

11 FACTS ABOUT ON-FARM BIOSECURITY



1. What is on-farm biosecurity

Pests and diseases pose a serious threat to the health, welfare and productivity of livestock and crops, as well as human and environmental health and farm sustainability (see Fact#2 for more details). Strict rules and protocols must be in place on farms to safeguard against these biological risks. On-farm biosecurity involves the management procedures and practices that prevent or mitigate the introduction and subsequent transfer of pests and diseases to and from agricultural operations. Disease and pest prevention and control, nutrient management, and visitor control are all farm management aspects involved in on-farm biosecurity.¹ On-farm biosecurity protects the health and well-being of consumers, farm businesses, plants, animals, and the environment and plays an integral role in food security².



2. Pests and diseases are biological risks that must be mitigated

The entry of diseases and pests onto a farm can have serious consequences, including:³

- Increased costs required for monitoring, production practices, additional chemical use, labor, and veterinary costs
- Reduced yield, quality and productivity
- Reduced profitability and loss of markets
- Poor plant and animal health and welfare
- Detrimental effects on human and environmental health
- Loss of consumer trust and acceptance of the quality and safety of the food supply



3. Animal biosecurity keeps livestock and humans healthy

In livestock operations, biosecurity practices keep pathogens such as bacteria, viruses, parasites, fungi, prions and toxins away from livestock.⁴ To reduce the introduction or spread of diseases within a farm, between farms, and between species, animal biosecurity practices are typically specific to individual operations.⁵ Livestock biosecurity safeguards against the threat zoonotic diseases,^{6,7} which are pathogens that are transmitted between animals and humans. Due to the close relationship between humans and animals in agriculture, zoonoses could potentially lead to pandemics and recurrent disease outbreaks, posing a serious threat to human and public health.



4. Crop biosecurity keeps plants healthy and supports sustainable agriculture

The goal of crop biosecurity is to prevent, reduce and control the introduction and spread of plant pests at the farm level.⁸ Crop pests include weeds, insects, nematodes, molluscs, bacteria, fungi and viruses, which can cause significant losses in crop yield and quality and pose a threat to food safety.⁹ Effective crop biosecurity reduces the need for pesticides. Climate change poses new challenges for crop biosecurity with the expansion of the ranges of native pests, changes to pest life cycles, and the introduction of new invasive alien species.¹⁰



5. On-farm biosecurity impacts the economy

The success of Canada's agricultural exports is closely linked to the quality and health of its livestock and crops. In 2021, Canada's agri-food sector generated \$134.9 billion in economic output or roughly 6.8% of the country's GDP.¹¹ Crop exports brought in \$28.3 billion, and exports of products from animal agriculture brought in \$2.2 billion for Canada's economy.¹² Because export partners require healthy and safe produce, Canadian crops and livestock exports carrying pests and diseases could be banned, resulting in the loss of markets. This is exemplified by a November 2021 decision by the Canadian Food Inspection Agency to halt the export of potatoes from Prince Edward Island to the United States after the detection of potato wart fungus. This export ban lasted for four months and resulted in a revenue loss of more than \$50 million.¹³



6. On-farm biosecurity is important for food security for feeding a growing global population

On-farm biosecurity is essential for protecting sustainable agriculture and food security for current and future generations. In a survey of the five major global crops (maize, potato, rice, soybean, and wheat) in 67 countries, pathogens and pests reduced crop yield by 10 to 40 percent. Those five crops provide 50 percent of global human calorie intake. As the world's population grows and with it the global demand for food, farmers are increasingly under pressure to increase the production of crops and livestock. Proper on-farm biosecurity measures serve to mitigate losses due to pests and disease and therefore contribute to food security.



7. Globalization of agriculture highlights the importance of on-farm biosecurity

Globalization of the agriculture supply chain (e.g., the reliance on trade of agriculture inputs, plants and livestock across international borders) highlights the need for rigorous on-farm biosecurity. As agriculture becomes more globally integrated, there are increased risks of introducing and spreading foreign and exotic diseases and pests that threaten farms, as well as public and environmental health.¹⁴ National biosecurity measures, in addition to on-farm biosecurity, are necessary to minimize and mitigate the risk pests or diseases from imported animals, plant materials, food and other agricultural products.¹⁵



