Variation in modelled healthy diets based on three different food patterns identified from the Danish national diet – and the impact on carbon footprint Nordic Nutrition Conference, Gothenburg 2016 (poster)

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Citation (APA):
**Introduction** A healthy diet complies with the national food-based dietary guidelines (FBDG) and Nordic nutrition recommendations (NNR2012). Although mostly plant-based it might not be the most climate friendly diets.

**Objectives** 1) Develop new healthy diet compositions by a simple diet modelling technique that ensures a nutrient content in accordance with the recommended values and depending on food preferences and habits, and 2) Further optimize the diet composition with regard to carbon footprint (CF).

**Methods**
- A simple modelling of the 'Traditional', 'Health conscious' and 'Fast food' patterns identified from national dietary data (Knudsen et al. 2014) into iso-caloric (10MJ) healthy diets that fulfill the Danish FBDGs and NNR2012 with respect to both micro- and macronutrients and in accordance to core preferences.
- Updated list of estimated carbon footprint (CF) of food items included in the diets, based on literature.
- Extension of modelling was used to optimize the healthy diets with regard to their estimated carbon footprint (CF).

**Results**
- Around 415 food items are included in the three original food patterns and used in the modelled healthy food patterns.
- Based on literature CF of these foods is updated, including the contribution from waste, transportation and cooking at home.
- Around 125 foods with the lowest CF from each food group were included in the CF optimized dietary patterns.
- Despite variation in the amounts of contribution of foods in each food group and in the composition of foods within each food group, the estimated CFs of the modelled healthy dietary patterns are similar to original Danish patterns.
- CFs of the CF-optimized dietary patterns are similar to each other, and CF of CF-optimized dietary patterns are 17-25% lower than the original patterns. Only a small contribution to CF from transportation and cooking at home.

**Conclusion** Different dietary patterns can fulfill Danish dietary recommendations. Specific constraints are needed to lower the Carbon Footprint of the both original and healthy diets.

### Table 1. Food composition of Original Danish dietary patterns, Healthy modelled dietary patterns and CF-optimized healthy dietary patterns. The number of foods (N) within selected food groups included.

<table>
<thead>
<tr>
<th>Food group</th>
<th>Original</th>
<th>Green</th>
<th>Fast</th>
<th>N</th>
<th>Healthy modelled</th>
<th>Green</th>
<th>Fast</th>
<th>N</th>
<th>CF-optimized</th>
<th>Green</th>
<th>Fast</th>
<th>N</th>
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<tbody>
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<td>861</td>
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<td>4</td>
<td>812</td>
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<td>461</td>
<td>4</td>
<td>813</td>
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<td>3</td>
<td>640</td>
<td>1384</td>
<td>863</td>
<td>3</td>
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<td>360</td>
<td>345</td>
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<td>Super, honey, marmalade</td>
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<td>Fast food meals etc.</td>
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</table>

**Table 2. Carbon Footprint (CF) estimated of the Original Danish dietary pattern, Healthy modelled dietary pattern, and CF-optimized healthy dietary pattern. (Estimated CF from production and processing, from waste within the food chain, from transportation and cooking at home.)**

<table>
<thead>
<tr>
<th>CF, g CO2:</th>
<th>Original</th>
<th>Healthy modelled</th>
<th>CF-optimized</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ps</td>
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<tr>
<td>Cooking</td>
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<td>201</td>
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This study is part of the project: The role of dairy products in future healthy and sustainable diets partly funded by The Danish Dairy Research Foundation.