

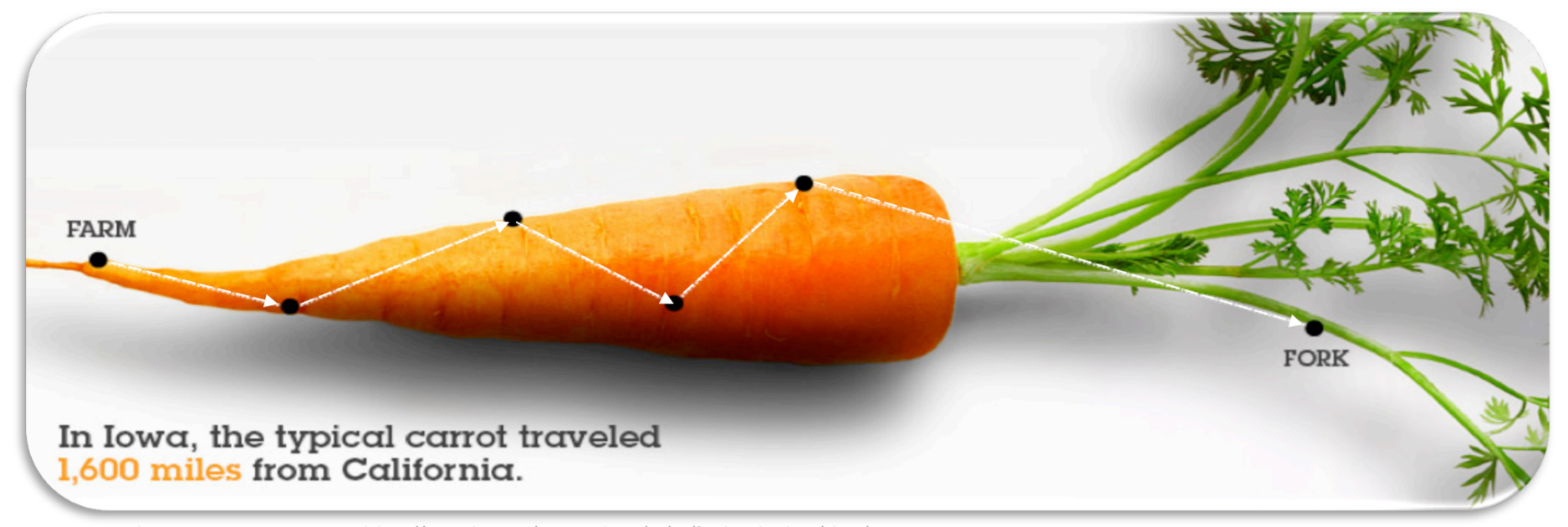
The Mantra of 'Food Miles': Will sourcing locally-produced food save the planet?

An investigation into the regional and global impacts of the UK's sustainable food supply-chains.

Concept

What are Food Miles?

