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The feasibility of shifting diets towards just food systems and global sustainability

A review of influence factors

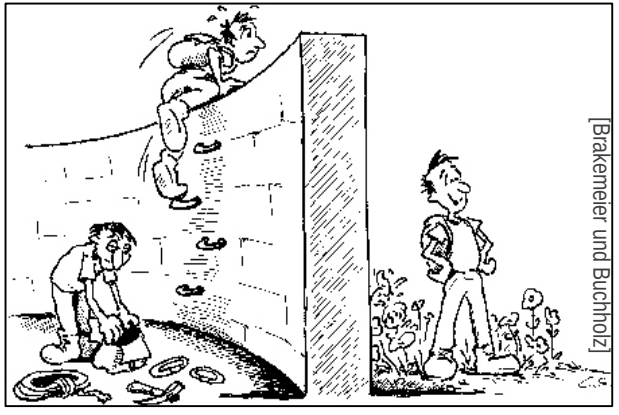
Prof. Dr. Susanne Stoll-Kleemann

WINS Seminar Series
Berlin, December 8, 2016

Outline

- Meat consumption and environmental problems
- Meat consumption and social/justice problems
- Review: Barriers and opportunities for reducing meat consumption
- Conclusions


[© Hans von der Beele / Thinkstock]


[Brakemeier und Buchholz]

Leverage points for just food systems and global sustainability

- „Yield Gap“ due to inefficient agriculture
- „Diet Gap“ due to inefficient use of resources
- Food wastage

[West et al. 2014]


[Laurent Gillieron (Keystone)]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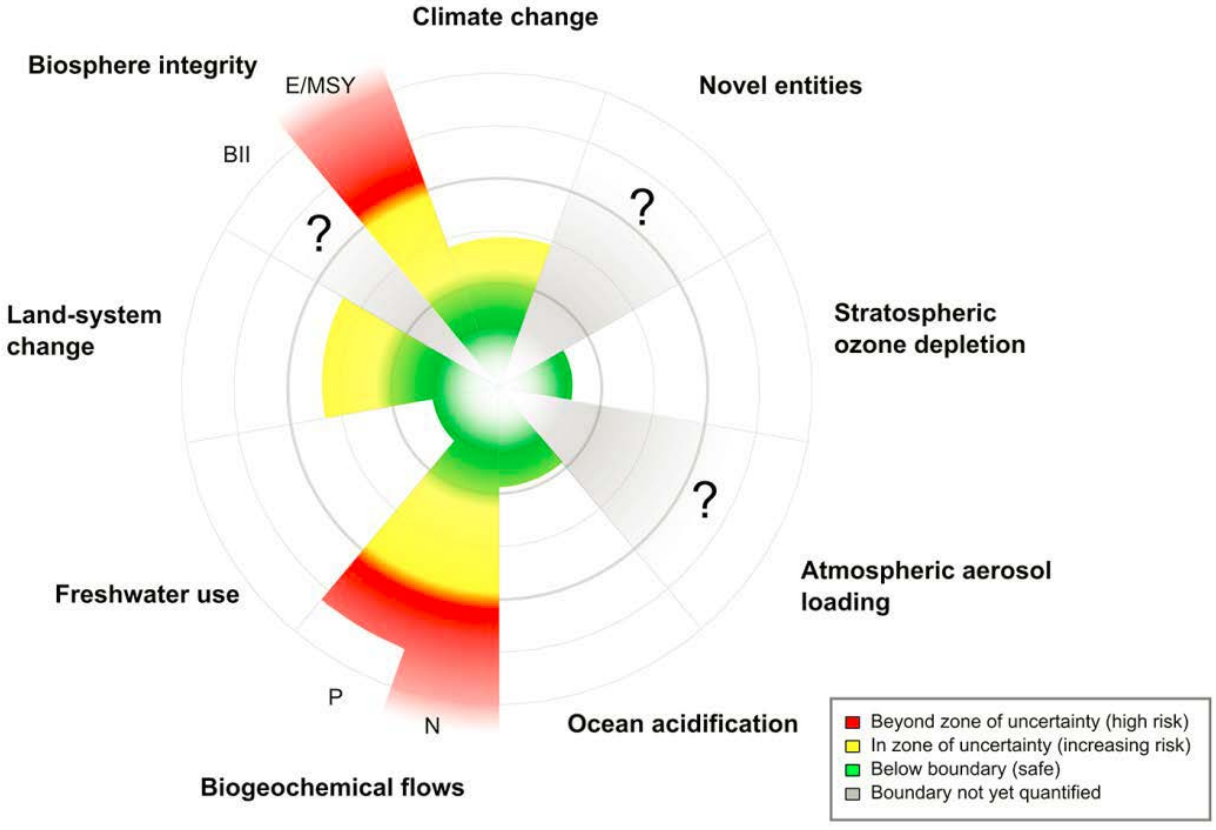
Planetary boundaries

Environmental Problems

- Already beyond the zone of uncertainty in red areas
- Flow of N and P from fertilizers to erodible soils more then two times above the boundary



[Steffen et al. 2015]

Meat consumption and environmental problems

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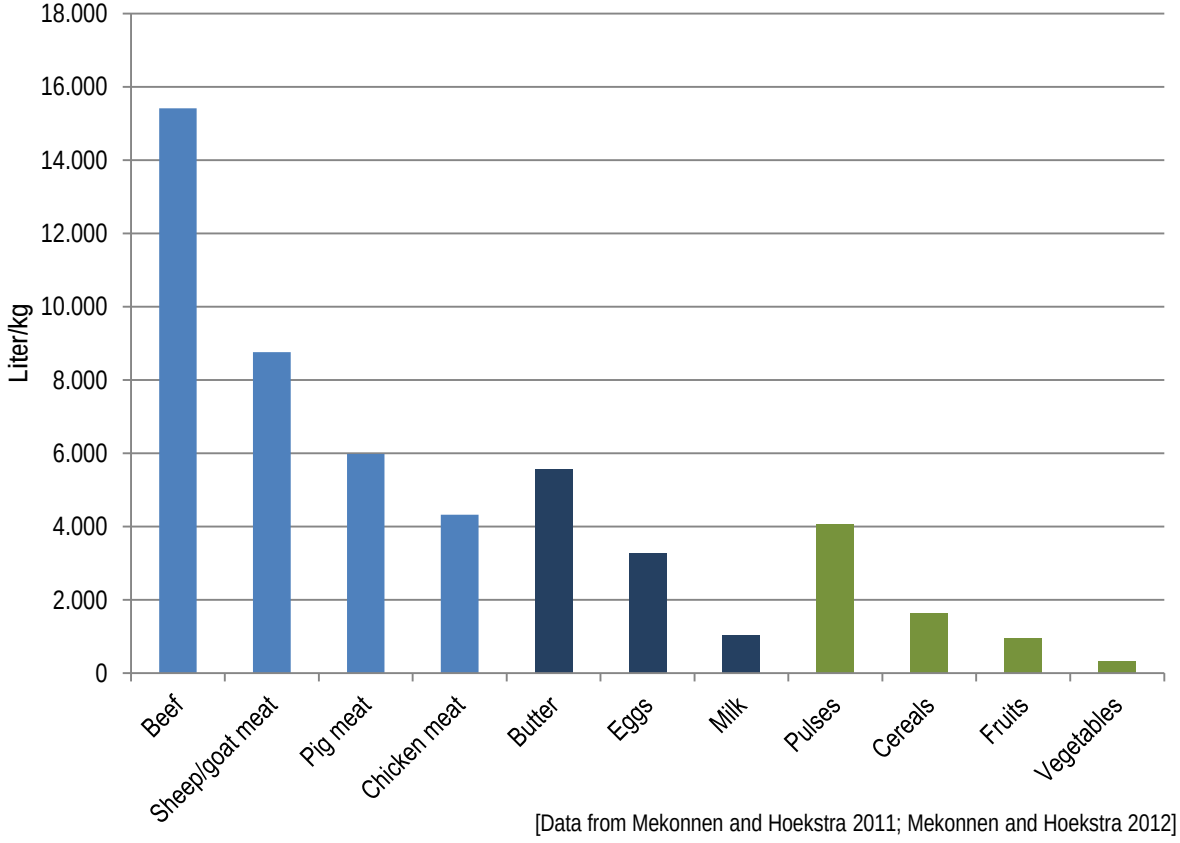
Water



