

Carbon footprint of "Lofotburger" & "Hjemmelagde Fiskekaker" and comparable meat products



Goal

To quantify greenhouse gas emissions of two Lofotprodukt fish products, “Lofotburger Torsk & Sei” and “Hjemmelagde Fiskekaker”, and compare these with meat-based products.

Functional unit

1 kg of product transported from factory in Lofoten to Oslo

System boundaries

Production of supply materials for fisheries and agriculture, fisheries and agriculture production, primary and secondary processing and distribution to Oslo.

For further background information see associated documentation

**The project and
goal & scope of the
LCA study**

March 2022

Ingredients

- Haddock fillet
- Cod fillet
- Greater Argentine mince
- Saithe fillet
- Rice milk powder
- Water
- Potato flour
- Olive oil
- Salt
- Onion
- Potato flakes
- Dijon mustard
- Garlic puré
- Nutmeg
- Celery salt
- White pepper
- Carrageenan



Lofotburger

Ingredients

- Haddock fillet
- Milk
- Potato sticks
- Water
- Onion
- Butter
- Salt
- Nutmeg
- White pepper
- Carrageenan



**Hjemmelagde
Fiskekaker**

Ingredients

- Beef, raw
- Pork, raw
- Salt
- Pepper
- Ground ginger
- Egg
- Onion
- Cooked potatoes
- Milk
- Butter (for frying)

SVIGERMORS KJØTTKAKER

TID: 30–40 MIN.	1–2 POR.	4–6 POR.
kjøttdeig	250 g	600 g
medisterdeig	75 g	200 g
salt	½ ts	ca. 1 ts
pepper	1 krm	¼ ts
malt ingefær	½ krm	¼ ts
potetmel	¼ ss	1 ss
løk	¼ stk.	1 stk.
rå potet	¼ stk.	1 stk.
melk	¾–1 dl	2 ½–3 dl
egg	1 eggeplomme	1 stk.
smør eller margarin til steking		

■ Bland kjøttdeig og medisterdeig. Tilsatt salt og rør blandingen seig. Ha i krydder og potetmel og bland godt. Rens løken og skrell poteten. Riv begge deler og bland i.

■ Visp egget sammen og rør det i. Spe med melk, litt om gangen. Farsen skal bli glatt og fin, men

Kjøttkaker

The recipe used is «Sviger mors kjøttkaker» from “Den rutede kokeboken” by Ingrid Espelid Hovig.

Ingredients

- Beef, raw
- Salt
- Pepper
- Potato starch
- Water
- Butter (for frying)

The recipe used is «Hamburger/Karbonader» from “Den rutede kokeboken” by Ingrid Espelid Hovig.

A HAMBURGER

HAMBURGERE/KARBONADER

Til hamburgere eller karbonader brukes karbonadedeig. Deigen må blandes raskt sammen. Den skal ikke bli seig.

TID: 30 MIN.	1-2 POR.	4 POR.
karbonadedeig	200 g	600 g
salt	¼ ts	1 ¼ ts
pepper	½ krm	¼ ts
potetmel	½ ts	1 ¼ ts
vann	1 ½ ss	5 ss
TIL STEKING		
margarin eller smør	½ ss	1-2 ss
TILBEHØR TIL HAMBURGERE		
hamburgerbrød	3 stk.	8 stk.
strimlet salat	1 dl	1 ½ dl
løkringer	2-3 stk.	8-12 stk.
sennep	1 ss	3 ss
ketchup	1 ss	3 ss
sylteagurk i skiver	½ stk.	1 ½ stk.
osteskiver	3 stk.	8 stk.

