

# Plain Calcium Soy Milk and Soy Burger Mild Carbon Footprints

## Summary

July 2009

# 1. Soy milk and soy burger footprints

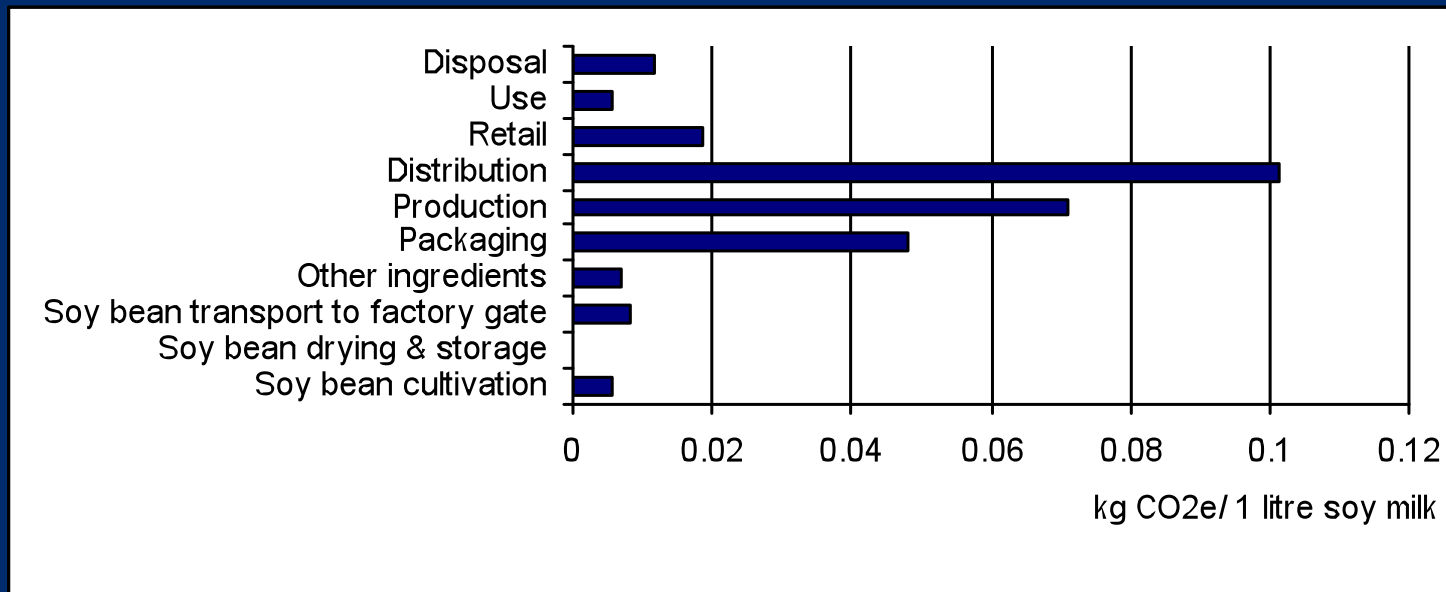
## Methodological approach

- Life cycle assessment, consistent with ISO 14040
- Mass allocation for co-products produced at Alpro factories

