What is the Safe Operating Space for EU Livestock?

RISE Foundation

#balancedlivestock

Scotland House, Brussels
13th September 2018

Agenda

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- Introduction
  Janez POTOČNIK - RISE's chairman
- Report of RISE project:
  'What is the Safe Operating Space for EU Livestock'
  Allan BUCKWELL and Elisabet NADEU
  Q&A including Prof Erik Mathijs (KU Leuven)
- Panel discussion:
  Ingrid ODEGARD – Member of the RLI Council
  Jean-Louis PEYRAUD – President, Animal Task Force
  Henk WESTHOEK – PBL Netherlands Environmental Assessment Agency
  Allan BUCKWELL – RISE Foundation

Chaired by Janez POTOČNIK

What is the Safe Operating Space for EU Livestock?

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- RISE funded study conducted by Allan Buckwell, Elisabet Nadeu and Annabelle Williams with special help from Erik Mathijs and Natalia Brzezina (KU Leuven), and invaluable comments from our advisory panel:
  - Tim Benton
  - Krijn Poppe
  - Henk Westhoek
  - Alberto Bernués
  - and from those attending our workshop in March 2018

- Context: positive & negative contributions of livestock (AB)

- Is there a Safe Operating Space for livestock? (EN)

- Policies and recommendations to move into the SOS (AB)

Context

- **Significant milestones in the literature**:
  - FAO's Livestock's Long Shadow 2006
  - Planetary Boundaries (Rockström 2009, Steffen 2015)
  - N, P: European Nitrogen Assessment (Sutton 2011), Nitrogen on the Table (Westhoek 2015), RISE Nutrient report (2016)
- The **tone is overwhelmingly critical;** substantial adjustments suggested; understandable reaction from the sizable livestock ag & food sector
- Our central idea is **the need to rebalance livestock** in the EU:
  - For millenia crop & animal agriculture were balanced, low pressure
  - For 150 years: Popn. & Econ growth + technical change ⇒ imbalance
  - All expectations are the imbalance will grow – this is unsustainable
  - Where does the balance lie? How can we move there?
- Can we find a framework to engage constructive debate and action?

Benefits and negative impacts of livestock

	Benefit	Negative
1 Human nutrition and health	Hi quality nutrients	Overconsumption
2 Utilisation of pastures & by-products	Cultural landscape	Over-grazing
3 Culture and livelihoods	We enjoy it! Provides jobs	
4 Climate harm		GHG emissions
5 Nutrient cycles	Manure Agro-Eco	Water & air pollution
6 Biodiversity	HNV systems	Simplification & specialisation
7 Land use and soil degradation		Pressure for feed
8 AMR and Zoonoses		Dangers for human health
9 Animal welfare	Looking after animals	Treatment, housing, transport

