The contested futures of livestock farming in the context of the protein transition

Océane Duluins

Circle U Sustainability Talk
Green transitions in Europe

18/02/2026

The issues at stake

Consumption-related issues

Health impacts

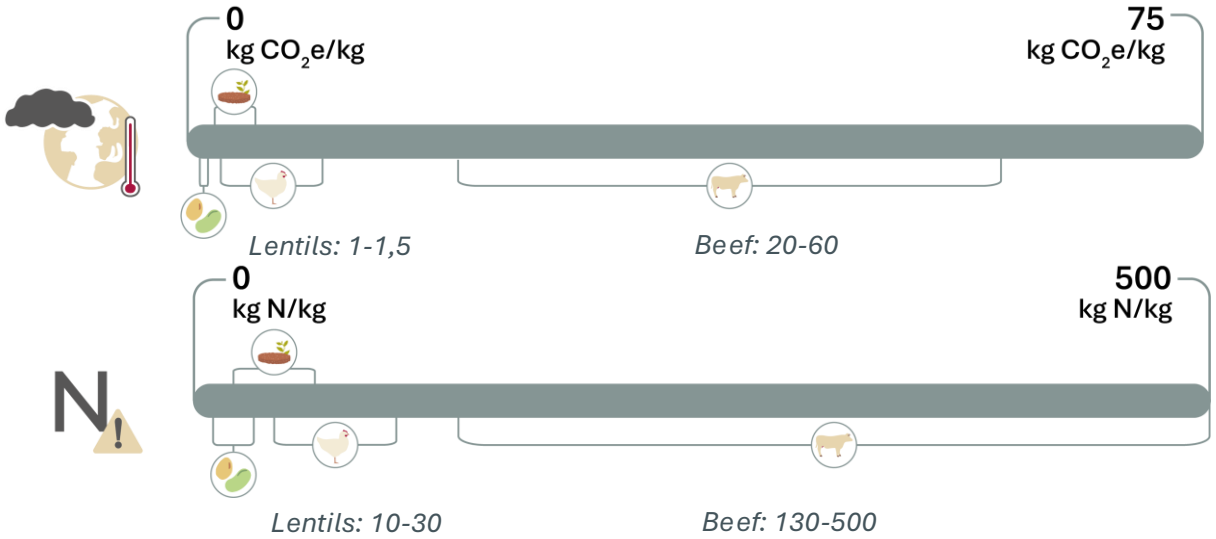
Obesity

Corona heart disease

Type-2 diabetes

Production-related issues

Environmental impacts



Animal welfare impacts

The proposition of the protein transition

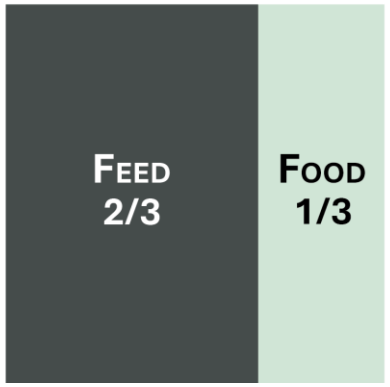
But what is the role of livestock farming in the context of a protein transition?

1. The current European context

Europe is the world leading exporter of animal products

2/3 of EU agricultural land is dedicated to animal feed

European agricultural area



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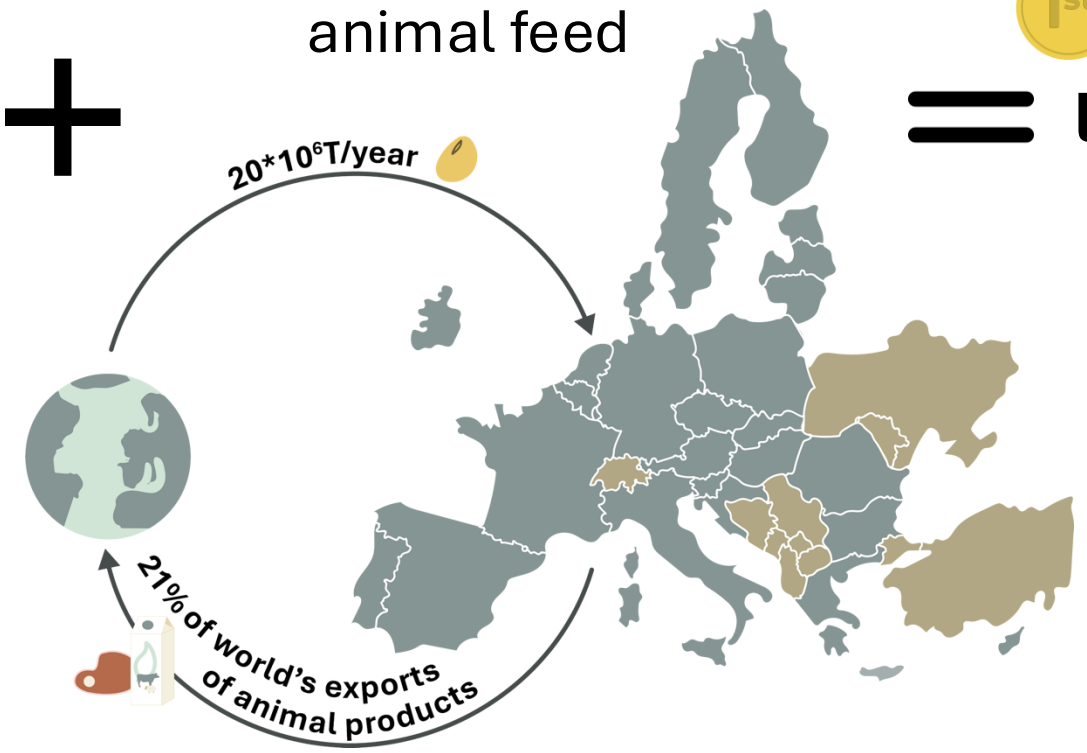
Soybean imports for animal feed



