Euroopa Maaelu Arengu Põllumajandusfond: Euroopa investeeringud maapiirkondadesse

Trends in animal nutrition

or

May I ask you, HOW YOU PRODUCED MY MEAT?

Franz Waxenecker

SOCIAL DEMOGRAPHY

WORLD POPULATION GROWTH, NOW

7,651,343,069

view all people on 1 page >

Source: worldometers.info

Euroopa Maaelu Arengu Põllumajandusfond: Euroopa investeeringud maapiirkondadesse

SOCIAL DEMOGRAPHY

WORLD POPULATION GROWTH, NOW

Sep 06, 2019:

7,728,526,685

Source: worldometers.info

Euroopa Maaelu Arengu Põllumajandusfond: Euroopa investeeringud maapiirkondadesse

Scope of the Animal Protein Industry

1.537.546.000.000 USD

(1 Trillion 537 Billion 546 Million USD)

Source: FAOSTAT, 2016
The State of World Fisheriers and Aquaculture, 2018

Scope of the Animal Protein Industry

1.380.000.000 tons

of meat, milk and eggs and seafood
(1 Billion 380 Million tons)

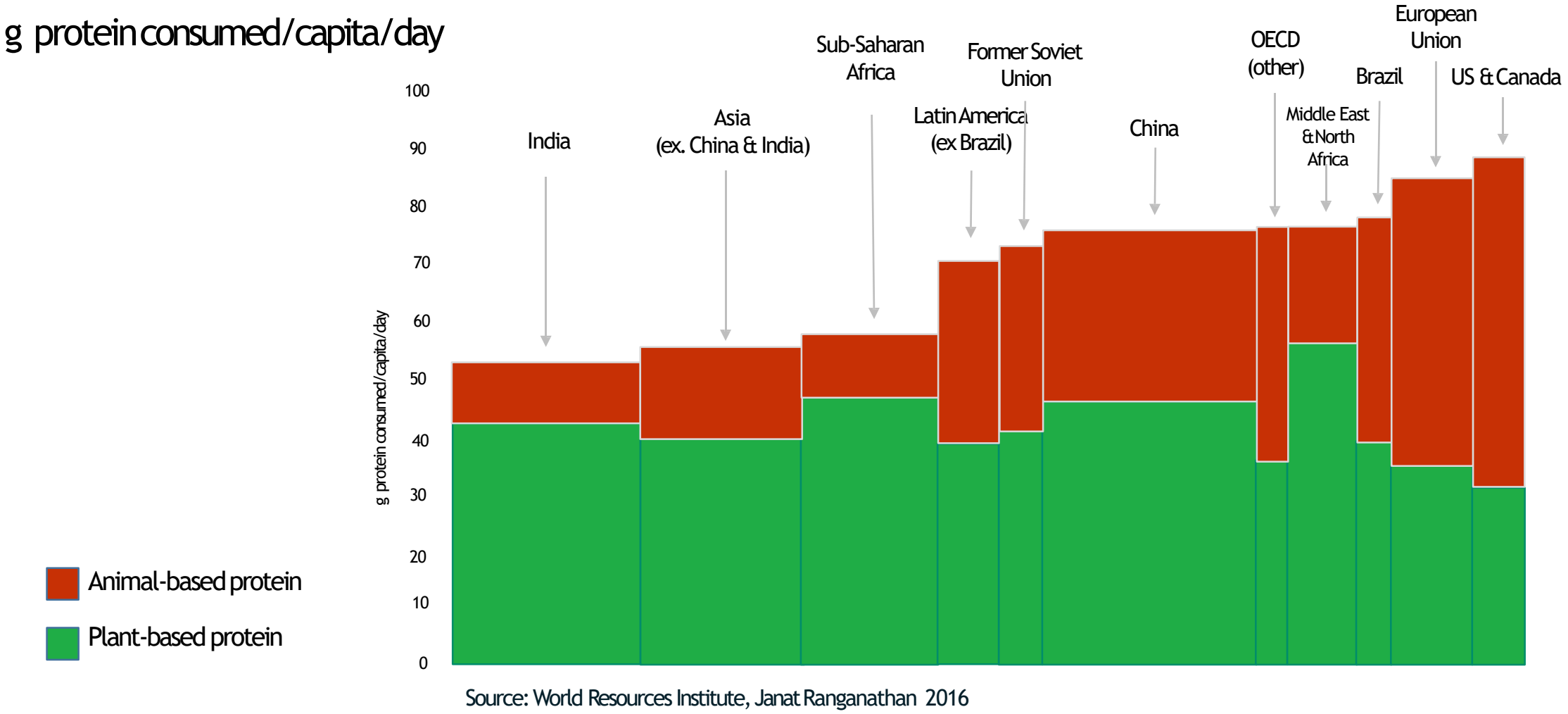
- **140.000.000 tons protein**
  - Meat 85 Mio tons
  - Milk 25 Mio tons
  - Seafood 20 Mio tons
  - Eggs 10 Mio tons

Source: FAOSTAT, 2016
The State of World Fisheriers and Aquaculture, 2018

Euroopa Maaelu Arengu Põllumajandusfond: Euroopa investeeringud maapiirkondadesse

ANIMAL PROTEIN ← → PLANT PROTEIN

Euroopa Maaelu Arengu Põllumajandusfond: Euroopa investeeringud maapiirkondadesse

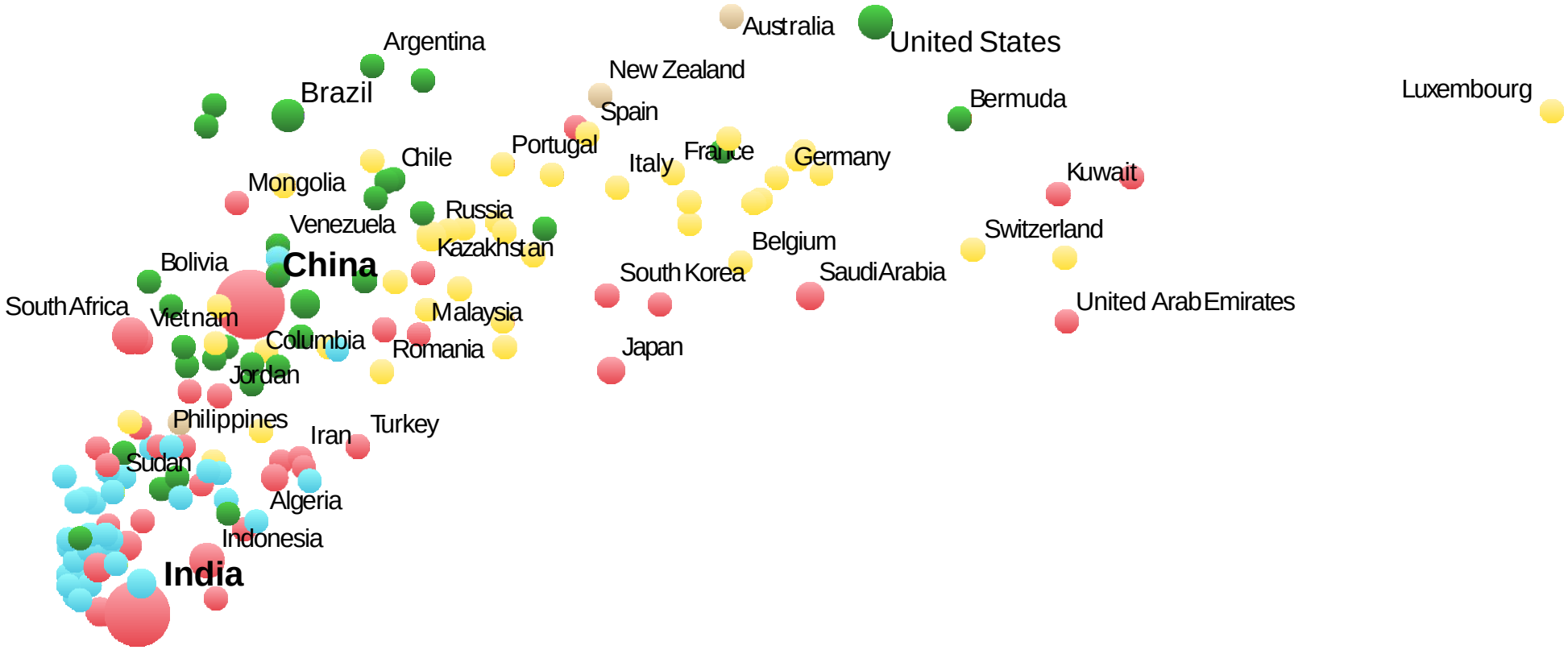


Source: World Resources Institute, Janat Ranganathan 2016

Biomin

SOCIO-ECONOMICAL

MEAT CONSUMPTION VS. GDP PER CAPITA, 2013 TO 2014

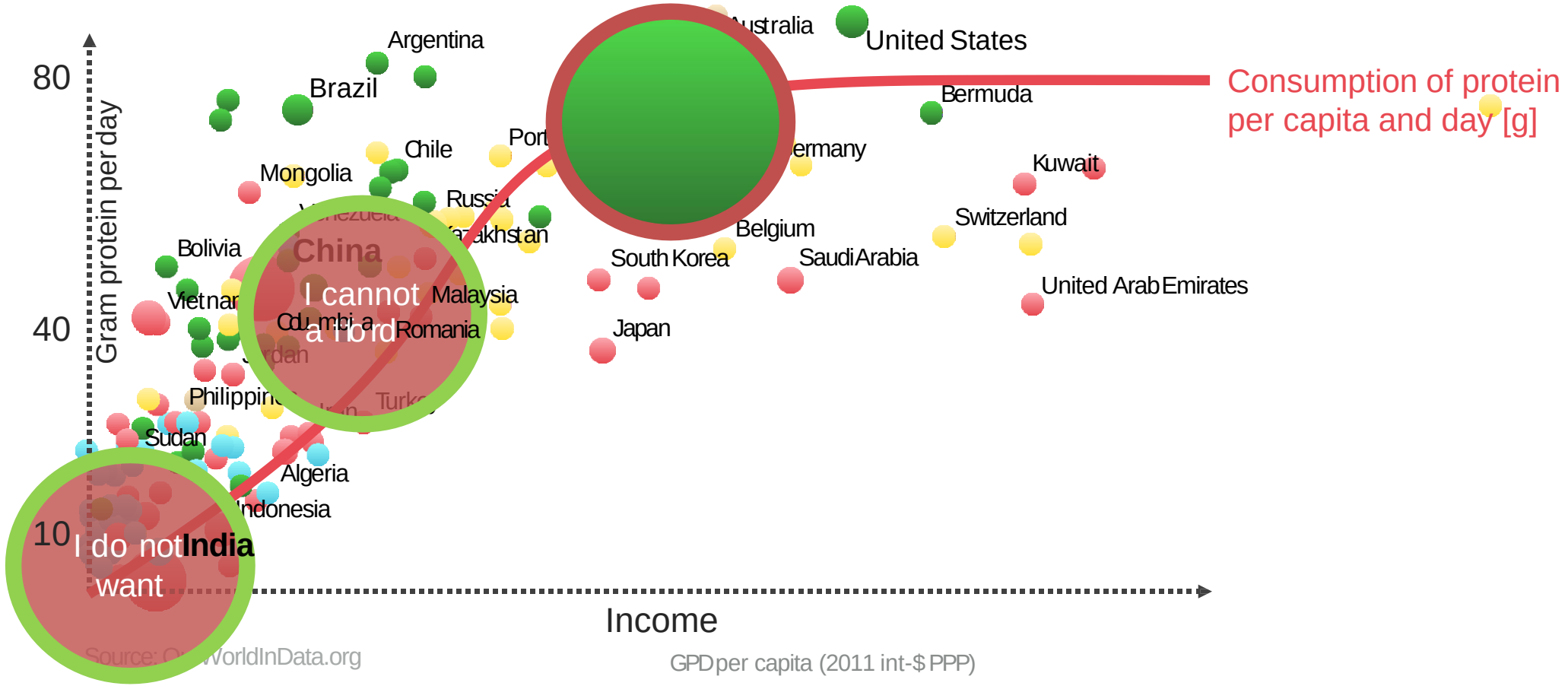


GPD per capita (2011 int-$ PPP)