Adapting the idea of a safe operating space

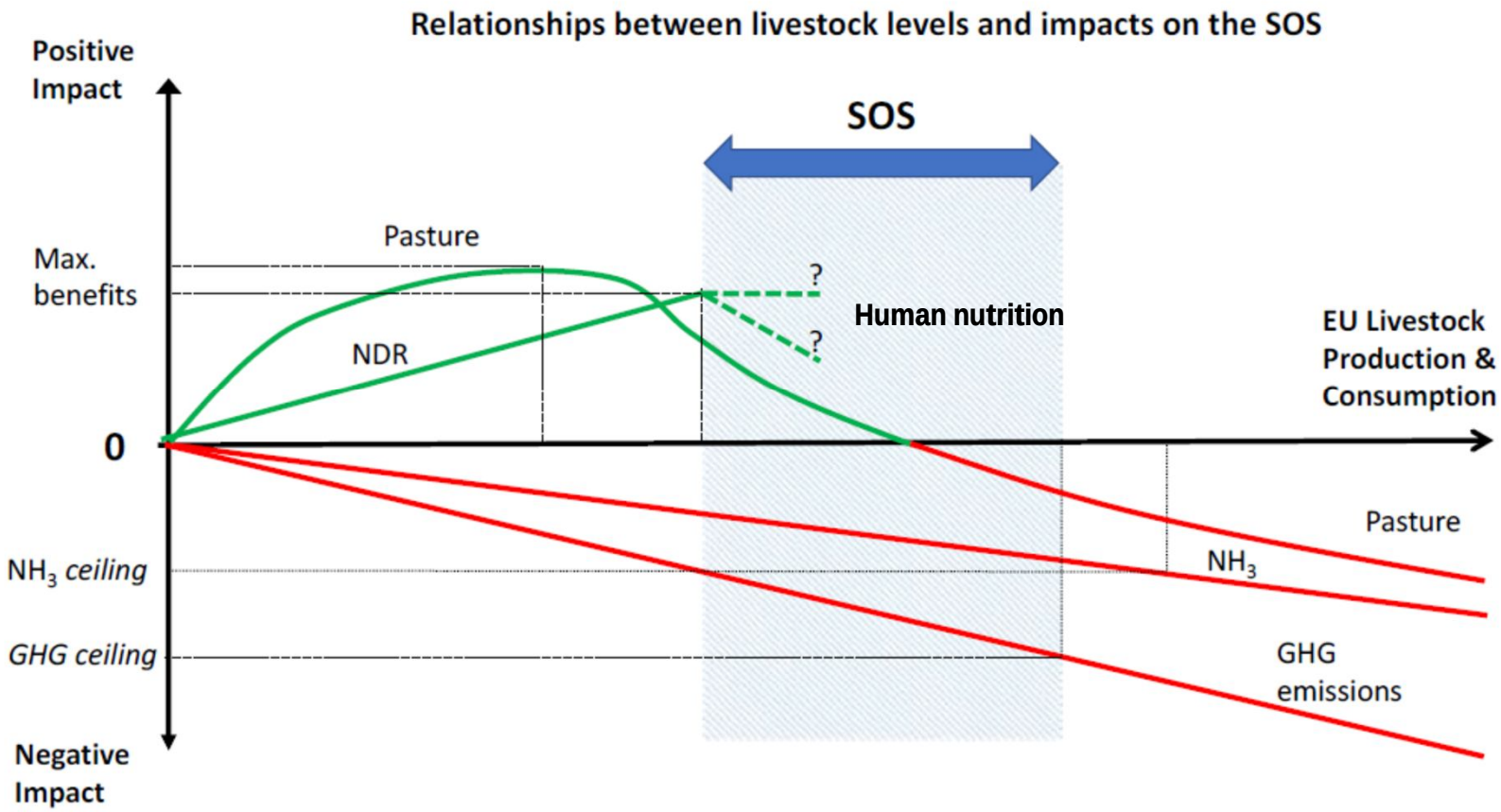
- Started with Rockström's (2009) nine planetary boundaries:
  - **Beyond which** irreversible, non-linear, catastrophic change
  - **Within which** is a safe operating space
- 7 quantified: 3 exceeded: climate, biodiversity loss, N disruption
- Big response: powerful concept: strong communication tool.
- Are the boundaries really global? Maybe only 3, for others global boundary = sum of regional
- Treated as independent – yet they interact
- We try to build a SOS:
  - for a region - EU,
  - for a sector – livestock

A safe operating space for EU livestock

- De Vries (2013) suggests a SOS is a balance between
  - Human needs and adverse impacts
  - A social floor and an environmental ceiling
- For EU livestock: two steps to define the SOS:
  - **Select variables** indicating benefits of livestock & their negative impacts treated independently
  - Determine an **objective boundary condition** for each variable
- Use data on the **benefit variables to quantify the lower bound**, of livestock to provide the health, cultural and social needs
- Use data on the **negative variables to quantify the upper bound** , with regard to environment, health & animal welfare.
- We try to do this at EU or Member State level initially to explore the idea, then consider interactions

A SOS for livestock

Illustrated by considering two benefits (nutrition & pasture) and two negatives (GHG and Ammonia)



Quantifying the SOS boundaries

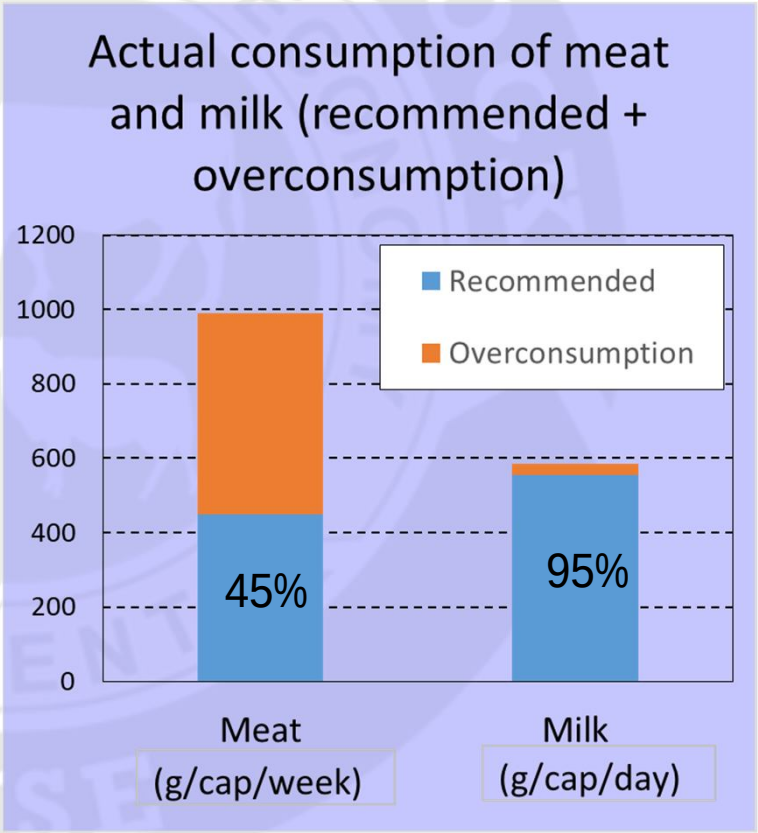
Benefit or negative impact of livestock	Boundary definition	Current values
Human nutrition & health	The recommended diet	Current consumption
Utilisation of pastures	Minimal number of ruminants needed to graze permanent pastures (preserv. habitats) at sustainable stocking rates	Current number of ruminant livestock
Climate harm	Achievement of the Paris agreement emission reduction targets.	Direct GHG emissions from livestock
Nutrient cycles	Downscaled planetary boundary	Total N fixation (biological + fertiliser)

