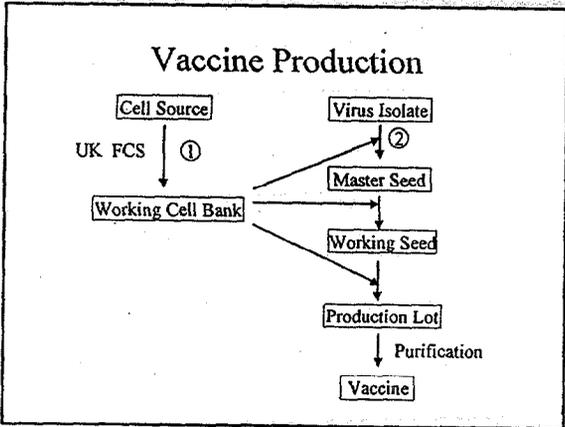


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Risk of BSE Contamination in Viral Vaccines

Ira Berkower
Division of Viral Products
CBER

- ### Potential Source of BSE in the Manufacture of Viral Vaccines
- Media Components
 - fetal calf serum from the UK during early years of the epidemic when incidence was about 1 in 200 adult cows (USDA)
 - maternal/fetal transmission rate about 10%
 - pooled in lots of about 1500



How vaccines are made

1. Multiple entry points for cells and FCS into production.
2. Potential amplification of contaminants during cell culture
3. Limited purification and/or inactivation of final product.

Assumptions about BSE Risk

1. One in 2000 FCS donors is infected
2. BSE agent are < 1 infectious unit per ml (the largest volume tested for infectivity)
3. Input BSE agent = final BSE agent.
No increase by propagation or decrease by purification.
4. Dilution effects:
Number of infectious units spread over number of doses = risk per dose.
5. No species barrier
6. Route of administration: IM < intracranial

Risk Calculation

<u>For FCS :</u>	<u>risk factor</u>
Assuming < 1 infectious unit/ml FCS	<1
Dilution of each infected FCS with FCS from 2000 normal calves	0.5×10^{-3}
Cells grown in 1 ml FCS used to make 10 ⁵ doses of vaccine	1×10^{-5}
Route of administration (IM)	0.5×10^{-2}
Risk of infection per dose	$<0.25 \times 10^{-10}$

Uncertainties

1. Incidence of BSE in cows in the early and peak years of the epidemic.
2. Transmission to fetal calf may be <10%.
3. Actual infectivity of FCS may be significantly < 1 per ml, since transmission has not been detected using concentrated blood cells.
4. Further reduction in risk due to :
species barrier
route of administration
purification.
5. Error bars around each of these estimates.

Summary

Risk is less than one BSE infectious dose per 4×10^{10} vaccine doses for viral vaccines made with UK FCS.
