Animal Justice

Leading the legal fight for animal protection

Submission to the House of Commons Standing Committee on Finance
2019 Pre-Budget Consultation

August 3, 2018

Recommendation 1: That the government provide funding to the Canadian Centre for Alternatives to Animal Methods, recognizing the opportunities presented by investing in alternatives to animal testing.

Recommendation 2: That the government invest in plant-based agriculture and product development.

Animal Justice Canada Legislative Fund
5700-100 King Street West, Toronto, Ontario M5X 1C7
info@animaljustice.ca

Introduction:

Animal Justice is Canada's only animal law organization. Our legal team works to enhance legal protections for animals through groundbreaking court cases, law reform and public policy initiatives, and public education.

We thank the Standing Committee on Finance for the opportunity to participate in consultations for the 2019 Budget. As an organization dedicated to animal protection, the focus of our submissions is on investment opportunities that improve conditions for animals in Canada, while recognizing the growth potential of the so-called "humane economy."

Specifically, Animal Justice recommends investing in innovative medical research science that replaces animal research and teaching models with animal-free alternatives, and investing in plant-based agriculture and food production that supplies global markets without the use of animals.

Recommendation 1: That the government provide funding for the Canadian Centre for Alternatives to Animal Methods

According to the Canadian Council on Animal Care, 4.3 million animals were used in research, testing and teaching in Canada in 2016, representing a 21% increase over the previous year. Animals are used in tests to predict toxicity, corrosivity, as well as the effectiveness of new products, chemicals, consumer products, medical devices and new drugs.

Replacing animal research methods is beneficial to animals, but there is also a strong economic case for doing so. High costs and inefficiency in animal research, coupled with relatively low success rates in transferring results to human models support a move toward animal-free alternatives.

Animal testing is not as efficient or accurate as human-based methods. Research using animals cannot accurately predict human outcomes due to the vast physiological differences between humans and other species. The National Institutes of Health reported that more than 90% of animal experiments fail to lead to treatments for humans and more than 95% of pharmaceutical drugs that test safe and effective on animals, fail in human clinical trials.

Countries around the world have established institutions dedicated to developing alternatives

to animal testing. The European Centre for the Validation of Alternative Methods (EVCAM) was originally founded in 1991 and expanded and codified in legislation in 2010. Many other countries have dedicated research centers, including, Brazil, China, Japan, Korea, Italy, and the United States. This has led to incredible breakthroughs in technology.

Scientists now have access to *in vitro* testing, which is based on human cell and tissue cultures. The Wyss Institute at Harvard University has engineered "organs-on-a-chip", which mimic key functions of human organs through computing and are able to replace thousands of animals who would otherwise be used in testing, and replicate human physiology, disease, and drug response more accurately than animal experiments. Skin corrosivity and irritation tests that relied on animals can now be replaced and more accurately measured using *in vitro* systems such as EPISKIN and EpiDerm. *In vitro* methods can also be used to replace screening for mutagenic potential, such as the AMES test or the In Vitro Chromosomal Aberration Test. There have also been incredible advancements with *in silico* methods (computer simulated testing). Toxicity tests on rats can now be easily replaced by identifying and modelling a drug's absorption, distribution, metabolism, and excretion (ADME) using a computer and through *in vitro* methods.[1]

There are currently around 50 validated alternative methods in use around the globe. According to an article published in the prestigious ALTEX journal,[2] these high-performing animal-free methods have reduced animal experimentation by 80% or more when implemented. The *in vitro* and *in silico* approaches are also being used as enabling technologies in many other fields, including drug discovery, non-regulatory toxicology, basic biological and biomedical research, and vaccines.