Source: OurWorldInData.org

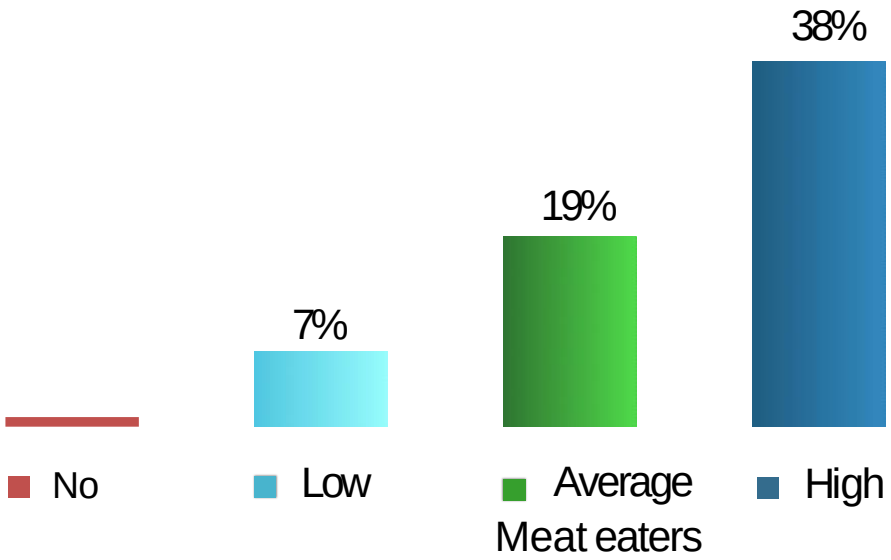
SOCIO-ECONOMICAL

MEAT CONSUMPTION VS. GDP PER CAPITA, 2013 TO 2014



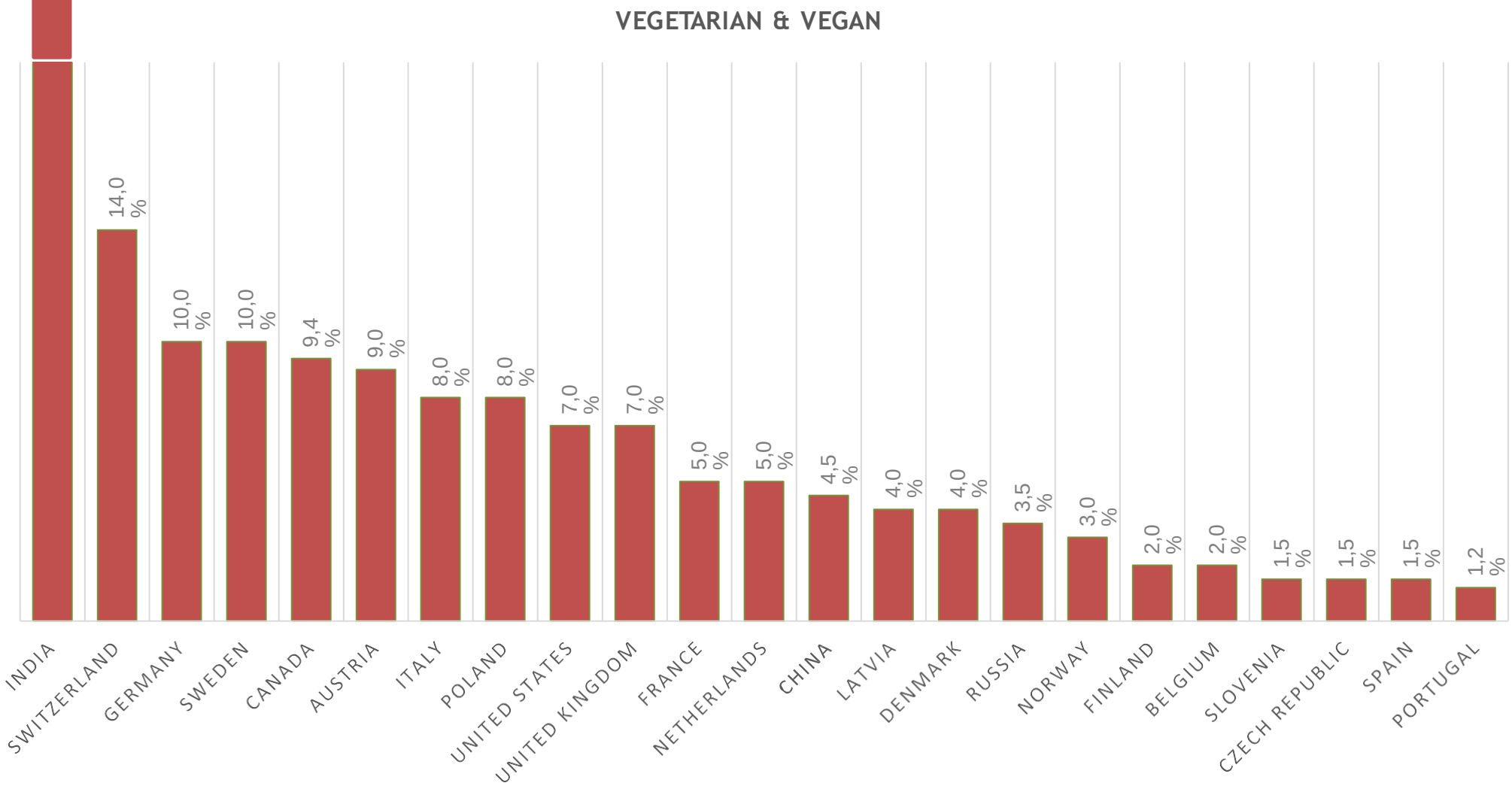
SOCIO-ECONOMICAL – HIGH INCOME COUNTRIES

PROPORTION OF MEAT IN THE TOTAL DIET [%]



Source: International Food and Agribusiness Management Review, Volume 16, Issue 2, 2013

Vege tarian & Vegan [% from population]



Adapted from Wikipedia „Vegetarianism per country“

Euroopa Maaelu Arengu Põllumajandusfond: Euroopa investeeringud maapiirkondadesse

SOCIO-ECONOMICAL – HIGH INCOME COUNTRIES

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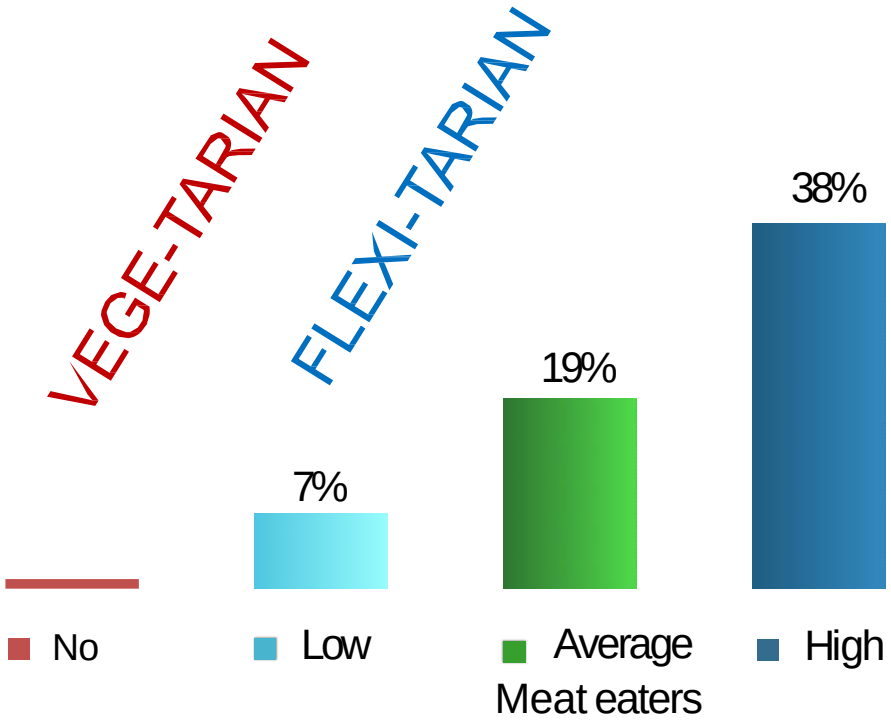
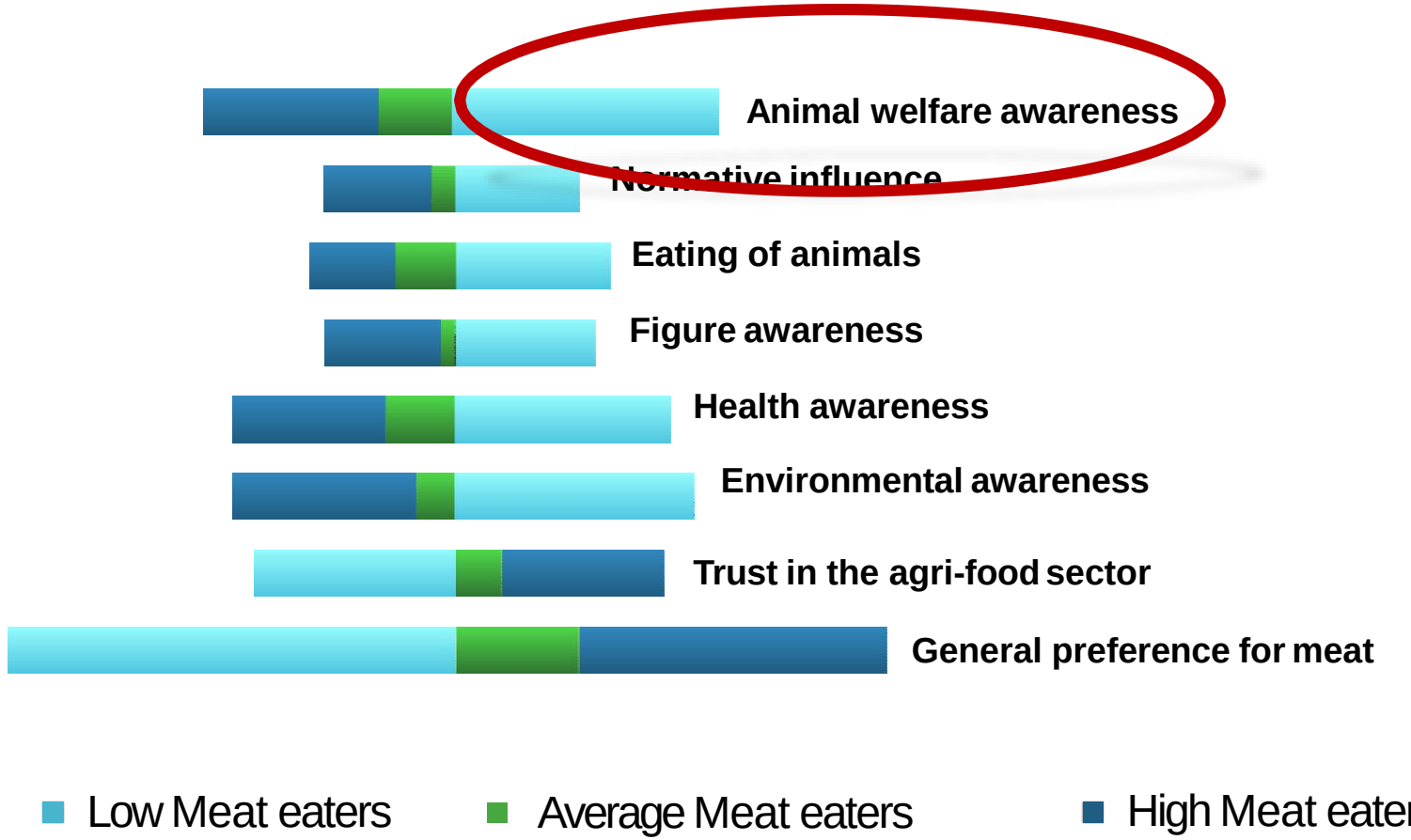


Source: International Food and Agribusiness Management Review, Volume 16, Issue 2, 2013

SOCIO-ECONOMICAL – HIGH INCOME COUNTRIES

MEAT CONSUMPTION PATTERNS



Source: International Food and Agribusiness Management Review, Volume 16, Issue 2, 2013

Euroopa Maaelu Arengu Põllumajandusfond: Euroopa investeeringud maapiirkondadesse

Animal welfare – the consumers perspective

Other animals not harmed (dophin-safe-tuna)	68%
Animals raised in natural environment	65%
Animals not given hormones and antibiotics	63%
Company supports animal welfare organisations	51%
Animals fed only organid feed	33%

Source: Sustainability – Transparency report 2015 (The Hartman Group)

How much would you pay more per kg meat?

Up to 2 Euro	13%
Up to 5 Euro	50%
Up to 10 Euro	22%
More than 10 Euro	8%

Source: German Ernährungsreport 2019

Animal welfare – expert definition

An animal is in a good state of welfare if (as indicated by scientific evidence) it is:

- ❑ Healthy
- ❑ Comfortable
- ❑ Well nourished
- ❑ Safe
- ❑ Able to express innate behaviour
- ❑ Not suffering from unpleasant states such as pain, fear, and distress.

(OIE, 2010)

Animal welfare – expert definition

Principles of FREEDOM:

- Freedom from discomfort
- Freedom from hunger and thirst
- Freedom from pain, injury and disease
- Freedom to express normal behaviour
- Freedom from fear and distress

https://ec.europa.eu/food/animals/welfare_en#ref93-119
https://ec.europa.eu/food/animals/welfare/legislative_aspects_en

Animal welfare – the experts perspective

Euroopa Liit maaelu arenguks
Euroopa Maaelu Arengu Põllumajandusfond: Euroopa investeeringud maapiirkondadesse

Promoting animal welfare through proper animal nutrition

Animal welfare includes the combination of both physical and mental well-being. A properly balanced diet and water supplied in adequate amounts avoid physical and psychological suffering from hunger and thirst; furthermore correct nutrition is crucial for optimal performance and to sustain optimal fitness.

An expert meeting held in September last year in Rome reviewed the impact of animal nutrition on animal welfare. For both ruminant and monogastric species, the experts identified: a) feeding options for different livestock production systems (extensive, mixed crop-livestock, and intensive) that improve animal welfare while increasing profitability of the livestock producers and ensuring safety and quality through the food chain; and b) challenges and opportunities to enhance animal welfare through animal feeding approaches. In addition, guidelines and policy options promoting sustainable animal feeding that enhance animal welfare, animal productivity, animal product quality and profitability were formulated.

In *Extensive production systems,* the major challenge identified is the supply of adequate nutrients year-round despite climatic variation. In *Mixed-crop production systems* the challenge is to better integrate the nutrient management of crop and animal production enterprises within the system, to be relatively self-sufficient and reduce dependence on external inputs. In *Intensive production systems,* the highly specialized genotypes and diet formulation approaches, and the large scale of operation, mean that the nutritional welfare of the animals is best safeguarded when expert nutritionists are involved in diet formulation. Feeding to sustain high production levels can lead to metabolic disorders in ruminants, whilst breeding animals of monogastric species which are restrict-fed to optimise health and production may suffer from chronic hunger.

A number of **Opportunities and challenges to enhance animal welfare through animal feeding approaches** were identified. In ruminant species, *welfare assessment* could be improved by development of better integrated and more robust welfare measures. *Preventing undesirable competitive behavior* requires appropriate group composition and facility design. *Maintaining appropriate nutrient balance* involves avoiding excessive mobilization of body reserves for high production, preventing rumen acidosis by appropriate diet formulation, and providing minerals as well as protein supplements to remedy imbalances in grazing conditions. Correct nutrition can reduce *infectious afflictions* by enhancing cell-tissue integrity and optimising defence mechanisms of the immune system. *Toxicity issues* associated with ingested herbage can be reduced by better management of grazing lands, training animals to avoid poisonous plants and use of medicines in supplements to counteract their negative effects. *Parasite control* can be aided by appropriate host nutrition, particularly adequate metabolisable protein nutrition, and regular use of anti-parasitic drugs. To reduce *morbidity and mortality in young stock*, adequate provision of colostrum at birth and adequate supply of milk replacer until weaning age is essential to ensure proper immune protection.

