



## A BRIEF REVIEW ON BIO-SECURITY AND HEALTH MANAGEMENT

### Veterinary Science

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### ABSTRACT

Biosecurity is the back bone of quality food security, in larger perspectives biosecurity is a multi disciplinary approach which reduces the risk of transmission of infectious diseases in crops, livestock and other living organisms which are directly related to food chain. Under the regime of WTO international trade is playing pivotal role in exchange of all food items between the countries and continents. Underdeveloped and developing countries are mostly depending on the international trade of animal products and by products through which the possibility of transmission of infectious agents and environmental pollutants are serious threat to the human health if biosecurity is at sparse.

### KEYWORDS:

Biosecurity, FAO, WTO, WHO,OIE, Zoonoses,Strategies,Concepts,Risk analysis, Linkages.

### INTRODUCTION

Biosecurity has multiple meanings and is defined differently according to various disciplines. Originally biosecurity is defined as a set of preventive measures designed to reduce the risk of transmission of infectious agents and environmental pollutants among crops, livestock, invasive alien species, and living modified organisms<sup>7</sup>. It is a set of management practices that prevent infectious diseases from being carried into a herd<sup>10</sup> and also a strategic, integrated and regulatory approach for analyzing and managing relevant risks to human, animal, plant life and environment. Biosecurity also covers food safety, zoonoses and issues related to genetically modified organisms (GMOs) & their products and management of invasive alien species and genotypes<sup>11</sup>. Thus, biosecurity is a holistic concept for sustainable agriculture, public health, environment and biological diversity<sup>3</sup>. An effective biosecurity program can improve the cost-efficiency of the farm, improve the reputation of the producer, and allow the producer to better maintain the health status of the herd<sup>8</sup>. Hence biosecurity is cheap insurance against diseases.

### OBJECTIVES OF BIOSECURITY

1.Preventing the entry of etiological agents into farm premises;  
2.Early Detection, accurate Diagnosis and specific Treatment (DDT);  
3.Effective eradication of diseases, pests and weeds for EPH (Efficacy, Production and Health); 4.Improve the economy (Village, State and National -VSN).

### FARM BIOSECURITY (LIVESTOCK, POULTRY AND ALIEN SPECIES)

In modern animal medicine, biosecurity deals with the complexity of host, disease-causing agent, and the environment. It also considers with individual animals or populations of animals, economic entities, geographic regions, thus facilitating the trade and addresses the strategies for both disease prevention and control<sup>1</sup>. According to Singh (2006 & 2008) the biosecurity problem is most acute among Indian livestock, due to Transboundary Animal

Diseases (TAD), Emerging and re-emerging diseases like Peste Des Petits Ruminants (PPR), Blue Tongue (BT), Caprine Arthritis/Encephalitis (CAE), Caprine Mycoplasmosis, and Maedi-Visna in sheep & goat, Classical Swine Fe-ver (CSF) and Cysticercosis in pigs, Infectious bovine Rhinotracheitis/Infectious Pustular Vulvovaginitis (IBR/IPV) Bovine Viral Diarrhea (BVDMD), Bovine Immunodeficiency Virus (BIV), Foot and Mouth Disease (FMD), Theil-eriosis, Enzoic Abortion (Chlamydia), Babesiosis, Anaplasmosis in cattle, Equine rhinopneumonitis and Equine pioplasmosis in horses, Infectious Bursal Disease (IBD), and Infectious Hydropericardium Syndrome (HPS), Avian Influenza (HPAI) etc., among organized and backyard poultry. Duck Hepatitis Virus (DVH) in ducks and Rabbit Hemorrhagic Disease (RHD) in rabbits, Rabies and Leptospirosis in dogs, Clostridium, Vobrio, Salmonella in fish and also some zoonotic important zoo animal diseases due to introduction of new livestock into zoo. These diseases are responsible for enormous economic losses, community development and zoonosis. In addition to biological origin phytotoxins, drug residues and environmental pollutants were also responsible for refuse of

livestock & its products in the global market. Largely this could be due to scarce in bio-security knowledge and regulatory mechanisms in India.

Therefore, there is a need to practice and promote strict bio-security measures at livestock & poultry farm in two ways (1) external measures (external biosecurity) to prevention of entry of new diseases into a group, and (2) internal measures (internal biosecurity) for prevention of spread of disease within a group<sup>2</sup>.

### CONCEPTS OF BIO-SECURITY

As per Collett (2016), comprehensive biosecurity program should represent a hierarchy of *conceptual, structural, and procedural* components directed at preventing infectious disease transmission within and across farms, companies, facilities, regions, countries, and continents. Prevention is the most effective way to minimize disease transmission.

#### Conceptual biosecurity

This primary level of biosecurity revolves around the location of animal facilities and their various components. The most effective way to limit risk is physical isolation, making this a primary consideration when setting a new confinement facilities or farms. Facilities/farms should not be located next to public roads, especially when the area has a high density of animal facilities. Similar isolation methods include limiting the use of common vehicles and facilities, limiting access by personnel not directly involved with the operation, and controlling the spread of disease by vermin, wild animals, and wind.

#### Structural biosecurity

This secondary level of biosecurity deals with physical factors such as farm layout, perimeter fencing, drainage, number/location of changing rooms and housing design. Long range planning and programming is important and should consider onsite movement of vehicles, equipment, and animals; traffic patterns; and feed delivery/storage.

