Appendix A

LFM Photos

A Farmer's Market

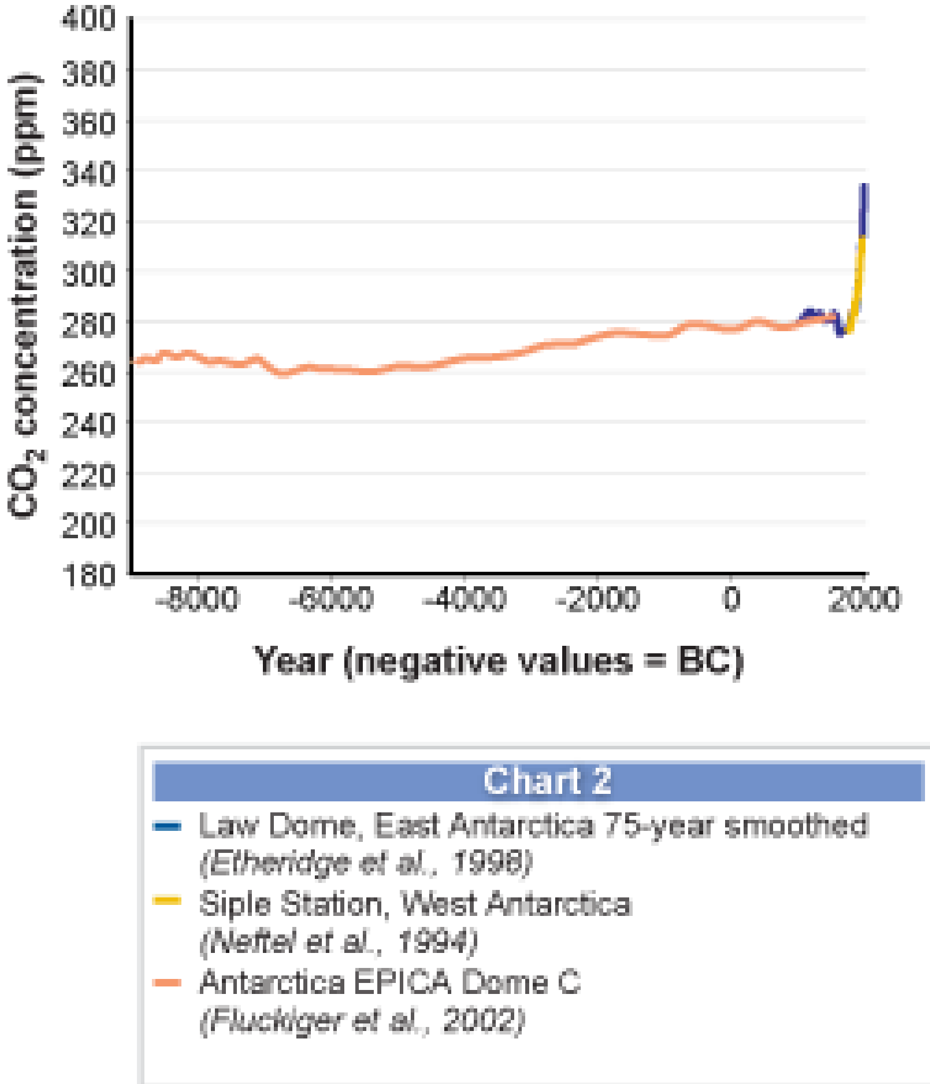
Source: "Farmers Markets". *GetRealMaine.com*. Get Real Get Maine!. 2011. Web. 18 Oct 2011.

Community Supported Agriculture

Source: "Ultimate Guide to Community Supported Agriculture". *Recipes.howstuffworks.com*. TLC Cooking. 2011. Web 18 Oct 2011.

Appendix B

Carbon Dioxide Concentrations 8947 BC to 1975 AD



Source: “Atmosphere Changes” *Epa.gov*. EPA, n.d. Web 11 Nov. 2011.

Appendix C

Carbon Emission Sources in Global vs. Local Food Systems

These figures compare a grocery delivery service in the global food system to the common model of a local food system in which the consumer drives to a local farm shop to retrieve their food.

A. Main sources of fossil Fuel Related Carbon Emissions and Flow of Products for the large scale system

Farm production: Tractors and other machinery (diesel) → Cold storage on farm (electricity) → Packing and administration (electricity and heating)

→ Distribution by heavy goods vehicle to regional hubs (diesel) → Cold storage at hub (electricity) → Loading and hub administration (electricity and heating

→ Home goods delivery by light goods vehicle diesel → Storage by consumer (electricity)

B. Main sources of fossil fuel related carbon emissions and flow of product for the small scale system

Farm production : Tractors and other machinery (diesel) → Travel by consumer to farm shop → Storage by consumer (electricity)

Source: Coley, David, Mark Howard, and Michael Winter. "Local Food, Food Miles and Carbon Emissions: A Comparison of Farm Shop and Mass Distribution Approaches" *Food Policy* 34 (2009) 150-155. *Wilson*. Web. 22 Sept 2011.

Appendix D

Attributes of Global and Local Food Production Systems

GLOBAL	LOCAL
Market Economy	Moral Economy
An Economics of Price	An Economic Sociology of Quality
Transnational Companies Dominating	Independent Artisan Producers Prevailing
Corporate Profits	Community Well-being
Intensification	Extensification
Large Scale Production	Small Scale Production
Industrial Models	“Natural” Models
Monoculture	Biodiversity
Resource Consumption and Degradation	Resource protection
Relations Across Distance	Relations of Proximity
Commodities Across Space	Communities in Place
Big Structures	Voluntary Actors
Technocratic Rules	Democratic Participation
Homogenization of Foods	Regional Palates

Source: Hinrichs, C. “The Practice and Politics of Food System Localization” *Journal of Rural Studies* 19 (2003) 33-45. *Wilson*. Web. 23 Sept 2011. Pg 36.

Appendix E

High vs. Low Impact Meals

Table 1. Meal components, dietary energy, and life cycle energy inputs for two different dinners, high and low

Meal component	Kg	MJ dietary energy (SNFA, 1996)	MJ life cycle inputs
Dinner: high			
Beef	0.13	0.80	9.4
Rice	0.15	0.68	1.1
Tomatoes, greenhouse	0.070	0.06	4.6
Wine	0.30	0.98	4.2
Total	0.65	2.51	19
Dinner: low			
Chicken	0.13	0.81	4.37
Potatoes	0.20	0.61	0.91
Carrot	0.13	0.21	0.50
Water, tap	0.15	0.23	0.0
Oil	0.02	0.74	0.30
Total	0.60	2.61	6.1

Table 2. Meal components, dietary energy, and life cycle energy inputs for two different breakfasts, high and low

Meal component	kg	MJ dietary energy (SNFA, 1996)	MJ life cycle inputs
Breakfast: high			
Yoghurt, imported	0.15	0.59	1.8
Baked cereal product	0.04	0.64	1.6
Raspberry jam	0.02	0.15	0.32
Bread, frozen, imported	0.07	0.76	0.88
Cheese	0.03	0.46	1.8
Butter	0.01	0.30	0.40
Total	0.32	2.9	6.8
Breakfast: low			
Milk	0.15	0.36	0.74
Oat porridge	0.23	0.50	0.57
Lingonberry jam	0.02	0.13	0.22
Apple, Sweden	0.05	0.11	0.17
Bread, fresh, local bakery	0.07	0.76	0.62
Egg	0.03	0.18	0.53
Margarine	0.01	0.30	0.17
Total	0.56	2.3	3.0

Source: Carlsson-Kanyama, Annika, Marianne Pipping Ekstrom and Helena Shanahan. “Food and life cycle energy inputs: consequences of diet and ways to increase efficiency” *Ecological Economics* 44 (2003) 293-307. *SciDirect*. Web. 27 Oct 2011.

