



nzo

nederlandse zuivel organisatie

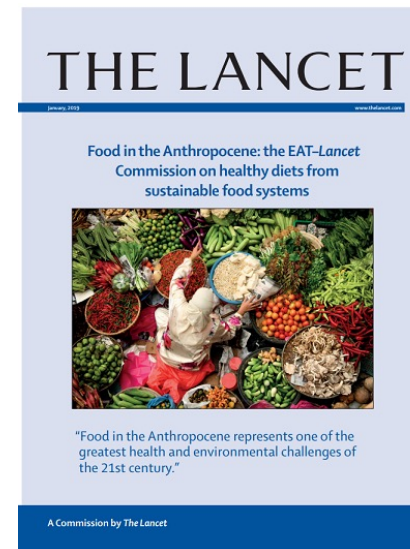
Replacing animal products in a healthy diet in a sustainable diet

Dr. Stephan Peters

Dutch Dairy Association



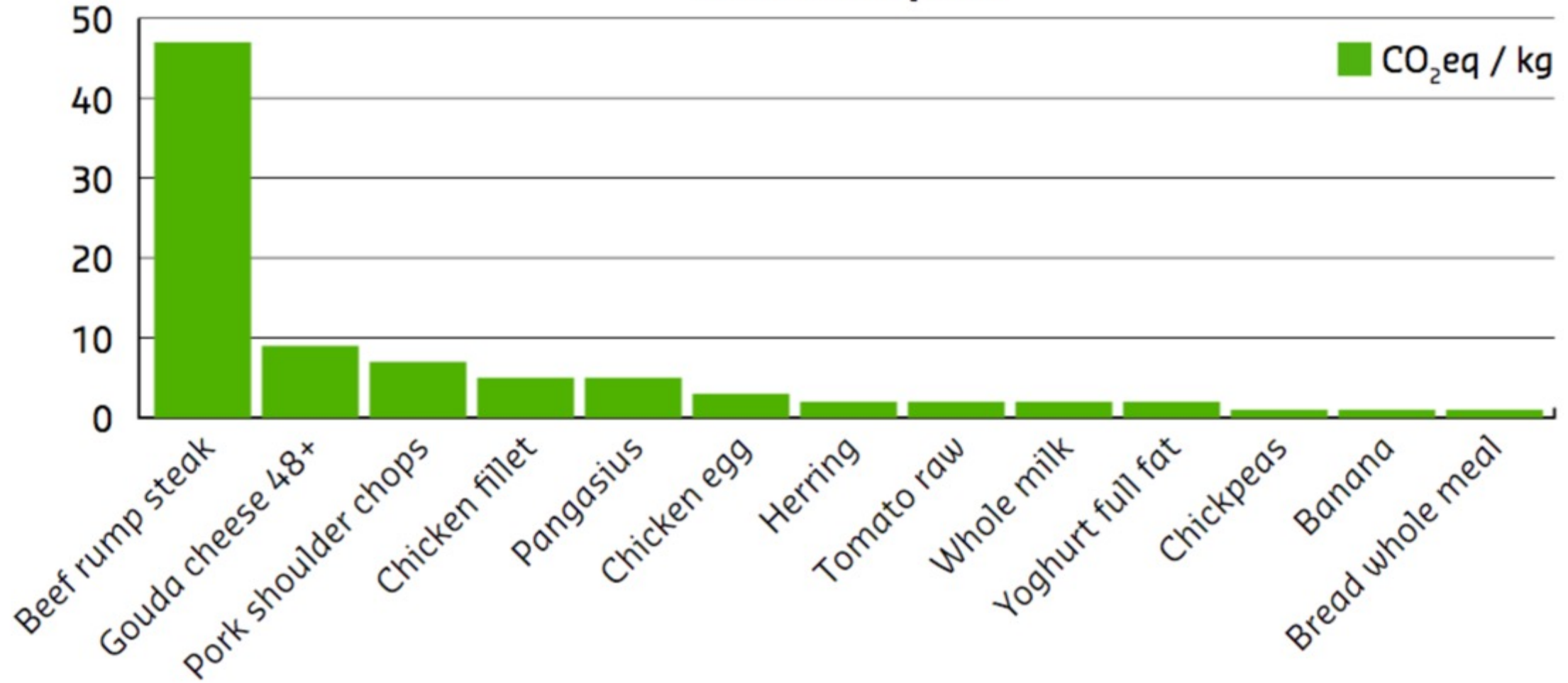
Less animal – more plant-based?



Life-Cycle Assessment (LCA)



