Infant Feeding, the Environment and Climate Change:

Green Parties and Green Feeding in Canada

Introduction

The purpose of this document is to show how the case of infant feeding could further the policy initiatives of the Green party in Ontario and Canada. In the next few months, there will be an additional document relevant to the Green parties in the European Union (EU); this might provide useful policy comparisons for Canadian Greens to consider.

Currently, there are no legislative initiatives directly related to infant feeding in Ontario, or Canada. This document proposes that infant feeding might provide a useful example to support Green party policy initiatives related to sustainable economies, strong communities, good governance and climate change. Attention to infant feeding provides another way of thinking about sustainability and change, equality and social justice, and thus offers a valuable analogy for people who still question the science behind climate change. Since every human alive today was nurtured as an infant by being fed with either human milk or an animal or plant-based substitute, everyone can relate to this example.

Green Feeding describes optimal and sustainable infant and young child feeding practices which protect the health of infants, young children and their mothers as well as the environment of our planet – Mother Earth. Green feeding could be one of the small transformational changes that contribute to a healthier population and planet; an added advantage is that the message around infant feeding is clear and evidence-based. It is easy to feel that climate change is such an immense problem that there is nothing individuals can do about it. In fact, green feeding, including infant and young child feeding, is something that individuals and households can control locally. Green feeding becomes a way to link the little and the large, a case where the little – infant feeding – has a clear impact on the large – climate change. Such an example would be particularly useful when the complexities around the science of climate change may feel inaccessible to some who are not well versed in the scientific literature. Even climate change deniers have to feed their children.

The priorities of the Green party include sustainable economies, strong communities, good governance and climate change. Green feeding is implicated in all these priorities. Other stated priorities include developing a bridge to a future clean economy, energy efficiency in homes and businesses, mental health services for children, and sustainable water plans, all compatible with green feeding. For the purposes of this document, we begin with climate change and the environment, and then integrate initiatives around sustainable economies, strong communities, and good governance into the argument.

Climate Change

Canada is warming twice as fast as the rest of the world, and three times as fast as the United States [58]. In response to this situation, the Greens in Canada call for policy actions around pipelines, fracking, ocean ecology and energy strategies. Infant feeding provides an additional

line of argument – one that may resonate directly with many people who do not see how their individual actions could contribute to climate change.

Breastfeeding is the most environmentally friendly way to feed an infant, producing zero garbage, zero greenhouse gases (GHG), and zero water footprint. As a renewable natural food resource, human milk contributes to local food and water security. When mothers breastfeed their children, they are helping reduce GHG, conserving water, and producing no waste, in both industrialized and developing countries. Breastfeeding mothers are protecting the environment as well as protecting their children's health. Yet few policy makers acknowledge this contribution or make reference to infant feeding in their deliberations. The protection, promotion and support of breastfeeding could have a significant impact on mitigating harm to the environment. This is an unacknowledged contribution that breastfeeding mothers make to reduce the impacts of man-made climate change in households and communities worldwide.

Breastfeeding when initiated early, practised exclusively for six months and continued until babies are two years of age or older, provides substantial health protection for mothers and children. This is ideal for infant nutrition, but any breastfeeding is beneficial. In the short-term it ensures survival and healthy infant development, and in the long term, protects against many childhood diseases and reduces the risk of obesity and non-communicable diseases in later life. According to WHO and UNICEF, worldwide "children who are not breastfed at 12-20 months of age are about twice as likely to die as those who are breastfed in the second year of life". Mothers who breastfeed have reduced risk of breast and ovarian cancer, while "continued breastfeeding delays the return of fertility, contributing to longer birth intervals in the absence of contraceptive use" [1].