Appendix F

Food Consumption and Mimicking Localization

This table shows the percentages of expenditures or caloric intake in various food categories that would have to be switched in order to create the same change in greenhouse gas emissions as theoretical complete localization.

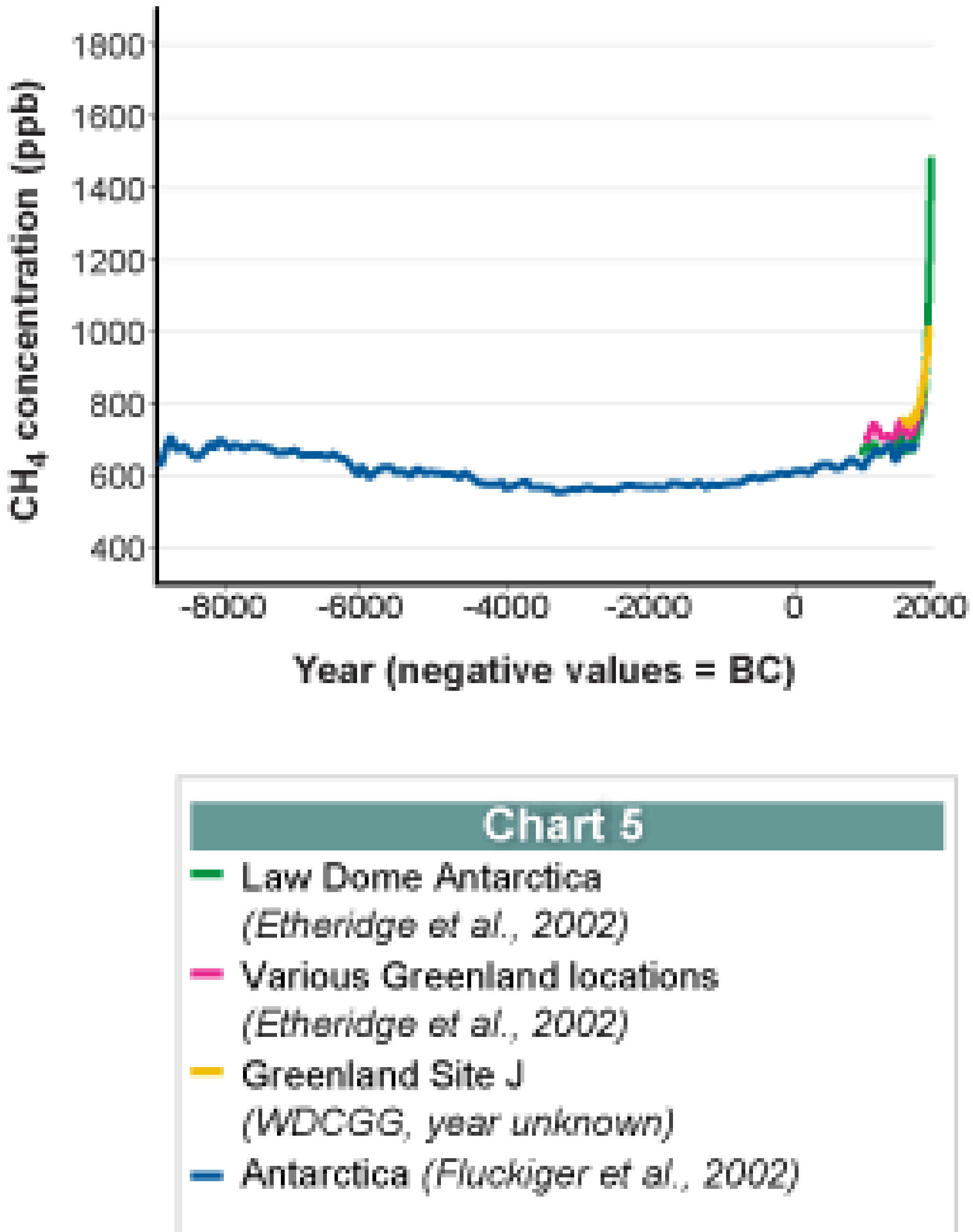
TABLE 2. Shifts in Expenditure (Top) or Calories (Bottom) from Row Category to Column Category Which Result in a GHG Reduction of 0.36 tCO_2e/Household-yr, the Equivalent of a Totally "Localized" Diet ("Non-dairy Veg Diet" Represents the Average American Diet Less All Meat and Dairy)

$expenditure	chicken	grains	fruit/veg	nondairy veg diet
red meat	24%	21%	21%	21%
dairy	42%	37%	37%	36%
meat + dairy	15%	14%	14%	13%
kCal	**chicken**	**grains**	**fruit/veg**	**nondairy veg diet**
red meat	22%	17%	23%	17%
dairy	93%	33%	107%	38%
meat + dairy	18%	11%	19%	12%

Source: Weber, Christopher L. and H. Scott Matthews. "Food Miles and the Relative Cliamte Impacts of Food Choices in the United States" *Environmental Science Technology* 42 (2008) 3508- 3513. *Wilson*. Web. 23 Sept 2011.

Appendix G

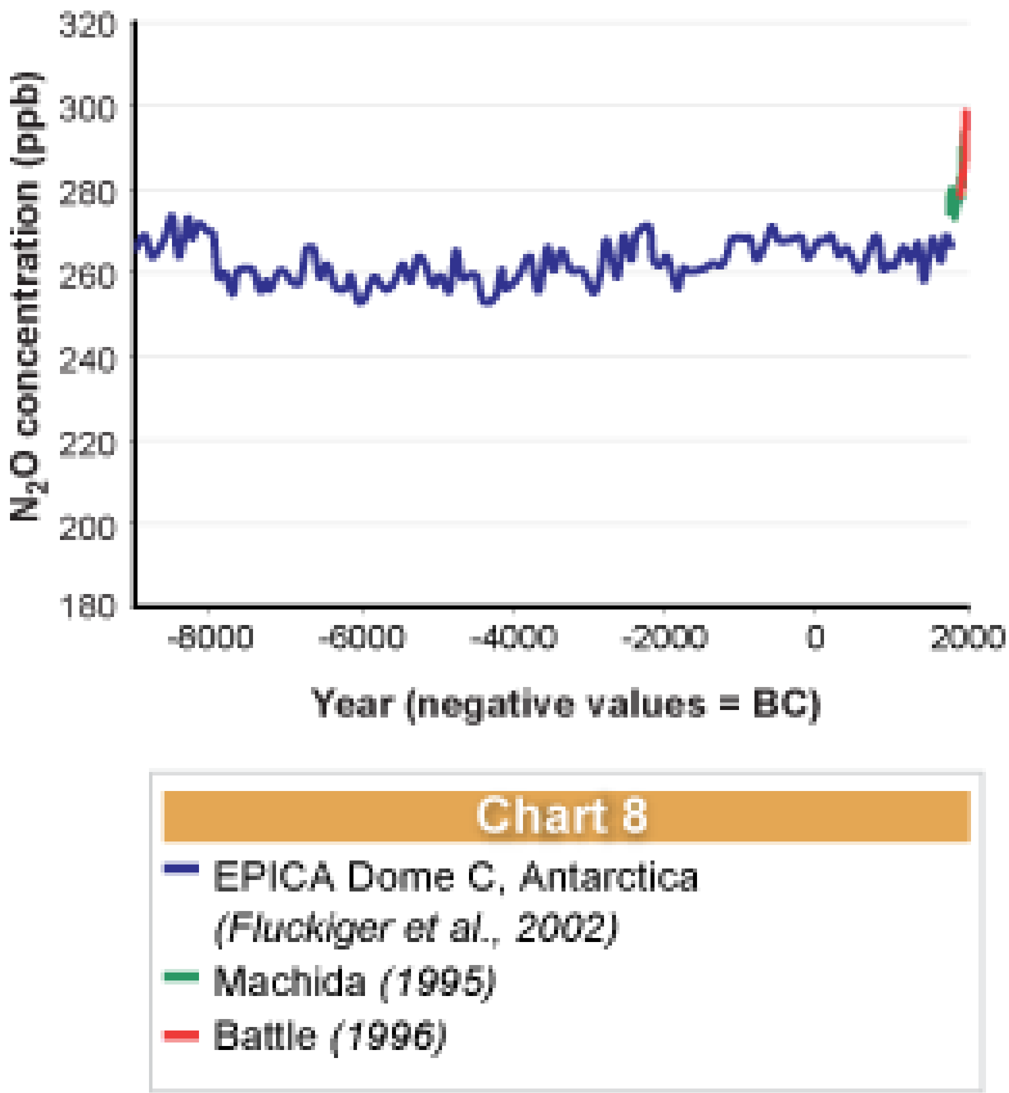
Methane Concentrations 8945 BC to 1980 AD