In monogastric species, the greatest challenge involves *understanding and dealing with chronic hunger,* which can arise fromthe absence of sufficient feed in subsistence systems, the deliberate restriction of feed for breeding animals in intensive systems, and the possibility of nutrient specific hungers arising from imbalances between the diet supplied and the metabolic needs of the animal. There is also scope for *bettermatching of diets to nutritional needs* through improved knowledge of the nutrient requirements of animals in different situations, and particularly of local breeds of livestock used in more extensive systems. In improved breeds, there are nutritional opportunities to mitigate the effects of problems associated with genetically induced fast growth and the partitioning of nutrients to production functions. The *development of more sustainable nutritional strategies* requires consideration of the use of nutritional approaches to address other societal goals including the supply of food which is both safe and nutritious to humans whilst generating low environmental impact from production systems. Furthermore, there is a challenge in *implementing knowledge and socio-economically applicable solutions* in the field by promoting effective dissemination and motivating uptake of good practice.

http://www.fao.org/ag/againfo/home/en/news_archive/2012_Promoting_animal_welfare_through_proper_animal_nutrition.html

Animal welfare – the experts perspective

Promoting animal welfare through proper animal nutrition

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- Prevent undesirable competitive behavior
- Maintain appropriate nutrient balance
- Reduce morbidity and infectious diseases
- Reduce mortality

http://www.fao.org/ag/againfo/home/en/news_archive/2012_Promoting_animal_welfare_through_proper_animal_nutrition.html

ANIMAL WELFARE

- Main achievements
- EU Platform on animal welfare
- EU strategy on animal welfare
- EU Reference Centre for Animal Welfare
- Animal welfare in practice
- Legislative aspects

EU strategy on animal welfare

The Strategy lays the foundation for **improving welfare standards from 2012 to 2015**, as well as making sure that these standards are **applied and enforced** in all European Union countries. It focuses on enhancing knowledge among the many key agencies, organisations and individuals who are involved in the process. It also works to improve the competitiveness of European agricultural products by ensuring that markets and consumers recognise animal welfare as an added value.

It operates under the guiding principle **'Everyone is responsible'.**

For full details of the strategy please refer to the documents below:

- Strategy EN

Share

RELATED LINKS

- Video - "Animal welfare, everyone is responsible"
- Milestones in improving animal welfare - factsheet
- Animal welfare of wild animals
- Keeping of wild animals in zoos (summaries of EU legislation)

New feed additive category:

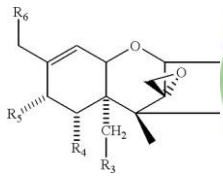
physiological condition stabilizer (ANIMAL WELFARE IMPROVER)

New feed additive category:

physiological condition stabilizer (ANIMAL WELFARE IMPROVER)

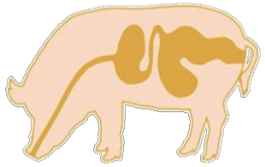
- Reducing Ammonia
- Reducing food pad lesions in chicken
- Reducing heat stress
- Reducing stress
- Reducing negative effects of vaccinations
- Reducing inflammation
- Reducing incidence of diseases
- Reducing mycotoxin effects
- Improving feed intake

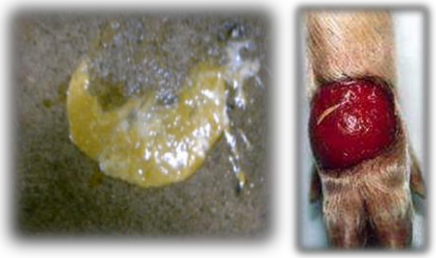
Tricothecenes – General effects



Euroopa Maaelu Arengu Põllumajandusfond: Euroopa investeeringud maapiirkondadesse

- Dermal toxicity
- Nephrotoxicity
- Neurotoxicity
- Gastrointestinal alterations
- Immune suppression



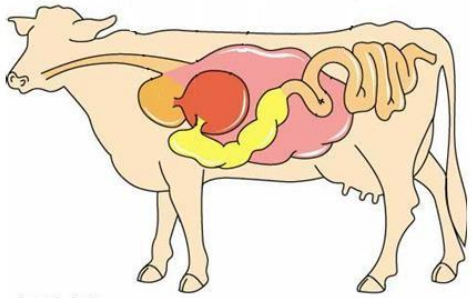


Vomit

Dermal lesions

Black tongue

Beak lesions

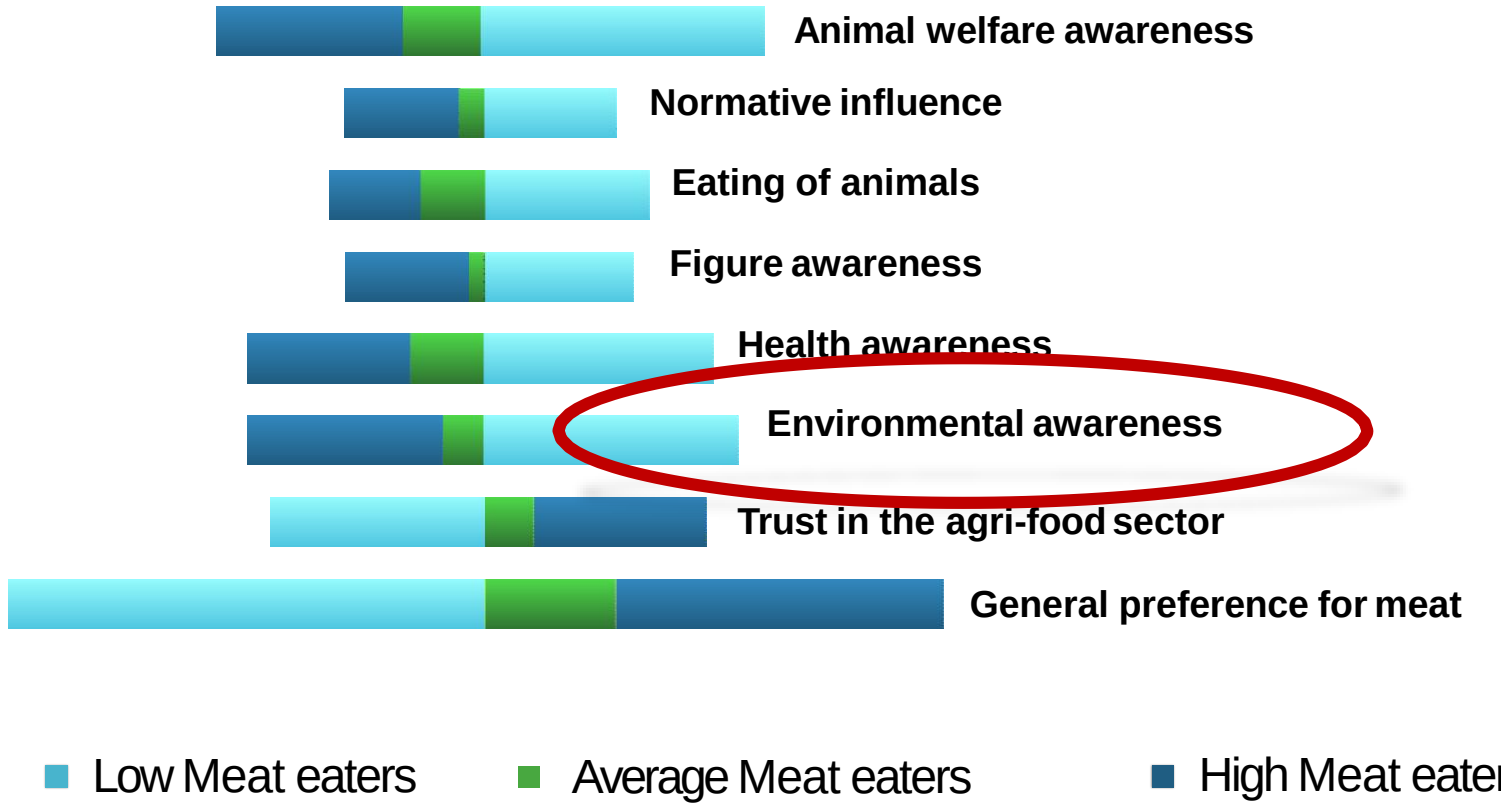


Ketosis

Dermal lesions

SOCIO-ECONOMICAL – HIGH INCOME COUNTRIES

MEAT CONSUMPTION PATTERNS



Source: International Food and Agribusiness Management Review, Volume 16, Issue 2, 2013

- Wysokie spożycie mięsa

Which one has the lower carbon footprint?

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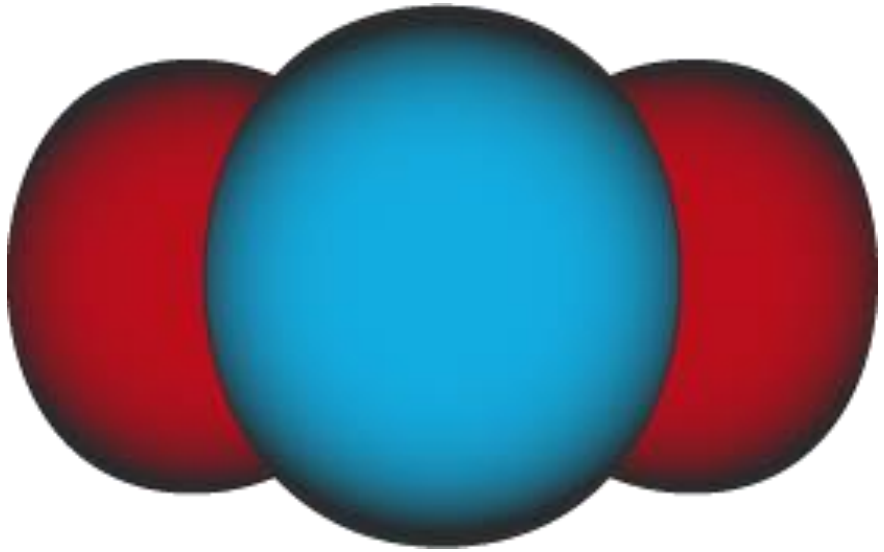
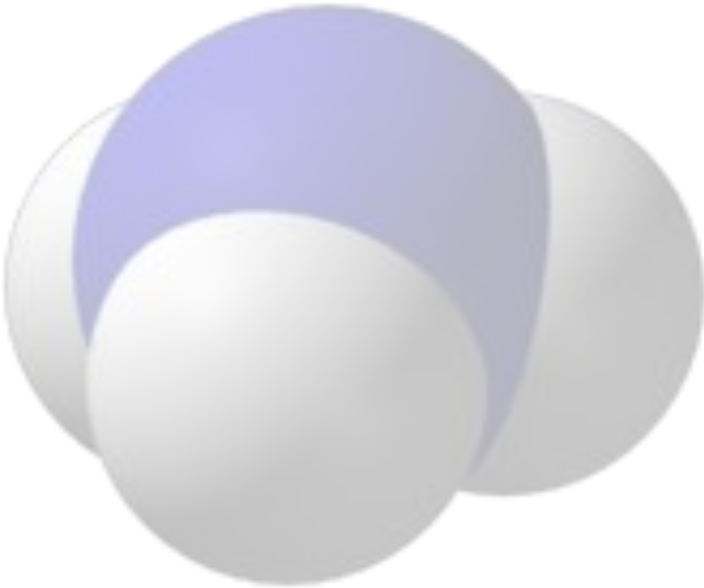
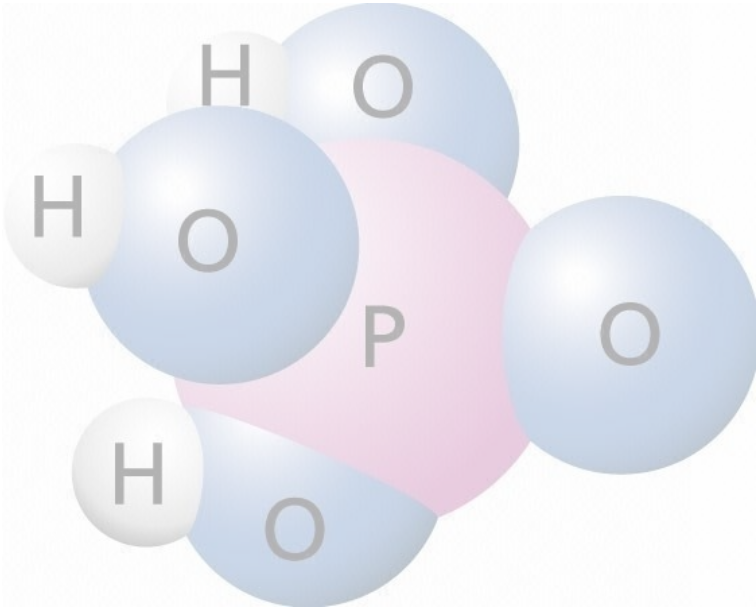
Euroopa Maaelu Arengu
Põllumajandusfond:
Euroopa investeeringud
maapiirkondadesse

C N P

Euroopa Maaelu Arengu Põllumajandusfond: Euroopa investeeringud maapiirkondadesse



