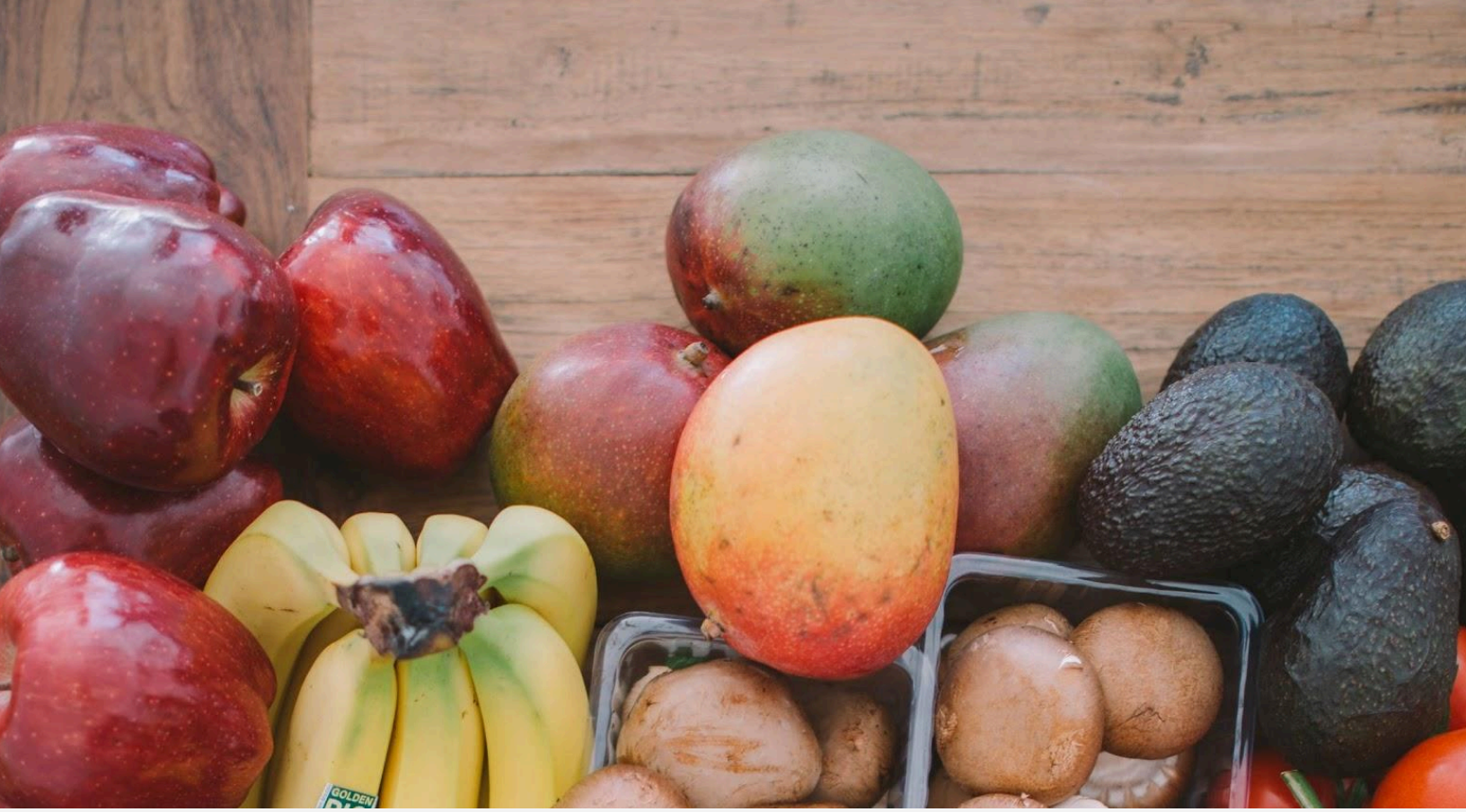

Food Security in Canada

A Science & Policy Exchange Public Forum Report

About

Science & Policy Exchange (SPE) is a non-profit organization led by early-career researchers that aims to assemble students and leaders in government, industry, research, and the community to exchange ideas on science and policy issues. To learn more, visit: http://www.sp-exchange.ca.

