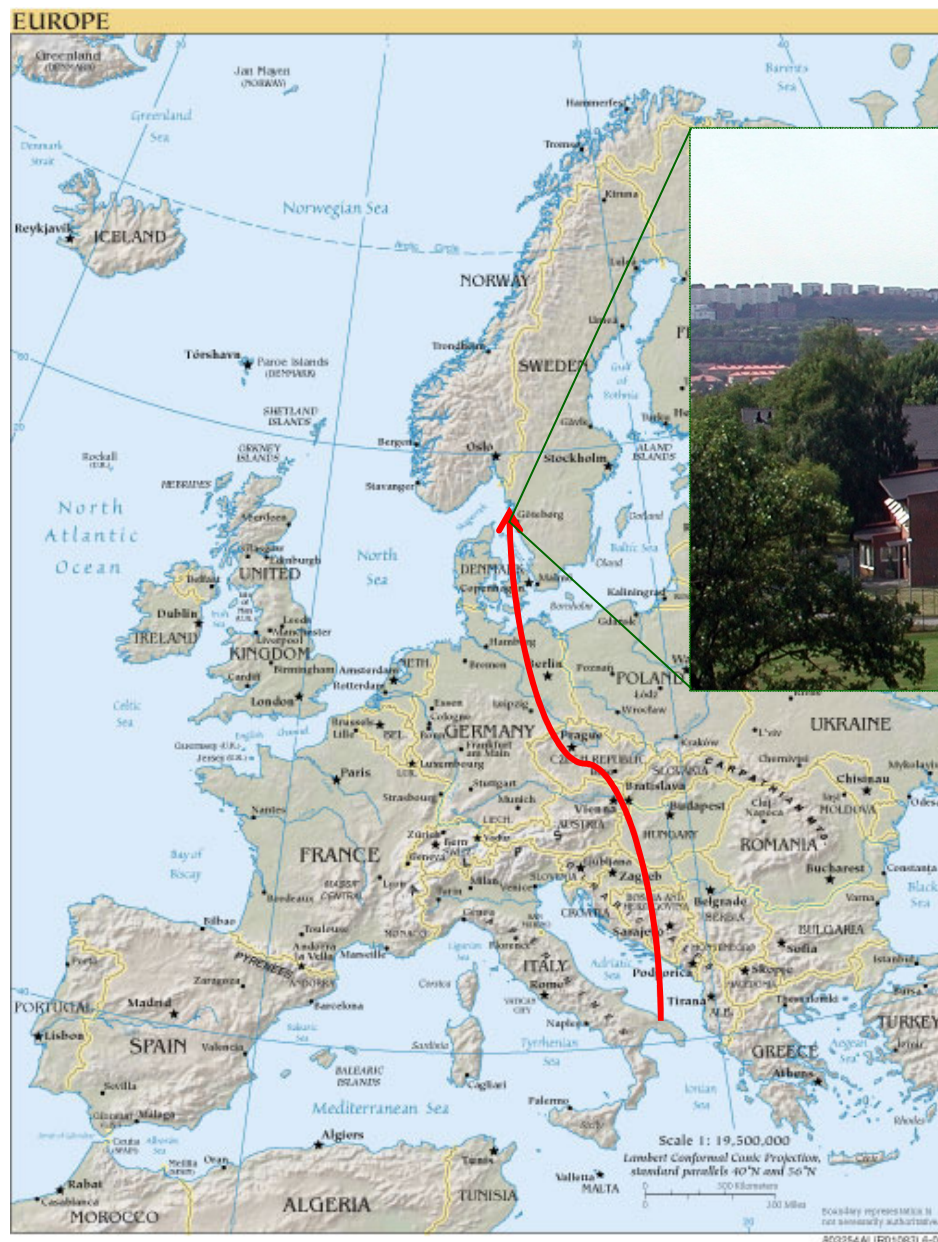


Changing diets – what is the influence on greenhouse gas (GHG) emissions of different consumption patterns?

