

**Sociodemographic aspects
in a LCA of the food consumption in
Germany - with a focus on animal-based foods**

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Contents

- 
1. **Overview - methodology**
 2. **Results**
 3. **Summary**

Overview - methodology

According to ISO 14040 / 14044 (2006) *life cycle assessment*

1. Goal & scope

Attributional LCA

- meat products
- milk products
- egg products
- fish products
- grain products
- vegetables
- fruits
- potato products
- margarine, oils
- sugar, sweets
- **without beverages**

due the socio-demographic indicators:

- gender
- region

- from „cradle to store“

- Functional Unit (FU):
1 kg consumed product

- reference year: 2006

2. Life cycle inventory

Nutrition data

social indicators

3. Life cycle impact assessment

Environmental data

impact indicators

4. Interpretation

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Official statistics (FBS)

- average consumption, production on a yearly basis

Federal Ministry of nutrition, agriculture & consumer protection

National Nutrition SurveyII

- 2006
- among 13.000 Germans
- 14 - 80 years
- whole country

Max Rubner-Institute



National Nutrition Survey I

- 1985-88
- among 20.000 Germans
- Western Germany

social indicators

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Environmental data

Top-down input/output data

- C A P R I *Joint Research Committee*
- S E E A *Von-Thünen Inst.*
→ Sector: **agriculture & upstream processes**
- Energy usage *Federal stat. Bureau*
→ Sector: **processing**

Bottom-up data

- G E M I S *Öko-Institut*
→ Sector: **transport, trade, packaging**

impact indicators

- **greenhouse gases (CO₂ eq.)**
- **ammonia (NH₃)**

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- **social status**
- **age group**

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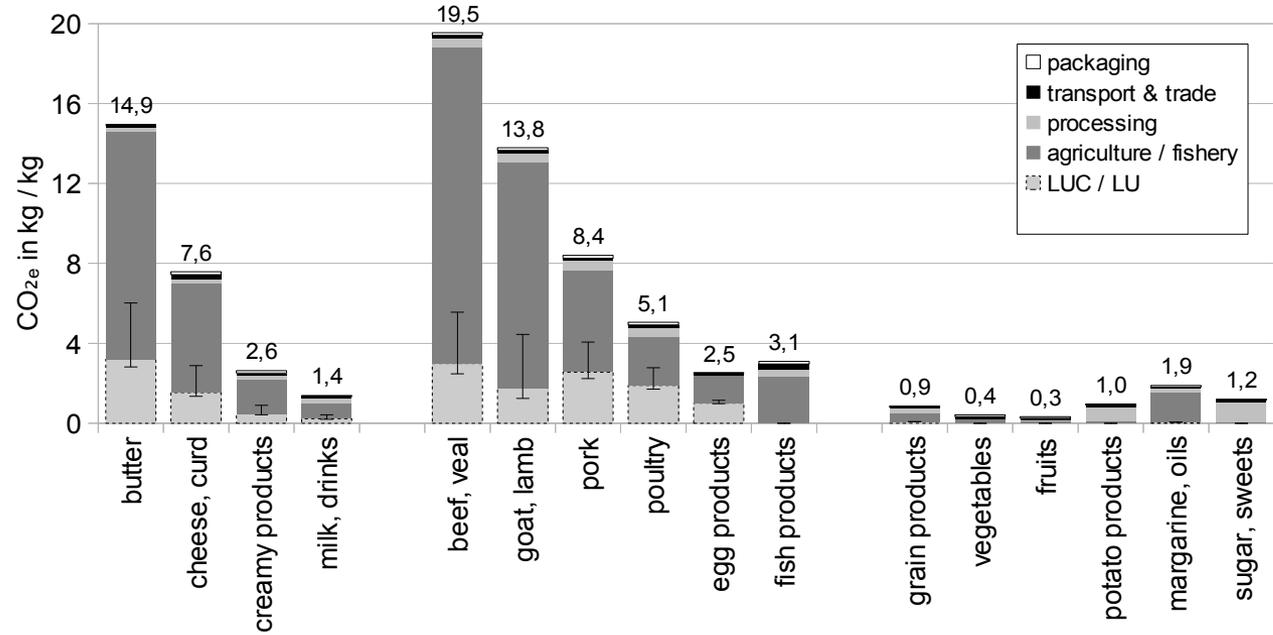
- **water usage**
- **area usage**

4. Interpretation

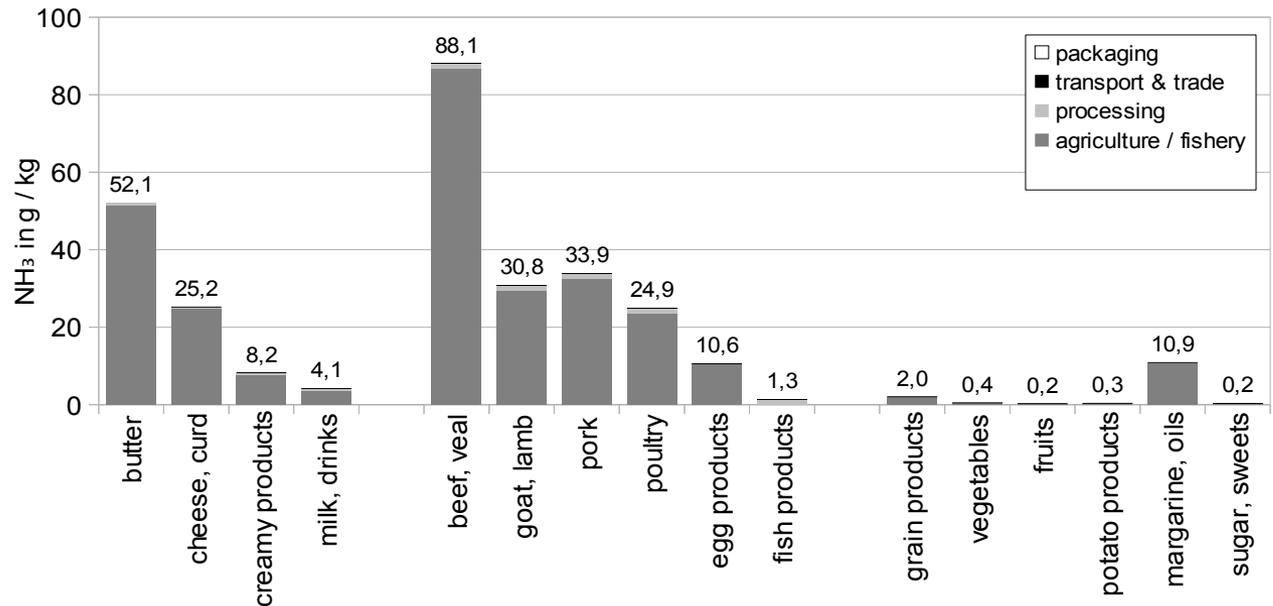
- critical review
- verification of the validity via sensitivity analysis

Results: Impacts of analysed products 2006 "cradle to store"

CO_{2e} emissions in kg / kg

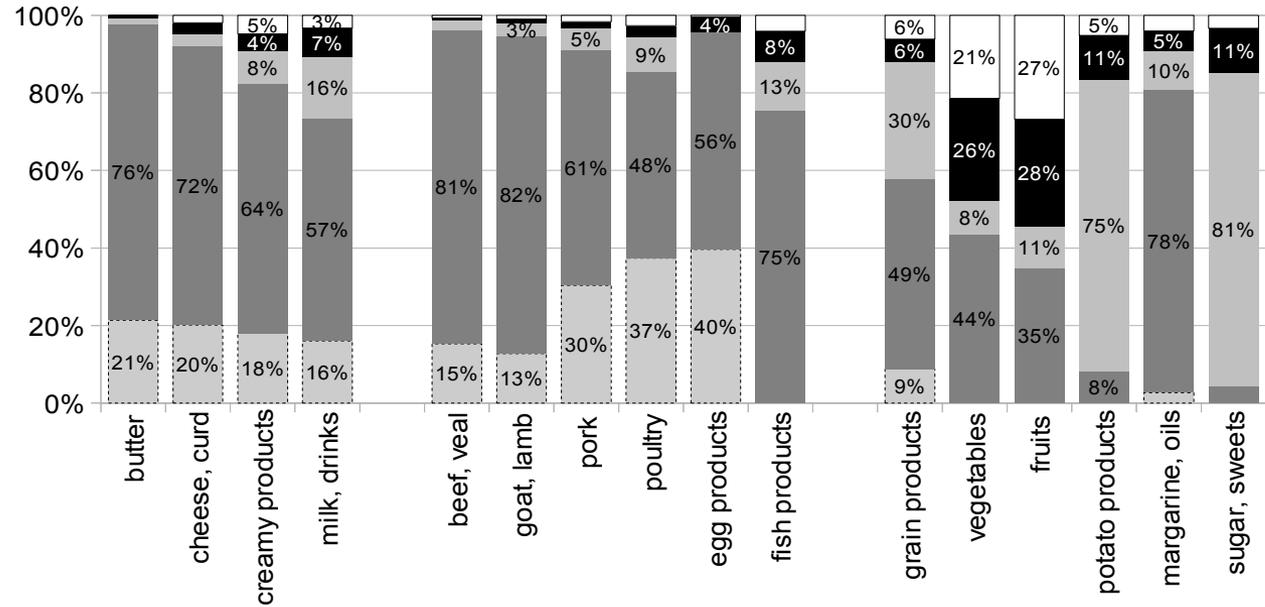
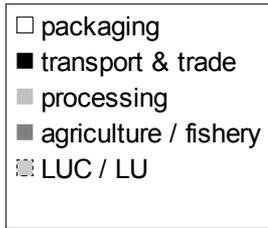


