

Empowering Eaters to Make Climate-Friendly Choices: A Public Education Initiative

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The U.B.C. Food System Project Scenario 3B

**Empowering Eaters to Make Climate-Friendly Choices:
A Public Education Initiative**



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1. ABSTRACT

There are few things that so clearly connect us to the environment as food, or illustrate how overtly dependant we are on the plant for our survival. Examining how our food is produced is at the core uniting many of the global issues relating to our misuse of land, energy and other resources – and with a modest amount of thought and effort about the food selections we make, we have the potential to make strides towards resolving climate-related problems each time we pick up a fork.

Initially, it may seem like changing one's eating habits is a strange way to approach preventing climate change, however, it is known that our food system is a significant contributor of greenhouse gas (GHG) emissions. Therefore, educating ourselves about climate-friendly food choices is an essential step towards becoming empowered eaters who are able to effect change.

As a first attempt to increasing public awareness about the relationship that exists between food choices and climate change, our group was assigned the task of developing an educational campaign to be used at The UBC Farm. The main purpose of this initiative is to encourage patrons at the Saturday Farmer's Market to adopt a more sustainable approach to food-shopping and eating by exposing them to one or more of three complementary marketing tools:

1. a "Carbon Smart Food Guide" containing general information and guiding principles on how to become a carbon smart consumer
2. an on-line publication aimed at providing those interested with more detailed information than that presented in the food guide
3. a carbon smart logo to be used as a part of a visual display at food stands so that shoppers are able to quickly and clearly identify carbon smart items

It is our goal that, collectively, this campaign will help climate-concerned consumers be more successful at navigating the food system, thereby having a positive impact on our community, and our environment.

2. INTRODUCTION

Today, people are more eager to try and experience new foods from around the world. To compete with these desires, food usually travels an extensive distance to get to our plates. Not only does this increase the onset of carbon emissions, but it also demonstrates a lack of support to farmers within the province who grow, cultivate and process locally grown foods.

Through participating in the University of British Columbia Food System Project (UBCFSP), our group created a carbon smart food guide to educate the public on awareness of local farmers markets and how consumers' support of these markets will help reduce carbon emissions. Moreover, our group came up with the idea of creating a reusable carbon smart grocery bag. The bag was designed to promote local grocery shopping with hopes to ultimately reduce carbon emissions. In addition, this bag will reduce the use of wasteful disposable bags. Furthermore, we hope to set a trend for using this bag, by working collaboratively with local farmers markets and supermarkets.

After extensive research, our group constructed initiatives and recommendations to educate consumers about the environmental impacts of the food system. The UBCFSP is trying to set an example by promoting reduction of carbon emissions caused by food systems within the university. Our group fits into this larger picture by giving people practical and realistic suggestions on how to achieve this goal. It is our hope that in the future this initiative will not only influence people within UBC, but will also provide carbon emission awareness globally.

2.1. Problem Definition

In scenario 3B, our purpose was to provide public education on how to make changes to the food system, which will ultimately improve the changing climate. That is, to promote reducing greenhouse gas (GHG) emissions in order to reduce the climate changes seen globally.

UBC, serving as a microcosm to the global issue of GHG emissions affecting climate changes, is the initiative which will serve to promote low carbon lifestyle to the public. In an effort to collaborate, our group designed a carbon smart food guide to be used at the

UBC Farm, which promotes supporting local farmers markets in order to reduce the carbon emissions emitted by food transporting vehicles. This brochure guides people on how to adopt realistic habits to adapt to a low carbon lifestyle. Furthermore, we created a logo and a carbon smart bag to promote awareness of low carbon food choices. Our group hopes that this initiative will trigger consumers to become more involved in making efforts to be carbon smart. We believe that efforts in support of local farmers is a good initiative to begin a new lifestyle - the low carbon lifestyle.

If our carbon smart food guide and logo become a success at the university, we plan to use this outcome as a stepping stone to further promote awareness provincially, nationally and globally. Our group believes that once this project is harmonized with the other scenarios, the complete UBCFSP can evolve to accurately portray a microcosm of a sustainable food system.

2.2. Vision Statement and Identification of Value Assumptions

As a group, we agreed with all of the UBCFSP vision statements developed by project coordinators and its partners. For example, we think that recycling and composting waste locally is very important. We suggest that the government should promote and educate the public about having a compost box. We definitely agree that food should be ethnically diverse, affordable, safe and nutritious (AGSC 450, 2009) because we should be given a variety of foods that provide health benefits to our bodies. Food not only provides us energy, we also concur that food brings people together and enhances community. Our group believes that food creates bonds between people, especially between those who share common tastes. Most importantly, we think that food should be locally grown,

produced and processed to reduce carbon emissions produced by the transportation vehicles (AGSC 450, 2009).

3. FINDINGS

3.1. Problems of Greenhouse Gas Emissions

Greenhouse gases (GHGs) are naturally found in the Earth's atmosphere; however, some of these GHGs are also human made. These GHGs are considered a problem to Earth because they are capable of trapping heat within the Earth's atmosphere and increasing the Earth's temperature (DSF, 2009). Sunlight normally travels through the Earth's atmosphere as short wavelengths of energy where it is not absorbed by GHGs (Pidwirny, 2008). When these radiations hit the Earth's surface they are expected to re-radiate back out into space as infrared or as longer wavelengths of energy. However, the infrared radiations are absorbed by GHGs and the heat is trapped within the Earth's atmosphere (Pidwirny, 2008). Despite these consequences, GHGs are continually being released in the environment. Conclusively, the amount of heat trapped within Earth's atmosphere continues to rise and consequently, the Earth's surface temperature rises accordingly. This is also known as global warming (EIA, 2008).