Carbon footprint





Sources of minerals

Food Consumption Survey 2012-2016, ages 1-29

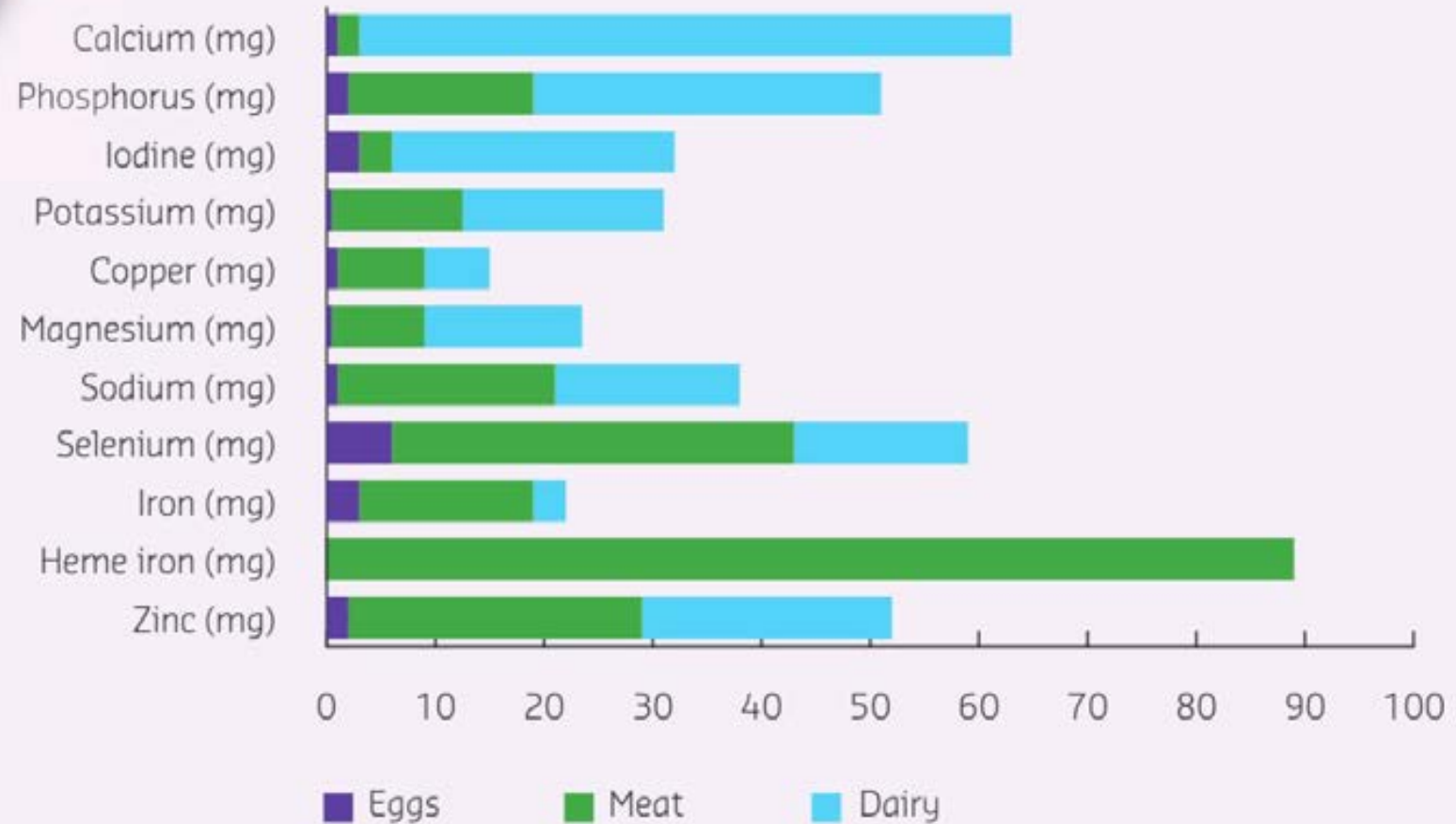


Figure 1a. Share of eggs (green), meat (orange) and dairy (blue) in the average Dutch person's (ages 1-79) mineral intake according to the RIVM Food Consumption Survey, 2012-2016.