NH₃ emissions in g / kg

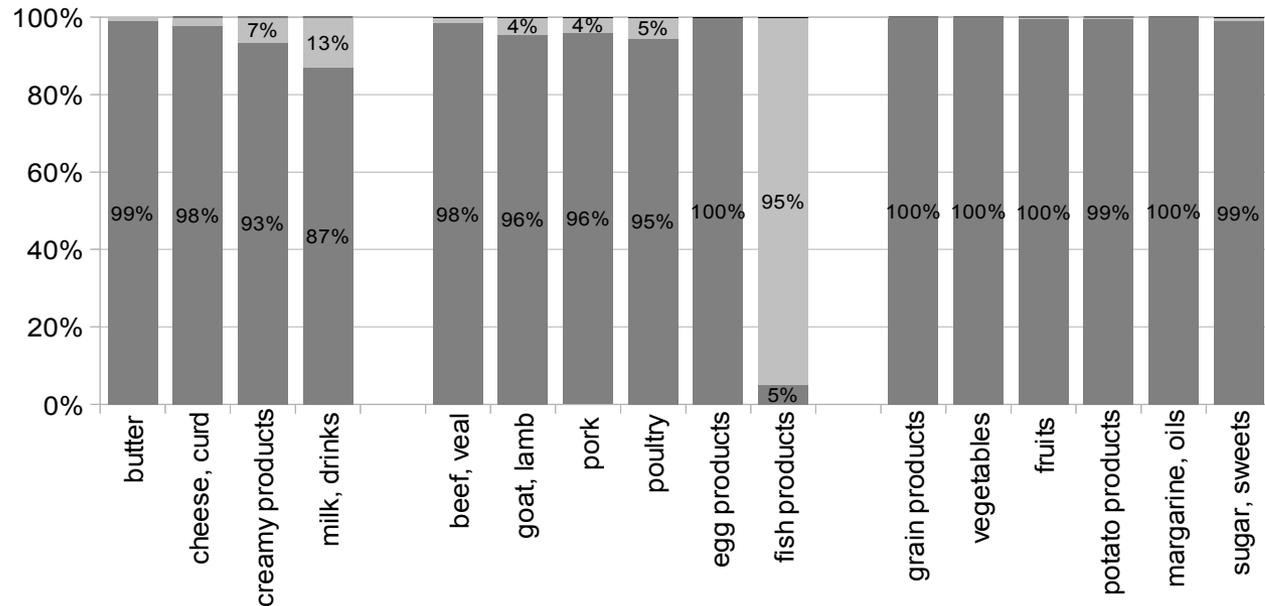


Results: Impacts of analysed products 2006 “cradle to store” - relative

CO_{2e} emissions in %

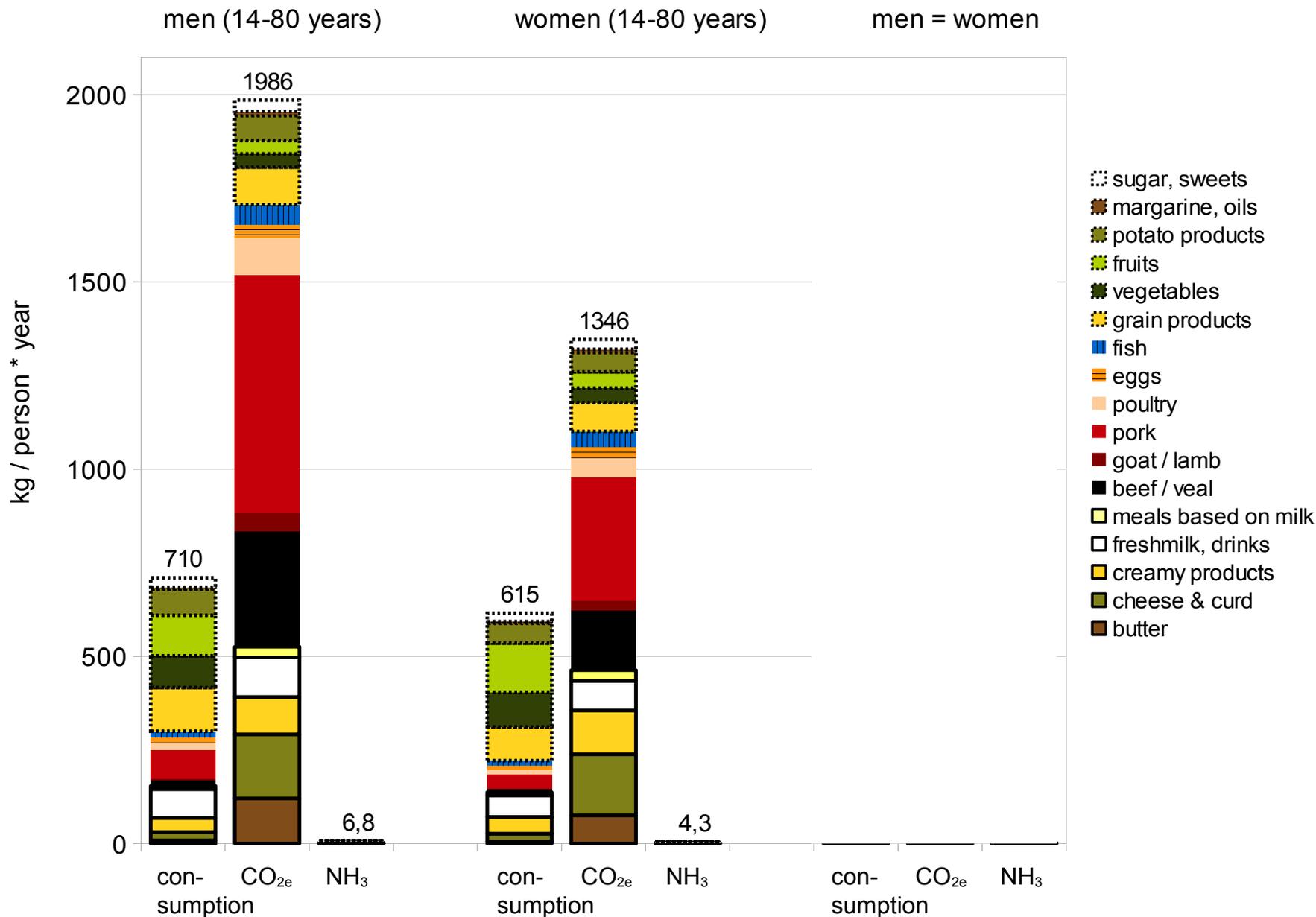


NH₃ emissions in %