Lower boundary for nutrition

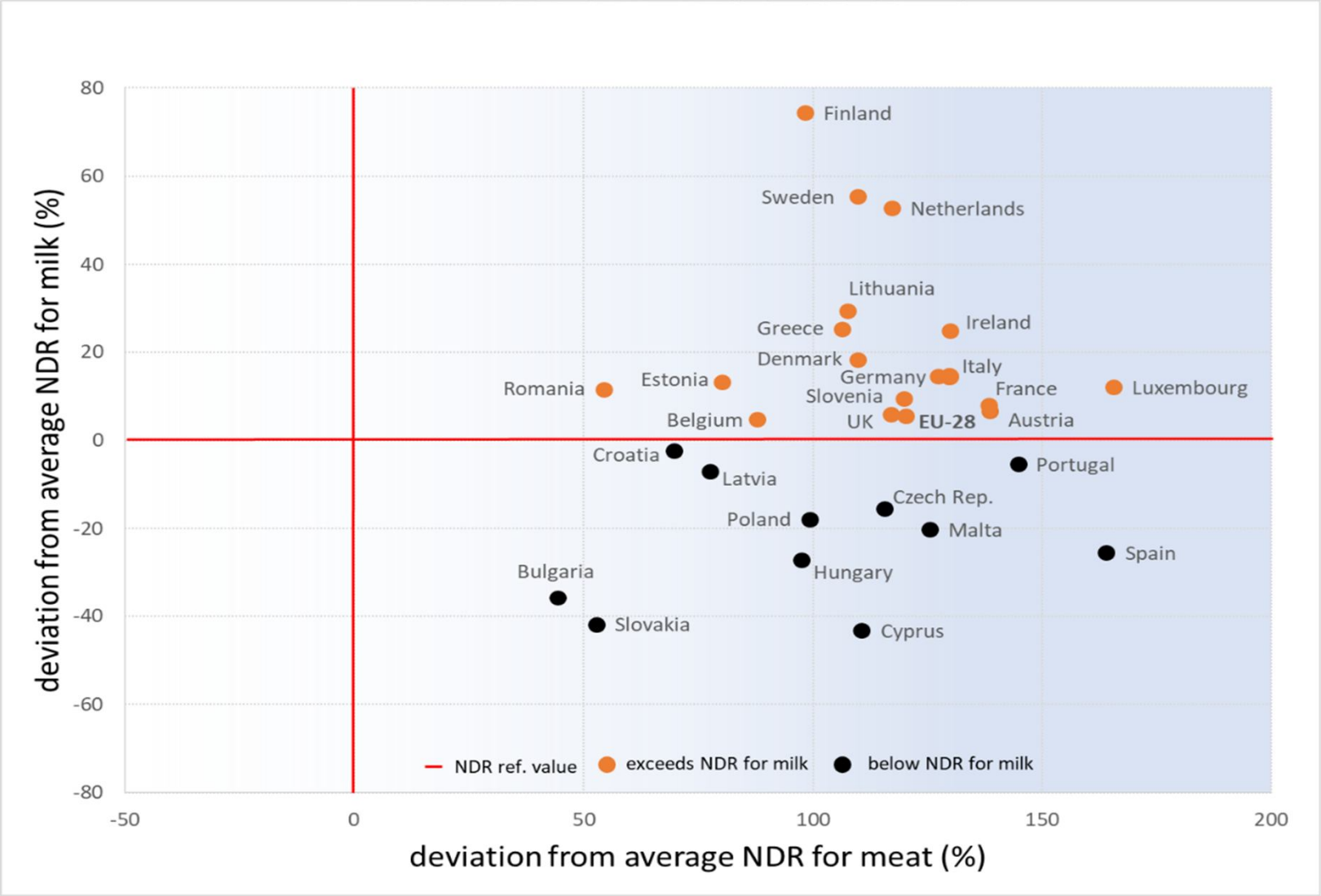
Boundary

Group of animal products	Recommendations averaged for EU-28
Meat	450 g per week
Milk and milk products	555 g per day
Eggs	3 eggs per week