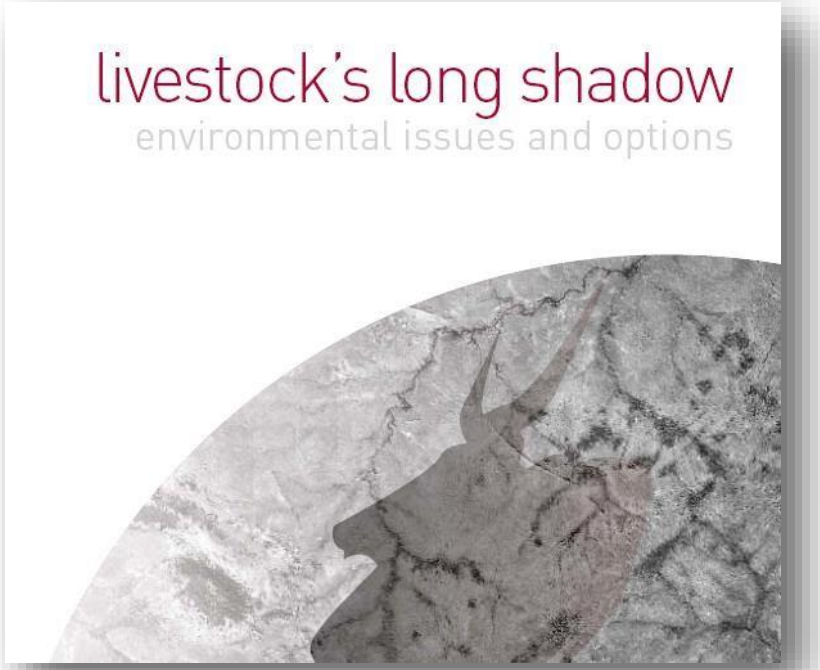


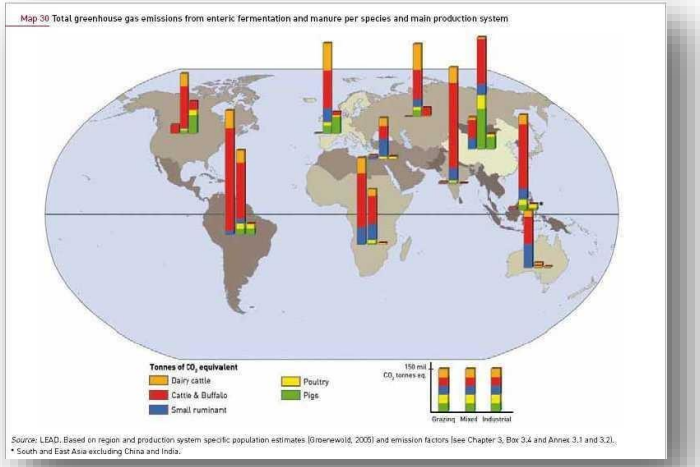


CO_2 NH_3 PO_4

FAO livestock`s long shadow

…livestock industry contributes to global warming…

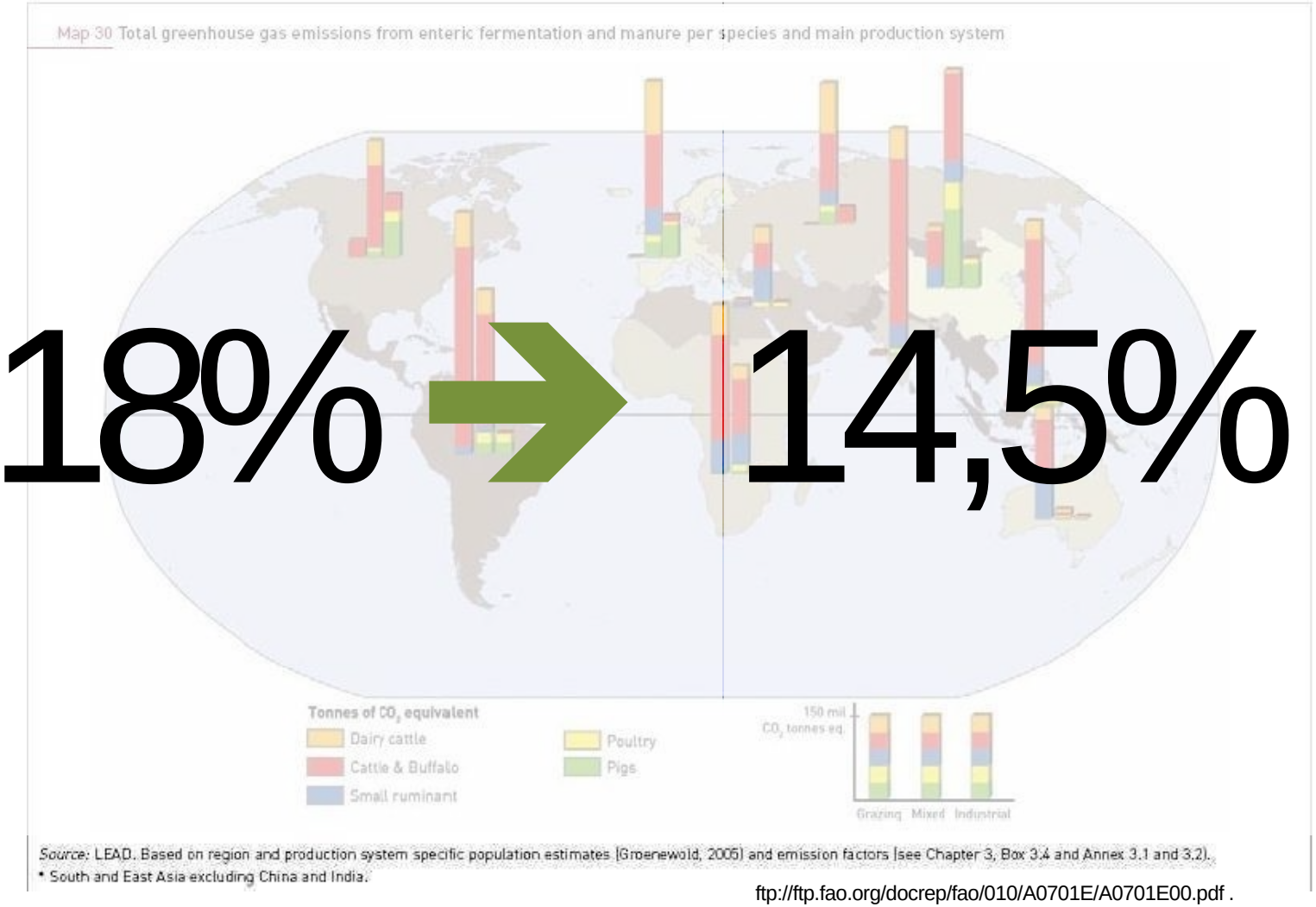




In 2006 FAO estimated that meat industry contributes 18% of all emissions of greenhouse gasses. This figure was revised in 2009 by two World Bank scientists and estimated at 51% minimum.

ftp://ftp.fao.org/docrep/fao/010/A0701E/A0701E00.pdf .

FAO livestock`s long shadow



18% → 14,5%

ftp://ftp.fao.org/docrep/fao/010/A0701E/A0701E00.pdf .

ISO 14040 since 2011

SGS

Certificate AT11/0728

The management system of

BIOMIN Holding GmbH

Industriestraße 21, 3130 Herzogenburg, Austria

has been assessed and certified as meeting the requirements of

ISO 14040:2006

For the following activities

Life Cycle Assessment BIOMIN
Certification of the organisation, the product groups and the successional swine- and poultry husbandry

This certificate is valid from 18 July 2011 until 17 July 2014
and remains valid subject to satisfactory surveillance audits
Recertification audit due before 5 July 2014
Issue 1. Certified since July 2011

Authorised by

SGS Austria Controll-Co GmbH Dieselgasse 35 A-1150 Wien Austria
t +43 (0)1 512 25 67-0 f +43 (0)1 512 25 67-9 e sgs.austria@sgs.com
www.at.sgs.com

Page 1 of 1

JOANNEUM RESEARCH LIFE
Zentrum für Klima, Energie und Gesellschaft

Greenhouse Gas Emissions and Final Energy of ERBER GROUP for 2016 and 2017

–

Report for Auditing Process

G. Jungmeier, L. Canella

Project No.: LIF.02-18.AF.006-01
Report No.: LIFE 2018/4

Under Contract of

ERBER GROUP

THE INNOVATION COMPANY

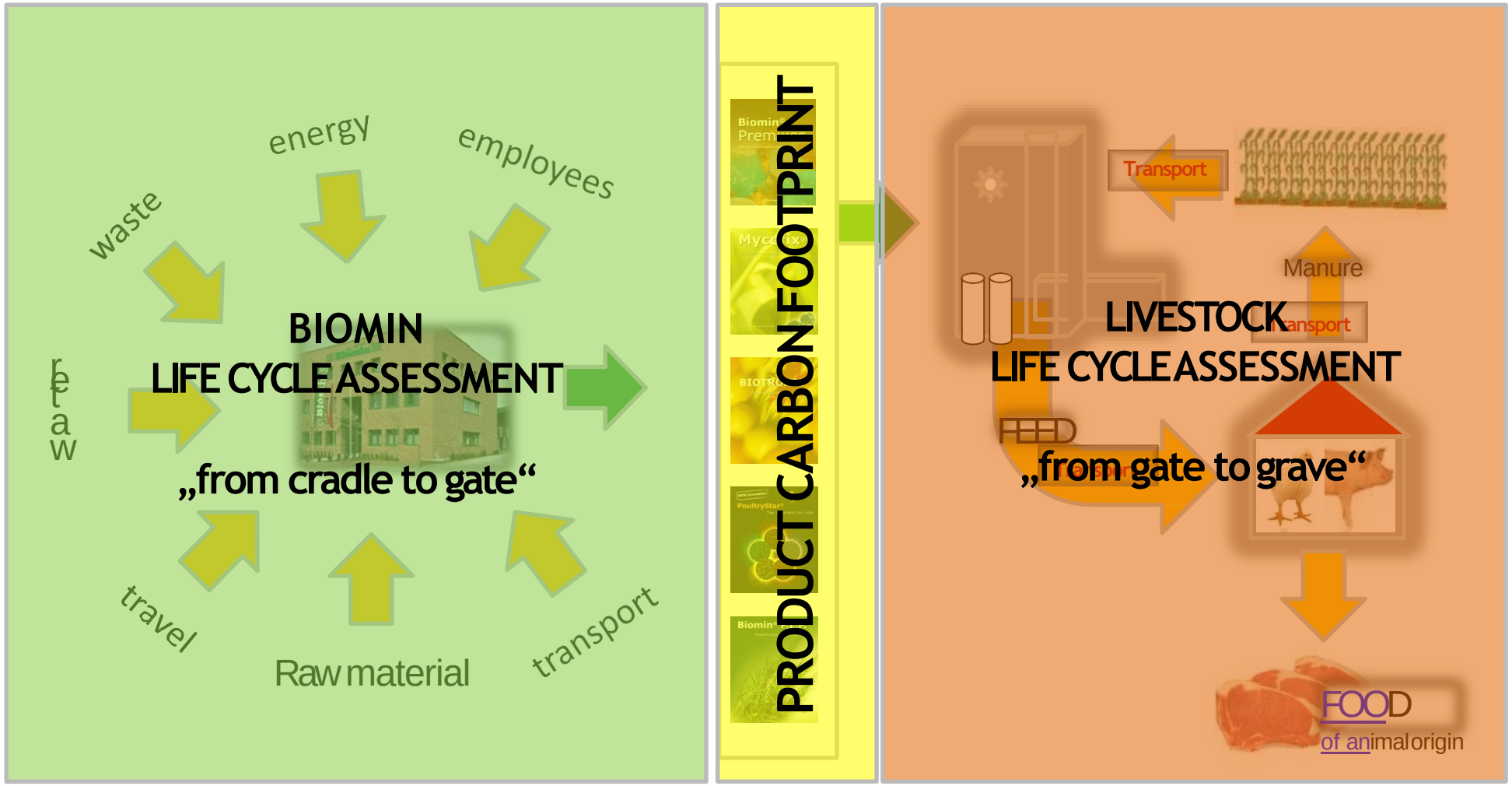
Graz, July 2018

Euroopa Liit maaelu arenguks

Euroopa Maaelu Arengu Põllumajandusfond: Euroopa investeeringud maapiirkondadesse