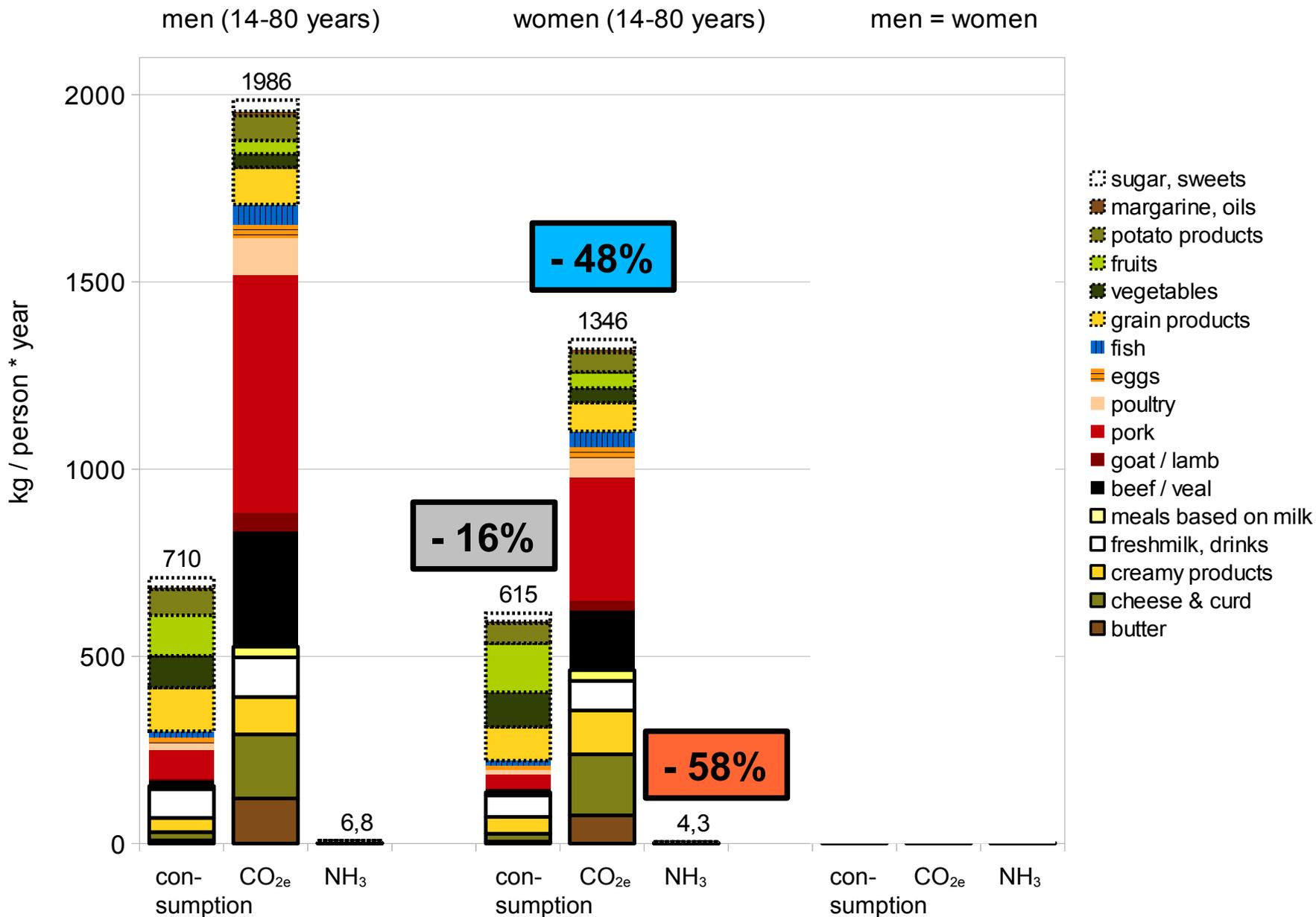


Own calculations due to Leip et al. 2010, BMELV 2009, Öko-Institut 2010, LCA consultants DK 2006

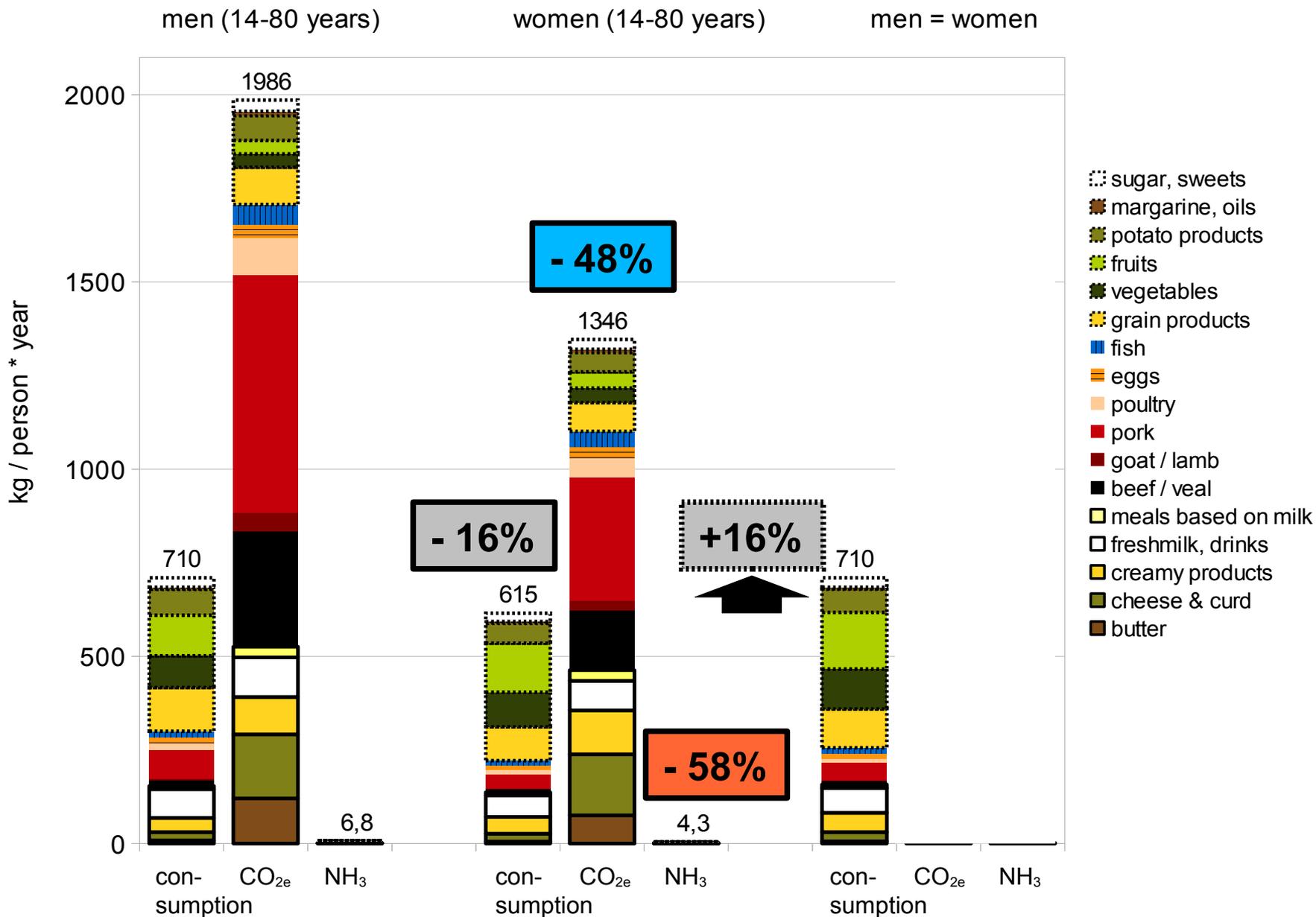
Consumption related CO_{2e} & NH₃ emissions due to gender