Human milk as a renewable natural resource is often neglected in discussions about sustainable food production and environmental concerns. But according to Australian economist Julie Smith [14], "the highly sustainable and efficient food system provided by lactating women for children is ignored, devalued and dishonoured by national and global leaders". It is not a high political priority for governments in spite of growing evidence of the benefits of breastfeeding. Breastmilk is a natural, renewable food that is environmentally safe and produced and delivered to the consumer without pollution, unnecessary packaging, or waste. Breastfeeding helps households and communities transition to a low carbon economy. Breastfed babies produce no plastic waste, and need no extra water.

By contrast, the evidence that formula feeding "costs the earth" is well established [23]. The industries that produce infant formula are among the biggest polluters. Artificial feeding contributes to global warming, pollution and toxic emissions from waste disposal. Baby milks and foods are manufactured on an industrial scale, and are exported or imported world-wide. For example, nearly all Canada's infant formula is imported from the US. Manufacturers use aggressive advertising and intensive promotion to create new markets for breastmilk substitutes and to expand their market share. Each additional kilo of these products for feeding babies and toddlers means an increase in the exploitation of scarce natural resources such as land, fuel, energy and water, as well as increasing environmental pollution.

The production and distribution of breastmilk substitutes leaves a substantial ecological footprint, since energy is needed throughout the manufacturing process - to produce materials for packaging, fuel for transport for distribution, and water, fuel, and cleaning agents for daily household preparation and use. Numerous pollutants are generated across this pathway. However, many parents do not even realize that infant formula is made from milk (or soy) constituents [12, 61].

Breastmilk substitutes are any products that substitute for or supplement human milk, and include infant formulas, specialty formulas, follow-up milks, toddler milks, and milk-based cereal foods. Follow up, toddler and growing up milks are ultra-processed, expensive, sweetened and flavoured milks which account for 50% of absolute growth in the formula market. Follow-up formulas and especially toddler formulas produced higher GHG emissions than infant and specialty formulas. WHO maintains that these products are unnecessary and unsuitable [3]; in Canada, Nutrition for Healthy Term Infants (NHTI) agrees. These products have a major ecological impact; they require energy for processing after the raw milk leaves the farm: energy for cooling and storage, for separation into skimmed milk, followed by the processes of homogenization, pasteurization, evaporation, mixing, and spray drying, and further cooling. More fuel is needed for processing the sugars, oils and additives to the powdered milk formula [7]. Manufacturers use materials for packaging, fuel for transportation and distribution, and households use water, fuel and chemical cleaning agents for daily preparation and use, as well as energy for refrigeration.

The dairy industry is known to be one of the most polluting industries in the world. Enteric fermentation in cattle and their manure produce methane, a far more potent greenhouse gas than carbon dioxide. Cattle grazing increases land degradation and reduces biodiversity. Dairy farming to produce raw milk for the manufacture of milk powder, a constituent of infant formula, requires many energy-intensive processes, including the production of feed for cattle, especially soy bean cakes. “The major contributors to GHG emissions were enteric fermentation (57%), manure (18%), purchased feed concentrate (8%), energy (8%) and fertilizer (9%)” [7].

GHG other than CO2 are emitted at every stage of production and transport of baby milks and foods. Nitrous oxide, (N2O) and methane (CH4) are all produced by intensive dairy farming. New Zealand is a major milk producer and exporter; an annual GHG emissions inventory showed that “methane emissions from ruminants increased by 10% since 1990, while over the same period CO2 emissions from road transport grew by 62% and those for N2O emissions from agricultural soils by 25%” [19]. In Australia, direct livestock emissions account for about 70% of GHG emissions in the agricultural sector and 11% of total national GHG emissions [20].

Water usage on dairy farms includes drinking water for cows, prepping cows for milking, cleaning milking systems as well as bulk milk tanks, and pre-cooling milk. More than 4000 litres of water are needed to produce just 1 kg of breastmilk-substitute powder. The Lancet article explains further: “The global average water footprint of whole cow milk is about 940 litres of water per kilo of milk. One kilo of whole milk gives about 200 grimes of milk powder, making an estimated water footprint of milk powder as 4700 litres of water per kilo of milk powder” [6,7]. Soy-bean and palm oil cultivation also require water for irrigation and processing [23]. Palm oil is one of the fats added to baby milks and foods. The demand for palm oil is

ever-increasing and palm oil plantations in countries such as Indonesia and Malaysia contribute to deforestation, loss of forest habitats and biodiversity. Cultivation methods are also water-intensive, causing irreparable harm to human and animal populations.

