Practical Biosecurity for Cattle Veterinarians

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Veterinarians have a vital role to play in educating livestock producers about biosecurity and helping them establish practical, relevant biosecurity policies and practices, for example, with Farm Biosecurity Plans. Critical to this opportunity, producers need to have confidence their veterinarian understands their biosecurity needs and is able to assist in biosecurity management in a practical way. Veterinarians need to demonstrate high standards of hygiene and cleanliness on farms to build trust and respect for their biosecurity knowledge and ability to implement practical biosecurity measures.

Veterinarians visiting properties are generally a high risk biosecurity themselves, simply because they have frequent direct contact with both diseased and healthy animals, and as such are at higher risk of transmitting disease through indirect contact (fomites) than most other visitors to a farm. While rarely directly implicated, it is possible that veterinarians may be important vectors of some endemic and sporadic infectious diseases, both within a herd and between herds. Veterinarians must implement practical biosecurity measures to mitigate this risk, and importantly, to demonstrate that these risks are being controlled.

Importantly, biosecurity measures routinely adopted as part of day to day production animal practice is as much about promoting a professional image as it is about mitigating risk. The challenge veterinarian's face is that these goals have some practical limitations and can be difficult to achieve consistently in day to day practice. This paper describes a checklist for veterinary practices to develop and apply practical biosecurity practices relevant to routine and ambulatory livestock practice.

While veterinarian's are acutely aware of the consequences poor biosecurity measures have in an EAD incursion, arguably of more relevance on a daily basis is the risk of transmitting a wide range of endemic or sporadic infectious diseases with a variable population prevalence and a range of consequences for individual farms.

In many farming enterprises, within-herd biosecurity (biocontainment) is as important as external infectious disease risks. Examples would include the risk of enteric pathogens spreading from maternity paddocks or sick cows to calf housing facilities in dairies, or BVDV spreading from one management group to another susceptible group in both beef and dairy herds.

Biosecurity measures for veterinarians appropriate for significant exotic animal diseases such as FMD, and for OH&S purposes for emerging zoonotic diseases such as Hendra virus have been extensively developed and are not specifically addressed in this paper. Similarly, resources for veterinary hospital biosecurity practices have been well described. Resources for these aspects of biosecurity are readily available online and include Ausvetplan manuals and AVA's Guidelines for Veterinary Personal Biosecurity.

Implementing practical biosecurity measures that manage risk for endemic or sporadically occurring diseases my not be sufficient to mitigate risk for EAD’s or high risk zoonotic diseases, however, these measures raise awareness and the general standard of biosecurity on farms and the principles can be readily modified when more stringent practices must be implemented.
Table 1 illustrates a range of common pathogens that may pose biosecurity risks in day to day ‘low risk’ veterinary activities.

Table 1.

<table>
<thead>
<tr>
<th>Disease / Pathogen</th>
<th>Likely Sources</th>
<th>Likely Route of Infection</th>
<th>Survival in Environment</th>
<th>Infective Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salmonella</td>
<td>faeces, nasal secretions, milk</td>
<td>oral</td>
<td>+++</td>
<td>+++</td>
</tr>
<tr>
<td>Rotavirus</td>
<td>Faeces</td>
<td>oral</td>
<td>+++</td>
<td>+</td>
</tr>
<tr>
<td>Johne’s Disease</td>
<td>Faeces, milk</td>
<td>oral</td>
<td>+++</td>
<td>+</td>
</tr>
<tr>
<td>Anthrax</td>
<td>soil, body fluids</td>
<td>oral</td>
<td>++++</td>
<td>+</td>
</tr>
<tr>
<td>EBL</td>
<td>blood</td>
<td>blood</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>BVDV</td>
<td>faeces, saliva, nasal secretions</td>
<td>oral, nasal</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td>Digital Dermatitis</td>
<td>soil, slurry</td>
<td>Skin contact</td>
<td>+++</td>
<td>++</td>
</tr>
</tbody>
</table>

Veterinary practices can improve effectiveness of their day to day biosecurity measures by developing a biosecurity plan specific to their enterprise, day to day activities and level of risk.

