Human nutrition as key to nutrient emissions into water

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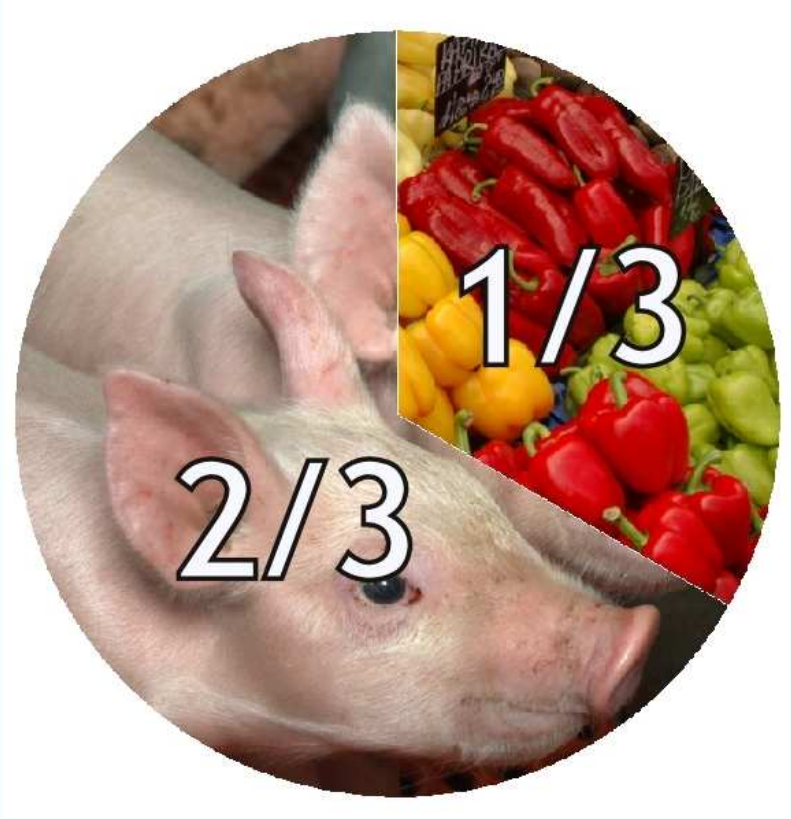
basics human nutrition in Austria – actual state



(rough illustration)