Hamburger

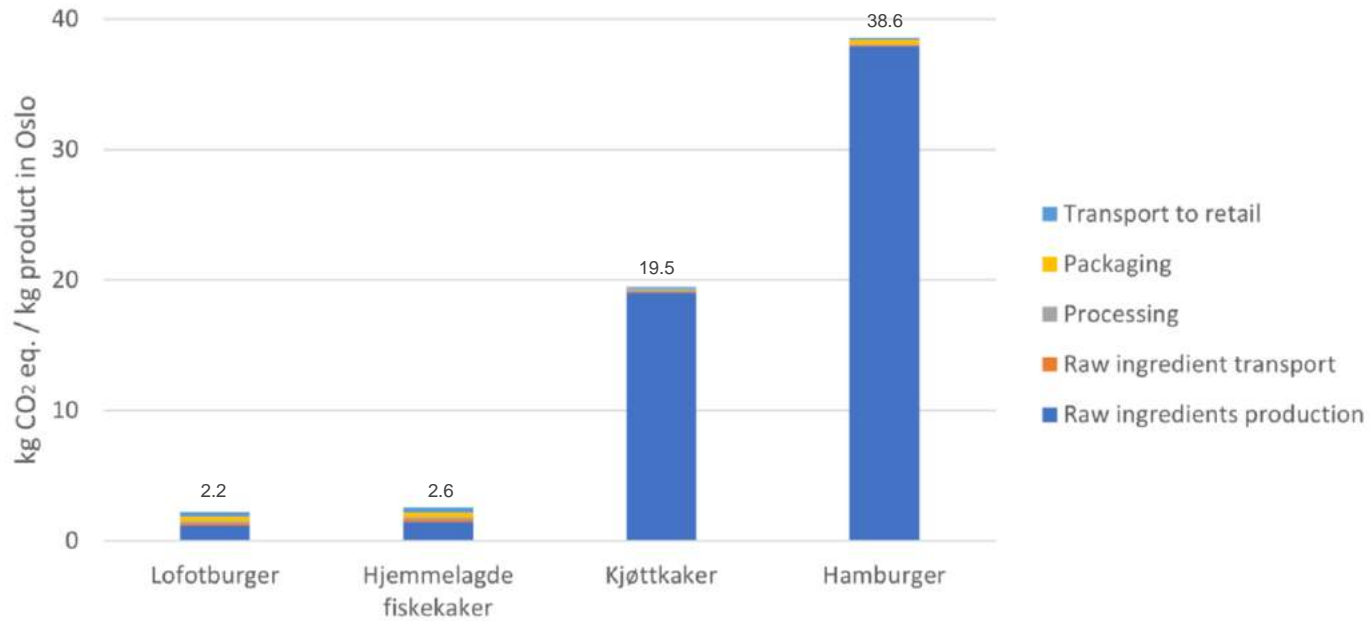
- Atlantic cod, Haddock and Saithe
 - *Primary data for fishing method, generic processing data*
- Greater Argentine* mince
 - *Primary data from supplier to Lofotprodukt*
- Meat, vegetables and other ingredients (meat assumed to be produced in Norway, other ingredients as sourced by Lofotprodukt)
 - *RISE Food Climate Database – Norwegian version 2.0*
- Transport
 - *Fish ingredients: transport distances from Lofotprodukt*
 - *Other ingredients: Average transport distance from Climate database*
- Processing
 - *Primary data from the factory in Leknes, Norway*

