

THE NEXT COURSE

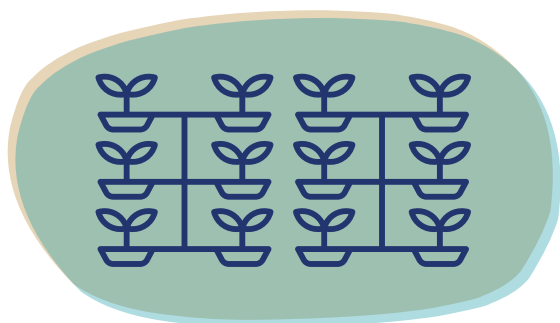
The Expert Panel on Atypical Food Production Technologies for Canadian Food Security



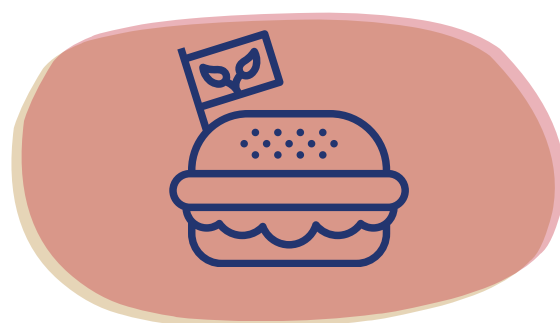
Innovative approaches to food production can support a more resilient food system in Canada. *The Next Course* considers novel technologies that may shape food production in the decades ahead, as well as their potential impacts on food security in Canada and the factors necessary to enable their success.



Atypical food production technologies enable precise control over food production through the manipulation of environmental factors.



For fruit and vegetable production, this includes **controlled environment agriculture (CEA) facilities** such as **vertical and container farms**, as well as **advances in greenhouse technologies** beyond those in wide operation today.



Atypical protein production technologies include **cellular agriculture** practices such as **precision fermentation** and **cultured meat**, as well as improvements to plant-based meat.

Can changes in food production ensure Canadian food security?

Increasing the production of food in isolation will not translate to greater food security. Any benefits related to increased food production would not directly help Canada's most food-insecure populations without specific policy interventions.



However, some atypical food production technologies have the potential to support some aspects of food security:

Improved stability via a more diverse and resilient food production system



Supporting choice through consumer alternatives that meet preferences and needs.



Supporting the environmental and economic sustainability of food production



Improved availability of produce at the community level





Beyond food security, advancements in atypical food production may encourage domestic innovation and help Canada further develop expertise in globally relevant fields, supporting job creation and economic prosperity.



Advancements in atypical food production technologies will not progress without adequate enabling conditions:

Adequate infrastructure

Community-led development

Coordination across the policy landscape

A comprehensive approach to skills development

Enabling technologies

Novel funding and financing approaches



Realizing the full potential of atypical food production depends on other technological advances—particularly in **genomics** and **digitalization**.

Genomics

Gene editing can optimize plant performance in CEA operations, improving productivity and expanding the types of foods that can be grown indoors. Genomics is also integral to atypical protein production.



Digitalization

Robotics and automation can improve productivity while **AI** may support critical activities across atypical production, from hardware control in CEA facilities or bioreactors to simulations for operations or training.

These technologies, with other enabling conditions—including access to renewable and affordable energy sources—are necessary for advancements in atypical food production to reach their fullest potential.

