

Healthy Soil = Healthy Food = Healthy People

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Introduction to the
26th Conference of the Working Group Sustainability / Soil Protection
Innovations for Soil Health
April, 09-10, 2019
Tulln an der Donau, Austria



Content



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- Welcome to BOKU & Campus Tulln
- Introduction to the conference theme

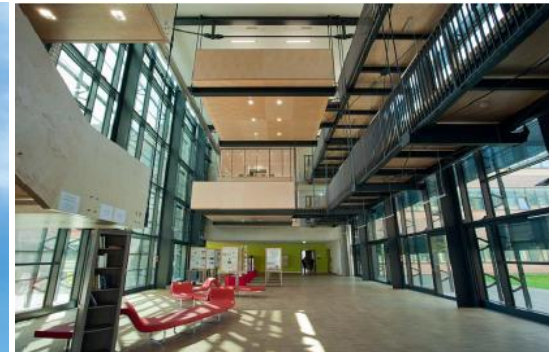
Welcome to BOKU & Campus Tulln



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Welcome to BOKU & Campus Tulln



Welcome to BOKU & Campus Tulln



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- 6 ha total land area
- 7.100 m² rented by BOKU
 - 3.270 m² Laboratories
 - 2.130 m² Office space
 - 1.000 m² Seminar area
 - 700 m² Storage, archives, cool rooms
- Staff:
 - BOKU ca. 180 + master students
 - AIT ca. 80
- 3.150 m² rented by AIT
- 12.000 m² jointly used
- 45 ha research fields close-by

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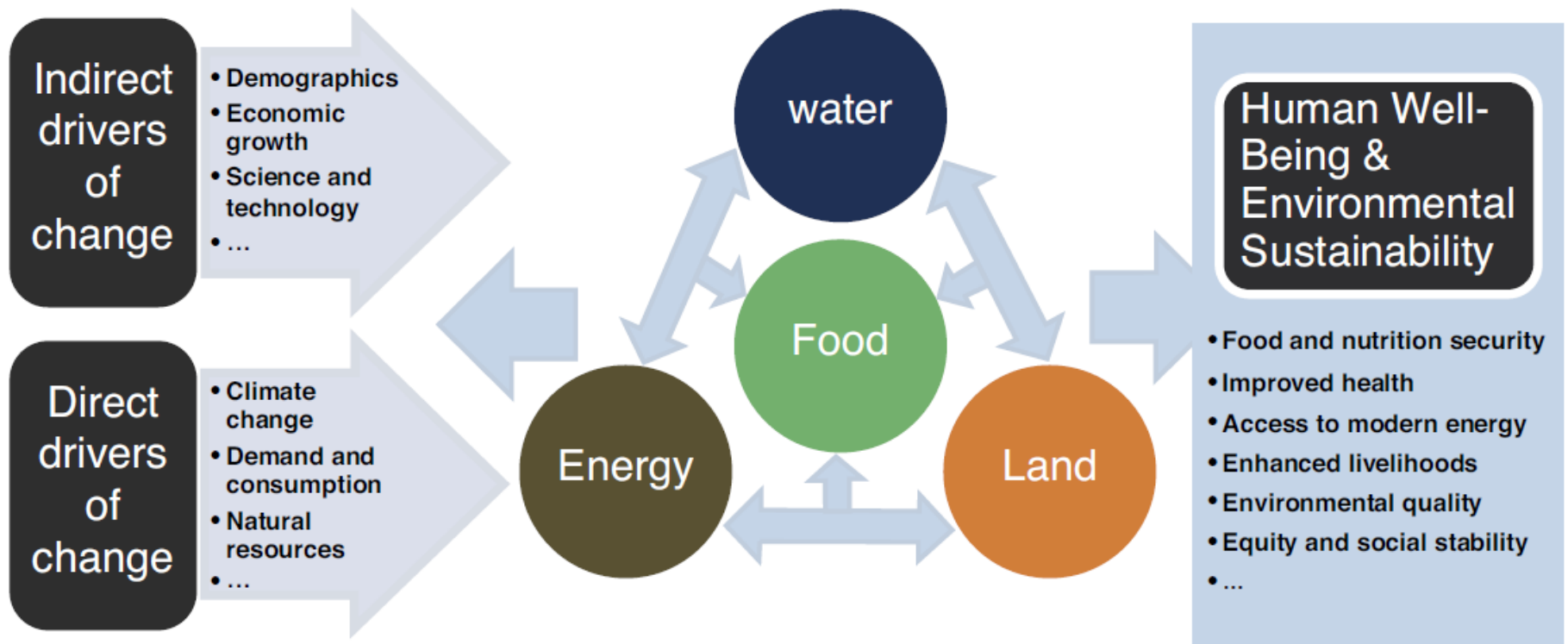
Let's talk about the soil – food – health nexus