7 *Hvitlaks in Norwegian, Guldax in Swedish

Data sources

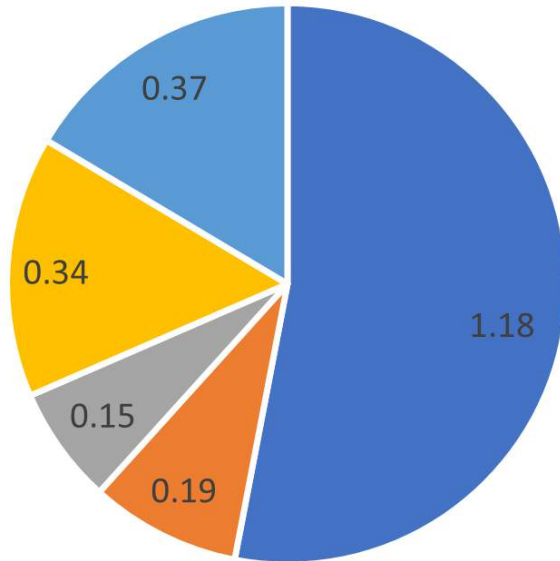
Results





Total carbon footprint

Carbon footprint Lofotburger

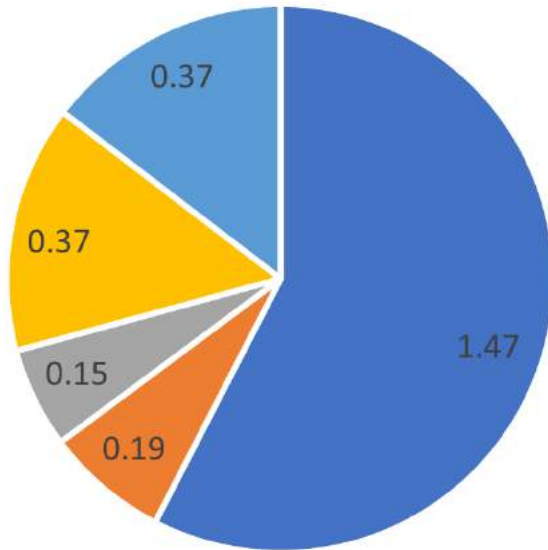


- Raw ingredients production
- Raw ingredient transport
- Processing
- Packaging
- Transport to retail

Total emissions per kg :
2.2 kg CO₂ eq.

Lofotburger

Carbon footprint Hjemmelagde Fiskekaker

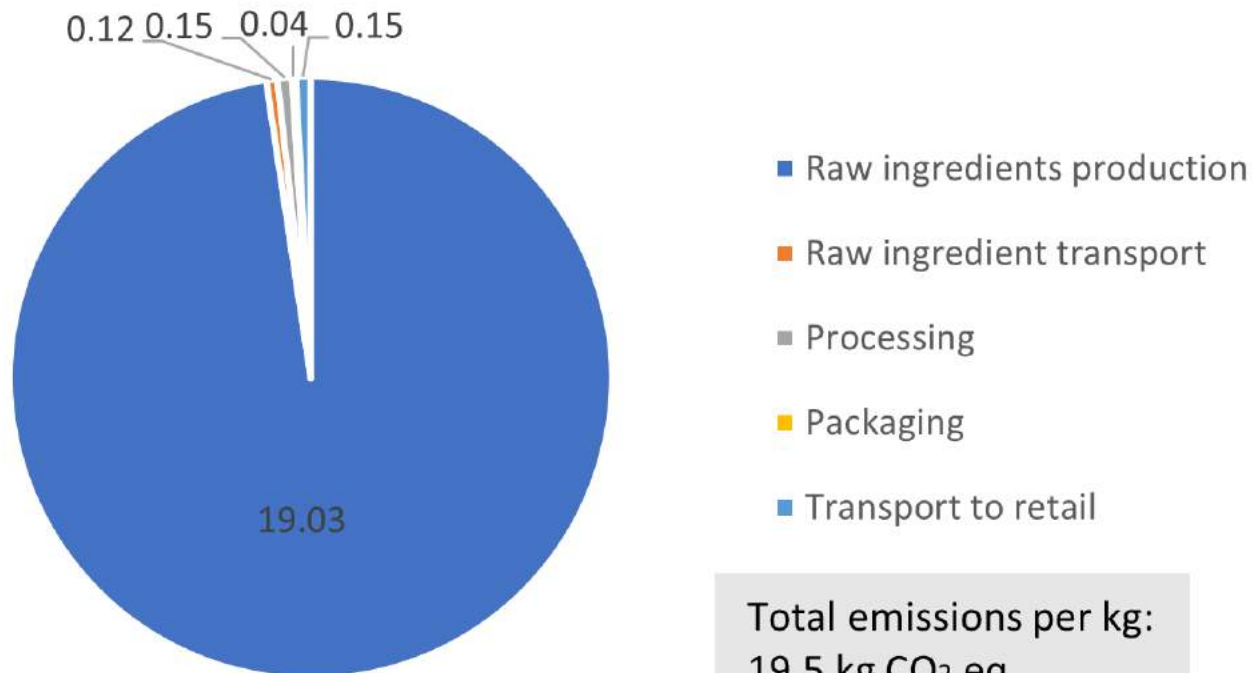


- Raw ingredients production
- Raw ingredient transport
- Processing
- Packaging
- Transport to retail

Total emissions per kg:
2.6 kg CO₂ eq.

