

International Food Safety Authorities Network (INFOSAN)

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Biosecurity: An integrated approach to manage risk to human, animal and plant life and health

SUMMARY NOTES

- Biosecurity is a strategic and integrated approach to analysing and managing relevant risks to human, animal and plant life and health and associated risks for the environment.
- National stakeholders include relevant government agencies, agricultural producers and the food industry, scientific research institutes, specialist interest groups, nongovernmental organizations (NGOs) and the general public.
- International standard-setting organizations, international bodies and international legal instruments and agreements provide a governance framework for biosecurity.
- Benefits of biosecurity include early recognition of emerging pest and disease threats, ability to consider complete exposure pathways, integrated responses to threats, rationalization of controls, improved emergency preparedness and response, overall ensuring the more efficient use of available resources.

What is biosecurity?

Biosecurity is a strategic and integrated approach to analysing and managing relevant risks to human, animal and plant life and health and associated risks for the environment. It is based on recognition of the critical linkages between sectors and the potential for hazards to move within and between sectors, with system-wide consequences. Reviewing national capacity provision for biosecurity as a whole helps identify any gaps in regulations and monitoring. Also, as technologies for the detection of pests and disease develop, it is likely that synergies will emerge between sectors in areas such as virology or detection of low levels of chemical contaminants. Ultimately the aim is to enhance national ability to protect human health, agricultural production systems, and the people and industries that depend on them.

The goal of biosecurity

The overarching goal of biosecurity is to prevent, control and/or manage risks to life and health as appropriate to the particular biosecurity sector. In doing so, biosecurity is an essential element of sustainable agricultural development.

The context of modern biosecurity

Biosecurity issues have an ever-increasing profile on a global basis due to a range of factors (Box 1). With increasing public awareness of the impact of adverse biosecurity events and interventions, political and social demands on government regulatory agencies are resulting in considerable infrastructural change. Stakeholder interest is fuelled by technological advances in detection and management of hazards to life and health, together with the often unresolved scientific debate that surrounds the potential of very low levels of hazards to result in adverse health or environmental impacts.

What constitutes a biosecurity hazard?

Biosecurity systems are primarily concerned with preventing, controlling or managing hazards to life and health. There are various descriptions in the different biosecurity sectors as to what constitutes a hazard, as illustrated in Table 1.

Box 1. Some factors influencing biosecurity

- Globalization
- 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
- Greater public attention to biodiversity, the 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 imports

Sectors	Definitions of hazard
Food safety	A biological, chemical or physical agent in, or condition of, food with the potential to cause an adverse health effect (CAC).
Zoonoses	A biological agent that can be transmitted naturally between wild or domestic animals and humans (OIE).
Animal health	Any pathogenic agent that could produce adverse consequences on the importation of a commodity (OIE).
Plant health	Any species, strain or biotype of plant, animal or pathogenic agent injurious to plants or plant products (IPPC).
Plant health quarantine	A pest of potential economic importance to the area endangered thereby and not yet present there, or present but not widely distributed and being officially controlled (IPPC).
“Biosafety” in relation to plants and animals	A living modified organism (LMO) that possesses a novel combination of genetic material obtained through the use of modern biotechnology that is likely to have adverse effects on the conservation and sustainable use of biological diversity, taking also into account risks to human health (Cartagena Protocol on Biosafety).
“Biosafety” in relation to food	A recombinant DNA organism directly effecting or remaining in a food that could have an adverse effect on human health (Cartagena Protocol on Biosafety).
Invasive alien species	An invasive alien species outside its natural past or present distribution whose introduction and/or spread threatens biodiversity (CBD)

Who is involved?

National stakeholders: the sector-specific government agencies have a primary interest in dealing with biosecurity threats, but industry, scientific research institutes, specialist interest groups, nongovernmental organizations (NGOs) and the general public all have a vital role to play. Even within government, bodies responsible for the sectors usually associated with biosecurity – food safety, public health, agriculture, forestry, fisheries and the environment – play the primary role in a contemporary integrated approach to biosecurity. However, other parts of government responsible for sectors such as trade, customs, transport, finance and tourism may also become involved depending on national circumstances.

