

## European Pig Production – The Role of Policy

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Presentation

at the European Pig Producers Congress 2019  
on „European Pig Production in Transition“

by

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## Why this topic?

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- EU livestock producers must not only withstand strong international pressure from competitors but also large societal pressure domestically
- Critics recommend foregoing meat and milk consumption, request stricter animal welfare and animal-related environmental standards as well as restrictions of soy imports from South America
- In this context the presentation aims to quantify the economic consequences of these requests as well as the effects on CO<sub>2</sub>-emissions, land and water use, nutrient losses and food security
  - Health and animal welfare effects are not addressed
  - Central questions: How sustainable are these proposals? Are more efficient measures/policies available? What kind of policy can be expected in the future?

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## Why this topic?

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**Greenpeace call:** “Europe must halve meat and dairy production by 2050 to save the planet”

**Alan Buckwell (Report 2018 of the RISE Foundation):** “Europe’s animal farming has exceeded safe bounds for GHG emissions, nutrient flows and biodiversity loss, and urgently needs to be scaled back.”

**Liam MacHale (Irish farmers’ association):** “Farmers are an easy target and are scapegoats for environmentalists. Don’t single out our sector.”

## Methodological tools used

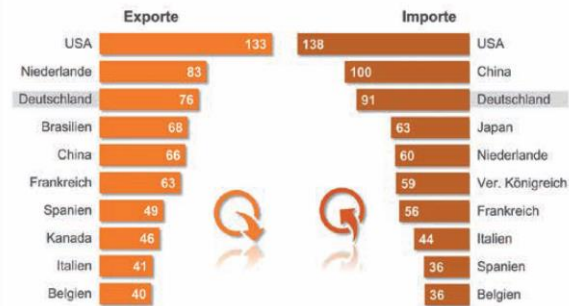
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- **Comprehensive literature survey on the topic**
- **Partial sectoral equilibrium simulation model (AGRISIM) with 18 countries/regions and 15 agricultural commodities**
- **An adjusted general macro-economic equilibrium simulation model (GTAP-energy-model) for eight countries/regions and 14 agricultural and non-agricultural commodities**
  - **Numerous scenarios are run for different**
    - reduction rates in meat/milk production and consumption
    - countries/regions (OECD, EU, Germany only)
    - eating habits (vegetarian, vegan)

## Top ten of world agricultural trade (bn USD, 2016)

### Rangfolge im Weltagrarhandel

im Jahr 2016, in Mrd. USD



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Quelle: WTO

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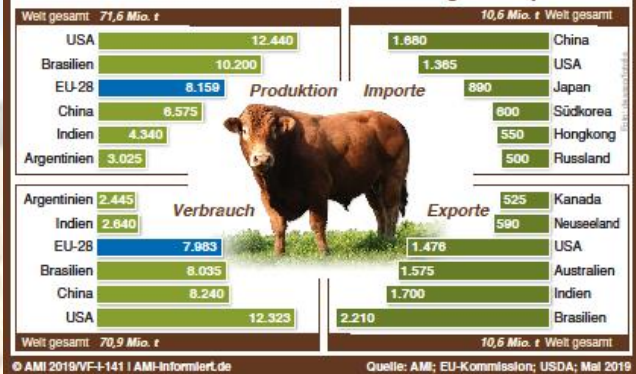


## World beef market (1.000 tonnes sw, forecast - 2019)

### Welt-Rindfleischmarkt – Prognose 2019



#### Rind- und Kalbfleisch in 1.000 Tonnen Schlachtgewichtäquivalent



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Quelle: AMI; EU-Kommission; USDA; Mai 2019

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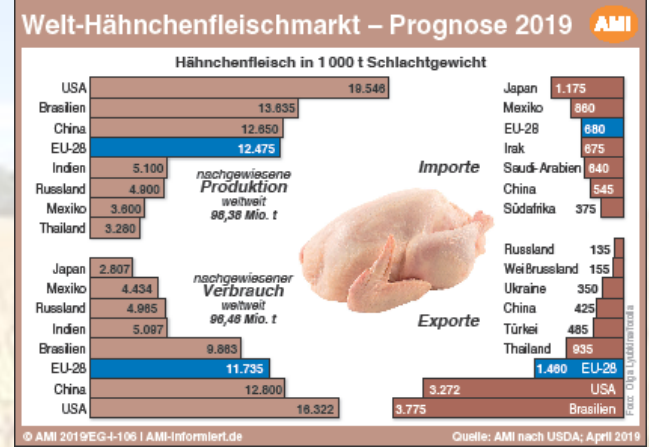
## World pork market (mln tonnes, forecast 2019)



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## World poultry market (mln tonnes sw, forecast 2019)



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## World exports of milk products (in 1.000 tonnes, 2018)

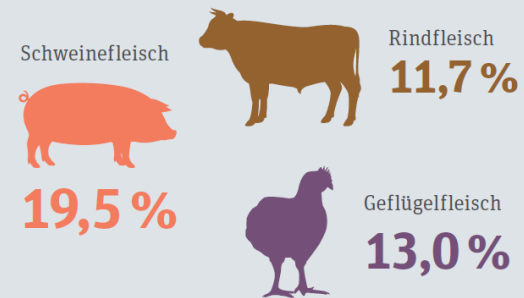


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## EU as important meat producer (Production shares 2018 in %)

### Die Anteile der EU an der Weltproduktion von Fleisch



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## How do politicians respond to the request of critics?