Biomin

Life Cycle Assessment



BIOMIN CO2-eq emissions

ERBER Gruppe emits ca 115.000 tons CO_2-eq per year

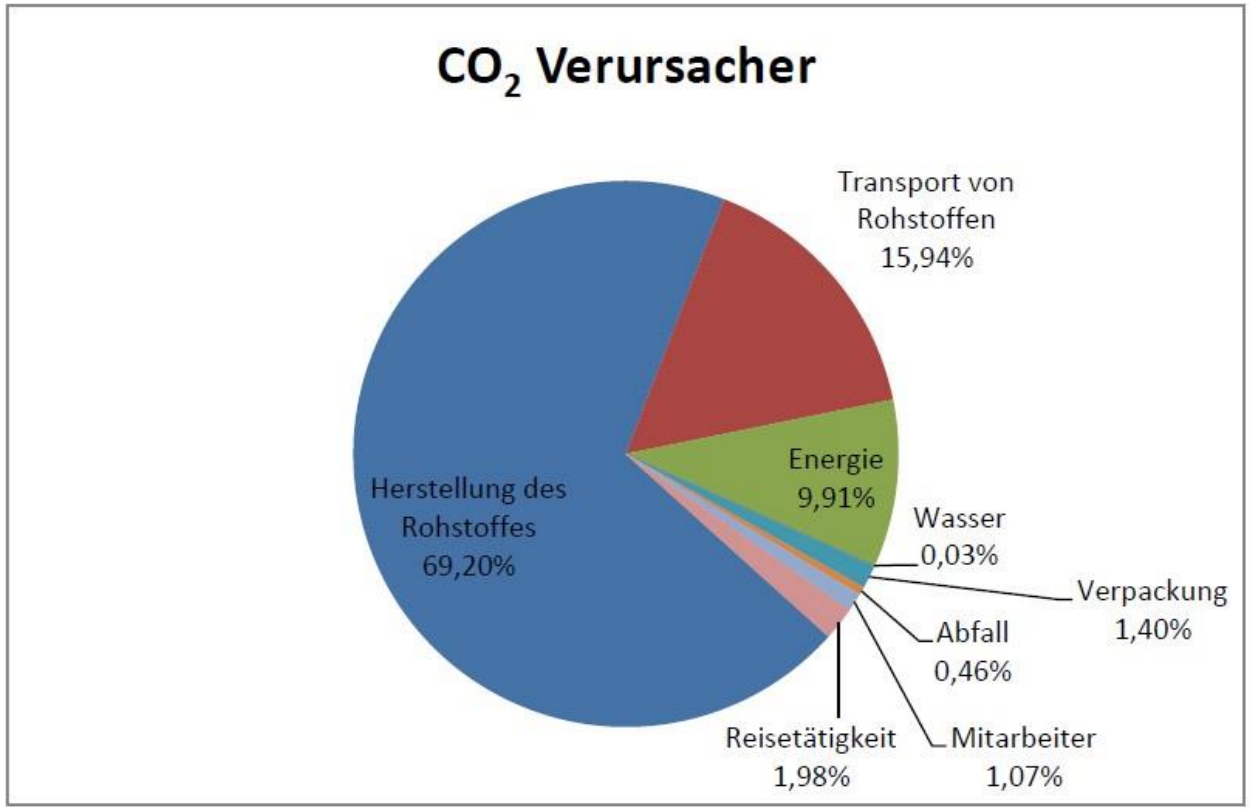
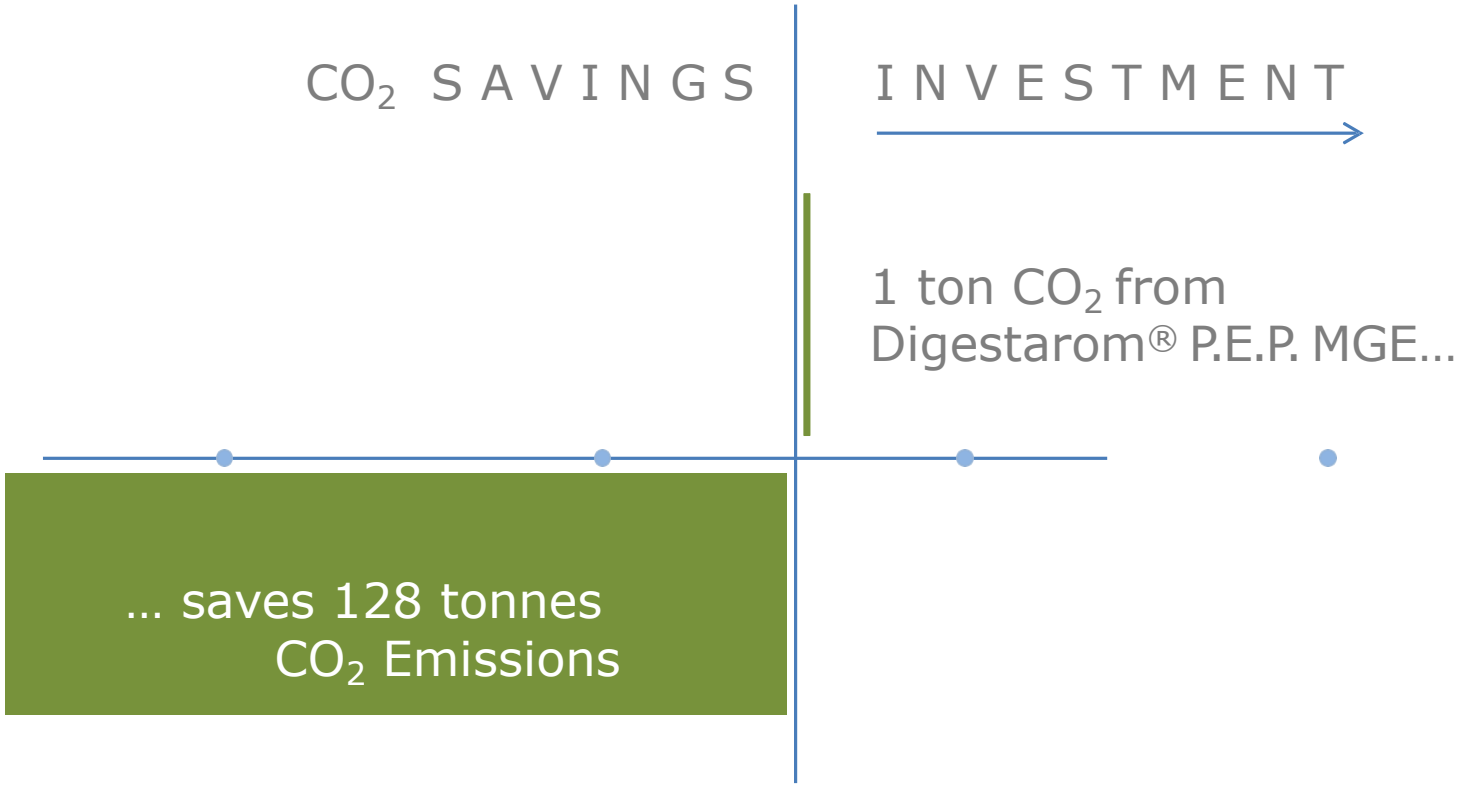


Abbildung 2: Anteil der CO_2eq Emissionsverursacher an der Gesamtemission von Biomin

ISO 14040 – Life Cycle Assessment



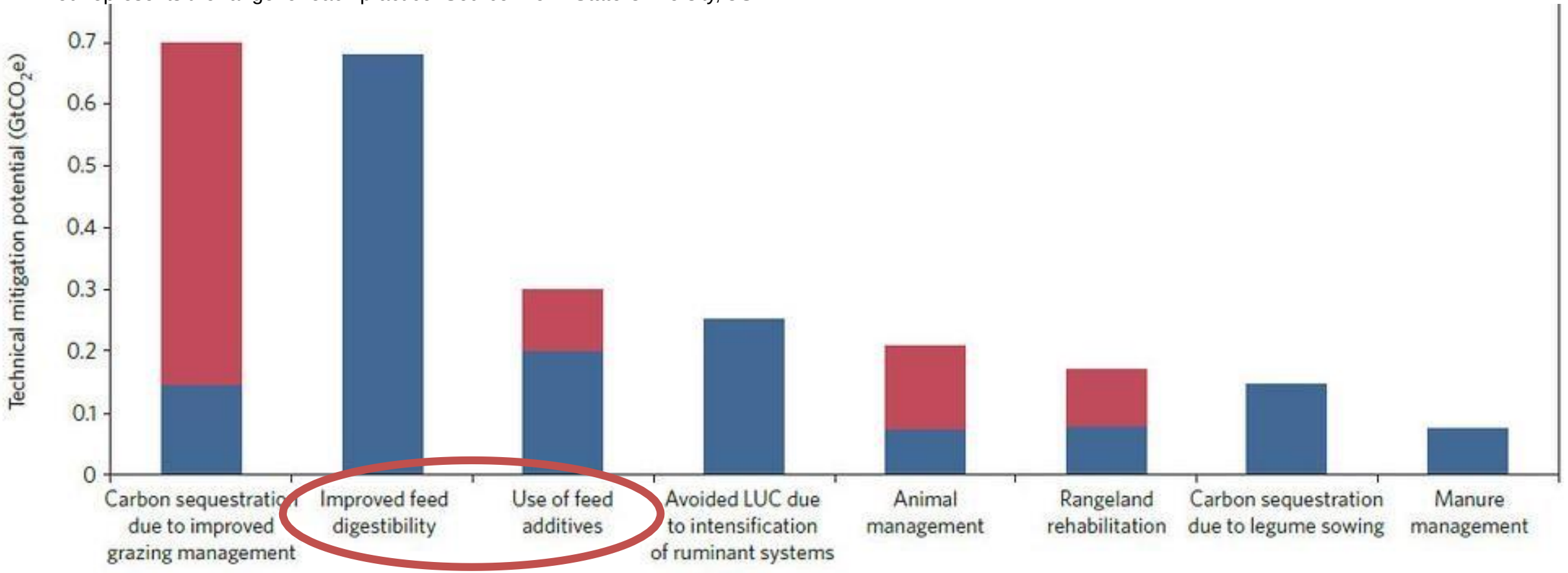
ISO 14040
Approved Life Cycle Assessment

Euroopa Maaelu Arengu Põllumajandusfond: Euroopa investeeringud maapiirkondadesse

Better efficiency ➔ better foodprint

Technical mitigation potentials of supply-side options for reducing emissions from the livestock sector.

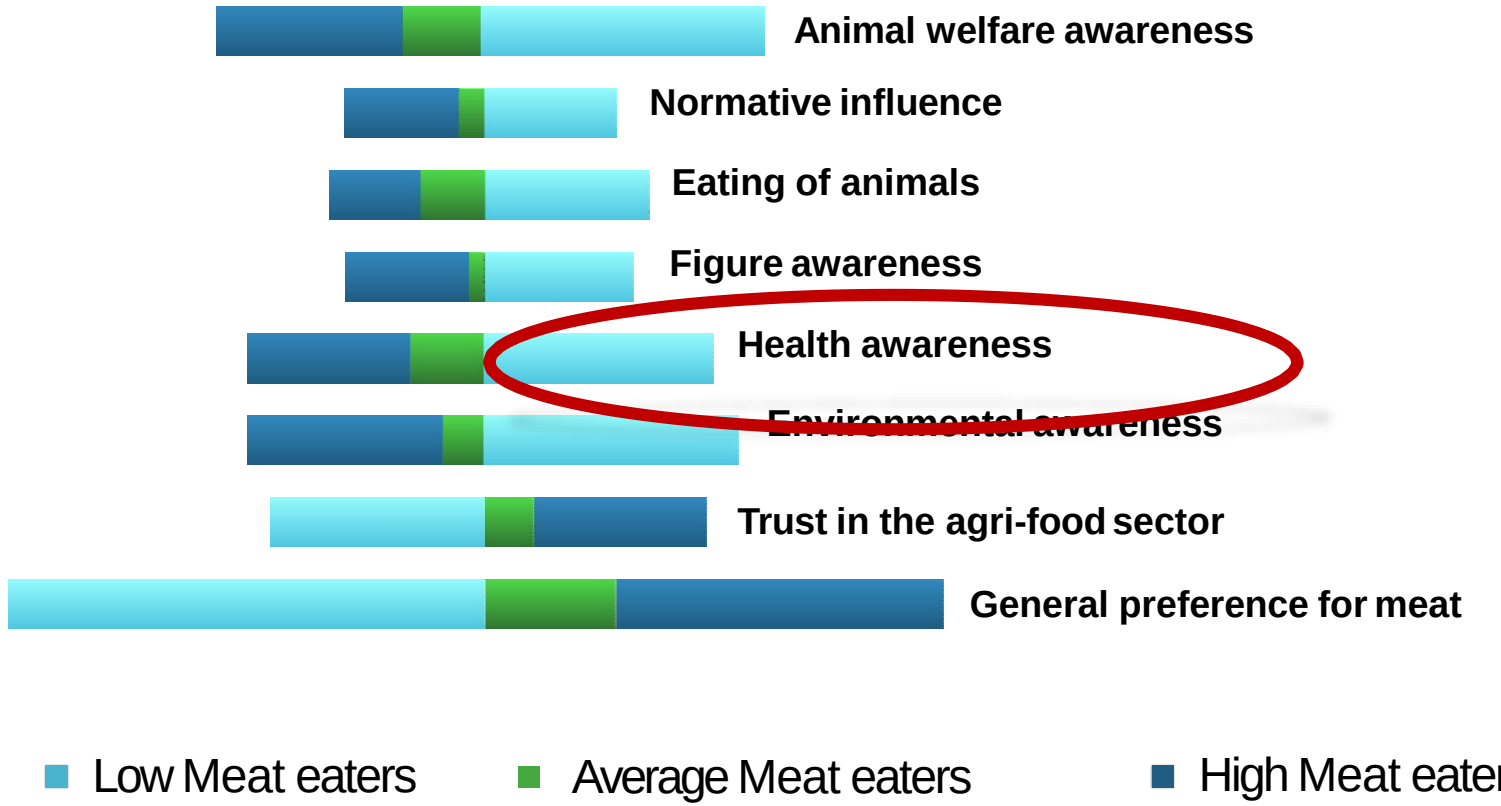
Red represents the range for each practice. Source: Penn State University, USA



Source:
Herrero, et al., 2016, Greenhouse gas mitigation potentials in the livestock sector, Nature Climate Change
https://news.psu.edu/story/399440/2016/03/23/research/worlds-livestock-industry-offers-huge-potential-greenhouse-gas
https://www.nature.com/articles/nclimate2925

SOCIO-ECONOMICAL – HIGH INCOME COUNTRIES

MEAT CONSUMPTION PATTERNS



Source: International Food and Agribusiness Management Review, Volume 16, Issue 2, 2013

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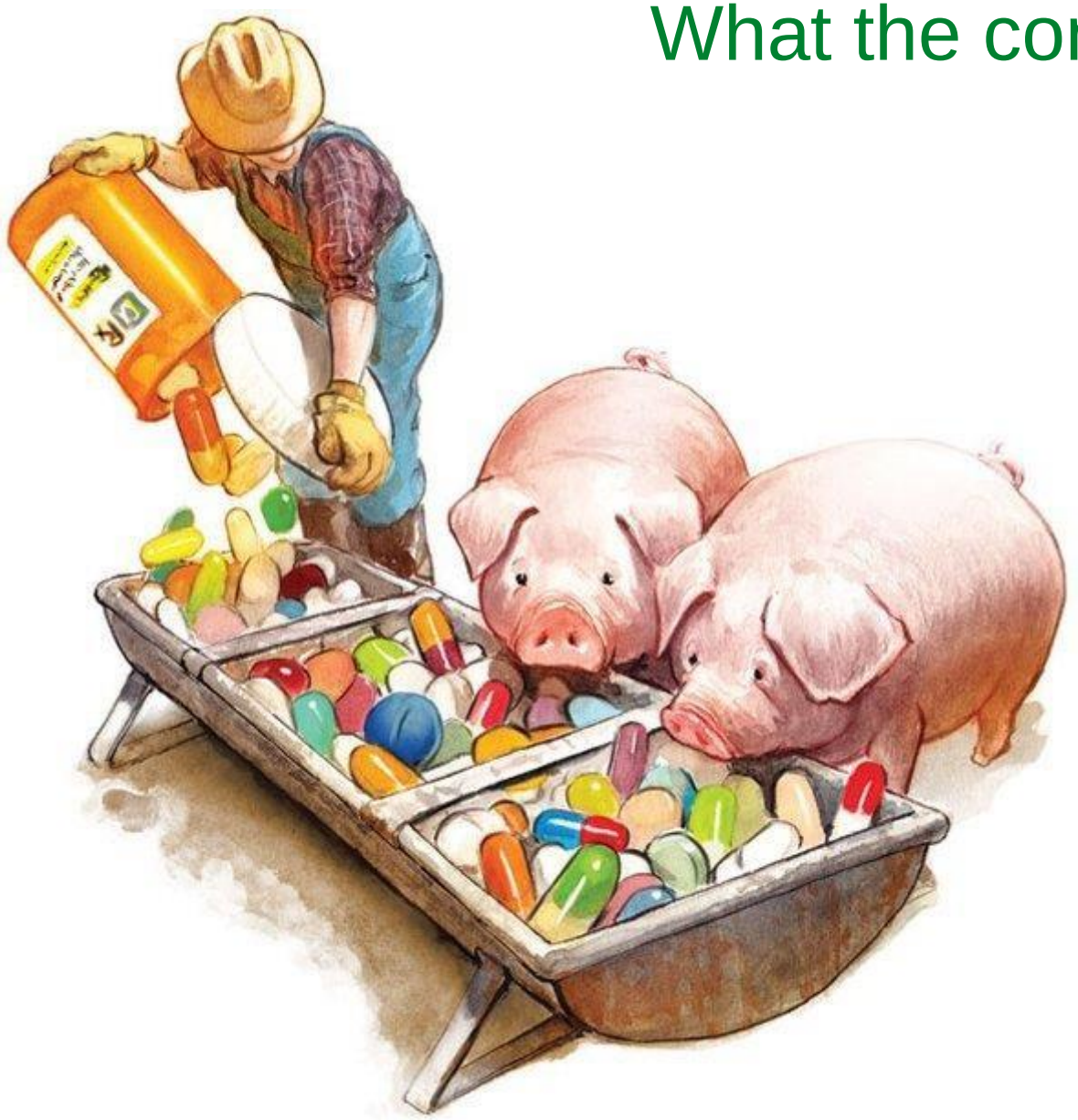
- Wysokie spożycie mięsa

