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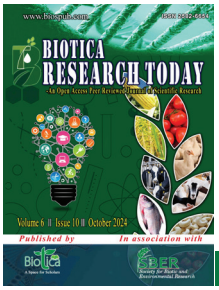

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Bio-Security Measures: Inevitable Steps to Control Biohazards at Farms Level

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Abstract

Bio-security implies to a series of comprehensive strategies and rules to mitigate and curb spreading of diseases as well as to safeguard the life and health of flora and fauna with other environmental risks associated with it. With the changing world order and climate change, it has become very essential to check the pathogens at every check point to prevent pandemic situations like Covid-19. The application of these strategies and set of rules are very critical at regional, national and international level to prevent trans-boundary diseases also. In addition to that, bio-security at farm levels guarantees the food safety down the line and prevents any health hazards.

Keywords: Bio-security, Food security, Health hazard, Vector

Introduction

Bio-security implies to a series of comprehensive and integrated strategies which includes the legal and policy frameworks to analyze and control the risks in the areas of food safety, animal and plant life and health related environmental risks. The general definition of livestock bio-security is "any practice or system that prevents the introduction of infected animals into a herd, region, or country in which the infection has not yet occurred, or prevents the spread of pathogens from infected to susceptible animals."

The global population boom and increasing demand for protein rich diet has heightened the commerce in cattle and animal products, which makes up about half of the world's agricultural economy. Additionally, the increasing commerce activity has predisposed the entire global population to zoonotic diseases. Animals might increase or spread a bioterrorism epidemic because they are difficult to manage and can disseminate bio-warfare weapons worldwide through animal-to-animal transfer. Therefore, it is of paramount importance to have rules, guidelines and standards at the regional, national and international levels to avoid, control and recover from the unintentional, intentional, or natural introduction of animal diseases. Furthermore, with the advent of newer technologies, attempts should be made to incorporate newer technologies to existing strategies for disease prevention and containment to help nations better.

Types of Bio-Security

Bio-security measures can be classified in three levels as follows.

1. Conceptual bio-security pertains to the farm's orientation, position and geographic placement (Maye and Chan, 2020). The extent and dimensions of animal production facilities and complexes are also included in this category. Along with this it also suggests the proper distance between two farms to avoid spread of any disease *viz.*, breeder farm should be built in an isolated area at-least 3 km away from the nearest poultry farm and 1.6 km in the case of commercial layer and broiler farm. Furthermore, facilities like hatcheries and feed mills should be kept a sufficient distance from breeder and grower farms.

2. Structural bio-security refers to the capital investment that enhances the ability to prevent disease spread. It includes the physical design, construction and maintenance of a facility which helps to prevent the transfer of diseases like fencing, testing as well as providing good water source,

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weather proof roads, proper housing and building. In addition to that, three meters vegetation free boundary around the farm should be in place to prevent contamination of fodder with poisonous plants.

3. Operational bio-security refers to those processes and protocols, management practices, or standard operating procedures implemented to exclude or contain diseases. Operational bio-security pertains to procedures conducted on the premises, as well as the management of people, animals, supplies, equipment, vehicles and other items related to disease control. Operational bio-security measures are commonly perceived as procedures related to personnel movement, but they also include processes to mitigate risks from vectors, equipment, vehicles, carcass disposal, manure/ litter management, animals, feed, replacement bedding/ litter, water supply and maintenance and security of the facility.

Different Ways to Implement Bio-Security

Developing a bio-security plan that focuses on bio-containment in a population of diseased animals or bio-exclusion in ordinary livestock management requires comparable ideas and concerns (Hennessy, 2007). There should be a certain set of measures depending upon the particulars of the activity and the venue.

• *Separate Clean and Dirty*: Areas can be physically separated using a cleaning and disinfection (C&D) line, a clean/ dirty line, or a line of separation. Contaminated and non-contaminated regions are distinguished by the line of separation.

• *Visitors*: People, particularly caregivers and emergency response staff, can spread disease pathogens through their actions and movements therefore strict rules are essential for these people.

• *Vectors*: Insects, animals and even family pets are examples of living things that may transmit illness either mechanically or biologically. This can be done by cleaning up spilled feed or materials that may draw vectors right away. Keeping domestic pets and animals out of restricted animal zones, programs for controlling vectors that could have gotten inside the building in spite of structural safeguards are other methods to contain the vectors.

• *Farm Equipments*: All instruments and equipment should follow proper cleaning and sanitization procedures between animal groups.

• *Disposal of Carcass*: Disposal of carcasses is one of the major areas of concern. It should be disposed of away from the farm in a secluded area and the rest of the animal population shouldn't be exposed during the handling and disposal of carcasses.

• *Management of Animal Excreta*: Removal of discarded litter and manure to reduce cross-contamination of other operations and exposure to living animals. One of the best ways to recycle the excreta is bio-composting, which can be utilised also.

Among these and other bio-security examples, livestock producers and owners must make informed decisions. Although the above-mentioned list is not all-inclusive, there are precautions which go beyond this in terms of cleaning and disinfection. It is recommended that all operational bio-security measures be selected as most appropriate for the site's activities, as well as for its conceptual and structural bio-security which will shield animals from illness and separate them as much as feasible.

Conclusion

In conclusion it can be noted that bio-security measures at farm level are of utmost importance due to the changing dimension of zoonotic diseases along with the changing environment from day to day. These measures checkmate the potential health hazards along with spreading of zoonotic diseases.

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