Acknowledgements

Science & Policy Exchange (SPE) is based in Tiohtiá:ke/Montreal, the traditional and unceded territory of the Kanien'keha:ka (Mohawk) - a place which has long served as a site of meeting and exchange amongst many First Nations, including the Kanien'kehá:ka of the Haudenosaunee Confederacy (also referred to as the Iroquois or Six Nations Confederacy), Huron/Wendat, Abenaki, and Anishinaabeg. We further acknowledge the deep ties between colonialism and modern western science and research. At SPE, we strive to support Indigenous students and researchers by actively reaching out to and working with the Indigenous STEMM community to advocate for their inclusion in evidence-informed decision-making.

We are further grateful to SPE's executive committee for their contributions in their respective roles to the organization of this public forum and subsequent report.

Finally, we would like to thank the forum's panelists, moderator, and attendees for their contributions to the thoughtful discussions that form the foundation of this report.

A recording of the public forum is hosted on the Science & Policy Exchange YouTube Channel.

Contributors

Nadine Wellington[1,2,3,5], Gavin Douglas[1,3,5], Emma Anderson[1,2,3], Farzaneh Barak[1,4,5], Maïa Dakessian[2], Sai Priya Anand[2], Meghomita Das[2], Sofia Pineda[2], Arnaud Cheuk[3,4], Félix Proulx-Giraldeau[3], Hadjara Sidibé[3], Catherine Cimon-Paquet[3], Thuy Nguyen[5], Tarasha Sharma[5], Kaitlyn Easson[5], Erica Yeo[5], Julia Messina-Pacheco[5], Antoine Zboralski[4,6]

[1]Organization of the event
[2]Fundraising
[3]Promotion of the event
[4]Event moderator and supporting volunteer
[5]Report writing
[6]Report translation

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Panelist biographies

Dr. Erna van Duren, University of Guelph

Dr. Erna van Duren was a Professor in the School of Hospitality, Food and Tourism Management at the University of Guelph before retiring in 2023. Her long-standing interest in food and resources stems from an early interest in food security and sustainability. Her other research interests include value chains, food industry competitiveness, sustainability and corporate social responsibility in the food and resource industries. She was part of the team that developed the University of Guelph's industry-focused MBA program, and has taught and advised at the graduate level. She has also worked with industry-specific organizations on policy and economic analysis and strategy development; published cases, journal articles and research monographs; and developed distance learning courses and a textbook. Her article “Forging Vertical Strategic Alliances” in the Best of Choices (1996) was selected as one of the 10 best articles of the decade to be published in this journal of the Agricultural & Applied Economics Association.

Dr. Gisèle Yasmeen, University of British Columbia

Dr. Gisèle Yasmeen was a senior Fellow at the School of Public Policy and Global Affairs at the University of British Columbia (UBC) since her appointment in 2014. In February 2023 she was appointed Associate Vice President, International, at University of Ottawa. Her expertise lies in Asian food systems, on which she has published and consulted widely since the early 1990s with both Canadian and international clients. She is also affiliated with the Margaret A. Gilliam Institute for Global Food Security at McGill University, where she sits on the advisory committee. Dr. Yasmeen is an experienced senior federal government and not-for-profit executive, has served on numerous boards of directors, and is currently a Director of Farm Radio International, Équiterre, and the Association of Canadian Studies. She regularly provides media commentary in English and French and has studied Spanish, Thai, Urdu and Mandarin. She holds a Ph.D. from UBC, a Master’s degree from McGill, and an Honours BA degree from the University of Ottawa.