Katarina Nilsson and Ulf Sonesson

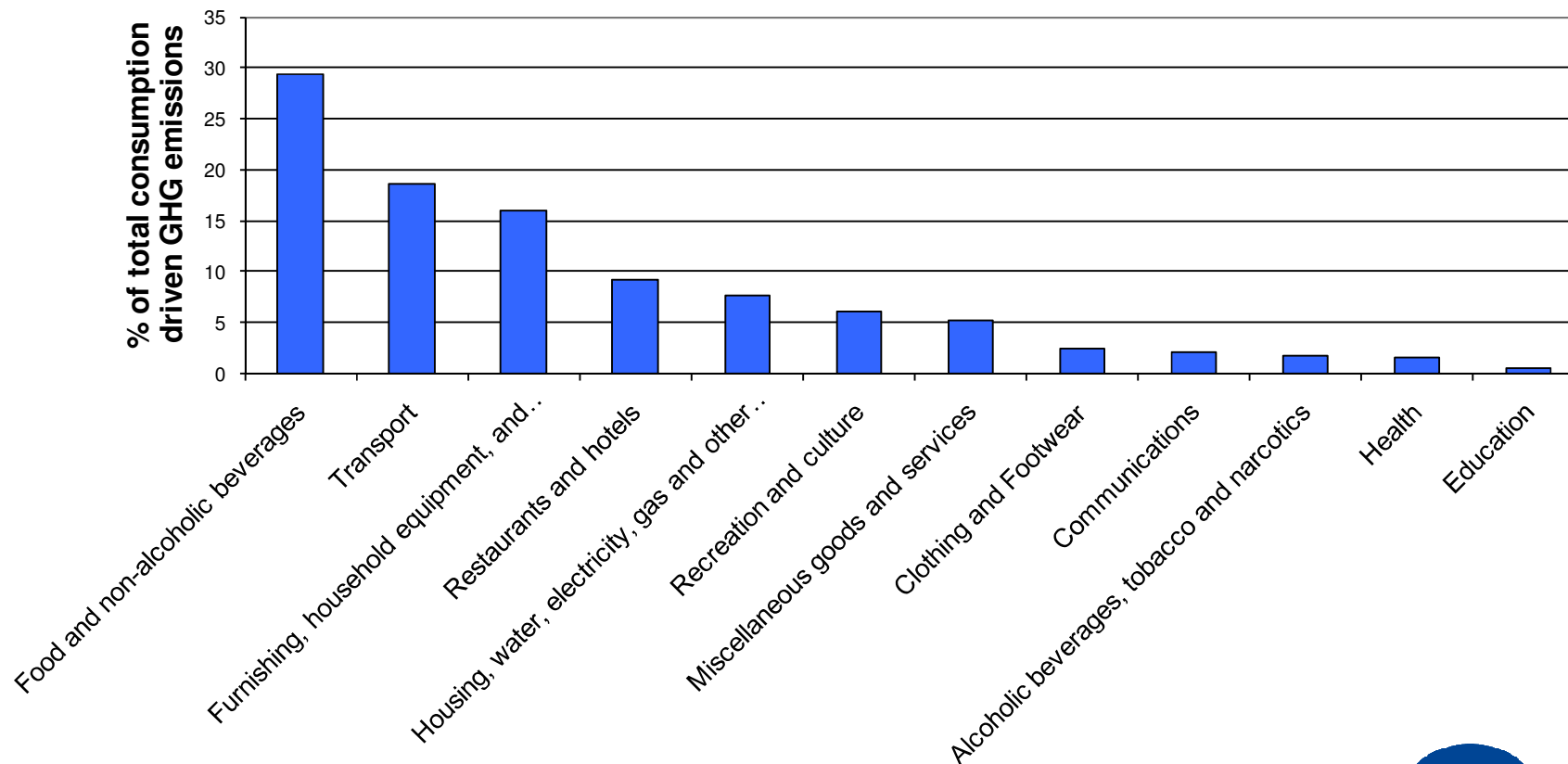
SIK- the Swedish Institute for Food and Biotechnology,
Sustainable Food Production, Göteborg, Sweden.