The Earth's surface temperature is constantly rising in unnoticeable increments; and continuous disturbances can induce severe consequences such as: a rise in global surface temperature, severe weather conditions, and rising water levels (EIA, 2008). A large portion of GHGs come from the burning of fossil fuel by people. The burning of fossil fuel, like petroleum, natural gas and coal releases carbon dioxide (CO₂) in to the environment. Carbon dioxide makes up a large portion of GHGs because of our excessive dependency on the benefits of utilizing fossil fuel. The inevitable consumption of fossil fuel

is largely driven by the demand for energy to sustain economic growth (EIA, 2008; DSF, 2009).

Regrettably, the burning of fossil fuel is not the only source of GHG. The release of methane and nitrous oxide also contribute to the increase of GHG concentration on Earth. Methane is a GHG that comes from landfills, coal mines, oil and natural gas operation, and in particular, agriculture. Nitrous oxide is another GHG that is emitted through the use of nitrogen fertilizers, from industrial and waste management process and burning of fossil fuel (EIA, 2008). Methane and nitrous oxide are known to excessively trap heat and contribute to global warming. It was found that methane has 21 times the global warming potential and nitrous oxide has 310 times the global warming potential than that of CO₂ (CCS, 2009; BBC, 2008). Methane and nitrous oxide are also of particular interest because they are released to the environment from food production (DSF, 2009).

3.2. Contributions to Greenhouse Gas Emission by the Food System

The food system contributes approximately one-third of the total global GHG emissions (BAF, 2009). Of all the GHGs, CO₂, methane, and nitrous oxide are the most hazardous. All three GHGs are released to the environment through production, processing, packaging and transporting of food. Vehicles used for transportation and delivery of food exhaust a tremendous amount of GHG emissions by burning fossil fuel. Despite the large contribution food transportation has on GHG emissions in the Earth's atmosphere, according to the United Nation livestock production generates 18% more GHG than transportation (FAO, 2006). The FAO states that the global livestock sector is growing more rapidly compared to other agricultural sub-sectors. This would then further increase the amount of GHG emission if production methods are not improved (FAO, 2006).

Carbon dioxide is the main GHG released from the food sector in Canada (GA, 2004). Human contribution of CO₂ to the atmosphere is roughly 95% of the total and most of it comes from the use of fossil fuel. Twenty pounds of CO₂ is produced for every gallon of fossil fuel burned (LIL, 2009). The transportation sector has always been a large source of global CO₂ emissions (LIL, 2009). Due to international trade, currently the distance that food travels from its point of origin to their markets is escalating (LIL, 2009). The major vehicles used for transporting food are: train, truck, plane and ships. Amongst these four methods of transportation, research has found that transporting food by truck produced the most GHG. Therefore, consumers can reduce food miles and GHG emissions by purchasing local foods (Weber & Matthews, 2008).

Methane and nitrous oxide are the two main GHGs released from the agricultural sector in Canada. Livestock and rice cultivation are the main contributors to the release of methane gas into the atmosphere in the agricultural sector (Government of Alberta, 2004). Bacteria in the intestinal tract of livestock digest nutrients into methane gas and release them into the environment as waste (Government of Alberta, 2004). Another source of methane gas is from the rice cultivation industry because rice grows in flooded fields where bacteria thrive in waterlogged soil and release methane (US EPA, 2006).

Nitrous oxide is produced naturally in soils through microbial processes, but these emissions can be increased by a variety of agricultural practices and activities, including: the use of synthetic and organic fertilizers, production of nitrogen-fixing crops, cultivation of high organic content soils, and the application of livestock manure to croplands and pasture (Government of Alberta, 2004). On the other hand, nitrous oxide is also released to

the environment through fossil fuel combustion when nitrogen is reacted with oxygen (US EPA, 2006b).

3.3. Carbon Smart definition

To be carbon smart means to be able to recognize how our choices may contribute to enhance or reduce current environmental problems. The goal of being carbon smart is to make educated lifestyle choices in order to lessen GHG emissions.

3.4. Carbon Smart Diet Choices

Research was done on various types of diets, including: local, seasonal, organic, and vegetarian. It was found that all of these diets can help reduce the amount of GHG that is being released to the environment (Weber & Matthews, 2008). By eating locally, consumers can help improve the local economy by supporting local farmers. This would also lessen the chance of the local food system becoming vulnerable to food shortages as it would be less dependent on imported food products. The decrease in demand for imported food will decrease the fossil fuel burned by transportation. Finally, the most important benefit about eating local is the availability of fresh produce in contrast to the non-fresh produce that has travelled long distances to reach the consumers' plates. (Halweil, 2003).

Eating in-season food not only has environmental benefits, but it also has health benefits. This is because seasonally appropriate foods contain more nutrients that can be absorbed by the human body (GVPCA, 2009). Moreover, seasonal produce is recommended because off-season produce requires the use of greenhouses to grow them. Greenhouses burn fossil fuel in order to provide enough heat to create an ideal growing environment; ultimately, making further contributions to global warming (Bailey, 2008).