Dr. Peter Berry, Health Canada and University of Waterloo

Dr. Peter Berry has been working on climate change issues at Health Canada since 2000. He is currently a Senior Policy Analyst and Science Advisor to the Director at the Climate Change and Innovation Bureau. He also serves as Adjunct Assistant Professor in the Faculty of Environment at the University of Waterloo. Dr. Berry is involved in a number of collaborations that plan for climate change impacts, including with the World Meteorological Organization's Study Group on Integrated Climate and Health Services to develop climate and health information utilization strategies, and Health Canada's HealthADAPT initiative to help Canadian health authorities assess climate-related health risks and develop adaptation plans. Most recently, he was co-editor and author for the national assessment “Health of Canadians in a Changing Climate: Advancing our Knowledge for Action,” served on the Health Advisory Table of the National Adaptation Strategy, and with the Science Advisory Group which supports the development of Canada's Climate Change Science Plan 2050.

Farzaneh Barak, McGill University (Moderator)

Farzaneh is a PhD graduate of the School of Human Nutrition at McGill University, affiliated with McGill's Margaret A. Gilliam Institute for Global Food Security. Her research focused on the intersections of food security, women's empowerment, equity, and policy. Farzaneh has over a decade of national and international academic research and professional experience in public health nutrition and food security, including her doctoral project working with fishing communities in Uganda, Africa. She has collaborated with Food Secure Canada as a research consultant and now works as a Senior Policy Advisor at Inuit Tapiriit Kanatami. Farzaneh aims to combine her practical and theoretical expertise to work toward equity and justice in achieving food security through providing research-based policy solutions.

Introduction

Food security exists when all people, at all times, have social, physical, and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life (FAO, n.d).. In Canada, a lack of food security, or food insecurity, is measured using the Household Food Security Survey Module which assesses inadequate or insecure access to food due to financial constraints. It is a serious public health problem that has worsened due to the cumulative impacts of myriad factors, including the COVID-19 pandemic, climate change, income inequality, geographic and geopolitical constraints, and socioeconomic policies (Tarasuk et al., 2022; UN Press, 2023). Through 2020-2021, an estimated 15.9% of Canadian households (5.8 million individuals) across the provinces experienced some level of food insecurity (Figure 1), with disproportionate impacts to visible minorities, Indigenous communities, lone-parent households, and other vulnerable populations (Tarasuk et al., 2022). This is further compounded by economic inflation, which increased food costs by more than 10% year over year in 2022 (Trading Economics, 2023).

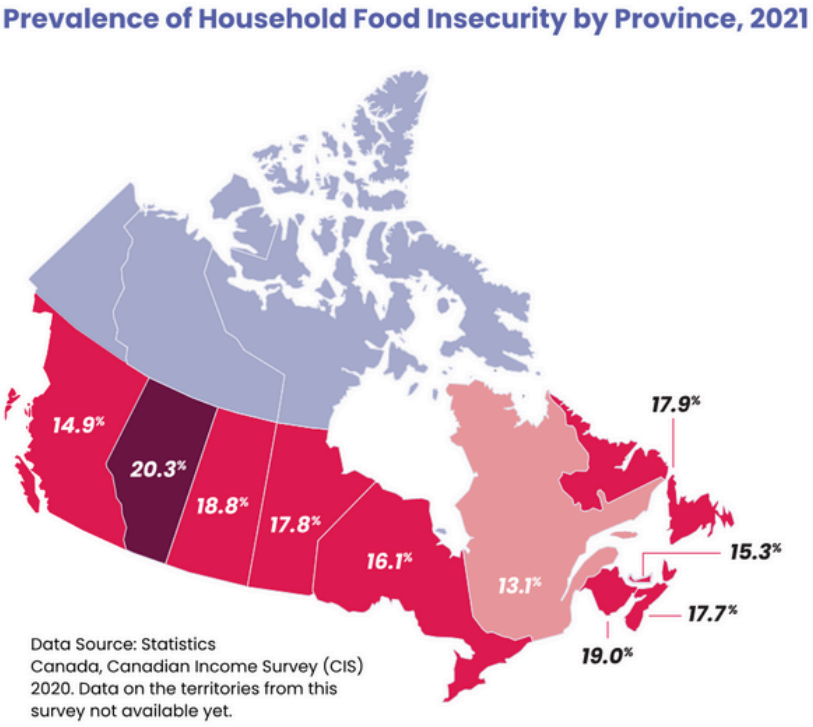

Figure 1: Prevalence of food insecurity by province. Source: Tarasuk et al., 2022.