Ringler et al (2013)
Current Opinion in Environmental
Sustainability 5: 617-624

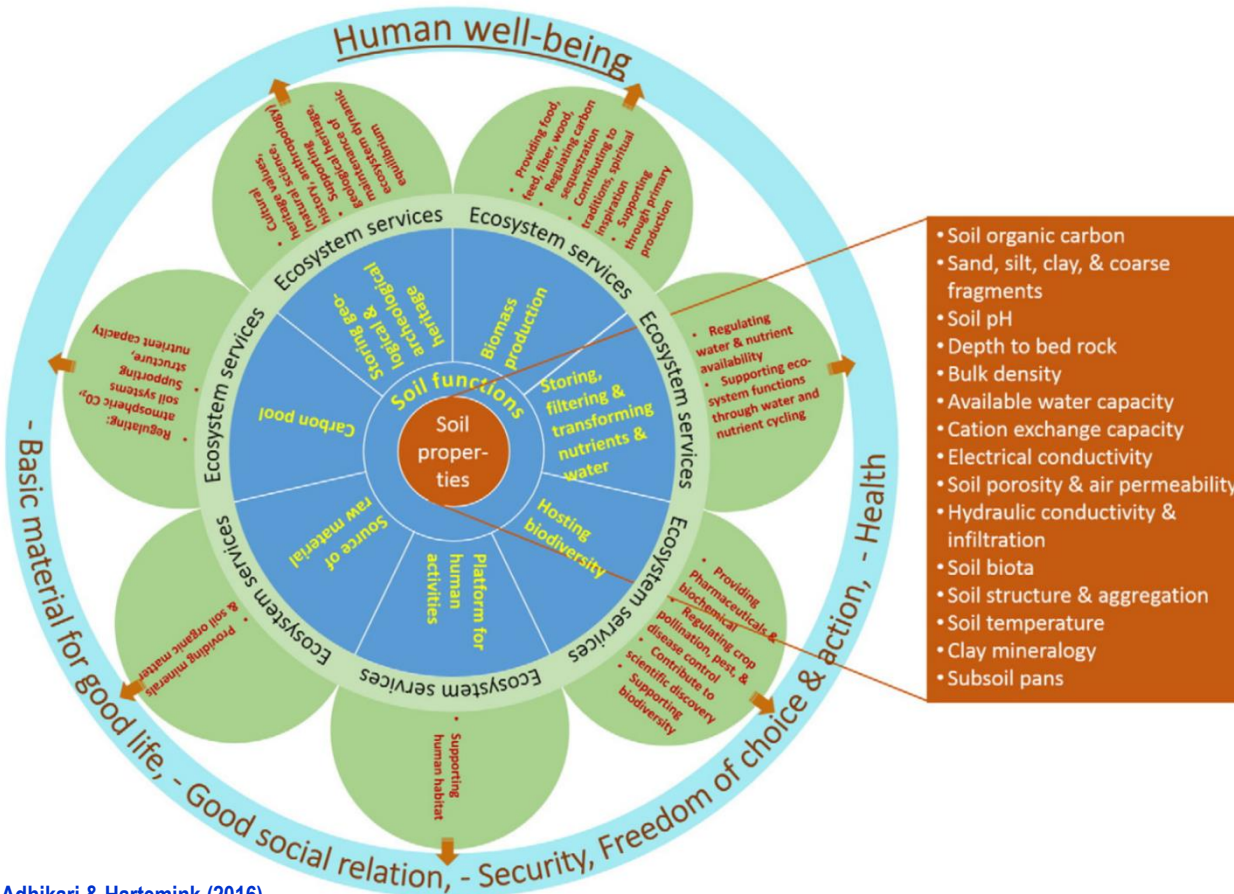


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Current Opinion in Environmental Sustainability

Soils under pressure ...