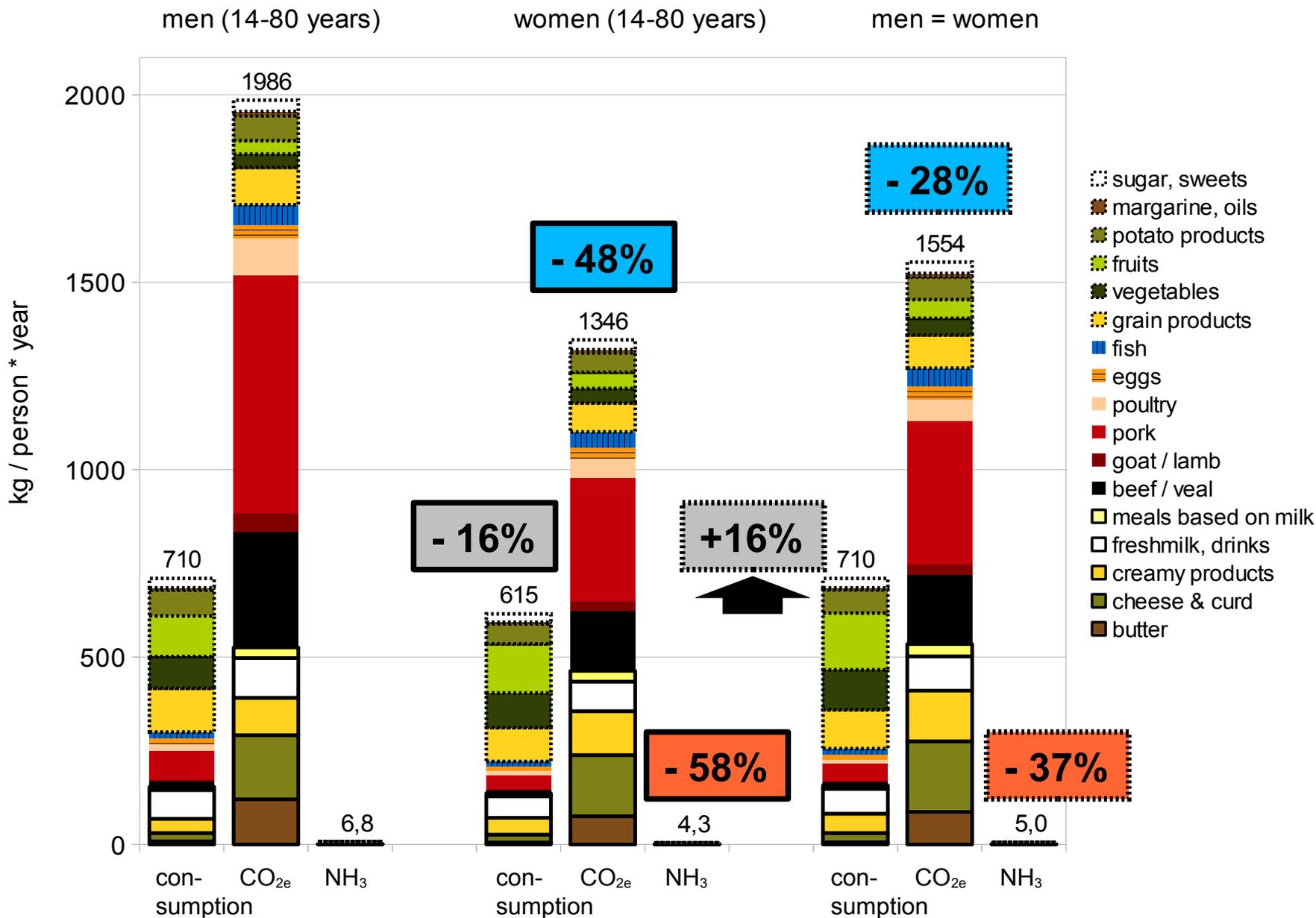
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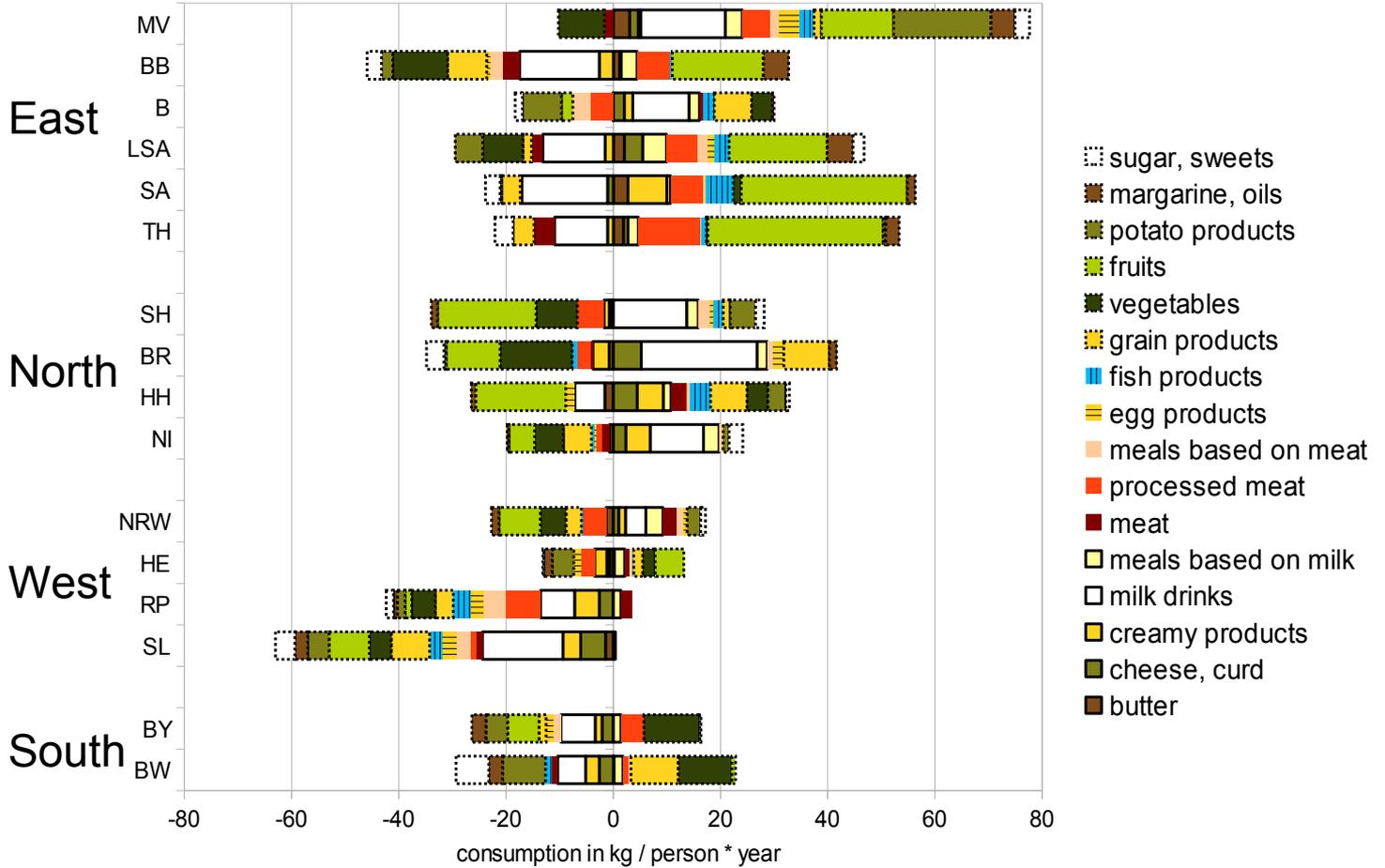
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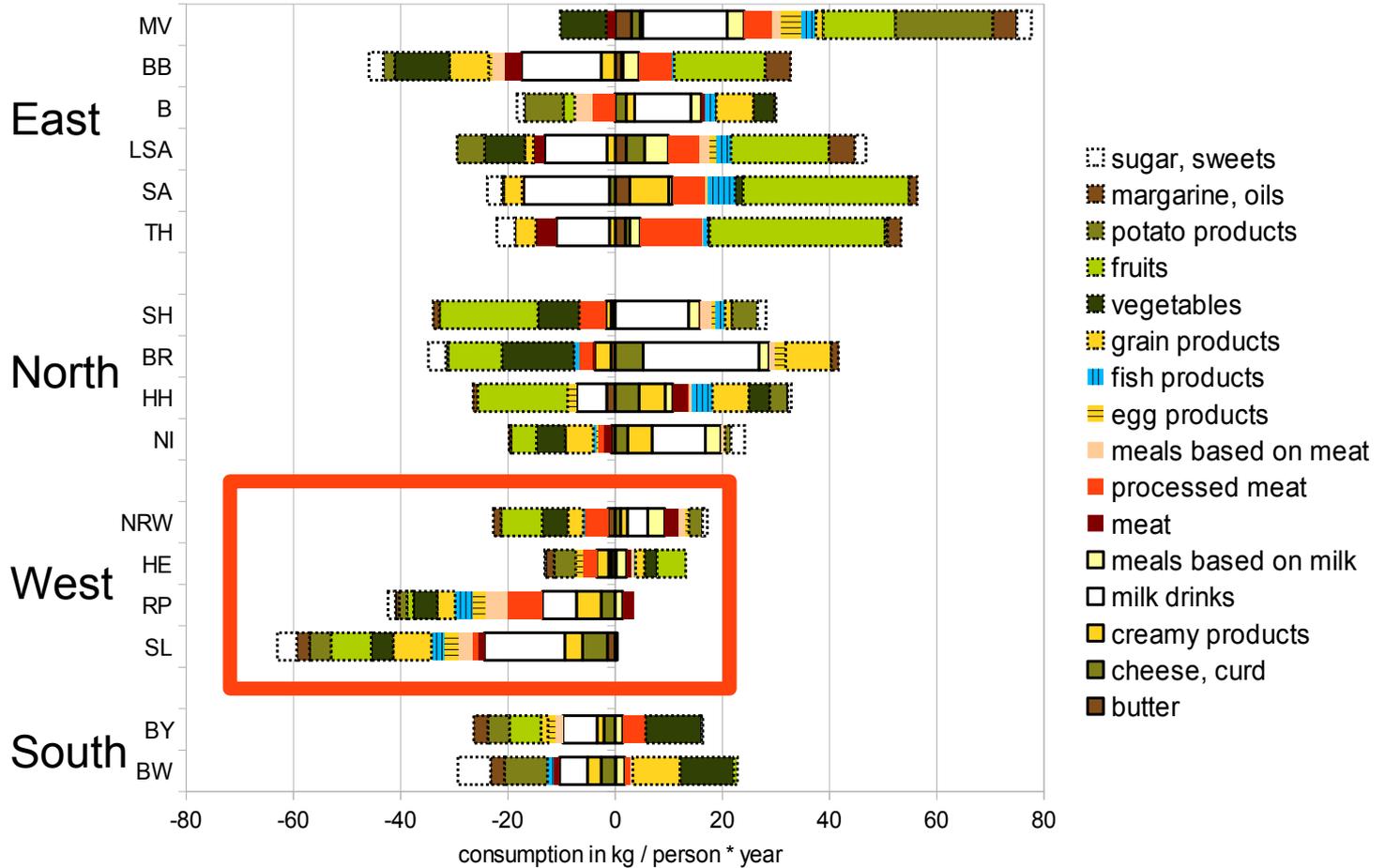
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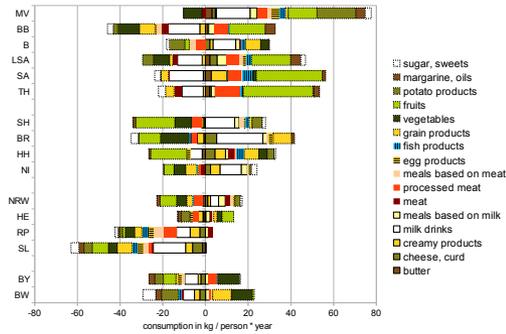
Regional consumption differences