protein consumption

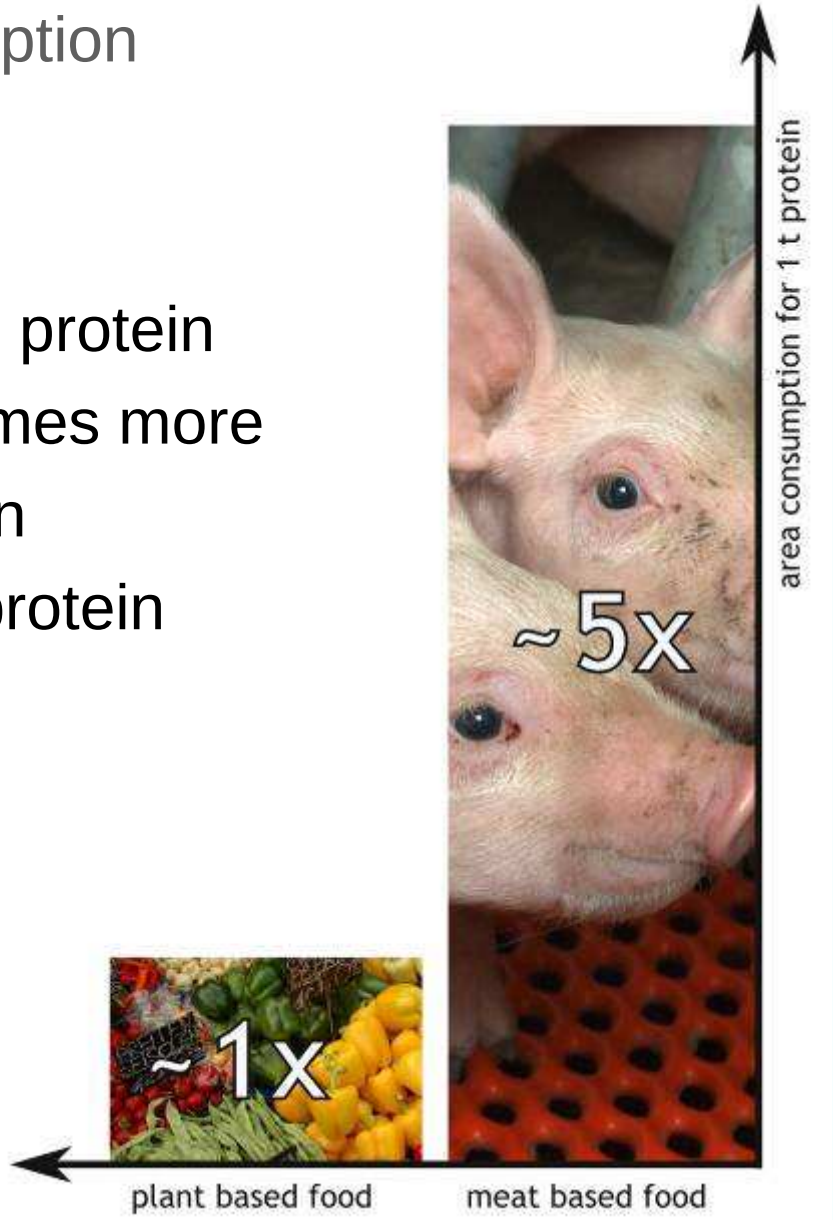
~1/3 plant based protein

~2/3 meat based protein