Organic farming contributes less GHG to the environment since this practice relies on organic nitrogen rather than synthetic fertilizer. Therefore, the release of nitrous oxide emissions is lower in organic farms than conventional farms (OACC, 2008). In addition, farms that use organic soil have great potential to reduce GHG emissions because organic soil has the ability to sequester atmospheric CO₂ and other GHGs, and convert them into soil nutrients (Rodale Institute, 2003). It was reported that organic agriculture can sequester 3,500 pounds of CO₂ per acre-foot per year. The sequestering ability of organic soil on GHGs increase the carbon level in soil by 15 to 28% and nitrogen level by 8 to 15% (Rodale Institute, 2003). The sequestering of GHGs also improves water quality since the action reduces the amount of nitrogen that is lost through leaching where it would reach underground water supply and affects its quality (Rodale Institute, 2003).

Since livestock production is a powerful driving force on environmental damage, a vegetarian diet will also reduce negative environmental impacts. These include: deforestation, erosion, fresh water scarcity, air and water pollution, climate change, biodiversity loss, social injustice, community destabilization, and disease spread (WWI, 2004). In addition, non-environmental benefits of the vegetarian diet include: reducing the risk of heart disease, lowering blood pressure, reducing digestive problems, to name a few (Thompson, Manore, & Sheeshka, 2007).

3.5. Foodshed Map

The foodshed map is a product of the foodshed project where its purpose is to guide people who are interested in eating local food to their source. The concept of the foodshed came from the 100-Mile Diet experiment where the experimenters were faced with questions like, “where do foods come from” and “what grows in which region” and “what

foods are available in this season”. However, the answers were not readily available to the consumers. This led to the initiation of the foodshed project and thus foodshed map was created. The map is used to show the location and seasonal availability of local foods, and the location of where processed foods are available. In summary, the main goal of the foodshed map is to offer help to those that wish to eat more local food but do not know where they are available. Appendix 1 is an example of a foodshed map which was created by the 100 Mile Diet Society showing the foodshed of south western British Columbia (100 Mile Diet Society, 2009). This earlier version illustrates the main towns and cities in the south-western part of BC and the local farm products that are available in each location. Currently, a revised online version of the south-western BC foodshed map is under construction. The online foodshed map allows its users to type in their address and find what kinds of food are within a 100 mile radius of their location. The users also have the option to create an account and generate their own foodshed map by adding farms or food businesses to the map. Furthermore, the innovation will allow users to learn about the environmental and economical impacts of reducing food miles. The online version of the new foodshed map can be accessed from the following link:

<http://www.localfooddirectory.ca/foodshed/geobrowser/> (LifeCycles Project Society & 100 Mile Diet Society, 2009).

4. DISCUSSION

The ideas and focus which our research and publication efforts are based on, was generated from our teaching assistants, professors, colleagues, presentations, guest speakers, and published literatures. Through these education mediums, we were introduced to the environmental impacts of food production. We expanded on this

knowledge by assembling our own education medium which involves the importance of food-related GHG emissions.

We addressed the issue of GHG emissions by building a carbon smart food guide brochure (appendix 2) and a carbon smart food label printed onto a reusable grocery bag (appendix 3). Both these projects promote carbon smart food choices. The food guide was made as a collaborative effort with the UBC Farm and the 100 Mile Society. It serves as a vehicle to educate the public about the environmental impact of foods and recommends strategies to reduce this impact by making good lifestyle choices. In addition, the purpose of the carbon smart food label is to help consumers identify and promote food associated with low GHG emissions and other environmental consequences. The local and organic foods sold at the UBC Farm are good examples of carbon smart foods (UBC Farm, 2009), and will be labelled with the carbon smart food logo.

The central concept in our carbon smart food guide and label was mainly developed based on our literature research on the influence of diet and food production on GHG emissions. The recommended resources in the UBCFSP scenario description package were examined as guidance for the organization of issues considered in our publications. To obtain information about the definition and importance of GHG, as well as the factors that connect food to GHG emissions, we reviewed the preliminary bibliography for our scenario and assigned readings. For example, we consulted “Canada’s 2005 Greenhouse Gas Inventory: A Summary of Trends” by Environment Canada for general background information (facts, statistics) on GHGs and their impact on our country. The articles, “Cool Farming: Climate Impacts of Agriculture and Mitigation Potential” by Bellarby, “Diet, Energy, and Global Warming” by Eshel, and “Fighting Global Warming at the Farmer’s

Market” by Bentley, were all excellent resources for details about the contributions of agriculture and diet to GHG emissions. Information obtained from these resources was compiled into six feasible principles for achieving a low carbon diet, which is the central educational component of the carbon smart food guide.

4.1. Carbon Smart Food Guide

The layout of the guide was inspired by several authentic brochures, as a reference for the general components, the visual organizations and communication approach for our own publication. The cost for printing the carbon smart food guide was estimated and summarized in Appendix 5. Depending on the size and the type of material used, the cost of 5,000 copies ranged between \$710 to \$1710. In general, Vancouver companies estimated that printing with recycled paper can cost up to 10% more than regular paper.

Our carbon smart food guide took the form of a gate-fold brochure, composed with Microsoft Publisher. The layout of the guide was arranged to work around four sections, namely: background information on GHG emissions, guiding principles to eat carbon smart, a sample recipe, and a list of local farmers’ markets. The main purpose of this guide is to educate the public to choose carbon smart food, ultimately, reducing greenhouse gas emissions.

