

Sustainable Food Systems in the 21st Century- Considering the Natural Capital Embodied in Israeli Meat Consumption



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Step 1-Defining the Problem

Current Global Food System

Research Question

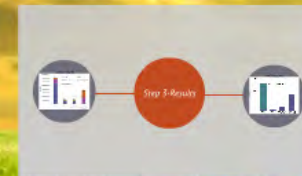
The Case of Israel

Step 2-Methodology

Methodological approach

Data Sources

Research Limitations



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Step 1-Defining the Problem



REST OF THE WORLD
1,850 tonnes (0.33%)
Beef Import

Current Global Food System

The Global Meat System

Agricultural product requiring the highest demand of land and water

Most significant producer of greenhouse gas emissions (9% of anthropogenic GHG's)

Red meat emits 5 times more greenhouse gases than chicken or pork



Economic efficiency

Expansive selection of food commodities from all over the world

10-15% of global energy use

34% percent of global land area

70% of global freshwater resources

The Global Meat System

Agricultural product
requiring the highest
demand of land and water

Most significant producer
of greenhouse gas emissions
(9% of anthropogenic
GHG's)



Research measuring a nation's
natural capital use only consider
processes related to domestic
production

To understand a nation's true global
environmental impact, it is important
to consider domestic consumption

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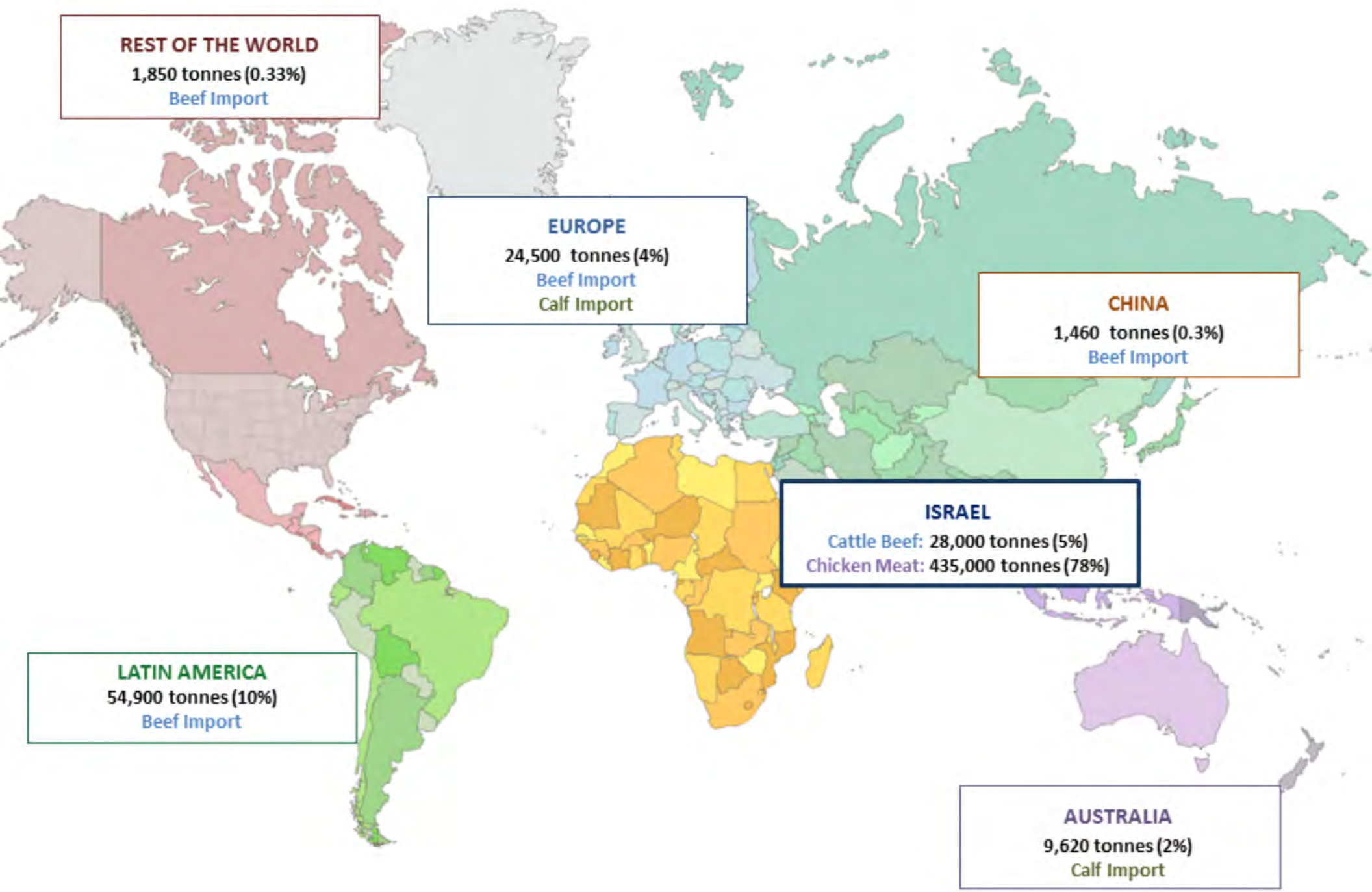
LATIN AMERICA
54,900 tonnes (10%)
Beef Import