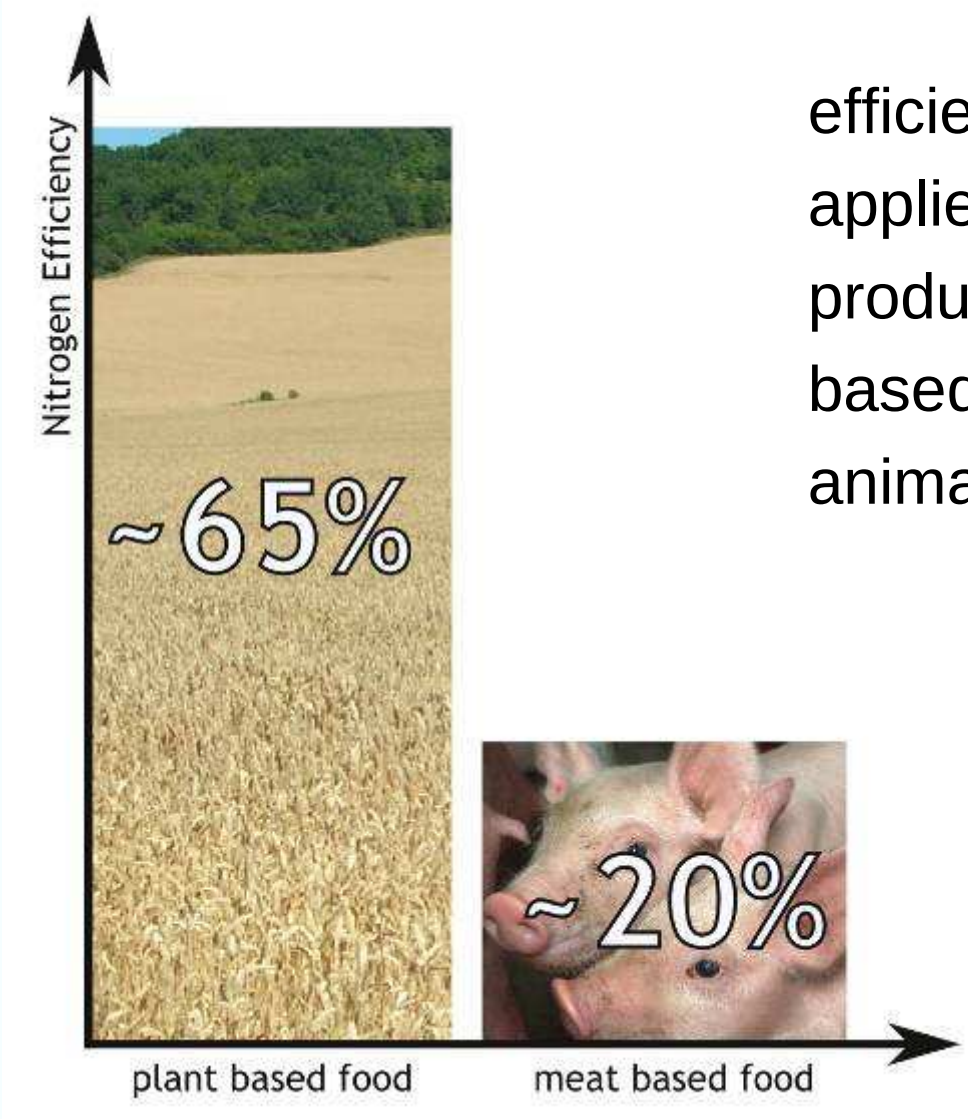
e.g. unhealthy nutrition is one of the main risk factors for cardiovascular diseases