The detrimental impacts of food insecurity on individuals and communities can be significant and may lead to poor physical and mental health outcomes, and social and economic isolation (Jessiman-Perreault et al., 2017; Pineau et al., 2021; Tarasuk et al., 2020). For children in food insecure households, there may be long-term effects on their physical and cognitive development due to inadequate nutrition (Faught et al., 2017; Melchior et al., 2012).

On October 4, 2022, Science & Policy Exchange (SPE) hosted a forum entitled “Food Security in Canada: A Public Health and Policy Perspective,” where distinguished researchers presented

the latest scientific evidence on the factors contributing to food insecurity and discussed viable policy solutions that could reduce its prevalence among Canadian households.

Dr. Erna van Duren, Professor at the University of Guelph School of Hospitality, Food and Tourism Management, explained the socioeconomic drivers of food insecurity, and proposed an alternative view of food insecurity in a food system supply model. This would allow targeted, technological approaches to more effectively address factors that challenge equitable food access. Dr. Gisèle Yasmeen, a senior Fellow at the School of Public Policy and Global Affairs at the University of British Columbia, discussed income inequality as a key factor underpinning food insecurity in Canada. She highlighted the needs for policy changes to land use and food distribution, noting that not-for-profit initiatives like food banks cannot adequately combat this problem. Dr. Peter Berry, Adjunct Professor in the University of Waterloo, department of Geography and Environmental Management, presented recent climate research to forecast the impacts of a warming planet on food production, distribution, food insecurity, and human health.

This report summarizes the current state of food security in Canada as presented by our invited speakers, and the recommended policy solutions to better support food insecure Canadians and reduce the prevalence of food insecurity in Canada.

Socio-Economic Factors Driving Food Security in Canada

Dr. van Duren highlighted the work of PROOF during the forum, a University of Toronto research program founded in 2011 to identify effective policy interventions to address household food insecurity. Their analysis of the 2021 Canadian Income Survey data, which reports quantitative income and socioeconomic data on Canadian households, indicates that 15.9% of households (in the 10 provinces) experienced some level of food insecurity that year (Tarasuk et al., 2022). The authors also investigated the impact of several demographic and socioeconomic factors on the respondents' experiences with food insecurity, including, but not limited to, household income, home province, household size, income source, homeownership status, and racial/cultural identity. The authors found a significant difference in the prevalence of food insecurity by province, after controlling for provincial differences in income distribution, where Québec households reported the lowest rate at 13.1%, and Alberta reported the highest rates of overall (20.3%) and severe (6.3%) food insecurity.

Food insecurity is strongly correlated with a household's primary source of income, where households on social assistance, employment insurance, or with COVID-19 benefits were more than twice as likely to experience food insecurity. Similarly, renters rather than homeowners, individuals living with no other adults (especially female lone-parents), and racialized groups were impacted at higher rates. In particular, if the main income earner identified as Indigenous the risk of household food insecurity was 1.8 times greater than households where the main income earner was not a visible minority.

Overall, the PROOF report (Tarasuk et al., 2022) showed that income levels are strongly correlated with the risk of food insecurity, and that current social assistance initiatives are not sufficient to prevent food insecurity, a conclusion supported by all panelists. Notably, data was not collected for individuals living in Indigenous reserves or settlements, remote communities, and institutions, or for those without homes (approximately 2% of Canadians). As these groups are at higher risk of food insecurity, it is possible their inclusion could increase these reported rates.

Dr. van Duren then introduced the Food Supply System Model, an alternative approach to conceptualizing food insecurity that includes the associations between the drivers of food insecurity. The model has four key dimensions:

1. Availability: Sufficient quantities of adequate foods.
2. Access: Social, physical, and economic resources to secure suitable and nutritious foods.
3. Utilization: Food is used appropriately to provide an adequate and healthy diet, which requires clean water and sanitation, food availability, and health care.
   Stability: Ensuring the stability and resilience of these factors to unforeseen disruptions (e.g., economic and climate crises), at all times.