Actual vs. boundary EU-28



Deviations from EU-28 dietary recommend. for meat and milk, EU28 and MS, 2007-2013

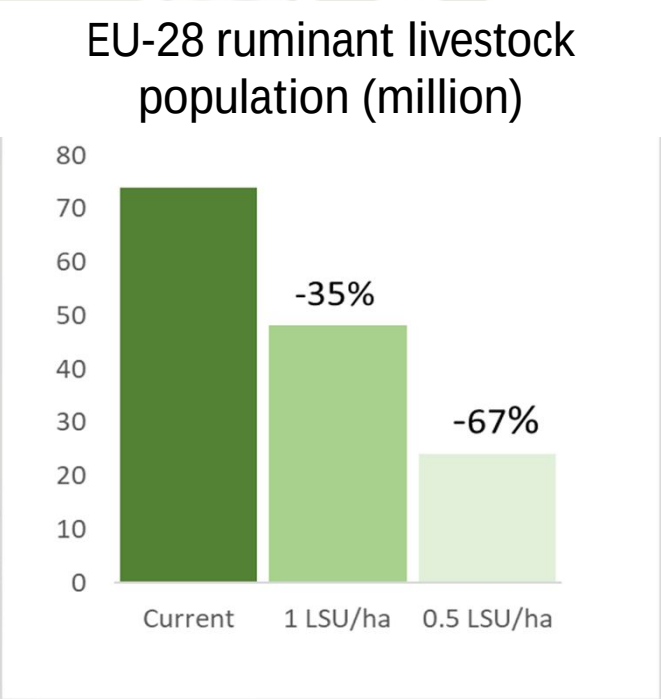


Pasture utilisation

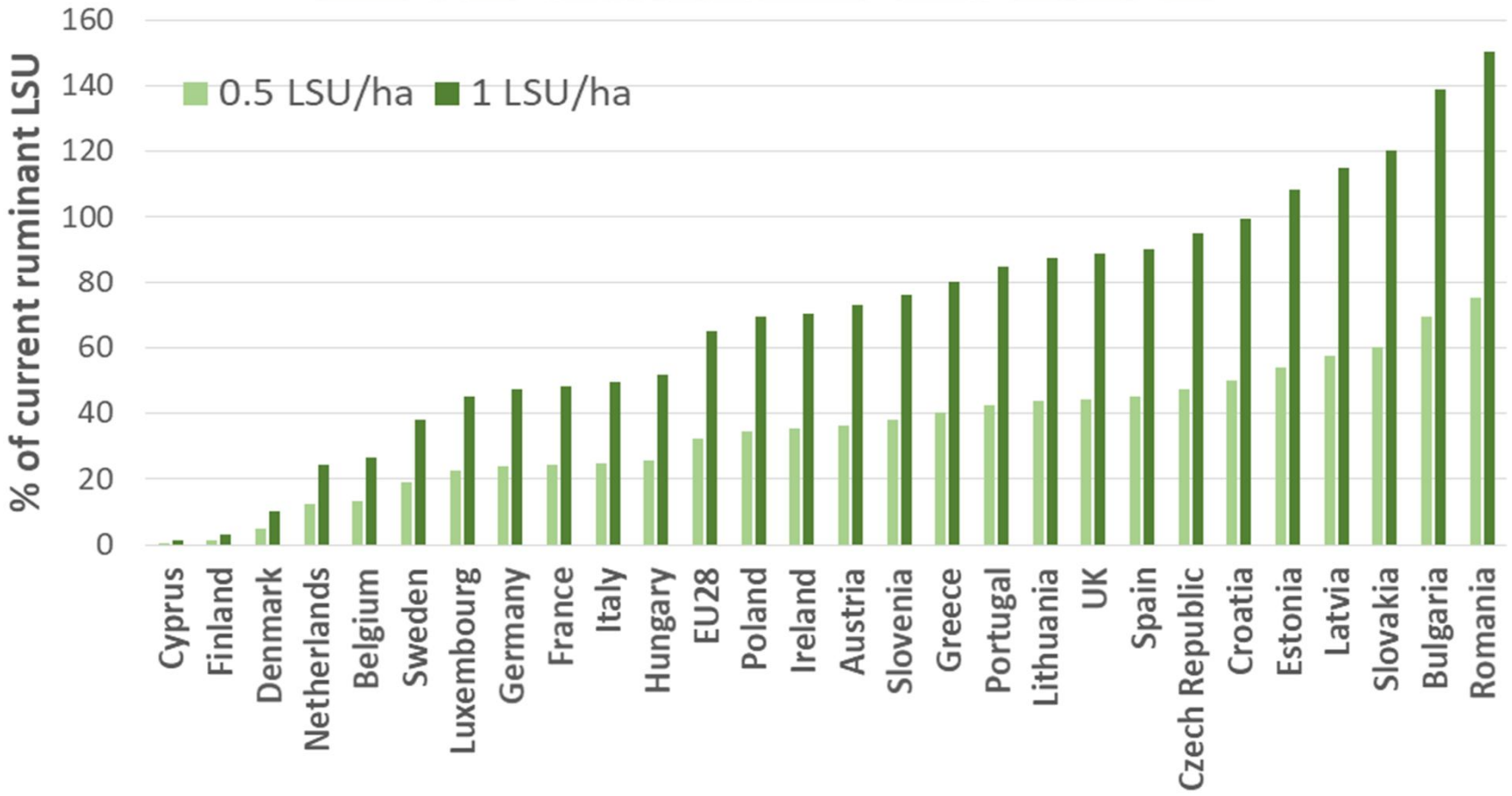
Boundary

Scenario	Million LSU
Current	74
1 LSU/ha	49
0,5 LSU/ha	24

