

Assessment of the potential of the 9CFR methods currently used in the production of biologicals to detect bovine/porcine viruses with human host range

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Background:

Current U.S. regulatory requirements for testing cell substrates used in production of biological products for human use [including vaccines and therapeutic products] for viral contamination specify use of USDA 9CFR tests for detecting bovine and porcine viruses in cells exposed to bovine serum or porcine trypsin. 9CFR requires testing of bovine serum by inoculation into cell cultures, detection of cpe and hemadsorption, and immunofluorescence assay for seven specific viruses in six families [reoviridae, flaviviridae, adenoviridae, paramyxoviridae, rhabdoviridae, parvoviridae]. Depending on choice of positive controls up to 2 additional families may be represented. Cells exposed to trypsin are only tested for porcine parvovirus [one virus family]. Recent contaminations have highlighted concerns as to whether these tests are appropriate.

Methods:

A detailed literature search was undertaken to determine which viruses that infect cattle or swine or bovine or porcine cells in culture also have human host range [ability to infect humans or human cells in culture] and to predict whether these viruses would be detected by the currently used 9CFR procedures. Information was stored in a database. Viruses were grouped by family to predict ability to be inactivated or removed by product purification.

Results:

21 virus families were identified which contain >70 viruses with bovine and human host range. For porcine viruses with human host range >58 viruses in 17 virus families are represented. There are many more viruses of potential risk to biological products manufactured using bovine or porcine raw materials than would be detected by 9CFR testing procedures; even within families, not all members would necessarily be detected. Testing gaps and alternative methodologies should be evaluated.