- Ideally politicians should make sure that all three components of the sustainable development concept are met
  - However, reality shows voters maximizing behavior, short-term policy responses to current fears and concerns as well as an unilaterally focus on environmental/climate issues
  - Policy is thus mainly driven by NGO campaigns, social media and the green movement instead of considering the income and employment effects of their measures on farm families
- A further greening of the CAP and farm-related policies can be expected with more scope for the member states to regulate the livestock sector, especially the meat sector

## World market price effects of a 50% reduction of consumption/production in the EU (%)

Scenarios	EU-consumption: -50%		EU-production: -50%	
	vegetarian diet	vegan diet	meat	meat, milk, eggs
beef	-7.4	-7.0	+8.9	+8.6
pork	-10.2	-9.9	+8.9	+8.8
poultry	-5.7	-5.7	+8.4	+8.6
milk	+0.4	-14.1	-0.4	+19.1
eggs	+0.2	-6.2	-0.1	+5.4

Source: Own calculations with AGRISIM

### Welfare effects of a 50% reduction of consumption/production in the EU (bn USD)

Scenarios	EU-consumption: -50%		EU-production: -50%	
	vegetarian diet	vegan diet	meat	meat, milk, eggs
EU	-11.6	-17.3	-22.3	-42.8
USA	+1.0	+1.0	+0.4	+1.1
China	+4.8	+5.9	-1.0	-0.1
Japan	+1.0	+1.3	-1.0	-1.1
Brazil	-0.8	-0.9	+1.5	+2.0

Source: Own calculations with AGRISIM

### Trade and welfare effects of a complete import ban of soybeans and soybean meals by the EU and by Germany alone

Economic effects	EU Import ban	German Import ban
<b>Beef exports (%)</b>		
- EU	-3.0	+0.7
- Germany	-7.5	-6.4
<b>Pork and Poultry exports (%)</b>		
- EU	-2.0	+1.6
- Germany	-11.4	-13.0
<b>Milk exports (%)</b>		
- EU	+0.3	+2.4
- Germany	-12.8	-14.7
<b>Welfare effects (bn USD)</b>		
- EU	-29.7	+1.6
- Germany	-10.3	-10.1

Source: Own calculations with GTAP

## CO<sub>2</sub>equ.- emissions per ton of meat and milk products in selected countries/regions

Countries/regions	Beef, sheep and goat meat	Pork and poultry	Milk products
USA	11,9	2,0	0,8
EU-27	16,9	1,9	0,8
Brazil	44,0	2,4	1,6
Canada	20,6	1,3	0,7
Japan	13,8	1,6	0,7
China	33,6	2,4	1,2
India	67,4	2,9	1,1
Russia	15,0	2,1	1,2
Central Asia	15,6	1,7	1,5
Australia	21,1	2,5	1,0
SubSahara Africa	92,7	8,1	3,1

Source: GOLUB u.a. (2013)

## Global water footprints for selected agricultural products

Products	Per ton of product weight (m <sup>3</sup> /t)	Per nutrient unit		
		Calories (Liter/kcal)	Protein (Liter/gr)	Fat (Liter/gr)
Sugarbeet and sugarcane	197	0,69	0,0	0,0
Vegetable	322	1,34	26	154
Styrche roots	387	0,47	31	226
Fuits	962	2,09	180	348
Grains	1.644	0,51	21	112
Oil seeds	2.364	0,81	16	11
Legumes	4.055	1,19	19	180
Peanuts	9.063	3,63	139	47
Milk	1.020	1,82	31	33
Eggs	3.265	2,29	29	33
Poultry	4.325	3,00	34	43
Butter	5.553	0,72	0,0	6,4
Pork	5.988	2,15	57	23
Sheep and goat meat	8.763	4,25	63	54
Beef	15.415	10,19	112	153

Source: MEKONNEN and HOEKSTRA, 2012, S.409



## Global environmental effects of a 50% reduction of consumption/production of meat and milk in the EU (%)

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Effects on	EU-consumption: -50%	EU-production: -50%
CO <sub>2</sub> -emissions	-4.2	+1.4
Water use	-2.9	-2.0
Land use	-1.3	-0.9

Source: Own calculations with AGRISIM

## Neglected substitution effects in consumption

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GRABS (2015) questions the climate friendliness of a vegetarian/vegan diet by referring to the often-neglected rebound effects. These occur when saved budgetary expenditures are spent on other food and non-food items in the consumer basket (housing, transport, travels) and burden the climate this way.