1. **Essential steps in this process include;**
2. **Evaluate Current Practices**
3. **Practice Policy**
4. **Establish SOP’s**
5. **Staff training and endorsement**
6. **Monitor performance**

**Evaluate Current Practices**
Conduct a thorough risk assessment of your current practices. This may include;

- Consider the relative risks of transferring infectious material between animals, between management groups on a farm, and between farms. This would include faeces, urine, blood, saliva, nasal discharges and other tissues. Consider what pathogens may be present in these materials and the risk of these being transmitted on veterinary clothing or equipment.
- Consider the range of veterinary equipment used on farms and the level of contamination that commonly occurs.
- Evaluate the current decontamination and disinfection practices you use, and ask other veterinarian’s and staff to do the same.
- Do a ‘car park risk assessment’ of vets, vehicles and equipment. Pull out all the relevant veterinary equipment, boots and clothing at risk of being contaminated and examine for visible evidence of contamination. Consider the risk of dried material and biofilms that may not be visibly detectable.
- Veterinary nurses are well trained in hygienic hospital practices and can provide objective assessment and assistance in this process initially and on an ongoing basis.
Practice Policy
Developing a practice policy is valuable in establishing and clearly communicating to all staff, and external parties, what your biosecurity goals are. Policy statements are, by necessity, somewhat generic in nature and many veterinarians would regard policy statements with a healthy dose of scepticism. In regard to biosecurity however, objectives and goals are relatively specific and unambiguous, and as such a policy statement is a valuable part of establishing biosecurity outcomes and ensuring compliance with specific practices or SOP’s that mitigate biosecurity risks. A biosecurity policy can be specific to routine farm visits and ambulatory work, or can incorporate hospital biosecurity, EAD and biosecurity relevant to OH&S considerations.

Standard Operating Procedures
Standard operating procedures are self-explanatory and are especially relevant to biosecurity practices where consistent performance and high quality outcomes are required.

SOP’s define specific goals or outcomes, provides a training manual, and is a reference point for performance monitoring and reviews. SOP’s help to clarify and mitigate biosecurity risks in an objective manner. Many veterinarians will be familiar with SOP’s within their organisation, and templates are readily available online.

Develop specific SOP’s for high risk equipment. This should include what cleaning and disinfection is required on farm, and what, if any further action is required on return to the practice premises, prior to storage, or before visiting the next farm. As a minimum, Specific SOP’s could be developed for the following;

1. Overalls, aprons, boots and personnel
2. halters, mouth gags, nose grips, ropes, stomach tubes and rumen drenching equipment
3. Lameness and foot trimming equipment
4. Calving Equipment, Surgical kit, Post Mortem kit, Examination kit
5. Ultrasounds,
6. Vehicles, portable crushes, pregnancy-testing stands, bull testing crates.

Biosecurity SOP’s should prioritise managing equipment and materials at high risk of contamination with faeces, urine, blood, saliva, nasal discharges and other biological substances.

Staff Training and Endorsement
While it is important a nominated person within the practice or organisation takes responsibility for development and implementation of a biosecurity plan, compliance is unlikely unless all relevant veterinarians and staff are appropriately trained, agree with the practice policy and embrace the relevant SOP’s. This is more likely if there is discussion and involvement, or ‘ownership’, in development of the biosecurity plan.

Biosecurity practices are in many ways ingrained habits and are not easily changed. Tips that may help to improve consistent application of biosecurity practices include;

1. Staff meeting and discuss current practices and scenarios.
2. Provide objective information and additional resources to ensure specific practices are sound and effective.
3. Task other team members to develop or provide input into specific SOP’s, and to deliver training specific to their SOP.
4. Discuss SOP’s and road-test practicality of specific practices before implementation.
5. Provide a consistent, highly visible example yourself.

6. Ensure veterinarians take ‘ownership’ of their own biosecurity and are largely responsible for cleaning and disinfection of the equipment they use on farms.

**Monitor Performance**
This is probably the most challenging aspect of implementing a biosecurity plan. It is very difficult to accurately monitor the effectiveness of biosecurity practices in the field. While veterinarians are considered high risk personnel for transmitting disease on farms, evidence of transmission is rare, and obviously to be avoided at all costs. Generally, cultures, PCR or other diagnostic evidence of efficacy of biosecurity measures is cost prohibitive, although routine culture for enteric pathogens has been demonstrated as a useful indicator for routine use in equine hospitals.

