foot-and-mouth disease and Rinderpest. However, there are many other important diseases for which efforts to develop effective methods of vaccination have been unsuccessful. The potential returns for animal vaccine producers are much less than those for human vaccines, with lower sales prices and smaller market sizes, resulting in a much lower investment in research and development in the animal vaccine area than in the human vaccine area, although the complexity and range of hosts and pathogens are greater. This study will consider recent developments in immunology that are pertinent to understanding how the immune system controls infections and will discuss their implications for contemporary approaches to veterinary vaccine development.

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