basics area consumption

production of animal protein
consumes up to 5 times more
agricultural area than
production of plant protein

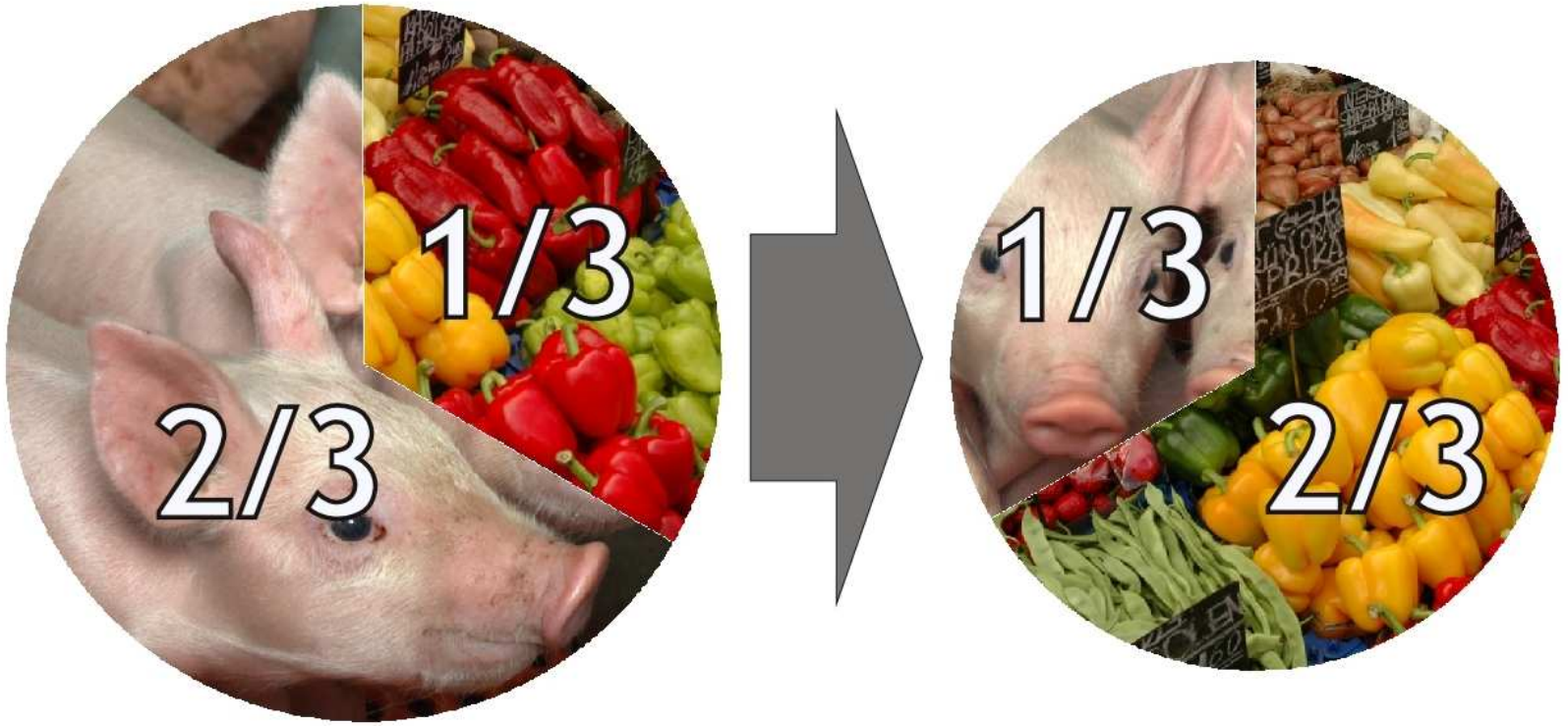


basics nitrogen efficiency



efficiency of the transfer of applied nitrogen into the product is 60-70% for plant based and 15-25% for animal based food

