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Transboundary Animal Diseases of Ruminants in Pakistan

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Transboundary Diseases in Ruminants

- **Large Ruminants (Cattle and Buffaloes)**
 - Foot and Mouth Disease
 - Lumpy Skin Disease
 - Brucellosis (Prevalence is increasing)
- **Small Ruminants (Sheep and Goats)**
 - Peste des Petits Ruminants (PPR)
 - Sheep and Goat Pox (endemic in the country, low prevalence rate)
 - Brucellosis (Prevalence is increasing)
- **Swine**
 - African Swine Fever (Only feral pigs found in the country; AFS has not been reported in the country)





FMD in Pakistan – Economic Considerations

- **FMD is the most prevalent and economically most important infectious disease of cattle and buffaloes in Pakistan**
- **Estimated annual economic losses due to FMD are USD 349.3 millions (Lyons et al 2021; Based on Livestock Census 2006 Data)**
- **Afzal (2019) reported annual losses of USD 692.88 due to FMD based on estimated Livestock population of 2018**
- **Ferrari and others (2014) reported loss of 220 litres of milk in cattle and 211 litres of milk in buffaloes per animal in 60 days**
- **Shah and colleagues (2014) reported loss of Rs. 20,871 per cow and Rs. 25,336 per buffalo in rural areas and loss of Rs. 64,590 per cow and Rs. 55,605 per buffaloes in dairy colonies**
- **Ashfaq and colleagues (2014) reported loss of Rs. 13,286 per animal in cattle and Rs. 18,270 per animal in buffalo due to FMD. Losses due to FMD constituted 70.25 % of economic losses due to all diseases**
- **FMD does not kill the animal, it kills the farmer**





Outbreak surveillance model for FMD and PPR

Essential Elements

- **Awareness of livestock farmers / herders**
- **Training of veterinary staff**
- **Provision of sample collection kits and dispatch material**
- **Cover expenditure of sample collection and dispatch**
- **Respond back with outbreak handling – SOP provided to the department**
- **Report back to field staff on lab findings**





Recent FMD Serotypes and Genotypes in Pakistan

Year	Serotype O	Serotype A	Serotype Asia-1
2012/13	PanAsia-2 ^{ANT-10} Unnamed	Iran-05 ^{SIS-12} Iran-05 ^{FAR-11}	Sindh-08
2014/15	PanAsia-2 ^{ANT-10} Unnamed	Iran-05 ^{FAR-11} Iran-05 ^{FAR-09}	Sindh-08
2016/17	PanAsia-2 ^{ANT-10}	Iran 05 ^{SIS-13} Iran 05 ^{FAR-11}	Sindh-08
2018/19	PanAsia-2 ^{ANT-10} Ind-2001^e	Iran 05 ^{SIS-13}	Sindh-08
2020/21	PanAsia-2 ^{ANT-10} Ind-2001^e	Iran 05 ^{AFG-07}	Sindh-08
2022/23	PanAsia-2 ^{ANT-10}	Iran 05 ^{FAR-11}	Sindh-08





Country Specific FMD Vaccine Provides Effective Control

- Dairy colonies in Karachi are the most important hotspot for FMD in Pakistan
- In 2016-17, animals (310,689 cattle and buffaloes in 2119 farms) of all dairy colonies were given primary and booster dose. All new incoming animals were also vaccinated immediately and given booster dose
- **Number of FMD outbreaks in Karachi given below:**



Month / Year	2012 - 2013	2013 - 2014	2014 - 2015	2015 - 2016	2016 - 2017
November	124	163	109	24	13
December	164	553	97	55	15
January	188	218	74	53	18
February	104	110	52	76	1



FMD Control Efforts in Pakistan

- **FMD vaccination is voluntary in Pakistan and cost is born by the farmers**
- **Drug Regulatory Authority of Pakistan (DRAP) has registered 5 FMD vaccines and imported vaccines (5 to 6 million doses annually) are being imported and used**
- **Only corporate and progressive dairy farmers and established feedlot fattening farmers undertake regular vaccination**
- **Government of Punjab is funding FMD control in South Punjab including Free FMD vaccination (UTF with FAO) in Bahawalpur Division (4.5 million cattle and buffaloes). This has resulted in effective FMD control in this region. A few cases seen in newly brought in unvaccinated animals**