Not only are alternative methods more accurate, they are also more cost-effective. Humane Society International compiled a list of the costs of studies in the US that used animal tests in comparison to the costs of using *in vitro* tests. In every test type, *in vitro* testing was significantly lower in cost. For example, genetic toxicity tests ranged from $32,000-$22,000 in comparison to *in vitro* methods costing $20,000-$8,000 per study. Hormone interaction tests on rats could be replaced with subcellular receptor-binding assay tests at a cost of four to five times less.[3] The cost and effectiveness of these alternative methods has led to an increased global market. Markets and Markets estimated that the global market for *in vivo* toxicology in 2017 reached $4.4 billion, while *in vitro* toxicology testing market was at an estimated $6.3 billion in 2017 with a CAGR of 6.6%.[4]

---

[1] Sonali K Doke & Shashikant C Dhawale, "Alternatives to animal testing: A review" (2015) 23:3 Saudi Pharmaceutical Journal 223.
[2] Lucy Meigs et al, "Animal testing and its alternatives – the most important omics is economics" (2018) 35:3 1 275.
[3] *Ibid* at 284.
[4] https://www.prnewswire.com/news-releases/in-vivo-toxicology-market-worth-614-billion-usd-by-2022-674036653.html

To date, Canada has lagged behind in these developments, threatening the efficiency and profitability of Canada's research and medical industries. With the recent emergence of the Canadian Centre for Alternatives to Animals Methods (CCAAM) and its subsidiary, the Canadian Centre for the Validation of Alternative Methods (CaCVAM), the government now has a key opportunity to take meaningful steps to improve medical research.

The University of Windsor launched CCAAM in October 2017—the first Canadian centre developing new methodologies of biomedical research, education, and chemical toxicity that do not require the use of animals. CCAAM has close relationships with regulators, including Health Canada, to help develop integrative, human-centered alternatives. CCAAM is already working on organoid modelling, which creates 3-D models of organs from human stem cells that can be used to measure *in vivo* biological responses to drugs, mutations, or damage.

CCAAM is also planning to establish the first-of-its-kind degree program in Animal Replacement Science. This program would allow Canada to become a world leader in training the next generation of scientists and ethicists. Investing in CCAAM will ensure Canada gains a foothold in the profitable economy of alternative approaches while directly benefitting human health.

Recommendation 2: That the government invest in more plant-based agriculture and products.

The market for plant-based food continues to expand at an astonishing rate. Canada has an opportunity to capitalize on the ongoing growth in the market for plant-based products.

People are incorporating more plant-based foods into their diet due to concerns about human health, the welfare of animals and the environment. Research indicates that a plant-based diet benefits human health, and decreases the risk of chronic illness like cardiovascular disease, diabetes, and certain cancers. A study published by JAMA Internal Medicine studied the effects of plant and animal protein intake on 131,342 participants, finding that substituting plant protein for animal protein was associated with lower mortality.[5]

Health Canada has also highlighted the important of plant-based proteins and consuming meat and dairy alternatives. A preliminary draft of Canada's new Food Guide[6], released in 2017, suggested a shift toward recommending that Canadians eat more plant-based foods.

[5] Mingyang Song et al, "Association of Animal and Plant Protein Intake With All-Cause and Cause-Specific Mortality" (2016) 176:10 JAMA Intern Med 1453.
[6] Health Canada, *Summary of Guiding Principles and Recommendations* (Government of Canada, 2017).

Canadians are catching on. A Neilson study found that 43% of Canadians are trying to eat more plant-based food, and 23% of consumers want more plant-based protein on the market.[7] This shift in consumer awareness has even spurred animal-based meat and dairy companies to increase their plant-based protein offerings to round out their existing product lines. Canadian meat giant Maple Leaf Foods recently acquired two profitable plant-based companies, Field Roast and Lightlife Foods for $120 million and $140 million, respectively.[8] Nestle, the largest food company in the world is currently rolling out plant-based products across Europe.