What the consumer



Euroopa Maaelu Arengu Põllumajandusfond: Euroopa investeeringud maapiirkondadesse

What the consumer does not know: a clear downward trend in EU

- Overall decrease of 25% since 2011

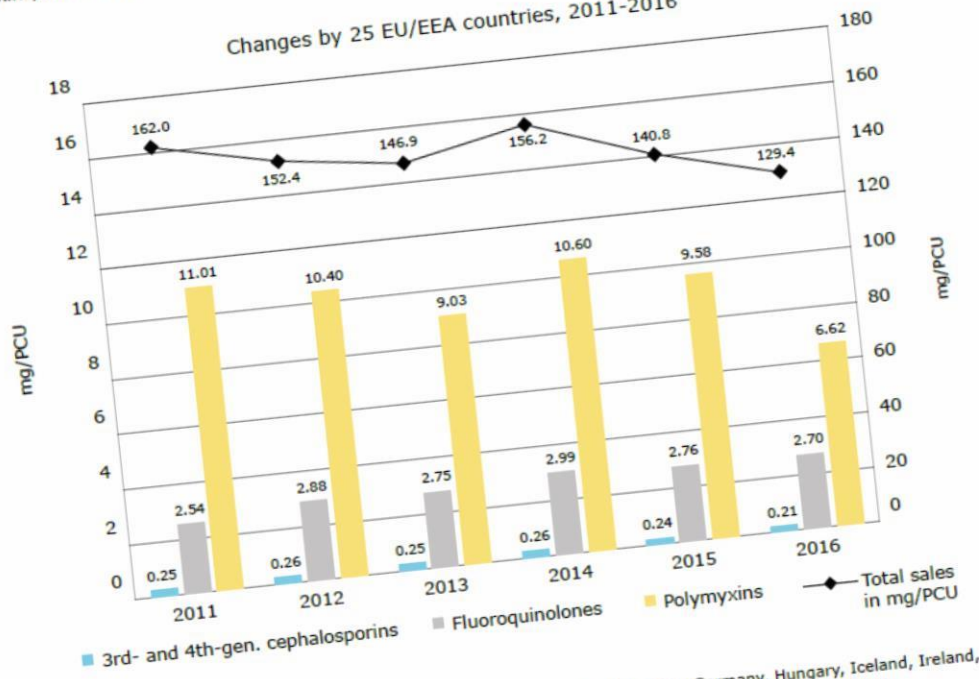
Changes in sales (mg/PCU) across 2011-2016 aggregated by 25 countries

For the 25 countries reporting sales data to the ESVAC for all the years from 2011 to 2016, an overall decrease of 20% in sales (mg/PCU) was observed (Figure 34).

For the period 2011 to 2016, a drop in sales (in mg/PCU) of more than 5% was observed for 16 of the 25 countries. For the same period, there was an increase in sales of over 5% in six of the 25 countries (Table 8).

During 2011-2016, the sales (mg/PCU) of 3rd- and 4th-generation cephalosporins decreased by 15%, and sales of polymyxins decreased by 40%. From 2011 to 2016 the consumption of fluoroquinolones increased by 6%, but in comparison to 2014, sales of fluoroquinolones decreased by 9.8%.

Figure 34. Changes in aggregated overall sales and sales of fluoroquinolones, 3rd- and 4th-generation cephalosporins and polymyxins, for 25 EU/EEA countries[1], from 2011 to 2016 (note the differences in the scales of the Y axes)



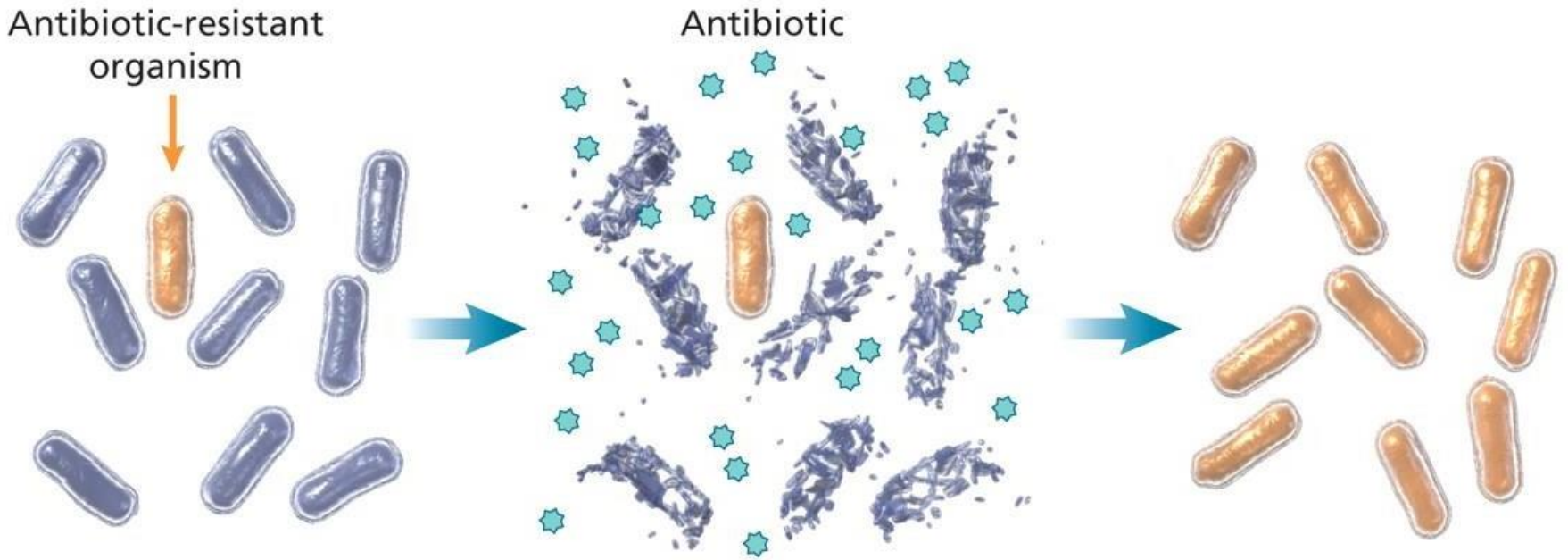
[1] Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden and United Kingdom.

Euroopa Maaelu Arengu Põllumajandusfond: Euroopa investeeringud maapiirkondadesse

Antibiotic resistance is a natural old phenomenon

“The gut bacteria inside 1000-year-old mummies from the Inca Empire are resistantto antibiotics” New Scientist, 07 2016

All antibiotic use will lead to selection of resistant bacteria



Euroopa Maaelu Arengu Põllumajandusfond: Euroopa investeeringud maapiirkondadesse

Antibiotics

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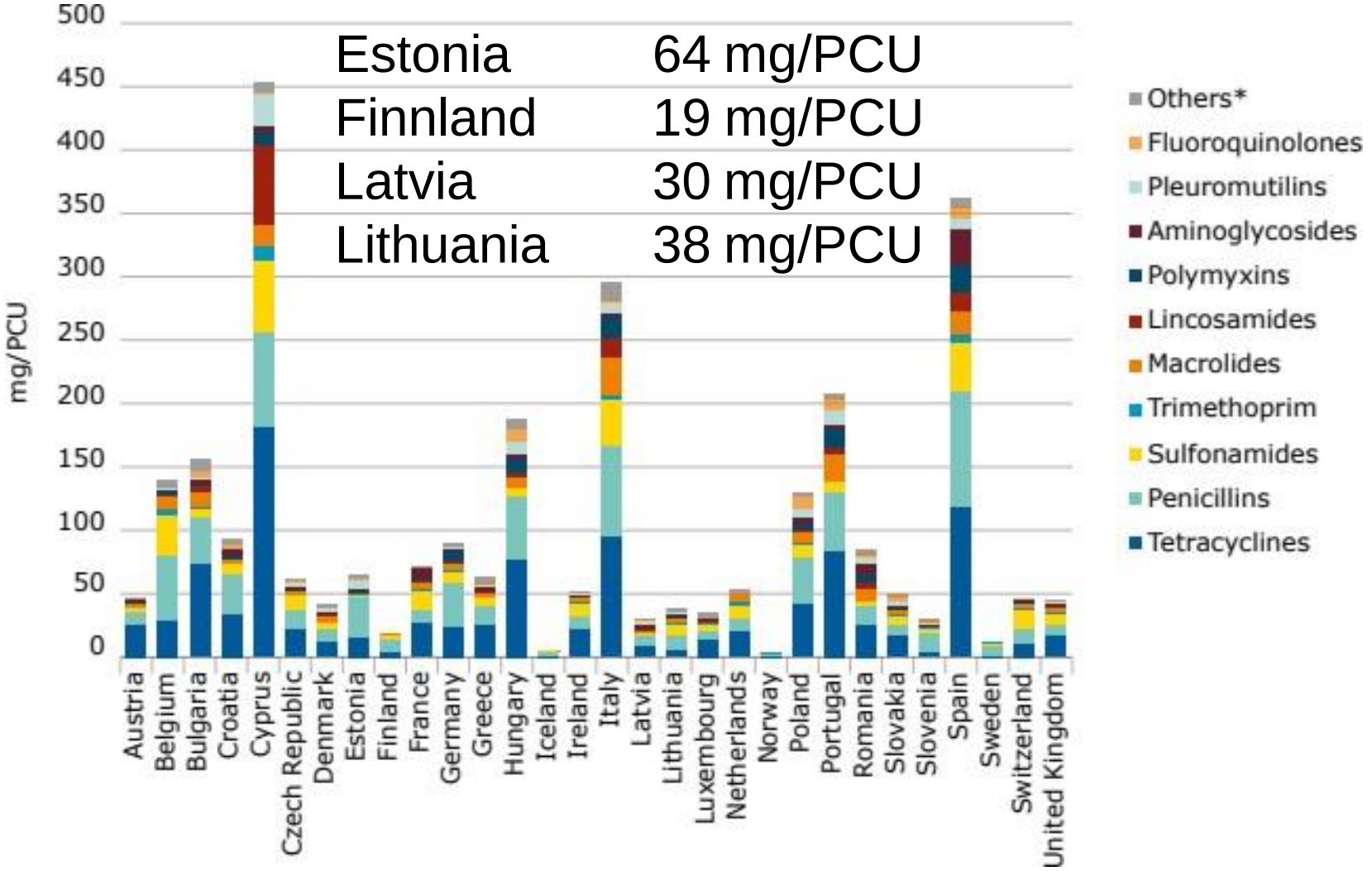
Antibiotics used in 30 European countries in 2016

mg/PCU = sales of veterinary antimicrobial agents, expressed as mg sold per population correction unit (PCU)



Source: https://www.ema.europa.eu/documents/report/sales-veterinary-antimicrobial-agents-30-european-countries-2016-trends-2010-2016-eighth-esvac_en.pdf