## Decreasing land use despite increasing meat consumption (Mottet et al. 2017)

- Two thirds of feed dry matter stem from products not suitable for human consumption
- Of 2.5 bn hectare feed production area in total, 2.0 bn hectare are grassland
- Assuming an average yield growth and a slight improvement of feed efficiency by 5 % the authors forecast that by 2025 despite an increasing meat consumption
  - the demand for land which is suitable for the production of food for human consumption will even decline by 2 %
  - while the demand for land that is unsuitable for the production of food for human consumption will increase by 14%

## Short-term effects of less meat consumption in developed countries\*

- |  |        |  |
|--|--------|--|
| Meat waiver in OECD-countries by 50 % (MSANGI/ROSEGRANT, 2011) | -0.6 % | of undernourished people in all developing countries |
| Meat waiver in the EU of 50% (KLÜMPER/QAIM, 2013)              | -2.9 % | of undernourished children up to five years          |
- In the long-run even more poor and hungry people are estimated world-wide, because shrinking prices discriminate against agricultural and rural areas (HEADY, 2014 and IVANIC/MARTIN, 2014)

\* Under the assumption that world market prices are fully transmitted to domestic markets in developing countries

## Transmission of world market prices of agricultural commodities on domestic markets in developing countries

Indicator	Africa	Asia	Latin Amerika	Developing countries
Number of poorest surveyed countries	9	7	7	23
Number of pairwise time-series comparison	33	16	28	77
Share of cointegrated time-series	33%	44%	36%	36%
Number of time-series with significant price transmission elasticities				
• Long-term (total time period)	15%	13%	25%	18%
• Short-term (after one month)	6%	0%	11%	6%

Source: Moleva, 2017

## Take-home-messages on food security in developing countries

- Agricultural price transmissions seem to be very low, or even zero in case of remote areas with poor infrastructure
- Hence, hunger and poverty in poor countries are primarily home-made by bad governance, inefficient administration, corruption, civil wars, natural disasters and last not least by political discrimination against agriculture

## Positive nutrient conversion by world livestock production

The sum of all beef production systems together (including feedlots), plus pork and poultry production systems of smallholder farmers globally produce more proteins (41 Million tons) via animal products than they use proteins found in feed (33 Million tons), which could fundamentally also be used for human consumption. Hence, the often criticized nutritional losses cannot be confirmed and should certainly not be made responsible for undernutrition in poor countries. (MOTTET et al, 2017, Journal fo global food security, Vol. 14, p. 1-8)

## Costs of nutrient production at farm and retail level in the US 2004-05

Products	Farm level		Retail level	
	Energy costs \$/kcal	Protein costs \$/gr	Energy costs \$/kcal	Protein costs \$/gr
Corn	0,001	0,020	0,009	0,359
Soybeans	0,001	0,012	0,017	0,203
Wheat	0,001	0,031	0,021	0,543
Peanuts	0,002	0,035	0,009	0,206
Pork	0,008	0,218	0,026	0,701
Beef	0,019	0,321	0,041	0,685
Poultry	0,010	0,115	0,025	0,285
Milk	0,016	0,290	0,050	0,928

Source: Own compilation of data from LUSK and NORDWOOD, 2009

## Conclusions and policy implications I

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- Summarizing, politicians seem to have no coherent, balanced and clearcut strategy for the future development of the livestock sector. Instead they seem to prefer a further greening of the CAP and farm-related policies as well as a big-bang-approach of transition for the meat sector.
- The results show that foregoing meat consumption, tighter production standards and restricted soy imports exhibit an extremely poor benefit-cost-balance. Hence, the requirements of sustainability are not met.
- Large producer income and social welfare losses are taken into account for at best marginal, sometimes even counterproductive, contributions to the environment and food security.



## Conclusions and policy implications II

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- This disproportion is the result of substitution and adjustment effects in consumption, production and resource use on domestic and foreign markets, which are very often neglected in the literature.
- Instead of unilaterally trying to change consumption and dietary preferences as well as introducing costly production standards and distorting trade barriers, policy should focus on fully taken advantage of technological progress and innovations.
- Areas of technological progress and innovation include plant and livestock breeding, animal feeding and livestock farming, animal health as well as irrigation systems and soil management.



## Conclusions and policy implications III

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- In addition, policy should give meat producers enough time to adapt to stricter standards, should apply least distorting measures with minimal abatement costs and should, if necessary, compensate meat farmers for their income losses.
- If western countries want to improve food security in developing countries, they should open their own markets and promote agriculture, infrastructure, education and health in the effected countries.

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**Thank you very much for your attention!**