- Soil organic carbon
- Sand, silt, clay, & coarse fragments
- Soil pH
- Depth to bed rock
- Bulk density
- Available water capacity
- Cation exchange capacity
- Electrical conductivity
- Soil porosity & air permeability
- Hydraulic conductivity & infiltration
- Soil biota
- Soil structure & aggregation
- Soil temperature
- Clay mineralogy
- Subsoil pans



26.04.2006 11:32

Humans eating them up ...



Kastner et al. (2012)

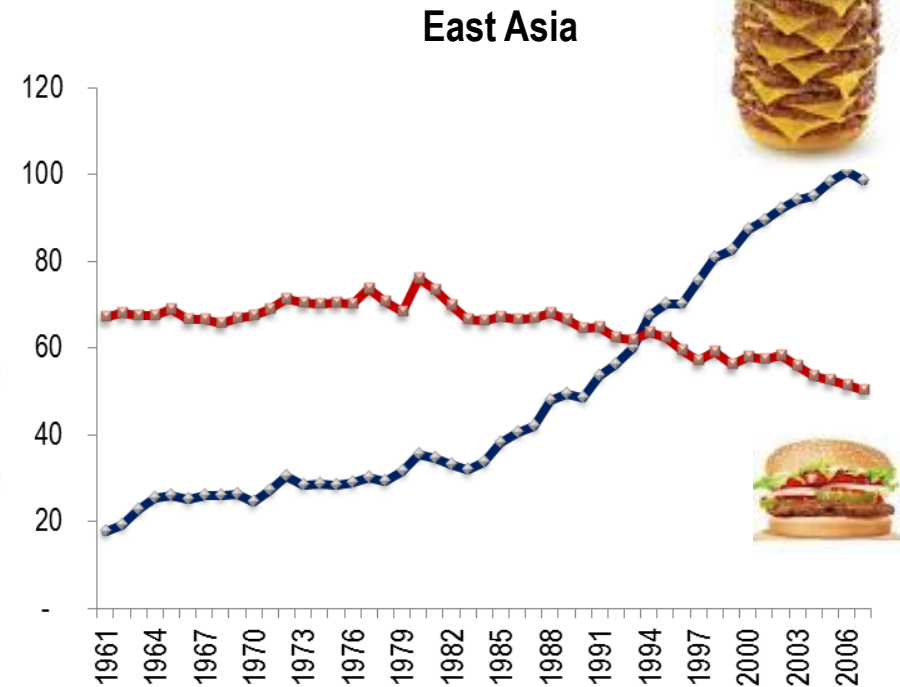
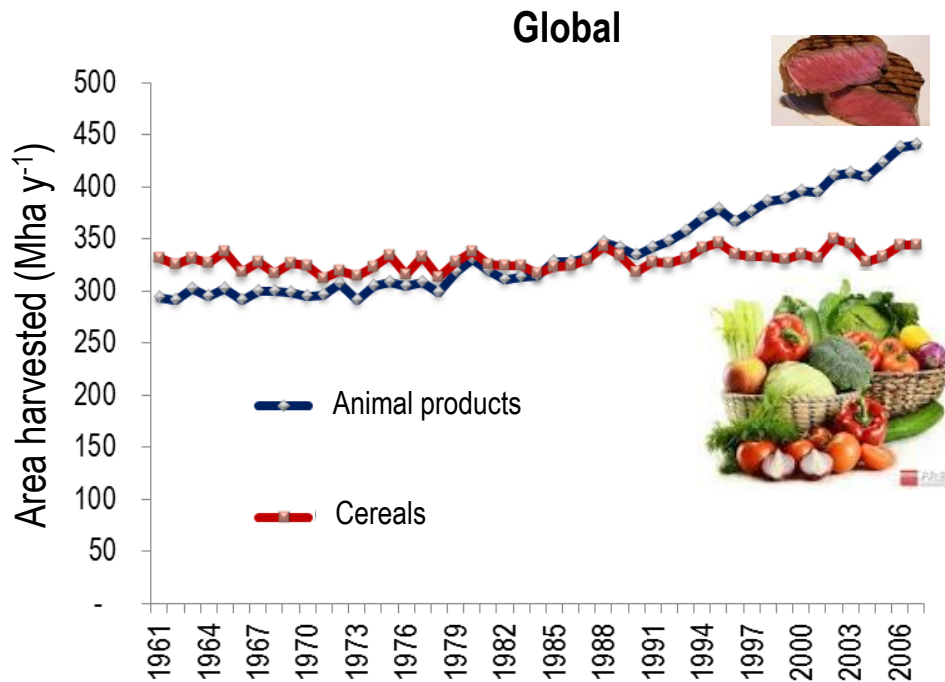
PNAS, www.pnas.org/cgi/doi/10.1073/pnas.1117054109

Total land area required for food production

- Population growth
- Nutritional habits (meat consumption)



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... on expense of their own health ...