In addition, pollution of domestic water supplies in milk-producing countries such as New Zealand and Canada is caused by run-off from over-use of arsenic-rich pesticides in agriculture, and effluent due to manure from intensive dairy farming. Arsenic-rich pesticides [27, 28] are also used to cultivate GMO soy used for soy-based infant formulas widely prescribed in North America for infants diagnosed with cow's milk allergies, and also in the production of the brown rice syrup used in baby milks and cereal foods as a substitute for high-fructose corn syrup. A study of the types of infant formula consumed by infants in the US showed that 69% were fed with cow's milk-based formulas, 12% soy- based formulas, 5% lactose-reduced, 6% with specialty formulas, and 13% with regular milk [60]. Specialty formulas made with rice protein were withdrawn from markets in Europe in 2018 because of salmonella contamination [50, 51].

Human milk is around 87% water; breastfed babies need no extra water. Globally, water is an increasingly scarce resource. Water insecurity occurs when households have a problem with water quality, quantity, access or availability of water for consumption, hygiene or economic resources (such as agriculture or livestock). Water insecurity is particularly serious in indigenous communities where over one hundred communities face long or short term boil-water advisories. Drought and water insecurity are worsening under conditions of climate change. The Food and Agriculture Organization (FAO) of the United Nations estimates that around 1800 million people will face absolute water scarcity, and almost 2/3 of the world's population will live under conditions of water stress by 2015. Aquifer depletion is accelerating as underground freshwater sources are in increasing demand for agriculture, industry and domestic use [29].

Climate change is the greatest risk to Canada's water; yet the public considers water an abundant resource. Meanwhile, Ontario in general and Guelph in particular are battling companies like Nestle who are removing water from local aquifers. Nestle removes 3.6 million litres of public water per day from local water sources in the towns of Aberfoyle and Erin, near Guelph. Bottled water companies like Nestle buy public water and sell it back to us at rates 3000 to 5000 times higher than they paid for it – in disposable, but non-biodegradable, plastic bottles. The same problem exists in France, as well as other European countries [30].

The baby food industry argues that infant morbidity and mortality resulting from infant formula use are caused by problems with water in developing countries. Thus, companies like Nestle promote the use of their bottled water to be used in preparing bottles of infant formula to "solve the problem". The World Health Organization does not recommend the use of bottled water to prepare baby milks because bottled water is not sterile (free from bacteria) and may contain too much salt or sulphate [29]. Companies like Nestle profit from the sale of infant formula and the sale of bottled water, but at what cost to the environment and child health? Water, like human milk, is an irreplaceable life-sustaining resource that should not be privatized; as advocacy campaigns argue - water for life, not for profit.

The WHO Report on Climate Change and Food Safety spells out the consequences of climate change for human health and survival: climate change increases deaths from malnutrition,

diarrhea and heat stress. Food poisoning increases the risk of death and disease in infants because of bacterial contamination of powdered infant formula. Bacterial multiplication (such as Salmonella species, Cronobacter/Enterobacter species, spore-forming bacteria such as Bacillus cereus) intensifies under warm, humid conditions [46].

The Greens plan to demonstrate leadership at UN climate summits in Paris and elsewhere, perhaps to make up for Harper's past policies, and to build on Trudeau's insistence on incorporating gender and environmental issues into policy deliberations. Green feeding might be one way to showcase Green policies at climate change meetings, and help link climate change to international standards around sustainable development goals (SDG) in the global community. During the recent COP 24 meetings in December, 2018, Green ministers from all countries attending took an active role, even when the heads of governments were absent. Further, they worked together to compare strategies and speak with a single strong voice in support of immediate action on climate change, under the leadership of Elizabeth May. Unfortunately, no one brought up the example of infant feeding [16]. (Their co-operation inspired the preparation of these comparative documents).