Actual vs. boundary EU-28



Percentage of ruminant livestock units which could be kept to utilise permanent grasslands, EU and MS, 2 stocking rate assumptions.



Climate protection

Boundary

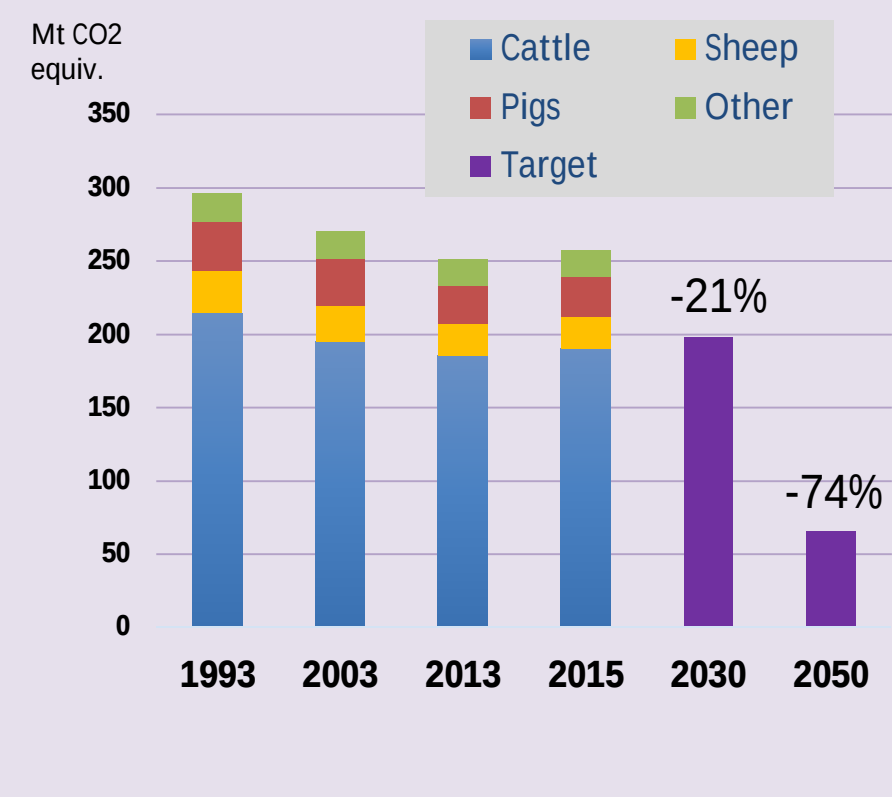
GHG reduction targets
(Paris Climate Agreement)