Regional consumption differences & related emissions

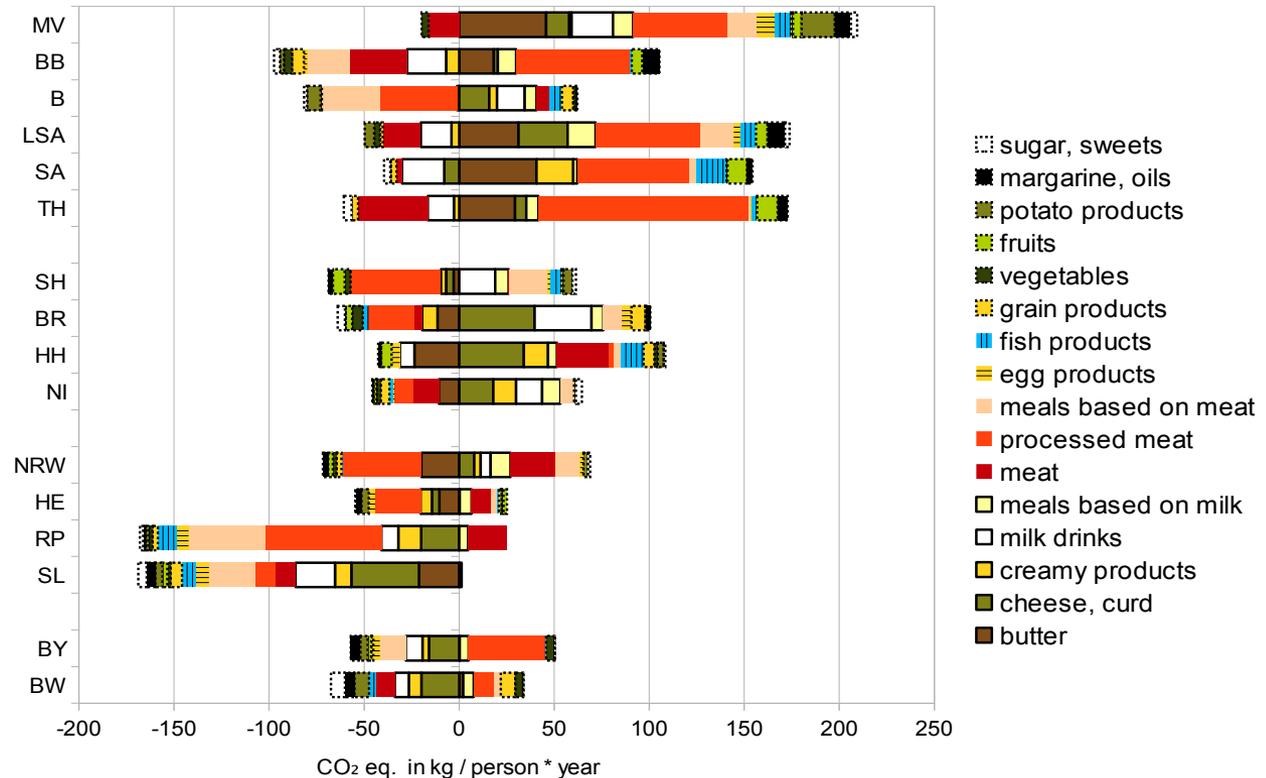


Regional consumption differences

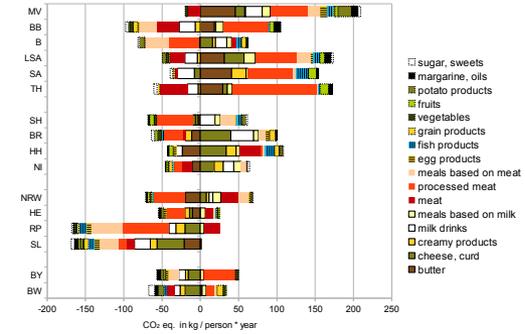
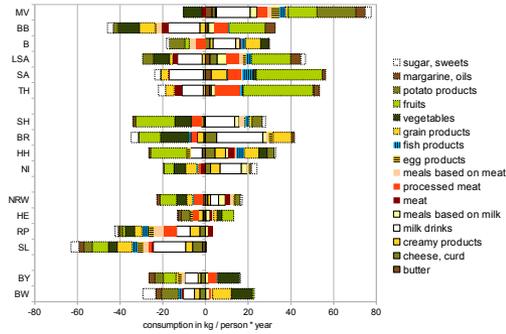


... and related CO_{2e} emissions

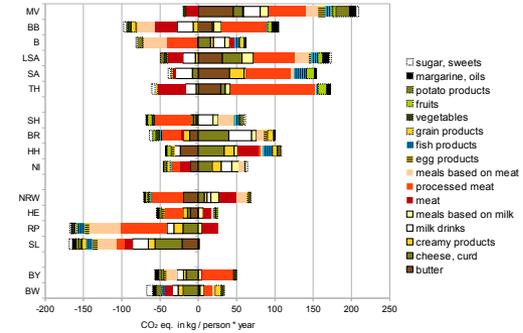
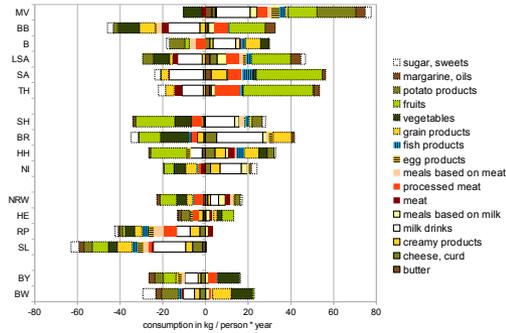
Maximal difference of related GHG emissions between Mecklenburg-Pomerania & Saarland of 357 kg CO_{2e} / person * year