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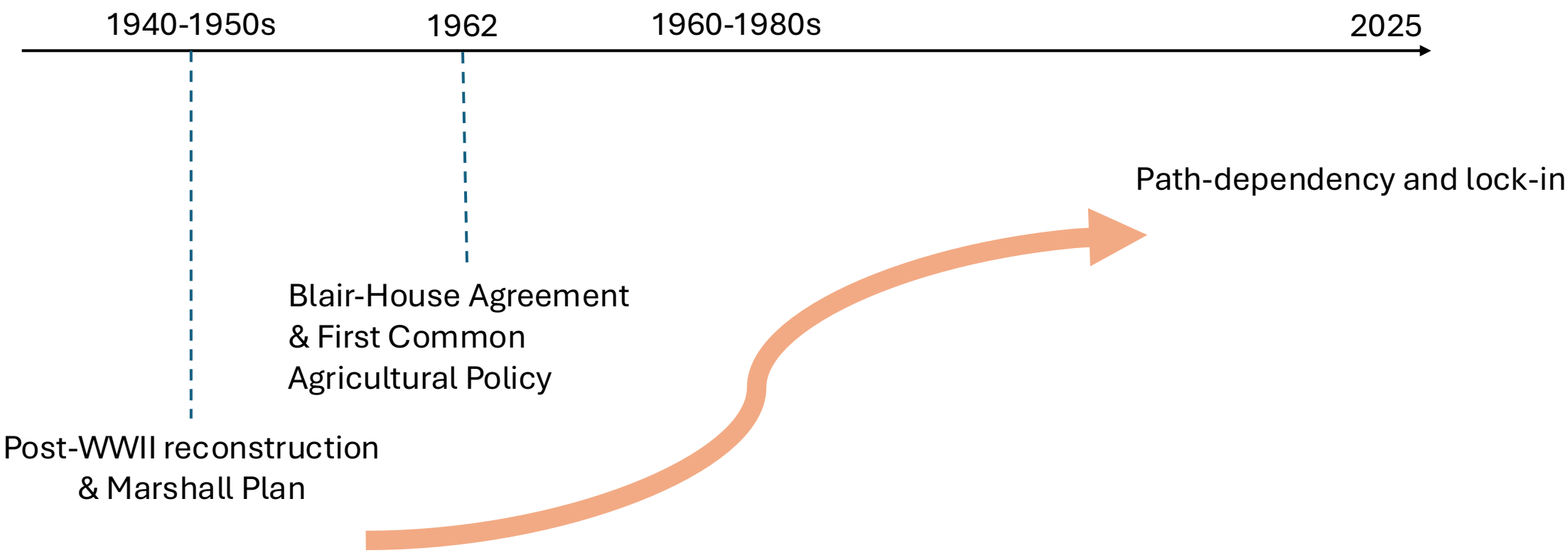
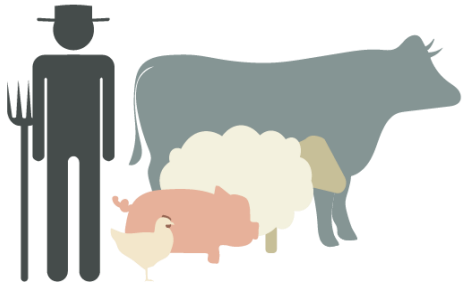
Europe is the leading exporter of animal products.

The dependence is nothing but new



Europe is not isolated

EU livestock production



EU livestock consumption

Disconnection between production and consumption due to exports

Animal-based productions represent 22% of all EU agricultural exports

We consume much more than we need

Recommended protein intake

0.83 g/kg of body weight/day

European consumption

1.25g/kg

We overconsume proteins

We overconsume **animal** proteins

Is the protein transition up to the challenge?

Consumption-related issues

Health impacts

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Corona heart disease

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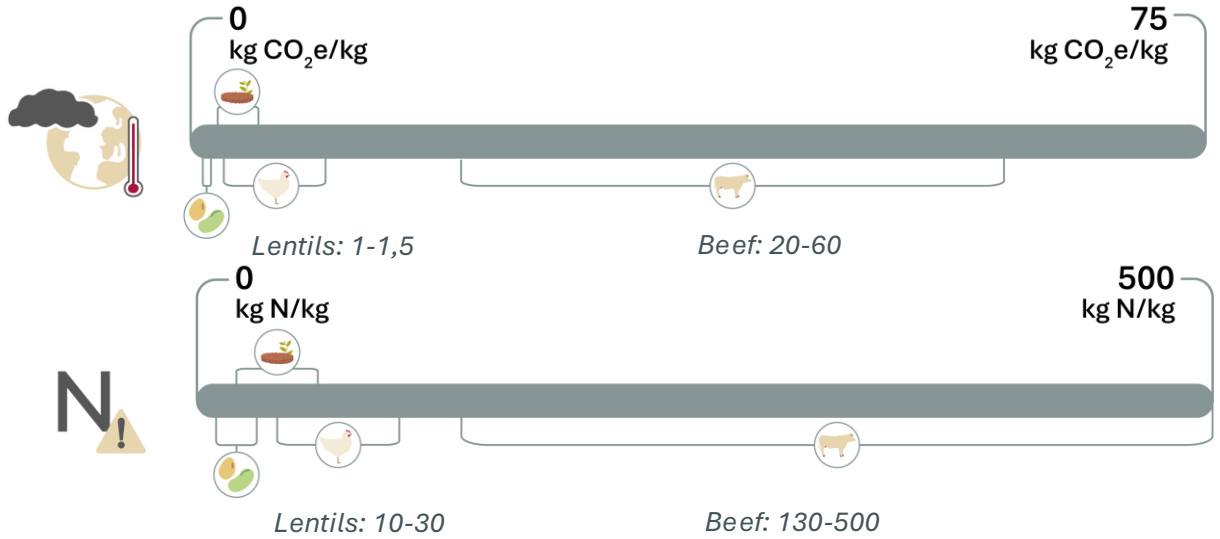
Production-related issues