Source: “Atmosphere Changes” *Epa.gov*. EPA, n.d. Web 11 Nov. 2011.

Appendix H

Nitrous Oxide Concentrations 9000 BC to 1976 AD



Source: “Atmosphere Changes” *Epa.gov*. EPA, n.d. Web 11 Nov. 2011.

Appendix I

Emissions by Mode of Transport

TABLE 1. Energy and Greenhouse Gas Emissions Per ton-km for Different Modes of Transport[a]

	MJ/t-km	t CO_2e/t-km $\times 10^6$	source
inland water	0.3	21	(*23*)
rail	0.3	18	(*23*)
truck	2.7	180	(*23*)
air[a]	10.0	680[a]	(*25*)
oil pipeline	0.2	16	(*23,24*)
gas pipeline	1.7	180	(*23,24*)
int. air[a]	10.0	680[a]	(*25*)
int. water container	0.2	14	(*26*)
int. water bulk	0.2	11	(*26*)
int. water tanker	0.1	7	(*26*)

[a] CO_2 emissions were used as an indicator for the radiative forcing effects of aviation, which are actually higher than just CO_2 emissions (*27*).

This figure displays the differences in energy use and greenhouse gas emissions per ton-km (a measurement analogous to food miles per item). Air and trucking are the two biggest users of energy and emitters of greenhouse gas emissions. Rail and water transport are the most efficient.

Source: Weber, Christopher L. and H. Scott Matthews. “Food Miles and the Relative Cliamte Impacts of Food Choices in the United States” *Environmental Science Technology* 42 (2008) 3508- 3513. *Wilson*. Web. 23 Sept 2011.

Appendix J

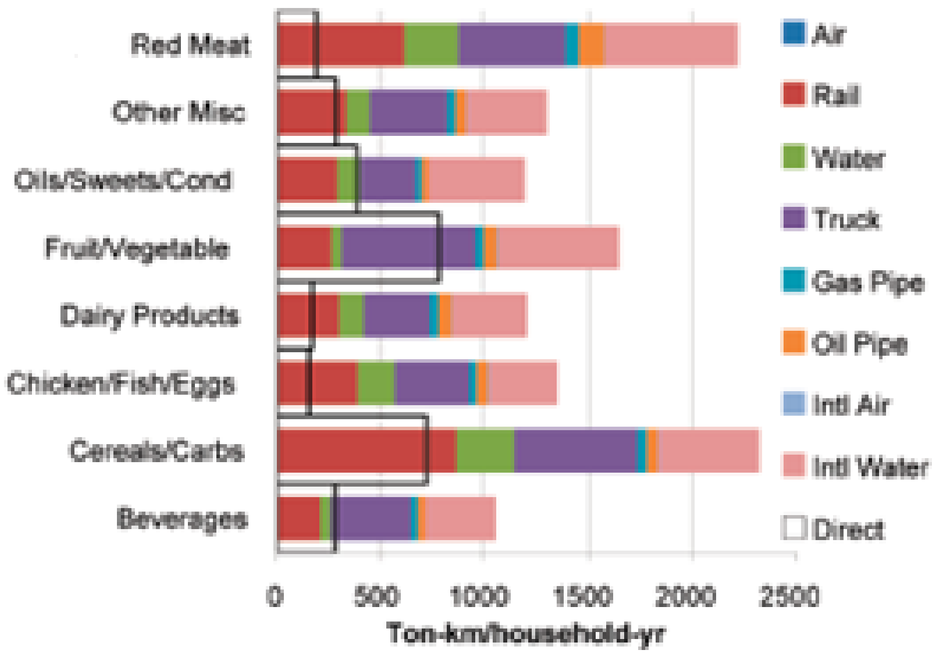
Aims of Organic Production and Processing

To produce food of high quality in sufficient quantity.
To interact in a constructive and life-enhancing way with natural systems and cycles.
To consider the wider social and ecological impact of the organic production and processing system.
To encourage and enhance biological cycles within the farming system, involving micro-organisms, soil flora and fauna, plants and animals.
To develop a valuable and sustainable aquatic ecosystem.
To maintain and increase long term fertility of soils.
To maintain the genetic diversity of the production system and its surroundings, including the protection of plant and wildlife habitats.
To promote the healthy use and proper care of water, water resources and all life therein.
To use, as far as possible, renewable resources in locally organised production systems.
To create a harmonious balance between crop production and animal husbandry.
To give all livestock conditions of life with due consideration for the basic aspects of their innate behaviour.
To minimise all forms of pollution.
To process organic products using renewable resources.
To produce fully biodegradable organic products.
To produce textiles which are long-lasting and of good quality.
To allow everyone involved in organic production and processing a quality of life which meets their basic needs and allows an adequate return and satisfaction from their work, including a safe working environment.
To progress toward an entire production, processing and distribution chain which is both socially just and ecologically responsible.

Source: Rigby, D. and D. Caceres. "Organic Farming and the Sustainability of Agricultural Systems" *Agricultural Systems* 68 (2001): 21-40. *Wilson*. Web. 25 Sept. 2011.