Sources of vitamins

Food Consumption Survey 2012-2016, ages 1-29

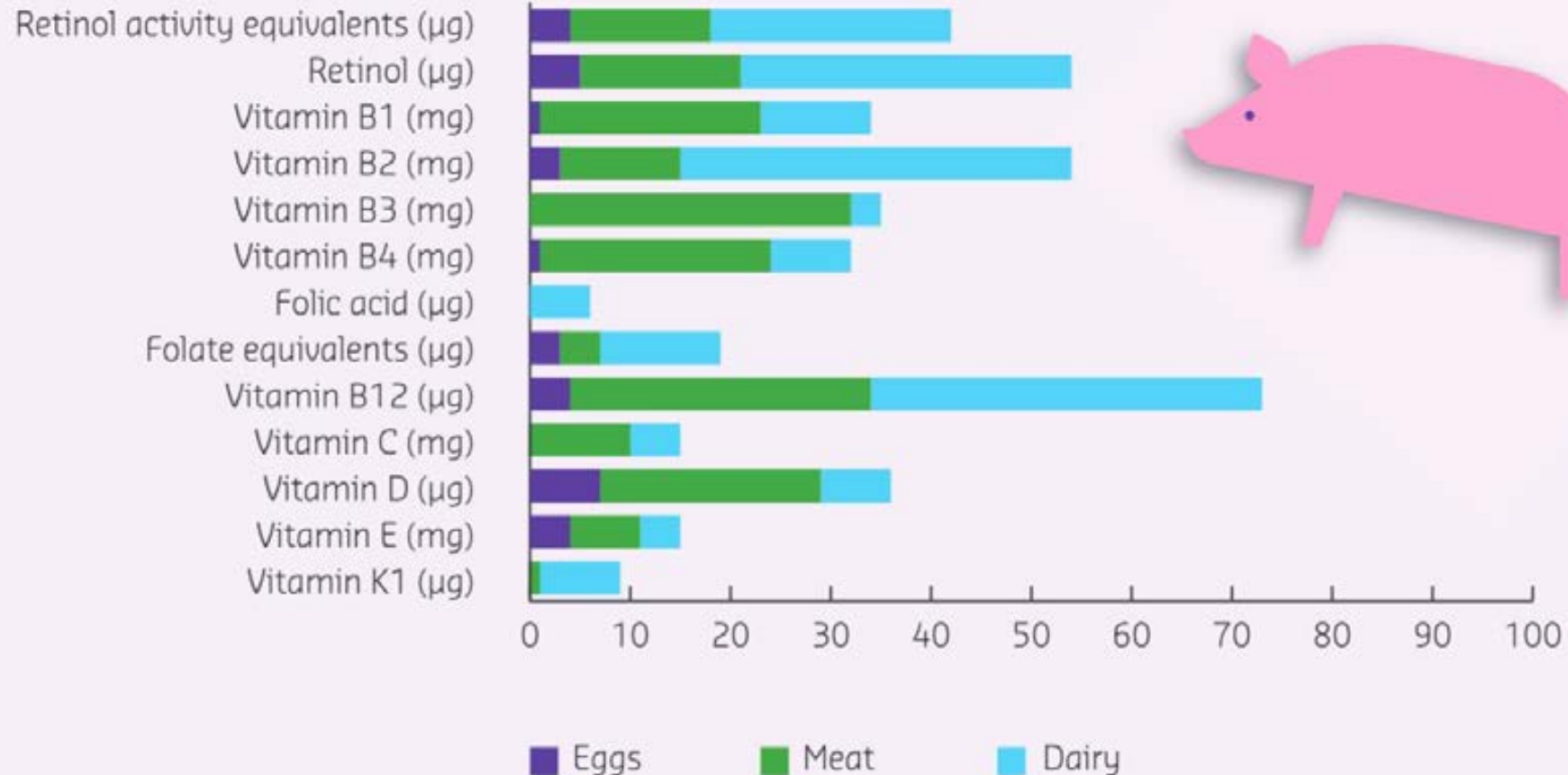