[Data from Mekonnen and Hoekstra 2011; Mekonnen and Hoekstra 2012]

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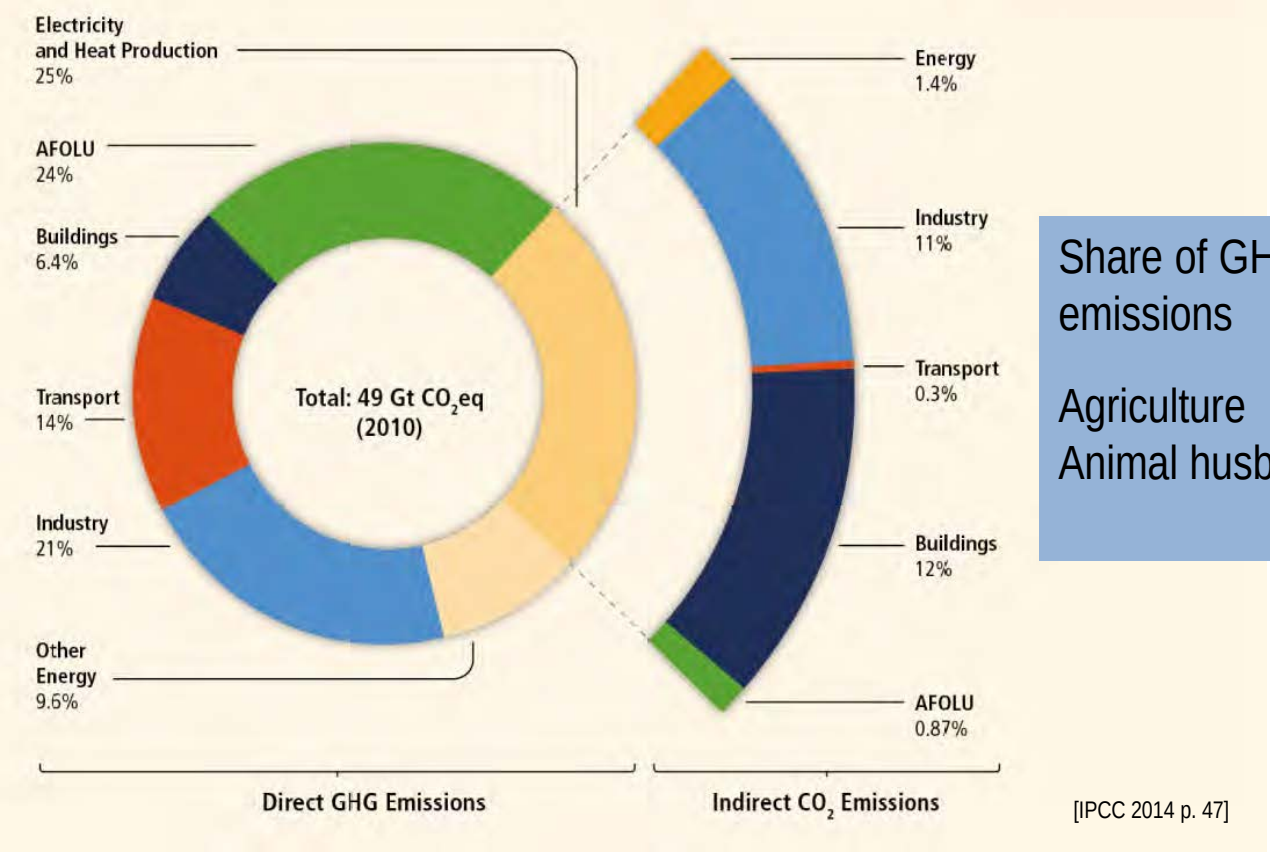
GHG emissions by economic sectors



[IPCC 2014 p. 47]

Share of GHG emissions in worldwide emissions

Agriculture	25 % - 35 %
Animal husbandry	14,5 %

[Gerber et al. 2013; Foley et al. 2011; IPCC 2014]

Meat consumption and environmental problems

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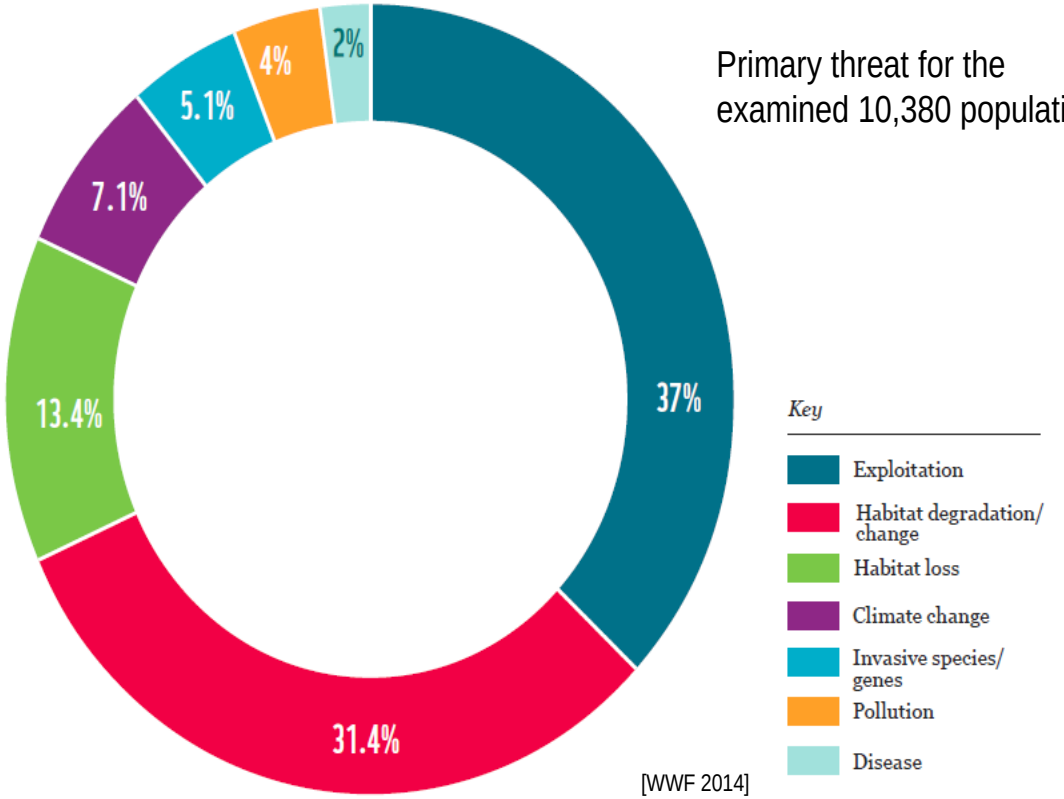
Biodiversity

Animal husbandry causes ca. 30% of the worldwide biodiversity loss, predominately due to land use change

[Westhoek et al. 2011]



Primary threat for the examined 10,380 populations

[WWF 2014]