International stakeholders: International standard-setting organizations, international bodies and international legal instruments and agreements constitute the governance framework for biosecurity. International standard-setting organizations and bodies like the Codex Alimentarius Commission (CAC), the World Organisation for Animal Health (OIE) and the Commission on Phytosanitary Measures (CPM) develop standards according to their mandates, which have become international reference points through the World Trade Organization (WTO) Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement), 1995. Other relevant agreements include the Cartagena Protocol on Biosafety, the Codex Alimentarius, the Convention on Biological Diversity (CBD), the Food and Agriculture Organization of the United Nations (FAO), General Agreement on Tariffs and Trade (GATT 1947), the International Health Regulations 2005 (IHR, 2005), the International Plant Protection Convention (IPPC), the International Maritime Organization (IMO), the Organisation for Economic Cooperation and Development (OECD) and the World Health Organization (WHO) are the potentially most important and relevant global and regional agreements, soft-law instruments, international organizations and bodies that are associated with biosecurity.

Harmonization and integration of approaches to biosecurity

A traditional sector-based approach to biosecurity is increasingly under challenge, and many countries are revising the relevant legal and regulatory systems, institutional responsibilities and resources available for essential infrastructure in response. The aim is to ensure a more integrated approach, and ensure a faster and more effective response to biosecurity threats.

Some countries have even made major changes to institutions to join all relevant responsibilities ‘under one roof’ – an example would be New Zealand; others have combined some responsibilities e.g. for plant and animal health inspection; while a larger group have instituted formal communication mechanisms (such as a national biosecurity committee or task force) to ensure regular and effective dialogue between the different stakeholders.

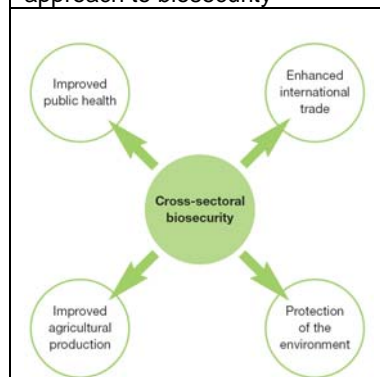
Requirements for a harmonized and integrated approach to biosecurity

The successful implementation of a harmonized and integrated biosecurity approach requires a clear policy and legal framework, an institutional framework that defines the roles and responsibilities of relevant stakeholders, adequate technical and scientific capability, including use of risk analysis, a well-functioning infrastructure for testing and control, and a system for communication and information exchange.

Examples of enhanced outcomes

In a modern biosecurity environment, considerable importance is placed on a holistic approach. Countries are encouraged to base their controls, as far as possible, on international standards where they exist. At the national level and internationally, there are likely to be significant benefits in integrating biosecurity activities to the extent practical (Figure 1). Examples of enhanced outcomes of biosecurity include better risk analysis, ability to consider complete exposure pathways, integrated responses to new and emerging diseases, rationalization of controls, improved emergency preparedness and response, integrated surveillance or traceability systems and more efficient use of available resources.

Figure 1. Potential benefits associated with a cross-sectoral approach to biosecurity



Conclusions

Improved health and well-being of human populations are the ultimate outcomes of functioning biosecurity systems. Biosecurity forms a bridge between agriculture and health. Poor practices in agriculture or food production can favour biosecurity threats, and directly have an impact on public health or threaten food security. The benefits of a more harmonized and integrated approach to biosecurity are already apparent in specific national situations. A more holistic approach to biosecurity will enable these benefits to be achieved in a manner that avoids inconsistencies, fills gaps, prevents the creation of

unnecessary barriers to trade, and protect human health and consumer confidence in agricultural and food products. For more information including a toolkit for developing and implementing a biosecurity framework, visit

http://www.fao.org/ag/aqn/agns/foodcontrol_biosecurity_en.asp.

INFOSAN serves as a vehicle for food safety authorities and other relevant agencies to exchange food safety information and to improve collaboration among food safety authorities at both the national and international level.

INFOSAN Emergency, embedded in INFOSAN, links official national contact points to address outbreaks and emergencies of international importance and allows for the rapid exchange of information. INFOSAN Emergency is intended to complement and support the existing WHO Global Outbreak Alert and Response Network (GOARN).

INFOSAN is operated/managed by WHO, Geneva. It currently includes 177 Member States.

More information is available at: www.who.int/foodsafety