



Biosecurity

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Biosafety and biosecurity strictly mean keeping life (Greek βίος = life) safe and secure. Although there are many things that threaten life, biosafety and biosecurity refer to protection from biological hazards. The term biosafety was initially coined for the measures necessary to protect laboratory workers from infection as they handled pathogenic agents and biocontainment refers to the measures in place to prevent the escape of pathogens from laboratories. Currently the terms, in particular biosecurity, are used to describe a much wider range of applications, and there are many definitions of both terms. Certain organizations restrict the use of the term biosecurity to the measures that prevent the loss or theft of biological agents that could lead to their misuse in malicious acts i.e. bioterrorism. However, the term biosecurity is widely used in and generally understood to be applicable to a number of contexts besides bioterrorism. Examples are barrier nursing to protect hospital workers caring for patients with highly contagious diseases, systems implemented in food factories to ensure food safety, and sanitary measures applied in a variety of situations to prevent spread of diseases, as well as laboratory containment of pathogens. The most important determinant of biosecurity is human behaviour, and its application often requires changes in behaviour, implying a strong educational focus. The online modules on biosecurity focus on the main applications of veterinary interest, namely

- the value chain for production of food derived from livestock,
- international trade in livestock and livestock commodities,

- veterinary laboratories and animal facilities, and
- emergency situations that involve animals.

Biosecurity: Value chain for animal-derived food

The main focus of biosecurity along the value chain shifts from protecting farmed animals from pathogens in order to ensure a sufficient supply of healthy animals for food production to protecting humans by ensuring that the food produced will contain neither pathogens from the animals themselves nor from humans who handle the food in the various stages of production. Biosecurity in livestock production systems emphasises hygiene and can offer alternatives to some of the conventional disease control measures that raise concerns about residues in food and environmental pollution. It is aimed at excluding pathogens that are not present on the farm and limiting or preventing the spread of those that are present. It ensures the safety of water and feed and provides rules to limit traffic through the facilities where animals are kept and ensure a high level of hygiene and the proper disposal of waste. Many of the biosecurity systems have been developed for animals farmed indoors and the challenge is to devise systems appropriate for extensively farmed animals and for smallholder farmers who lack the resources to implement sophisticated biosecurity systems. Along the chain biosecurity measures must be in place during the transport of animals to a slaughter facility, in the slaughter facility itself, and throughout any further processing that is undertaken up to and including the final retail outlet. Biosecurity in food producing facilities relies on the HACCP (Hazard Analysis Critical Control Point) system which is explained in more detail in the modules.



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Biosecurity: Hazards posed by international trade in livestock and livestock commodities

Biosecurity measures in international trade in animals and animal-derived commodities are aimed at protecting both the animal and human populations of the importing country from the introduction of pathogens. Unfortunately the easiest way to prevent introduction of pathogens via legal imports is to simply ban imports from any country or part of a country not scientifically proven to be free of the unwanted diseases. The unfairness of such trade bans is increasingly perceived, and there is strong pressure on standard setters and importers to accept that auditable biosecurity applications that ensure that particular pathogens are not present in the imports provide an alternative to area freedom. Indeed, they may well provide greater confidence. All aspects of international livestock trade are covered in online modules devoted to that topic. (See the modules on International trade and marketing of animal commodities and products).

Biosecurity and biosafety: Veterinary laboratories and animal facilities

The principles and application of biosecurity in veterinary laboratories are described in detail in Chapter 1.1.02 of the OIE Terrestrial Manual for Diagnostics and Vaccines. These relate to the protection of humans handling potentially zoonotic organisms, biocontainment to prevent the escape of pathogens from the laboratory into the environment, and also best practice to prevent cross contamination of samples. Animal facilities include facilities where laboratory animals are kept, also covered in the above manual, as well as quarantine facilities and animal hospitals.

Biosecurity: Emergency situations

Many emergency situations such as those created by natural disasters involve large numbers of animals as well as people. The presence of animals may simply be

seen by some as yet another hazard to human health and safety. However, to people who, having lost everything else, have managed to salvage their animals, they may represent the only resource that will enable them to pick up the threads of their life afterwards. Companion animals that survive with their owners may offer an important source of comfort and stability that will lessen the effect of the trauma and enable them to cope with the shock. Veterinary involvement is often minimal, yet veterinary and para-veterinary professionals have a vital role to play in providing assistance to animals that are sick or injured, reducing the risk to humans and animals by removing animals that are obviously dangerous, and advising on any health threats that animals may or may not pose to humans. The application of biosecurity measures in a disaster is usually extremely challenging, and people with veterinary knowledge should be part of the team that tries to meet the challenge.

