VACCINATION BASED PROPHYLACTIC AND METAPHYLACTIC DISEASE CONTROL PLANS FOR DAIRY ANIMALS

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1. **ECONOMICALLY IMPORTANT INFECTIOUS DISEASES OF DAIRY ANIMALS IN PAKISTAN**

- Well documented and widely known diseases
  - Foot-and-Mouth disease (FMD)
  - Hemorrhagic Septicemia (HS)
  - Black Quarter (BQ)
  - Anthrax
  - Mastitis

Less frequent and less known diseases in native dairy animals

- Bovine Ephemeral Fever
- Pox
- Bovine viral diarrhea (BVD)
- Babesiosis
- Theileriosis
- Para influenza 3 (PI-3)
- Brucellosis
- Tuberculosis
- Leptospirosis
- Pink eye (Infectious keratocunjunctivitis)

(Ahmad et al., 1999; Muhammad et al., 1999; Asi et al., 1998; Cheema, 1995)
Exotic cattle based burgeoning dairying in Pakistan → a recent phenomenon...

- Cattle with exotic blood ... extremely prone to contagious diseases that are economically less important in autochthonous (native) dairy animals.
2. PITFALLS AND ISSUES OF INFECTIONOUS DISEASE CONTROL

- Control of infectious diseases of epidemic proportion ... ought to be priority #1 in the animal sector. (Arye-smith, 1971)

- Small herd size ... a hallmark of Pakistan dairying ... one of the impediments in the application of principles of scientific management and disease control.
Movement of animals ... also a significant impediment in control of animal diseases.

Only < 20 % of cattle and buffaloes vaccinated annually.

Quality of vaccine produced in public sector generally perceived to be poor.
Convincing Pakistani dairy farmers for a holistic infectious disease control ... a sisyphean task (Egenolf, 1990).
Application of biosecurity and timely vaccination ... a **difficult** proposition.

Vaccination of cattle and buffalo generally resorted to when an infectious disease has **already hit** the animal population.

- Metaphylaxis (in the face of an outbreak) through vaccination and biosecurity ....... **extremely important**.
### 3. CURRENT VACCINATION PROGRAM

#### 1. VACCINATION SCHEDULE FOR CATTLE AND BUFFALO
(RECOMMENDED BY V.R.I, LAHORE & L & DD)

<table>
<thead>
<tr>
<th>Month</th>
<th>Weeks</th>
<th>Disease</th>
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<tbody>
<tr>
<td>February</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; week</td>
<td>FMD</td>
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<tr>
<td>April</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; week</td>
<td>BQ</td>
</tr>
<tr>
<td>June</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; week</td>
<td>HS</td>
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<tr>
<td>August</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; week</td>
<td>Anthrax</td>
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<tr>
<td>September</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; week</td>
<td>FMD</td>
</tr>
<tr>
<td>December</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; week</td>
<td>HS</td>
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- **NB:** REPEAT VACCINATION (Booster dose) 21-28 days following primary vaccination... not a recommendation of VRI and L& DD department
- Vaccination failures ... common.
RESPONSE OF BOOSTER VACCINATION
2. **GLARING OMISSIONS ... ONGOING VACCINATION PROGRAMS DO NOT TARGET**

- Bovine Ephemeral Fever
- Pox
- Bovine Viral Diarrhea (BVD)
- Babesiosis
- Theileriosis
- Para Influenza 3 (PI-3)
- Brucellosis
- Leptospirosis
- Mastitis
4. WHAT ARE THE WAYS FORWARD?

- **Revisiting** of current vaccines & vaccination program ... clearly **warranted**
  
  - Dairy animal vaccination plan should embrace:
    - HS, FMD, BQ, Mastitis, Brucellosis, Infectious bovine rhinotracheitis, Rota & Corona viruses, Para-influenza-3 and BVD.
    - Polyvalent mastitis vaccine developed at Dept. of Clinical Medicine and Surgery, UAF ... on horizon.
    - Development of a *pox vaccine* ... being contemplated
  
  - Booster dosing of vaccine .. Needs to be advocated.
  
  - Up-scaling the quantum of vaccines produced locally.
Improving the quality of vaccines produced locally in the public sector (Afzal, 2009), in particular FMD vaccine.

- Production of vaccine should be consistent with Good Manufacturing Practices ... a basic requirement for licensing of manufacturing facility.
- Aluminum hydroxide/ alum based vaccines do have a room in Pakistani dairying context due to need of a metaphylactic use.
- FMD vaccination in the face of an outbreak of FMD ... a recommendation of “PROGRESSIVE CONTROL OF FOOT AND MOUTH DISEASE IN PAKISTAN” (Recently launched FAO Project, GCP/PAK/123/USA)
Field staff training in handling vaccines, biosecurity and other aspects of vaccination.

- Repeated insertion of vaccination needle into the vaccination vial/bottle may lead to iatrogenic infections e.g. bovine leukemia, bovine immunodeficiency virus. These infections do exist in Pakistani dairy animals (Meas et al., 2000).
Vaccination ... not a panacea ... Vaccination programs must be complemented by adoption of biosecurity methods.

Subsidized/ free vaccination ... good quality vaccines.

Research imperatives ... e.g. combined HS-Mastitis vaccine.

1. Combined vaccine against FMD, Rabies, HS and BQ (Srinivasan et al., 2001)
2. Marker vaccines ... need to be developed and investigated to support test and slaughter based control program of brucellosis.
5. UPSHOT

- Current infectious disease control program in Pakistan leave a lot to be desired in
  
  A. Meeting expectations of fast developing dairying.
  
  B. Conforming to the phytosanitary standards of WTO accord
“CHANGE IS THE ONLY CONSTANT IN LIFE”

“CHANGE IS OFTEN DESIRABLE, FREQUENTLY NECESSARY AND ALWAYS INEVITABLE”
REFERENCES