According to research from Markets and Markets, the global meat alternatives market is valued at $4.33 billion and is expected to reach 6.43 billion by 2023, at a compound annual growth rate (CAGR) of 6.8%.[9] The global market for plant-based milk is set to reach $16.3 billion by the end of 2018 and exceed $21 billion by 2014, with a CARG of 20% from 2012-2016.[10]

Other countries have already begun to capitalize on the growth of the plant-based food sector. China's plant-based market is expected to grow by more than 17% between 2015 and 2020. Australia is the third-fastest growing plant-based market in the world, with a 92% increase in the number of plant-based food products launched between 2014 and 2016. Sales in the United States went up by 8.1% this past year, totaling $3.1 billion.[11]

A report from *Farm Animal Investment Risk & Return* (FAIRR), entitled, "The Future Of Food: The Investment Case For A Protein Shakeup," makes an important argument for the need to diversify protein sources to enable food supply chain security.[12] The report relies on FAIRR's 2016 risk report that outlines the negative impact of industrial farming. The livestock sector accounts for 18% of the greenhouse gas emissions, surpassing the global transport sector. Animal agriculture is the world's largest user of agricultural land and is far more resource intensive than plant agriculture.

---

[7] Neilson, "Plant-Based Proteins Are Gaining Dollar Share Among North Americans", online: <http://www.nielsen.com/us/en/insights/news/2017/plant-based-proteins-are-gaining-dollar-share-among-north-americans>.

[8] Anna Starostinetskaya, "Canada to Invest $150 Million in Plant-Based Food Sector", *VegNews.com*, online: <https://vegnews.com/2018/3/canada-to-invest-150-million-in-plant-based-food-sector>.

[9] MarketsandMarkets, *Meat Substitutes Market-Global Forecast to 2023* (2018).

[10] Innova Market Insights, (13 June 2017), online: <https://www.prnewswire.com/news-releases/global-plant-milk-market-to-top-us-16-billion-in-2018--dairy-alternative-drinks-are-booming-says-innova-market-insights-300472693.html>.

[11] Katrina Fox, "Here's Why You Should Turn Your Business Vegan In 2018", online: *Forbes* <https://www.forbes.com/sites/katrinafox/2017/12/27/heres-why-you-should-turn-your-business-vegan-in-2018/>.

[12] FAIRR- Farm Animal Investment Risk & Return, *The Future Of Food: The Investment Case For A Protein Shakeup* (2016).

The Canadian government has already recognized the economic opportunities that investing in the plant-based sector. In Budget 2017, the Government of Canada launched the Innovation and Skills Plan, funded by the Innovation Superclusters Initiative. The Initiative is investing up to $950 million to support business-led initiatives with the greatest potential to energize and grow the economy. This resulted in $150 million to be invested in the plant-based food sector.[13]

Canada is one of the largest exporters of agricultural commodities in the world. Agri-Food Canada's goals include growing exports and creating new trade opportunities like developing more varieties of value-added crops, including short-season soybeans. Canada exports well over $1 billion worth of soybeans annually and production is steadily increasing. Canada is already one of the largest producers of flaxseed, canola, oats, and durum wheat, and the third largest producer and exporter of pulses, with the highest yields in the world.[14] The Prairie provinces have a particular advantage in growing pulses, and investors have begun to take notice of the rising popularity of plant-based protein and the resources Canada has to offer. This led to the opening of Verdient Foods Inc. in Vanscoy, Saskatchewan, which will produce plant protein and plant-based food products. French company Roquette has also announced a $400 million investment to build the world's largest pea processing plant in Manitoba. Global revenues from pea protein are expected to be worth $104 million by 2026, according to Future Market Insights. As the world's largest producer of yellow peas, the Prairies are uniquely placed to benefit should Canada become a leader in the plant-based protein market.

With government support, Canada has the resources and capabilities to continue expanding our agriculture and agri-food industry into the plant-based market. The exponential growth of the plant-based protein market promises to create a more profitable and competitive economy for Canada, as well as ensuring long-term sustainability in the changing economic landscape.

[13] Ian Bickis, "Canadian farmers, companies invest in plant-based protein amid growing demand", *The Globe and Mail*, online: <https://www.theglobeandmail.com/report-on-business/canadian-farmers-companies-invest-in-plant-based-protein-amid-growing-demand/article38105245/>.
[14] P K Joshi & P Parthasarathy Rao, "Global pulses scenario: status and outlook" (2017) 1392:1 Annals of the New York Academy of Sciences 6.