basics balanced diet – protein consumption

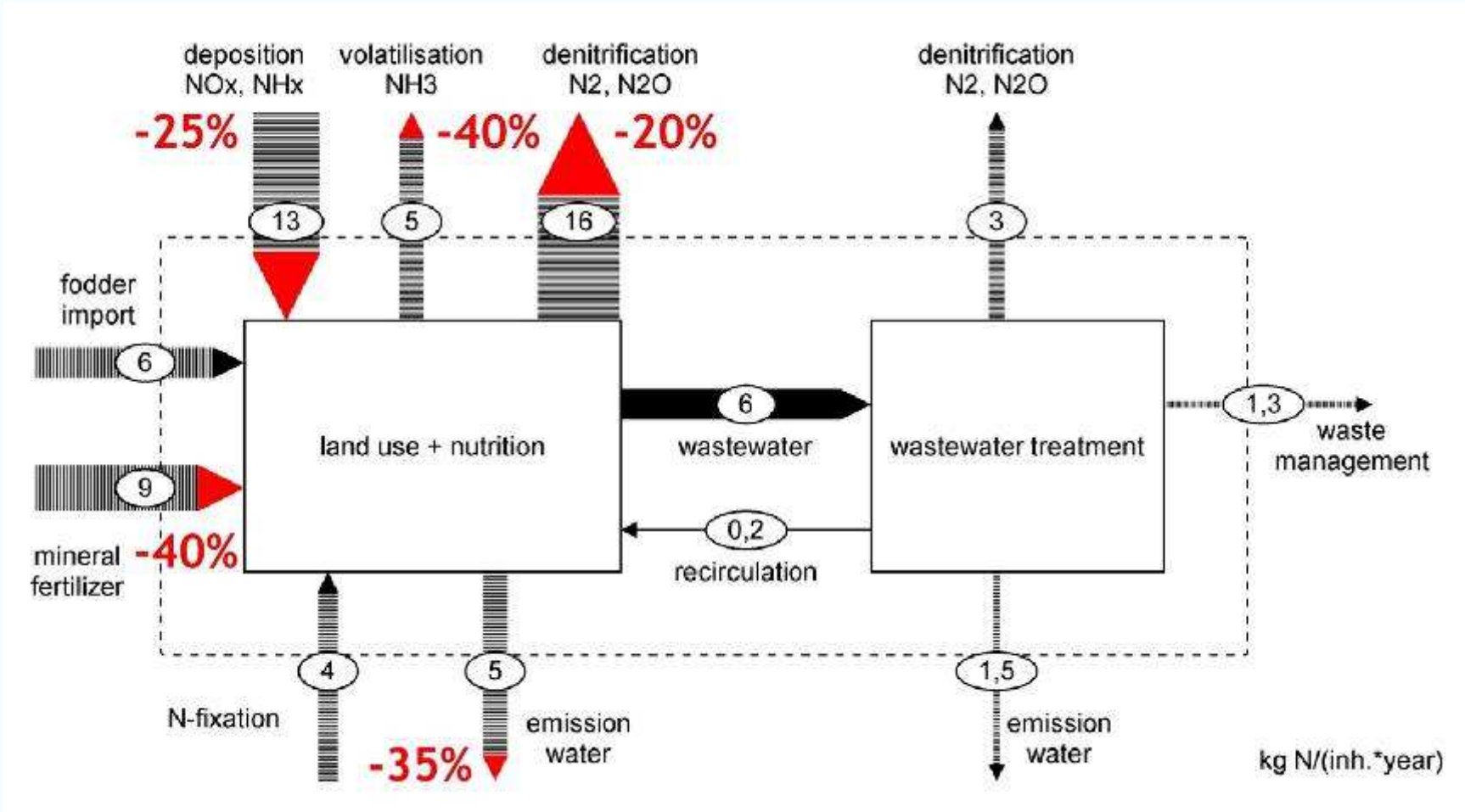


actual state

recommended balanced diet

(rough illustration)

basics nitrogen fluxes



first estimation of nitrogen fluxes under the condition of a healthy