Appendix K

Transport Emissions in Ton-Km/Household-year by Food Product

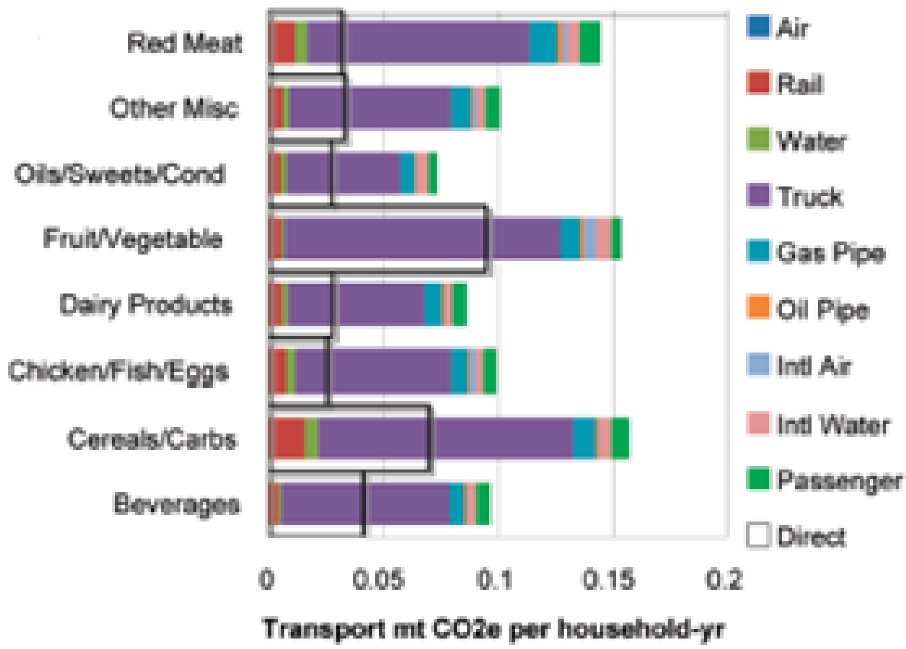


This figure shows the total kilometers per ton of food per household per year by mode of transport. The boxed portion shows the final delivery portion of the transport chain. Therefore, an item like red meat travels a lot of miles and a very small portion of those are in the final delivery portion. Fruits and vegetables have a great portion of their food miles made up by their final transport. This shows the importance of considering miles from other parts of production.

Source: Weber, Christopher L. and H. Scott Matthews. “Food Miles and the Relative Climate Impacts of Food Choices in the United States” *Environmental Science Technology* 42 (2008) 3508-3513. *Wilson*. Web. 23 Sept 2011.

Appendix L

Transport Emissions in mt CO2e/household-yr by Food Product

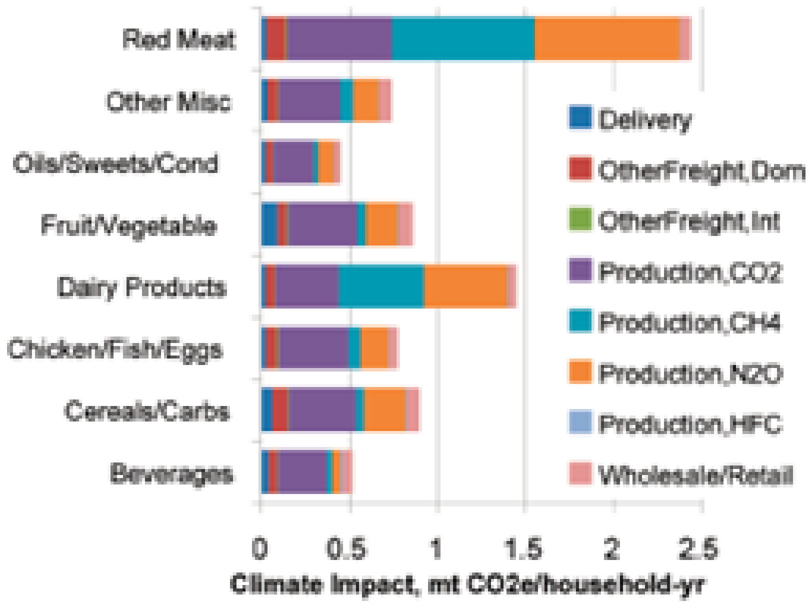


This figure shows transport related Carbon Dioxide emissions by mode. Trucking is a significant source of emissions Again, the clear box represents the amount of emissions contributed by the final transport stage. The final transport stage is most significant for fruits and vegetables.

Source: Weber, Christopher L. and H. Scott Matthews. “Food Miles and the Relative Climate Impacts of Food Choices in the United States” *Environmental Science Technology* 42 (2008) 3508- 3513. *Wilson*. Web. 23 Sept 2011.

Appendix M

Climate Impact in mt CO2e/household-yr by Food Product

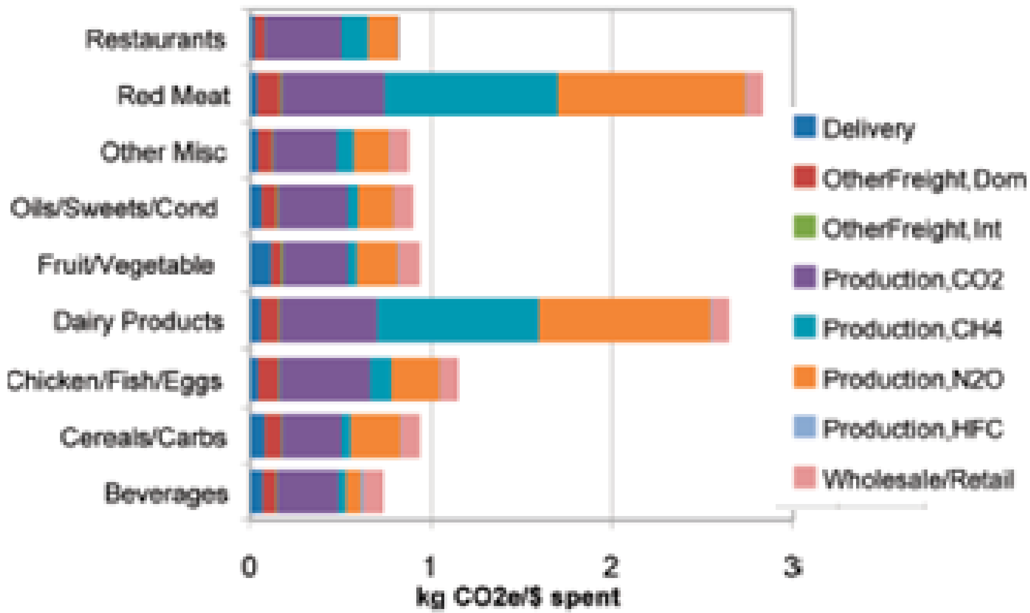


This figure shows the total greenhouse gas emissions by supply chain tier. As seen, red meat has the highest impact, coming primarily from nitrous oxide, methane, and carbon dioxide during production. Essentially, this graph shows that delivery is not a significant source of climate impact.

Source: Weber, Christopher L. and H. Scott Matthews. “Food Miles and the Relative Climate Impacts of Food Choices in the United States” *Environmental Science Technology* 42 (2008) 3508-3513. *Wilson*. Web. 23 Sept 2011.

