GHG Emissions of Food Systems:

Thinking about mitigation beyond the farm

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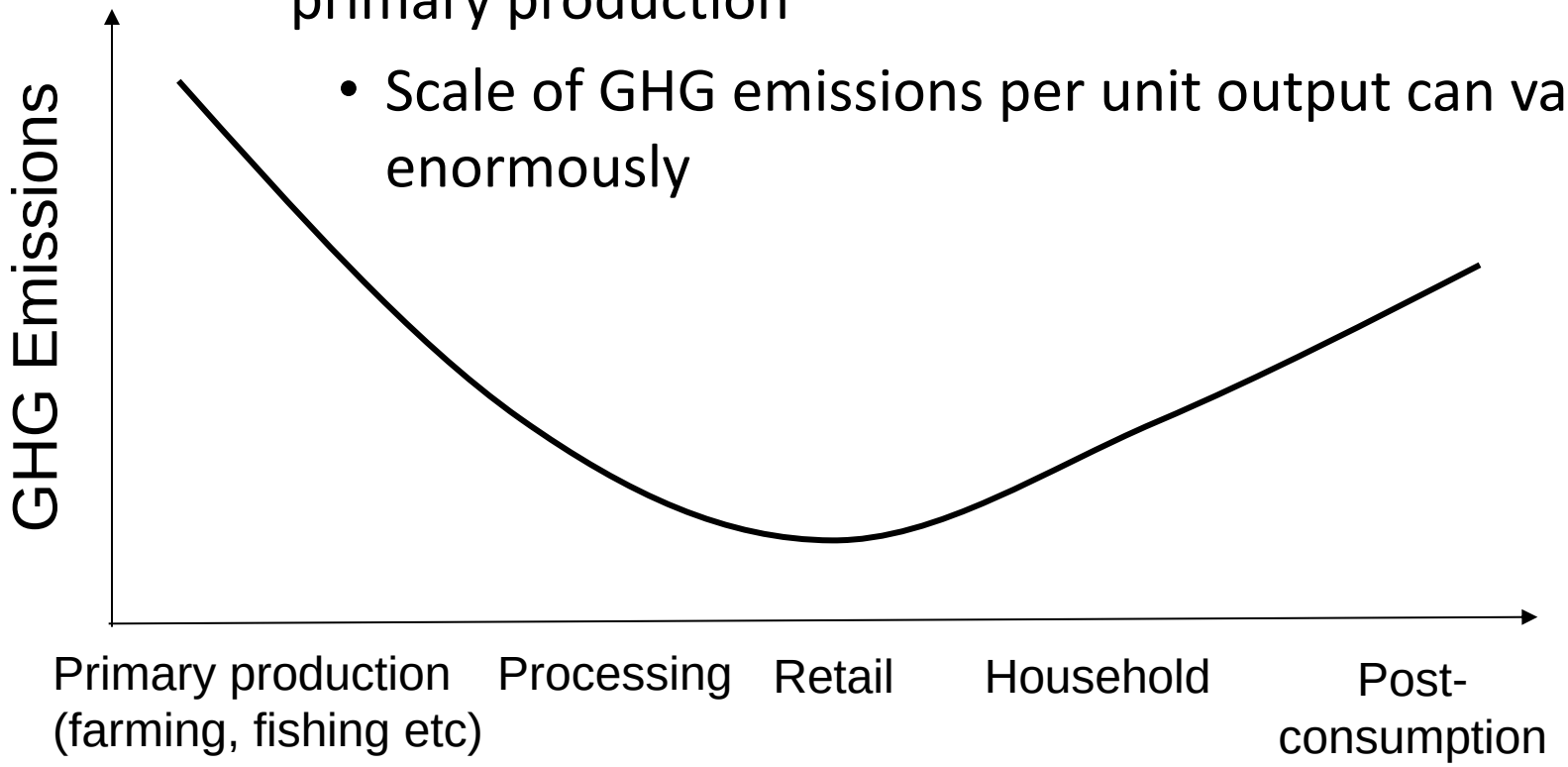
Life Cycle GHG Emissions of Food Systems

- Take-aways:
  - Food systems present substantial opportunities to reduce GHG emissions
  - Many occur beyond the farm but can be affected by on-farm decisions
  - Understanding where emissions occur helps target opportunities

Life Cycle GHG Emissions of Food Systems

How important is food in context of climate change?