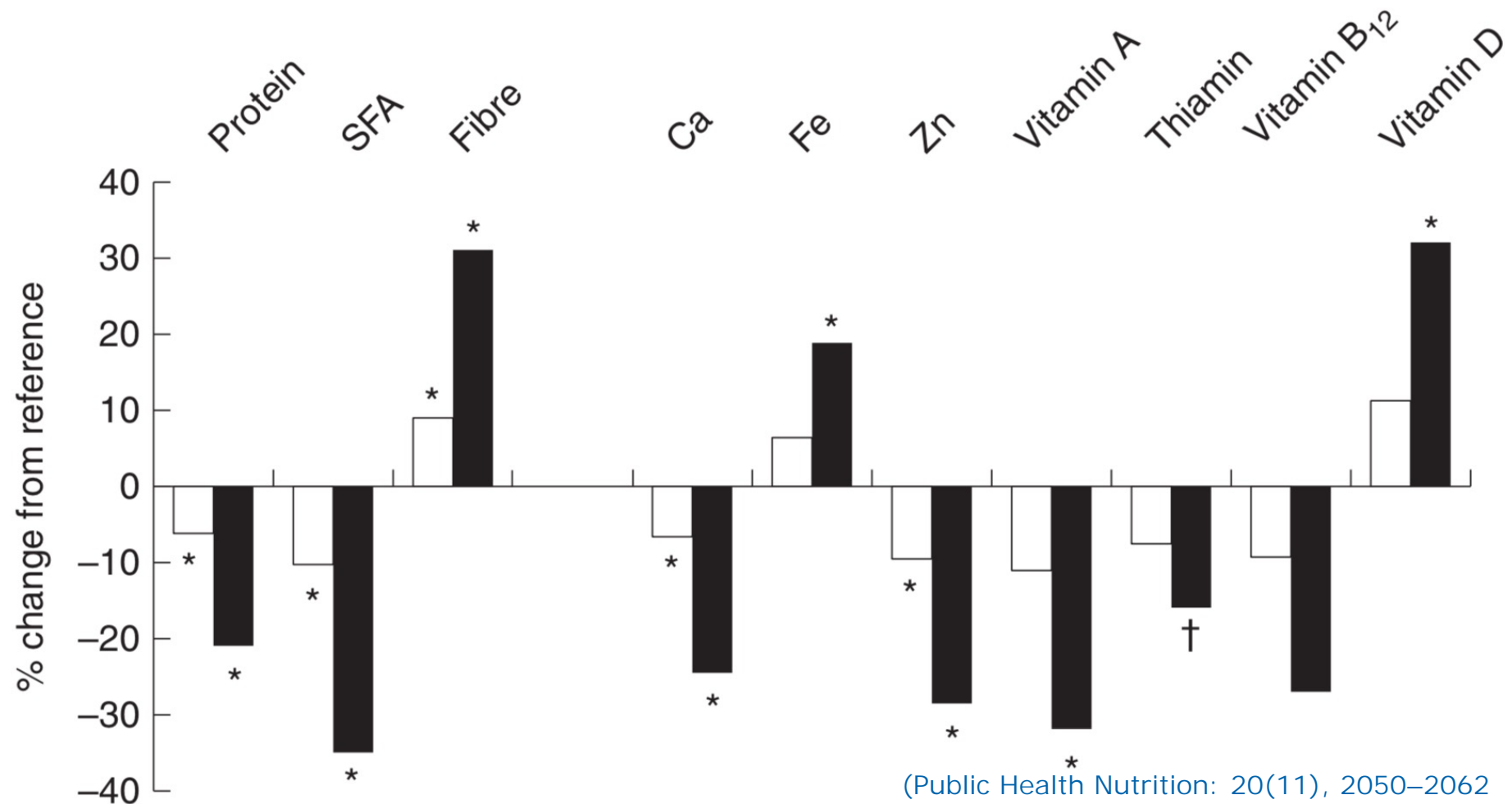
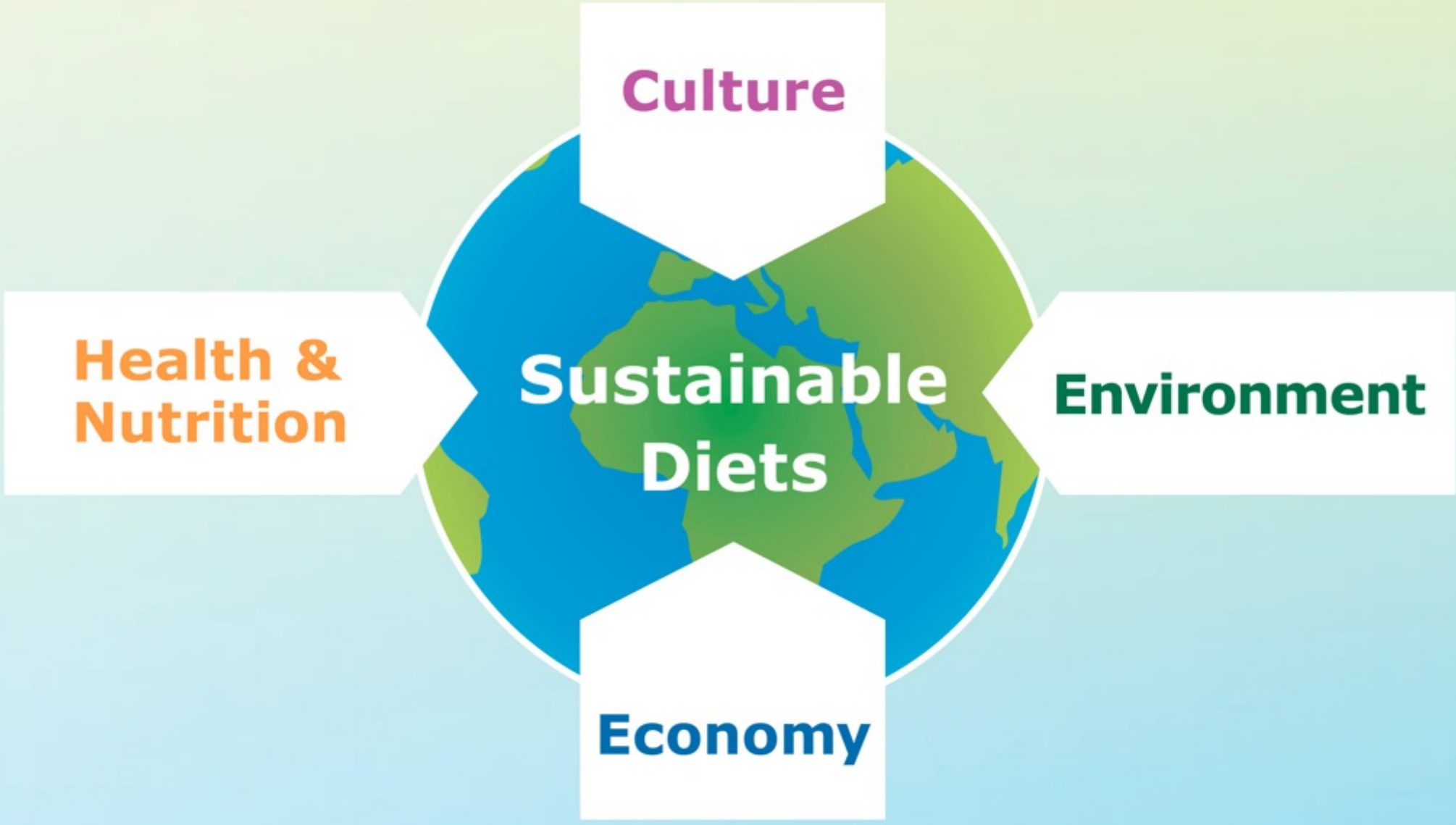


