



# CSF and Sheep Pox Vaccine

## Why in News

The [ICAR-Indian Veterinary Research Institute \(IVRI\)](#) has transferred the technology for **Classical Swine Fever (CSF) & Sheep Pox Vaccines** to an animal healthcare company Hester Biosciences.

- The technology was **transferred through state-owned Agrinnovate India (AgIn)**, which aims to work on the strengths of the Indian Council of Agricultural Research (ICAR).
  - AgIn promotes the development and spread of R&D outcomes through [IPR \(Intellectual Property Right\)](#) protection, commercialization and forging partnerships both in the country and outside for the public benefit.

## Key Points

### ▪ Classical Swine Fever (CSF):

#### ◦ About the Disease:

- **CSF**, also known as **hog cholera**, is an important **disease of pigs**.
- It is **one of the most economically-damaging pandemic viral diseases of pigs** in the world.
  - It is caused by a virus of the **genus Pestivirus** of the **family Flaviviridae**, which is closely related to the viruses that cause **bovine viral diarrhoea in cattle** and **border disease in sheep**.
  - **Mortality is 100%**.

#### ◦ About the Vaccine Developed in India:

- In India, the disease is controlled by a **lapinized CSF vaccine** (Weybridge Strain, UK) produced by **killing large numbers of rabbits**.
  - Lapinization means serial passage of a virus or vaccine through rabbits to modify its characteristics.
- To avoid this, the **ICAR-IVRI developed a Cell Culture CSF Vaccine** (live attenuated) using the Lapinized Vaccine Virus from foreign strain.
- The **new vaccine has been found to induce protective immunity** from **day 14** of the Vaccination **till 18 Months**.

### ▪ Sheep Pox:

#### ◦ About the Disease:

- It is a **severe viral disease** in Sheep and its virus is **closely related to the Goat (capripoxviruses)**.
- The virus is **also related to the virus of lumpy skin disease**.
- The disease is very serious, often fatal, characterized by widespread **skin eruption**.

- It is **confined to parts of southeastern Europe, Africa, and Asia.**
- **About the Vaccine Developed in India:**
  - A **live attenuated Sheep Pox Vaccine using indigenous strain** was developed by the **ICAR-IVRI** for preventive vaccination in the sheep population.
  - The developed Vaccine uses **indigenous Sheep Pox Virus Strain (SPPV Srin 38/00)** and is adapted to grow in the **Vero cell** line which makes the Vaccine production to be easily scalable.
  - It is potent and immunogenic for sheep aged **more than 6 months** of age. It protects the Vaccinated animals for a **period of 40 months.**

## Cell Culture

- Cell culture is the **process by which cells are grown under controlled conditions, generally outside their natural environment** in especially designed conditions and precise conditions of temperature, humidity, nutrition, and freedom for contamination.
- Cultured cells are excellent hosts for the propagation of many types of viruses. The ability of cell culture systems to produce large quantities of attenuated viral particles has **served as the basis for the production of both human and veterinary vaccines.**

## Vero Cell

- **Vero cells are lineages of cells used in cell cultures.** The Vero lineage was isolated from kidney epithelial cells extracted from an African green monkey.
- Vero cells are used for many purposes, including,
  - Screening for the toxin of *Escherichia coli*, first named "Vero toxin".
  - As host cells for growing viruses.
- The Vero cell lineage is **continuous and aneuploid.**
  - A continuous cell lineage can be replicated through many cycles of division and not become senescent (i.e. not deteriorates with age).
  - Aneuploidy is the characteristic of having an abnormal number of chromosomes.

## Live-attenuated Vaccines

- **Live vaccines use a weakened (or attenuated)** form of the germ that causes a disease.
- Because these vaccines are so similar to the natural infection that they help prevent, they create a strong and long-lasting immune response.
  - Just one or two doses of most live vaccines can give one a lifetime of protection against a germ and the disease it causes.
- The limitation of this approach is that these vaccines usually **cannot be given to people with weakened immune systems.**
- Live vaccines are used against: **Measles**, mumps, rubella (MMR combined vaccine), Rotavirus, Smallpox among others.

**Source: PIB**