- Food provision accounts for ~30% of total GHG emissions globally
- Emissions tend to be greatest at either end of the food "chain"
    - Need to attend to fine-grained sources underpinning primary production
        - Scale of GHG emissions per unit output can vary enormously



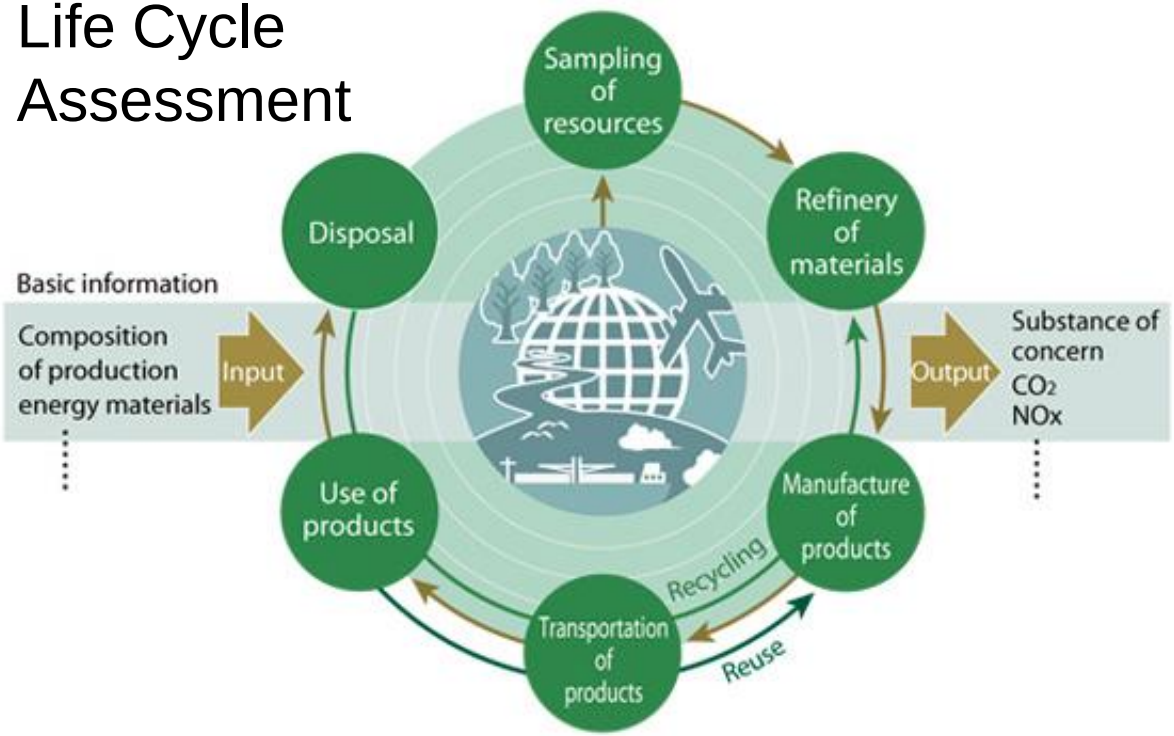
Life Cycle GHG Emissions of Food Systems

What is Life Cycle Assessment?

- Life cycle assessment is used to understand broad-scale resource and environmental implications of products

