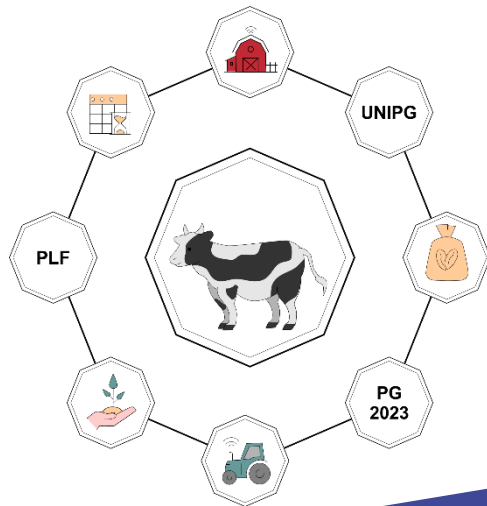


Livestock production today: Worldwide situation, European framework and future prospective



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BEFORE WE BEGIN...

- 1.- How would you **define** *LIVESTOCK FARMING*?
- 2.- How **important** is livestock farming **in your country**?
- 3.- What would you **highlight** about the present **relationship** between **livestock and environment**?
- 4.- How do you think the **Precision Livestock Farming** could **improve this relationship**?

Índex

1. What is Livestock Production?
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What is Livestock Production?

LIVESTOCK: Domesticated animals raised in an agricultural setting to provide labor and produce diversified products for consumption such as *meat, eggs, milk, fur, leather, and wool.*

The **LIVESTOCK POPULATION** describes the production system through the stocks of animals being farmed.

The **DURATION OF A PRODUCTION CYCLE** indicates how long is needed so that animals are ready to **slaughter for meat**, whilst others are being **reared**, or to give birth and in the case of cows, some sheep and goats can be **milked**.

According to FAO

FAO = *Food and Agriculture Organization of the United Nations*

Livestock are domesticated terrestrial animals that are raised to provide a diverse array of goods and services such as traction, meat, milk, eggs, hides, fibres and feathers.

The term **livestock systems** embraces all aspects of the supply and use of livestock commodities, including the **distribution and abundance** of livestock, the different **production systems** in which they are raised, **estimates of consumption and production** now and in the future, the **people engaged** in livestock production and the **benefits and impacts** of keeping livestock.

DIVISIONS:

- ❖ Animal Production and Health Division (NSA)
- ❖ Food and Agriculture Data (FAOSTAT)
- ❖ Domestic Animal Diversity Information System (DAD-IS)
- ❖ Global Livestock Environmental Assessment Model (GLEAM)

According to FAO - Divisions

Animal Production and Health Division (NSA)

- Supports member countries to **strengthen the contribution of the livestock sector to reduce hunger and poverty.**
- Areas of Activity:
 - Animal Genetics
 - Animal Health
 - Antimicrobial resistance
 - Climate Change
 - Pastoralist
 - Feed safety
 - Animal products
 - Livestock in emergency
 - Sustainable livestock development.

<https://www.fao.org/agriculture/animal-production-and-health/en/>

Food and agriculture data (FAOSTAT)

- This section provides **free access to food and agriculture data** for over 245 countries and territories and covers all FAO regional groupings from 1961 to the most recent year available.
- Posibilities:
 - Download/Visualize data
 - Data from several years
 - Data from different countries

<https://www.fao.org/faostat/en/#home>

Domestic Animal Diversity Information System (DAD-IS)

- Access to **searchable databases of breed-related information** and photos and links to other online resources on livestock diversity.
- Posibilities:
 - Contact information of National Coordinators for the Management of Animal Genetic Resources.
 - Analyse the diversity of livestock breeds (risk of extinction)

<https://www.fao.org/dad-is/en/>

Global Livestock Environmental Assessment Model (GLEAM)