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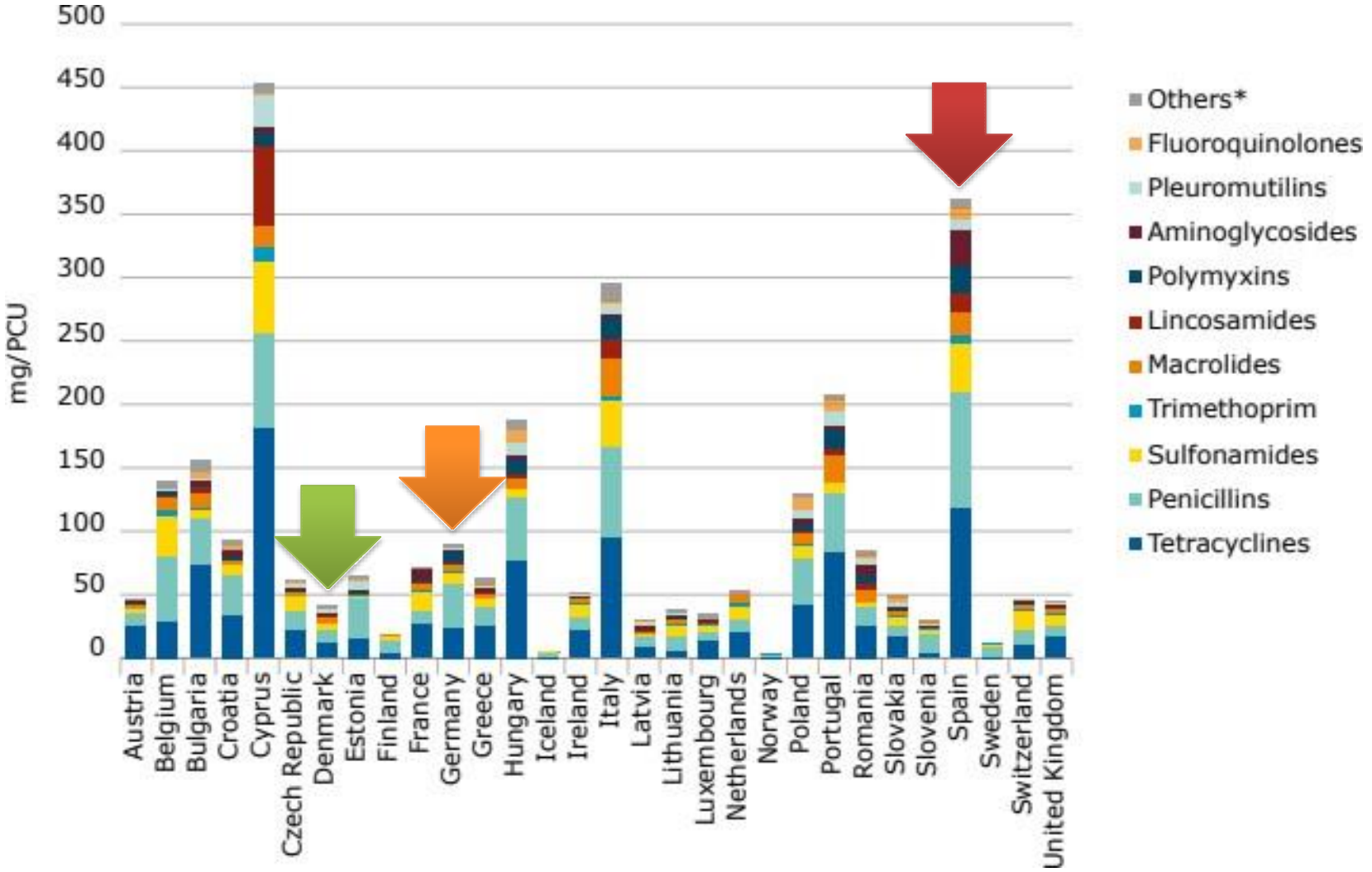
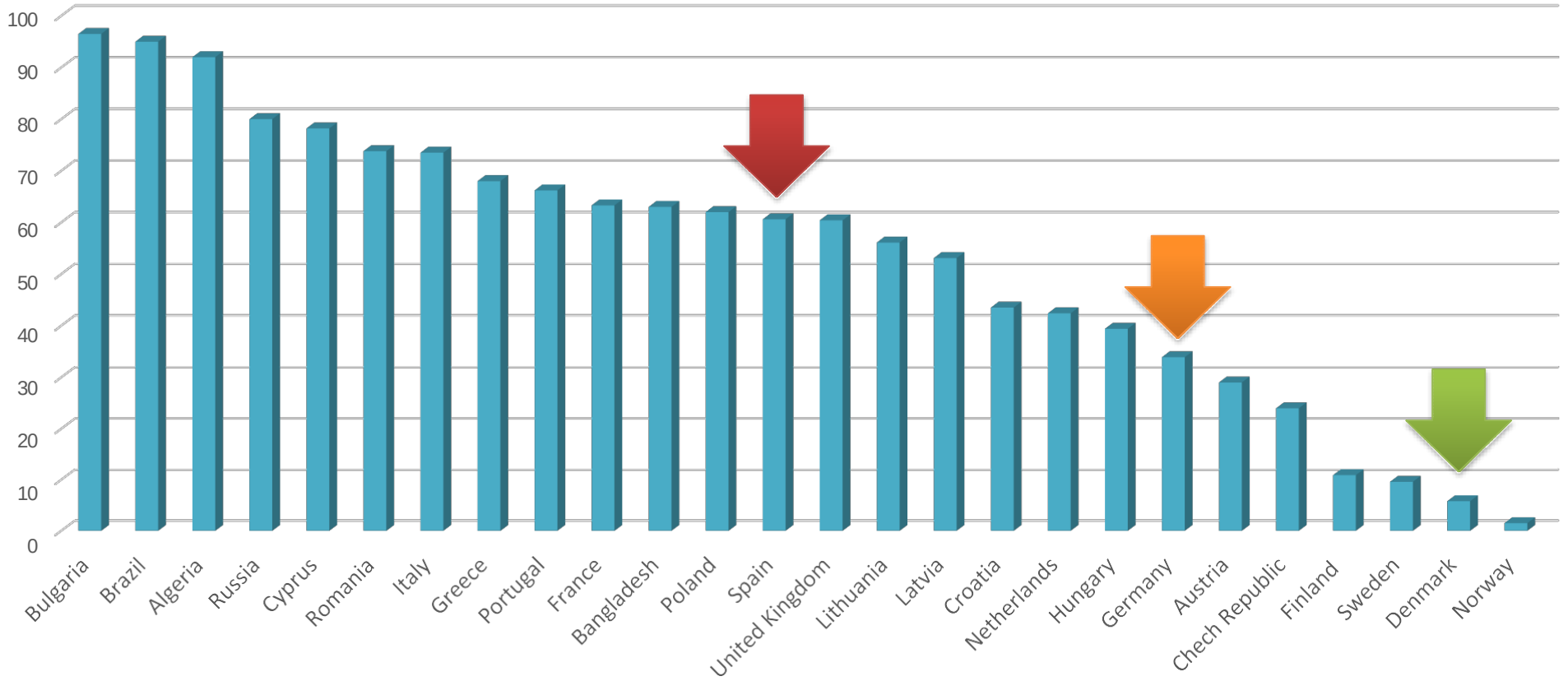


Source: https://www.ema.europa.eu/documents/report/sales-veterinary-antimicrobial-agents-30-european-countries-2016-trends-2010-2016-eighth-esvac_en.pdf

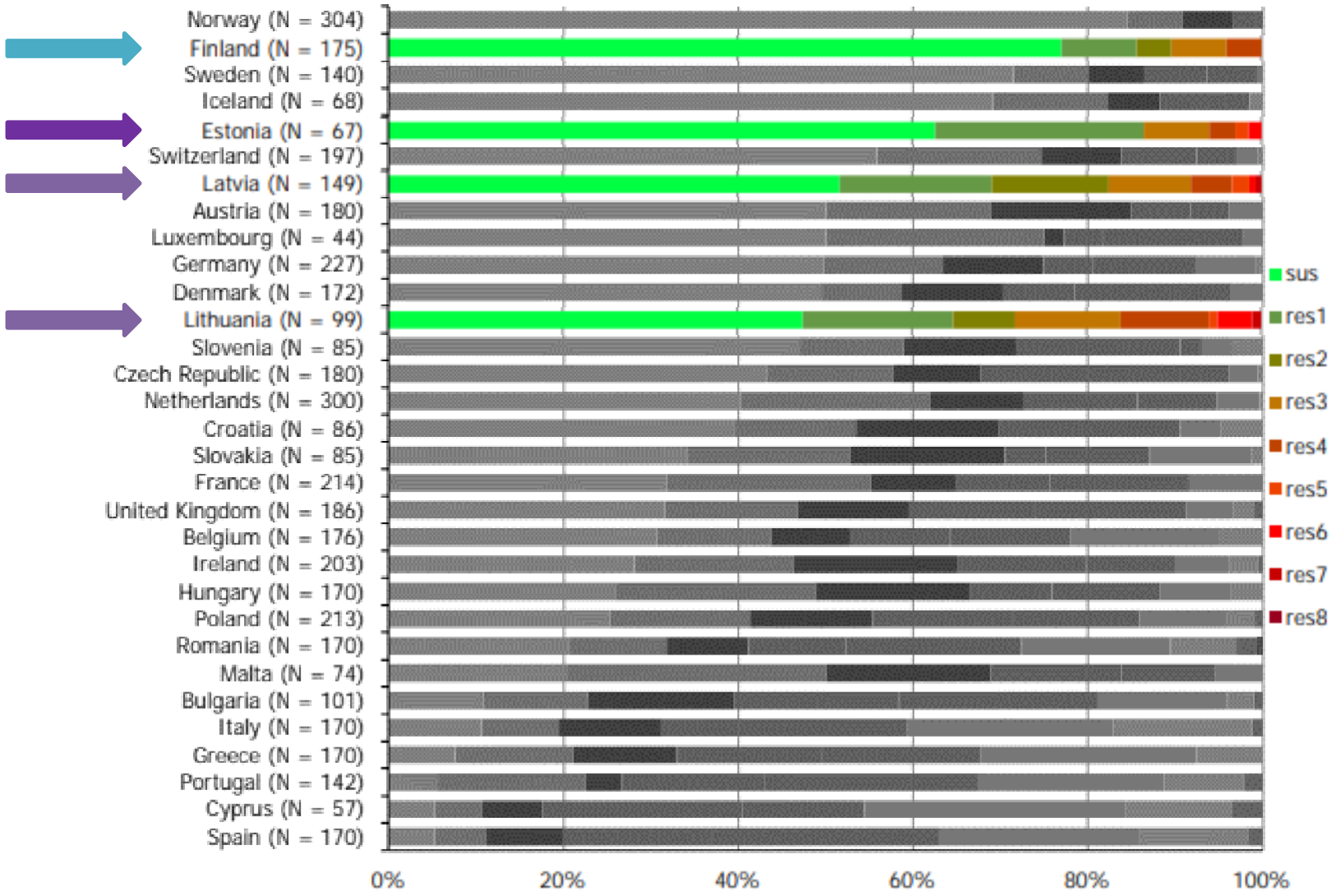
Percentages of tetracycline resistant *E. coli* isolates from pou



Source:

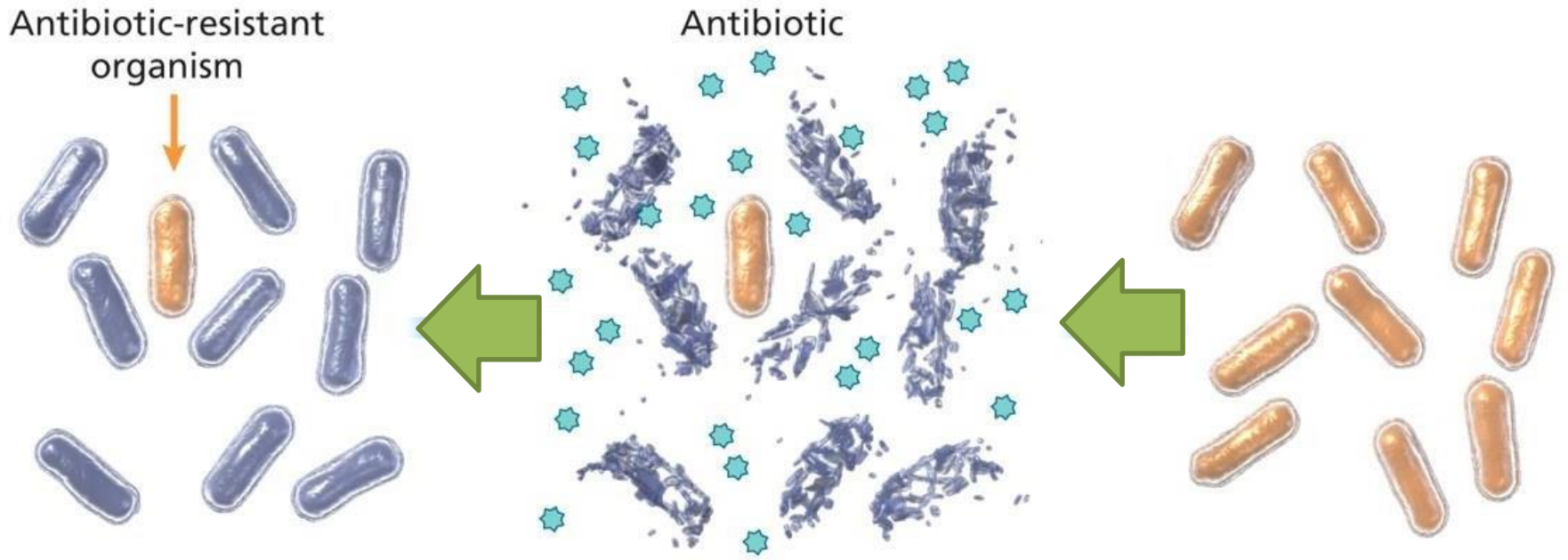
Algeria: Agabou et al., 2016, Aggad et al, 2010, Belmahdi et al., 2016, Benameu et al., 2014, Benklaou et al, 2016, Boudjerd et al., 2016, Messai et al., 2013
Bangladesh: Akond et al., 2009, Hasanet al., 2011, Hasan et al., 2012, Hossain et al., 2008, Khan et al., 2014, Parvez et al, 2016
EU: EFSA, 2016: The EU summary report on antimicrobial resistance in zoonotic and indicator bacteria from humans, animals and food in 2014
Brazil: (Barros et al., 2012, Bezerra et al., 2016, Cardoso et al., 2002, Korb et al., 2015, Pessanha and Filho, 2001, Stella et al.,2013)
Russia: Paramonova et al, 2014

Multi resistances of E.coli to antimicrobials



Source:
https://ecdc.europa.eu/sites/portal/files/documents/EU-summary-report-antimicrobial-resistance-zoonotic-bacteria-humans-animals-2017-web.pdf