- Limitations can include insensitivity to fine grained farm level details

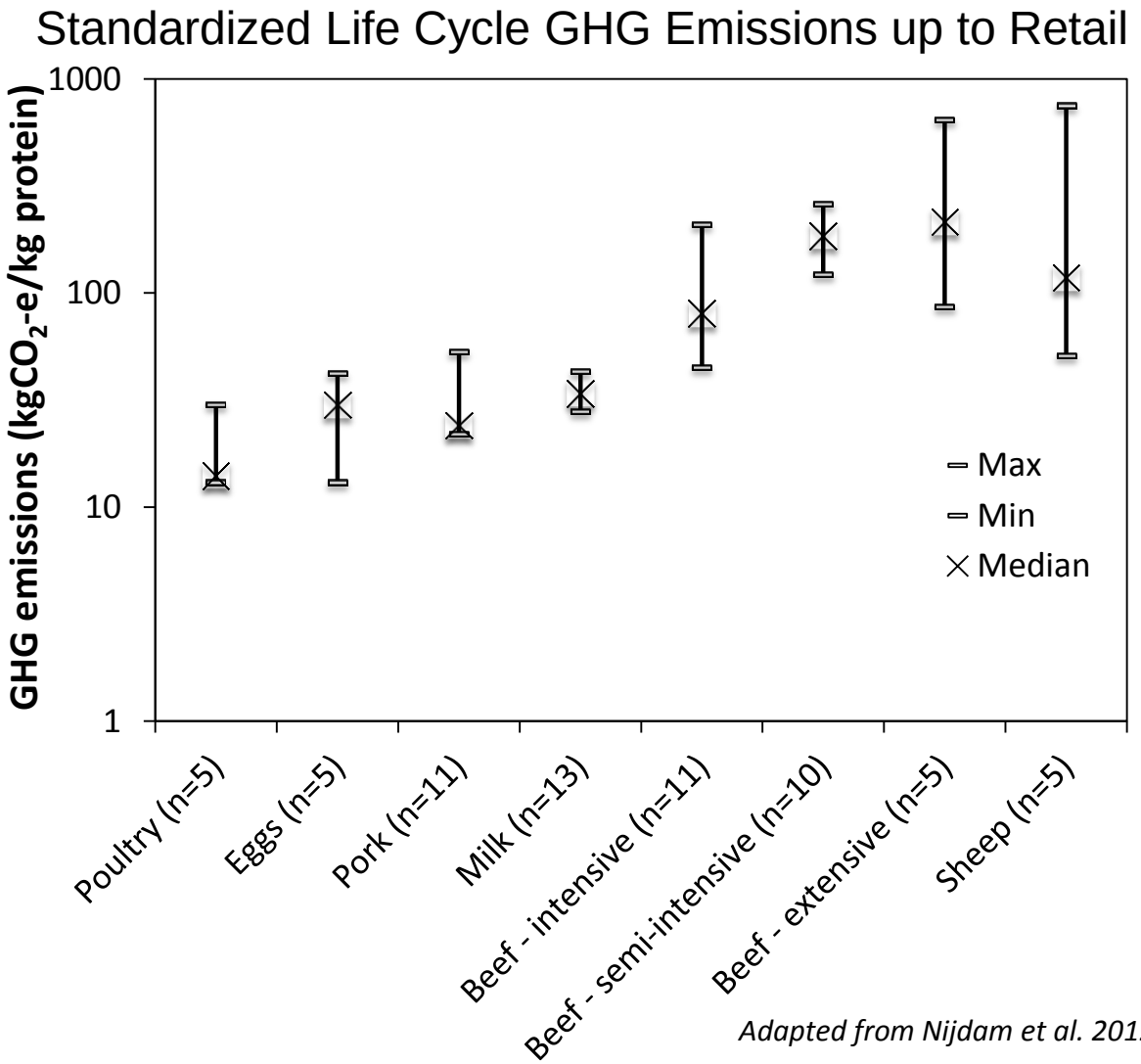
Life Cycle Assessment



Life Cycle GHG Emissions of Food Systems

All food systems emit GHGs, some more than others

- All food systems emit GHGs
- Substantial variation within & between
- Animal protein systems are major sources