Environmental impacts

Animal welfare impacts



2. Challenging the unchallenged: The paradoxes of the protein transition

The current consumption situation

Recommended protein intake

0.83 g/kg of body weight/day

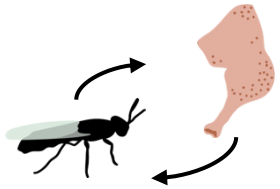
European consumption

1.25g/kg

We overconsume proteins

We overconsume **animal** proteins

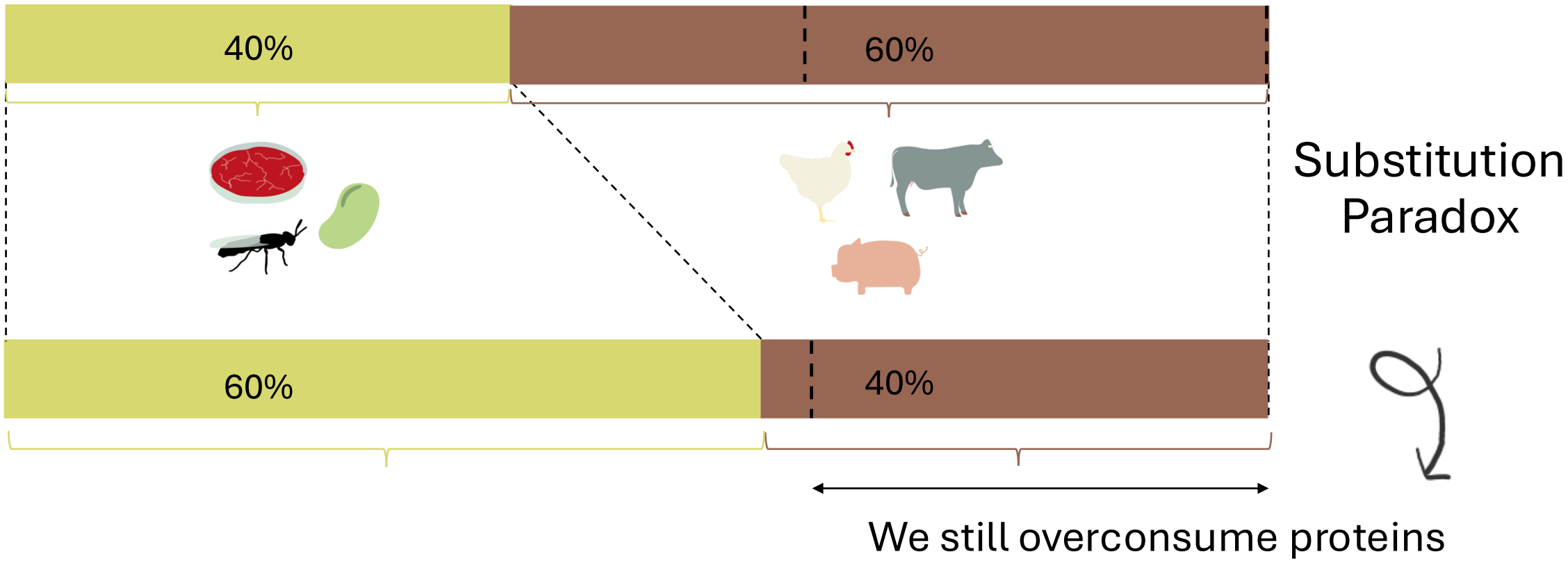
Three paradoxes



The substitution paradox

The paradoxes of the protein transition (Duluins & Baret, 2024)

The substitution paradox



The substitution paradox

The **substitution paradox** highlights the inconsistency of focusing efforts on substituting animal proteins with other sources, when the real issue is overconsumption.

Coming back to the issues

Consumption-related issues

Health impacts

Amount of protein consumed ✗

Type of protein consumed ✓

Production-related issues

Environmental impacts

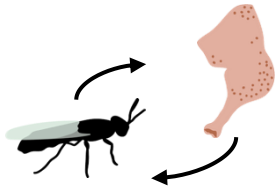
Per kg of protein ✓

Total ?

Animal welfare impacts

Total ?

Three paradoxes

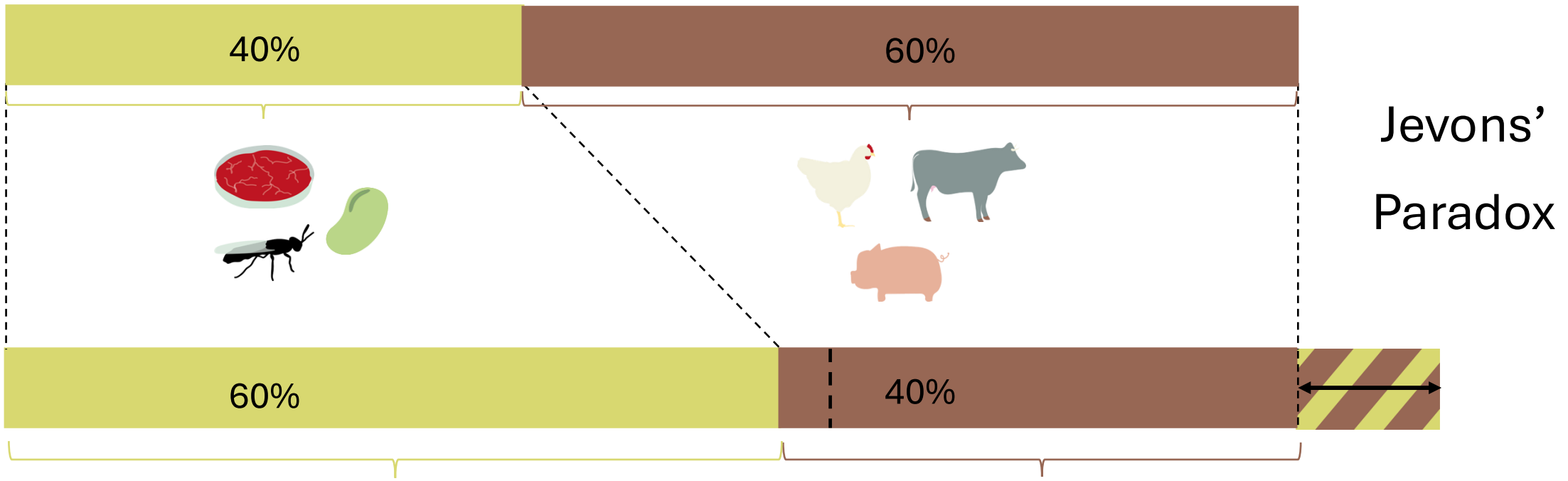


The substitution paradox

The Jevons’ paradox

The paradoxes of the protein transition (Duluins & Baret, 2024)

