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Directorate of Distance Education, TANUVAS, Anna Salai, Nandanam, Chennai - 600 035

Telefax: 91-44-2432 0411
Email: dde@tanuvas.org.in

SWINE INFLUENZA

Influenza is a highly contagious respiratory illness caused by influenza virus belonging to the family Orthomyxoviridae. The virus infects human beings, birds, pigs, horses and other species (currently reported in cattle, sheep and goats). In animals, it causes asymptomatic, mild or a severe disease condition. In humans, it causes fever, body aches, weakness and sometimes multi organ involvement. Popularly known as "flu", it spreads by infected droplet from coughs or sneezes of an infected person or animal. Influenza in man usually occurs in small outbreaks or as epidemics. Very rarely, it can be pandemic in occurrence. Influenza is both a zoonotic and an anthroponotic (infections transmitted from humans to animals) disease.

The influenza virus is enveloped and consists of 10 polypeptides. The virus is classified into 4 major types of influenza viruses A, B, C and D based on antigenic differences in viral Nucleoprotein (NP) and Matrix (M) antigens and is further grouped into subtypes on the basis of antigenic differences in their Haemagglutination (H) and Neuraminidase (N) antigens. Currently, 18 H antigens and 11 N antigens are recognized and new subtypes of influenza A virus emerge periodically. Each virus will have one type of H antigen and one type of N antigen e.g. H1N1, H5N1. Genomic alterations are responsible for development of new strains and subtypes. A number of mechanisms like point mutation and recombination - genetic reassortment are responsible for the emergence of new strains and new subtypes.

Swine influenza

Poultry and pigs are significantly affected by influenza virus infection. Swine influenza is a highly contagious viral infection of pigs. The disease occurs either in epizootic or enzootic form. In the epizootic form, the virus quickly moves through all phases with rapid recovery, provided there are no complicating factors such as secondary bacterial infections. In the enzootic form, clinical signs may be less obvious and not all pigs may demonstrate consistent clinical signs of infection. Morbidity rates can reach 100%, while mortality rates are generally low. The primary economic impact is related to retarded weight gain.

Zoonotic influenza

Zoonotic influenza refers to disease caused by animal influenza viruses that cross the animal divide to infect humans. People can be infected with influenza viruses that are usually circulating in animals, such as avian influenza virus subtypes H5N1 and H9N2 and swine influenza virus subtypes H1N1 and H3N2. The infection is transmitted from the reservoir population and may or may not be transmitted within the new host population.

Why the term swine flu used in human flu?

HINI flu (in humans) is also known as "swine flu" because in the past, people who got infected with this virus had direct contact with pigs. Several years back, a new virus of this subtype emerged that spread among people who did not have any contact with pigs. Thus, the current human H1N1 virus can be transmitted by other humans and without involvement of pigs in virus transmission among humans. Currently there is no incidence of clinical disease in pigs in the State of Tamil Nadu; however, the following points are highlighted as a matter of caution.

Signs of flu in pigs

The symptoms of flu in affected pigs include high fever, lethargy, going off feed, coughing, nasal discharge, sneezing and breathing difficulties. If pigs show these signs, appropriate veterinary care should be provided.

Hygiene practices to be followed by pig farmers

The following good hygiene practices are to be followed by the pig farm labourers / pig farmers.

- Cover your nose and mouth when coughing or sneezing.
- Do not touch your eyes, nose and mouth.
- Wash your hands often, using soap and water for 20 seconds. Influenza virus is an enveloped virus and soap will damage the lipid viral envelope thus reducing the infectivity. i.e. before and after contact with pigs, after contact with contaminated equipment or surface, before and after use of personal protective equipment.
- Shower and change your clothes when entering and leaving the piggery unit.

Personal Protective Equipment (PPE)

Use of personal protective practices / equipment helps to protect labourers and pigs and reduce the chances of carrying the flu virus outside the piggery unit. Workers should be provided with appropriate protective equipment, instructions and training in protective equipment care and use. The following personal protective equipment is recommended for pig farm labourers when working with known or suspected flu-infected pigs.

- Uniforms or coveralls
- Rubber, polyurethane boots or disposable shoe covers
- Disposable gloves
- Safety goggles
- Disposable, lightweight head or hair covers
- Masks: Minimum a surgical mask, ideally a disposable N95 is the minimum level of respiratory protection that should be worn by workers in contact with known or suspected flu infected pigs.
- Personal protective equipment should be laundered, disinfected or discarded at work and should never be taken home or worn outside of work areas.
- Strict adherence of bio-security practices (e.g. shower-in/shower-out procedures, proper use, and removal, cleaning or discarding of PPE, use of disinfectant footbaths, indoor raising of animals and water sanitation).