Sustainable Economies

Policy initiatives on healthy local sustainable food production and food security often ignore infant food security. Breastfeeding is food security for infants and human milk is the most sustainable local food resource, when its provider is fully supported. Support for breastfeeding also supports healthy local food and food security. On the other hand, infant formula is a prime example of an ultra-processed food. Regulations on food safety are particularly important for baby foods. International bodies such as the Codex Alimentarius of FAO set standards for labelling and food safety.

Although the global baby food business is growing rapidly, it has substantial negative consequences for individuals, households and the planet. "In contrast to stable trends in global exclusive breastfeeding measures, the total world milk-based formula sales volume grew from 5.5 to 7.8 kg per infant/child in the period 2008-2013. This figure is projected to increase to 10.8 kg per infant/child by 2018" [10]. The Lancet confirms this: "The retail value of the formula industry is growing. Unlike other commodities, baby milk formula seems to be resilient to market downturns. In 2014, global sales of all baby milk formula were about US$ 44.8 billion – by 2019, the market value is projected to reach US$ 70.66 billion" [6] – and to grow to about 102.29 billion by 2021. As a comparison, "The value of all arms transfer *agreements* with developing nations by the United States and foreign countries was over 71.5 billion USD. This was a substantial increase from 32.7 billion USD in 2010. In 2011, the value of all arms *deliveries* to developing nations was 28 billion USD, the highest total in these deliveries values since 2004" [62].

The baby food market is expanding rapidly, especially in Asia. Six Asian countries measured the amount of infant formula consumed in their countries in 2012 (720 450 tonnes of milk formula) and then calculated the amount of GHG emitted (almost 2.9 million tonnes), modelling the high carbon footprint of the baby food industry [23]. They used a measure of carbon dioxide equivalent to measure the global warming potential of these products. A follow-up study of ten

Asian countries made a comparison between the total volume of milk formula sales in 2012 and the volume of milk formula sales forecast for 2017, and compared these sales to the amount of GHG emitted. China had the highest sales and emissions, with sales predicted to reach 1,049,800 tonnes in 2017, with 2,249,287 tonnes of CO2 equivalent emitted [7].

In 2018, ten Asian countries updated these findings by comparing milk formula sales in 2016 with projected sales in 2021, and the corresponding increases in GHG emissions. The increase for Indonesia was substantial. In Vietnam, the increase was even greater. In contrast, in India the increase is greatly reduced; India has a policy of protecting, promoting and supporting breastfeeding and a strong law to limit marketing of breastmilk substitutes which is enforced and monitored [15]. In each country, the follow-up formulas and especially the toddler formulas produced higher GHG emissions than infant and specialty formulas. Calculations showed that GHG emissions of 3.95 CO2 equivalents were attributed to the production of each kilo of infant formula, whereas the figure for follow-up and toddler milk formulas was 4.04 CO2 equivalents per kilo [7]. Recall that WHO (2013) maintains that these products are unnecessary and unsuitable [3]

Much of the packaging used for breastmilk substitutes is plastic, as are most containers of bottled water. Plastics do not biodegrade; at present most are not compostable. Instead they solar-degrade and end up in our rivers and oceans as tiny pieces of micro-plastic that mammals and especially birds mistake for food to feed their young. Energy costs for production should also be taken into account, making it even more urgent to increase recycling rates, which are extremely low in many countries [40].

Other infant feeding products cannot be recycled, such as the plastic pumps and equipment used to express and store breastmilk. These cannot be re-used or shared because of the risk of infection and difficulty of cleaning tiny parts. In the US, it is estimated that 2 million breast pumps are sold to families every year. They are single-user equipment and once the package is opened, it cannot be returned; neither can storage bags for pumped expressed breast milk. How many end up in landfills and what is their carbon footprint?