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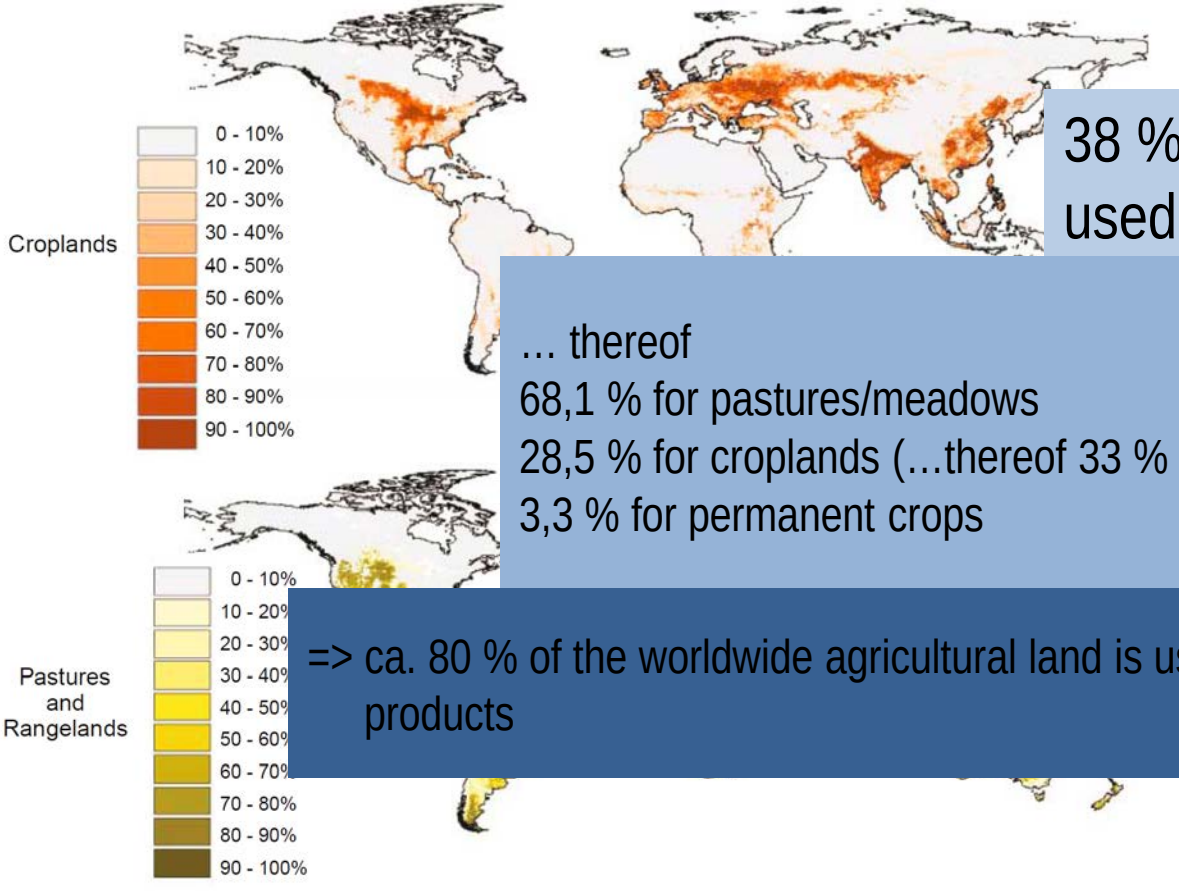
Land use



38 % of worldwide land area is used for agriculture

… thereof
68,1 % for pastures/meadows
28,5 % for croplands (…thereof 33 % for growing feed crops)
3,3 % for permanent crops

=> ca. 80 % of the worldwide agricultural land is used for the production of animal products

[Foley et al. 2005; FAOSTAT 2016]

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Land use

[UBA/DLR 2007]

Built-up area	8,32 %
Agricultural land	58,84 %

In Germany, 60 % of the agricultural land is in use for growing feed crops.

21 % of the agricultural land is used for growing renewable resources (e.g. biofuel).

19 % of the agricultural land is used for growing food directly consumed by humans

[UBA 2015]

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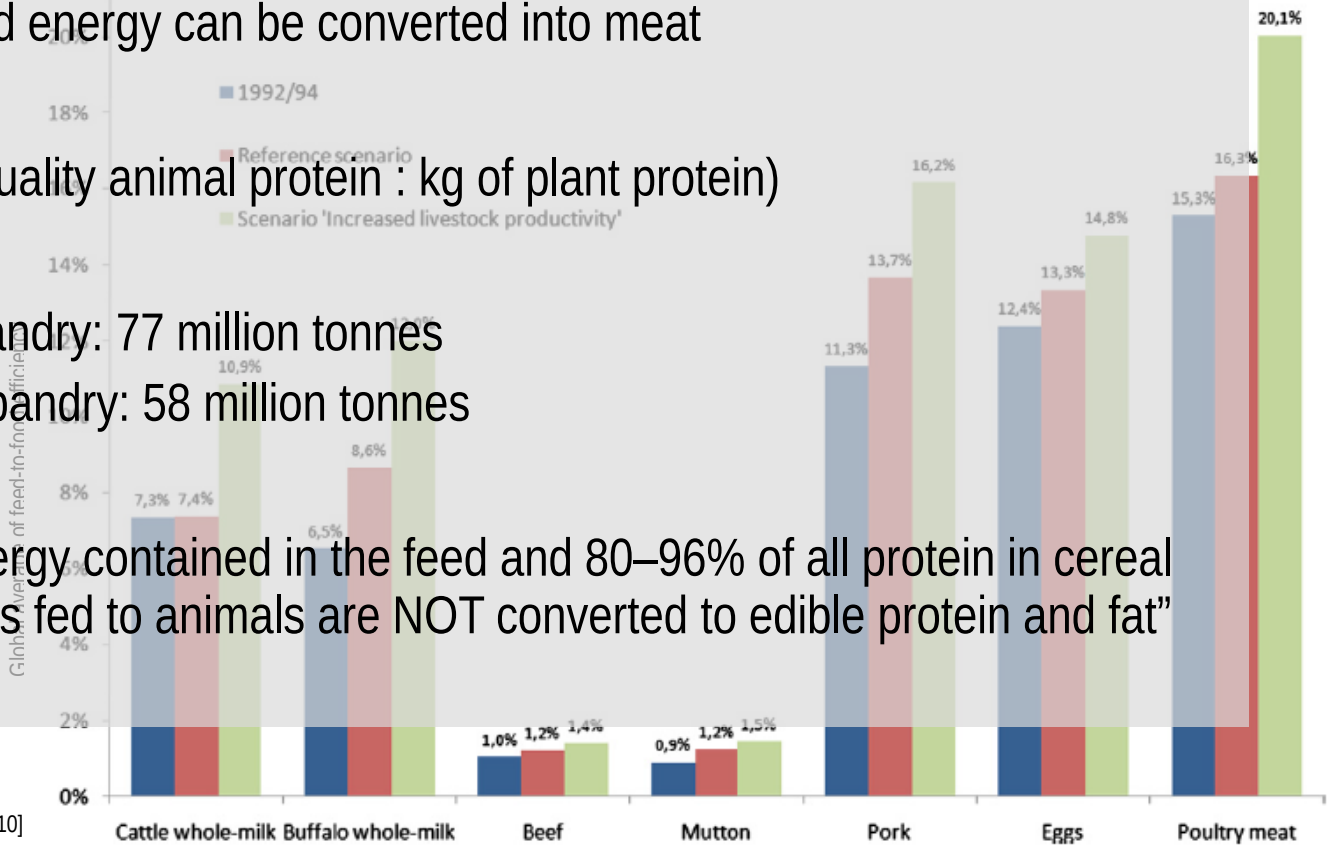
Feed inefficiency

- 1.2% of the cattle feed energy can be converted into meat
  [Wirsenius 2010]
- 1:6 ratio (kg of high-quality animal protein : kg of plant protein)
  [Pimentel and Pimentel 2003]
- Protein input to husbandry: 77 million tonnes
  Protein output of husbandry: 58 million tonnes
  [FAO 2006]
- "89–97% of gross energy contained in the feed and 80–96% of all protein in cereal and leguminous grains fed to animals are NOT converted to edible protein and fat"
  [Smil 2002 p.309]



