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## Motivation

- Warming of the climate system is unequivocal" (IPCC Report 2007, 2)
- Carbon dioxide (CO<sub>2</sub>) contributes notably to global warming
- CO<sub>2</sub> accounts for 75% of human-generated global warming (Stern 2008)
- Dietary patterns & private consumption cause 40% of climate relevant emissions in Germany (UBA 2007); likely to be similar elsewhere
- Consumption patterns can only be adjusted if consumers can identify ecological sustainable products**
- Ecological footprint concept: "nutrition label for the planet" (Rees 1992)
  - Carbon footprint: "amount of CO<sub>2</sub> created..."
  - Water footprint: "amount of water used..."
- ...during food production, processing, storage, packaging and distribution"
- Some countries are establishing pilot projects to encourage reduced CO<sub>2</sub> emissions by product labeling
  - For example: Carbon Counted, Canada; Carbon Trust label, UK
- Carbon footprint label introductions, e.g. by Tesco in the UK
- Such labels are slowly being introduced into the Canadian market

## Research question

To what extent do consumers prefer food products labeled with carbon and water footprints?

## Design of survey

- Apply an online consumer survey of Canadian adults, Winter 2011, n=1500
- Measure respondent preferences by introducing hypothetical market scenarios through attribute-based stated choice questions & analysis
- Attributes: price, carbon emission equivalents in kg, water usage in liters
- Products queried: ground beef and potatoes
- Example Question:

Imagine you are in your usual grocery store and you would like to purchase 1 kg of ground beef you usually buy. Do you choose Alternative A, Alternative B or Alternative C?

	Alternative A	Alternative B	Alternative C
1 kg of ground beef			
Carbon (CO <sub>2</sub> ) emission equivalents	22.93 kg	26.37 kg	
Water usage	120.75 ml/l	120.75 ml/l	
Price	6.25 CAD \$	6.14 CAD \$	
I would choose:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Data analysis

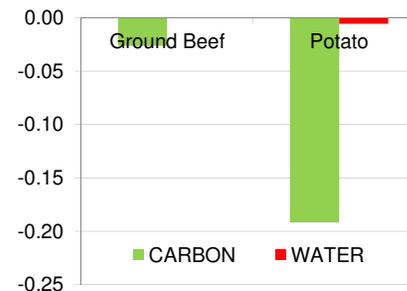
- Mixed logit models are estimated in order to measure respondent's willingness to pay (WTP) for less carbon emitted and less water used in these foods.

## Results: Mixed logit estimates

	Ground Beef		Potatoes	
	Coeff.	SE	Coeff.	SE
PRICE (M)	-1.33	0.05***	-0.80	0.03***
CARBON (M)	-0.18	0.02***	-1.34	0.11***
CARBON (SD)	0.18	0.03***	1.11	0.18***
WATER (M)	0.00	0.287D-04***	-0.04	0.00***
WATER (SD)	.255D-05	0.376D-04	0.01	0.01
NONE (M)	-25.90	1.24***	-22.43	1.00***
NONE (SD)	5.72	0.69	3.19	0.57***
Rest. LL	-3410.09		-3410.09	
R2	0.32		0.45	
Chi2	2208.58		3071.38	

p<0.1 \* ; p<0.05 \*\* ; p<0.01 \*\*\*

## Discounts for more carbon and water used by ground beef and potato (WTP, CAD\$/kg)



## Conclusions

- Significant WTP for lower carbon use
- Significant coefficient for water footprint (but very low WTP)
- Higher WTP footprint reduction for potato than meat
- Heterogeneity in WTP for less carbon (but not for less water use)

## Outlook

- Why is the carbon footprint seen as more important than water use in Canada?
- Labeling supports consumer actions that show their preferences: *If real numbers are provided, consumers are able to compare products*
- Environmental issues such as CO<sub>2</sub> emission and water usage have potential impacts on consumer choices
- Labeling with respect to climate issues, should promote consumption patterns supporting environmental sustainability

## References

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**Research Poster from the  
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**ABSTRACT CMD-01**

**Explaining consumers' attitudes towards carbon and water footprints**

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This poster reports results from ongoing research which aims to analyze consumers' knowledge and preferences regarding processed and unprocessed food products labelled with carbon and water footprints. To reach these goals, a large-scale online consumer survey was applied to adult members of the Canadian population in winter 2011. To capture the slow market acceptance of such labels in Canada, we introduce hypothetical market scenarios to consumers through attribute-based stated choice analysis. Applying mixed logit models we measure whether preferences for carbon and water footprints differ among unprocessed and processed food products. Results are anticipated to benefit public agencies engaged in food product labelling, as well as Canadian firms aiming to develop labelling strategies for ecological footprints.

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