Although banned in some countries, plastic feeding bottles made of polycarbonate are still used in many others. These bottles contain Bisphenol a (BPA), a known endocrine disrupting chemical (EDC). Even the substitutes for BPA, Bisphenol F and S, are not without risk. These toxic chemicals can leach from feeding bottles into baby milk; these bottles cannot be recycled and end up in landfills. Hard plastics and the epoxy resins used to line tin cans decompose in warming oceans and release potentially toxic substances such as BPA [40]. The Oceans Plastic Charter (2018) addresses the need for sustainable management of plastic waste worldwide.

Sustainable economies need to make the transition to non-plastic packaging. Around one third of the millions of tons of packaging that Nestle puts out each year are plastic. Along with their corporate counterparts, Nestle has pledged to make their packaging recyclable by 2025 [53]. This will increase the cost of baby foods for households. Are any baby feeding bottles, bottle feeding accessories such as sterilisers, breastmilk pumping equipment, plastic water bottles, and feeding pouches for complementary feeding being re-cycled?

A 1991 paper argued that in the US alone, 550 million cans, 86 000 tons of metal and 364 000 tons of paper were used annually to package infant formula, all of which end up in landfills [63]. These are very old figures, and the numbers, while difficult to obtain, are no doubt much higher today. Whether these breastmilk substitutes are produced, exported or imported in a country, the end result is the same – increased global warming.

Strong Communities

While previous governments slashed funding to services that help mothers and infants, and health care, including support for midwives, the Greens support strong public health care, and call for putting more attention on developing preventive health care plans. Breastfeeding is the basis of preventative health care for infants. If mothers and infants were supported to breastfeed according to WHO standards and Canadian guidelines (exclusive breastfeeding for six months followed by locally appropriate complementary foods, and continued breastfeeding) both households and health care systems would save money, as well as provide food security for infants.

In these uncertain times, breastfeeding provides a cushion of safety for households and communities in the face of emergencies. Climate change is resulting in more weather-based emergencies, typhoons, hurricanes, floods and droughts. In disasters, when food and water supplies may be scarce or polluted, breastfeeding provides sustainable food security, especially when mothers are supported to breastfeed optimally [49]. The Greens emphasize the need to ensure safety, defense and disaster preparedness at home. NGOs like SafelyFed Canada demonstrate how to support breastfeeding mothers in local emergencies, and internationally [70]. Breastfeeding allows families to adapt to unanticipated unknown future problems caused by climate change such as flooding, fires and draught.

The Greens also propose to adopt stricter regulations to prohibit cancer-causing chemicals in our food and consumer products. This is particularly important for infant feeding. For example, arsenic in the water supply is a concern for everyone, not just infants; but using this water to reconstitute powdered infant formula, itself potentially laced with arsenic, could become a serious public health problem.

Among the most significant and prevalent of all EDCs are those pesticides and fungicides used in large quantities in agriculture and horticulture. These include not only DDT, still used for some applications and widely persistent in the environment, but also glyphosate, the main ingredient of the herbicide Roundup. Glyphosate, like several pesticides, has carcinogenic properties. Concerns over the use of glyphosate-based herbicides and risks associated with exposures have led to action planned in some EU member states such as France, but are meeting with widespread opposition from manufacturers – and farmers. Discontinuation of traditional environmentally-friendly but labour-intensive agricultural practices, as well as the spread of genetically modified crops, have led to increased worldwide reliance on these chemicals, which

are poisons for pests, weeds – and humans. For a review of EDCs and infant and young child feeding see [42].