Figure 1b. Share of eggs (green), meat (orange) and dairy (blue) in the average Dutch person's (ages 1-79) vitamin intake according to the RIVM Food Consumption Survey, 2012-2016.

Substitution meat and dairy by plant-based alternatives: 30% less meat and dairy (white). No meat no dairy (black)





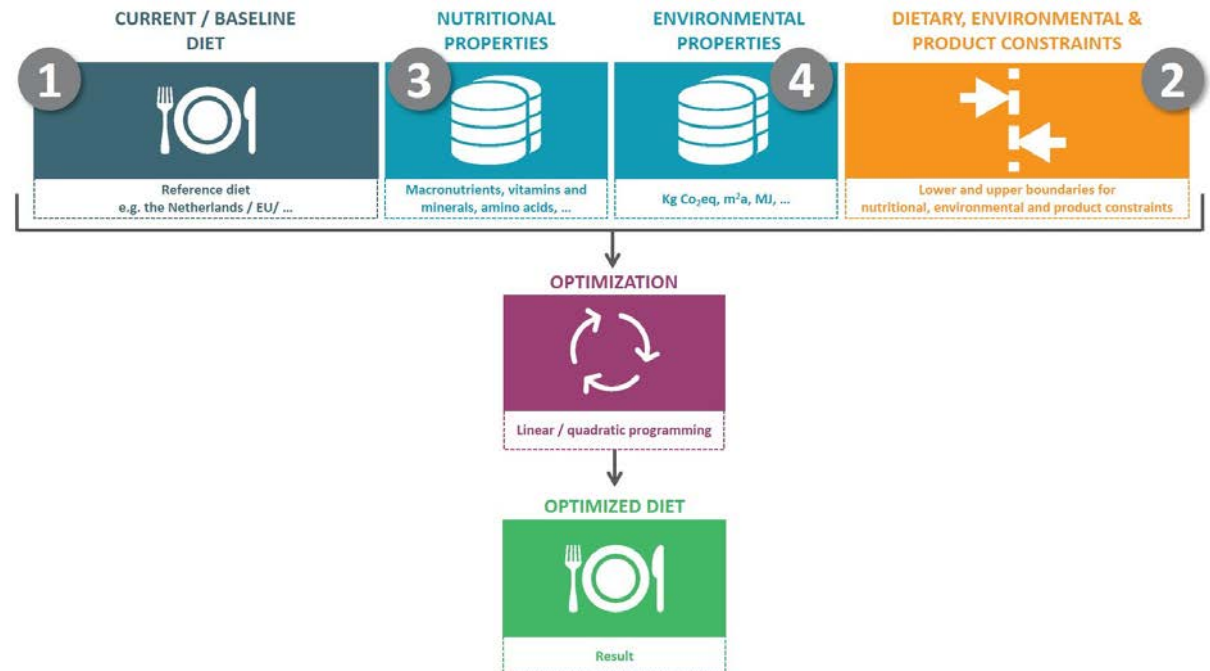
Optimeal at a glance



- Software package for optimization of diets on health and sustainability developed by Blonk Consultants in cooperation with the Netherlands Nutrition Centre (<https://www.optimeal.info/>)
- Contains:
 - Reference diet
 - Nutritional constraints
 - Food database (200+ products)

Nutrient content

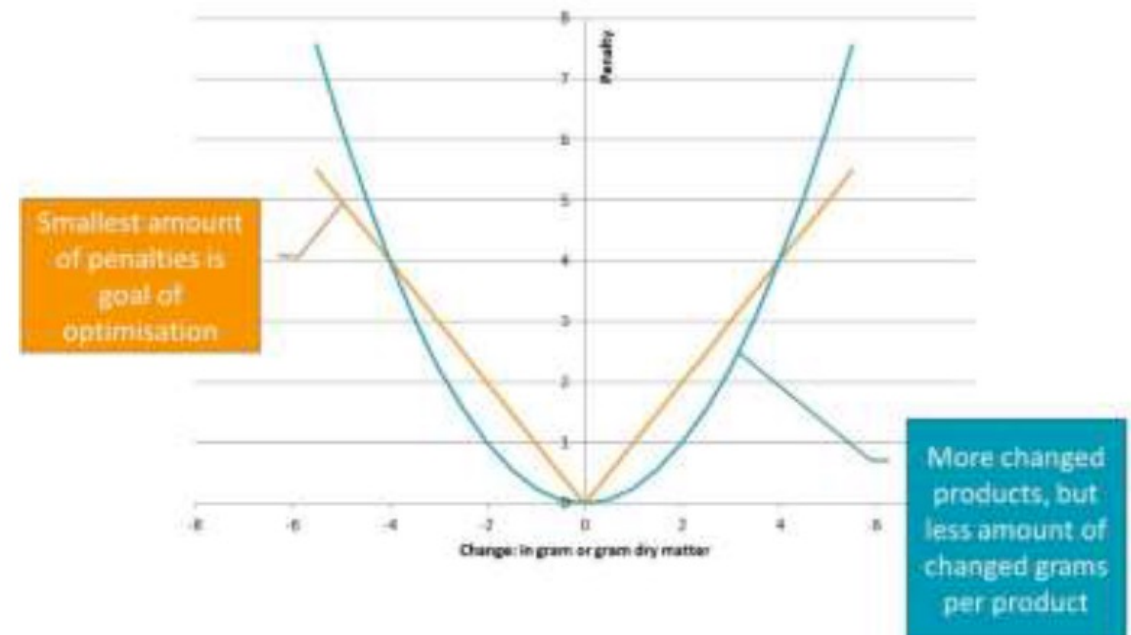
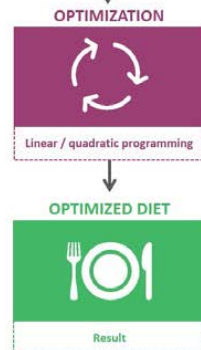
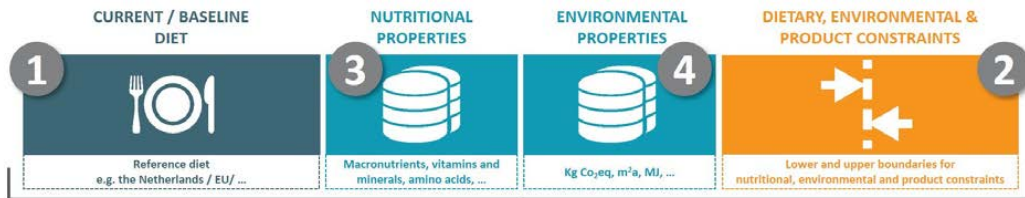
Environmental impact