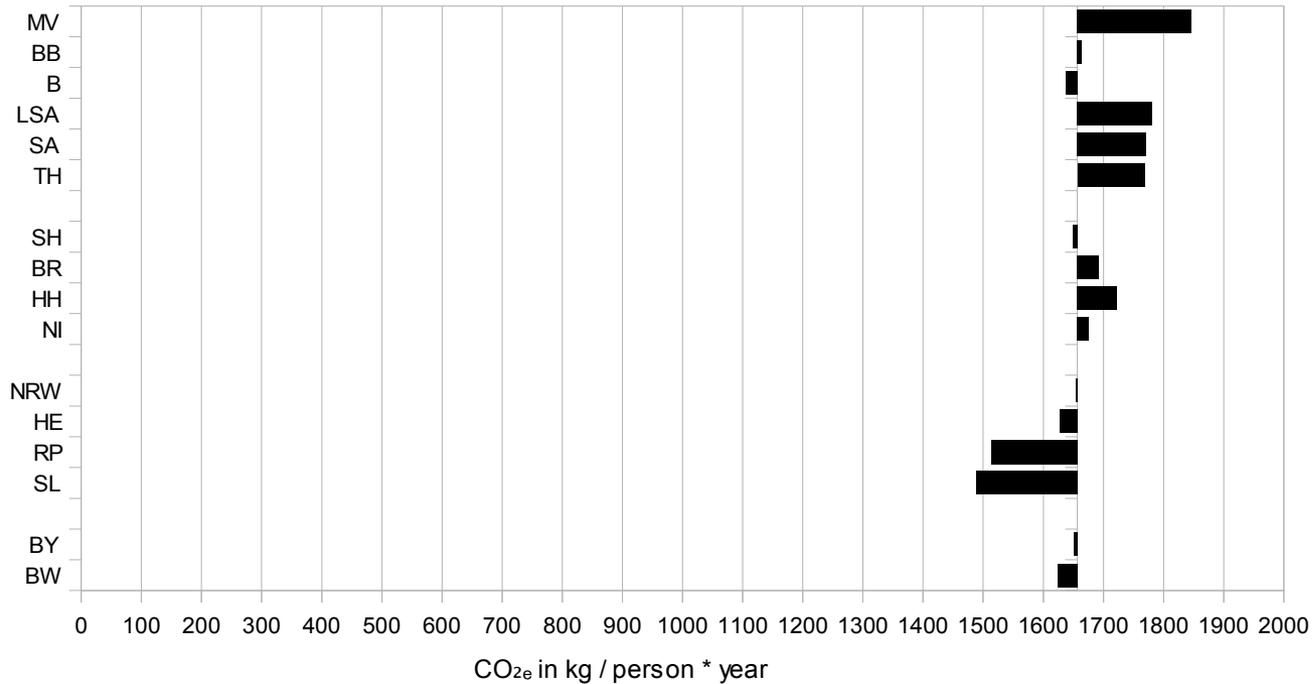
Regional consumption differences & related emissions



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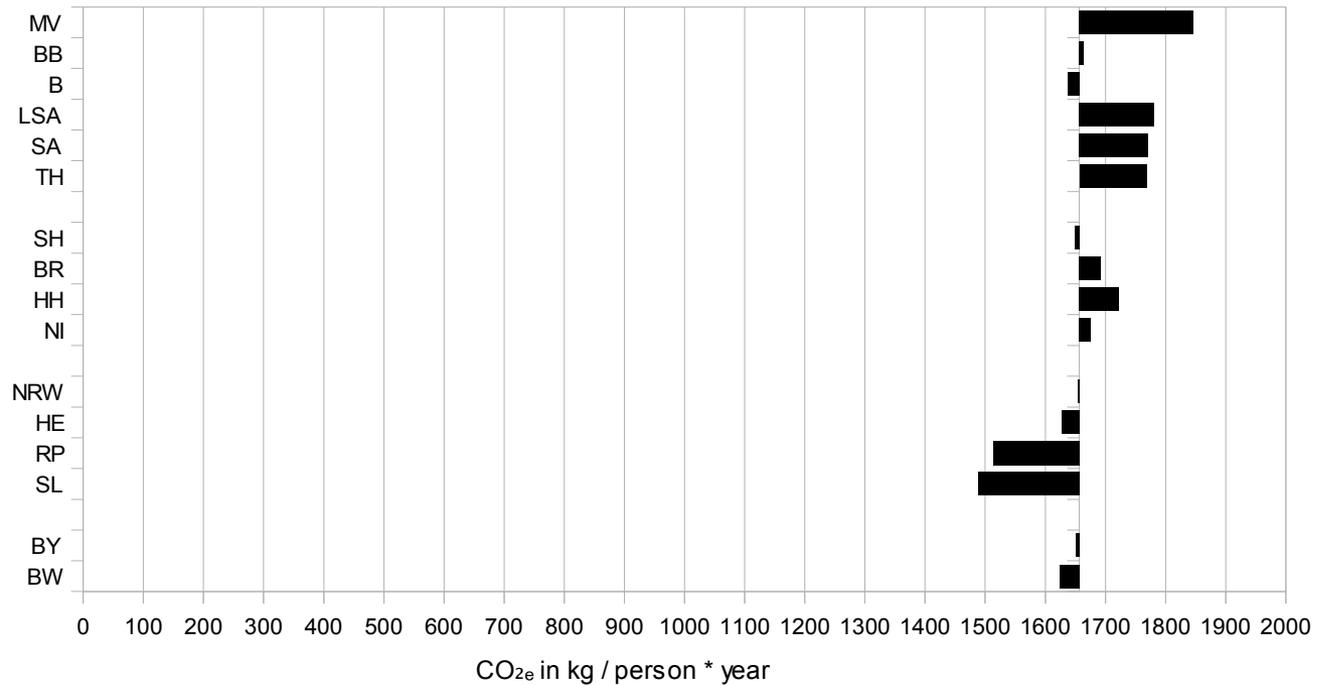