The Jevon's paradox



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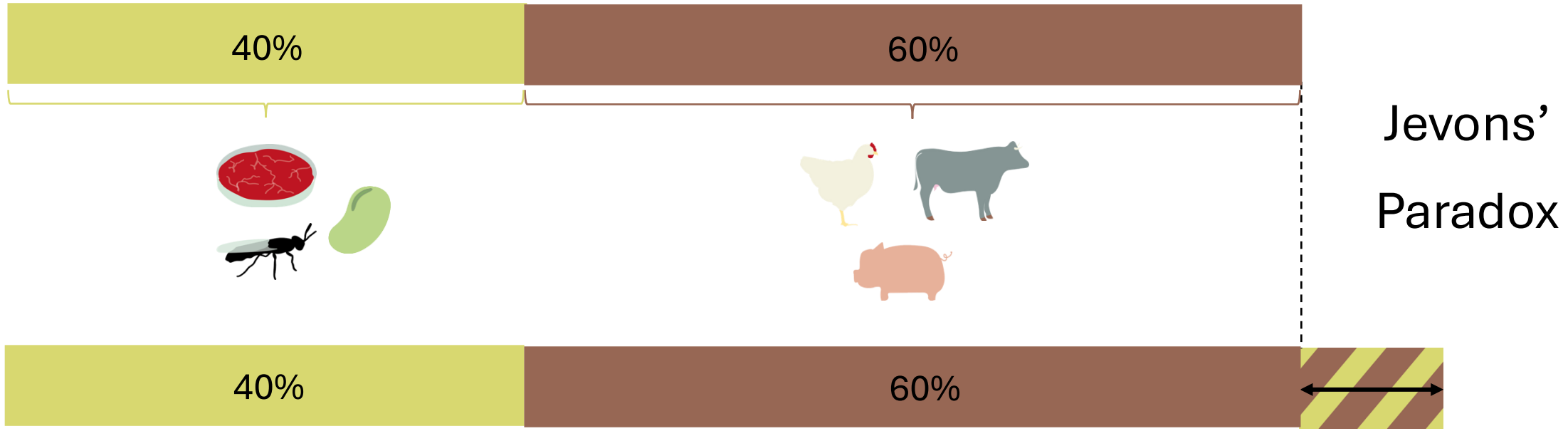


Increase in overall consumption (and production)

The Jevons' paradox

The **Jevons paradox** highlights the risk that developing protein sources perceived as more efficient could lead to a net increase in consumption and production, thereby reducing or negating efficiency gains per unit.

Coming back to the issues

Consumption-related issues

Health impacts

Amount of protein consumed ✗

Type of protein consumed ✓

Production-related issues

Environmental impacts

Per kg of protein ✓

Total ✗

Animal welfare impacts

Total ?

The proposal

@Unsplash

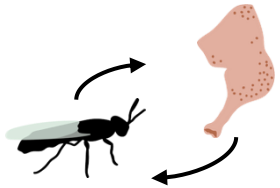
@Thailand unique

@Burger King

Focusing on changing diets and developing alternative proteins will be too short to address the issues at stake.

Three paradoxes

The paradoxes of the protein transition (Duluins & Baret, 2024)



The substitution paradox

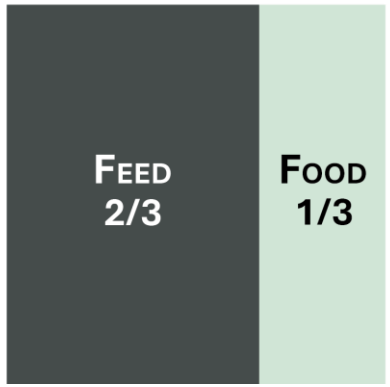
The Jevons' paradox

The productivism paradox

The productivism paradox

2/3 of EU agricultural land is dedicated to animal feed

European agricultural area



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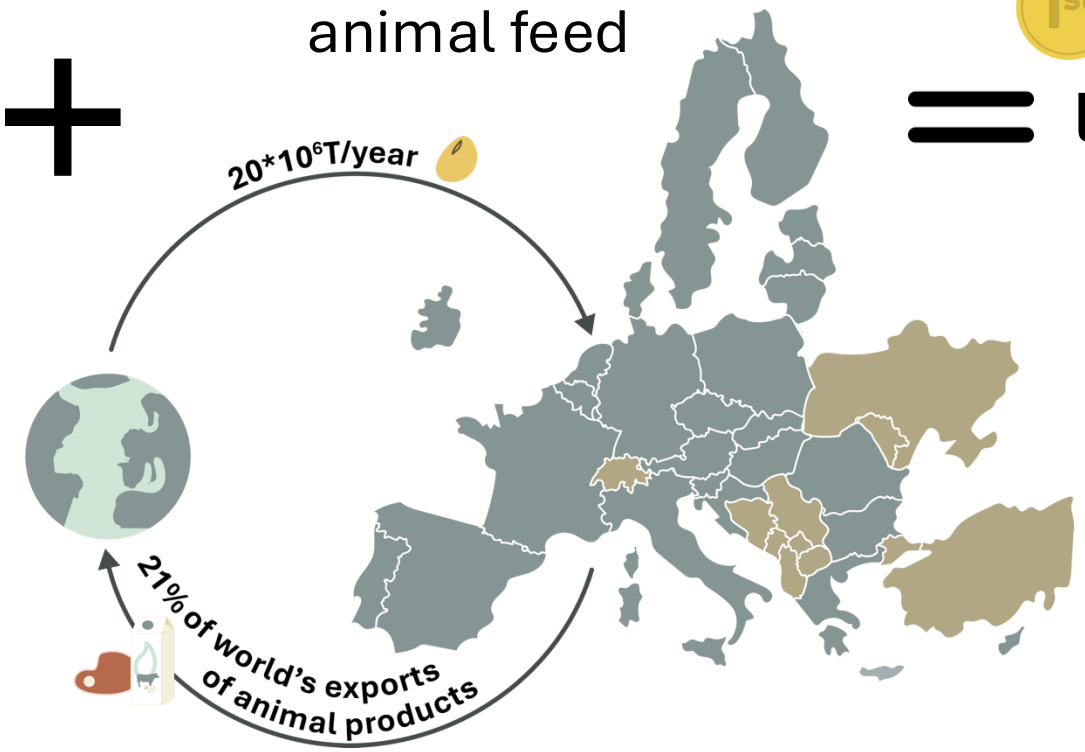

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Europe is the leading exporter of animal products.