[Wirsenius 2010]

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Food security

Loss of food energy due to meat production
⇒necessity of intensive agriculture
⇒environmental damage (land use change, biodiversity loss, climate change)
⇒increased vulnerability of the local citizens

Use of soil and other ressources for the production of fodder
⇒scarcity of land and food
⇒increasing prices
⇒ in developing countries urban citizens can't afford enough food anymore

Destruction of local markets in Sub-Saharan Africa due to cheap imports

[e.g. EED 2010]

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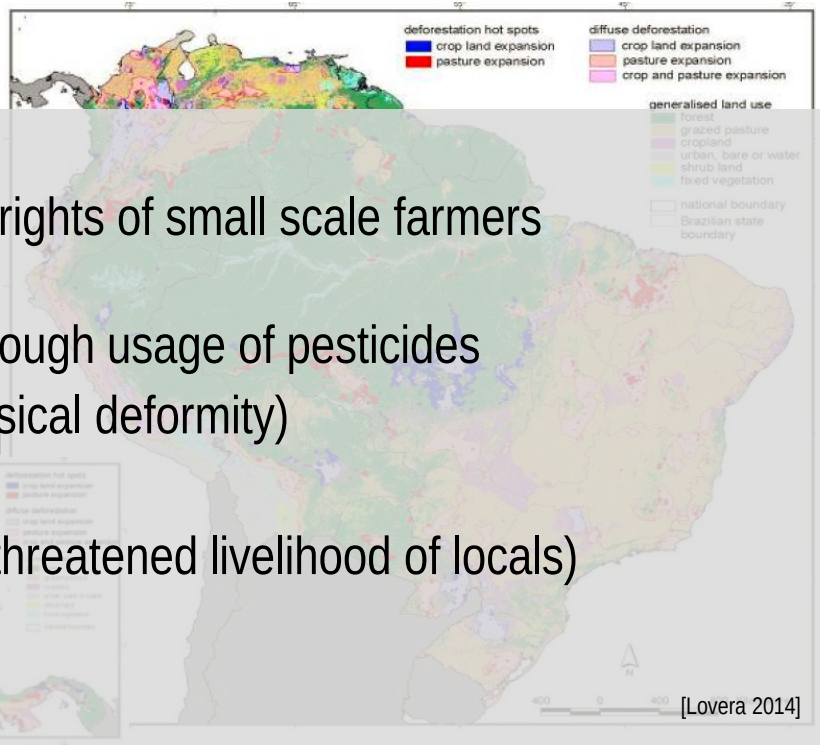
Social justice

Deforestation in South America



=> Ignorance of land rights of small scale farmers (displacement)

=> Health burden through usage of pesticides (e. g. cancer, physical deformity)

=> Landgrabbing

=> Biodiversity loss (threatened livelihood of locals)

Import of virtual land

Meat consumption and social problems

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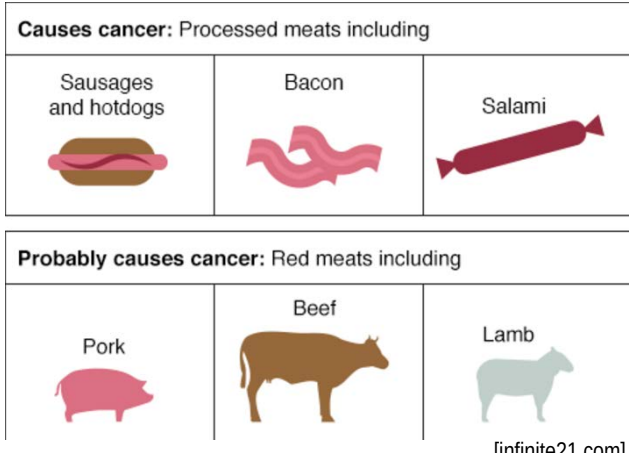
Health

- Adiposity [Berkow et al. 2006]
- Cancer [Rohrmann et al. 2013, Bouvard et al. 2015]
- Cholesterol and saturated fatty acids
  --> Cardiovascular diseases [Rohrmann et al. 2013]
- Diabetes mellitus Typ II [Wittenbecher et al. 2015]

Very high costs caused by meat eaters

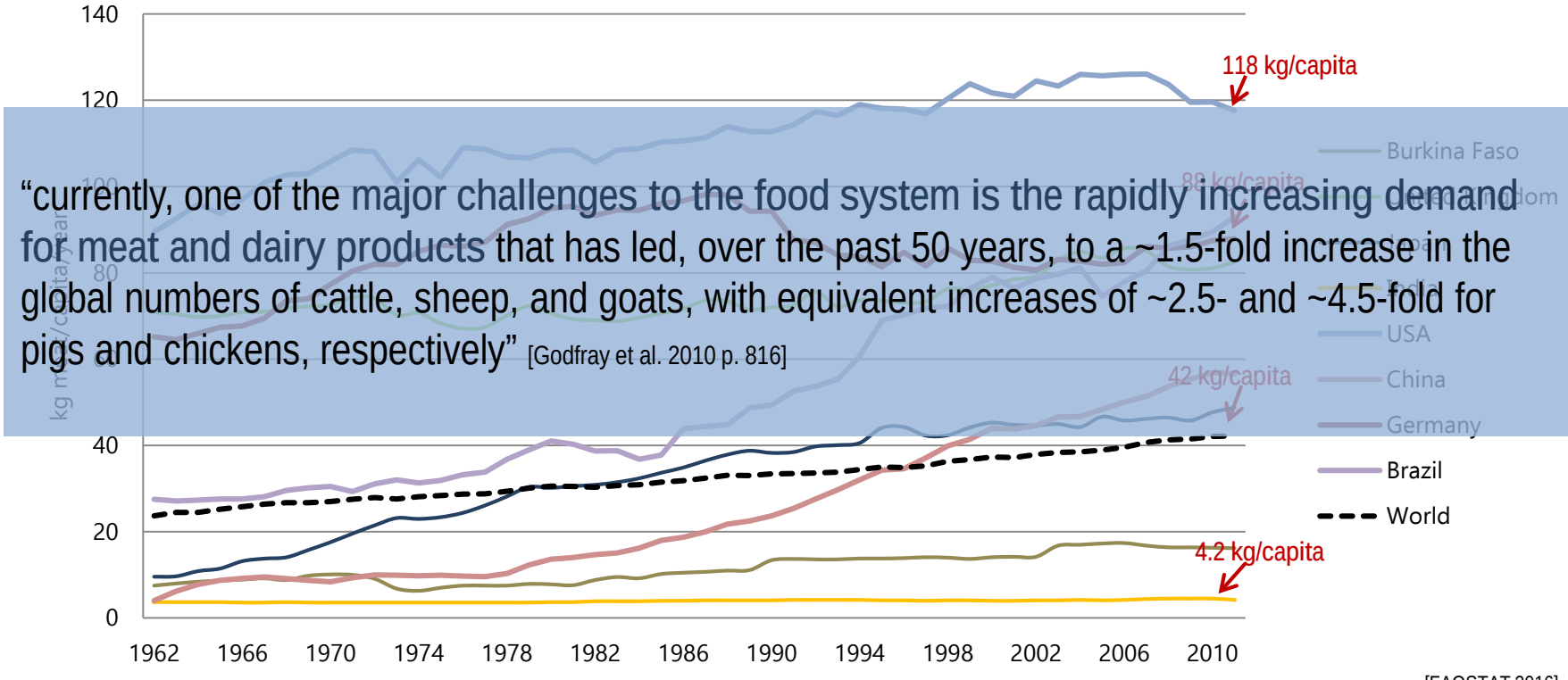
World Health Organization

Classifies Processed Meat as Being Cancer Causing



[infinite21.com]

Meat consumption worldwide



"currently, one of the major challenges to the food system is the rapidly increasing demand for meat and dairy products that has led, over the past 50 years, to a ~1.5-fold increase in the global numbers of cattle, sheep, and goats, with equivalent increases of ~2.5- and ~4.5-fold for pigs and chickens, respectively" [Godfray et al. 2010 p. 816]

[FAOSTAT 2016]

Review of influencing factors

Stoll-Kleemann S, Schmidt UJ (*2016*) Reducing meat consumption in developed and transition countries to counter climate change and biodiversity: a review of influence factors. Regional Environmental Change.