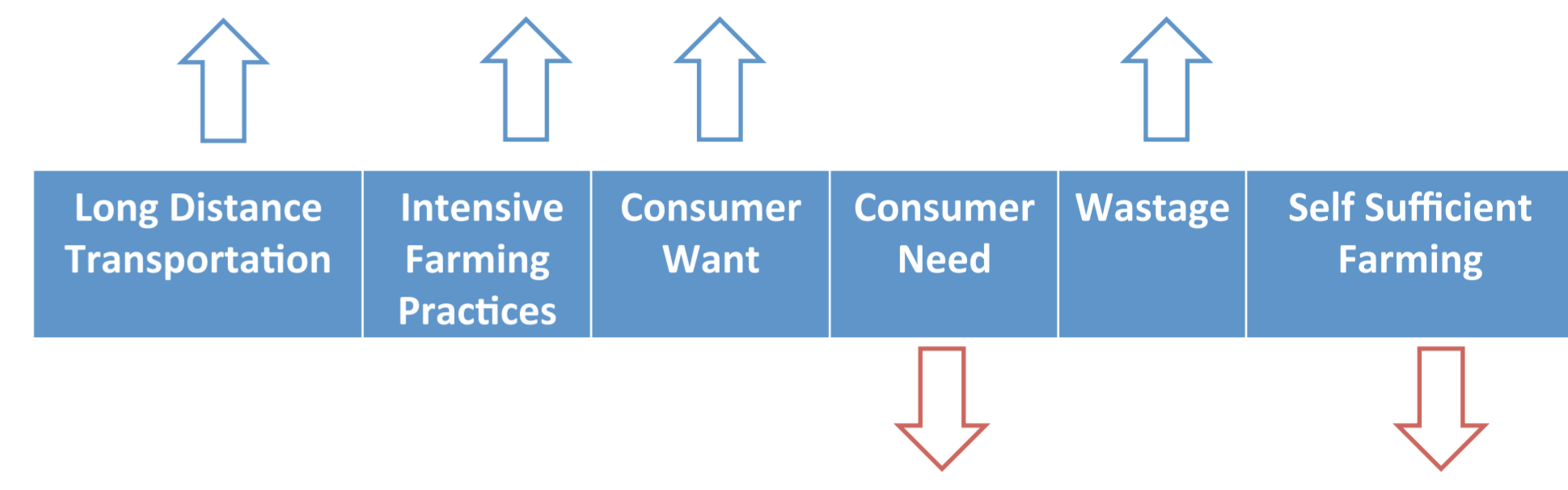
"A measure of how far food travels between its production and final consumption"
(Weber & Matthews, 2008)



- However the term Food Miles (FM) also:
- Seeks to illuminate the wider environmental and social costs of global food-transport (Paxton, 2011) and supporting localisation of the global food supply-chain network (Jones, 2002).
 - Originally introduced to aid carbon identification throughout the supply chain, from producers and processors to transportation (Paxton, 2011). Which led to the hypothesis that high import rates from distant countries led to increased rates of waste and pollution than consuming and producing local foods (Kemp et al, 2010).
 - Sought to alter the global food transportation-network by reducing waste and pollution through supply-chain streamlining (Paxton, 2011) and localisation (Jones, 2002) propelled by the consumer shift towards market-driven ethical consumption (Nicholls & Opal, 2005).

Current Environment

- Dramatic alterations in the status-quo of global agriculture over the past century, [e.g the rise of intensive farming practices, the emergence of long-distance transportation (Paxton, 2011), and consumer-want surpassing consumer-need (Bittman, 2007)], have led to an unsustainable supply chain producing wastage [1.3 billion tons per year] (Gustavsson, 2011) and high rates of greenhouse gas (GHG) emissions (Paxton, 2011).



Market Impact (Focus Areas)

Changes in Emission Type

Agriculture & Transportation

- DEFRA 2014 figures championed water transport followed by rail, in terms of carbon-efficiency.
- Seasonal produce demand has metamorphosed to year-round demand, aided by the increase in global transportation.
- EU states are responding by increasing supply via production of non-local foods (e.g. exotic fruits) out of season, and thus increase carbon levels despite reducing transport distance.
- Manual labour, natural fertiliser and low-tech irrigation systems leave a far smaller carbon footprint than, typically western, intensive agriculture incorporating oil-based fertilisers and petrol driven machinery.

Transport Type	Emissions (tonne.km / kg CO2e)
Water - Container	0.016047
Water - General	0.013154
Water - Bulk	0.003518
Rail	0.02831
Air - Long Haul	0.62754
Air - Short Haul	1.10985
Road - Articulated	0.103324053
Road - Rigid	0.294818602

