Proposed new European Union legislation prompted a scientific literature review

From studies in laboratory animals, humans and horses, it is apparent that viruses may sometimes attach to, or be integrated into, spermatozoa, although in domestic livestock, including cattle, this seems to be a rare phenomenon, and carriage of virus through the zona pellucida into the oocyte by fertilising sperm has never been described in these species.

Four specific viruses: enzootic bovine leucosis virus (BLV), bovine herpesvirus-1 (BHV-1), bovine viral diarrhoea virus (BVDV) and bluetongue virus (BTV), all of which tend to cause subclinical infections in cattle, but which can occur in bovine semen, were reviewed with regard to the risks that use of infected semen might lead to production of infected embryos.

With regards to in vivo-derived embryos, when internationally-approved embryo processing protocols are used, the risks from BLV- and BTV-infected semen appear to be negligible, and the same is almost certainly true for BHV-1 if the embryos are also treated with trypsin. This would apply especially to bulls that are not proven to be BHV-1 negative. For BVDV, there is insufficient data on how the virus is carried in semen and how different BVDV strains can interact with sperm, oocytes and embryos. There is a potential, at least, that in vivo-derived embryos resulting from virus-infected semen might carry BVDV, although field studies so far suggest this very unlikely.

With regard to in vitro-produced embryos, the use of semen infected with any of the four viruses, with probable exception of BLV, will often lead to contaminated embryos, and virus removal from in vitro fertilised (IVF) embryos is difficult even when the internationally-approved embryos processing protocols are used. However, it has never been demonstrated that such embryos have resulted in transmission of infection to recipients or offspring.