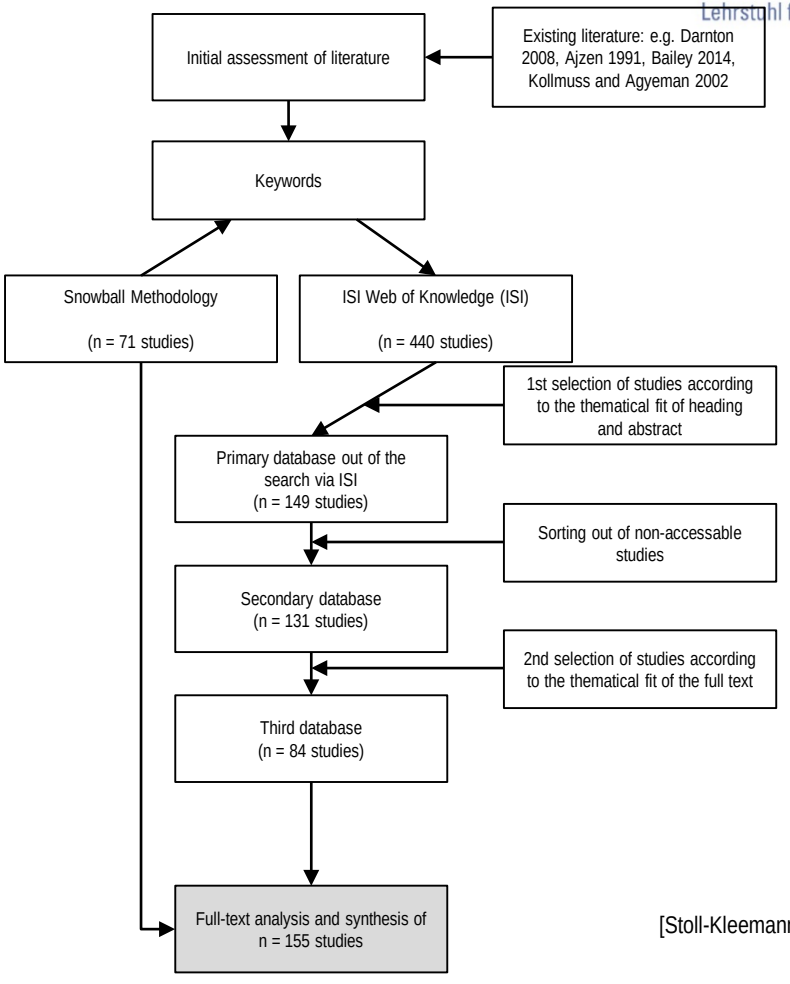
Research question: What are the barriers (individual, social, structural) to reducing meat consumption? How realistic is it to change meat consumption patterns?

Methodology

Meta-Analysis of 155 studies found by Snowball Methodology and ISI Web Search

Selection of studies based on thematic and structural criteria

Result: Model of impact factors on the consumption of meat



[Stoll-Kleemann and Schmidt, *2016*]

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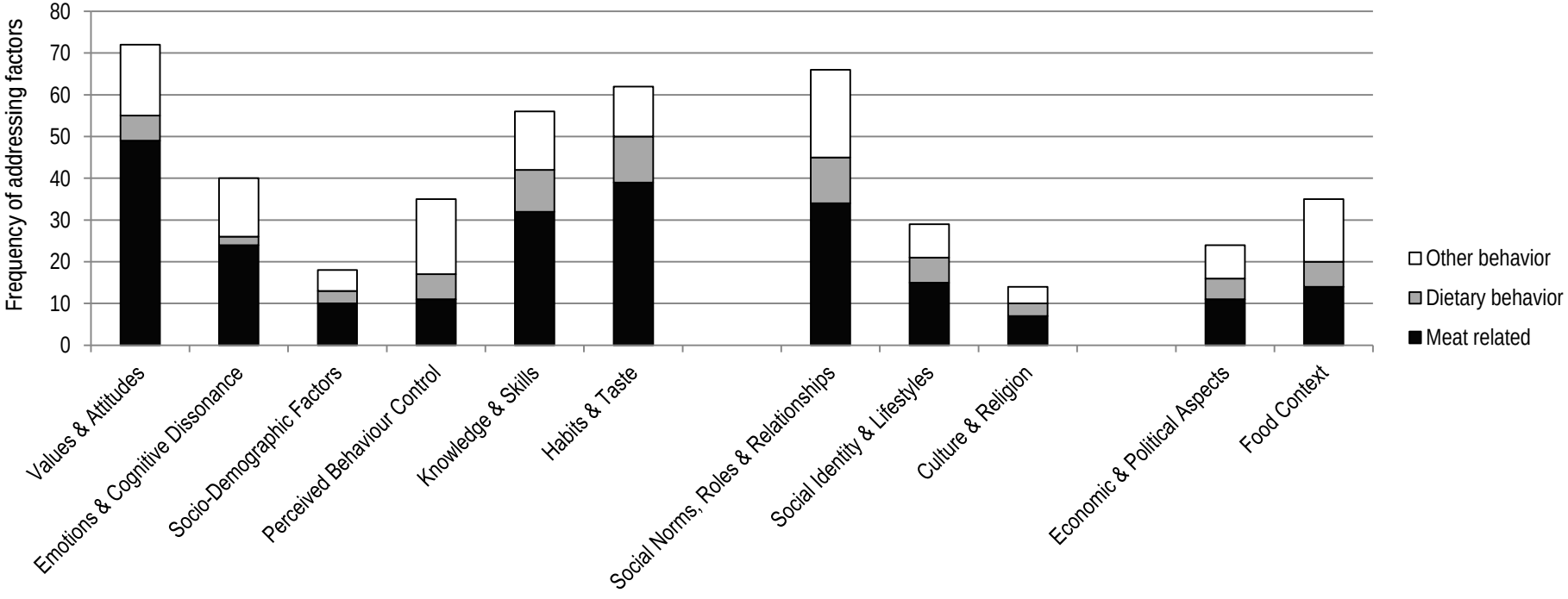
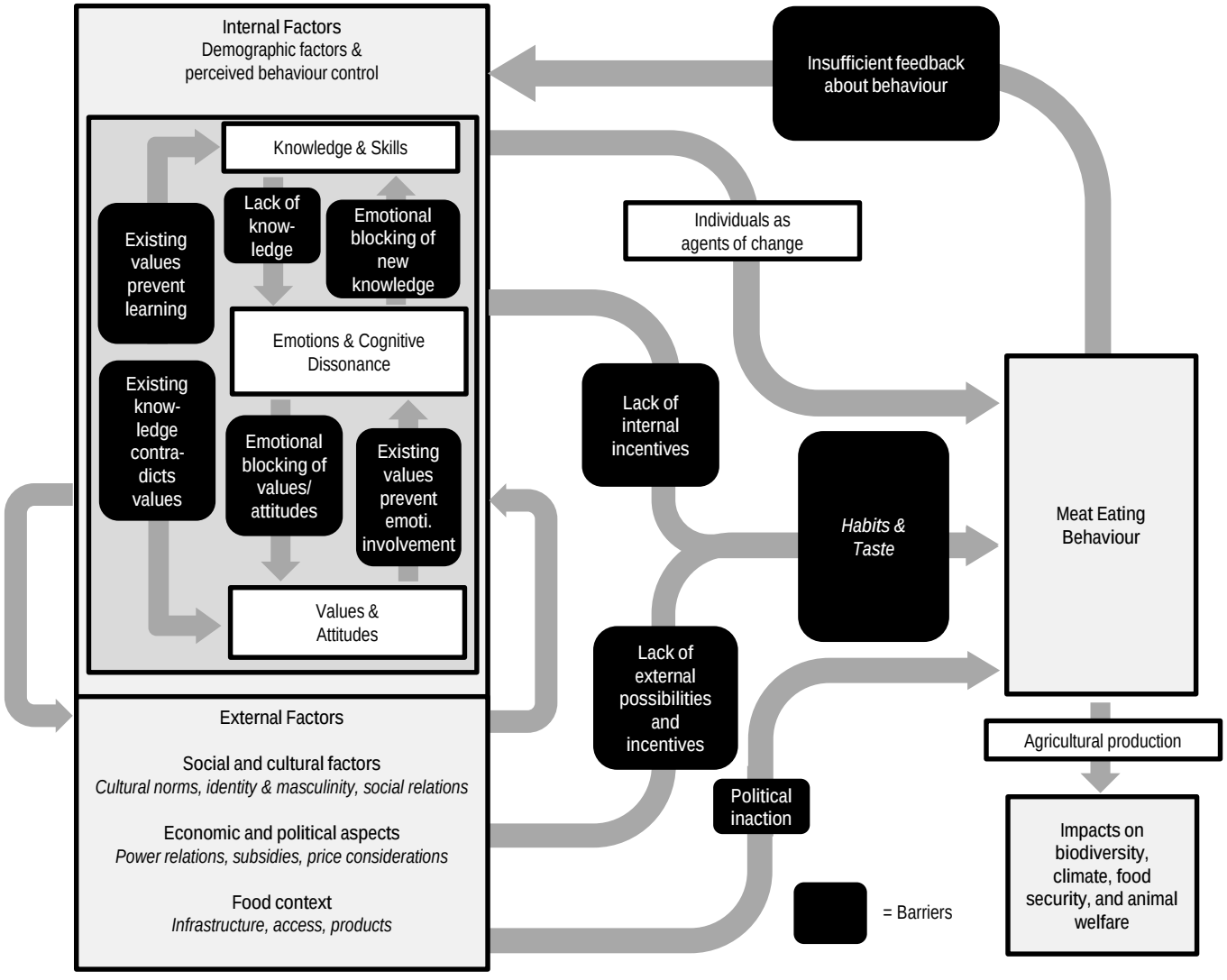
Frequency of examined influence factors (Codes)