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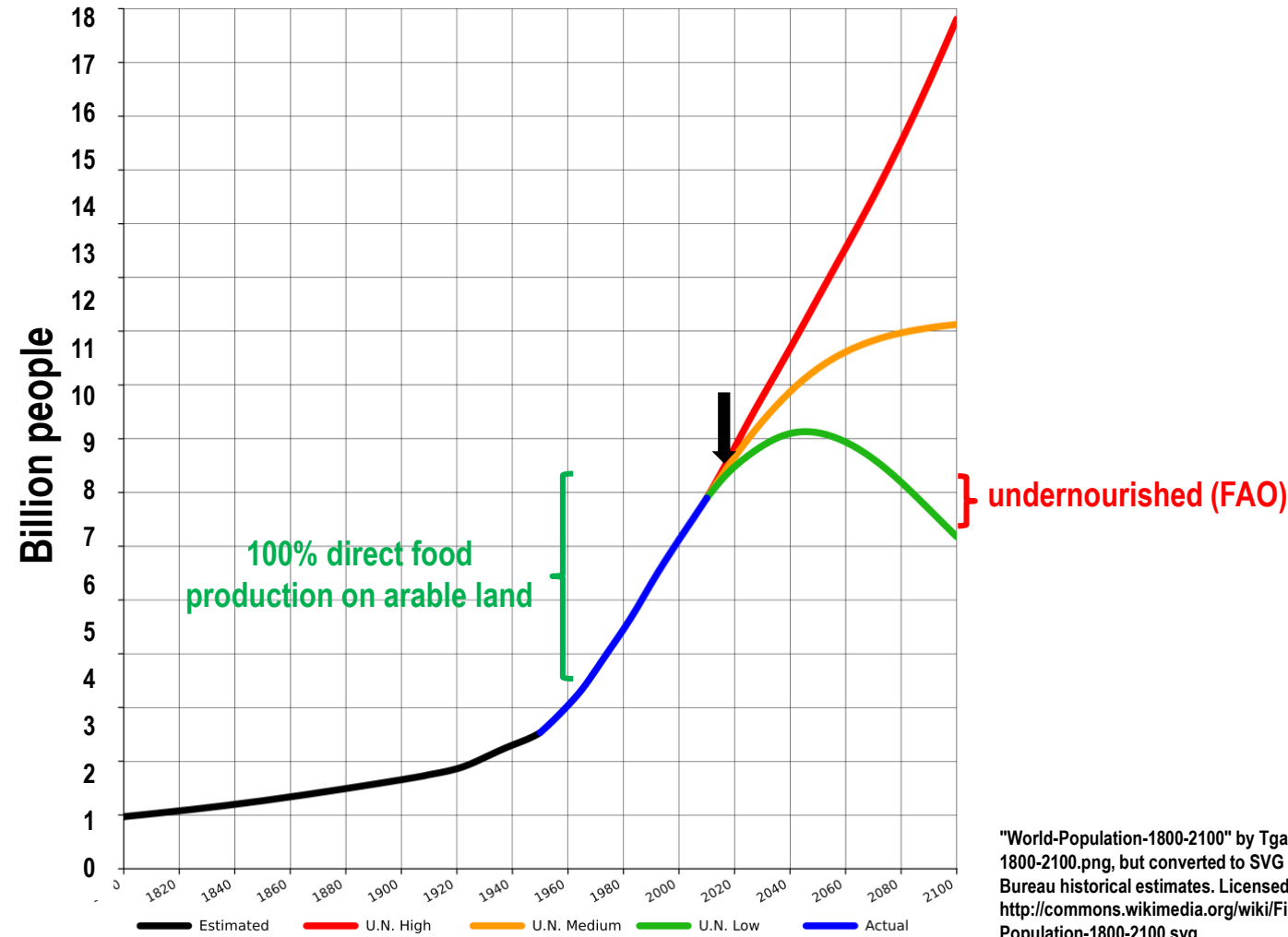


... while others stay hungry ...