2030 → -40 %
2040 → -60%
2050 → -80%

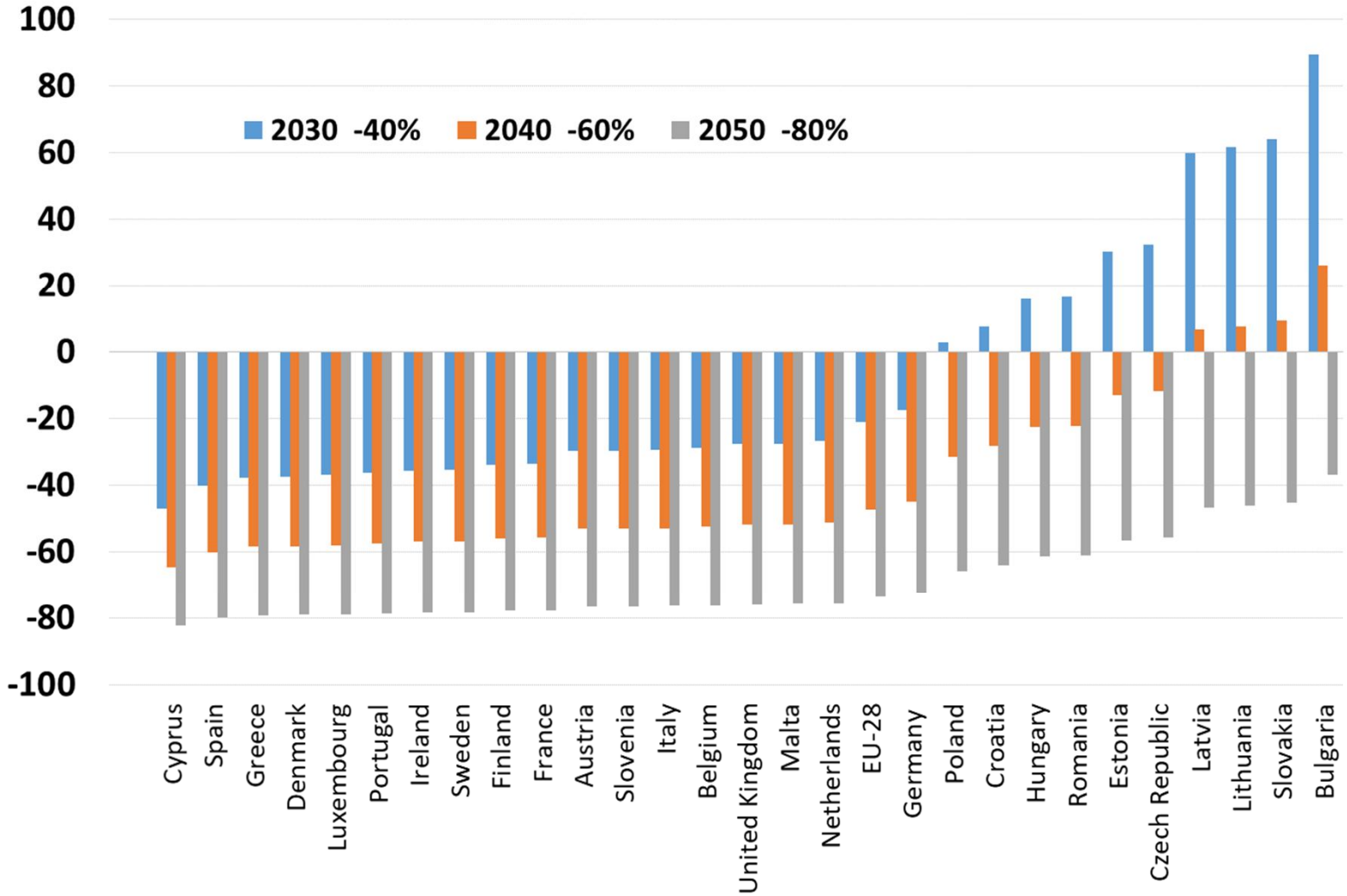
Direct, enteric fermentation & manure management

