Influenza is a viral respiratory disease having a major impact on public health. Influenza A virus (IAV) usually causes mild transitory disease in humans. However, in specific groups of individuals such as severely obese, the elderly, and individuals with underlying inflammatory conditions, IAV can cause severe illness or death. In this review, relevant small and large animal models for human IAV infection, including the pig, ferret, and mouse, are discussed. The focus is on the pig as a large animal model for human IAV infection as well as on the associated innate immune response. Pigs are natural hosts for the same IAV subtypes as humans, they develop clinical disease mirroring human symptoms, they have similar lung anatomy, and their respiratory physiology and immune responses to IAV infection are remarkably similar to what is observed in humans. The pig model shows high face and target validity for human IAV infection, making it suitable for modeling many aspects of influenza, including increased risk of severe disease and impaired vaccine response due to underlying pathologies such as low-grade inflammation. Comparative analysis of proteins involved in viral pattern recognition, interferon responses, and regulation of interferon-stimulated genes reveals a significantly higher degree of similarity between pig, ferret, and human compared with mice. It is concluded that the pig is a promising animal model displaying substantial human translational value with the ability to provide essential insights into IAV infection, pathogenesis, and immunity.