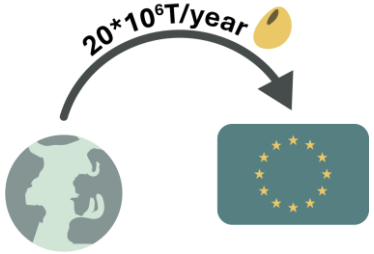
The so-called protein-deficit

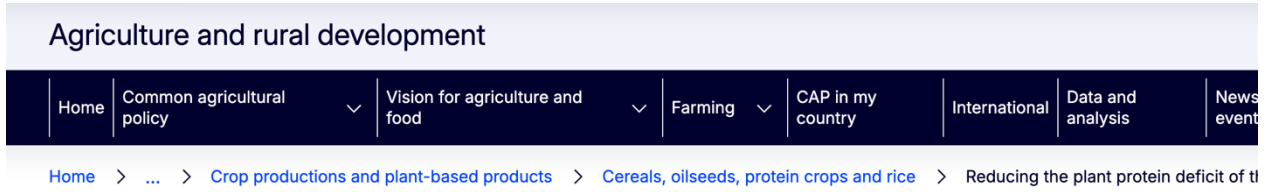
The so-called protein-deficit

Current European livestock production

Feed demand to sustain European livestock production

Current European feed production





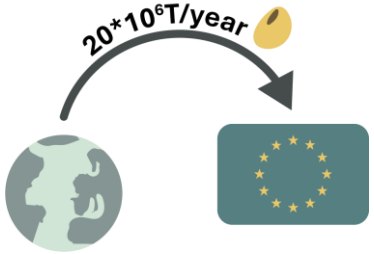
Reducing the plant protein deficit of the European Union

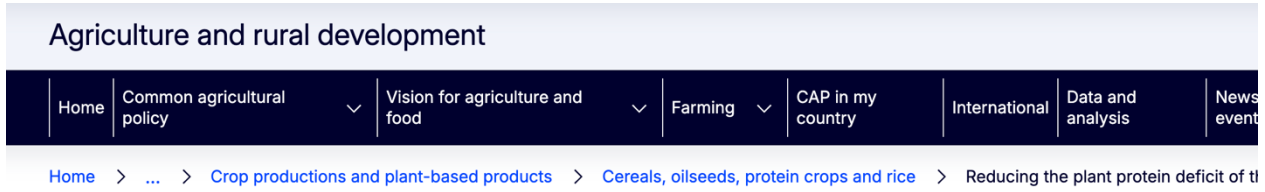
The so-called protein-deficit

Feed demand to sustain European livestock production

Current European livestock production

Current European feed production





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Reducing the plant protein deficit of the European Union

The productivism paradox

The **productivism paradox** shows that, despite protein overconsumption and surplus of animal production for export, Europe remains focused on achieving self-sufficiency in animal protein feed, without questioning its current production levels.

Coming back to the issues

Consumption-related issues

Health impacts

- Amount of protein consumed ✗
- Type of protein consumed ✗

Production-related issues

Environmental impacts

- Per kg of protein ✗
- Total ✗

Animal welfare impacts

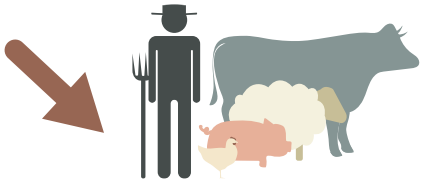
- Total ?

Focusing only on alternative protein sources is not enough

1. **Reduce** animal-based products consumption

2. **Replace** animal-based products by lowly processed alternative proteins

3. **Reassess** livestock production levels and livestock production systems



- Amount of protein consumed
- Type of protein consumed
- Environmental impacts per kg of protein
- Total environmental impacts
- Animal welfare impacts

3. The diversity of pathways

UNDP

Should livestock be part of the future?

Production-focused

Two potential futures are still considering meat and livestock

Alternative 'protein' scenario

Producing meat without animals, focusing on alternative protein production

Efficient meat scenario

Making current production systems more efficient

Low/no meat

Meat

Plant-based scenario

Meat consumption is eliminated in favor of plant-based diets

Less meat scenario

Reconsidering both production levels and production systems

Production and consumption

Source: Table Debates project (Futures for meat scenarios)

4. What will the future be?

Philippe Baret

Changing will be harder than continuing

A locked-in system resulting from the interplay of economic x political x social x infrastructural factors

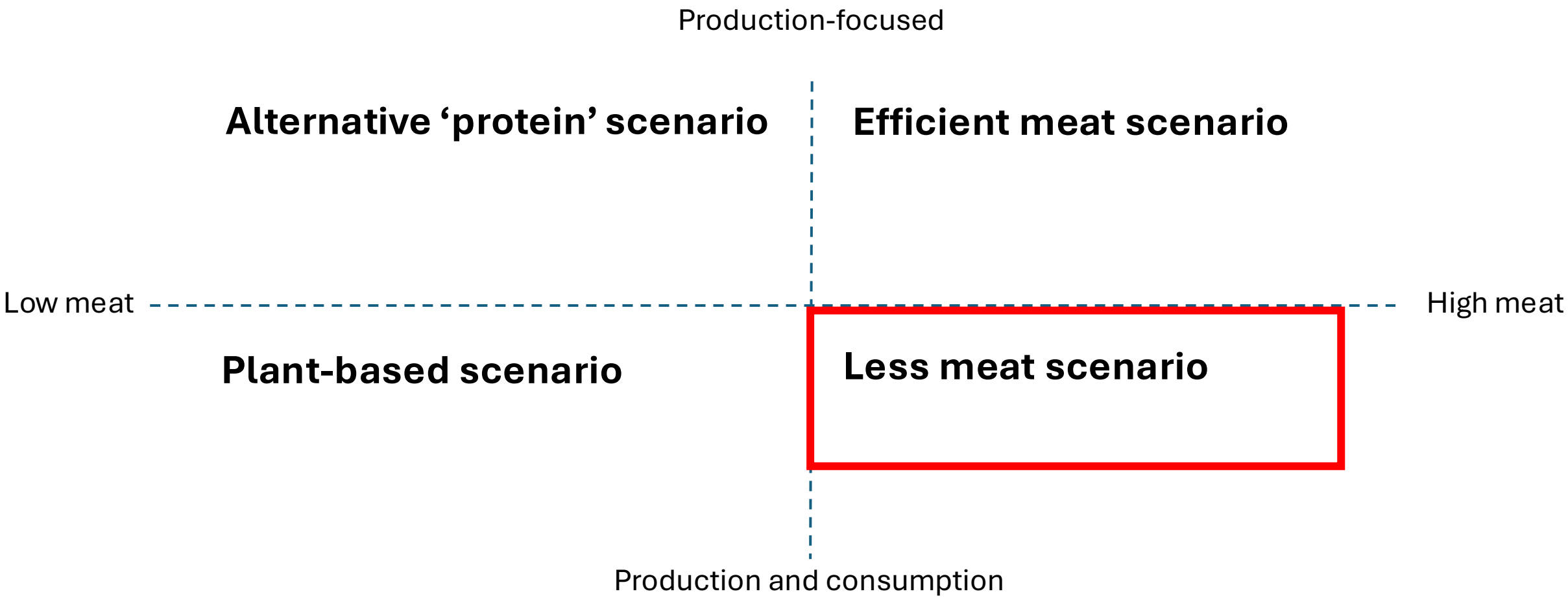
Which sectors?