Indirect emissions not included here

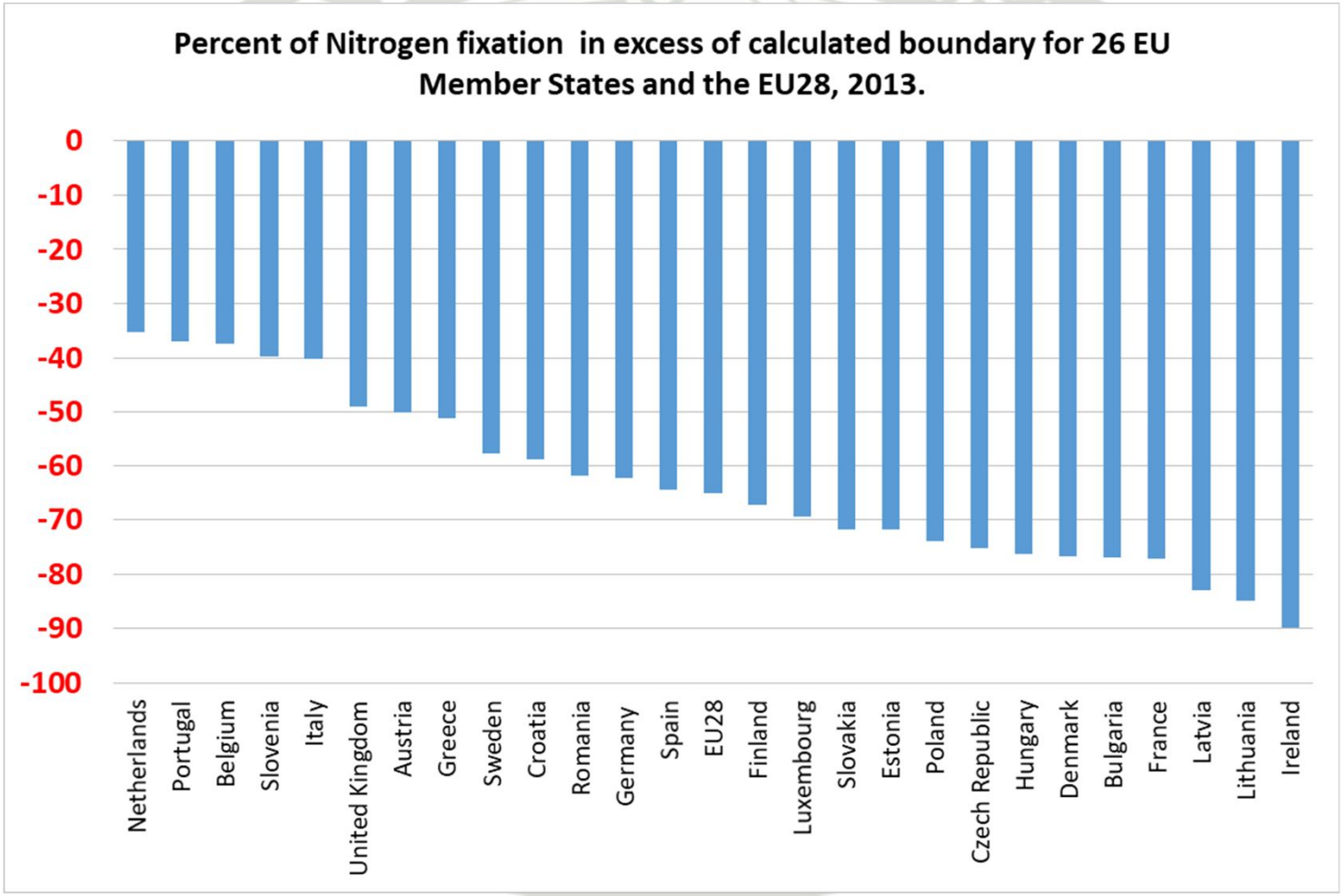
Actual vs. Boundary EU-28



GHG reductions required by EU and Member States to respect Paris targets.



Percentage of nitrogen in excess of calculated boundary for EU28 & 26 Member States, 2013



Lessons on the idea of SOS

1. The appropriate scale and spatial resolution for SOS boundaries is tricky: more work on biodiversity, soils, AMR and animal welfare
2. Note: strictly, none of the positive contributions are absolutes. The lower boundaries reflect long-standing cultural preferences.

- Key conclusions from our results:
  - EU livestock production & consumption are not in a SOS
  - Consumption & production are much greater than the lower SOS boundaries for diets & pasture utilisation
  - There are large exceedances for upper boundaries of GHG & nutrient flows, on average in the EU-28 reductions up to 60%
  - Lower boundaries may imply greater production than allowed to comply with upper boundaries. This implies uncomfortable choices for society. Upper environmental limits should take precedence over the cultural lower boundaries?

Adjustment on two fronts

1. **Reduce negative impacts of livestock production**
   - Resource efficiency: feed, water, animal health and welfare
   - Manure management, processing and reuse
   - Reducing density and concentration of livestock
   - Large scope for innovation in: breeding, nutrition, housing, pollution, waste capture & reuse
2. **Shift and reduce consumption** of livestock products
   - Changing the species balance of consumption
   - Substituting alternative animal protein: insect, algal, cultured
   - Changing diets to less protein and plant based protein

The indications are that route 1 alone is not sufficient.
Acting on current consumption is unavoidable.

Drawing the threads together

- The challenge is immense, it concerns all: the whole supply chain and consumers.
- The challenge is complex, not all the interactions are well understood.
- The message that livestock are not in a SOS is not yet accepted at high political level in EU.
- The issue has long been debated in scientific and NGO circles, a ‘Blue Planet’ jolt is needed.

This study has concluded

- EU livestock is out of balance, it is in disequilibrium
  - Consumption vs production (both products and feed)
  - Consumption and health
  - Production and the environment
  - Ruminants and monogastrics
  - Crops and animals
  - Spatial distribution
- To move into the Safe Operating Space, we need to bring about adjustments by all parties
  - Behavioural change by consumers
  - Knowledge intensive change by producers
- First we need **top-level acknowledgement that change is necessary**
- Much research is needed to identify the trade-offs ahead.