AUSTRALIA
9,620 tonnes (2%)
Calf Import

The Case of Israel





REST OF THE WORLD
1,850 tonnes (0.33%)
Beef Import

EUROPE
24,500 tonnes (4%)
Beef Import
Calf Import

CHINA
1,460 tonnes (0.3%)
Beef Import

ISRAEL
Cattle Beef: 28,000 tonnes (5%)
Chicken Meat: 435,000 tonnes (78%)

LATIN AMERICA
54,900 tonnes (10%)
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AUSTRALIA
9,620 tonnes (2%)
Calf Import

Research Question

What are the carbon and land footprints of Israeli meat consumption?

Analysis accounts for the two highest consumed meat products in Israel:

Cattle Beef and Chicken Meat

Step 2-Methodology

Calf Import

Cattle Digestion and Manure Decomposition



CH₄

Feed Import

Feed Production



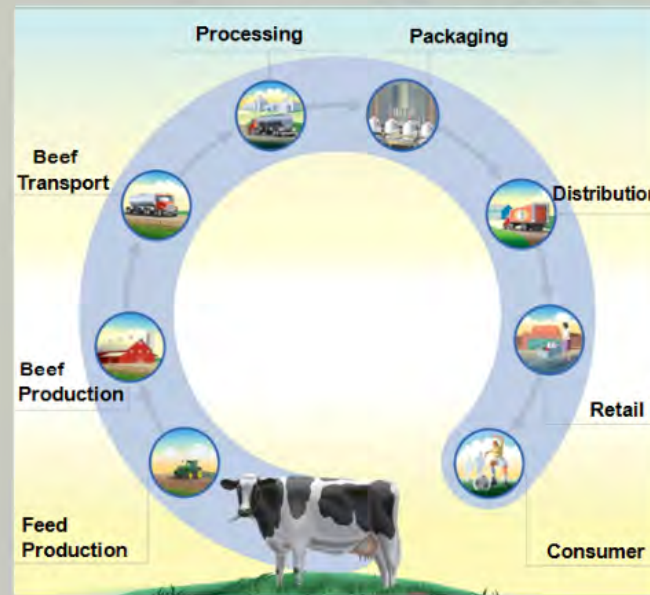
CO₂

Feed Production



Crop Land