[Stoll-Kleemann and Schmidt, *2016*]



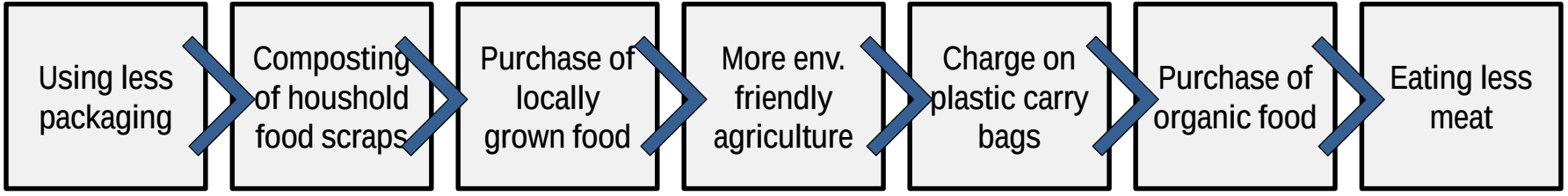
Result:

Model of impact factors on the consumption of meat

[Stoll-Kleemann and Schmidt (*2016*), based on the "Model of Pro-environmental Behaviour" of Kollmuss and Agyeman 2002]

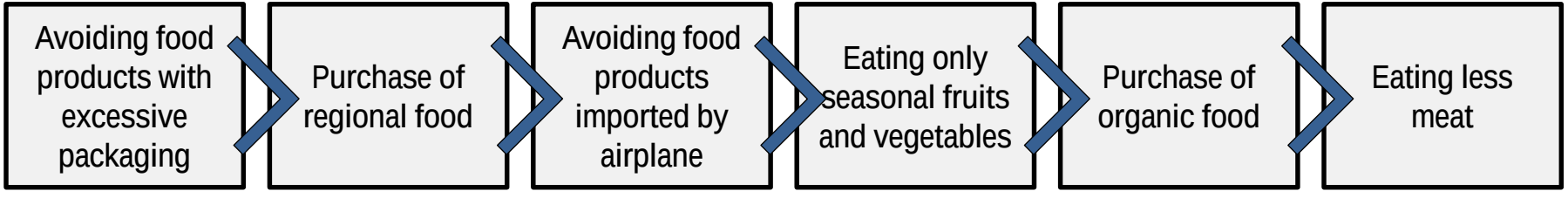
Result | Knowledge and Skills

Perceived benefits to nature through different kinds of nutrition behavior:



90 % of the participants estimated avoiding packaging as being beneficial for the environment, but only 22 % of the participants estimated eating less meat as being beneficial for the environment

[Lea and Worsley 2008]



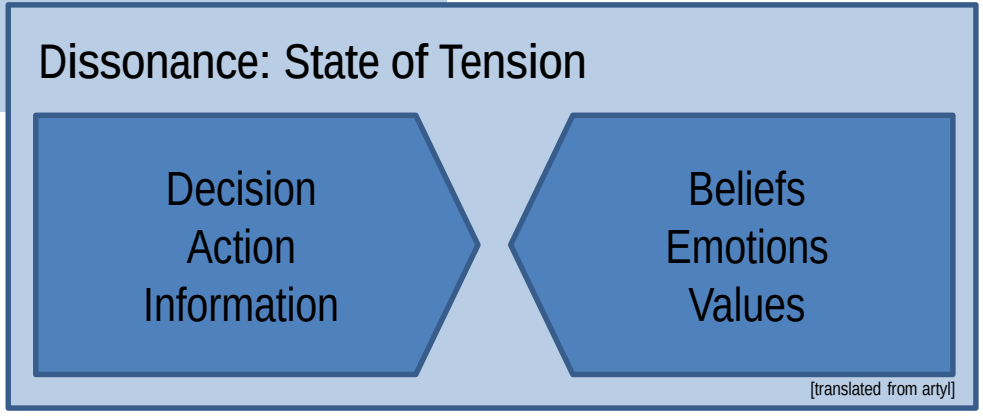
„The more frequently consumers eat meat, the smaller they perceived the environmental benefit of reducing meat consumption.“

[Tobler et al. 2011 p. 678]

Results | Cognitive Dissonance

= State of tension between emotions, thoughts and perceptions which are not compatible with each other.