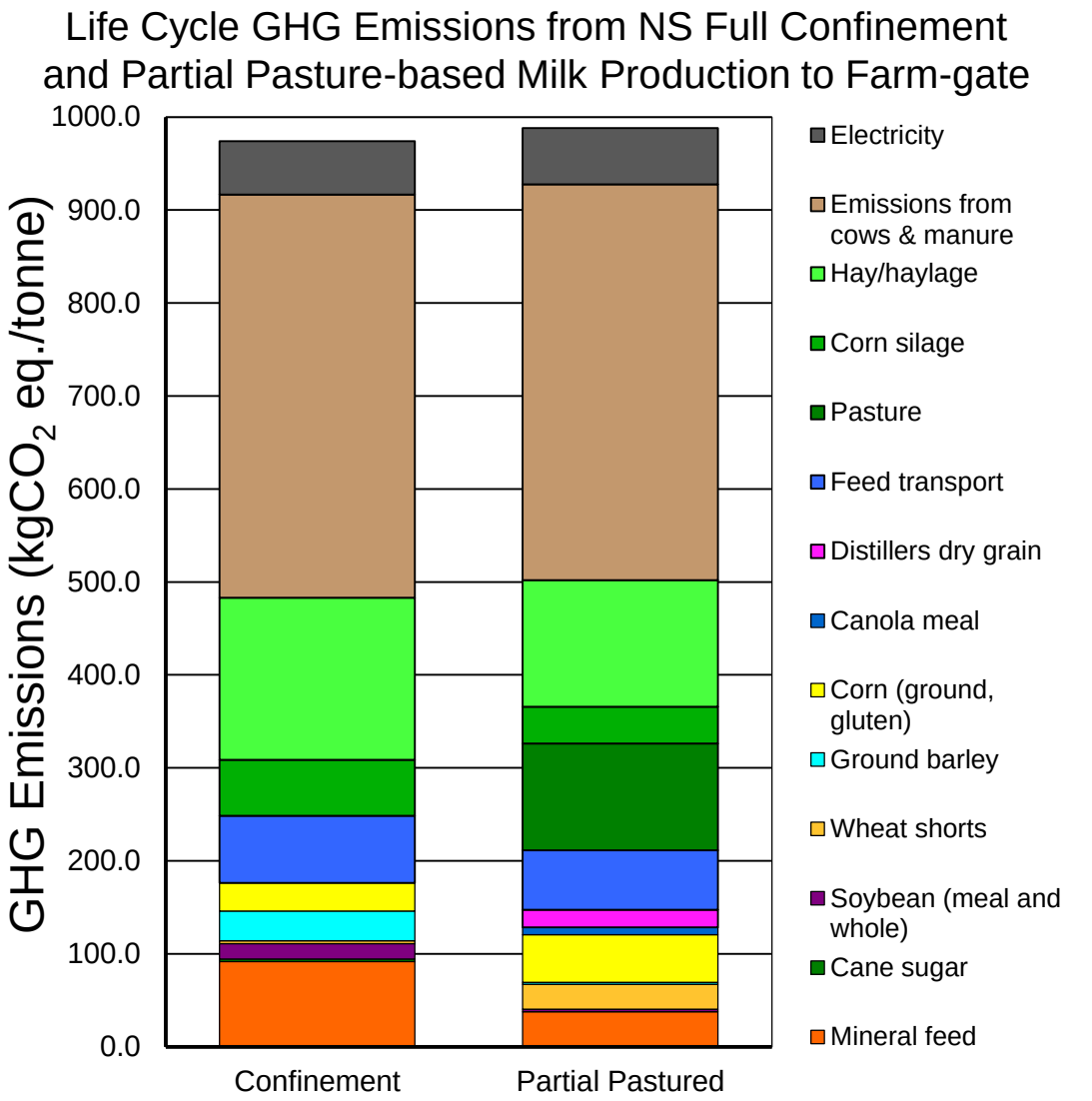


Adapted from Nijdam et al. 2012

Life Cycle GHG Emissions of Food Systems

Important GHG emissions occur upstream …

- Consider dairy:
  - Feeds are ~50%, much of this results from upstream cropping systems