Breastfeeding provides strong motivation for reducing chemical contaminants that can accumulate in breast tissue. The message that breastmilk may contain chemical residues is a powerful campaigning tool for actions to eliminate toxic chemicals from our environment. However, some campaign slogans, particularly those supported by industry, may become alarmist and refer to 'polluted breastmilk' or 'toxic breastmilk'. At the same time, such messages fail to address the larger problem – the body burden of toxic chemicals in all of us, starting prenatally. With Green feeding, breastfeeding advocates, environmentalists and social justice workers can work together and avoid working at cross purposes to reach their single issue goals.

The Greens favour the creation of a national pharmacare plan. This plan could be used to support green feeding by strengthening labelling regulations, for example. Although unsubstantiated claims about health benefits and the terms 'maternalized' or 'humanized' with reference to infant formula are not allowed under EU legislation, these claims are still frequently found on American product packages that are sold in Canada for infant feeding. At present, the Canadian Pharmacists Association has a powerful position statement on Breastfeeding and Infant Nutrition – one that is widely cited in Europe. This initiative of Canadian pharmacists includes support for the International Code of Marketing of Breastmilk Substitutes [64].

Green policies support women who re-enter the workforce. Local initiatives such as Mother-baby friendly workplace projects provide support for working women, and ensure that workplaces do not discriminate against breastfeeding women. Green parties also support workplace childcare. It is important to ensure that childcare is breastfeeding friendly. Although Canada offers paid, job-protected leave to new parents, breastfeeding will continue beyond 12-18 months and not all families are able to take advantage of the full length of leave with the breastfeeding parent. Thus, the needs of breastfeeding children in child care may be overlooked. Often parents of breastfed babies find that childcare workers provide a bottle to calm a hungry infant just before parents arrive to pick up their child, unaware of how anxious mother will be to breastfeed her child. The Carolina Global Breastfeeding Institute (CGBI) has guidelines for breastfeeding-friendly childcare.

Inequality and poverty are identified as key problems that Greens plan to address; breastfeeding is the great leveller, and contributes to efforts to eliminate poverty and challenge inequality. The high cost of formula can easily overwhelm family budgets. The costs of advertising budgets are passed on to the consumer. In the US, in 2004, the budget for TV, print and radio advertisements was 46 million USD [65]. Breastfeeding levels the playing field; while many food insecure households cannot afford to be ethical eaters – that is, unable to afford whole foods, organic vegetables and fruit, grass-fed beef or bulk purchases of ancient grains – all breastfed babies are ethical eaters. This implicates breastfeeding directly with the Green New Deal linking poverty and climate change. By merging environmental and social justice causes, both causes are strengthened. Green feeding already makes a synergistic contribution to both causes.

While First Nations had strong traditions of breastfeeding in the past, generations of colonial practices undercut local practices. As a result, many First Nations communities had low rates of

breastfeeding. According to Statistic Canada, aboriginal mothers living off reserve had low rates of initiation and exclusivity of breastfeeding. Residential schools destroyed support for indigenous systems of parenting, including breastfeeding. To further depress the rates of breastfeeding, cans of infant formula, often out of date or damaged were dumped into clinics on many reserves. Currently, programs have dramatically increased breastfeeding rates in some First Nations communities; for example, the Kanesatake Health Centre in Quebec saw a dramatic rise in breastfeeding rates following their advocacy programs [67]. The booklet *Breastfeeding for the Health and Future of our Nation*, opens with the quote: "All the rivers of the earth are milk that comes from the breast of the Great Mother. Our breasts give the waters of life to feed the children." (ChoQosh Auh'Ho'oh, Elder). [66].

Good Governance

The Greens aim to restore the integrity of Canadian science and the role of evidence-based decision making in government. This is very important for infant feeding policy where there has long been a problem with conflict of interest in policy-making and research on infant feeding. Policy-making must be based on evidence provided by independent research studies, free from conflicts of interest, particularly from pharmaceutical and baby food industries. At present, the 'evidence based' often refers to industry-funded studies using industry-produced protocols. Conflict of interest is thus an important governance issue. For example, until 2019, food industry lobbyists have had a strong advisory role in preparing Canada's food guide. Without industry influence, the newest food guide (2019) plays down the importance of consuming meat and milk products, and encourages the consumption of more fruit and vegetables. When industry sits on health and nutrition policy committees, the standards they propose benefit the food and pharmaceutical industries, not the public. This is equally true internationally with FAO committees such as the Codex Alimentarius.