Appendix N

Emissions by kg CO2e/$ spent by Food Product

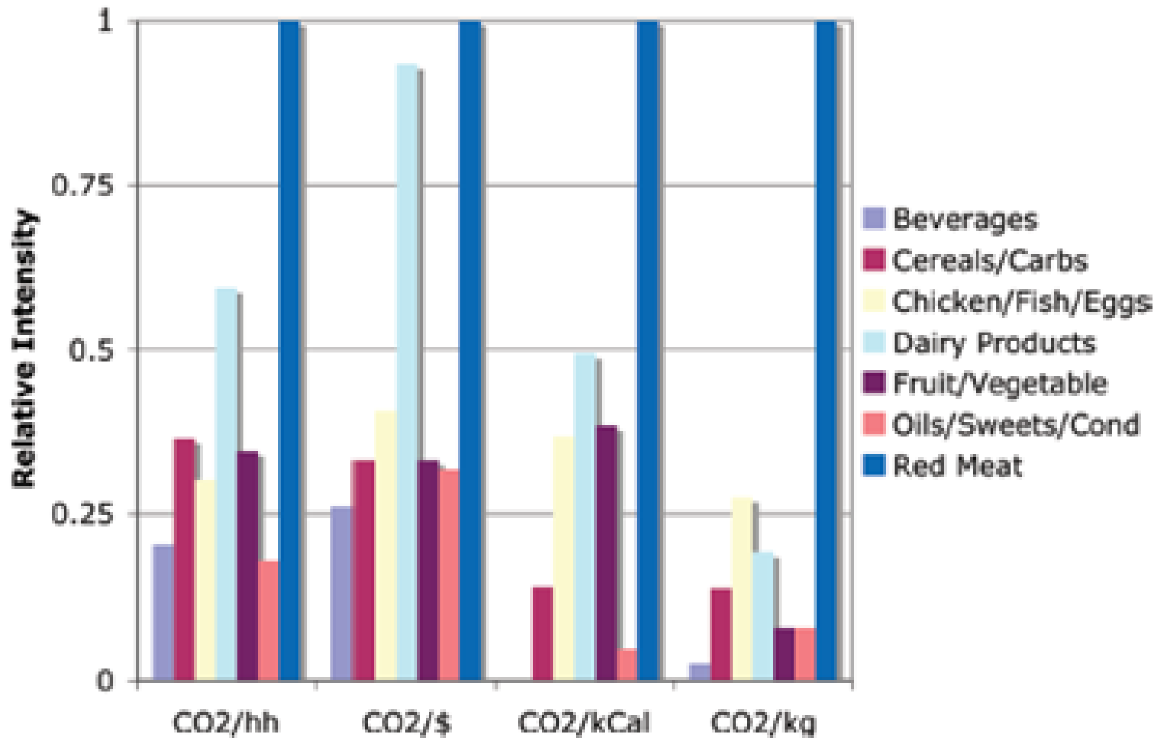


This figure shows the greenhouse gas emissions by phase of production when graphed by dollar spent. Again, red meat and dairy products have the highest impact.

Source: Weber, Christopher L. and H. Scott Matthews. "Food Miles and the Relative Climate Impacts of Food Choices in the United States" *Environmental Science Technology* 42 (2008) 3508-3513. *Wilson*. Web. 23 Sept 2011.

Appendix O

Comparison of Normalization Factors for Total GHG of Food

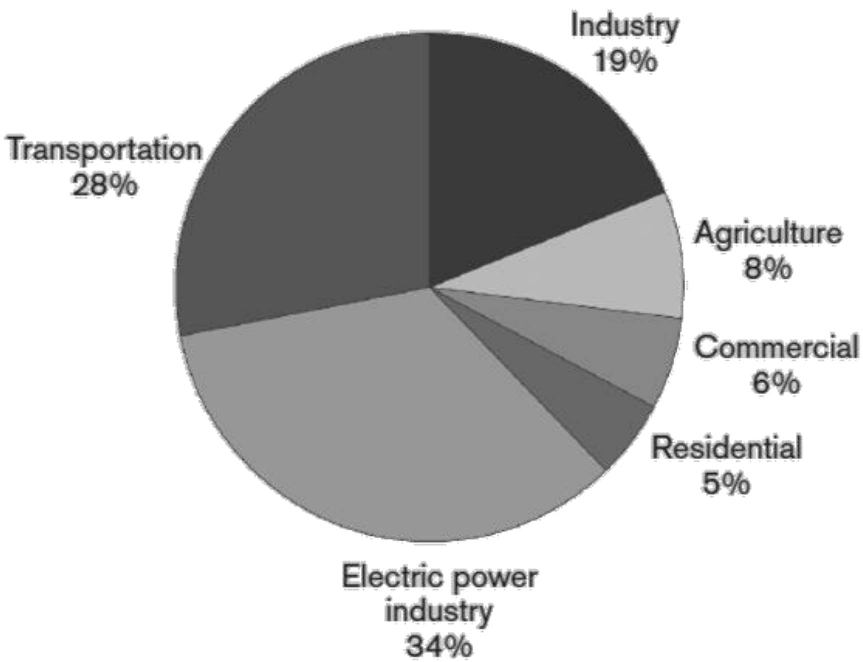


This figure shows carbon dioxide emissions for different food categories by household, dollars spent, calories consumed and kilogram. Consistently, red meat and dairy represents the highest impact.

Source: Weber, Christopher L. and H. Scott Matthews. "Food Miles and the Relative Climate Impacts of Food Choices in the United States" *Environmental Science Technology* 42 (2008) 3508-3513. *Wilson*. Web. 23 Sept 2011.