In the background information section, the definition and significance of GHGs were included to introduce readers to the significance of learning about the ecological footprint of eating. Articles listed under the preliminary bibliography found in the UBCFSP scenario description package, were consulted as resources for facts about the impacts and trends of GHG emissions. Principles for the assessment of GHG contributions of different foods are based on factors deemed considerably responsible for the ecological footprint of the foods,

researched from various resources. We initially brainstormed the general processes that are involved from production to the eventual disposal of foods, such as farming, transportation, processing, packaging, and waste disposal. Research was conducted to determine the processes that most significantly impact the overall amount of GHG associated with the food. As mentioned previously, we studied resources which provide information on the GHG contributions of agriculture and diet in order to formulate the carbon-impact assessment principles on which the carbon-smart guidelines in the brochure were based on.

The carbon smart food guide also provides information about local farmers markets, a list of in season fruits and vegetables, a sample recipe of a carbon smart dish, and other references for further education. Finally, the guide provides six guiding principles that individuals can utilize to become a carbon smart consumer. These will be discussed more in detail in the following sections.

4.1.1. Eat foods that are at lower levels of the food chain

Aside from choosing local food products, eating foods that are at the bottom of the food chain is recommended. According to the United Nations Food and Agricultural Organization (FAO, 2006), an estimation of 18% of all greenhouse gas emissions is from livestock production. Thus, we recommend reducing the consumption of dairy products and red meat, as these products require intensive processes to produce them. Grain products, fruits and vegetables are examples of foods that are lower on the food web.

4.1.2. Choose locally grown foods

Research has shown that by eating locally grown and in-season foods, consumers can reduce unhealthy food systems for British Columbia. To get started with “eating local”,

we recommend consumers to purchase foods from local farmers' market and dine out in restaurants that offer locally purchased ingredients. By doing so, it reduces CO₂ emissions because locally grown produce requires less travelling distances compared to foods from abroad (100 Mile Diet Society, 2009).

4.1.3. Choose in-season foods

To help reduce food miles, selecting foods that are in-season near the consumers' neighbourhood would be recommended. Purchasing foods that are available during the season can reduce the amount of CO₂ emitted to the atmosphere; thus reducing the distance travelled to import off-season foods (GVPCA, 2009).

4.1.4. Choose organic foods

To decrease the dependence on using fertilizers and pesticides during intensive farming, eating organic foods are recommended. The production of organic foods requires less use of fossil fuels as compared to conventional farming, and has the ability to reduce the release of GHGs into the Earth's atmosphere by carbon sequestration in soils and biomass (Kotschi & Müller-Sämman, 2004). According to the Rodale Institute (2003), 3500lbs of CO₂/acre-foot/year can be sequestered from organic farming.

4.1.5. Avoid highly processed and overly packaged foods

A way to offset carbon emissions from food processing is to dry the fruits and vegetables at home. If possible, we recommend that consumers try to plant and grow their own foods in their backyard garden. Furthermore, select food items that are bulky and packaged using recycled paper to reduce the extra waste from packaging (Rodale Institute, 2003).

4.1.6. Drink water from the tap

To reduce the negative impacts on the environment, drinking water from the tap instead of bottled water is recommended. According to the World Wide Fund for Nature (2001), 1.5 million tons of plastic are produced each year from bottled water. The production of plastic bottles requires large amounts of energy; in other words, the use of fossil fuels for manufacturing and transportation (WWF, 2001). Consequently, in order to decrease the amount of waste and CO₂ emissions, we recommend consumers to drink water from the tap instead of purchasing bottled water from the supermarket.

4.1.7. Don't waste food

Many people tend to throw away excess food and are unaware that wasting food can lead to an increase in CO₂ emissions, thus contributing to global warming. There are other factors to consider when foods are being wasted. For example, it expends unnecessary CO₂ emissions to the Earth's atmosphere by making unnecessary vehicle trips to purchase the food (DSF, 2009). Moreover, the process of making food requires the use of fossil fuel and throwing away unnecessary purchased foods contributes to CO₂ emissions that could be prevented (DSF, 2009). We recommend consumers reduce food waste by composting them or even better, don't waste food at all!

4.1.8. Make incentives to plan ahead

To create less transportation emissions, planning ahead is recommended. For example, we advise consumers to purchase all their needed items once a month to limit the number of vehicle trips. Moreover, consider alternative modes of transportation such as using the public transit, car-pooling, riding a bike or walking to the designated location.

4.2 Carbon Smart Food Guide: Online Publication

The online publication would essentially be an electronic version of the carbon smart food guide. It should be divided into sections that can be navigated by clicking on the corresponding tabs. Our ideas concerning the details of this website are summarized in Appendix 4.

On the homepage, an introduction about the website and our idea about the carbon smart food labelled-grocery bag should be given to draw attention from the visitors and get them to explore the rest of the website. One section should have quick tips on how to eat carbon smart, which are similar to the guiding principles on reducing environmental footprint during food-related activities in our carbon smart food guide. The goal of this section should be to provide access to practical and resourceful information for the general audience to shift to a sustainable lifestyle. Our ideas regarding the format of the quick tips was inspired by the “Diet for a Healthy Planet” guidelines on the David Suzuki Foundation website. We would also generate a footprint calculator, an interactive feature that allows website visitors to estimate the amount of GHG emissions associated with different foods. This provides a practical tool to help consumers adapt a low carbon lifestyle. Finally, a list of restaurants that promote the 100 Mile Diet menu should be listed along with their websites. We determined that the web address should be clear and simple; for example, www.smartco2.ca.