Another example is the "industry driven over-diagnosis" of cow's milk protein allergies in infants, who are then prescribed specialized expensive hyper-allergenic formulas. An article in the British Medical Journal [68] noted that prescriptions for these specialized formulas increased by nearly 500% in the UK between 2006 and 2016. The guidelines provided to health professionals regarding milk protein allergies come from the industries making hyper-allergenic formulas.

Another example, the FAO of the UN used the 2010 International Dairy Federation guide, A Common Carbon Footprint Approach for Dairy, in its 2010 document on Life Cycle Assessment of Greenhouse Gas Emissions from the Dairy Sector [7]. There is a critical need for an objective calculator for greenhouse gas measurements and equivalencies, independent from those provided by the dairy industry.

Scientific studies prove the severe damage caused by the use of toxic chemicals to the health and development of children as well as to the reproductive health of their parents. Dairy farming to produce milk to manufacture formula uses herbicides to increase grass production for hay and

fodder and for cultivating soy for cattle feed and other purposes, while agriculture uses insecticides to protect crops. Although the carcinogenic and endocrine disrupting properties of such toxic chemicals have been demonstrated, industry funded studies refute the evidence, as in the case of the cancers caused by the glyphosate in Monsanto's Round up.

Ontario's omnibus bill 66, Restoring Ontario's Competitiveness Act, has the potential to remove environmental regulations such as the Toxics Reduction Act (2009), in spite of the fact that the report of the Toxics Reduction Program (2013), from the Canadian Public Health Inspectors, revealed that Ontario has the highest release of toxins in Canada, and one of the highest in North America, including developmental and reproductive toxicants and known and suspected carcinogens. The public needs access to scientific evidence-based decision making for legislation, rather than industry funded science. Along with the Greens, breastfeeding advocates call for making all research results public unless it harms business interests. Child health should always trump business interests.

Greens oppose subsidizing foreign multinational corporations operating in Canada. Feihe International, a Beijing company registered in the Cayman Islands, is the largest infant formula manufacturer in China, and also makes other products from skim milk components. The fear of tainted formula in China is well founded, and has encouraged the industry to seek "purer" milk components elsewhere. Feihe's new Canadian subsidiary, Canada Royal Milk, is currently being built near Kingston with both Ontario provincial and federal support. The plant will export 80% of its milk components to China. It will be the first goat milk plant in Canada, with separate production lines for goat and cow's milk. It is expected to open in 2020, providing infant formula for markets in North America and China [69].

Ontario is investing $24 million in the plant that plans to produce 60 000 tons of infant formula annually, with 40 000 tons exported to China by the second year of operation. While this company will bring 250 jobs to the area, the plant is likely to be automated in the future. The plant could provide an opportunity for the province to regulate the quality and nutritional adequacy of the infant formula they produce and export. If Ontario exports this product to China, do they have the responsibility to ensure that it does no damage to the health of infants that use the product? Just because Canada does not currently produce infant formula, that does not mean that our national consumption of the product does not affect planetary health. Thus, a provincial policy may have global consequences for infant health, as well as for the planet.

The Case for Green Feeding

The dominant discourse around climate change is trade-offs and cost-benefit analysis. How much do we need to sacrifice now in order to address future problems that benefit future generations? These linear economic models calculate how much it will cost us to counter global warming. The implicit moral model pits our current wealth, comfort and convenience against the well-being of future generations. Green feeding suggests a new way of thinking more in tune with current approaches to circular economies. Circular economies advocated by Green parties say 'No to Over-consumption' and No to the present economic model of 'Take, Make, Dispose' which fails to recycle and treats the environment as a dumping ground. Breastfeeding provides the classic example of a circular economy based on biological cycles; breastfed babies take

exactly what they need. Nothing is transported because the product goes directly from the producer, the mother, to the consumer, her baby. Nothing is wasted and no natural resources are depleted.