nutrition (50% less meat) in Austria

Cost Action 869 Nottwil 2009

basics nutrition and resources

→ great potential to reduce nutrient losses

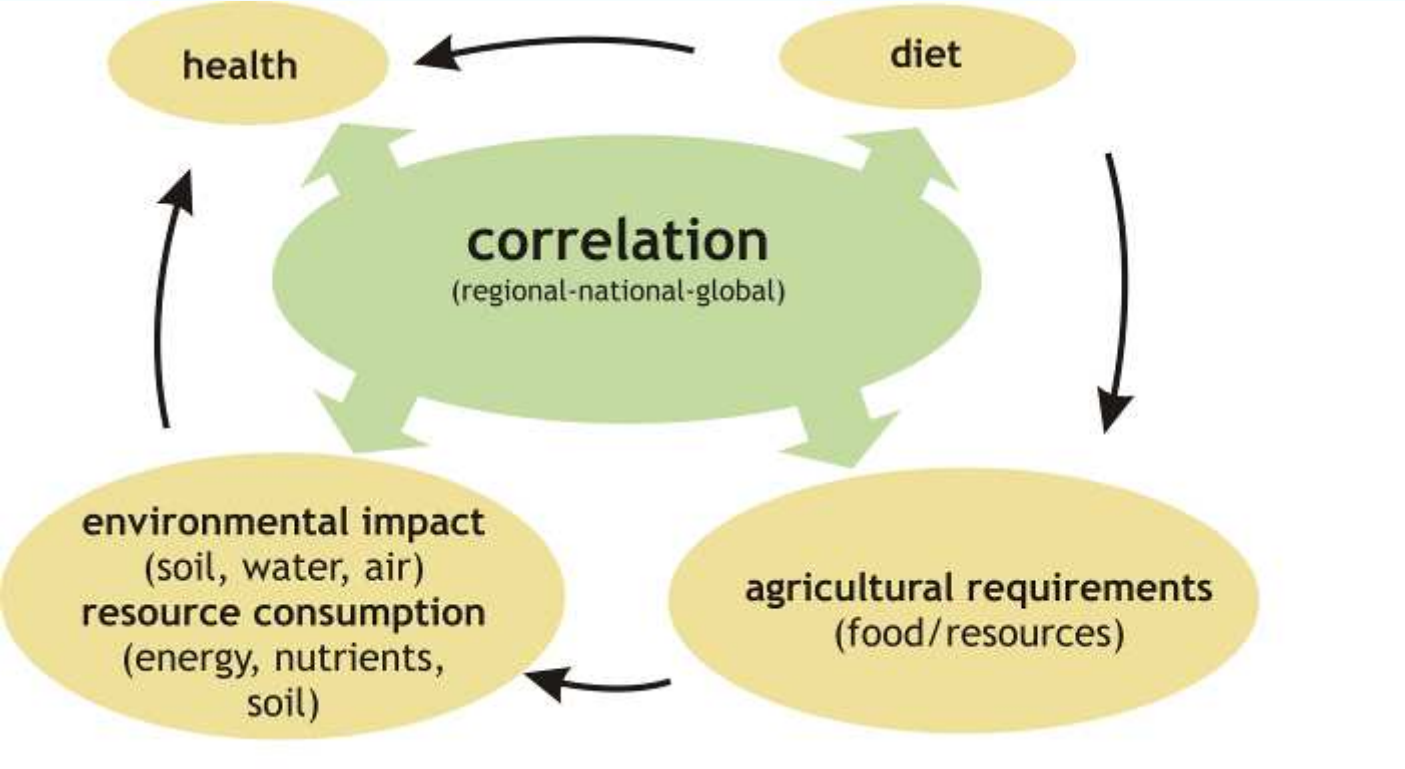
→ great potential to use (or not use) agricultural area