Optimeal at a glance



- Linear or quadratic programming for optimization
- Penalty based on changes in weight of each food item
- Minimize penalty within dietary and environmental and product constraints → minimize changes from starting diet
- Different scenarios for exploration

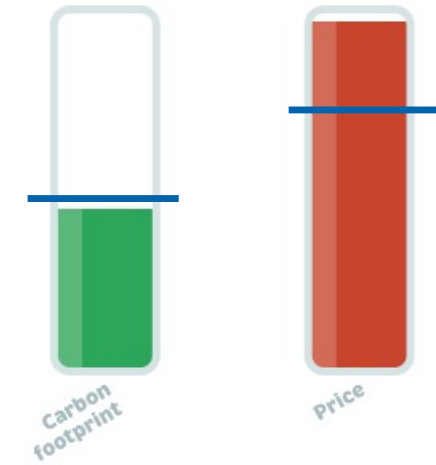
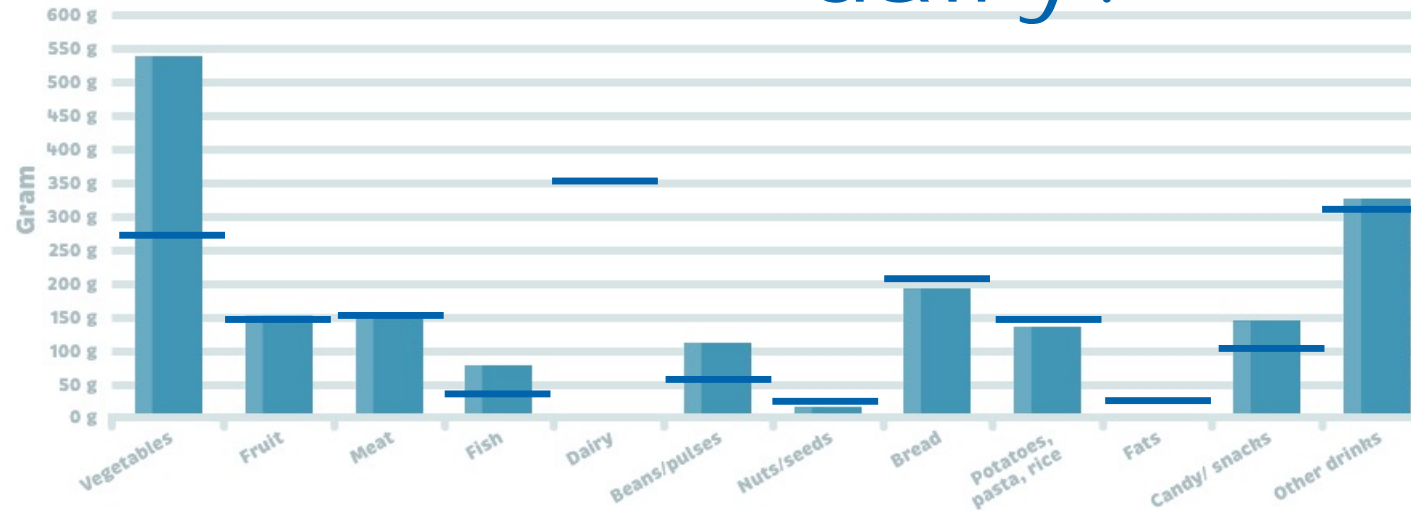




NUTRIsoft

nutritional software solutions

What has changed after removing all dairy?



Removal of dairy results in:

- Hardly any change in carbon footprint!
- Large increase in price!
- >2-fold increase in vegetable intake (>500 g per day!) but no change in fruit
- Increase in fish, beans and pulses and candy and snacks
- Limited change in other food groups

Sustainable and healthy diet: Conclusions (Dutch situation)

- Eat less calories and according to food-based dietary guidelines
- Eat less confectionary products and other extras
- Eat less red meat (especially imported red meat)
- Eat more whole grain products
- Eat vegetables and fruits according to recommendations and as local as possible
- Keep dairy intake at current level
- Drink less softdrinks and alcoholic beverages

- EAT A LESS ANIMAL AND MORE PLANT-BASED DIET IS NOT THE RIGHT PARADIGMA
DECREASING ENVIRONMENTAL FOOTPRINT

It's not that easy to replace nutrients from animal products

- Dairy meat and eggs are major sources of many nutrients in the Dutch diet
- >50% of dietary intake from animal products:
 - Calcium
 - Phosphorus
 - Selenium
 - Zinc
 - Retinol
 - Vitamin B2
 - Vitamin B12
- Not as easy to replace by other products
- And replacement diets are not always logical