The role of policy

- Re. Consumption
  - Internalise the externalities of over-consumption
  - If this raises livestock product prices this is part of the solution
  - Key is to influence the social discourse; fewer meat meals, smaller meat portions, flexitarians
  - Soft measures: public campaigns, environment and health messages
  - Harder measures: taxes, subsidies, procurement and regulation,
- Re. Production:
  - Political acknowledgement of need to move livestock into its SOS
  - Research to identify the SOS for beef, pork, chicken, milk, eggs
  - Use available public assistance to help farmers adjust: investment, production systems and knowledge

Recommendations food and nutrition policy

1. The EU should set up a formal inquiry to investigate the following questions.
   - Where is the safe operating space for EU livestock?
   - What adjustments in production and consumption are necessary to get into it?
   - What policy measures would be required to propel these adjustments?
   - What would be the impacts on health, environment and the economy of these changes?

Recommendations food and nutrition policy

2. The change must be a citizen-led, consumer-led, enterprise. Although it requires action by both consumers and producers the transition required will only occur if driven by consumers. This will not happen spontaneously but only if Government takes strong action to spur the necessary changes.
3. A mandated output of the proposed inquiry should therefore be a suggested set of policy proposals which include measures to discourage consumption of livestock products harmful to health and environment and to encourage consumption and production beneficial to health and environment.

Recommendations environmental policy

4. Implement existing environmental regulations and directives.
5. Specifically, help farmers better manage the environment on their farms by assisting establishment of better farm-level environmental performance indicators, benchmarks and plans for GHG emissions, nutrients and biodiversity.

Recommendations agricultural and research policy

6. Better target CAP Pillar 1 resources currently provided as direct payments, by deploying them to stimulate and enable structural changes required to help the livestock sector make the transition to a SOS.

7. An important task within the proposed inquiry is to develop a better conceptualisation and measurement of the ceilings or upper boundaries of the safe operating space especially with respect to nutrient flows and biodiversity.

8. It is essential that GHG emission factors for livestock are regularly updated to reflect the expected, and necessary systematic improvements in resource efficiency.

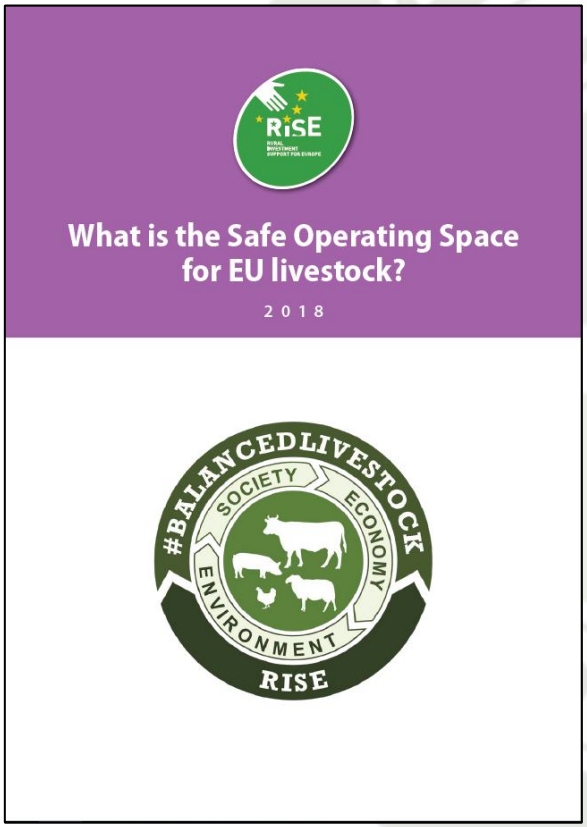
International impacts of moving EU livestock into its SOS

- The external impacts of EU livestock production & consumption
- If EU consumption falls more than production, are greater exports a concern?
- If EU production falls more than consumption: are greater imports a concern?
- Three reactions to such concerns:
  - If consumption & production are unsustainable the quicker we acknowledge and act the better. This applies to all countries.
  - Decisions must be based on trusted quantification of the marginal environmental impacts of production switches between countries
  - International agreement is ultimately the safeguard of global commons, climate and biodiversity

Final words

- The livestock challenge has come about because of the success of technical change in the food chain reducing the real price of food to the extent that we are consuming more than is good for our health and the environment. Because of their inherent inefficiency and leakiness, livestock are a special problem. This is an attack on the negative health and environmental effect of livestock, not farm animals *per se*.
- The EU should be confident that if it takes the lead in defining and moving to a safe operating space for livestock this can help set the standards and procedures which others will follow.

Thank you!



A digital copy of the report is available from:

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Panel discussion

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