

Monitoring for Infectious Disease in Cattle Operations

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Infectious diseases are among the most important problems in all types of livestock production. Costs can be tremendous to a single operation for diagnosing and treating sick animals, or associated with death losses. However, these probably are far outweighed by such hidden costs as associated with decreased production efficiency or lost production opportunities. Less-immediate losses that also must be considered include those linked to the inability to market stock because of the potential spread of infection.

Prevention and control of infectious diseases is therefore an important part of livestock production. The incidence of infection and disease in an operation must continually be reappraised to achieve efficient and effective disease risk management.

Production managers must have feedback regarding the status of the system so necessary corrective action can be taken. Monitoring programs are the foundation of any planned veterinary service in food animal production,¹ and such programs yield multiple benefits. Monitoring programs provide information on the current status operation's. They can help pinpoint problem areas to target for further investigation or corrective action. This also will assist in making disease prevention efforts efficient and economical by highlighting problem areas where resources are needed most. Regular review of data gathered from monitoring programs stimulates re-evaluation of disease prevention strategies. Monitoring programs can provide early warning for producers regarding problems that threaten productivity before they become large and unmanageable. Monitoring programs also are an essential component of a quality assurance program.

The requirements of a monitoring program are determined by the goals of the production and disease control program, and must be tailored to the requirements of each individual operation. However, the systematic approach of Hazard Analysis and Critical Control Points (HACCP) can be useful in designing operation-specific disease control programs.²

There are 7 essential parts to the HACCP approach to systematic monitoring and control processes:³

1) Conduct a hazard analysis. Prepare a list of steps in

the production system where significant problems or hazards can occur and describe preventive measures.

2) Identify critical control points (CCP) in the production system. A CCP is a step where control can be applied and a hazard can be prevented, eliminated, or reduced to acceptable levels.

3) Establish critical limits associated with each CCP that would trigger enactment of preventive or corrective measures.

4) Establish CCP monitoring requirements. Establish procedures for using monitoring results to adjust the process and maintain control of the production system.

5) Establish corrective actions to be taken when a critical limits are exceeded.

6) Establish effective record-keeping procedures that document the HACCP system.

7) Establish procedures for verifying that the HACCP system is working correctly.

Monitoring methods should be carefully considered and investigated. Any data-gathering effort can be part of a monitoring program, including both active and passive surveillance. Active monitoring refers to collecting information for a specific purpose. For example, culturing feces collected from all cattle in a herd specifically for the purpose of detecting enteric pathogens would be active monitoring. Passive monitoring is the capture of data that was obtained for other purposes. This might include using feed bills to help determine average feed consumption, rates or gain.

Monitoring programs should be efficient, but thorough. Only data that is useful should be actively collected, but monitoring should be conducted with sufficient rigor and frequency to ensure that the operation's goals can be met. Sensitivity and specificity of diagnostic tests should be considered when setting critical limits and interpreting data. Purposes for monitoring should be clearly defined for the operation when selecting monitoring procedures. For example, it should be considered whether the purpose of sampling and monitoring is to detect disease, or to detect subclinical infection. The epidemiology of disease also should be considered when designing monitoring programs. Consideration of risk factors for disease will help determine which animals should undergo the closest scrutiny.

While Information collected from monitoring programs should be reviewed regularly, monitoring protocols also should be routinely reviewed. Since livestock operations are dynamic enterprises, monitoring programs or control measures cannot be put in place and then forgotten. They must be reviewed and changed as necessary to better meet the operation's needs. It also is critical that rigor and vigilance of monitoring efforts be carefully maintained and guarded. Efforts can easily become stagnant so that the monitoring program becomes more of a pretense than a vital and effective management tool.

Whether a monitoring program is intended to identify infections so the producer can minimize the detrimental effects of subclinical disease, or to help establish that a farm or region is disease-free, monitoring programs can be extremely useful and powerful

tools. Regular input regarding the status of a livestock operation is an essential component of effective health and business management.

References

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