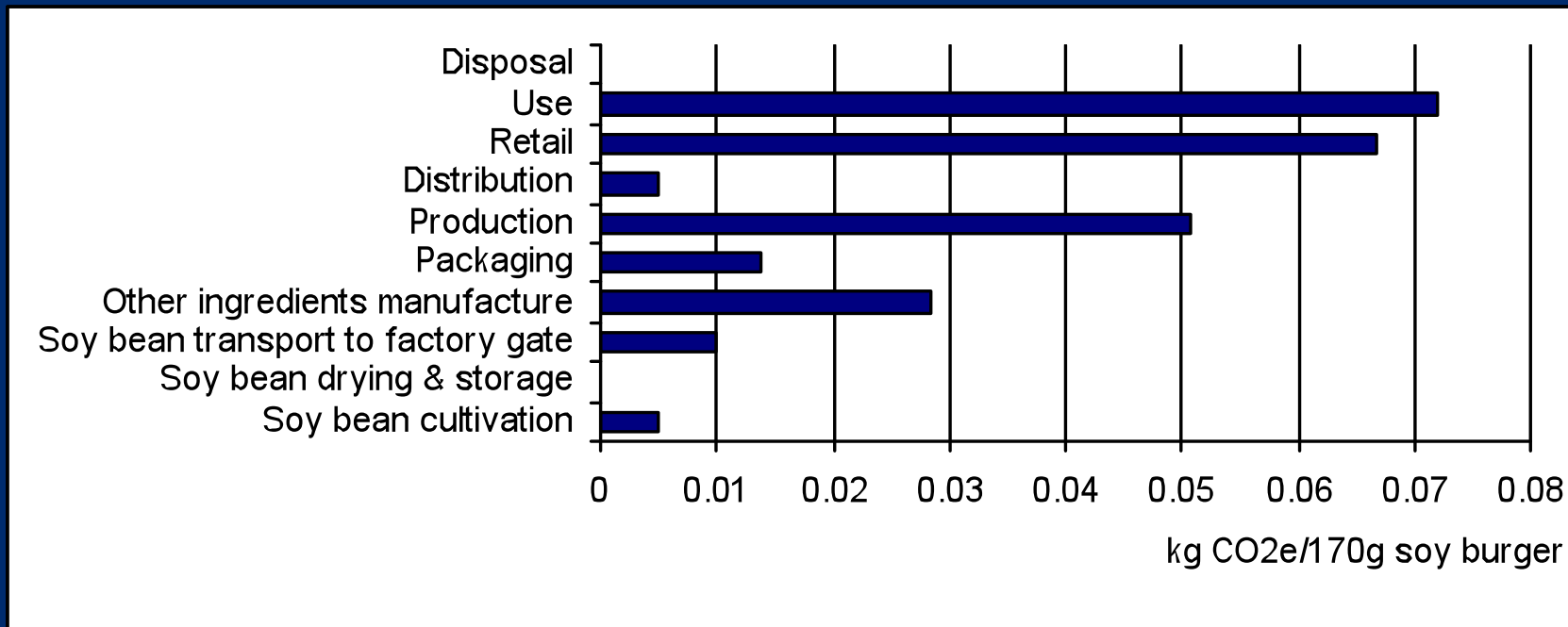
## Data inputs

- Primary data:
  - Soy bean cultivation and transport to factory
  - Wevelgem (soy milk) and Landgraaf (soy burger) factories
  - Tetrapak packaging and disposal (soy milk).
- Secondary data:
  - non-soy bean food ingredients
  - distribution, retail and use
  - soy burger packaging and disposal.