8. The Canadian Food Inspection Agency plays a vital role in supporting on-farm biosecurity

The Canadian Food Inspection Agency (CFIA) takes the lead in protecting Canada's high-quality agricultural goods.¹⁶ The CFIA works with producer organizations, other federal, provincial & territorial governments, and academia to develop national biosecurity standards, protocols, and strategies to help safeguard livestock and crops.¹⁷ It also works to protect Canada from the introduction of new invasive pests and to stop the movement of pests among and within provinces.¹⁸ Internationally, the CFIA works in collaboration with foreign governments to establish standards that set the foundation for importing and exporting safe high-quality animal and plant products.¹⁹



9. Farm inputs are potential sources of pests and diseases

Pests and diseases can be introduced onto farms through farm input supplies such as feed, fertilizers, seed, equipment, and vehicles. It is commonly said that "if it can move, it can carry diseases." To mitigate biosecurity risks arising from farm inputs, farmers must thoroughly check everything on a farm to ensure they are not sources of contamination. Standard practices include purchasing animals or plants and their products from reputable vendors with robust biosecurity protocols and keeping new animals, feed, seed, and fertilizers separate for a period before using them or mixing them with existing farm animals.²⁰



10. People are a biosecurity risk

Farm employees and visitors can unknowingly bring pests and diseases on a farm. Sources of contamination include clothing, footwear, equipment and vehicles. Individuals who visit multiple farms pose the greatest risk. On-farm biosecurity protocols include practices for people entering and exiting the farm. This includes wearing personal protective equipment (PPE) like coveralls, rubber or plastic disposable boots, and disposable gloves and cleaning and disinfecting footwear, equipment and vehicles before entering and leaving the farm.²¹



11. Weather and other environmental factors can increase biosecurity risks

Pest and pathogens are sensitive to climate and weather. Seasonal climatic patterns, such as warm, wet, humid summers trigger outbreaks of many crop diseases. Extreme weather events that involve high winds and flooding can spread pests and pathogens to both crop and livestock. Migratory animals, such as birds, can spread pests and diseases to livestock. Weather data play an important role in mitigating these biosecurity risks. Various types of weather data are used to predict and track the distribution and spread of pests and diseases, as well as in early warning systems to support responses to outbreaks.²²

Endnotes

- ¹ Dalrymple, J., Innes, P. (2004) Biosecurity Fundamentals for Visitors to Livestock Facilities. OMAFRA Factsheet 400/10. Available at: <http://omafra.gov.on.ca/english/livestock/vet/facts/04-003.htm> [Accessed 24 September 2022].
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- ³ Farmed Animal Antimicrobial Stewardship (2022). Improving Biosecurity on the Farm - Farmed Animal Antimicrobial Stewardship Initiative. Available at: <https://www.amstewardship.ca/faast-reviews/antimicrobial-stewardship/improving-biosecurity-on-the-farm/> [Accessed 24 September 2022].
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- ⁶ World Health Organization (2022). Zoonoses. Available at: <https://www.who.int/news-room/factsheets/detail/zoonoses#:~:text=A%20zoonosis%20is%20an%20infectious,food%2C%20water%20or%20the%20environment.> [Accessed 24 September 2022].
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- ⁸ Government of Canada (2022). Crop biosecurity - Canadian Food Inspection Agency. Available at: <https://inspection.canada.ca/plant-health/invasive-species/biosecurity/eng/1323475203667/1323475279124> [Accessed 24 September 2022].
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- ¹¹ Government of Canada (2022). Overview of Canada’s agriculture and agri-food sector - agriculture.canada.ca. Available at: <https://agriculture.canada.ca/en/canadas-agriculture-sectors/overview-canadas-agriculture-and-agri-food-sector> [Accessed 24 September 2022].

- ¹² Government of Canada (2022). Agriculture and Agri-Food Canada – Sector Commodity Breakdown. Available at: <https://agriculture.canada.ca/sites/default/files/documents/2022-07/Sector%20Overview%20-%20Commodity%20%282022%29%20EN.pdf> [Accessed 24 September 2022].
- ¹³ Global News (2022). U.S. clears ‘world class P.E.I. potatoes’ to be exported back over border – National | Globalnews.ca. Available at: <https://globalnews.ca/news/8730044/pei-potatoes-united-states-clears-export/#:~:text=potatoes%20to%20be%20exported%20back%20over%20border,-By%20James%20McCarten&text=Farmers%20in%20Prince%20Edward%20Island,over%20the%20Canada%2DU.S.%20border.> [Accessed 24 September 2022].
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