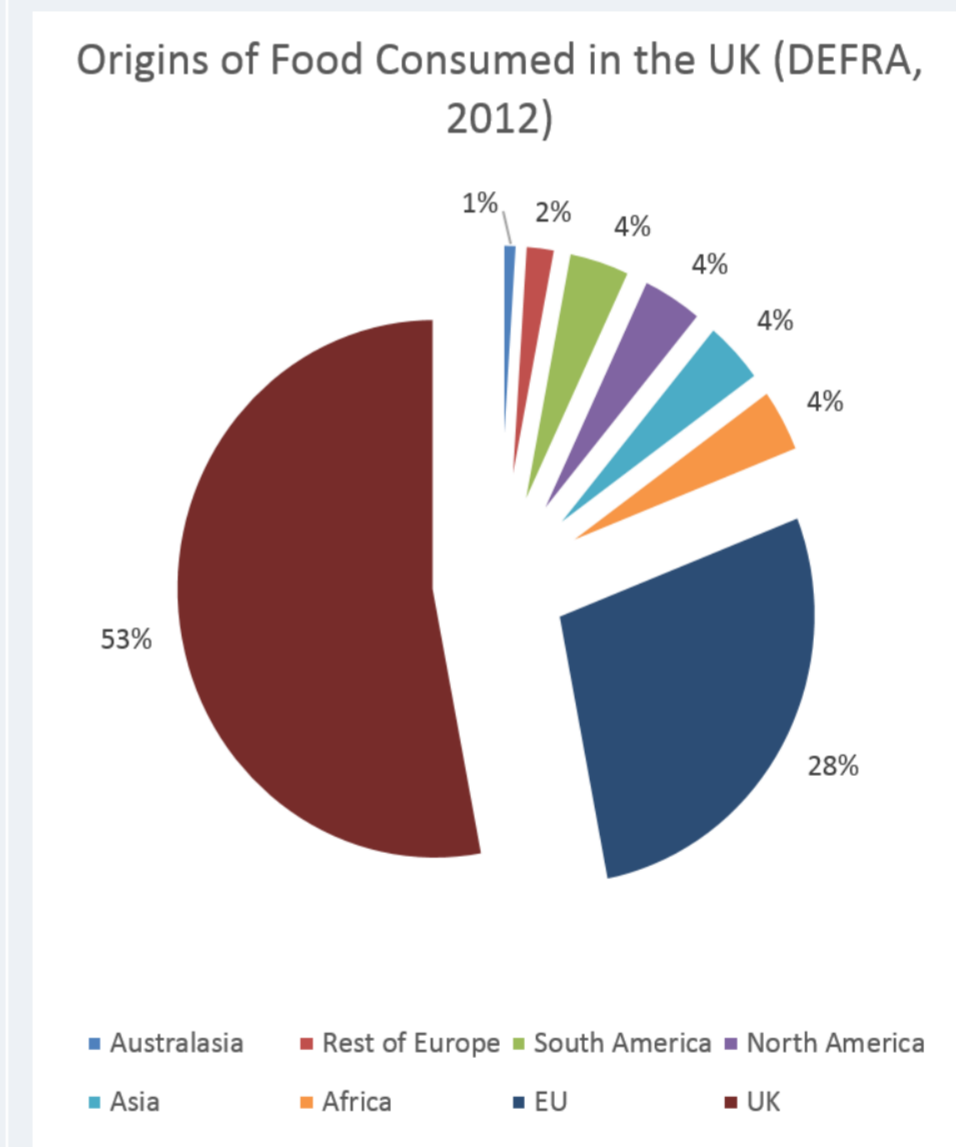
Air and Road transport both emit significantly higher levels of greenhouse gas, similar trends to data in 2005

Supply Chain Dependence

Reducing Dependence

- High import countries, e.g. UK 47%, demonstrate significant dependence on external producers.
- Increased dependence allows increased exposure supply change fluctuations and the consequences of climate change.
- The development of global risks in food security have led to price volatility
- Raising the proportion of domestic production may mitigate risk, but complete self-sufficiency is vulnerable to widespread disease and thus some import capability is necessary.