Pig farm labourers / farmers with a flu-like illness should consult the physician as soon as possible. Vaccine for pigs is not commercially available in India.

Cleaning and Decontamination

Commonly used disinfectants like sodium hypochlorite and bleaching powder are effective in killing flu viruses.

Disinfection of general liquid and high organic load liquid biological waste

S.No	Purpose	Conc. of stock	Required Conc.	Stock for a 10 L solution	Water / LBW	Final ppm
Commercial Sodium Hypochlorite (NaOCl)						
1.	Disinfection of farm premises	5% (50,000 ppm)	0.5%	1 L	9 L	5,000
2.	Disinfection of liquid farm waste	5%	1%	1 L	4 L	10,000
Bleaching powder - Calcium hypochlorite Ca $(ClO)_2$						
1.	Disinfection of drinking water	25-50%	1 ppm	4.4 to 5 g	1000 L water	1ppm

- Use of chlorinated drinking water should be practised right from the young age of an animal as sudden use of chlorinated water may not be preferred by animals. Alternatively, one can gradually increase the chlorine levels over a period of time.
- Minimum Contact time: Surface disinfection – 10 min, Liquid waste disinfection - 20 min.
- Sodium hypochlorite (SHC) should be stored in a cool and well ventilated area and should be stored separately from corrosives, soaps, detergents or other cleaning products. Commercial SHC has a shelf life of six months to one year from the date of manufacture and a 1:10 cSHC diluted solution has a shelf life of 24 hours.
- Application - Spray: Use a hand operated plastic knap sack sprayer of 15 L capacity. After use, wash the sprayer in clean water and store.
- Cleaning chemicals can cause skin, eye, nose, throat and lung irritation. Workers should be provided with proper protective equipment when using cleaning chemicals also.
- Minimum PPE required during spray and must be worn when preparing or handling a SHC solution; 1. Nitrile Rubber Gloves; 2. Safety Glasses; 3. Respiratory protection; 4. Lab coat or overall; 5. Gum boots.

References on request email: ravikumar.g@tanuvas.ac.in

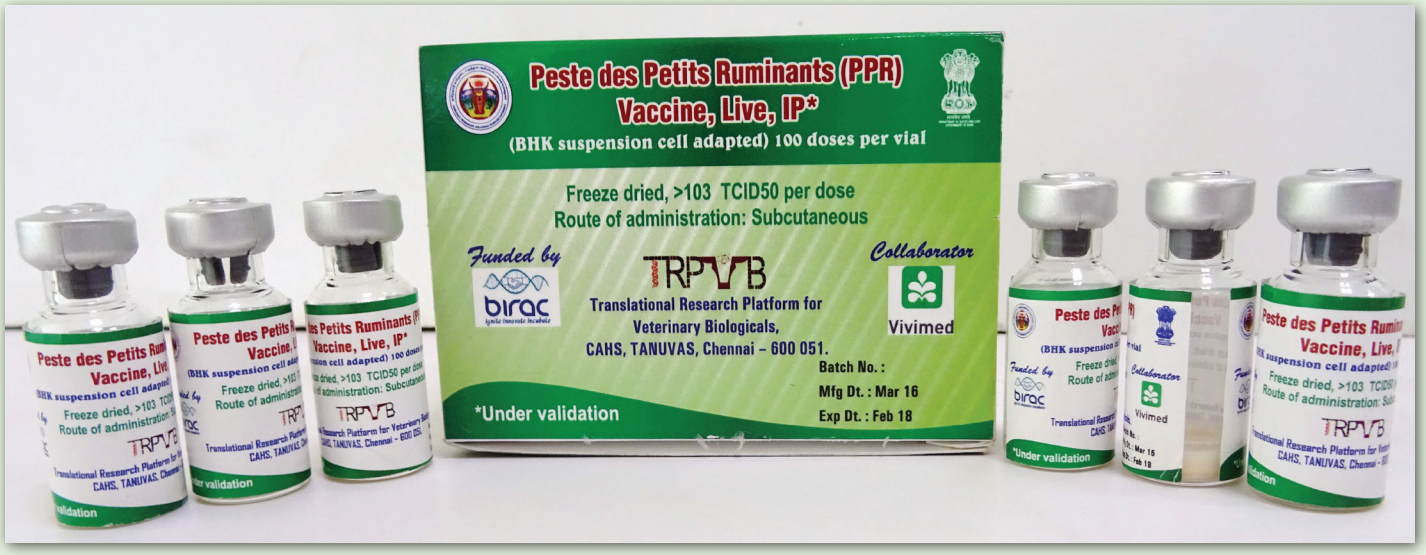
Dr. G. Ravikumar, Professor and Head, Zoonoses Research Laboratory, Centre for Animal Health Studies, TANUVAS, Chennai - 51.