Drivers of food insecurity can be economic, political, sociocultural, technological, or physical factors and may impact any of these four dimensions. For instance, infrastructure resiliency is a technological factor affecting global food security. The war in Ukraine and destructive weather events have damaged energy, water, and food distribution infrastructure in many countries, increasing the incidence of food insecurity, particularly in the Global South (Mbow et al., 2019). However, physical and economic barriers to resources are a bigger challenge to Canadian households. Many geographically or socially isolated communities within Canada struggle with precarious access to food, water, and energy (Exner-Pirot et al., 2016; Skinner et al., 2013).

Dr. van Duren then reviewed the impact of income inequality on access to sufficiently nutritious food in Canada, highlighting the proposal of a universal basic income (UBI) within the PROOF report. UBI, a policy that provides regular, unconditional cash payment to all individuals within a specified area, regardless of income, employment status, or other criteria, is meant to ensure a basic level of economic security by providing a stable income floor to meet people's basic needs (Ferdosi et al., 2022). Dr. Yasmeen highlighted the Canadian Labour Congress' consideration of the International Labour Organization's 2012 Social Protection Floors Recommendation (ILO, 2012), which provides guidelines for member states to establish "national floors of social protection" that could protect all members of their societies. These "social floors" would ensure that vulnerable groups had access to adequate nutrition, healthcare, income security and resources to safely raise children.

Dr. Yasmeen also noted concerns about economic initiatives like minimum wage increases and UBI which could lead to inflation, mitigating the intended benefits of their implementation. Thus, increased income across the board would not necessarily lead to increased food security. In response, Dr. van Duren suggested that pricing policies and more competition could help to ensure fair food pricing across Canada. She also suggested that a more sophisticated approach to minimum wages that considered the cost of living by geographical area could be valuable, while acknowledging the idea would come with unique challenges. The panelists emphasized the potential value of each proposal, agreeing that income inequality was the most important factor driving food insecurity, and that careful evaluation would be necessary to understand any potential economic consequences of an intervention.

Lastly, Dr. van Duren discussed the complementary potential of novel technologies to improve food security by increasing food availability and lowering food production costs. Controlled-environment agriculture (CEA) is one technology that could provide these benefits to Canadian communities, and refers to methods that rely on the regulation of environmental conditions (e.g., temperature, humidity, light, water) during food production (Wilkinson et al., 2021). CEA presents several advantages over traditional agriculture. First, requiring fewer resources to produce safe and high-quality food. Secondly, CEA has less transportation and

storage requirements, as facilities can be built closer to consumers and maintain smaller footprints by expanding vertically, rather than over arable land. CEA is also more resilient to climate-linked aberrations (e.g., droughts and floods) and supply chain disruptions (Garcia et al., 2023). Finally, the setups are highly configurable, ranging in complexity from plastic-covered containers to fully-automated environmentally-sustainable applications.

CEA is used to grow several commercial agricultural products year-round in Canada, including tomatoes, peppers, and cucumbers (AAFC, 2020). Dr. van Duren suggested similar small-scale approaches could help alleviate household and individual food insecurity, where urban CEA infrastructure could greatly improve access to nutritious food at a lower cost. However, she acknowledged factors like energy prices could challenge the economic viability of this idea. Further study is required to determine the practical applications of small-scale CEA infrastructure and its utility in addressing food insecurity in Canada.