Antibiotic resistance prevalence is reversible



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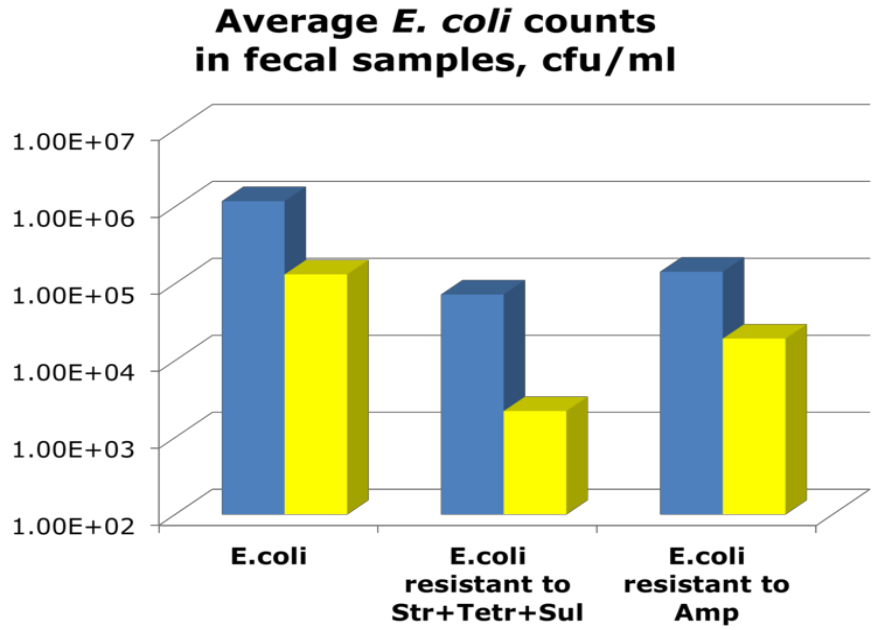
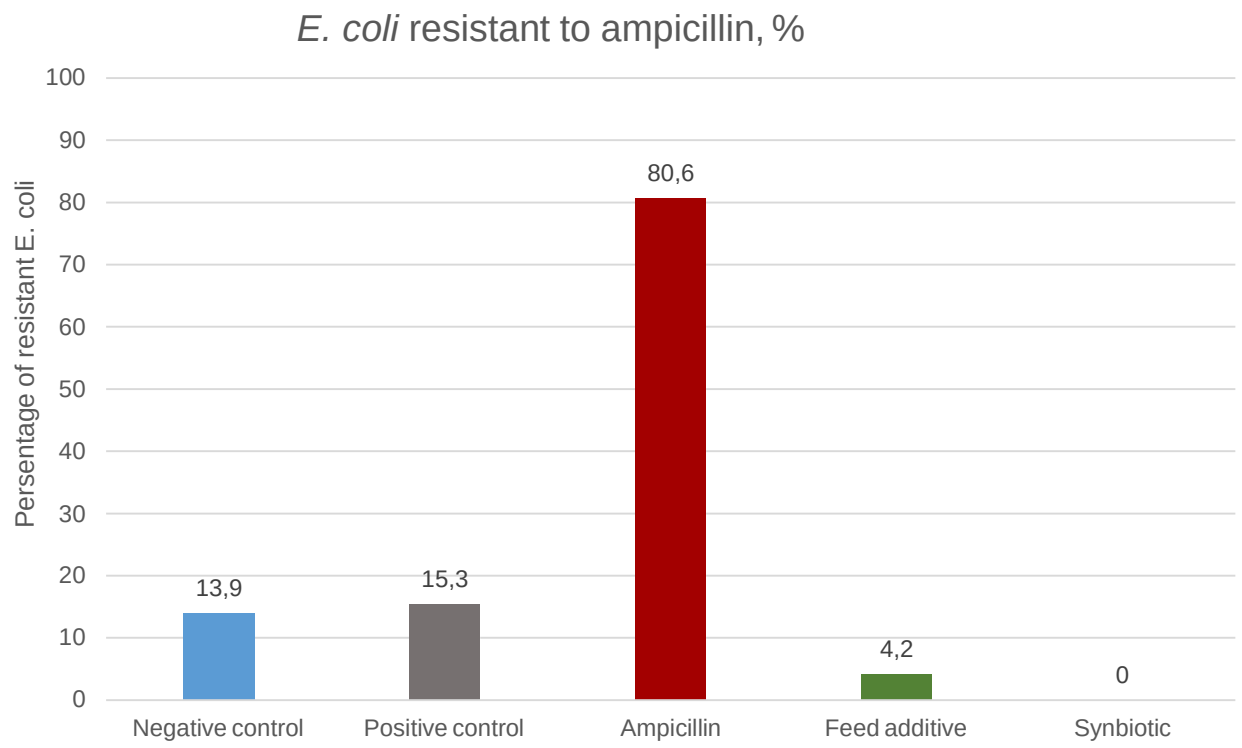
Biotronic has a bacteriocidic effect on resistant E.Coli

Caecum microflora	Control group	Biotronic® Top 3 group
E. coli	8.455 ± 0.35^{a}	7.842 ± 0.17^{b}
Salmonella	7.287 ± 0.41^{a}	6.892 ± 0.34^{b}
Lactobacilli	8.262 ± 0.28^{A}	9.115 ± 0.30^{B}
Clostridium perfringens	8.545 ± 0.43^{a}	7.798 ± 0.37^{b}



PoultryStar and Biotronic on resistant E.Coli



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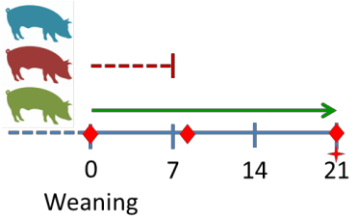
Digestarom on AB-resistance genes



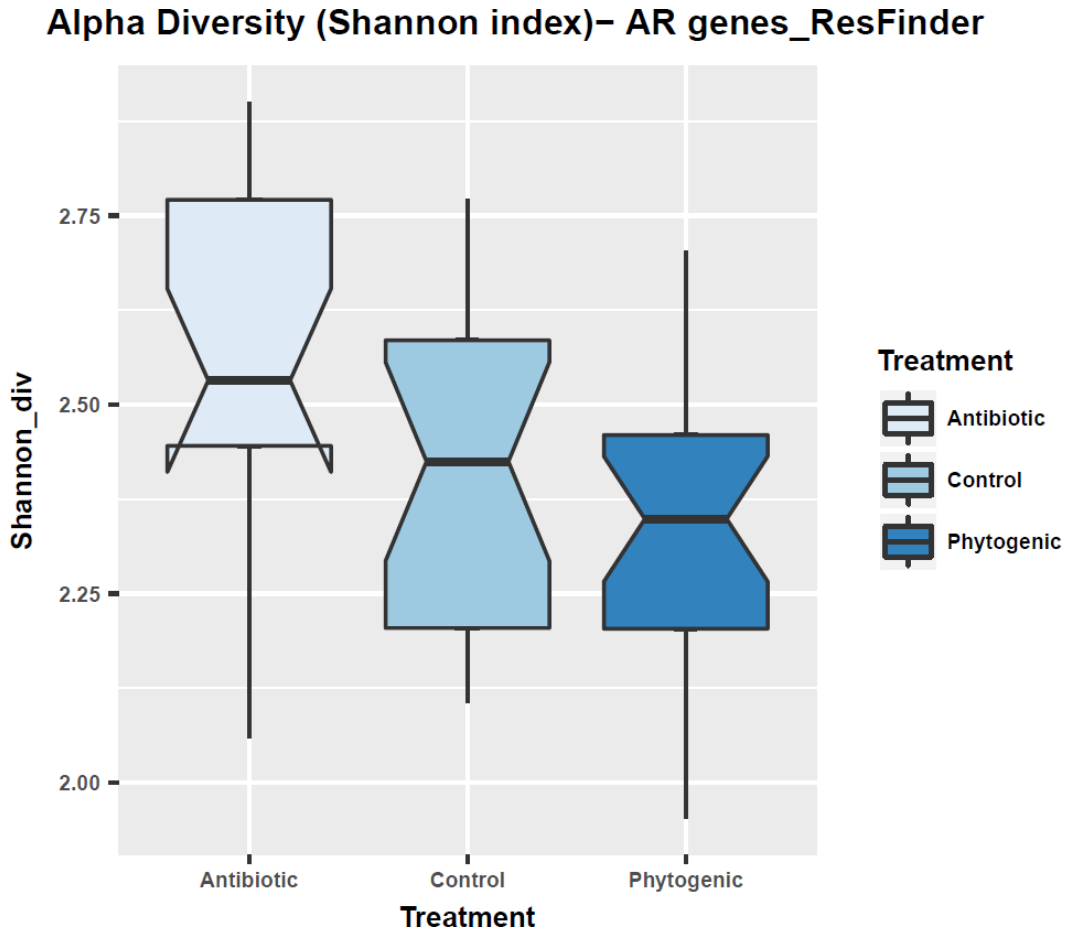
Control

Oxytetracyline

Digerstarom DC

♦ fecal samples

✦ GIT samples



Diversity analysis (number & abundance)

Euroopa Liit maaelu arenguks
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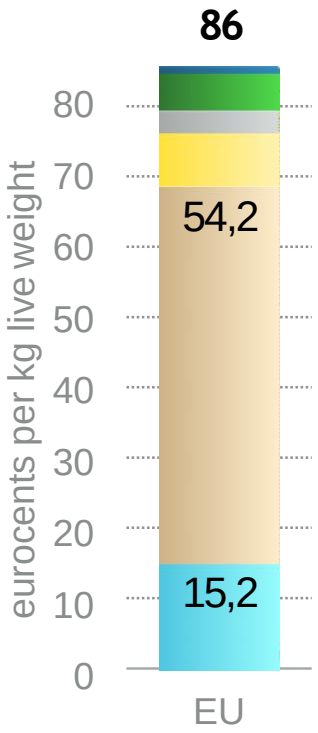
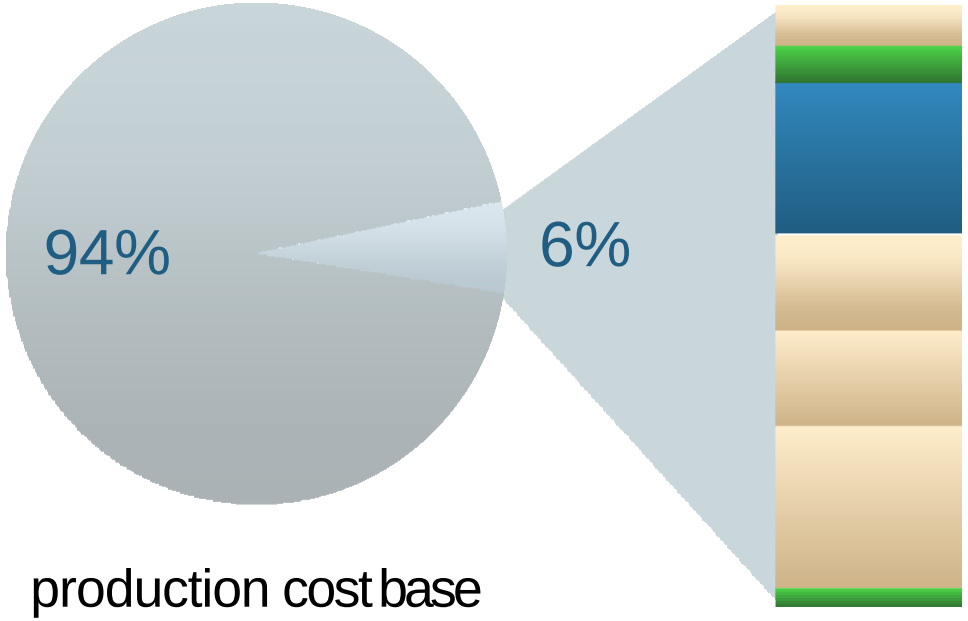
- Wysokie spożycie mięsa

WHY ARE PRODUCTION COSTS HIGHER IN THE EU?





0,3 N directive

0,3 amonia emission

1,3 salmonella control

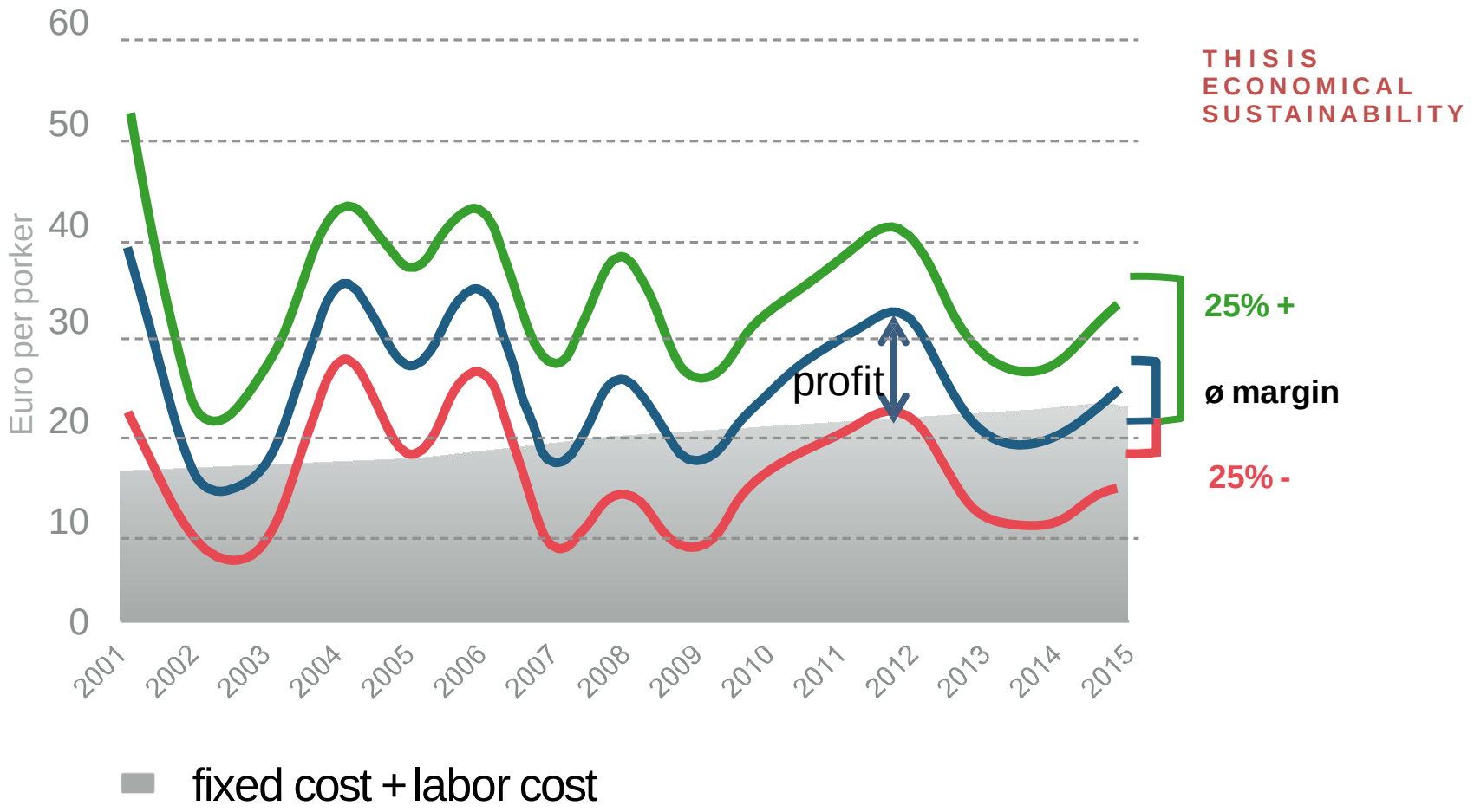
0,8 meat and bone meal

0,8 growth promotor

1,4 GMO

0,1 density production

HIGH PERFORMANCE PAYS OFF!



Source: noe.lko.at

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The future belongs to the INNOVATORS

Biomin®