"World-Population-1800-2100" by Tga.D based on Aetheling's work - based on file:World-Population-1800-2100.png, but converted to SVG using original data from U.N. 2010 projections and US Census Bureau historical estimates. Licensed under CC BY-SA 3.0 via Wikimedia Commons - <http://commons.wikimedia.org/wiki/File:World-Population-1800-2100.svg#/media/File:World-Population-1800-2100.svg>

Reducing losses (100%) along the food chain could potentially double the number of people that can be nourished



"World-Population-1800-2100" by Tga.D based on Aetheling's work - based on file:World-Population-1800-2100.png, but converted to SVG using original data from U.N. 2010 projections and US Census Bureau historical estimates. Licensed under CC BY-SA 3.0 via Wikimedia Commons - <http://commons.wikimedia.org/wiki/File:World-Population-1800-2100.svg#/media/File:World-Population-1800-2100.svg>

... because calories are wasted

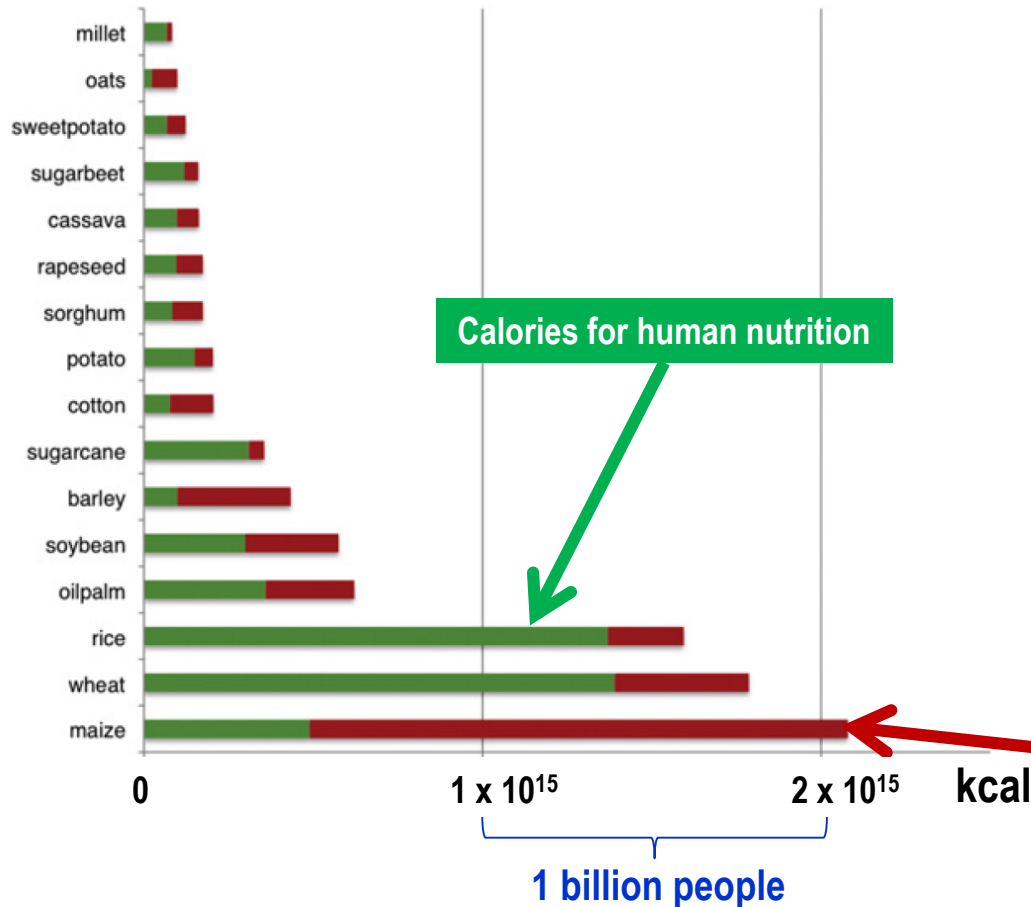


Cassidy et al. (2013) Environ.
Research Letters 8: 034015, 1-8



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Global crop calories delivered and lost



75% of the global maize production are being lost for human nutrition because of animal production and – increasingly - also ethanol production

Maize is among those crops contributing substantially to soil erosion

Calorie losses due to conversion to animal products (meat, milk,...) and bioenergy

Let's talk about solutions ...