General Policy Recommendations

Dr. Yasmeen's presentation centred on the core concept that food insecurity is fundamentally a problem of the unequal distribution of income and land, challenging the audience to think critically about those who benefit and those who are deprived in the current system. Discussing the PROOF report, she noted that approximately half of food insecure adults in Canada are working (52%) or are receiving benefits (48%) (Tarasuk et al., 2022), and these structural inequalities are driving the heightened susceptibility of vulnerable groups, like racialized minorities, Indigenous peoples, and lone-parent households, to food insecurity within Canada, and globally. She also emphasized that food and housing are inextricably linked: while renters are at greater risk, even homeowners are vulnerable to food insecurity, given that the growing costs of homeownership may leave families "cash poor." After an introduction to notable figures in food security research, she discussed proven interventions to reduce its incidence, and recommended policies that enforce equality of access, while addressing the broader systemic disparities underlying the issue.

Economic Theories of Food Insecurity

Dr. Yasmeen highlighted three important economists who contributed to the study of food insecurity: Thomas Malthus, Amartya Sen, and Ester Boserup. Malthus' hypothesis saw mass hunger as a logical consequence of an expanding population on a planet with finite resources and a limited carrying capacity. In contrast, Dr. Sen's Nobel Prize-winning work on the Bengal Famine of 1943 found that poverty, armed conflict, inequality, and poor distribution were the primary drivers of millions of deaths from hunger, not necessarily a lack of food availability (Sen, 1983). Boserup's work also contradicted Malthus' hypothesis. Her investigation of the relationship between food supply and population growth showed that with increasing standards of education for women, rates of infant mortality, urbanization, and population growth would decrease (Adam, 2021). Currently, systemic inequities are the primary driver of food insecurity in Canada, which require policy changes to adequately address (Mendly-Zambo et al., 2018).

Addressing Inequalities in Current Systems

Dr. Yasmeen advocated for rights-based policies that better address systemic inequalities using approaches that redistribute land and resources. She introduced the concept of food sovereignty, originated by the global *La Via Campesina* (the peasant's way) movement in 1993, as "the right of all peoples to have healthy, culturally appropriate food, produced through

ecologically sound and sustainable methods, and their right to define their own food and agriculture systems" (*The International Peasants' Voice*, no date). For instance, the Canada Emergency Response Benefit, a cash transfer program administered by the government of Canada from September 2020 to May 2022 during the COVID-19 pandemic helped to prevent the rate of household food insecurity from rising between 2019 and 2021 (Tarasuk et al., 2022). Québec's extensive social welfare programs, such as daycare subsidies and housing assistance, also likely contributed to the province's relatively low rate of food insecurity in Canada (13.1%), highlighting that effective policies to address food insecurity must also address socioeconomic inequalities to ensure equitable results.

She also showcased how charitable approaches, such as food banks and food aid, are "Band-Aid" solutions that only treat symptoms of food insecurity without providing long-term solutions. To address the root causes, self-sufficiency is essential for redistributive programs and sustainable livelihoods within inclusive and green economic structures. Dr. Yasmeen supported a "one health" approach, that would allow more equitable resource distribution that accounts for gender, class, race, colonialism, and other factors.

Power and wealth have always been deterministic factors in human societies and underlie the problem of food insecurity. Dr. Yasmeen argued for abandoning the idea of low food production as a key driver, noting that sub-Saharan Africa, an often-cited exemplar of food insecurity, was self-sufficient until the 1970s. The current level of global food production is enough to feed 10 billion people (UNEP, 2020), although approximately 1/3 of food (1.3 billion tons) is wasted (World Food Programme, 2020), and much of it is processed for junk food, fuel, and livestock applications. Poor storage infrastructure, inattentive shopping, armed conflict, and climate change are other factors that exacerbate the problem.

Dr. Yasmeen displayed an hourglass representation of the global agrifood system (Figure 2), showing small-scale producers and consumers at the ends, and the powerful food retailers, processors, and traders controlling the supply chain in the middle. McKinsey & Company have noted that the structure of the modern global food system creates a negative impact of $12 trillion a year, more than the $10 trillion in value it adds (Food and Land Use Coalition, 2019; Eis et al., 2022). She advocated for the necessity of a "one health" approach to restructuring these systems.