Multi-regional consumption perspective using a Life-Cycle Assessment approach

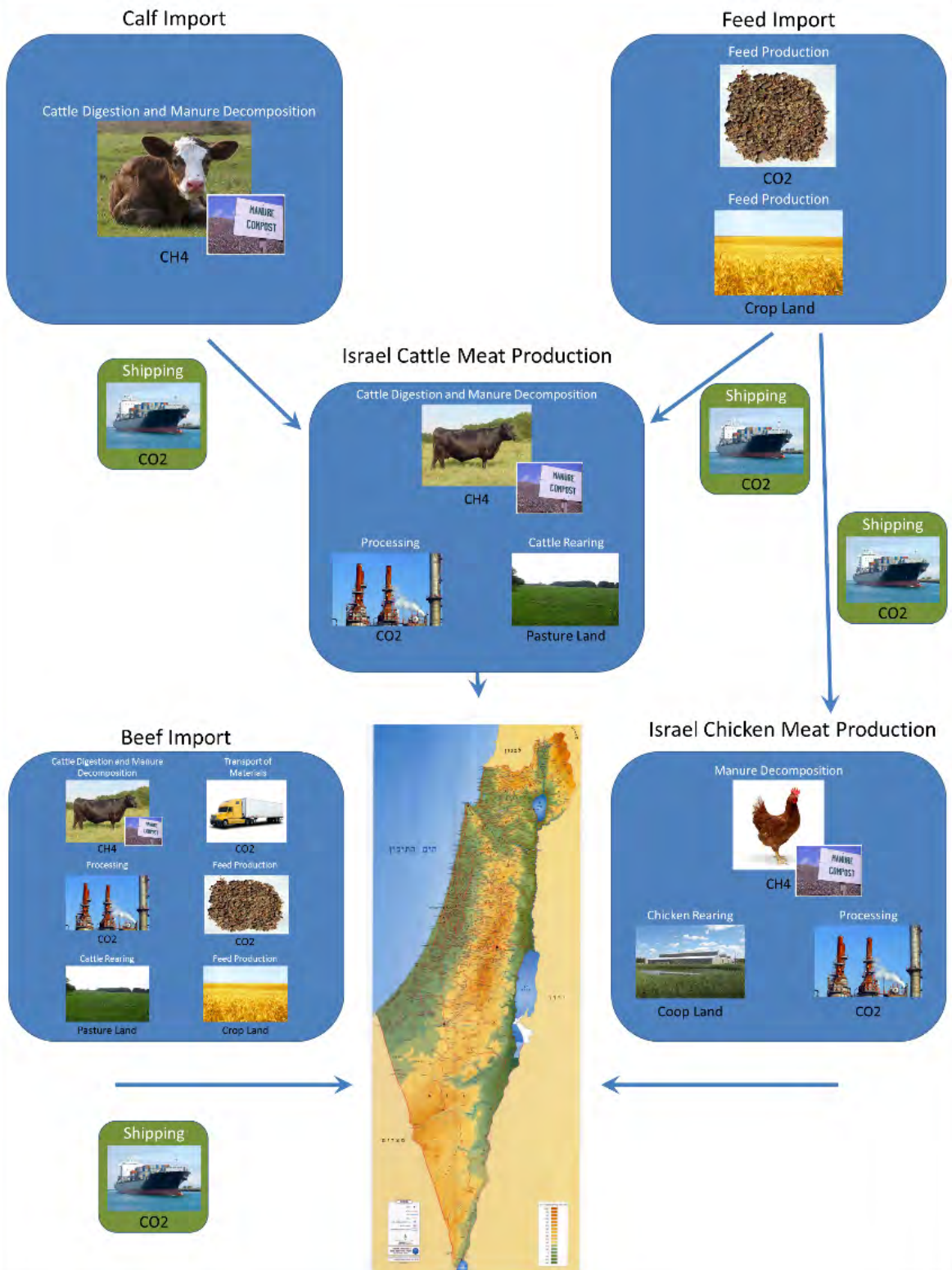


Scope of the research:
Cradle to Product +
International Shipping

Units:

1 tonne

boneless cattle beef/chicken meat



Data Sources

Israeli Central Bureau of Statistics

FAOstat database

Academic articles

Personal interviews with Israeli experts in the
Ministry of Agriculture, Israeli Dairy Council,
and private companies

Reports from international NGO's

Research Limitations

N₂O emissions

Other sources of meat (sheep, turkey, etc.)

Land-use changes

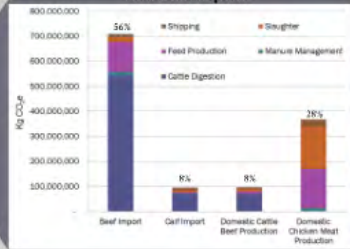
Land resources in calf exporting countries

Further stages of the life cycle

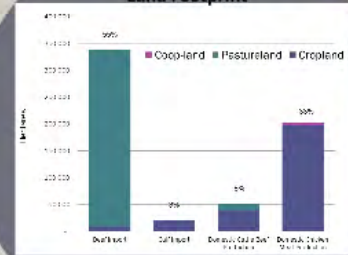
(i.e. local transportation, storage, food preparation, waste management)