# Alpro Plain Calcium Soy Milk carbon footprint



# Alpro Soy Burger Mild footprint



## 2. Cow milk and beef burger footprints

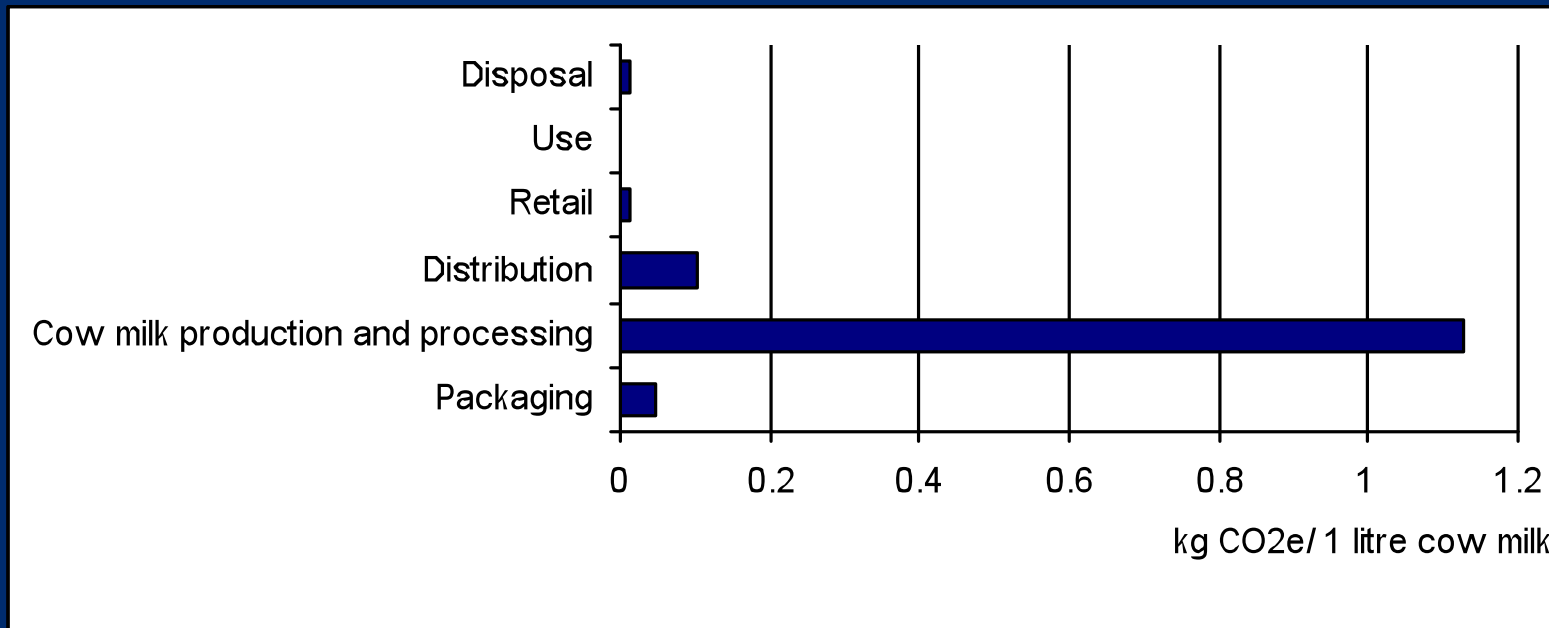
## Methodological approach

- Life cycle assessment, consistent with ISO 14040

## Data inputs

- Primary data:
  - Tetrapak packaging and disposal (cow milk).
- Secondary data:
  - emission factors for cow milk and beef
  - distribution, retail and use
  - beef burger packaging and disposal.