Appendix P

Greenhouse Gas Emissions by Sector

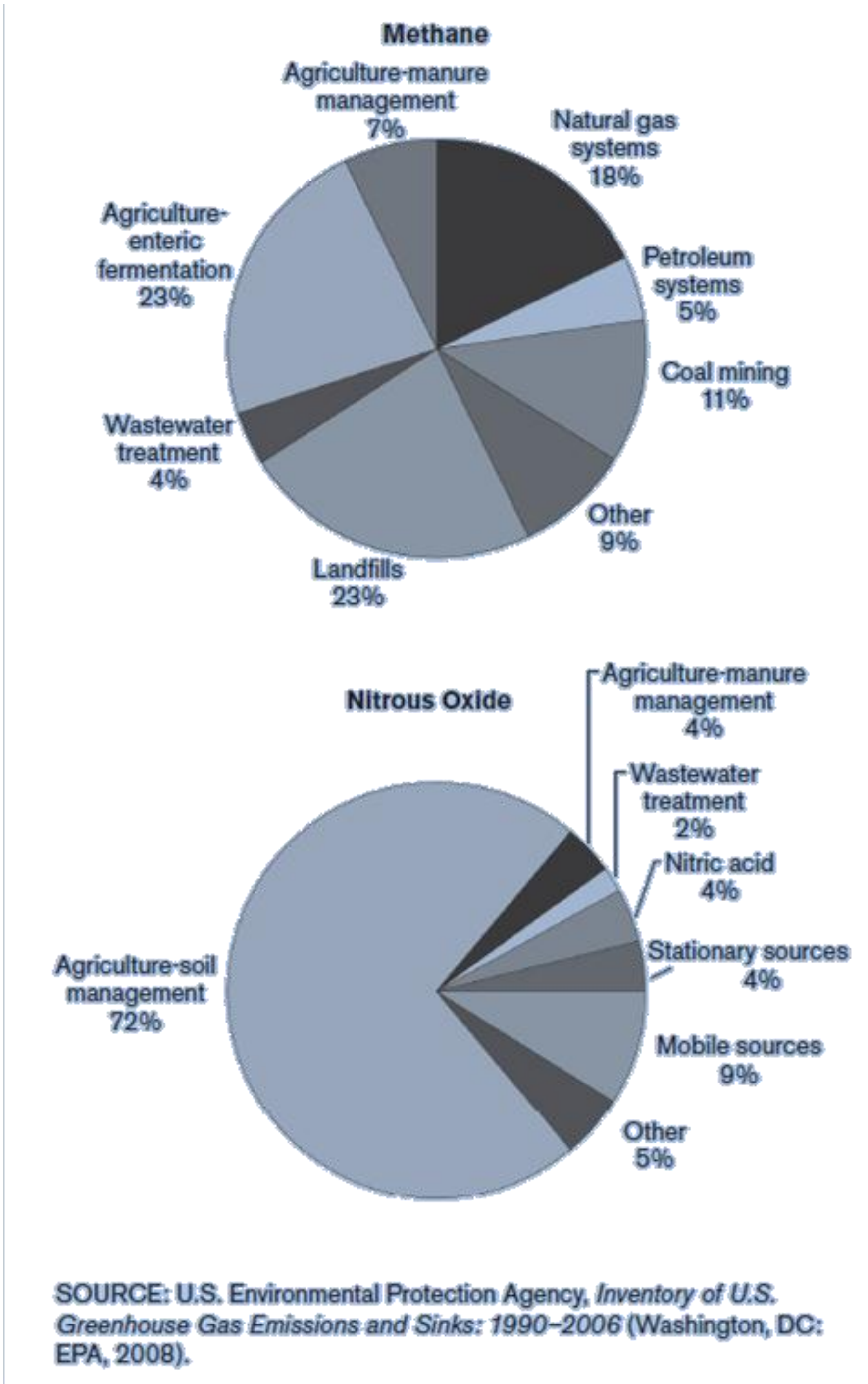


SOURCE: U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2006* (Washington, DC: EPA, 2008).

Source: Siikamaki, Juha. "Climate Change and U.S Agriculture: Examining the Connections" *Environment* (Jul/Aug 2008). 36-49. *Ebsco.* Web. 8 Nov 2011.

Appendix Q

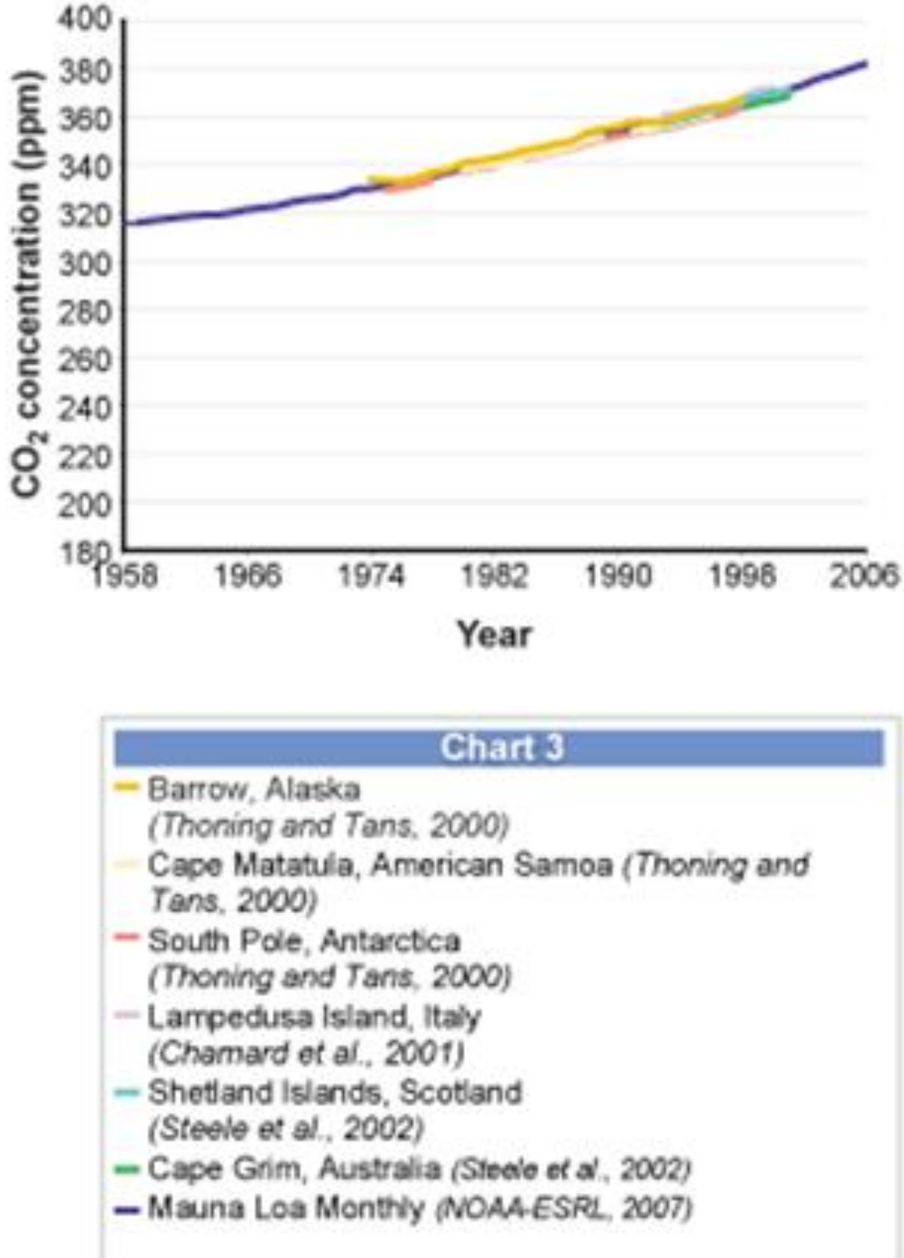
Methane and Nitrous Oxide Emissions by Source



Source: Siikamaki, Juha. "Climate Change and U.S Agriculture: Examining the Connections" *Environment* (Jul/Aug 2008). 36-49. *Ebsco.* Web. 8 Nov 2011.

Appendix R

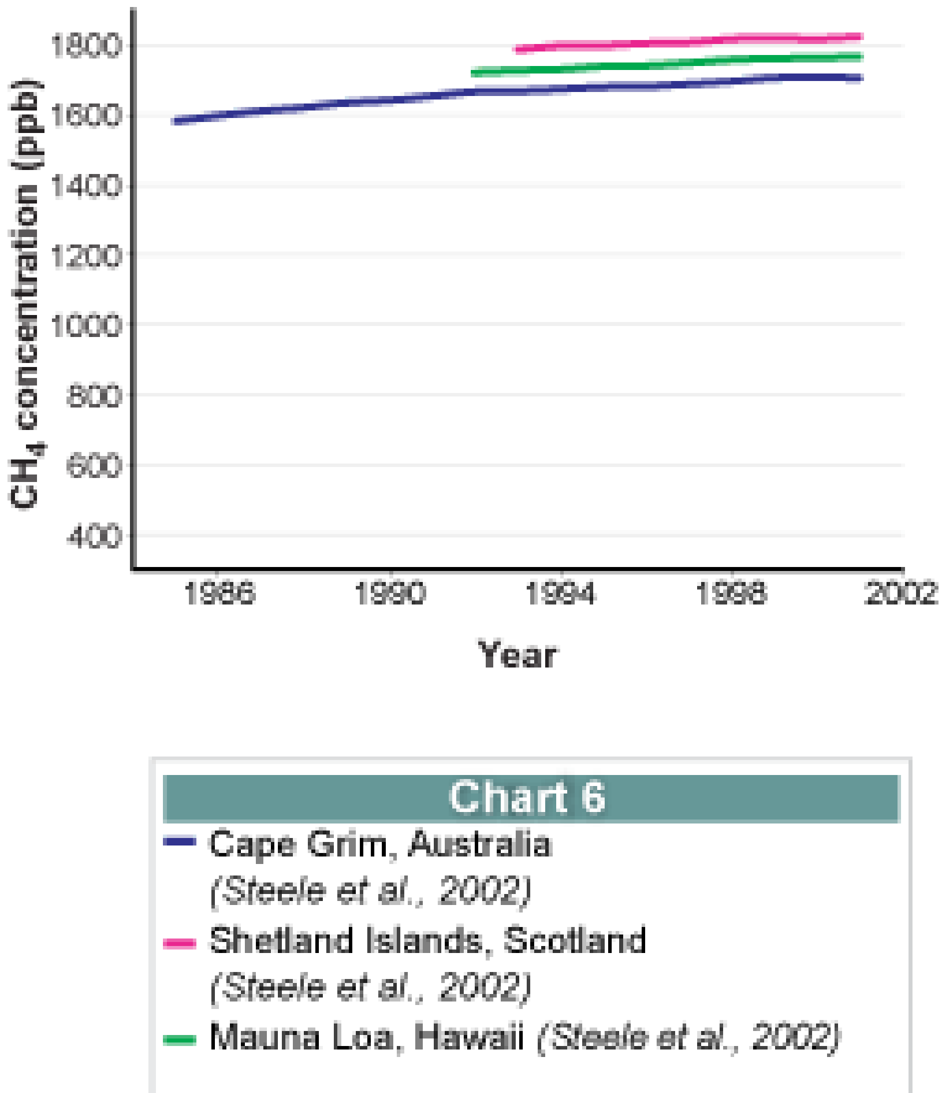
Carbon Dioxide Concentrations 1959 to 2006