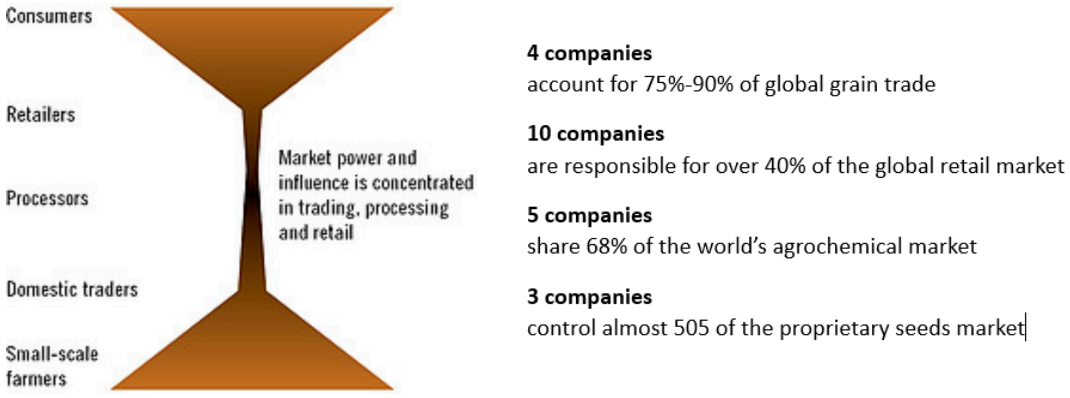

Figure 2: Hourglass representation of players in the agrifood industry. Source: Weltagrarbericht.

Food Security & Climate Change

Dr. Berry summarized the findings of a recent report by Health Canada (Health Canada, 2022) that investigated the effects of climate change on human health and health systems, and provided potential adaptations and solutions. Noting that Canada is heating at a rate twice the global average (Canada.ca, 2019), he reviewed a number of ways in which climate change could affect the production, processing, distribution, preparation, and consumption of food. Warming temperatures, changes in precipitation patterns, fire, and frequent and severe extreme weather events increase the risk of damaging agriculture, livestock, and other traditional sources of food. Food processing relies heavily on water, thus decreased water quality or availability will impact food systems, while increasing the prevalence of harmful pathogens that could impact humans, animals, and agriculture. These effects will not impact everyone equally, as an individual's vulnerability to these impacts is strongly dependent on demographic factors.

Dr. Berry explained that the complex pathways by which these demographic factors (e.g., gender, class, ethnicity) interact with each other, and climate change, determines an individual's vulnerability to climate-related health outcomes and, thus, the impacts to Canada's health system. He asserted the importance of including these demographic factors when developing solutions and adaptations to climate change.

Adaptations to Climate Change

Adaptation efforts can mitigate climate change-related challenges to food security and health. For instance, the pan-Canadian Nourish project (Nourish Project, 2018) and other similar urban agriculture systems strive to establish sustainable traditional and cultural food practices that support community health.

However, key to the successful implementation of adaptation programs are surveillance systems that provide information on their effectiveness, so that modifications can be made as needed. Integrating climate change variables can enhance their implementation and guide how the adaptation programs can best be implemented; projects should consider the local impacts of climate change and populations' health vulnerabilities. For example, Dr. Berry outlined a regional food security assessment in Toronto (Zeuli, 2018) that considered risks from flooding, ice storms, and extreme heat events. It recommended the development of food resilience plans for food-insecure neighbourhoods, and poverty-reduction strategies to address the roots of unequal food access in Toronto.

He also stressed the inclusion of Indigenous knowledge in these climate change adaptation projects and related surveillance efforts, and the importance of Indigenous-led adaptation programs, such as those in Northern communities. These place an emphasis on sharing traditional knowledge (e.g., harvesting management, hunting and ice safety), community food production efforts, and inter-generational participation.

Finally, Dr. Berry highlighted the intersectoral efforts needed to tackle food insecurity: collaboration among public health agencies, agricultural innovations, environmental efforts, supply chain networks, and coordination across multiple levels of government. Such collaborative efforts are necessary to close knowledge gaps and tackle the root causes of food insecurity.

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