- It **quantifies production and use of natural resources** in the livestock sector and to **identify environmental impacts** of livestock.
- Futures:
 - Global coverage of six livestock species and their products (cattle, buffalo, sheep, goats, pigs and chicken).
 - Modelling of livestock distribution, climatic data, feed yields

<https://www.fao.org/gleam/en/>

Main Goals of Livestock Production

1. Get **food** of high **nutritional value**, **quality** and with sufficient **quantity**
2. Constitute a **decent livelihood** for male and female farmers
3. Develop livestock production systems that **respects the animals**
4. Develop livestock production systems that **respects the environment**

To conform production systems for obtaining products of animal origin making rational, business and equitable use of limited resources and contributing to the balance of the regions.

POSITIVE aspects of Livestock Production

1. Provide **quality protein**
2. Take advantage of **grazing resources**
3. **Manure** production
4. Relationship with the natural environment.
Use of **native breeds**.
5. Generate employment in marginal areas.
Social function.

NEGATIVE aspects of Livestock Production

1. Damage to the **environment**
2. Damage to **people's health**
3. **Imbalances** in relationships
4. **Harm** to animals
5. Landscape **deterioration**

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What are we producing?

Main animal species used and their productions

MONOGASTRIC ANIMALS

	Milk	Meat	Wool	Eggs	Honey and wax	Skin and Leather	Manure
Porcine		X					
Poultry		X		X			
Equines		X					
Rabbits		X				X	X
Hunting Spp.		X				X	X

What are we producing?

Main animal species used and their productions

HERBIVORES AND RUMINANTS

	Milk	Meat	Wool	Skin and Leather	Manure
Ovine	X	X	X	X	X
Bovine	X	X		X	X
Caprine	X	X		X	X
Hunting Spp.		X		X	X

Main animal species used and their productions

OTHER SPECIES

	Meat	Eggs	Honey and Wax
Fish	x	x	
Bees			x
Snails	x		
Insects*	x		

* UE **Regulation 2015/2283** includes insects within the definition of “new foods”.

The **permitted insects** are:

- Warm (*Tenebrio molitor*)
- Locust (*Locusta migratoria*)
- Cricket (*Acheta domesticus*)
- Dung beetle (*Alphitobius diaperinus*)