Source: "Atmosphere Changes" Epa.gov. EPA, n.d. Web 11 Nov. 2011.

Appendix S

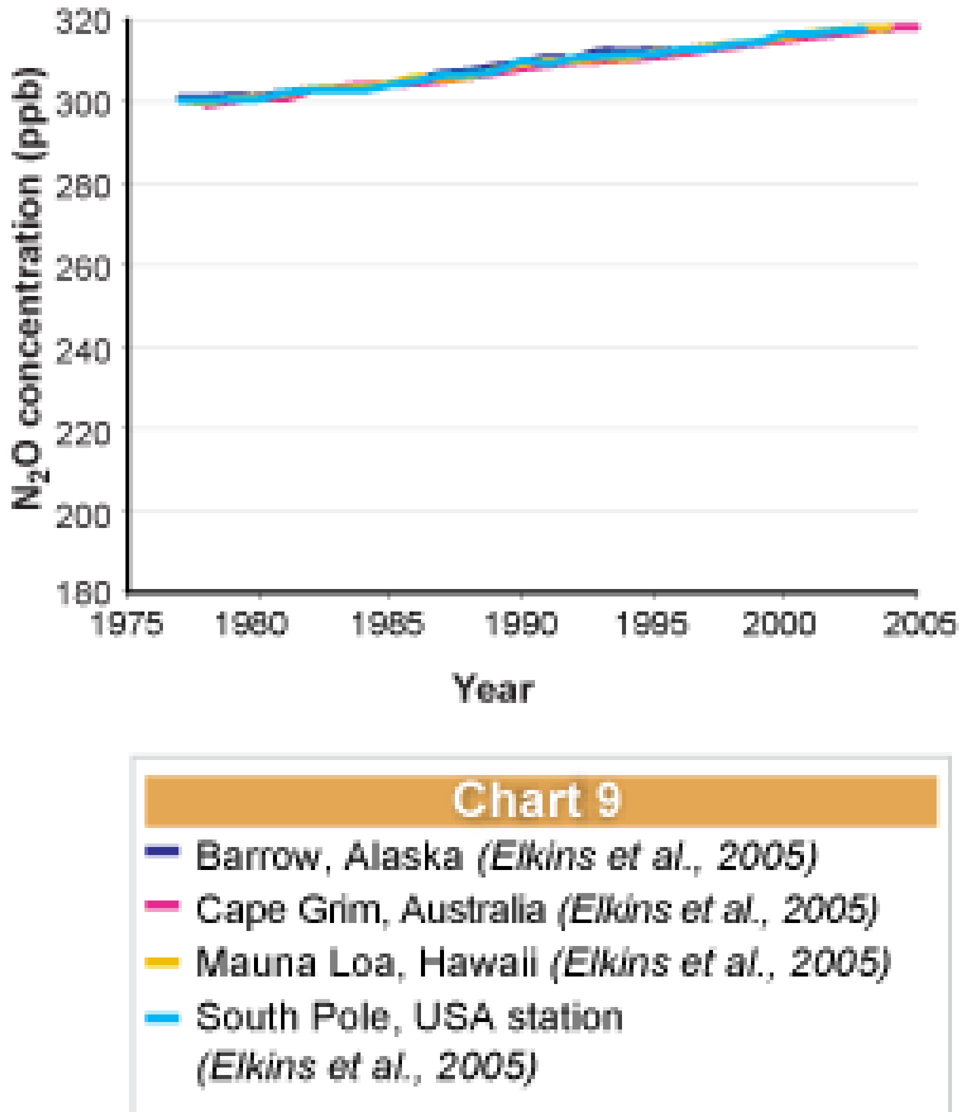
Methane Concentrations 1985 to 2001



Source: “Atmosphere Changes” *Epa.gov*. EPA, n.d. Web 11 Nov. 2011.

Appendix T

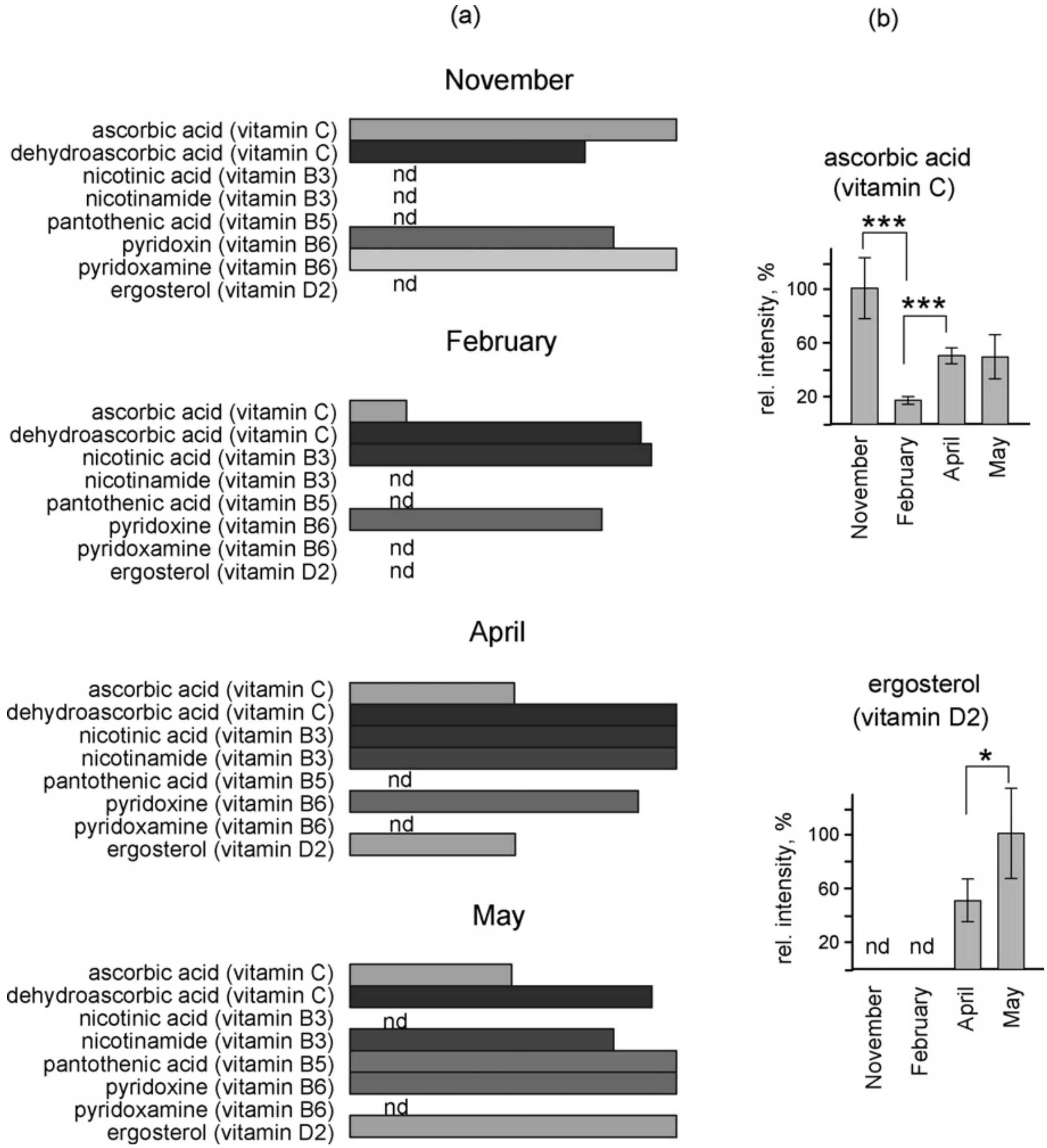
Nitrous Oxide Concentrations 1977 to 2005