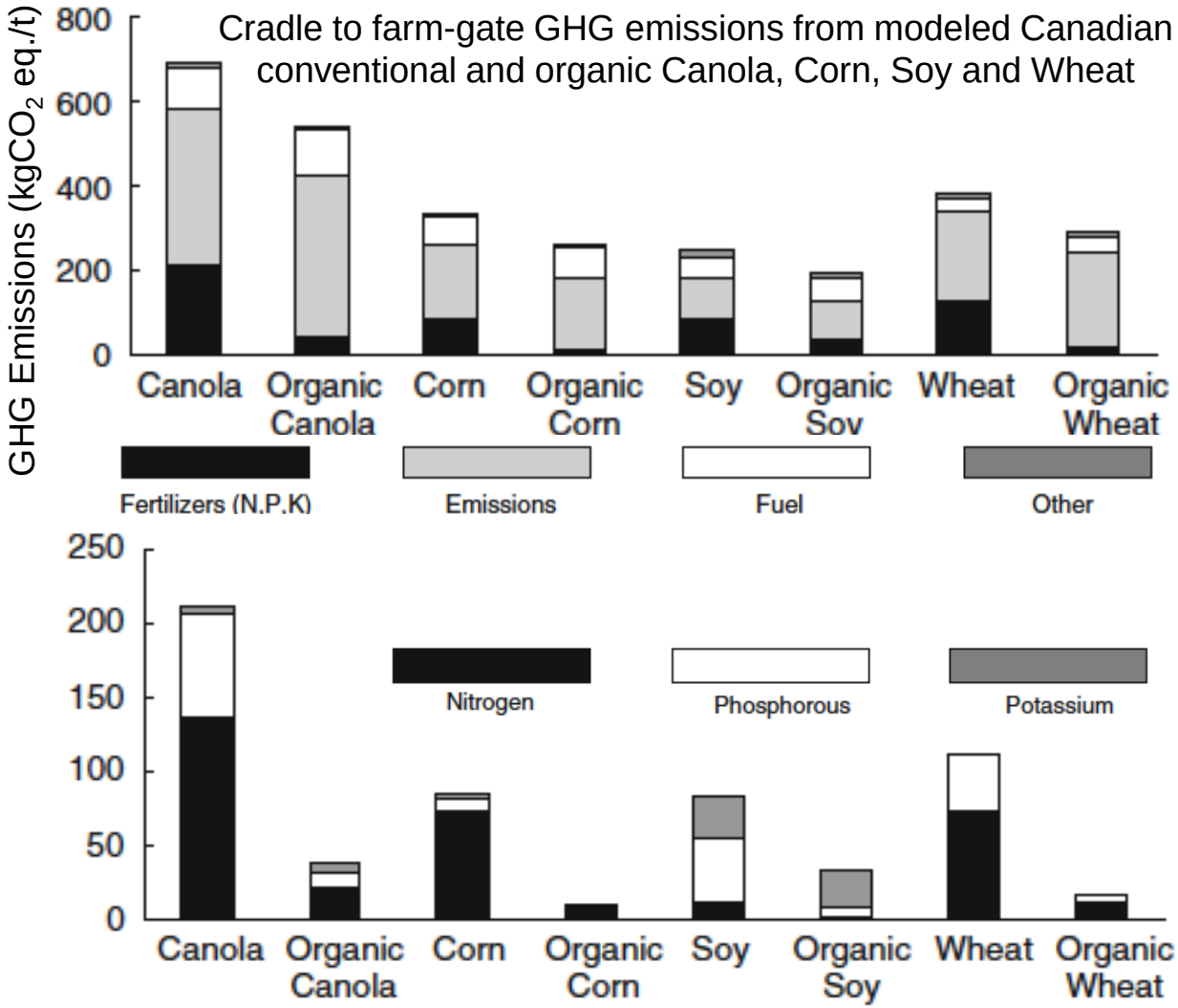


Arsenault et al. 2009 *Int. J. of Ag. Sustain*. 7(1):19-41

Life Cycle GHG Emissions of Food Systems

Important GHG emissions occur upstream …

- How we 'source' key inputs can have a substantial impact on emissions

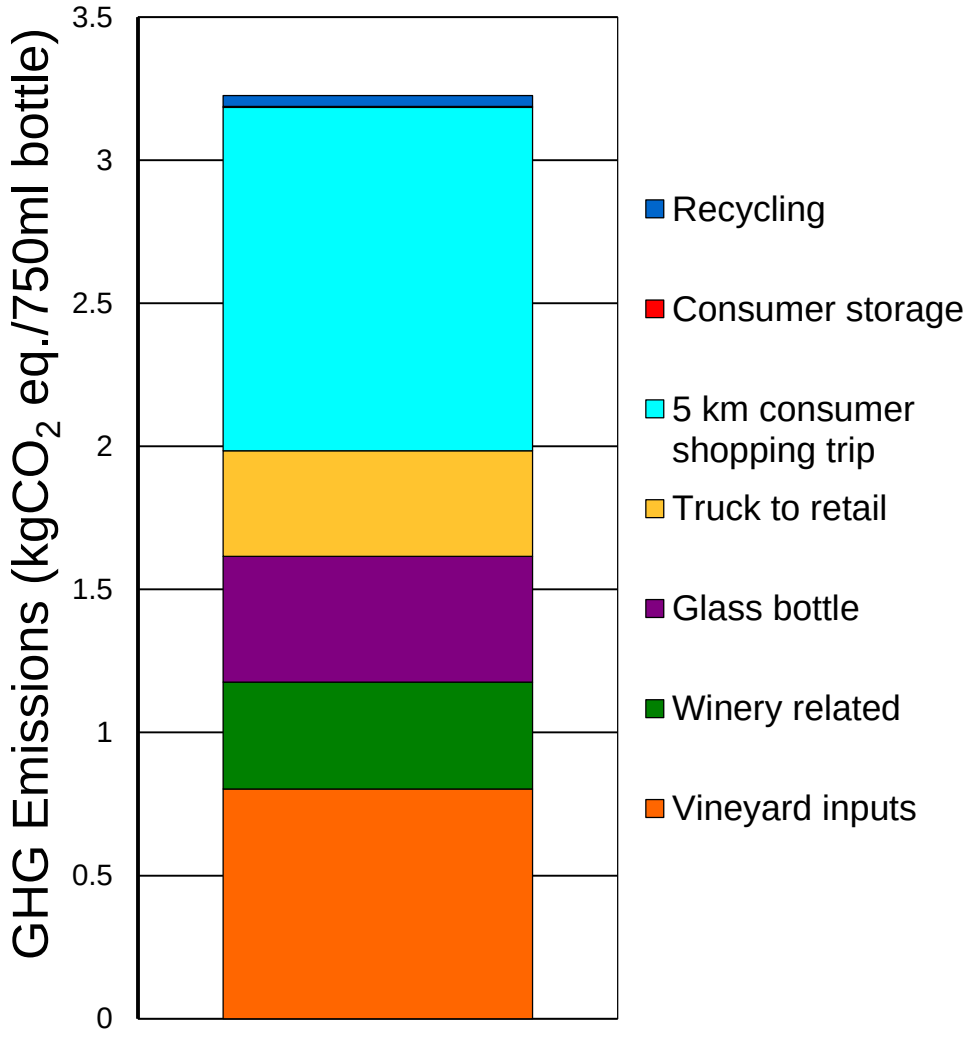


Pelletier et al. 2008 *Environmental Management*. 42:989-1001

Life Cycle GHG Emissions of Food Systems

Important GHG emissions occur upstream & downstream of farm

- Some ag products result in considerable emissions beyond the farm
- Consider GHG emissions from NS wine supply chain