LCA Food 2010, Bari 22-24 September 2010

GHG emissions from different areas of final consumption (EU 25)



Ref: Environmental Impact of Products (EIPRO), European Commission Joint Research Centre, available at http://ec.europa.eu/environment/ipp/pdf/eipro_report.pdf (2006)

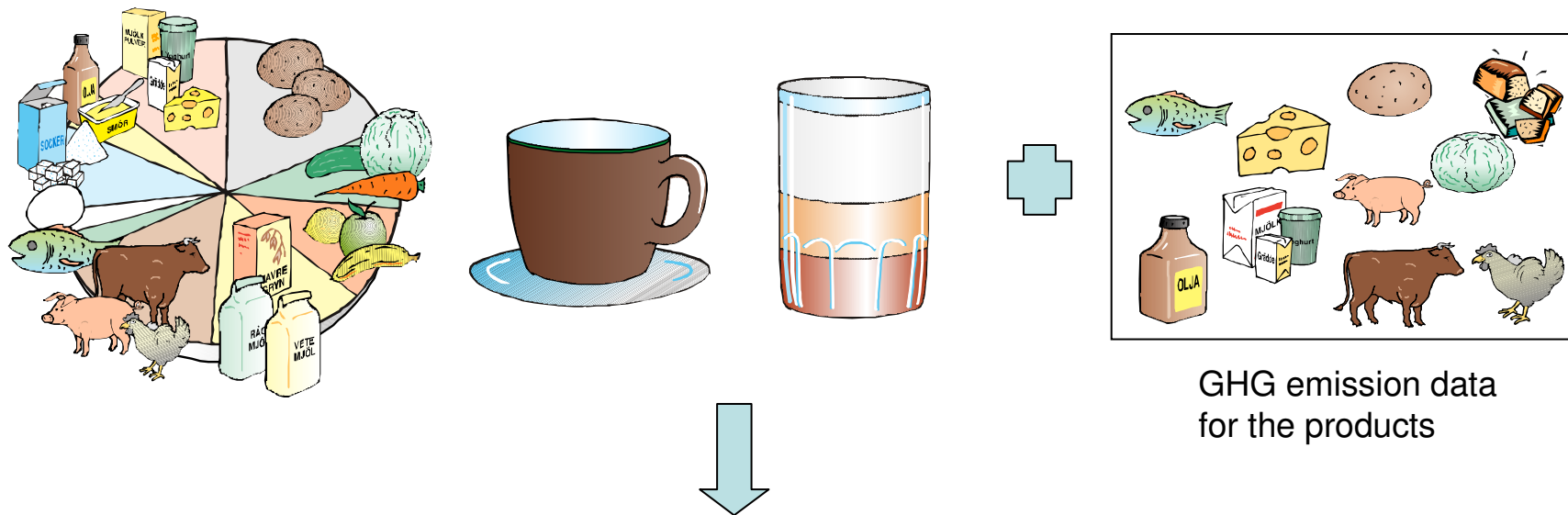
Emissions of GHG caused by the Swedish food consumption

Source	Milj ton CO ₂ e	Comments
Agriculture	11-11,5	<i>Incl. energy and prod. of imported fertilizer and feed</i>
Food import	+ ??	
Food export	- ??	
Food industry	0,93	<i>Fossil CO₂, (2000)</i>
Transports	1,3-1,7	<i>Fossil CO₂, (2000)</i>
Retail	0,13-0,14	<i>Fossil CO₂ (2000), not complete</i>
Household	0,3	<i>Fossil CO₂, (2000)</i>
Sum	Ca 14,5	

Total in Sweden: 75Mt CO₂e

Ref: Swedish EPA 2007. Sweden's National Inventory Report 2005; Swedish EPA 2003 (Report 5348)

Swedish consumption: ~ 800 kg food and drink per person and year



Ca 2 ton CO₂-eq per person and year

Ref : SIK-Report 733 and Swedish Environmental Protection Agency

Changing diets – what is the influence on greenhouse gas (GHG) emissions of different consumption patterns?

A project commissioned by the Swedish Board of Agriculture

Scenario 1: Change to a lacto-ovo vegetarian diet.