4.3 Carbon Smart Food Label

As a group, it was discussed that a carbon smart food label should be more than just a sticker. Rather, our group decided that an environmentally friendly grocery bag would be more effective. The bag itself has a carbon smart food logo and a slogan that promotes

consumers to purchase carbon smart food. It was concluded that stickers may be relatively ineffective and possibly environmentally unfriendly. Our group forecasted that stickers may be thrown out, therefore having little educational impact. In contrast, our group believed that a grocery bag would be effective in several ways. Firstly, our group believed that consumers who use this bag or see this bag will be more conscientious about choosing carbon smart foods. Secondly, this bag will be reusable; ultimately, reducing production of plastic bags which can be detrimental to the environment. Several prototype logos were designed (for examples, refer to Appendix 3). Eventually, as a group, we selected a logo which symbolized carbon smart.

The design of our carbon smart food label revolves around the visual representation of carbon dioxide. Initially, our group started with four sketches of possible logos: they were modified and selected according to group members' opinions. The final logo (displayed on the cover of the food guide) was chosen due to the simplicity and clarity of its depiction of "CO₂" and the globe. The "CO₂" symbolizes GHG and the globe is in recognition of our goal to reduce GHG emissions globally and achieve a cleaner earth. The grocery bag on which the logo will be displayed is related to the concept of consumer choice on food. This combination of symbols intends to remind consumers to choose carbon smart foods during grocery shopping.

To promote this logo, a marketing plan was discussed. The plan is that customers who shop with this environmentally friendly bag, would receive a rebate of \$1.00 on their final grocery purchase. Further ideas on the rebate promotion should be discussed carefully with participating stores. Therefore, discussion with UBCFSP partners and field test of the carbon smart grocery bag is recommended for future AGSC groups.

Finally, post stands of the carbon smart logo were suggested to be used in local farmers markets to further promote the symbol. Our group believes that being able to recognize the logo is a powerful initiative in raising awareness about carbon smart foods.

4. CONCLUSION

While it may be true that most students at UBC have heard about the topic of sustainability in relation to our food system, it is likely that the vast majority are unaware of how to practically implement these ideals into their lives. This is largely due to the fact that there is a vast array of conflicting advice in the marketplace, which can make it confusing and difficult for consumers to understand how to appropriately navigate the food system. For this reason, it is our belief that the initiation of a carbon smart educational campaign will be one of the key components in determining UBC's success in reaching their carbon-neutral goals.

Initiatives like the carbon smart food guide are so important, as they better equip people to make appropriate food-related decisions and help build self-efficacy through the translation of scientific findings into realistic and tangible suggestions. Being aware of how our choices influence carbon emissions is one of the first steps in developing a carbon smart community and a necessary measure to ensure that the community at large partners with UBC in their strides towards improving sustainability. Together, it is possible that our collective efforts can truly effect global change and provide hope for a sustainable future.

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8. APPENDIX

8.1. Appendix 1: Foodshed Map

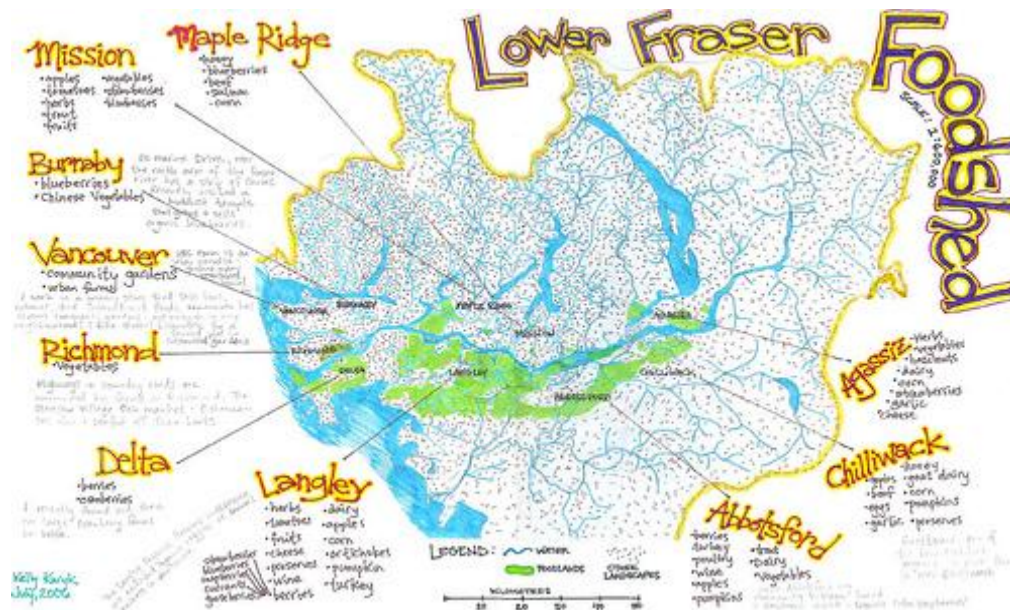


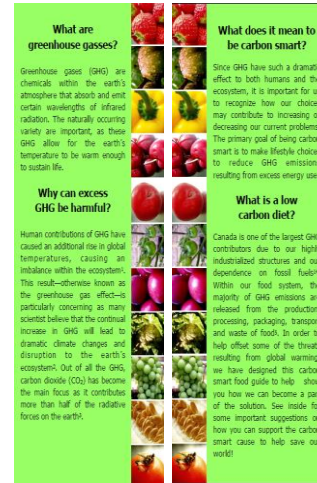
Figure 1. A map of the southwestern British Columbia illustrating the local foodshed. (100 Mile Diet Society, 2009).