Which production systems?

What proportion of meat/alternative proteins in diets?

→ The answers will depend on the indicators and criteria we choose to guide our decisions

The future roles of livestock farming in the four quadrants



The KISS for the less meat scenario

Main unknowns
Economic losses from decreased exports
Meat prices
Potential of niche markets

Keep

Grass-based and extensive systems
Local, high-quality labels

Improve

Economic viability of extensive farms
Pasture management, agroforestry, and mixed crop-livestock systems

Stop

Intensive systems disconnected from land and local feed resources
Production focused on quantity rather than quality

Start

Strategic thinking about which meats/dairy Belgium should produced
Public procurement and dietary guidelines aligned with « less but better » principles
Compensation or incentive schemes

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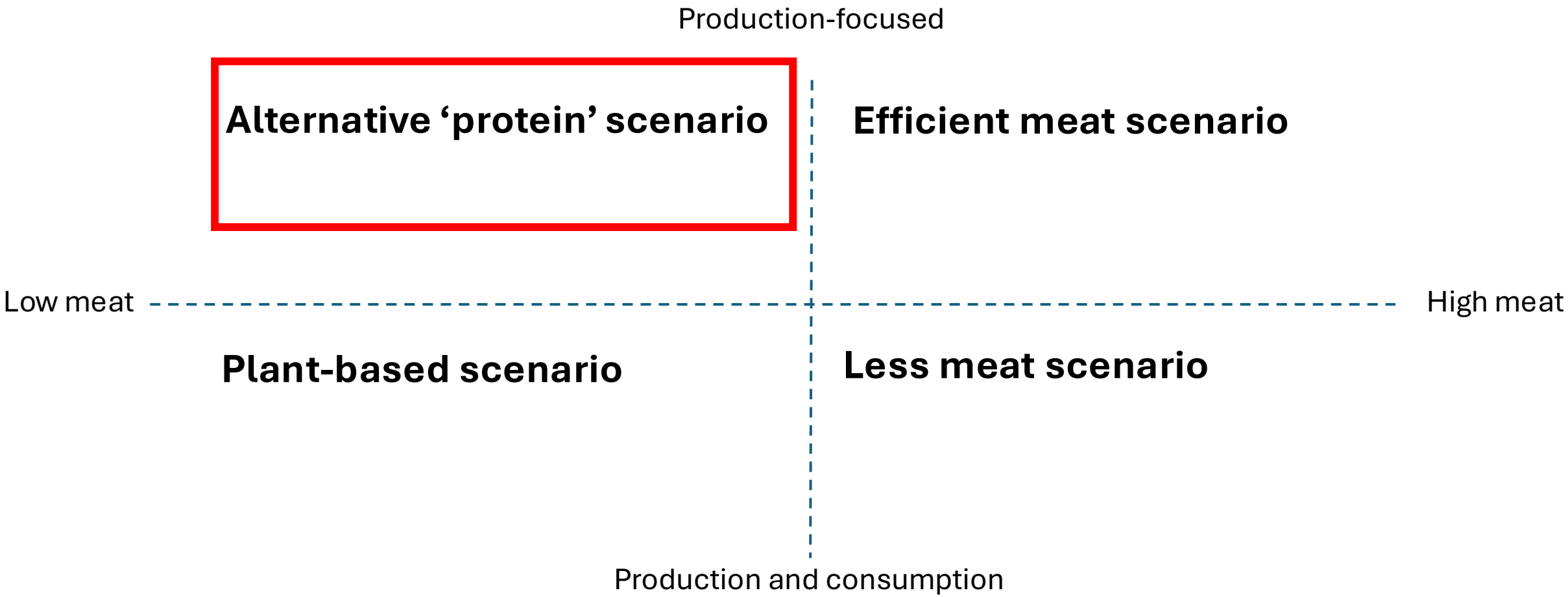


The KISS for the alternative protein

Main unknowns
Soil fertility and loss of grasslands
Who wins and who loses territorially?
Climate epistemic authority

Keep

Protein demand satisfaction
Technological innovation paradigm
Large-scale, industrial supply chains

Improve

Economic viability of alternative proteins
Consumer acceptance
Energy and environmental performance