Hjemmelagde Fiskekaker

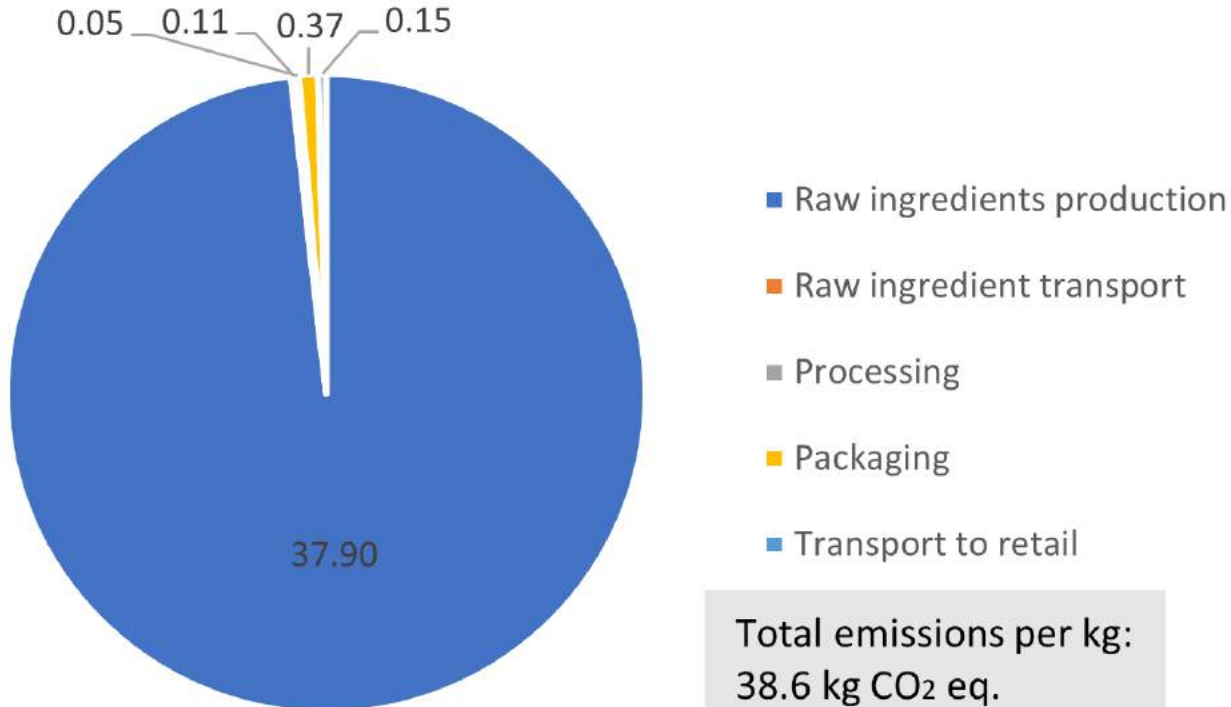
Carbon footprint Kjøttkaker



Total emissions per kg:
19.5 kg CO₂ eq.