8.2. Appendix 2: Images of the Carbon Smart Food Guide Brochure

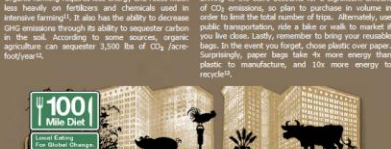
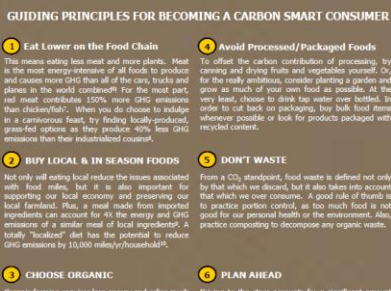
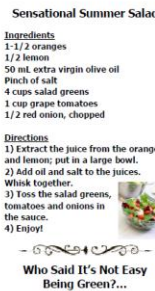
Front Cover



First panel



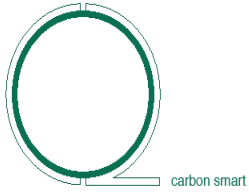
Inside



Back cover



8.3. Appendix 3: Examples of the Carbon Smart Labels



carbon smart



eat local
eat organic
reduce carbon emission



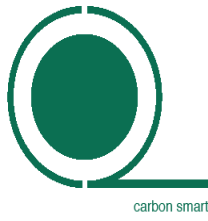
eat local
eat healthy
reduce carbon emissions



eat local
eat healthy
reduce carbon emissions



carbon smart



carbon smart



eat local
eat healthy
reduce carbon emissions



8.4. Appendix 4: Carbon Food Smart Website Information

Proposed website domain name: www.smartco2.ca

“Introduction” Section

- University of British Columbia Food System Project (UBCFSP) is a community based action research project involving many partners and collaborators
 - This link talks further about the UBCFSP and allows access for visitors to the course syllabus and the projects students have accomplished.
- Our goal is to produce a label to empower eaters to make climate friendly choices, such as reducing carbon emissions.
 - This link talks in depth about the goals of the students and the goals of the professors
- The carbon smart label for our team (group 14) symbolizes the molecular name of carbon dioxide (CO₂) and how it affects the world.
 - This link talks in depth about the Carbon Smart label.

“News” Section

- Read all the latest news releases regarding food, healthy living and the environment.
 - Our group hopes to receive sponsorship from the major newspaper companies - The Province, The Vancouver Sun, and The Global Mail - to filter the food, healthy living and environment sections to our website.

“The Carbon Smart Food Guide” Section

- A printable Carbon Smart food guide will be posted and available for download
- Each section in the Carbon Smart food guide will be covered in more in depth

“The Carbon Smart Grocery Bag” Section

- This section discuss about the Carbon Smart logo and what it represents
- This section also discuss about the purpose of the Carbon Smart grocery bag with the logo imprinted on the bag.
- Available to order the bag online

“Information” section

- The website will provide facts about the following:
 1. How CO₂ can affect the world.
 2. How our choice of eating can also affect the world.

“Reduce CO₂” Section

- When you do grocery shopping, do you really need to drive? If it is close to your house, it might be better to walk. This is good for your health, as well as reducing carbon emission from your car.
- During grocery shopping, it is better to buy local food instead of food from other countries. This way you have already chosen low carbon diet as the food required the lowest carbon emission in order to send to your house.

- Have a garden in your house just to plant onion or tomato. It doesn't have to be a farm-looking garden. For example you can put tulips and other kinds of flowers with the tomato plants. A variety of plants in garden always look good!
- Recycle whenever you can. For example, whenever you finish drinking soft drinks, don't throw the can into the trash. If you want to bring it home for recycle, just put it on top of the trash can and there are people collecting them!

"Greenhouse Gas Emission Calculator" Section

- There is a calculation for carbon emission of food transport over distance.
WASD = the sum of (MxD) / the sum of M (Heller and Keoleian 2003)

Where WASD = Weight average source distance

M = amount (weight) of product being transport

D= distance (in mile) from one place to the final destination

For example, if I have 100 boxes of computers and 50 boxes of monitors transport from the factory to the school. The distance in between is 150 miles for computer and 40 for monitors. The WASD then is...

$(100 \text{ boxes of computer} \times 150 \text{ miles}) + (50 \text{ boxes of monitor} \times 40 \text{ miles}) / 150 \text{ boxes}$

The WASD is therefore = 113.33 miles

With the average distance, we can calculate the carbon emission from different transports base on the data provides from Michael Bloch's carbonify.com.

- Small car emissions calculations based on .59 pounds emissions per mile
- Medium car emissions calculations based on 1.1 pounds of CO2 emissions per mile
- SUV/4 wheel drive carbon dioxide emissions based on 1.57 pounds per mile
- A small car that runs 113.33 miles, will emit about 66.86 pounds of carbon emits into the air. Therefore whenever you buy something over the internet, ask for the longest time choice as that can save up more carbon emission to our world!