Step 3-Results

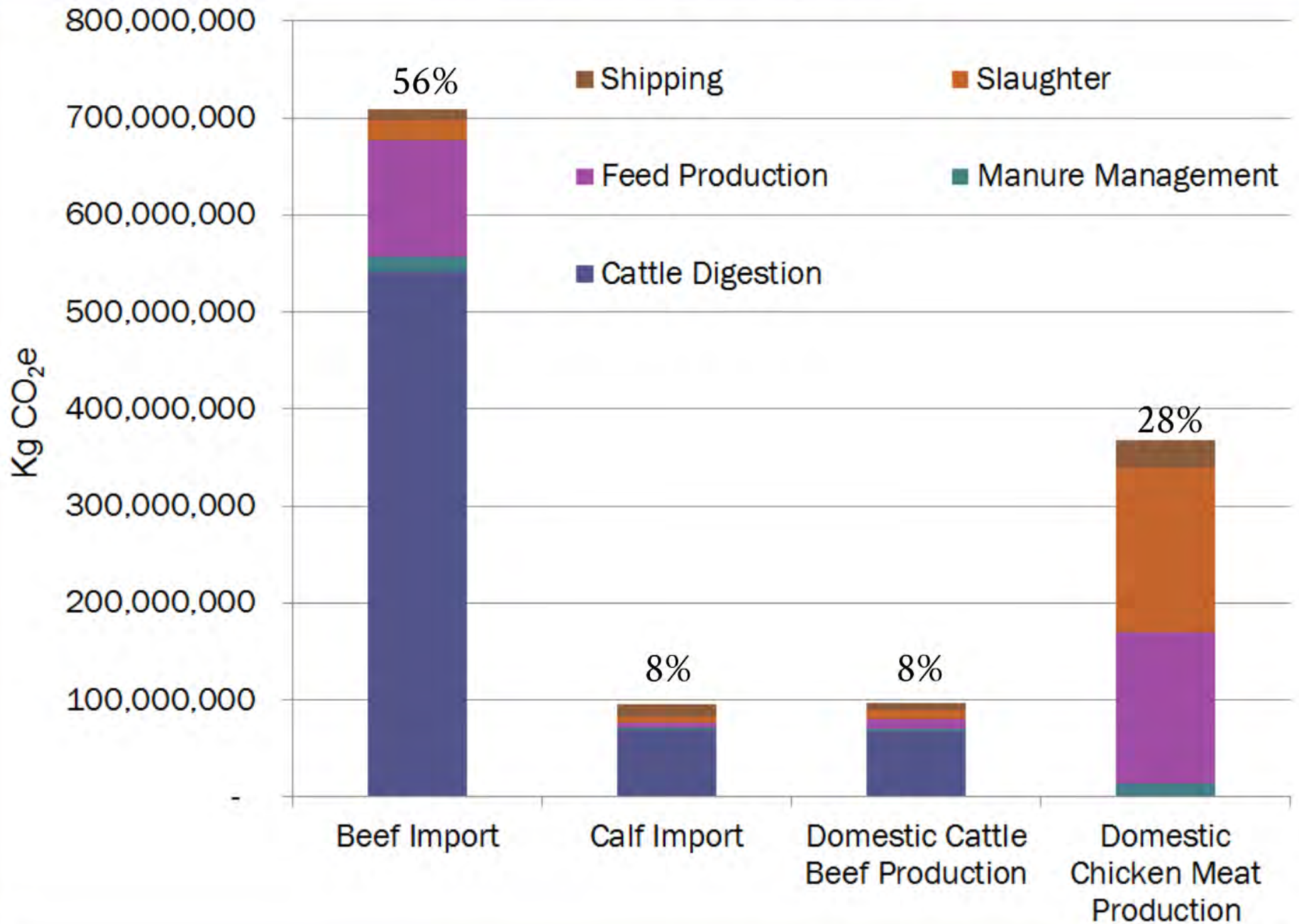
Carbon Footprint



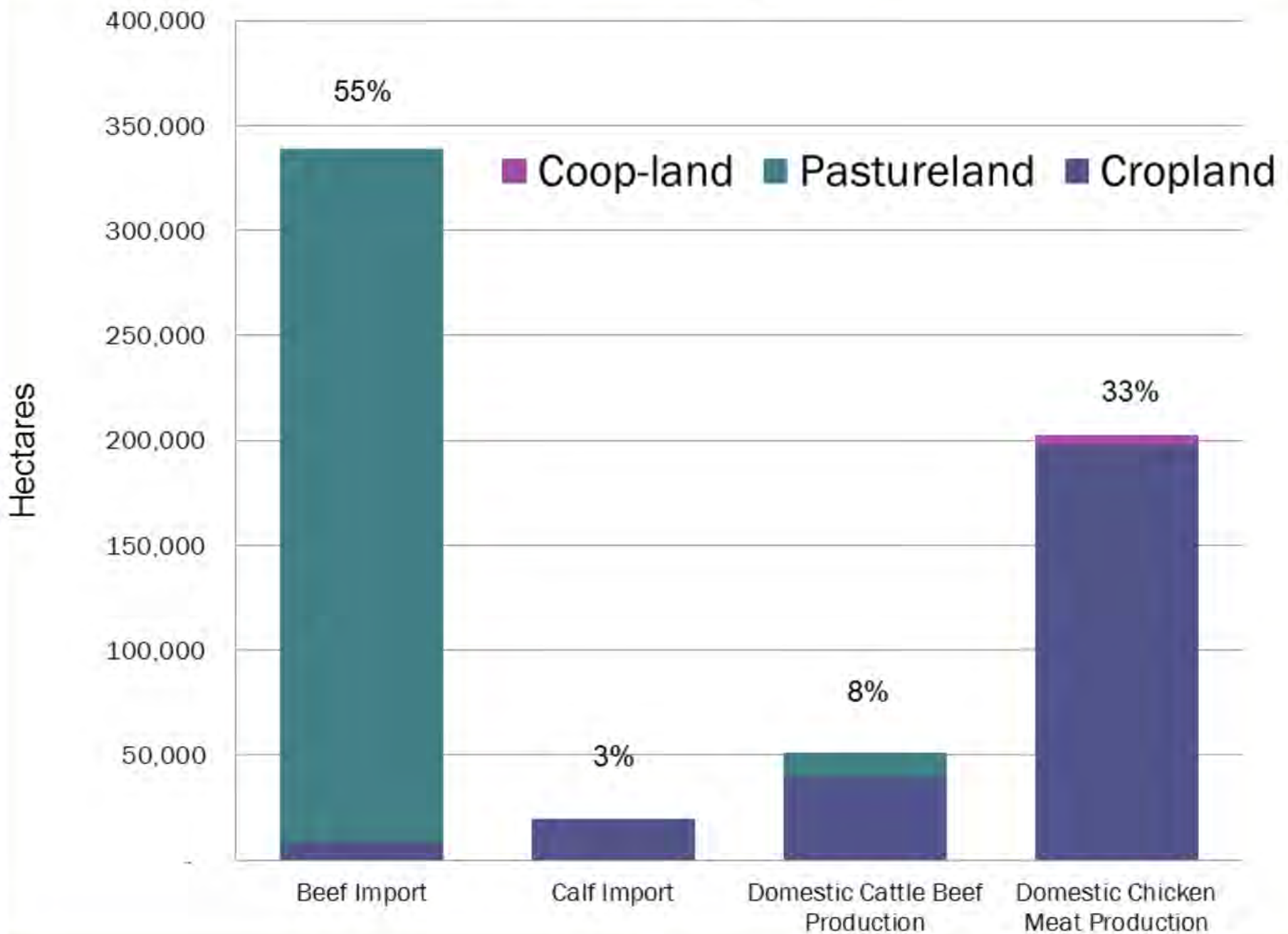
Land Footprint



Carbon Footprint



Land Footprint



Step 4- Discussion & Next Steps

Increasing awareness of a product's impact on the environment

The "virtual land" required to supply Israel's meat consumption totals an area 20% larger than the agricultural land of Israel

Opportunity # 1

Exploring options to change consumer habits

Replacing a portion of cattle beef consumption with chicken meat reduces the carbon and land footprints by 30%

Opportunity # 2

Managing the "supply chain" as a means of reducing global impact

Increasing import from Latin America in lieu of Europe decreases GHG by 10%

Increasing Israel production in lieu of beef imports decreases carbon and land footprints by 35%

Opportunity # 3

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