#### Procedural biosecurity

This tertiary level deals with routine procedures to prevent introduction (bioexclusion) and spread (biocontainment) of infection within a facility. Biosecurity programs consist of bioexclusion, surveillance and biocontainment.

### CONTENTS

#### Who is connected with farm bio-security

As per Food and Agriculture Organisation (FAO-2007) Government of India (GOI-2014, 2015 & 2016) and NSW (New South Wales Biosecurity Strategy, 2013-2021), the biosecurity is a strategic shared responsibility with specific aims, objectives and strategies for implementation and scope to improve the National economy through strict regulatory mechanism to promote the livestock trade in the regime of World Trade Organisation (WTO-2006). Hence, the Government, Industry and the People should work together to protect the economy, environment and community (EEC), against etiological agents for the benefit of people. Biosecurity involves many different kinds of stakeholders at the International and National level (FAO,

2007).

### International stakeholders

At the global level, international standard-setting organizations, international bodies and international legal instruments and agreements play an important and complementary roles in biosecurity. Those bodies are Codex Alimentarius Commission (CAC), the World Organization for Animal Health (OIE) and the Commission on Phytosanitary Measures (CPM) develops standards for different biosecurity sectors in accordance with their mandates. While international standards are not legally binding in and of themselves, they have become international reference points through the World Trade Organization (WTO).

Reflecting its mandate and competencies, FAO also plays a leading role in normative work and technical assistance, at the both the national and international levels, to support the implementation of a biosecurity approach. FAO hosts the secretariat for the CAC, under the joint FAO/WHO, FSP (Food Standards Programme) and IPPC (International Plant Protection Convention). WHO supports countries to prevent, detect, verify rapidly and respond appropriately to epidemic-prone and emerging disease threats when they arise to minimize their impact on the health and economy of the world's population.

### National stakeholders

Several branches of Government like food safety, public health, agriculture, forestry, fisheries and the environment play the primary role in a contemporary integrated approach to biosecurity in addition to sectors such as trade, customs, transport, finance and tourism.. Additionally "*third party*" organizations are often contracted by competent authorities to deliver biosecurity functions including surveillance programmes, incursion response activities and laboratory diagnostic services.

### GLOBAL FACTORS INFLUENCING THE BIOSECURITY

- Liberalisation, Privatisation and Globalization (LPG).
- New agricultural production and food processing technologies.
- Increased trade in food and agricultural products.
- Legal obligations for signatories of relevant international agreements.
- Increasing travel and movement of people across borders.
- Advances in communications and global access to biosecurity information.
- Public attention to biodiversity & environment and the impact of agriculture on both.
- Shift from country independence to country interdependence for effective biosecurity.
- Scarcity of technical and operational resources.
- High dependence of some countries on food.

### BIOSECURITY LINKAGES

Human, animal and plant life, health and protection of the environment are inextricably linked. Various types of biosecurity hazards exist in different sectors which are inter related (e.g. many animal pathogens readily infect humans; animal feed may be contaminated with mycotoxins and plant toxins). In respect of food chains, hazards can be introduced anywhere from production to consumption through breakdown in security at any point resulting in adverse health consequences. Changes in the environment, loss of biological diversity and contamination of food and water results in risk to human and animal health.

### RISK ANALYSIS

Risk analysis is composed of three distinct but closely connected components-risk assessment risk management and risk communication. Biosecurity risk assessment involves a scientific estimation of risks to life and health. Risk management incorporates considerably different processes to risk assessment. Core decisions involve in balancing of scientific findings against risks to improve the economic and social status through feasible cost-effectiveness techniques. Both risk assessment and risk management should be wrapped in a "sea of communication".

### HOW TO MINIMIZE BIOSECURITY RISKS

The increasing convergence of human, animal, plant and environmental health issues is motivating some governments/ governing bodies to:

- Share scarce biosecurity technical resources.
- Recognize and apply generic approaches to risk analysis.
- Develop nationally integrated responses to biosecurity problems.
- Promote nationwide access to biosecurity information and improve stakeholder awareness.
- Develop new international strategic alliances; and/or
- Shift from country independence to interdependence in complying with international agreements and instruments and ensure consistency in their application.

### CONCLUSIONS

**Bio-security is the Back bone of Food-security'(BS is the BB of FS).**

In order to be food secured, we must be bio-secured. As a matter of fact, **unsafe food is no food**. Therefore, whatever we produce and eat, we must ensure that it is free from bio-risks. Notwithstanding the usefulness of regional and global partnerships, biosecurity and food security must essentially be priority programmes of individual countries and locally owned research, information, strategies and management systems must be in place in each country. Local policy makers and service providers should be committed to the movement and biosecurity should be mainstreamed in national policy and political agenda.

Keeping the importance in view the Government of India has to focus on the following was discussed by Singh (2006 and 2008).

1. Setting up a National Agricultural Biosecurity Council.
2. National Centre for Agricultural Biosecurity.
3. National Agricultural Biosecurity Network.
4. National Agricultural Biosecurity Fund.

The discussions above relating to strategic interventions and strategic partnerships also need immediate attention. The above mentioned will help the Nation to strengthen our infrastructure, introduce new molecular techniques of identification and verification, derive benefits from our animal genetic resources, and provide needy and timely help to the affected families, so as the quality life of the people may increase there by national income can be boosted through overcoming barriers at the global market in the regime of WTO (2006).

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