**Measures to monitor performance could include;**
1. Regular inspection of specific equipment or vehicles.
2. Consider occasional culturing of equipment for enteric pathogens as a general indicator of
3. An open policy for feedback and discussion when any specific issues or problems arise.
4. Periodic discussion and review of biosecurity SOP’s

**Decontamination and Disinfectants**
The cornerstone of biosecurity for veterinarians at the farm level (or strictly, biocontainment) is to reduce the potential infective dose of pathogens by decontamination and disinfection. Numerous studies demonstrate that effective decontamination reduces pathogen load by approximately 90%, followed by effective disinfection that further reduce pathogen load by approximately 5%. Furthermore, most disinfectants are de-activated or poorly effective in the presence of organic material. Veterinarians need to be aware that 100% elimination of pathogens is very challenging and while sound biosecurity practices should mitigate risk of disease transmission to low-negligible levels, risk will not necessarily be eliminated completely.

While decontamination at the farm gate is essential, final decontamination and disinfection off-site, for example on return to the practice premises is often more easily achieved. While this in no way eliminates the need for farm-gate decontamination, in practical terms, efficacy of biosecurity practices can be greatly increased by further cleaning and disinfection at the practice premises.

There is no disinfectant that is universally suited for all biosecurity purposes and selection of disinfectant’s should take into account the product’s spectrum of activity, susceptibility to inactivation by organic matter, potential pathogens in the environment, compatibility with soaps and detergents, toxicity for personnel and animals, contact time required, residual activity, corrosiveness, environmental effects and cost. More extensive resources on disinfection selection can be found within Ausvetplan manuals and the AVA’s *Guidelines for Veterinary Personal Biosecurity*. For general purpose use, in low risk situations, corrosiveness or other damage to various materials and OH&S issues are key considerations.

**Practical Tips**
1. Avoid driving through laneways, dairy yards or other areas heavily contaminated with manure. If necessary transfer your equipment to a farm vehicle. Park in a clean area, preferably on concrete, bitumen or on grass so that equipment can be given a final clean before loading back into the vehicle using the dirty/clean principle
2. Use disposable nitrile gloves whenever practical, and include hand cleaner, an alcohol based hand rub, detergent and a general purpose disinfectant in your vehicle.

3. Carry a supply of water if necessary, and consider investing in built-in tank with 12v pressure pump. Use hot water whenever possible. (Always look for the hot water unit in dairies) Many pathogens are susceptible to heating and hot water greatly facilitates cleaning of faeces, dirt, blood and other body fluids.

4. Use detergent to thoroughly clean soiled equipment and only apply disinfectants on equipment once free of organic material.

5. Use rectangular buckets (teatseal buckets) for cleaning and equipment storage. You can stand in the bucket while washing boots, can be used to soak equipment and store equipment, and have sealing lids so that equipment can be kept clean and dry, or soiled equipment can be transported back to the practice for cleaning.

6. A large sponge with scour pad, and a hoof pick with small brush is more effective at cleaning rubber boots than a brush.

7. Carry a small portable table to keep equipment off the ground or out of the ‘splash zone’

8. Carry a small mat or tarp to use for dirty/clean zoning if necessary and carry a tub or plastic bin liners for transport of contaminated equipment back to the practice for further cleaning and disinfection.

9. Use long rubber boots with open, easily cleaned tread patterns. Polyurethane boots are lighter, more comfortable and easier to clean than traditional rubber boots. Consider using short rubber, short neoprene boots or other washable footwear rather than leather work boots.

10. Ropes, halters, belly straps, calving ropes, lifting pulleys should be modified so all metal parts are removable and ropes and straps can be washed in a washing machine. Welded metal loops can be replaced with short lengths of chain and D shackles that can be removed and easily disinfected.

11. Use needles only once and avoid re-using syringes. Avoid contamination of drug vials and disinfect vial rubber stoppers regularly. Use a sterimatic or other needle protection devices on vaccine guns

12. Avoid soaking equipment for prolonged periods. Any added disinfectants will likely be de-activated by prolonged exposure to organic material, and soaking promotes growth of biofilms that will facilitate survival of pathogens on equipment.