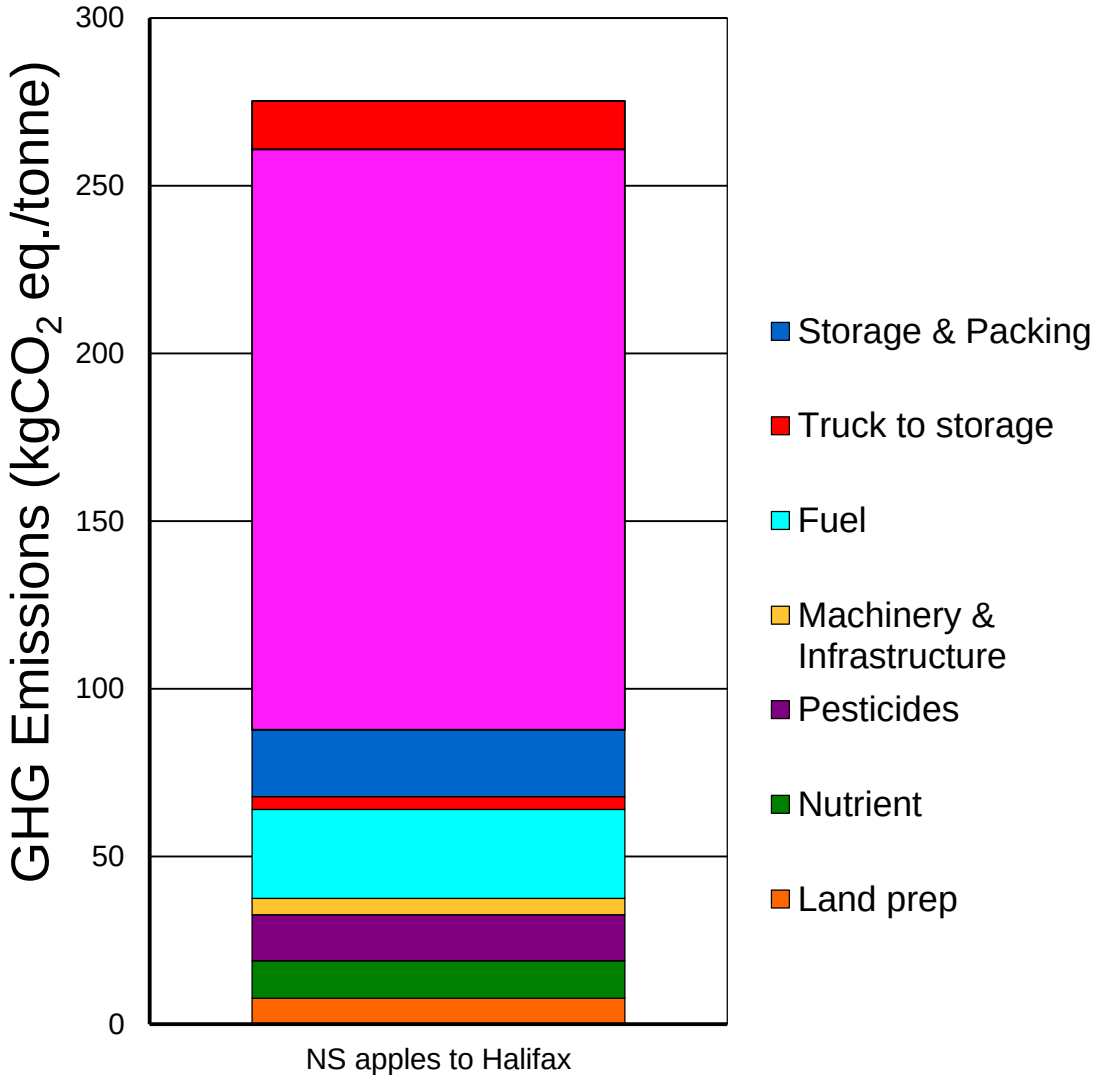


Point et al. 2012 *J. of Cleaner Production*. 27:11-20

Life Cycle GHG Emissions