LSD in Pakistan – Economic Considerations

- **LSD cases observed for the first time in October 2021 in South Punjab and Sindh**
- **Pakistan officially notified LSD outbreak on 3 March 2022**
- **A total of 221,399 cases (official figures) were reported in cattle during this a year long outbreak. This included 38,092 deaths (case fatality rate 17.21 %)**
- **Morbidity and mortality rate were 0.533 and 0.092 per cent**
- **Although no study on economic losses due to LSD was conducted / published, the peak of outbreak was close to Eid-ul Azha (slaughter festival). On this occasion, animals are reared specially and get at least 2 to 3 times the normally sale price. LSD affected animals could not be sold, so the farmers suffered huge losses**
- **Interpolation of data from a limited study quoted a figure of Rs. 80.4 billions losses in the country**
- **Beef consumption and export also declined due to LSD**





LSD Control Efforts in Pakistan

- **No LSD vaccine was registered by DRAP in Pakistan at the time of outbreak, thus no vaccine could be officially imported**
- **Corporate Dairy farmers were able to hand carry LSD vaccine under cold chain from Dubai and get their animals vaccinated, thus these animals remained unaffected**
- **When outbreak continued to spread, DRAP registered LSD vaccine from 5 international manufacturers on urgent basis**
- **Many progressive livestock farmers purchased the imported vaccines and tried to protect their animals**
- **Provincial Livestock Departments also purchased LSD vaccine and vaccinated the animals free of cost. Official records showed that provincial livestock departments vaccinated 7,452,600 cattle against LSD**
- **No federal Government control measures other than advisories were issued**





PPR in Pakistan – Economic Considerations

- **PPR was reported for the first time in 1991 in Pakistan and confirmed in 1994**
- **Since then, the disease has spread to all regions of the country and is now endemic in the country**
- **Zahur et al reported morbidity rate of 65.37 (58.02 to 72.72), mortality rate of 26.51 (21.54 to 31.47) and case fatality rate of 40.40 (34.41 to 45.88) per cent**
- **Zahur et al reported economic losses due to PPR ranging from Rs. 25.63 to 37.41 Billion with most likely losses of Rs.31.52 billion**
- **Annual economic losses of Rs.20.5 Billion due to PPR were reported (Abubakar et al, 2015)**





Quality PPR Vaccination provided Excellent Protection

- In 2017-18, 14.03 million sheep and goats in three division of South Punjab were vaccinated
- No clinical case was reported in 12 months following vaccination
- Protected titres in vaccinated animals are given below:



S.No.	Division	Samples (#)	% Protected	Protection Range
1	Multan	716	95.98	90.0 – 100.0
2	DG Khan	582	98.80	95.0 – 100.0
3	Bahawalpur	1013	92.15	81.7 – 100.0
	Total	2481	95.00	81.7 – 100.0



PPR Control Efforts in Pakistan

- **PPR vaccination is voluntary in Pakistan and cost is born by the farmers**
- **Drug Regulatory Authority of Pakistan (DRAP) has registered 4 PPR vaccines and these vaccines are being imported and used**
- **Only progressive sheep / goat herders and established feedlot fattening farmers undertake regular vaccination**
- **Government of Punjab has undertaken three rounds of PPR vaccination in all sheep and goats of the province reducing significantly number of outbreaks**
- **Government of Pakistan has initiated “Risk based PPR control in sheep and goats of Pakistan” since 2020. Cost is Rs. 1787.71 million for 5 years. It covers improvement in lab diagnosis, strengthening surveillance system, strategic vaccination, undertake research studies, enact legal framework and improve stakeholders’ involvement**





Challenges in Control of TADs

- **Governance of veterinary service – Federal vs provincial roles**
- **Facilitation in developing relevant legal framework in federal and 3 provincial governments**
- **Regulated animal movement among provinces and districts**
- **Formulation and implementation of national control / eradication programs for all TADs**
- **Strengthening of Vaccine Quality Control in Pakistan**
- **Improvement in animal disease surveillance**
- **Implementation of Animal Identification and Traceability System in Pakistan**





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Thank You

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