"Did You Know" Section

- It is estimated that about half of all GHG emissions in the food system are due to the off farm transport, processing, storage and preparation of food (Heller and Keolian, 2003).
- Local food markets sell much fresher produces than supermarket.
- Carbon emission can have an impact on the world.
- Carbon emission can be changed by your choice of eating.

"Friendly Neighbour" Section

- This section provides links to other homepages that have similar goals as the UBFSP:
 - 100 Mile Diet Society: <http://100milediet.org/>
 - Get Local: <http://www.getlocalbc.org/en/>
 - Food Climate Research Network: <http://www.fcrn.org.uk/>
 - David Suzuki Foundation: <http://www.davidsuzuki.org/>
 - Eat Low Carbon Calculator: www.eatlowcarbon.org
 - Flight emission calculator: http://www.carbonplanet.com/shop/flight_emissions_calculator

“Recipes” Section

- The website will start with four salads: Spring Salad, Summer Salad, Fall Salad, Winter Salad. All the recipes will be posted on the website (Food Network).
- Our website plans to have updates on a regular basis for two sections a “recommendation” section and “chef’s recipe” section where visitors can upload their own carbon smart recipes and where professional chefs upload their carbon smart recipes, respectively.

8.5. Appendix 5: Carbon Smart Food Guide Printing Quotes

Printing Quotes for:

- legal sized, gate fold brochure
- 4 colour, matte finish, double-sided (i.e. 4 over 4)
- Supplied ready to specs (PDF submit in CMYK with crop 1/4 inch past live area and 1/8 inch bleed marks)

Green printing companies in Vancouver:

1. En Masse Media: <http://www.enmassemedia.com/>

322- 666 Leg in Boot Sq.
Vancouver, BC V5Z 4B3

- prints on a 13.5pt 100% Post Consumer Recycled, process chlorine free Save-A-Tree card stock (same as above) w/ vegetable based Inks
- Legal sized charged at 11x17 rate (because have to use that size paper and cut to size; gate folding is included in the price
 - For 1000 on recycled = \$1030
 - For 2000 on recycled = \$1200
 - For 3000 on recycled = \$1370
 - For 4000 on recycled = \$1540
 - For 5000 on recycled = \$1710
 - All quantities in multiples of 1,000 are permitted; Prices do not include GST/PST/shipping; over 5000 they look at different ways of printing that will save more money

2. Linx Print: <http://www.linxprint.com/services/green-linxprint/>

1930 Powell Street
Vancouver, BC V5L 1J3

- gate folding is included in the price; recycled paper is more expensive
 - For 1000 legal sized = \$735 on regular paper, \$825 on recycled

- For 2000 legal sized = \$1395 on regular paper
- For 1000 letter sized = \$405 on regular paper, \$450 on recycled
- For 2000 letter sized = \$735 on regular paper

3. Juke Box Print Vancouver Printing Company
 303-938 Howe St.
 Vancouver, BC V6Z 1N9

[REDACTED]

[REDACTED]

- Recycled upgrade means brochure is printed on 10% post consumer waste and 30% recycled premium stock; price includes folding; low print runs of 250 are available
 - For 1000 letter sized = \$480 on regular paper, \$624 on recycled
 - For 2500 letter sized = \$675 on regular paper, \$810 on recycled
 - For 5000 letter sized = \$819 on regular paper, \$1147 on recycled

NON-Green printing companies in Vancouver:

4. I.P. Impressions In Print Ltd
 #23 - 8980 Fraserwood Court
 Burnaby, BC V5J 5H7

[REDACTED]

[REDACTED]

- No recycled paper; gate fold is extra as it is not considered standard
 - For 1000 letter sized = \$424 on regular paper
 - For 2500 letter sized = \$535 on regular paper
 - For 5000 letter sized = \$717 on regular paper
 - For 1000 11x17 sized = \$662 on regular paper
 - For 2500 11x17 sized = \$907 on regular paper
 - For 5000 11x17 sized = \$1216 on regular paper

What does it mean to be carbon smart?

Since GHG have such a dramatic effect to both humans and the ecosystem, it is important for us to recognize how our choices may contribute to increasing or decreasing our current problems. The primary goal of being carbon smart is to make lifestyle choices to reduce GHG emissions resulting from excess energy use.

What is a low carbon diet?

Canada is one of the largest GHG contributors due to our highly industrialized structures and our dependence on fossil fuels⁴. Within our food system, the majority of GHG emissions are released from the production, processing, packaging, transport and waste of food⁵. In order to help offset some of the threats resulting from global warming, we have designed this carbon smart food guide to help show you how we can become a part of the solution. See inside for some important suggestions on how you can support the carbon smart cause to help save our world!

Seasonal BC Products¹⁴

Apr - Jul	Rhubarb
Apr - Sep	Spinach
Apr - Oct	Chives
May - Oct	Radish
May - Feb	Turnips
Jun - Jul	Cherries, Peas
Jun - Sep	Chinese Vegetables, Strawberries
Jun - Oct	Cilantro, Lettuce, Potatoes, Salad Greens
Jun - Nov	Cauliflower, Thyme
Jul - Aug	Apricots, Summer Squash
Jul - Sep	Basil, Blueberries, Cucumbers, Raspberries
Jul - Oct	Beans, Beets, Broccoli, Celery, Kale, Peppers, Swiss Chard, Tomatoes
Jul - Nov	Carrots
Jul - Feb	Cabbage
Aug	Peaches
Aug - Sep	Currents, Melons, Plums, Shallots
Aug - Oct	Blackberries, Corn, Sweet Onion
Aug - Dec	Garlic
Aug - Apr	Pears
Aug - Jun	Apples
Sep - Oct	Pumpkins
Sep - Nov	Leeks, Cooking Onions
Sep - Dec	Winter Squash
Oct	Cranberries
Oct - Dec	Brussels Sprouts
Year Round	Rosemary, Sage