Source: “Atmosphere Changes” *Epa.gov*. EPA, n.d. Web 11 Nov. 2011.

Appendix U

Changes in Vitamin Levels in White Cabbage over Long-Term Storage

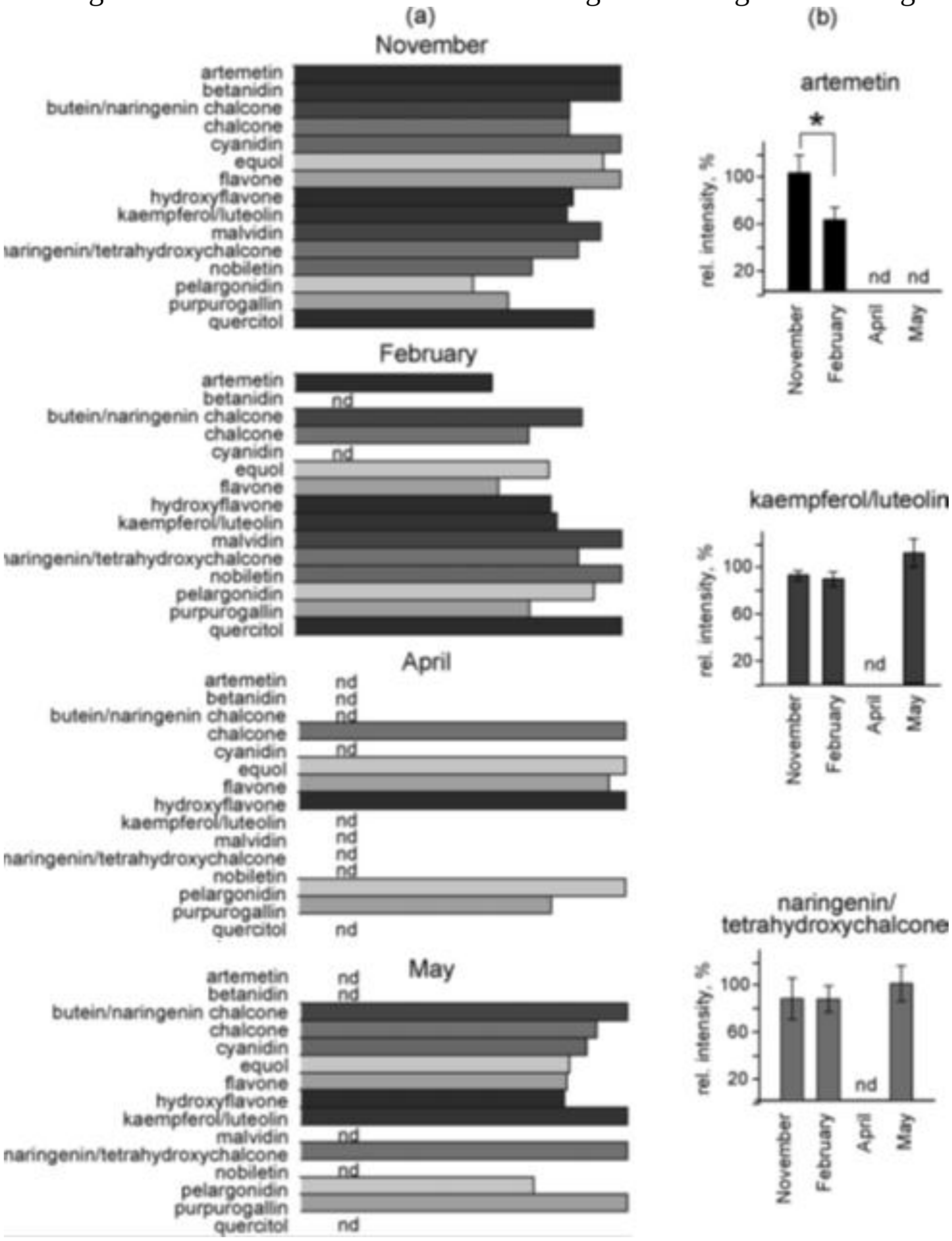


a. Vitamin profiles in white cabbage at different stages of storage. Bars represent mean peak intensities of metabolites from four cabbages at different months normalized to 100%
b. Changes in abundance of selected vitamins during storage period. Bars represent means ± SD for four cabbages. Asteriks indicate a significant different between months at *P<0.05 and ***P<0.0001 according to Student t-test; nd, not detected.

Source: Hounsome et al.

Appendix V

Changes in Flavonoid Levels in White Cabbage over Long-Term Storage



a. Flavonoid profiles in white cabbage at different stages of storage. Bars represent mean peak intensities of metabolites from four cabbages at different months normalized to 100%.
b. Changes in abundance of selected flavonoids during storage period. Bars represent means ± SD for four cabbages. Asterisks indicate significant different months at *P<0.05 accoding to Student t-test; nd, not detected.

Source: Hounsome et al.

Appendix W

Price Comparisons

Items	Farmers Market	Supermarket
Potatoes	$1.30/ lb	$1.29/lb
Salad Mix	$15/lb	$4.92/1b
Onions	$0.90	$1.49/ lb
Eggs	$4.50/ dz	$2.89/dz
Rhody Fresh Half Gallon	$3.00	$2.99
Apples	$0.80/ lb	$1.33/ lb
Shallots	$4/ lb	$ 3.49/ lb
Loaf of Bread	$6.00	$0.99 - $4.59
Baguette	$3.00	$2.19-$3.79
Garlic	$1.00/ head	$0.50/ head

Source: Data Collected by Jennifer Sliney at the Winter Farmer's Market in Pawtucket, RI and at Stop and Shop on Bellevue Ave in Newport, RI on April 14th, 2012