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# *LIST OF ABBREVIATIONS*

| | |
|---|---|
| **AEI** | Acetyl Ethylene Imines |
| **AI** | Artificial Insemination |
| **BEI** | Binary Ethylene Imines |
| **BHV-1** | Bovine Herpes Virus-1 |
| **BK** | Bovine Kidney |
| **BRSV** | Bovine Respiratory Syncytial Virus |
| **BVD** | Bovine Viral Diarrhea |
| **BVD-MD** | Bovine Virus Diarrhea-Mucosal Disease |
| **CPE** | Cyto Pathic Effect |
| **DDW** | Double Distilled Water |
| **DIW** | De Ionized Water |
| **ELISA** | Enzyme linked Immuno Sorbent Assay |
| **FAT** | Fluorescent Antibody Technique |
| **FITC** | Fluorescene Iso Thio Cyanate |
| **FMD** | Foot and Mouth Disease |
| **GMT** | Geometric mean titers |
| **HA** | Haemagglutination |
| **HBSS** | Hank's Balanced Salt Solution |
| **HI** | Haemagglutination Inhibition |
| **I/M** | Intra Muscular |
| **I/P** | Intra Peritoneal |
| **I/V** | Intra Venous |
| **IBR** | Infectious Bovine Rhinotracheitis |
| **IFT** | Immuno Fluorescent Technique |
| **IgA** | Immunoglobulins A |
| **IgG** | Immunoglobulins G |

| | |
|---|---|
| **IgM** | Immunoglobulins M |
| **IPB** | Infectious Palano Bosthitis |
| **IPV** | Infectious Pustular Vulvovaginitis |
| **MDBK** | Madin Darby Bovine Kidney |
| **MEM** | Minimum Essential Medium |
| **MLV** | Modified Live Virus |
| **OD** | Optical Density |
| **OPD** | Ortho Phenylene Diamine |
| **PBEK** | Primary Bovine Embryo Kidney |
| **PBS** | Phosphate Buffer Saline |
| **PI** | Persistent Infection |
| **PI-3** | ParaInfluenza-3 |
| **PV** | Post Vaccination |
| **S/C** | Sub Cutaneous |
| **SNT** | Serum Neutralization Test |
| **$TCID_{50}$** | Tissue Culture Infective Dose 50 |
| **VN** | Virus Neutralization |
| **VSVRI** | Veterinary Serum and Vaccine Research Institute |

# 6. SUMMARY

Infectious Bovine Rhinotracheitis (IBR), Bovine Viral Diarrhea (BVD) and Para Influenza-3 (PI-3) were responsible for approximately two thirds of sickness and deaths in feed lot cattle besides they are widely spread throughout the world.

The present study was planned to find out a suitable and economic method for quality control of vaccines of these diseases which appeared to be increased in recent years through:

Evaluation of combined inactivated vaccines containing IBR, BVD and PI-3 using:

- **Identity test:**

  It was carried out on 3 slides for each vaccine batch and examined using fluorescent microscope.

  All the slides examined gave satisfactory results except in batches 10 & 11 that gave slight positive reaction due to they pass the date of expiry.

- **Sterility test:**

  It was carried out and regulated according to the **United States Code of Federal Regulations (CFR) (2005).**

  The obtained results proved that the vaccines were free from any bacterial, fungal and mycoplasma contamination.

- **Safety test:**

It was performed in mice & guinea pigs and revealed that there is neither clinical abnormalities nor deaths were observed among inoculated mice and guinea pigs through the observation period.

In calves, safety results revealed neither elevation of body temperature nor appearance of any clinical abnormalities in calves during 21 days of observation.

These results indicate safety of the tested vaccines.

- Comparison of potency test results of the same vaccines using two different method:
  - ✓ Injection in farm animal (calves) and using their serum in titration of antibody response by SNT and ELISA.

It was performed in 3 mixed breed Friesian and Balady apparently healthy male calves of approximately 6 – 9 months old each about 100 Kg body weight obtained from El- Wadi El-Gedeed governorate, Egypt; for each batch in this experiment. Serum samples were separated from each calf at 0, 1, 2, 5, 8, 12, 16, 20 and 24 weeks post vaccination.

Sera were examined by SNT using tissue culture according to **Matsuoka *et al.*, (1972)** and the titer was found to be satisfactory and protective for all virus fractions in all vaccinated animals from the second week post vaccination except those vaccinated with expired vaccines, after calculation according to **Reed and Muench (1938).**

Enzyme Linked ImmunoSorbent Assay (ELISA) was carried out at the same time post vaccination for detection of antibodies against IBR, BVD and PI-3 according to **Suri Bubul *et al.*, (1984)** and **Durham and Sillars (1986)** and gave good satisfactory and protective results from the second week post vaccination.

- ✓ In the laboratory using specific hyper immune serum which was previously prepared in rabbits and Capture (Sandwich) ELISA was done to detect the titration of the vaccine according to **Ihemelandue *et al*., (1985)** and **Wassel *et al*., (1997).**

It was used for all vaccine batches, a sample from each batch was submitted to Capture ELISA.

The results were all good satisfactory and protective from the second week post vaccination such as the results of SNT and ELISA.

Regarding the comparison between the two methods of evaluation of the vaccines, we find that the *in vitro* method in the Laboratory using specific hyper immune serum and sandwich ELISA is more economic and time and effort saving, other than the old method through injection in farm animals and using the separated serum in titration of antibody response which takes a lot of time, money and effort.