Bottle-feeding with processed baby milks is an example of an inefficient system of biomimicry that dupes the consumer into believing there is equivalence between an industrial product and human milk. It is a part of our throw-away culture, in which the equipment needed is discarded after use. Unused baby milk must also be discarded after each bottle-feed because dangerous heat-resistant bacteria such as *Salmonella* and *Enterobacter/Cronobacter* species thrive and breed in reconstituted warm milk. The World Health Organization has produced guidelines to reduce the risk of severe and potentially lethal infections caused by contamination of packages of powdered baby milks and cereals by these harmful bacteria [25].

Breastfeeding is part of an economy that is restorative and regenerative in design, and is based on biological rather than technical cycles. Green feeding requires no trade-offs; breastfeeding mothers do no harm to the environment. Both current and future generations benefit. In fact, a generation of exclusively breastfed infants will be better equipped intellectually and physically to address future climate change and produce the next generation of immunologically strong adults.

Like the Green New Deal (GND), green feeding advocates can work with environmentalists and social justice workers synergistically to reach their shared goals. All single issue movements are easily fractured, but it is relatively easy to unite around green feeding, particularly by youth who are at the vanguard of climate change action. While the GND advocates will retrofit energy inefficient buildings, green feeding will retrofit humans to prepare them for fighting climate change.

The costs of going green are supporting new mothers to breastfeed and reducing both the promotional practices of infant food corporations and their influence on health policy. Finally, breastfeeding is like the canary in the mine, warning us about vulnerabilities in ecological systems very close to home. If we pay attention to the little things, perhaps the large will begin to look less intractable. As the song says, sometimes little things mean a lot!

Suggested Actions for Canadian Greens

- Include breastfeeding in list of actions to reduce carbon, water and waste footprint
- Include infant feeding in public education about climate change and the environmental costs of not breastfeeding.
- Publicize the value of breastfeeding to reduce carbon, water and waste footprints and to mitigate health risks caused by climate change.
- Implement the International Code of Marketing of Breast-milk Substitutes and its subsequent relevant World Health Assembly Resolutions, federally and provincially.
- Propose or support an amendment to the Ontario Water Resources Act to prohibit commercial water taking for bottling and improve access to clean reliable public water.
- Prohibit ads that suggest infant formula should be mixed with bottled water.
- Engage breastfeeding groups to support the Paris-Galt Moraine Conservation Plan.

- Encourage links with the Canadian Pharmacist Association when developing the national pharmacare plan.
- In budget allocations, include the health, economic and environmental importance of exclusive breastfeeding for six months followed by continued breastfeeding for up to 2 years and beyond, and advocate for increased financial resources for the protection, promotion and support of breastfeeding.
- Support the Baby-friendly Hospital Initiative to facilitate early initiation of breastfeeding within one hour of birth and exclusive breastfeeding for six months.
- Campaign for baby-friendly workplace childcare to enable employed mothers to breastfeed.
- Use green feeding to advance SDGs and sustainable development. Breastfeeding and the contribution of human milk to environmental sustainability and food security year-round should be considered in climate-smart development goals at provincial, national and global levels.
- Use tax incentives or insurance discounts to reward breastfeeding families.

This advocacy document is the result of a collaborative effort begun by Penny van Esterik and Alison Linnecar with the assistance of Britta Boutry and Rebecca Norton. We have all benfitted from on-going discussions with breastfeeding and climate change activists, but these are not official publications which have been reviewed and approved by all interested parties. They are intended as starting points to encourage other individuals and groups to integrate green feeding into their ongoing advocacy work on climate change.