→ we already know this relationships on a qualitative level

→ what does a change from an animal based diet to a plant based diet mean for Austria?

project introduction

- we started the project “A healthy diet and sustainability” dealing with the above mentioned issues in autumn 2008



project goal

- to quantify changes
  - agricultural area
    - what will happen if we use free area for biomass production?
  - nutrient emissions
  - use of energy
  - costs (health, environment,…)
- to show the impact of nutrition on the environment
- to show the scope of action for future movements

- we don't look at the issue how we can achieve this nutritional change

project method

- method
  - compare actual state with hypothetic scenarios
  - mass flow analysis for nitrogen and phosphor (on a simplified level for pesticides and heavy metals)
  - nutrient emissions into rivers and the sea (MONERIS)
  - use of energy
  - emissions (global warming gases) calculated with GEMIS

- observed regions
  - Austria
  - two Austrian catchments (Wulka and Ybbs)
  - Europe (Danube catchment)

MONERIS: MOdelling Nutrient Emissions in RIver Systems

GEMIS: Globales Emissions-Modell Integrierter Systeme

project method

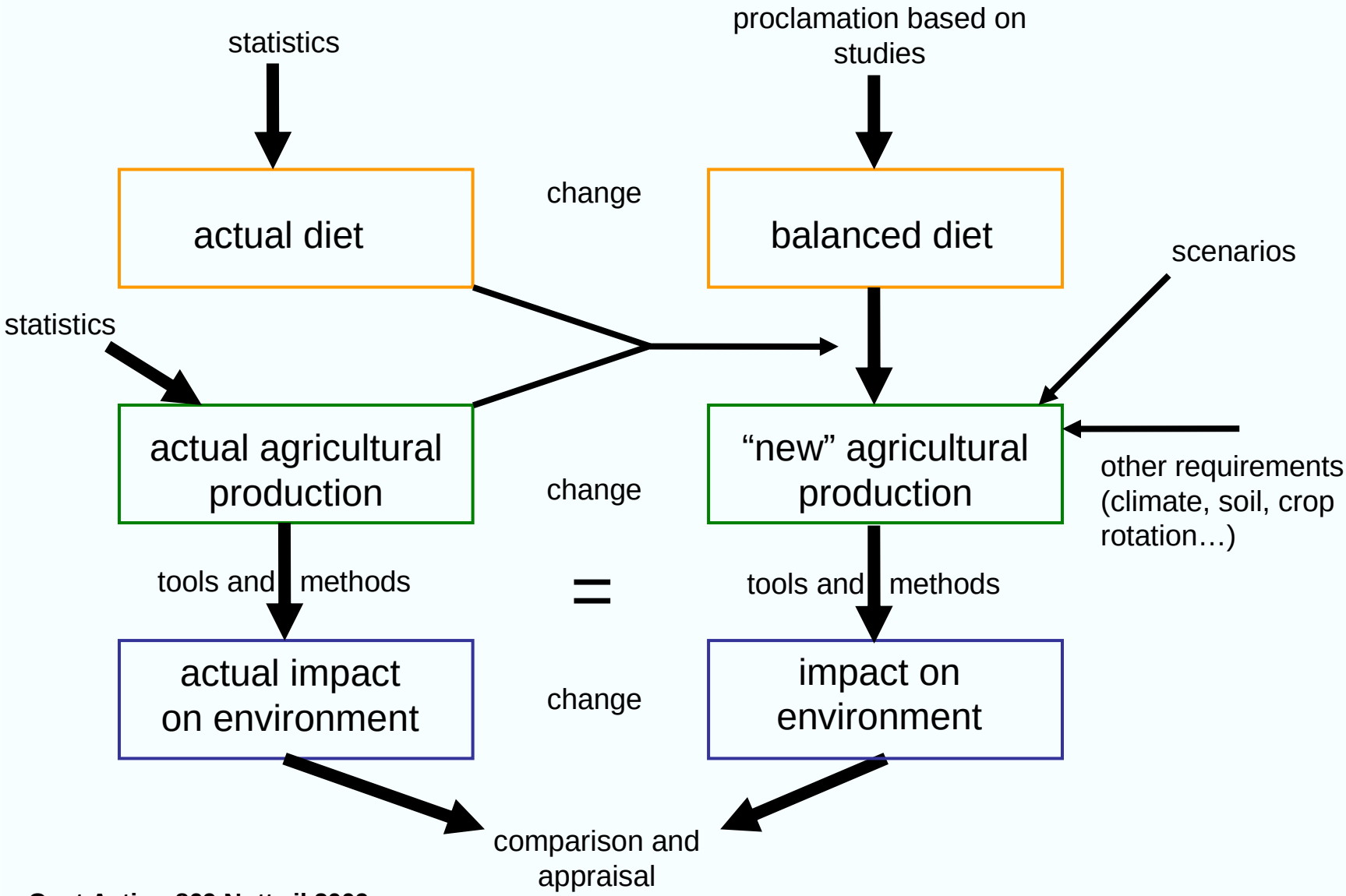
- actual state
  - study period: 2001-2006
- different scenarios

study period: future (not exactly defined)

production based on the new balanced diet

- self-supply of the agriculture with energy
- biomass production vs. natural succession on free areas
- import vs. self-sufficiency
- conventional vs. organic farming

project overview



project outcome

- scientific dissemination
- beside scientific dissemination the results will be edited for a broad public
  - project cooperation partners
    - e.g. grammar school, Children University, Climate Alliance
  - teaching materials
  - contributions to non scientific magazines
  - webpage
    - www.iwag.tuwien.ac.at/page2000.aspx (in German)

project partner and duration

due to the multidisciplinary of the project we are working together with:

- Department of Nutritional Sciences of the University of Vienna **(Nutrition)**
- Energy Institute of the Johannes Kepler University of Linz (**Energy and global warming gases**)
- Austrian Association for Agricultural and Environmental Research (**Agriculture)**

project duration: from autumn 2008 to spring 2011

Thank you for your attention

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