Comparison with 1988 (NNS I), German Nutrition Society (DGE) & UGB

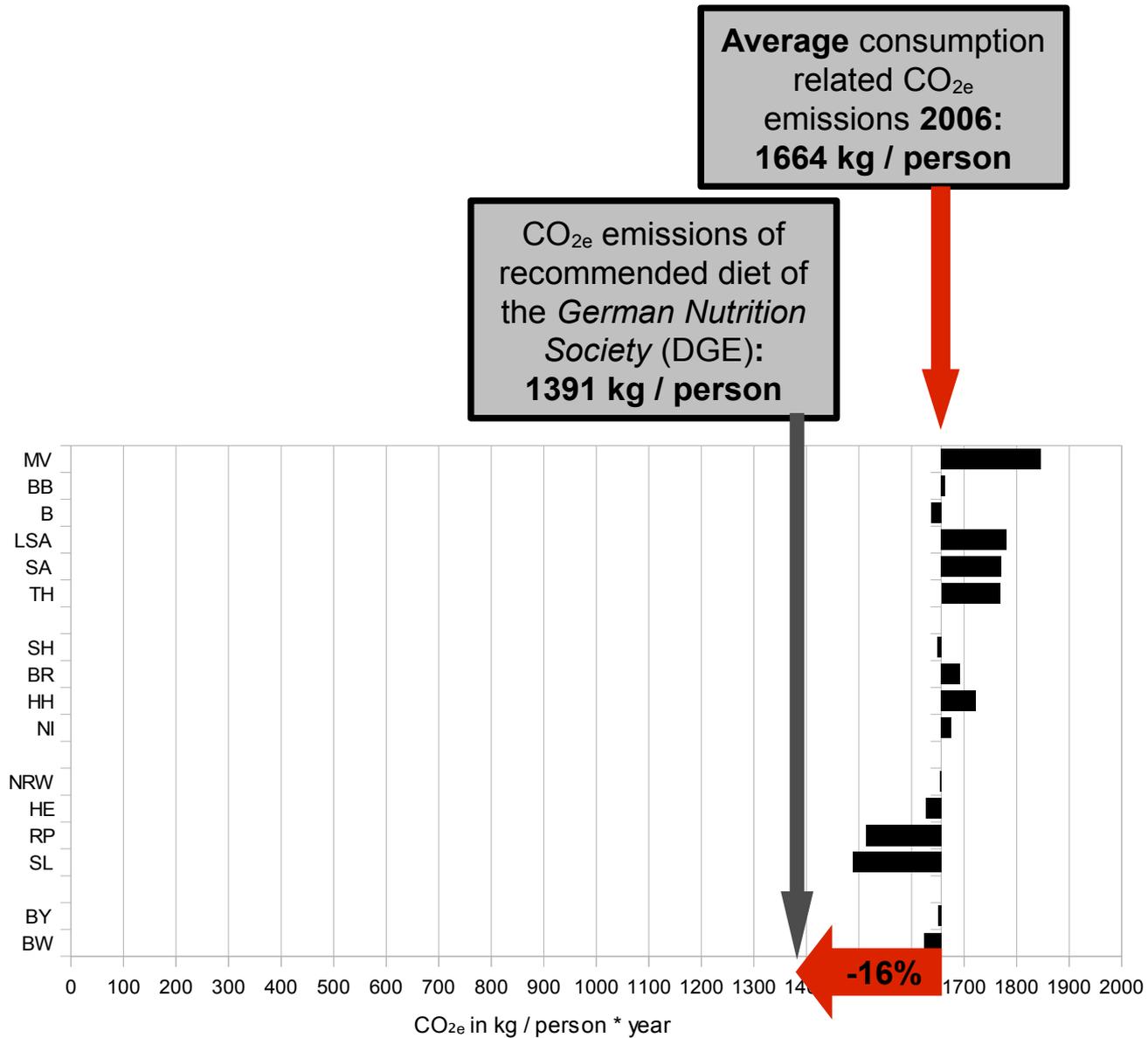


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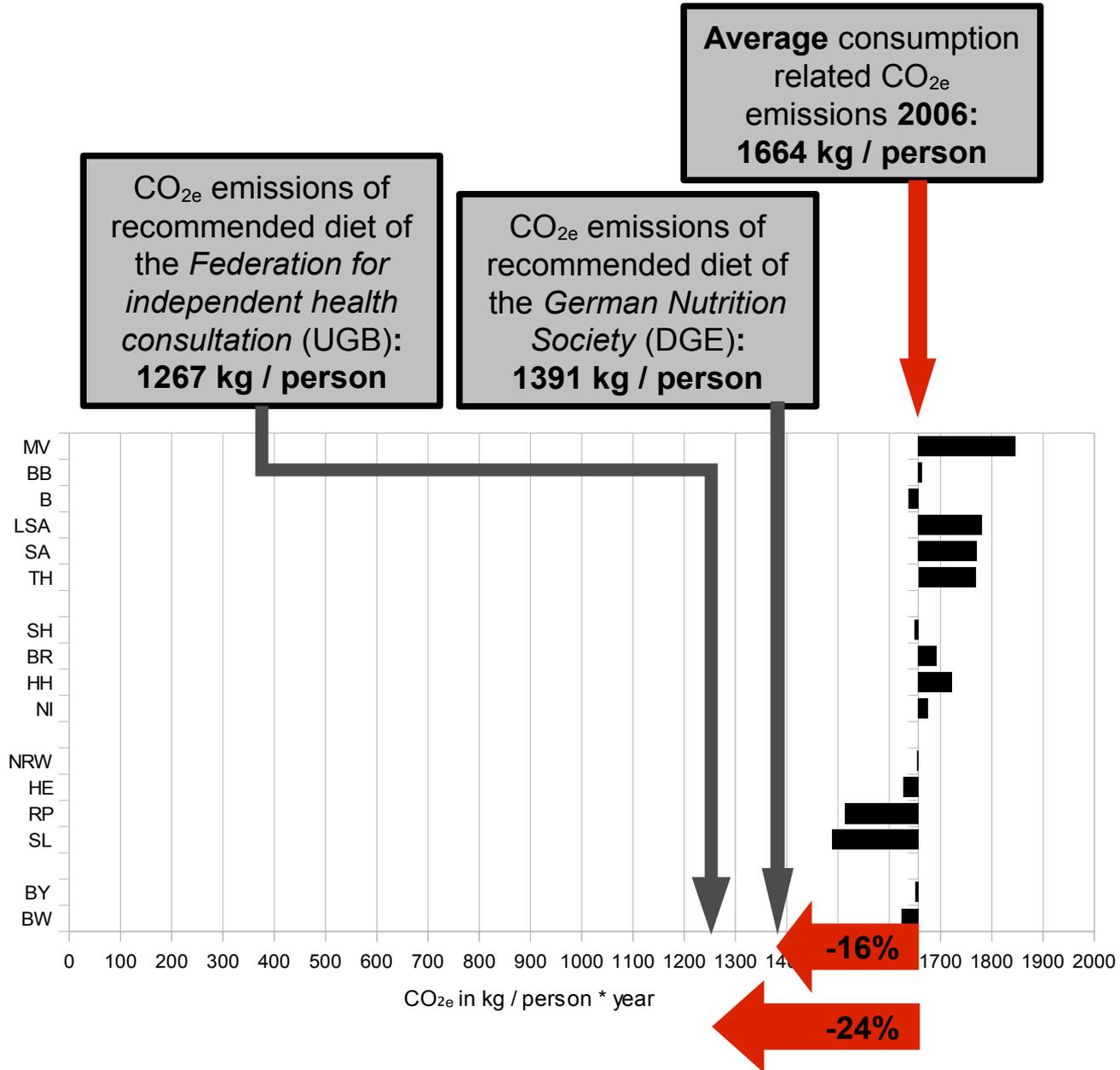
**Average consumption
related CO_{2e}
emissions 2006:
1664 kg / person**