# Cow milk carbon footprint

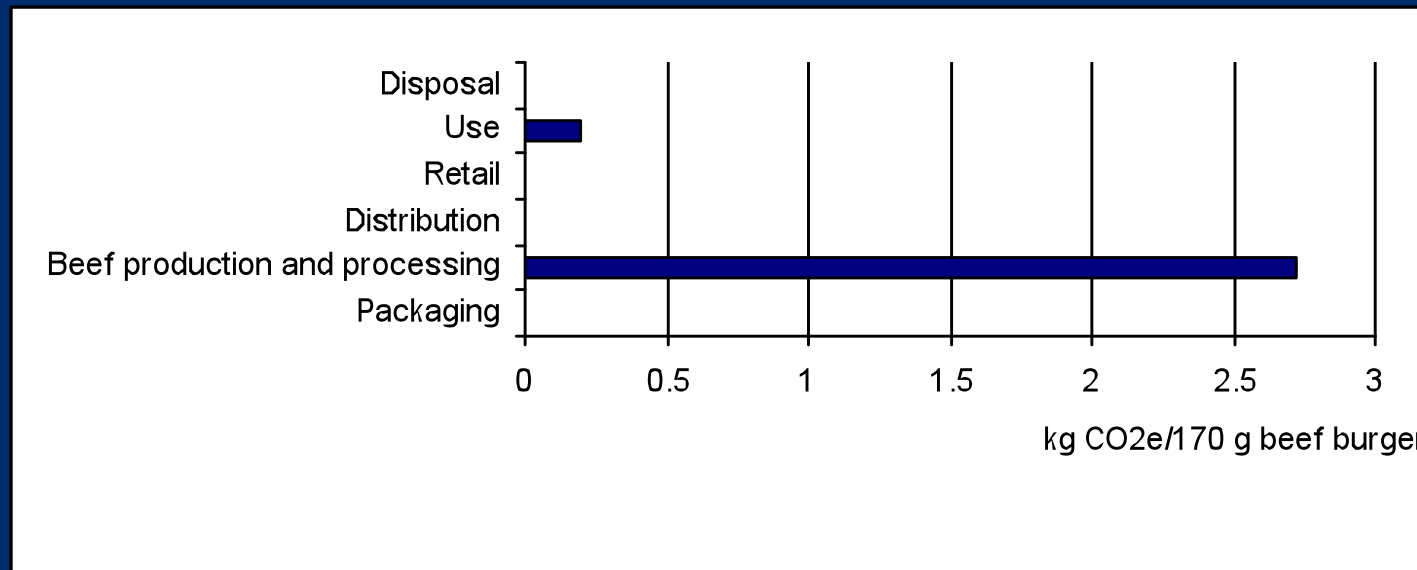


## Detail cow milk production and processing emission factors

Emission factor	Units (kgCO <sub>2</sub> e/?)	Source
0.92-1.51	Kg ECM	Casey JW and Holden NM (2005)
0.95-1.07	Kg ECM	Cederberg C and Mattson B. (2000)
0.64-1.07	Kg ECM	Cederberg C and Stadig M. (2003)
1.06-1.23	Litres ECM	Williams, A.G., Audsley, E. and Sandars, D.L. (2006)
1.03-1.2	Kg milk	Lovett D.K., Shalloo L., Dillon P., O'Mara F.P. (2006)
0.8 (NZ)–1.4 (Holland)	Kg milk	CE Delft (2008)
1.06	Kg milk and milk products	Defra (2006)
0.94 (NZ)	Litre milk	Fonterra farmer's collective (2009)
1.2 (approx)	Kg milk (includes production + retail phase)	Blonk (2008)

If the midpoint of the range of emission factors found by each study is taken on a study-by-study basis, and then the median value of these midpoints found, the emission factor for milk is **1.1 kgCO<sub>2</sub>e/kg milk**.

# Beef burger footprint



## Detail beef production and processing emission factors

Emission factor	Units (kgCO <sub>2</sub> e/?)	Source
11.1-13	Kg live weight	Casey JW and Holden NM (2006)
15.8-25.8	Kg carcass	Williams, A.G., Audsley, E. and Sandars, D.L. (2006)
12.09	Kg beef	Greenpeace (2008)
9 (Dutch, fm dairy cows) – 60 (Brazil)	Kg beef	Blonk (2008)
16	Kg beef	Defra (2006)

If the midpoint of the range of emission factors found by each study is taken on a study-by-study basis, and then the median value of these midpoints found, the emission factor for beef is **16 kgCO<sub>2</sub>e/kg beef**.

### **3. Alpro Plain Calcium Soy Milk vs cow milk**

### **Alpro Soy Burger Mild vs beef burger**

# Soy milk vs cow milk

Life cycle phase included in footprint	Alpro Plain Calcium Soy Milk (kgCO <sub>2</sub> eq/l)	UHT cow milk (kgCO <sub>2</sub> eq/l)	Comment
To factory gate (excl packaging)	0.092	1.13 (0.66-1.55)	Cow milk is 12 times more carbon intensive (7-17 times)
To factory gate (inc packaging)	0.14	1.18 (0.70-1.60)	Cow milk is 8 times more carbon intensive (5-11 times)
Whole life cycle	0.278	1.31 (0.84-1.73)	Cow milk is 5 times more carbon intensive (3-6 times)

Noting the spread of emission factors available in the literature for cow milk, three figures are provided for each cow milk data point: the footprint using a median value for the milk emission factor (1.1 kgCO<sub>2</sub>e/kg) and then, in brackets, the footprint using the lowest (0.64) and highest (1.51) emission factors found for milk.

# Soy burger vs beef burger

Life cycle phase included in footprint	Alpro Soy Burger Mild (kgCO <sub>2</sub> eq/kg)	Beef burger (kgCO <sub>2</sub> eq/kg)	Comment
To factory gate (excl packaging)	0.55	16 (11.10-25.8)	Beef burger is 29 times more carbon intensive (20-47 times)
To factory gate (inc packaging)	0.64	16.08 (11.18-25.88)	Beef burger is 21 times more carbon intensive (17-40 times)
Whole life cycle	1.48	17.30 (12.40-27.10)	Beef burger is 12 times more carbon intensive (8-18 times)

Noting the spread of emission factors available in the literature for beef, three figures are provided for each beef burger data point: the footprint using a median value for the beef emission factor (16) and then, in brackets, the footprint using the lowest (11.1) and highest (25.8) emission factors found for beef.