RESEARCH HIGHLIGHTS
(2017-18)

Development of a novel production technology to enhance the scalability and affordability of the *peste des petis* ruminants (PPR) vaccine

- A BHK21 adapted vaccine for PPRV was developed for use in sheep and goats to protect against PPR disease. This vaccine is scalable in fermenters and hence, would result in cost reduction compared to existing vaccine in Vero stationary cell culture system.
- A local isolate of PPRV was passaged in BHK21 cell line and further adapted to BHK suspension cells.
- The candidate vaccine was tested in goats which showed complete protection.
- Limited field trials were also done and seroconversion indicated elicitation of protective immune responses in vaccinated small ruminants.

Principal Investigator: Dr. G. Dhinakar Raj
Director, Centre for Animal Health Studies, TANUVAS, Chennai



Bioconversion of poultry litter as vermicompost

- Pre-composting of poultry litter was done after optimization of C: N (Carbon : Nitrogen) ratio to 25:1 to 35:1. Compost recipe with C: N ratio of 25: 1, 30: 1 and 35:1 were formed with coir pith waste and farm yard manure (FYM). Eight windrows were formed for pre-composting. The temperature profile of windrow composting was favourable in terms of pathogen reduction property. Precast cement rings were used as vermibed and earthworm *Eudrilus eugeniae* was employed as primary agents of decomposition. Vermicomposting work was done for a period of 90 days with initial feed substrate of 50 kg on dry weight basis and moisture of the vermin-bed was maintained at 70-75 per cent. The economics of vermicompost making was worked out.

- During pre-composting, pH, electrical conductivity and total dossolved solids declined and were within acceptable levels. Tdial Kjeldahl Nitrogen per cent increased during pre-composting and resulted in decrease in C: N ratio. Feed substrate to vermicompost ratio was higher in T8 (FYM alone C/N 25%) followed by T7 (FYM+BPL C/N 35%), T3 (BPL C/N 35%), T6 (FYM+BPL C/N 30%),T2 (BPL C/N 30%).

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- Vermicomposting with poultry litter alone is not possible. However, bio conversion of Poultry Litter (BPL) can be successfully converted into vermicompost by optimizing C : N ratio to 30:1 or 35:1 with carbon materials like coir pith which favours earthworm survivability. FYM as such or C: N ratio optimized to 30:1 or 35:1 favours vermicomposting.

Research Scholar: N.R.Saravanan
Department of Livestock Production Management, VC&RI, Namakkal
Chairman: Dr.K.Sivakumar

Goat farming practices in north-western zone of Tamil Nadu with special reference to intensification

- In intensified farming, majority of the activities were jointly done by men and women (68.30 per cent), while in traditional farming, majority of the activities were done by women (90.00 per cent).
- In intensified goat farming, 88.30 per cent of the respondents followed vaccination; whereas in traditional farming, only 3.30 per cent of the respondents followed vaccination.
- Continuous drought was perceived as the first and foremost constraint by the intensified farmers, but in traditional farming, lack of grazing land was perceived as the first constraint.
- Intensified farmers perceived the Tellicherry breed as profitable (53.33 per cent), easy to maintain (53.33 per cent), observable (53.33 per cent), compatible (46.67 per cent) and most trialable (46.67 per cent).
- The slatted floor was very easy to maintain (88.33 per cent), most trialable (55.00 per cent), profitable (50.00 per cent), observable (41.67 per cent) and most compatible (35.00 per cent) as perceived by the intensified farmers.

Research Scholar: C.Ramkumar
Department of Veterinary and Animal Husbandry Extension Education, VC&RI, Namakkal
Chairman: Dr.D.Thirunavukkarasu.

Clinico-pathological evaluation of foreign body syndrome in cattle

- The incidence of foreign body syndrome in cattle was 6.24 per cent of various medical disease conditions. The predominant clinical signs in traumatic pericarditis were positive venous stasis, distended jugular veins, pyrexia, muffled heart sounds, brisket oedema, tachycardia and abduction of elbow.
- Cattle with traumatic pericarditis showed presence of radiopaque metallic foreign bodies perforating the cranial wall and diaphragm. All animals with diaphragmatic hernia revealed herniation of reticulum into the thoracic cavity in contrast radiography.
- The ultrasonographic imaging in animals with traumatic reticuloperitonitis depicted reticulum surrounded by anechoic fluid with hyperechoic fibrinous strand or without fibrinous strand extending between wall of peritoneum and reticulum.

Research scholar: V. Periyasamy
Department of Veterinary Clinical Medicine, VC&RI, Namakkal.
Chairman: Dr. S. Sivaraman.