Sources of minerals

Food Consumption Survey 2012-2016, ages 1-29

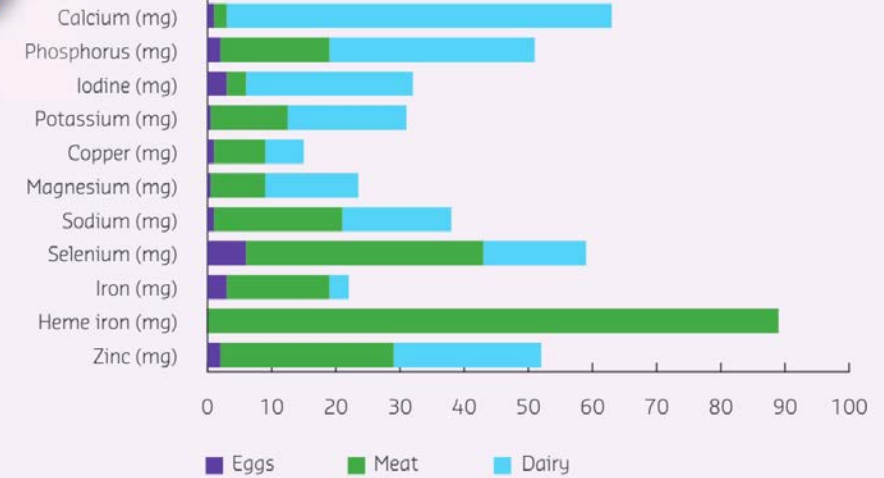


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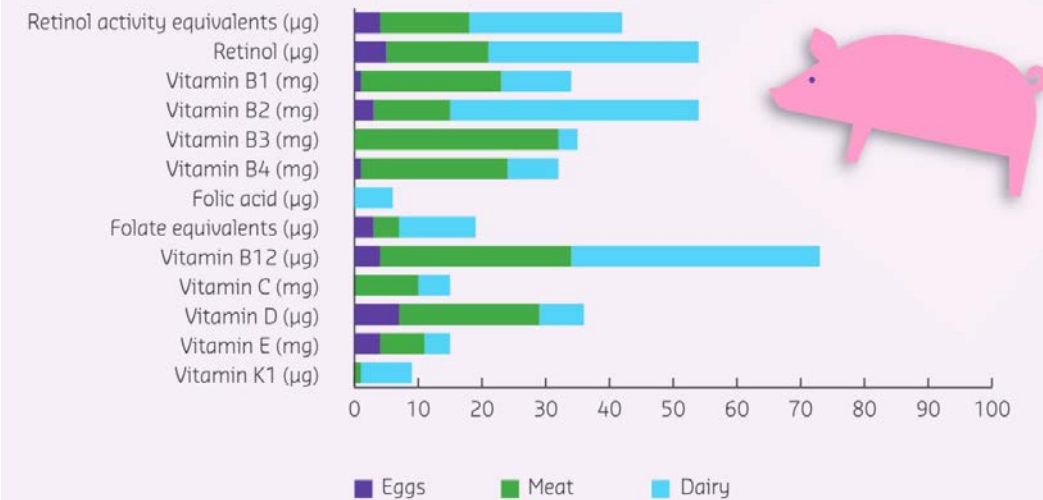


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Conclusions

- A healthy and more sustainable diet is more complex than 'eat less animal, more plant-based'
- Relating ecological effects to 'kilogram product' is an oversimplification
 - Better: per nutrient - nutrient density score - health effect
- A food or consumption transition should consider 4 dimensions:
 1. Health
 2. Ecology
 3. Culture
 4. Economy

- <https://www.nzo.nl/en/nutrition/sustainable-diets/>
- Twitter @StephanPetersNL
- peters@nzo.nl



UK: Livewell Plates

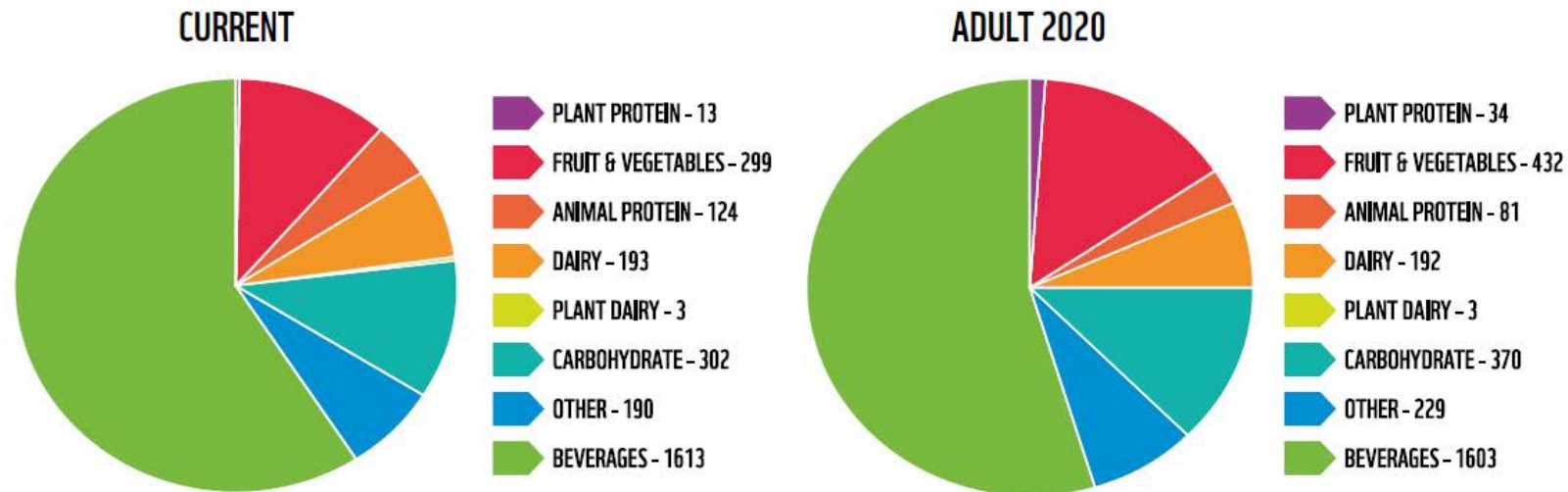
WWF 'eating for 2 degrees'

Optimeal©

"Dietary changes needed by 2020 (and 2030) in order to keep the average global temperature rise well below 2 degrees"

The Livewell Plates for UK adults: diet that is sustainable – looking at carbon, water and land – affordable and in line food preferences in the UK.