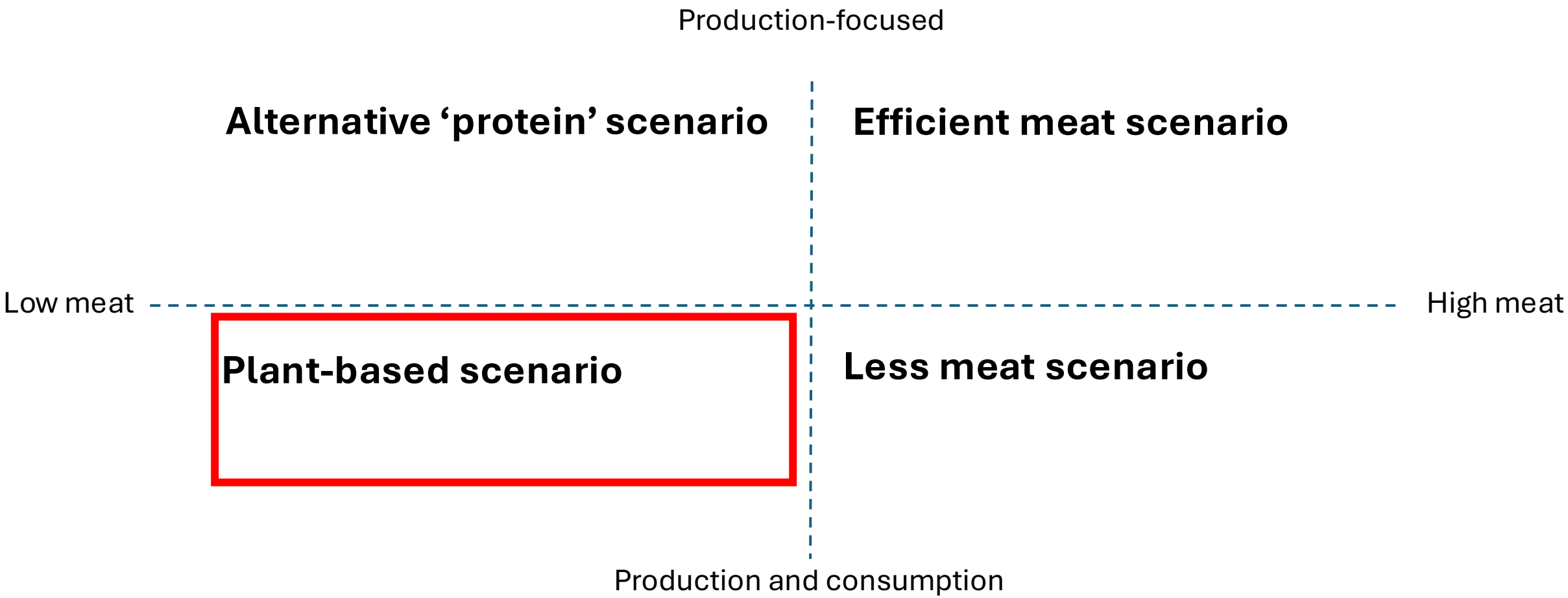
Stop

Large-scale industrial livestock systems.
Feed-import dependency (soy for EU livestock).
Public subsidies for animal production.
Policy protection of livestock as a default

Start

Redirecting CAP subsidies
Revising regulatory frameworks
Large-scale dietary transition policies

The future roles of livestock farming in the four quadrants



The KISS for the plant-based

Main unknowns
Culture & Identity
Rural justice and compensation/transformation issues
Land politics

Keep

Nutritional adequacy and food security

Improve

Increase production of diverse plant proteins
Re-adjust processing and value chains
Acceptance of lowly transformed plant-based options

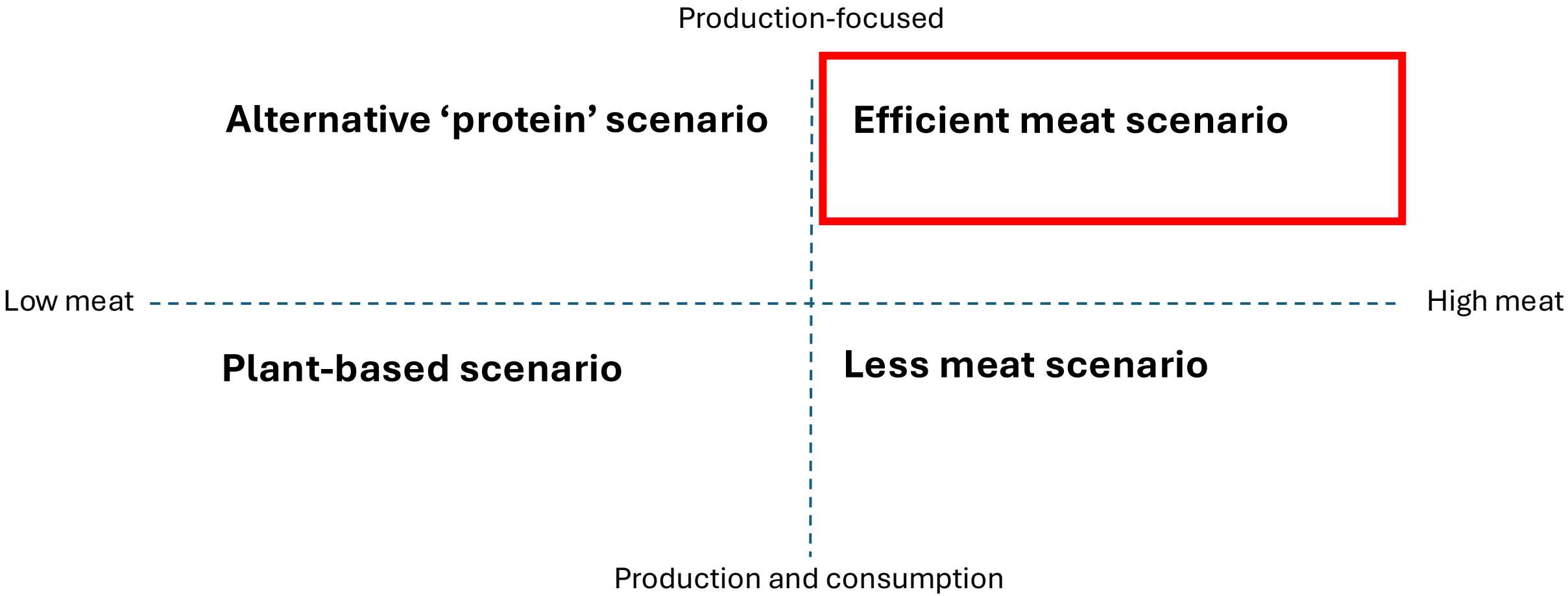
Stop

Large-scale industrial livestock systems.
Feed-import dependency (soy for EU livestock)
Public subsidies for animal production
High per capita meat consumption norms.
Policy protection of livestock as a default