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Westhoek et al. (2014), Global
Environmental Change 26: 196-205

Human Health = Soil Health = Environmental health

Halving the production of meat, eggs and dairy production in Europe.....

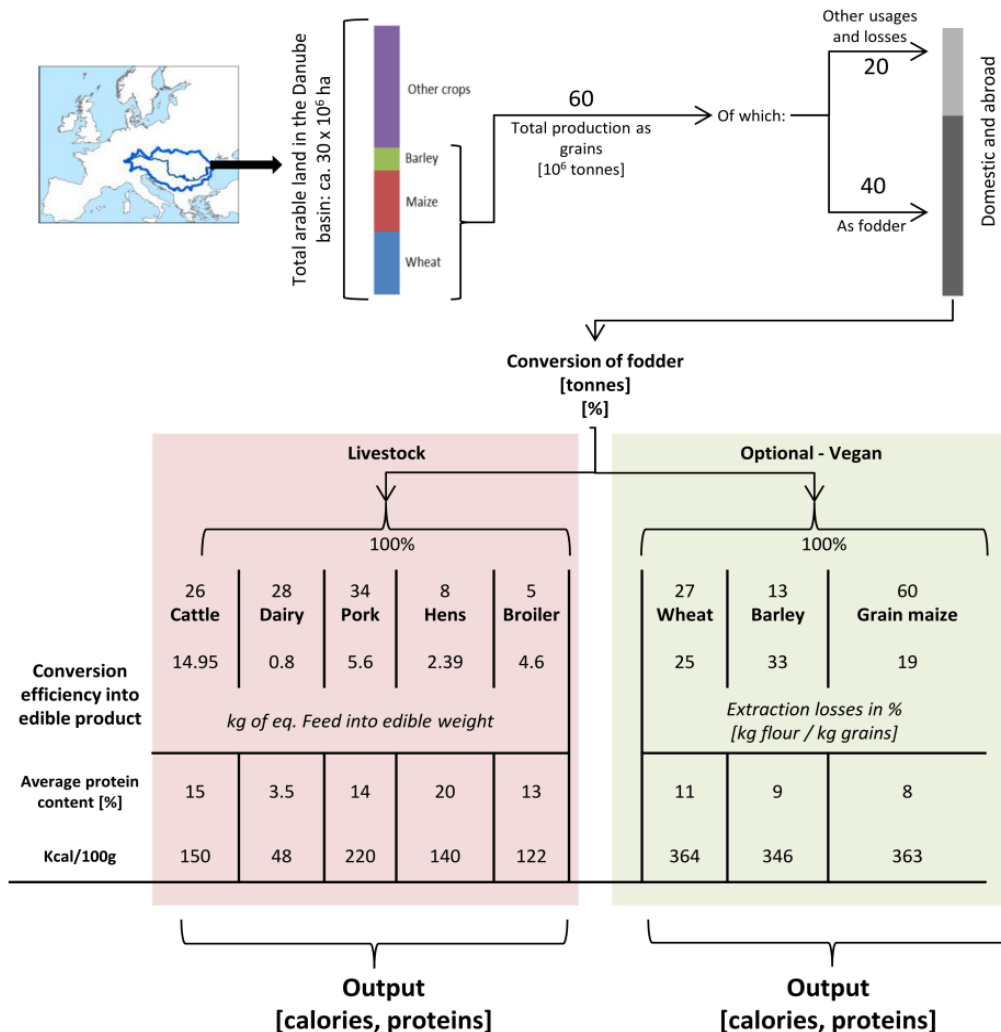
-40% reduction in nitrogen emissions
-25-40% reduction in greenhouse gas emissions
-23% per capita decrease in cropland use for food production
-enhance human health (40% reduction of intake of saturated fat)
-soymeal use reduced by 75%
-nitrogen use efficiency in food system would increase from 18% to 41-47%

... in the Danube region and abroad



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Rittler et al. (unpublished)



8.9×10^{13} kcal

↓

3400 kcal / capita and day

↓

72 Mio. people

Schematic illustration of the diet transition model. The model compares the conversion efficiency, measured in calories and proteins, from crops into edible products between livestock production, with an optional direct consumption of the fed grains.