Provides the required amount of calories as well as meeting all national nutrient requirements and the food-based dietary requirements of the Eatwell Guide.



AND HERE'S WHAT WE SHOULD BE EATING EVERY DAY

FRUIT AND VEGETABLES

Fruits **200g**

Vegetables **300g**

Including **100g** of dark green vegetables (cabbage, broccoli etc) AND

100g red and orange vegetables (peppers, carrots)

SOURCE: Lancet

SUGAR

Added sugar and artificial sweeteners **31g**

FAT
Olive oil, sunflower oil
52g

Plant-sourced PROTEIN

Soy foods **25g**
Lentils or peas **50g** Nuts **50g**

Beef or lamb (16th of a burger) **7g**



Eggs (fifth of an egg) **13g**



28g



Fish (two thirds of a fish finger)

Animal-sourced PROTEIN

Pork **7g** (quarter of a rasher of bacon)



Poultry (1.5 chicken nuggets) **29g**



CARBOHYDRATE

Whole grains **232g**

Two slices of wholemeal toast

Rice **60g** Pasta **80g**

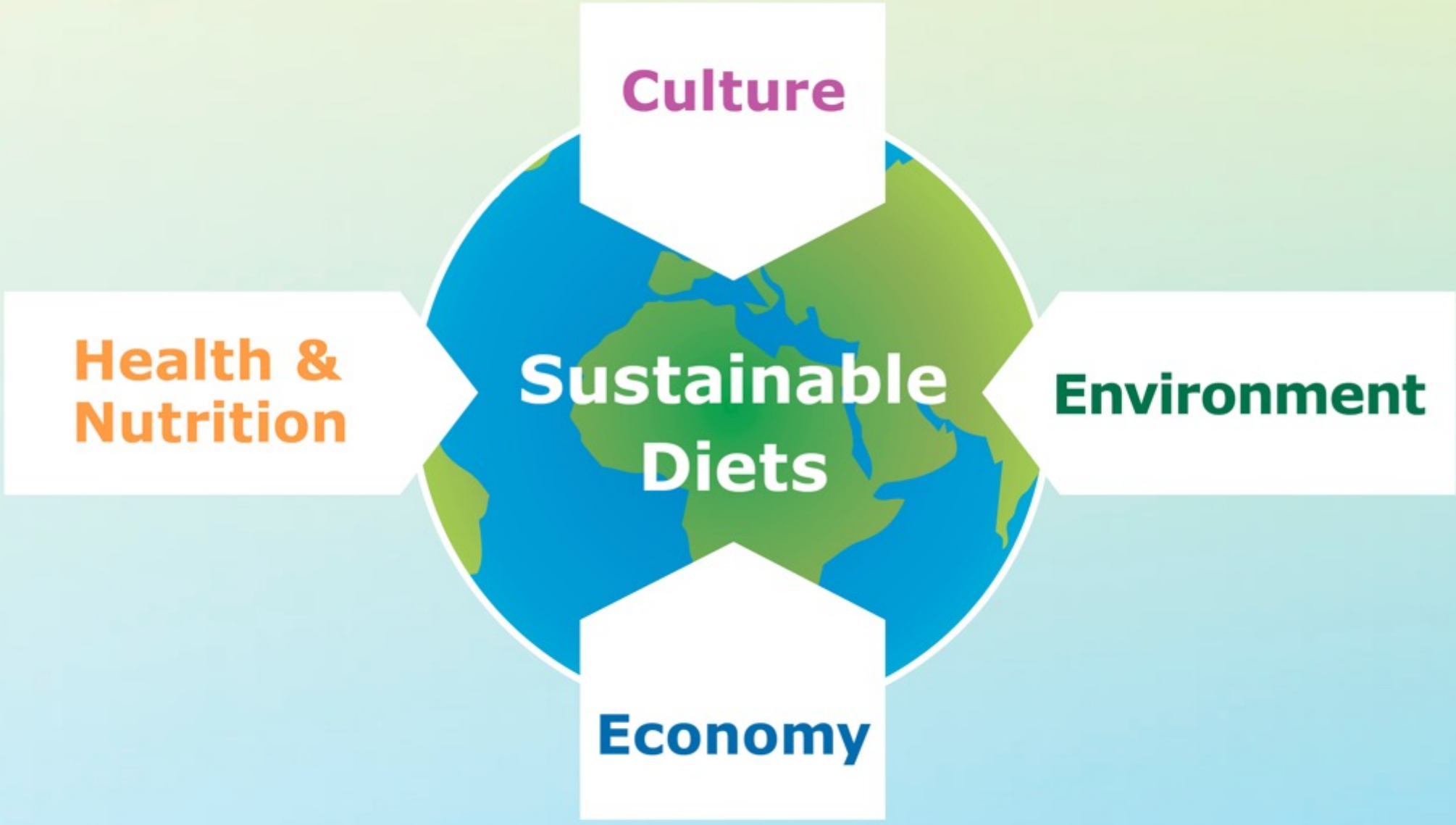
Starchy vegetables (potatoes) **50g**



DAIRY

(half a pint of milk) **250g**





Culture

**Sustainable
Diets**

**Health &
Nutrition**

Environment

Economy