Start

Strong consumption-side interventions
Strong fiscal instruments (e.g., meat taxes)
Major CAP subsidies redirection
Cultural reframing of meat as occasional rather than central

The future roles of livestock farming in the four quadrants



The KISS for efficient meat

Main unknowns
Technological optimism
Farming livelihoods vs. reinforcing industrial concentration.
Global justice framing

Keep

High levels of meat consumption
Livestock as a pillar of EU agriculture
Export-oriented production models
Industrial-scale supply chains

Improve

GHG intensity per kg of meat
Feed conversion efficiency
Animal health and welfare through monitoring
Affordability and global protein supply

Stop

Calls for large-scale meat reduction
Strong consumption-side interventions
Narratives positioning livestock as fundamentally incompatible with sustainability

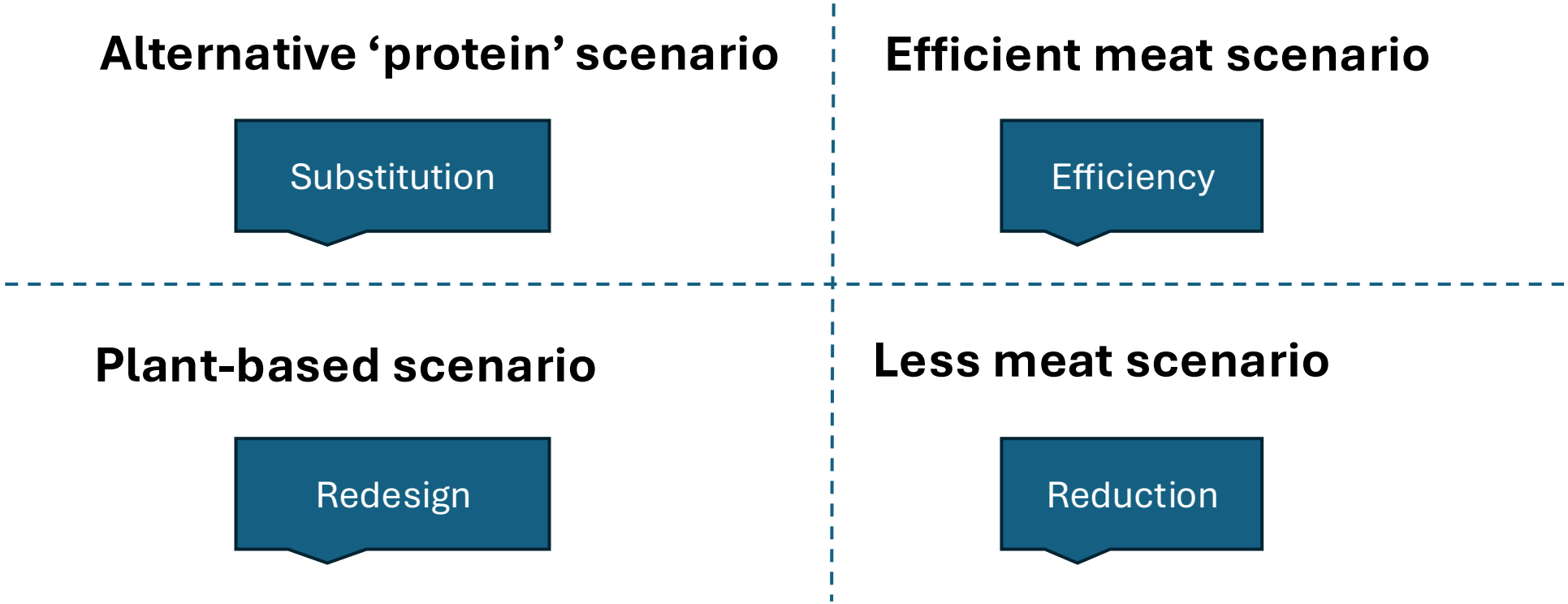
Start

Large-scale deployment of precision livestock farming (digitalization, AI, sensors).
Public-private R&D alliances.
Financialization of livestock through carbon markets.

5. The inevitable trade-offs

Alexander Schimmeck

All scenarios seek climate and environmental goals



All scenarios are innovation-driven

Alternative ‘protein’ scenario

Biotech & food techn innovation

Efficient meat scenario

Livestock precision technology & genetics

Plant-based scenario

Food culture and crop diversification innovation

Less meat scenario

Ecological and social innovation

The structural trade-offs

Axis	Alternative protein	Efficient meat	Plant-Based	Less meat
Demand	Maintained	Maintained	Reduced	Moderated

The structural trade-offs

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Technology reliance	Very high (biotech)	High (livestock tech)	Moderate	Low–Moderate

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The structural trade-offs

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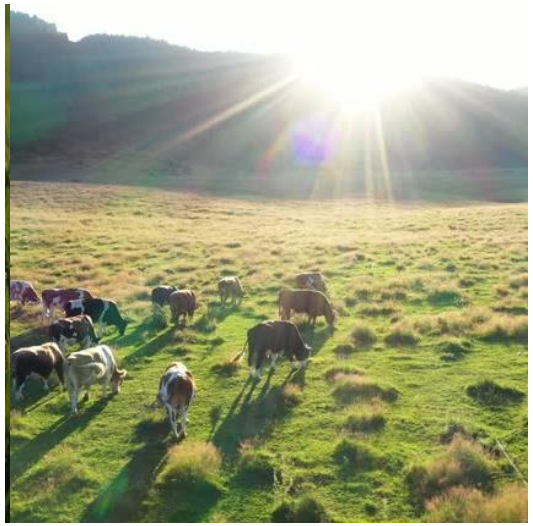
Technology reliance	Very high (biotech)	High (livestock tech)	Moderate	Low–Moderate
Livestock herd size	Stable or larger	Strong decline	Strong decline	Moderate decline
System logic	Industrial optimization	Industrial substitution	Socio-cultural shift	System redesign

On what foundations de we want to rebuild?

1) What is the objective of the system?
2) What counts as efficiency?
3) Who carries the transition?
4) What happens to territories?
5) Are we substituting or transforming?

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