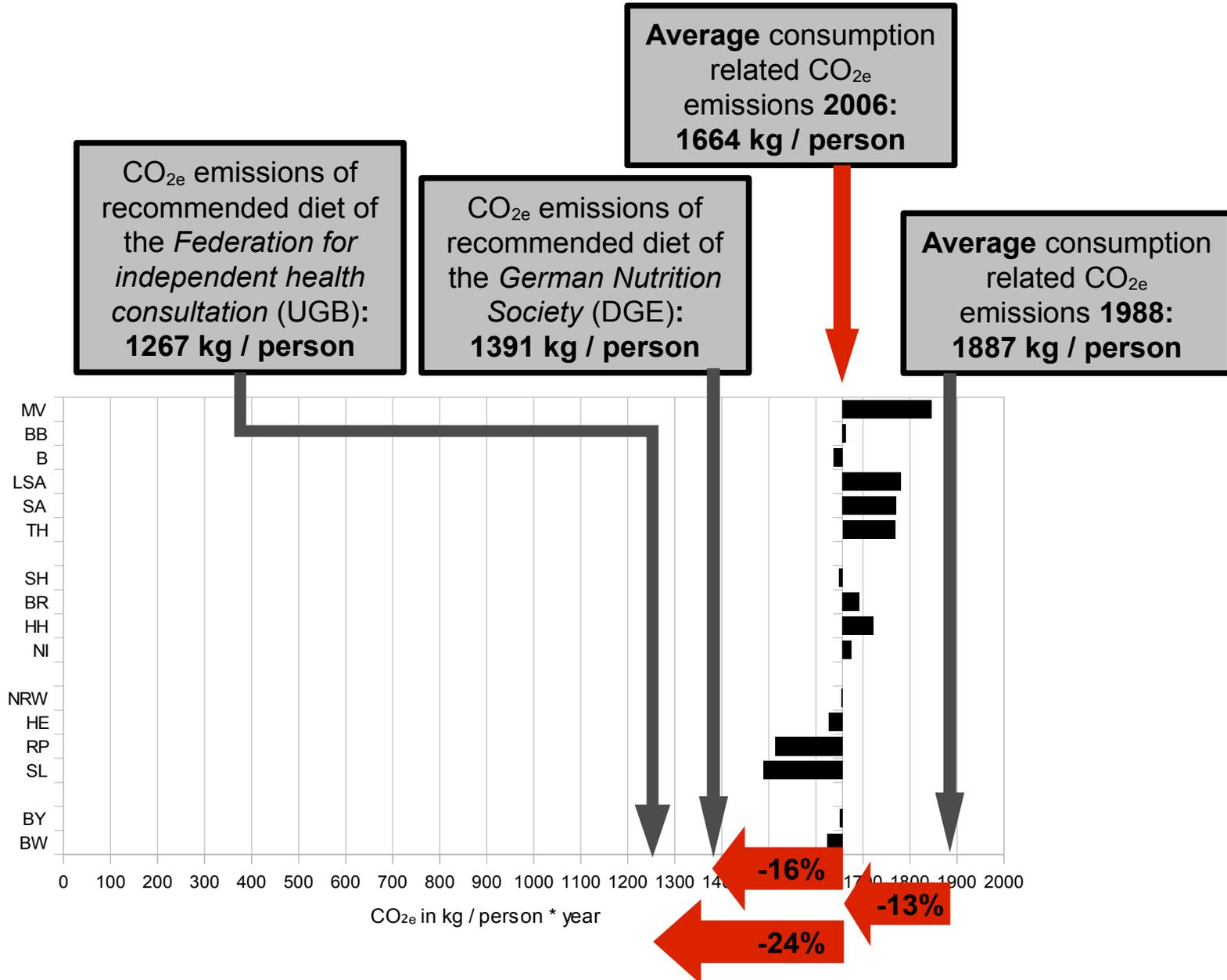
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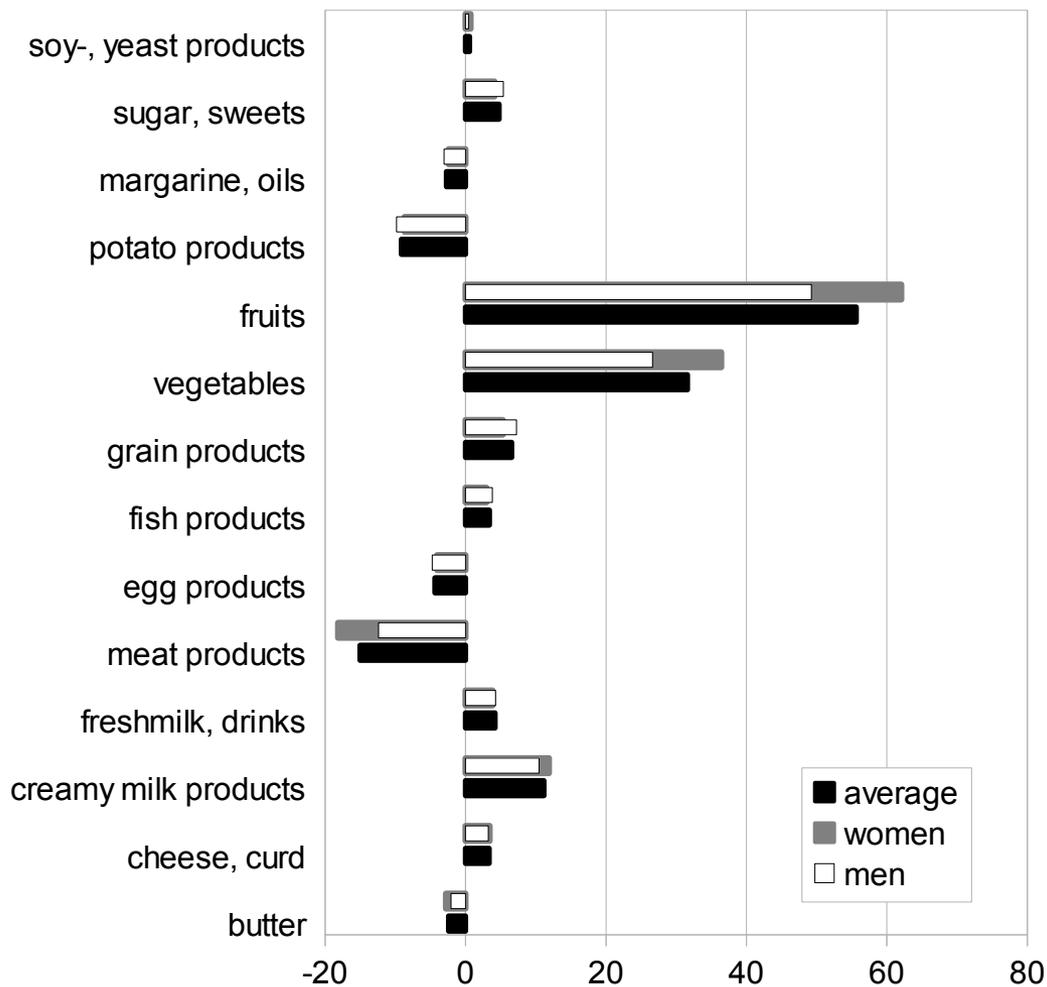
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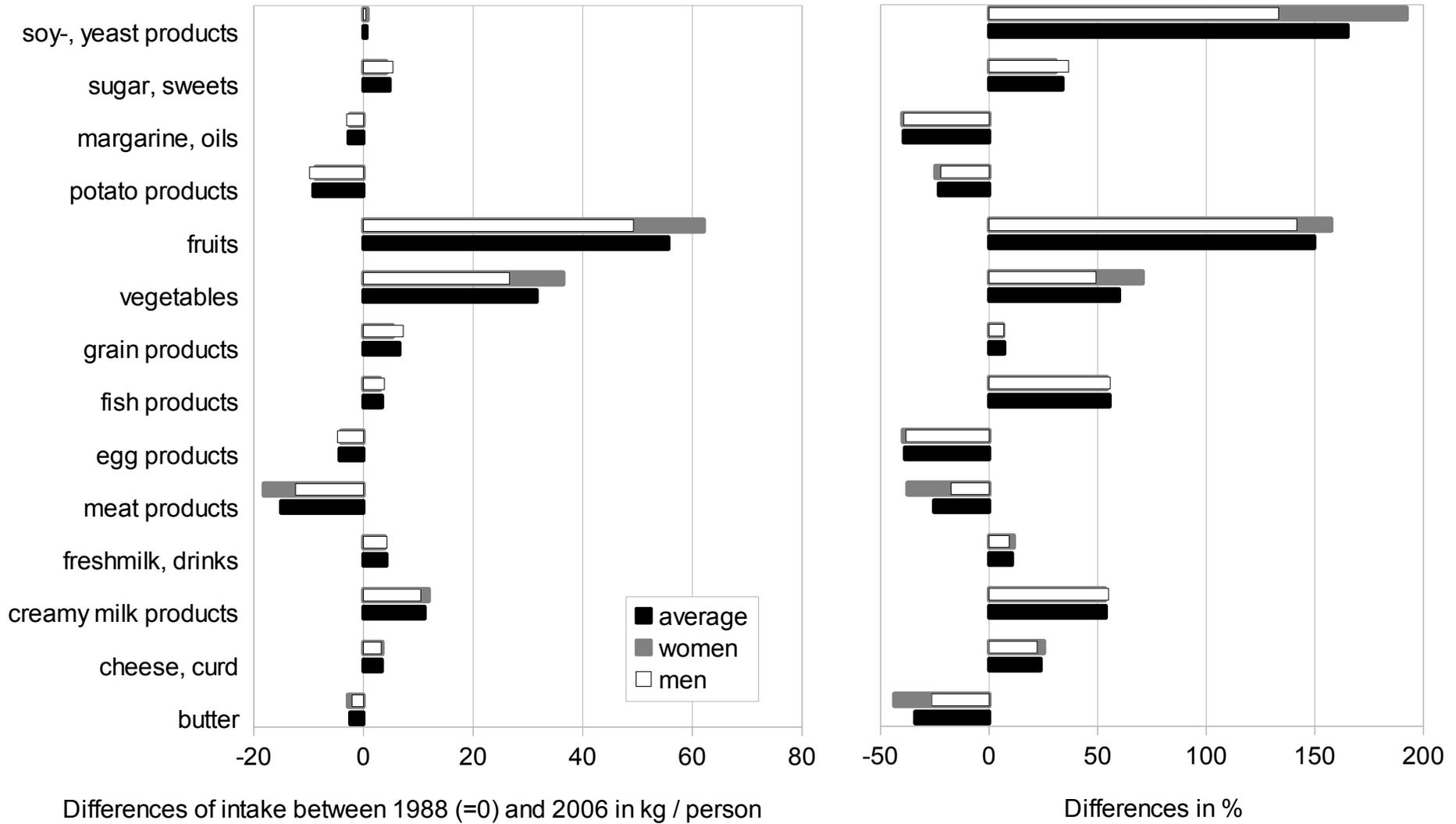


Comparison of the food intake in 2006 with 1988



Differences of intake between 1988 (=0) and 2006 in kg / person

Comparison of the food intake in 2006 with 1988



Summary

Gender, region & nutrition recommendations

- women's consumption is in comparison to men's significantly more environmental friendly: (after levelling) GHG: - 28 % Ammonia: - 37 %
- Mainly due to less meat & meat products and butter in the diet, in contrast: more vegetables, fruits and creamy milk products

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- Regional differences in the consumption and in related impact categories exist, but are relatively low in comparison to official nutrition recommendations:
- *German Nutrition Society (DGE)*: GHG: - 16 % Ammonia: - 28 %
Federation for independent Health Consultation (UGB): GHG: - 24 % Ammonia: - 32 %
- Comparison of the **Second** (2006) with the **First National Nutrition Survey** (1988) shows a reduction: GHG: - 13 % Ammonia: - 20%

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• Conclusion

Changes in nutrition patterns over the last 20 years had positive effects on environmental indicators, but ...

- There are still potentials to unite environmental and health benefits completely – at least in Germany



Special thanks for the attention !

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Consumption related differences after **l e v e l l i n g** (women +16%)