Scenario 2: Change to chicken and pork instead of beef.

Scenario 3: Change from rice to potatoes, pasta and wheat

Scenario 4: Change to eat fruits and vegetables by season

Scenario 5: Eat according to the NFA recommendations



Boundaries, comments and used data

Consumption data from SBA (official statistics)

GHG emission data from SIK database and other published sources

Including GHG emissions from:

- Agriculture (with inputs)
- Transports of imported products

NOT including GHG emissions from:

- Industrial processing
- Packaging
- Retail
- Household
- Domestic transports



Boundaries, comments and used data, cont.

When no known GHG emission data of an imported food product was found, Swedish data for the same product was used but with an added contribution from the transport to the boarder of Sweden (Malmö).

Fixed distances for imported products

Scenario 1: Change to a lacto-ovo vegetarian diet.

	Today's consumption (in 1000s tons)	With lacto-ovo diet (in 1000s tons)
Soybeans	0	136
Yellow peas	9	170
Egg	112	282
Pork meat	351	0
Poultry	147	0
Beef	235	0
Lamb, game, reindeer	29	0
Meat products	219	0
Fish	170	0
GHG emissions in million tons of CO₂-eq	9,8	0,9



Scenario 2: Change to chicken and pork instead of beef.

	Today's consumption (in 1000s tons)	Beef replaced by pork and chicken (in 1000s tons)
Pork	351	542
Chicken	147	192
Beef	235	0
Lamb, game, reindeer	29	29
Meat products*	219	219
GHG emissions in million tons of CO₂-eq	8,6	3,6

* Beef content replaced by pork and chicken; same amount but less GHG emissions



Scenario 3: Change from rice to potatoes, pasta and wheat

	Today's consumption (in 1000s tons)	Rice replaced with pasta and couscous* (in 1000s tons)	Rice replaced with potato** (in 1000s tons)
Rice	49	0	0
Potatoes	504	504	723
Couscous	0	24	0
Pasta	86	110	86
GHG emissions in million tons of CO₂-eq	0,29	0,19	0,15

* One kg of rice is replaced with one kilogram pasta or couscous

** One kg of rice is replaced with 4.5 kg of potatoes, since potatoes contain much more water.



Scenario 4: Change to eat fruits and vegetables by season

	Today's consumption (imports in parentheses)	Fruits and vegetables by season (imports in parentheses)
Tomato	94 (85)	
Onion	63 (30)	
Leek	10 (9)	
Cauliflower and Broccoli	19 (6)	
Other cabbage	41 (34)	
Salad	56 (36)	
Carrots	84 (12)	
Other root crops	11 (6)	
Cucumber	40 (24)	
Bananas	191**	0
Apples	150 (148)	569*
Oranges	151**	0
Grapes	26**	0
Other fresh fruit	42**	0
GHG emissions in million tons of CO₂-eq	0,46	0,10

Imported tomatoes, cucumber and lettuce are replaced by carrot, leek, cauliflower, broccoli, cabbage and other root crops

* Only Swedish cultivation

** Only imported fruit



Scenario 5: Eat according to the NFA recommendations

	Today's consump.	According to NFA recommend.	Impact on GHG emissions (million tCO ₂ -eq)
Vegetables (salad greens, root vegetables, onions and cabbage)	688	1309	+ 0,18
Potatoes	759	850	+ 0,01
Fruit fresh and processed (including fruit jams, juices)	961	1020	- 0,11
Bread and pasta and other cereal products	964	986	- 0,05
Dairy products, eggs	1629	1785	+ 0,65
Meat and sausage	982	340	- 4,3
Fish	194	170	- 0,17
Butter and fat	131,7	119	-0,29
Spirits, Wine, Beer and Soft Drinks	1219	0	- 1,49
Snacks and confectionary	150	0	- 0,18
GHG emissions in million tons of CO₂-eq	17,3	11,5	- 5,8

Conclusion:

- By changing the diet you can reduce the level of GHG emissions
 - But still also important to eat up and minimise waste
 - And consumption is not only food...
what about consumption pattern of living, traveling..?