[Festinger 1962]



Result | Emotions and Cognitive Dissonance

The inner conflict: Cognitive Dissonance

„I don‘t want animals to suffer“

„I don‘t want the rainforest to be cut“

„I don‘t want an unjust food system“

Meat-Paradox

„I eat meat“

Defense mechanisms
- Perception bias (farm animal vs. pet animal)
- Denial (invisibility)
- Justification (normal, natural, necessary)

[see Joy 2013, Piazza et al. 2015, Loughnan et al. 2014, Rothgerber 2014]

Result | Social and Cultural Aspects

- Culture => Norm => „normal“ [Joy 2013, Piazza et al. 2014, Rauschmeyer and Omann 2012]

> “Social eating norms are perceived standards for what constitutes appropriate consumption, whether that be amounts of foods or specific food choices, for members of a social group.” [Higgs 2015 p. 39]

- Meat consumption and masculinity [Lea and Worsley 2001, Schösler et al. 2015, Ruby and Heine 2011, Vartanian 2015]

> “following a norm enhances affiliation with a social group and being liked; and […] following a norm results in eating that is correct” [Deutsch and Gerard 1955 in Higgs 2015 p. 39]

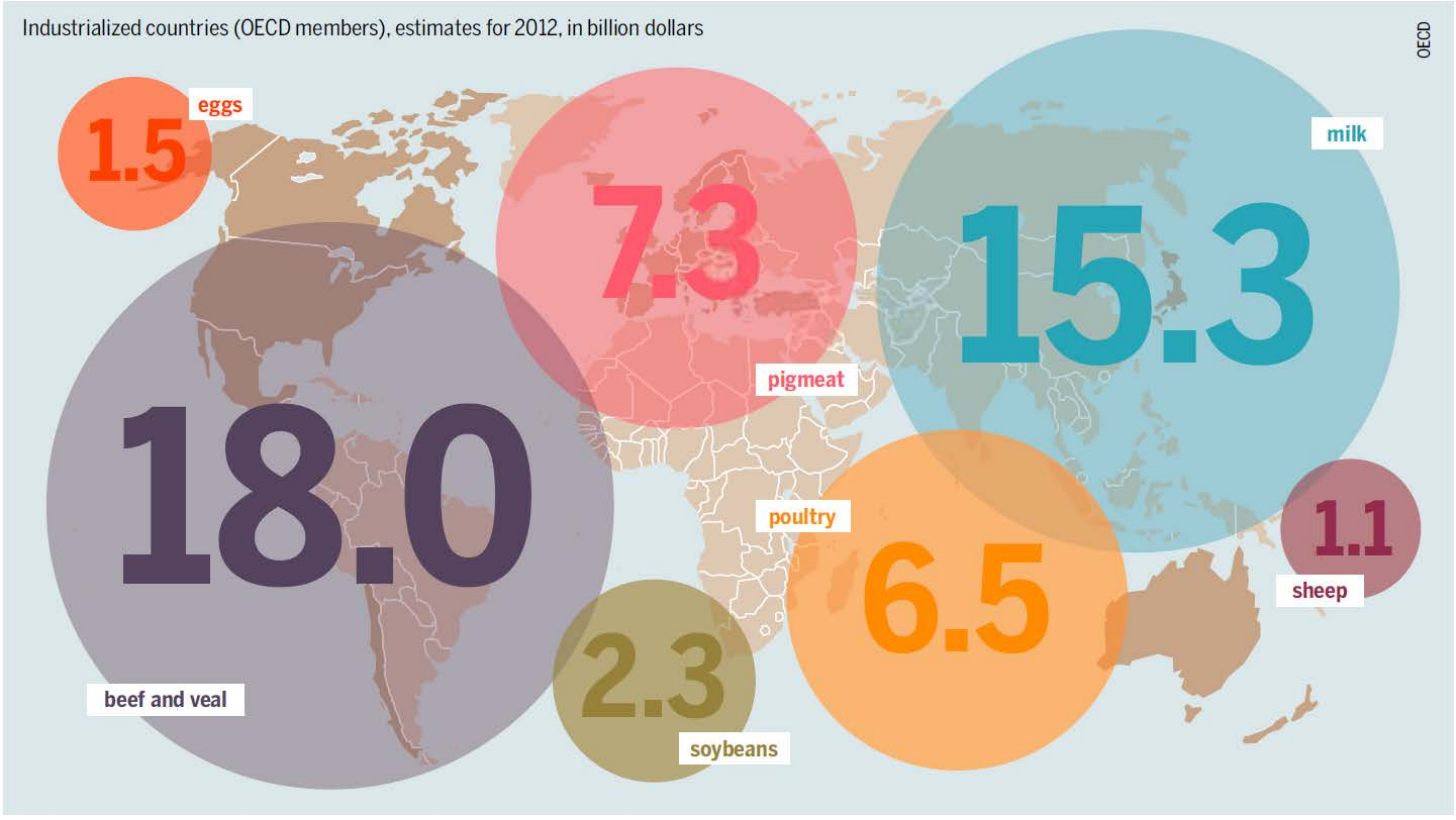
Result | Economic und Political Aspects

"advocating reduced meat consumption as part of healthy sustainable diets has not yet translated into policies and practices from government to support consumer behaviour change" [Dibb and Fitzpatrick 2014 p. 5; see also Dagevos and Voordouw 2013, Laestadius et al. 2014, Bailey et al. 2014, Westhoek et al. 2011]

Why?

- Lobbying / political will [WBGU 2011, Withana et al. 2012, NABU 2001]
- Short election periods / Fear of loss of votes
- Personal interests

Result | Economic und Political Aspects | Subsidies



[HBF 2014]

Result | Economic und Political Aspects

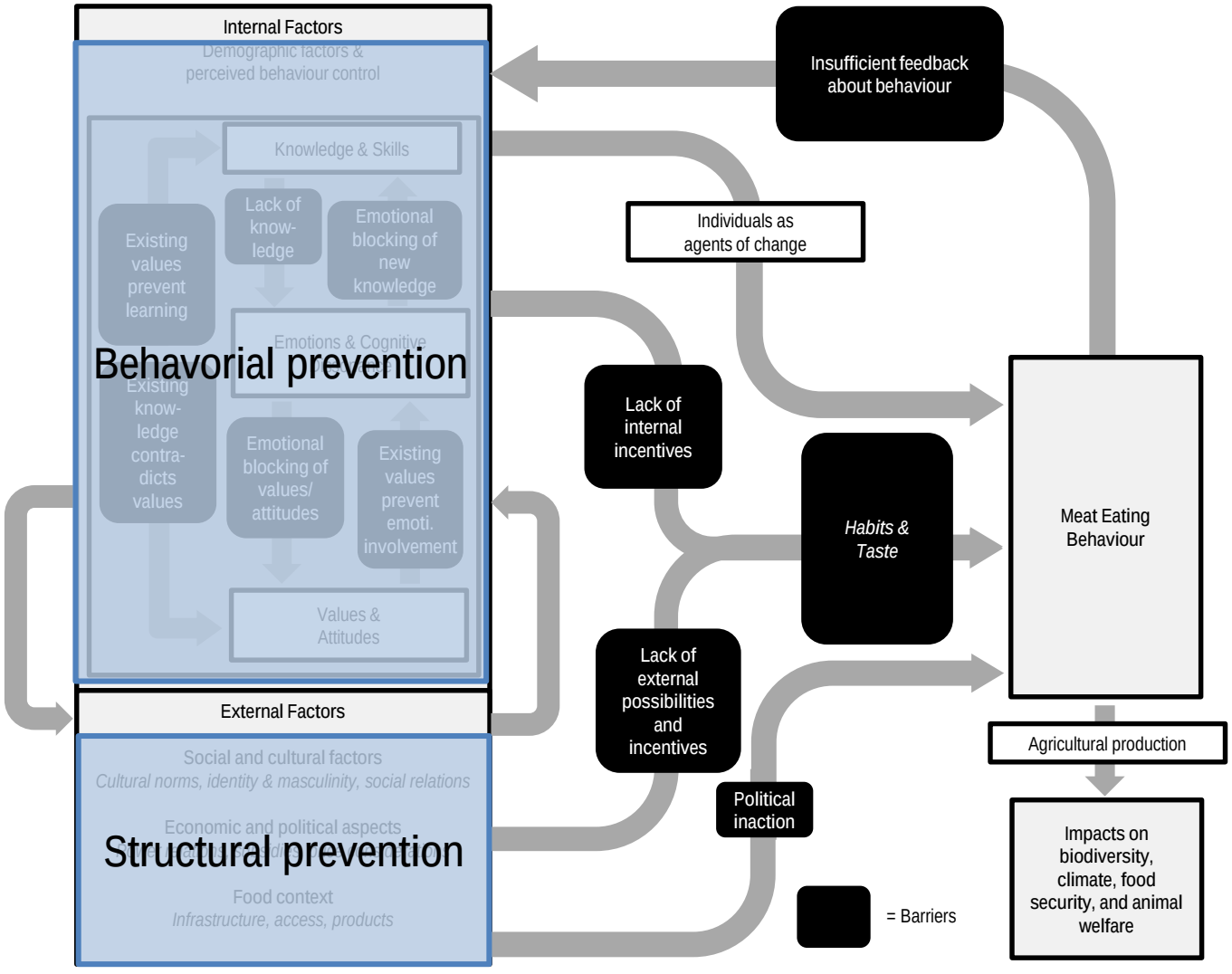
Cheap prices because of...