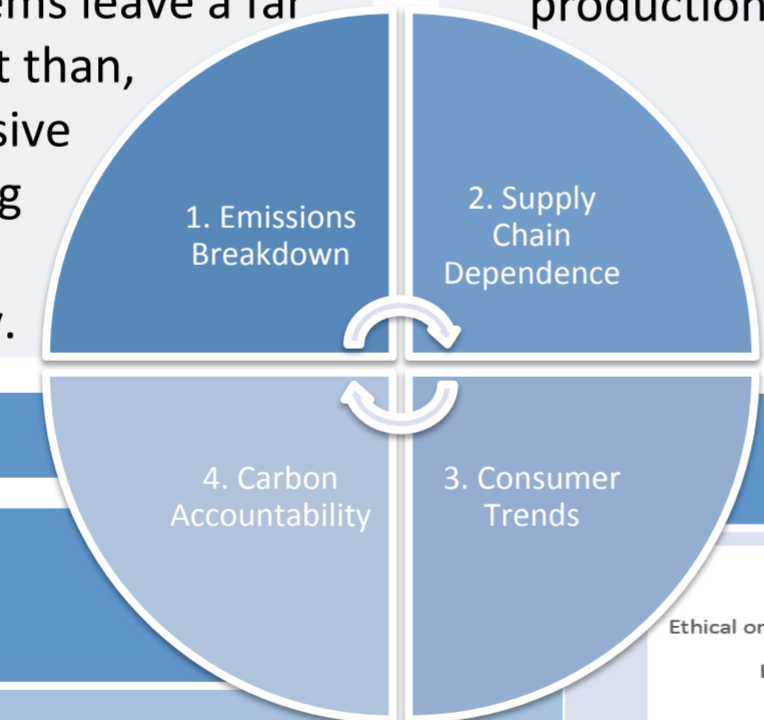
UK food-Infrastructure Findings



Paradox of Carbon Accountability

Produce Efficiency: Distance vs. Agriculture Type

Area Produce	Agriculture Type	
	Seasonal	Non-Seasonal
Local	<ul style="list-style-type: none"> Low transport distance, low emissions. Requires less artificial factors to sustain production, fewer emissions. 	<ul style="list-style-type: none"> Low transport distance, low emissions. Requires high amounts of artificial factors to sustain production, more emissions.
Non-Local	<ul style="list-style-type: none"> Higher transportation distance, possible higher emissions. Requires low amounts of artificial factors to sustain production, fewer emissions. 	<ul style="list-style-type: none"> Higher transportation distance, possible higher emissions. Requires high amounts of artificial factors to sustain production, more emissions.



Consumer Response

Factor	Rated First	Rated Second	Rated Third, Fourth or Fifth
Ethical or Eco Friendly	15%	25%	15%
Ease of Using	17%	20%	15%
Brand	28%	25%	15%
Familiar	34%	25%	15%
Use by Date	35%	25%	15%
Healthy Option	31%	25%	15%
Taste or Smell	27%	25%	15%
Quality of Performance	24%	25%	15%
Promotions	43%	20%	15%
Price	28%	24%	15%

Top Factors

- Price [39%]
- Quality [16%]
- Taste/Smell [14%]

DEFRA Findings

- £6,000m+ increase (1999-2012)
- Emerging sectors

Rebranding Food Miles

- The solution to combating negative environmental externalities is ultimately about global transport and production efficiency
- There is evidence of rising customer preferences for ethical trading, but market-driven ethical consumption will be hamstrung until a more complete and universally agreed concept of Food Miles is promoted.

Researching Food Miles

- With a high import rate and a complex trade-network any solution requires a greater understanding of the carbon-levels within the whole-supply chain.
 - Further research into carbon-measurement schemes alongside a reclassification of the food-miles initiative could provide a global supply network promoting regional and seasonal production, reduced dependence, lower GHG emissions and greater transparency.
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Reducing Food Miles

- The research indicates that greater emphases on carbon-reduction within the production phase are required, particularly involving carbon-counting individual agricultural practices.
- Within the existing transportation phase, the promotion of rail and water methods alongside a decrease in HGV transportation could create meaningful reductions.

Will Sourcing Locally-Produced Food Save The Planet?

- Overall, this research implies that a measurement scheme which identifies emissions and externalities within both transport and agricultural methods could provide a clearer carbon-count to consumers.
- Sourcing locally-produced seasonal food combined with a carbon efficient transport system may greatly reduce supply-chain carbon levels
- While sourcing locally produced food is a start, greater awareness into production and transport types are necessary to instigate change.

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