of Food Systems

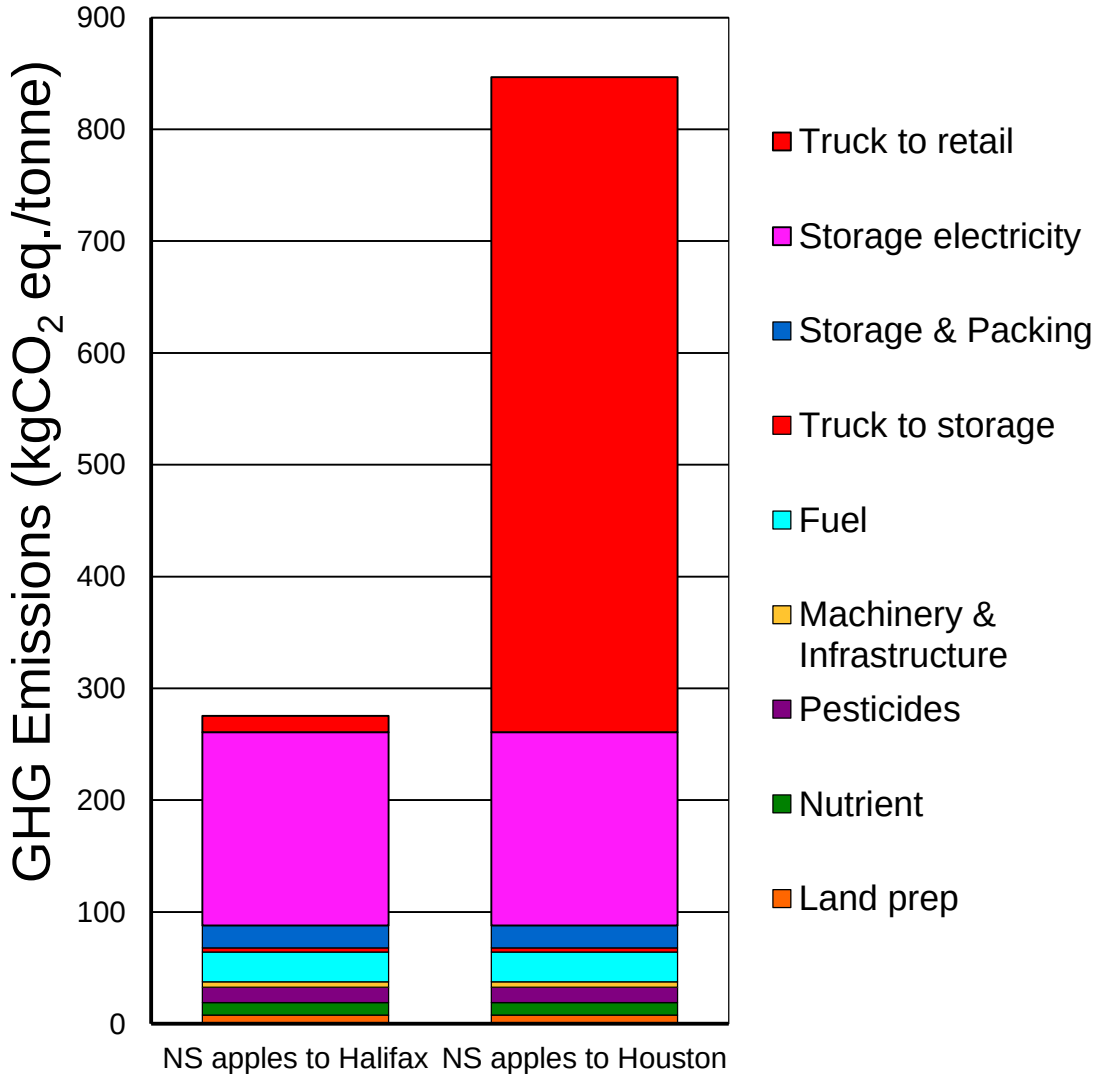
Important GHG emissions occur upstream & downstream of farm