- externalisation [Withana et al. 2012]
- exception from the law (low VAT)
- subsidies [Benning and de Andrade 2011, Withana et al. 2012]

  > 1 Bio. € subsidies per year in Germany (2008/2009) for the intensive poultry and pig meat production and big slaughter companies

  [Benning and de Andrade 2011]

- market concentration [Sexton 2012, NABU 2001]



Result:

Model of impact factors on the consumption of meat

[Stoll-Kleemann and Schmidt (*in review*), based on the "Model of Pro-environmental Behaviour" of Kollmuss and Agyeman 2002]

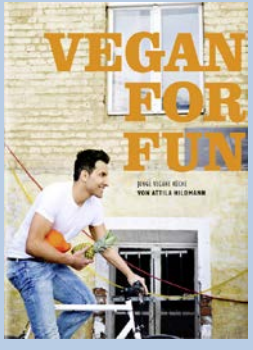
Opportunities

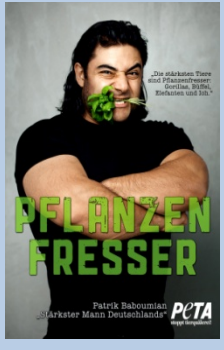
Critical mass?

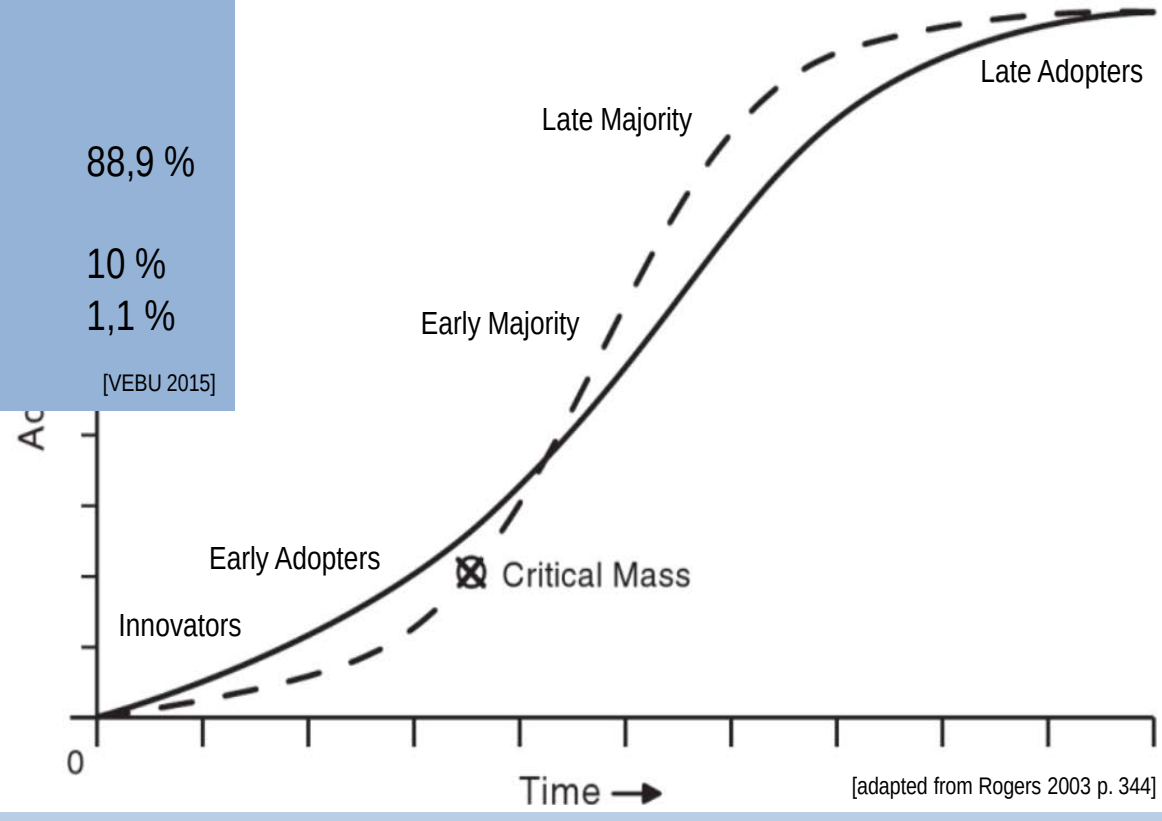
Number of

…Meat Eaters	88,9 %
But high numbers of flexitarians!!!!	
…Vegetarians	10 %
…Vegans	1,1 %

[VEBU 2015]







[adapted from Rogers 2003 p. 344]

Behavorial prevention

- Education, information:
  Health and animal ethic related arguments [Cordts et al. 2013, Dibb and Fitzpatrick 2014, Tobler et al. 2011]
- Transparency [Hoogland et al. 2005]
  => Impeding cognitive dissonance [Joy 2013, Piazza et al. 2014]
- Supporting (perceived) skills / empowerment / encouragement / motivation [Ajzen 1991, Wyker and Davison 2012, Mäkiniemi and Vainio 2014]
- New social norms and role models

[lerngesundheit.files.wordpress.com]

Structural prevention

Enhancing surrounding factors / Food context

- Infrastructure (easy to buy in supermarkets/on menues of restaurants)
- Prices (subsidies, externalisiation, market concentration)
- Supply (schools, canteens, hospitals, etc.)

[Veganz.de]


[topagrar.com]

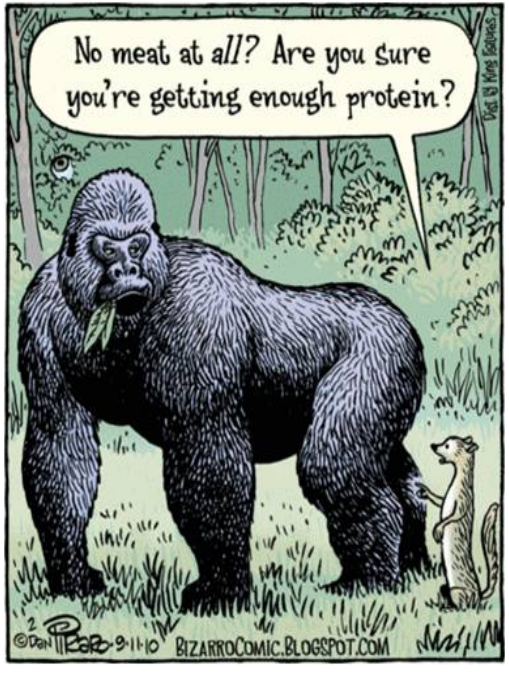
[frankfurt-berger-strasse.de]

Conclusion

- Without the reduction of meat consumption a sustainable diet is hardly possible (additionally: reduction of food wastage, organic and regional grown food, etc.)
  => in general: Respect for Life

- Barriers:
  - Internal: Lack of knowledge, cognitive dissonance, habits
  - External: Infrastructure, subsidies, externalisation, market concentration

- Chances:
  - Behaviour: Critical mass, education/information
  - Context: Enhancing of infrastructure/supply, political and economic claims
  - New Social norms



[Ackerhelden.de]

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Many thanks for your attention!

Prof. Dr. Susanne Stoll-Kleemann

Berlin, December 8, 2016

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