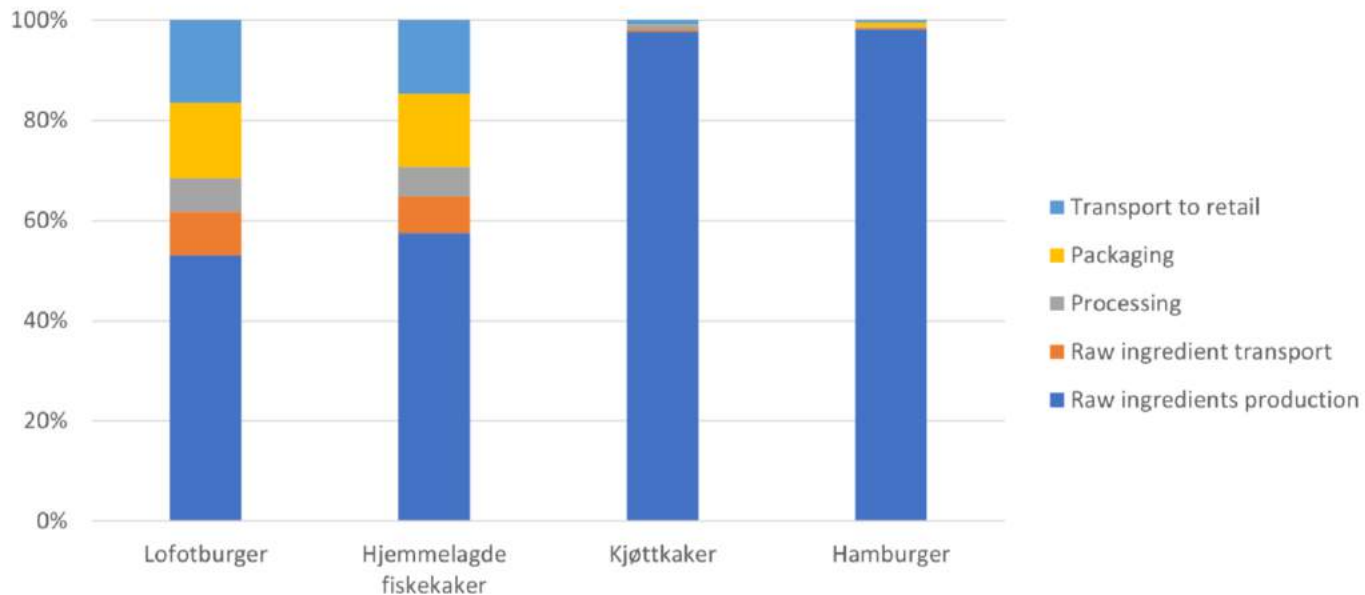
Kjøttkaker

Carbon footprint Hamburger



Hamburger

% contribution of productions steps



Proportional contribution of production steps



Pasta
0.06 kg O₂e/portion



Kaffe
0.04 kg O₂e/kopp

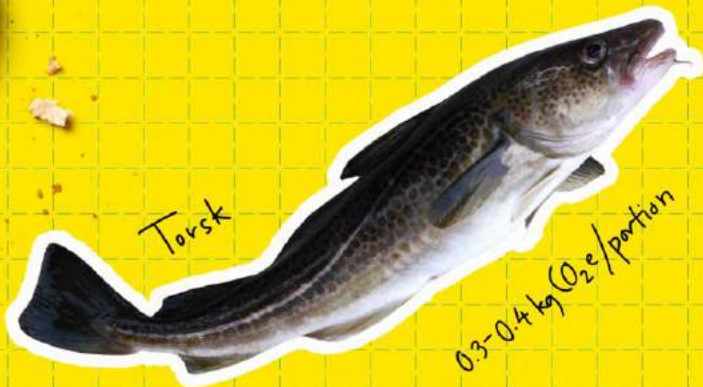


Morötter
0.1 kg O₂e/knippen

Conclusions



Vete
0.4-0.7 kg O₂e/kg



Torsk
0.3-0.4 kg O₂e/portion

- Replacing "kjøttkaker" with "Hjemmelagde Fiskekaker" or a hamburger with a "Lofotburger" or leads to a 8 and 17 times lower carbon footprint, respectively
- Production of ingredients has a lower proportional share of total greenhouse gas emissions in fish products than in meat products
- The main improvement potential in fish product value chains is found in the sourcing of fish and dairy ingredients

Conclusions

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