- Similarly, consider NS apple supply chain up to retail in Halifax



Life Cycle GHG Emissions of Food Systems

Important GHG emissions occur upstream & downstream of farm



Life Cycle GHG Emissions of Food Systems

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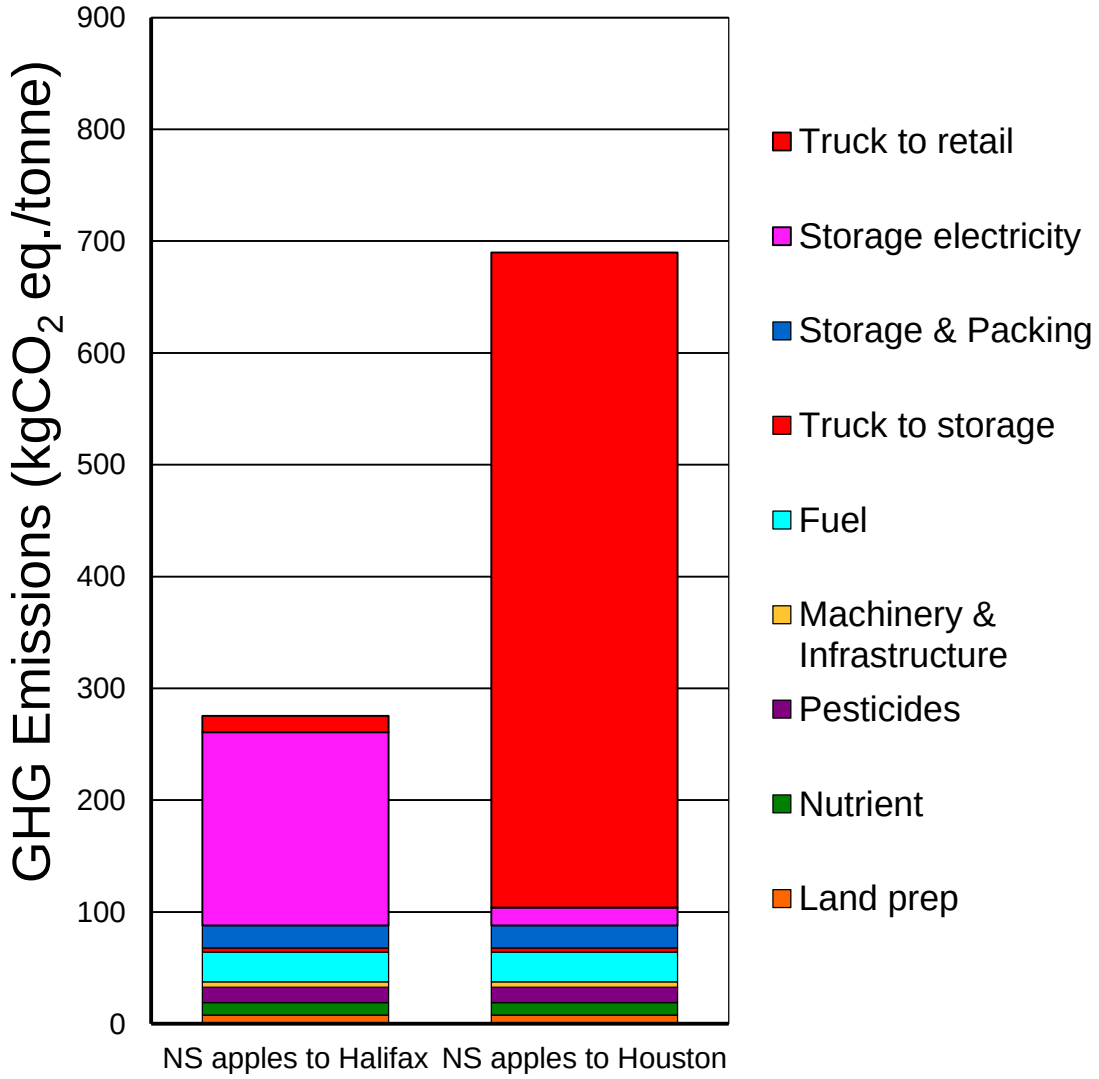

Life Cycle GHG Emissions of Food Systems

- In conclusion:
  - Within food systems, there are enormous opportunities to reduce GHG emissions
  - Many occur beyond the farm but can be affected by on-farm decisions
  - While individuals (farmers, feed suppliers, etc) may have a limited scope of action, understanding where emissions occur helps target opportunities

Thanks to

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