For More Information

To learn more, visit our website as well as those listed below:

100 Mile Diet Society: www.100milediet.org
UBC Farm: www.landfood.ubc.ca/ubcfarm
Farmer's Markets: www.eatlocal.org

The Carbon Smart Food Guide



eat local
eat healthy
reduce carbon emissions

Developed by:
AgSc 450, Group 14
Faculty of Land & Food Systems,
University of British Columbia

In collaboration with:
the UBC Farm & the 100 Mile Diet Society



ubcfarm
AT THE UNIVERSITY OF BRITISH COLUMBIA



What are greenhouse gases?

Greenhouse gases (GHG) are chemicals within the earth's atmosphere that absorb and emit certain wavelengths of infrared radiation. The naturally occurring variety are important, as these GHG allow for the earth's temperature to be warm enough to sustain life.

Why can excess GHG be harmful?

Human contributions of GHG have caused an additional rise in global temperatures, causing an imbalance within the ecosystem¹. This result—otherwise known as the greenhouse gas effect—is particularly concerning as many scientists believe that the continual increase in GHG will lead to dramatic climate changes and disruption to the earth's ecosystem². Out of all the GHG, carbon dioxide (CO₂) has become the main focus as it contributes more than half of the radiative forces on the earth³.

Sensational Summer Salad

Ingredients

1-1/2 oranges

1/2 lemon

50 mL extra virgin olive oil

Pinch of salt

4 cups salad greens

1 cup grape tomatoes

1/2 red onion, chopped

Directions

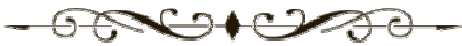
1) Extract the juice from the oranges and lemon; put in a large bowl.

2) Add oil and salt to the juices.

Whisk together.

3) Toss the salad greens, tomatoes and onions in the sauce.

4) Enjoy!



Who Said It's Not Easy Being Green?...



... Well now it is! With a minimum purchase of \$50 or more, you will receive your very own reusable Carbon Smart grocery bag. Look for the CO₂ label (as displayed on the bag) when shopping at the UBC Farm to identify what items are best choices for supporting the Carbon Smart initiative.

GUIDING PRINCIPLES FOR BECOMING A CARBON SMART CONSUMER

1 Eat Lower on the Food Chain

This means eating less meat and more plants. Meat is the most energy-intensive of all foods to produce and causes more GHG than all of the cars, trucks and planes in the world combined⁶! For the most part, red meat contributes 150% more GHG emissions than chicken/fish⁷. When you do choose to indulge in a carnivorous feast, try finding locally-produced, grass-fed options as they produce 40% less GHG emissions than their industrialized cousins⁸.

2 But Local & In-season Foods

Not only will eating local reduce the issues associated with food miles, but it is also important for supporting our local economy and preserving our local farmland. Plus, a meal made from imported ingredients can account for 4X the energy and GHG emissions of a similar meal of local ingredients⁹. A totally "localized" diet has the potential to reduce GHG emissions by 10,000 miles/yr/household¹⁰.

3 Choose Organic

Organic farming requires less energy and relies much less heavily on fertilizers and chemicals used in intensive farming¹¹. It also has the ability to decrease GHG emissions through its ability to sequester carbon in the soil. According to some sources, organic agriculture can sequester 3,500 lbs of CO₂ /acre-foot/year¹².

4 Avoid Processed/Packaged Foods

To offset the carbon contribution of processing, try canning and drying fruits and vegetables yourself. Or, for the really ambitious, consider planting a garden and grow as much of your own food as possible. At the very least, choose to drink tap water over bottled. In order to cut back on packaging, buy bulk food items whenever possible or look for products packaged with recycled content.

5 Don't Waste

From a CO₂ standpoint, food waste is defined not only by that which we discard, but it also takes into account that which we over consume. A good rule of thumb is to practice portion control, as too much food is not good for our personal health or the environment. Also, practice composting to decompose any organic waste.

6 Plan Ahead

Driving to the store accounts for a significant amount of CO₂ emissions, so plan to purchase in volume in order to limit the total number of trips. Alternately, use public transportation, ride a bike or walk to market if you live close. Lastly, remember to bring your reusable bags. In the event you forget, chose plastic over paper. Surprisingly, paper bags take 4x more energy than plastic to manufacture, and 10x more energy to recycle¹³.



Find Your Local Farmers' Market

Kitsilano Farmers Market
10th Ave & Larch St, Parking Lot of
Kitsilano Community Centre
Sundays, June 7 - October 25
10am - 2pm each week

Riley Park Farmers Market
30th & Ontario St, Parking Lot of
Riley Park Community Centre
Wednesdays, June 10 - October 21
12:30pm - 5:30pm each week

Trout Lake Farmers Market
15th Ave & Victoria Dr, Parking Lot of
Trout Lake Community Centre
Saturdays, May 16 - October 10
9am - 2pm each week

West End Farmers Market
1100 Block of Comox St across from
Nelson Park at Mole Hill
Saturdays, June 6 - October 24
9am - 2pm each week



Experience a 100 Mile Diet Menu at one of these restaurants