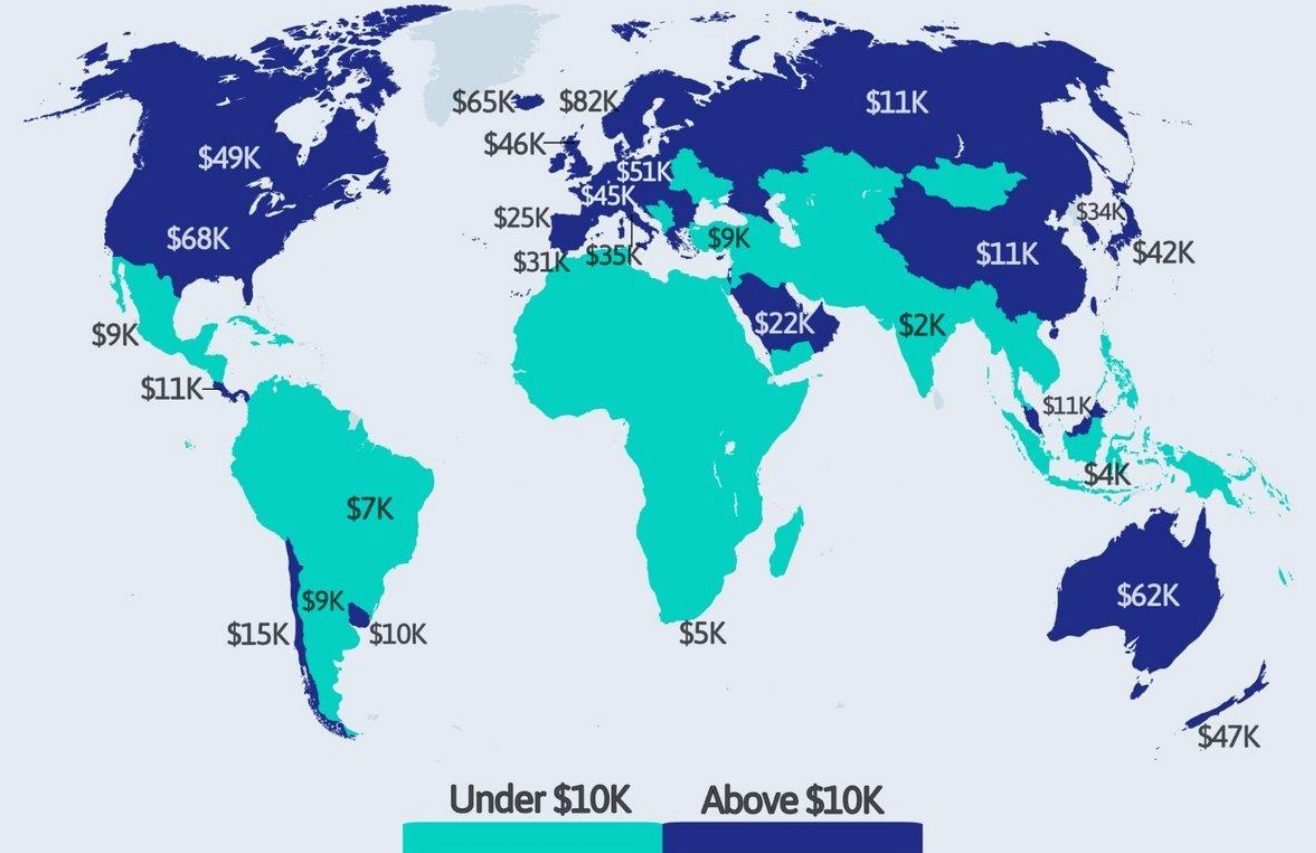
What are we producing?

Factors affecting demand for Animal Products

- They **provide** approximately **12% of the total Energy consumption** of the population, but a **large part of the Protein intake**.
- **Differences between countries** according to level of industrialization:
 - **Developed**: They contribute more than 19% of the Energy consumption.
 - **Underdeveloped**: They contribute 10% of the Energy consumption.
- **Gross Domestic Product** or **GDP per capita** explains 70% of the variations in the consumption of animal proteins in different countries.

GDP per capita in the world 2021

countries with highest and lowest values than \$10k USD per person



Selected countries that are members of the G20 (and some) of the OECD. World average is \$12K, advanced economies average \$51K, emerging and developing markets \$5K.

Factors affecting demand for Animal Products

- **Population**: greater demand for a greater population
- **Income (level and distribution)**: The higher the income, the higher the demand, but up to a certain level.
 - Equal distribution of resources ► greater demand
 - Higher revenue ► higher demand
- **Relative prices**: some products substitute others.
If ↑price ► ↓demand: Eg. Beef-pork
- **Tastes and preferences**: religion, culture and customs
 - In **cold climates** more **fats** are consumed.
 - In areas of **western Asia and central Africa**, the population has **difficulty assimilating lactose**, so they tend **not to consume dairy** products.
 - Incorporation of **women into the world of work**. Quick and pre-cooked meals.
 - Concern for **human health**: due to fat consumption.
 - Concern for **animal welfare**.
 - **Advertising** affects the consumption of products.

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Worldwide Situation (data from FAO, 2022)

- **Feeding the world in a sustainable way** is one of our most pressing challenges in the coming decades.
- **Meat is an important source** of nutrition for many people around the world.
- **Global demand** for meat is **growing**: Today the world produces > 340 million tonnes / year.
- Environmental impacts:
 - > greenhouse gas emissions
 - > agricultural land use
 - > freshwater use.

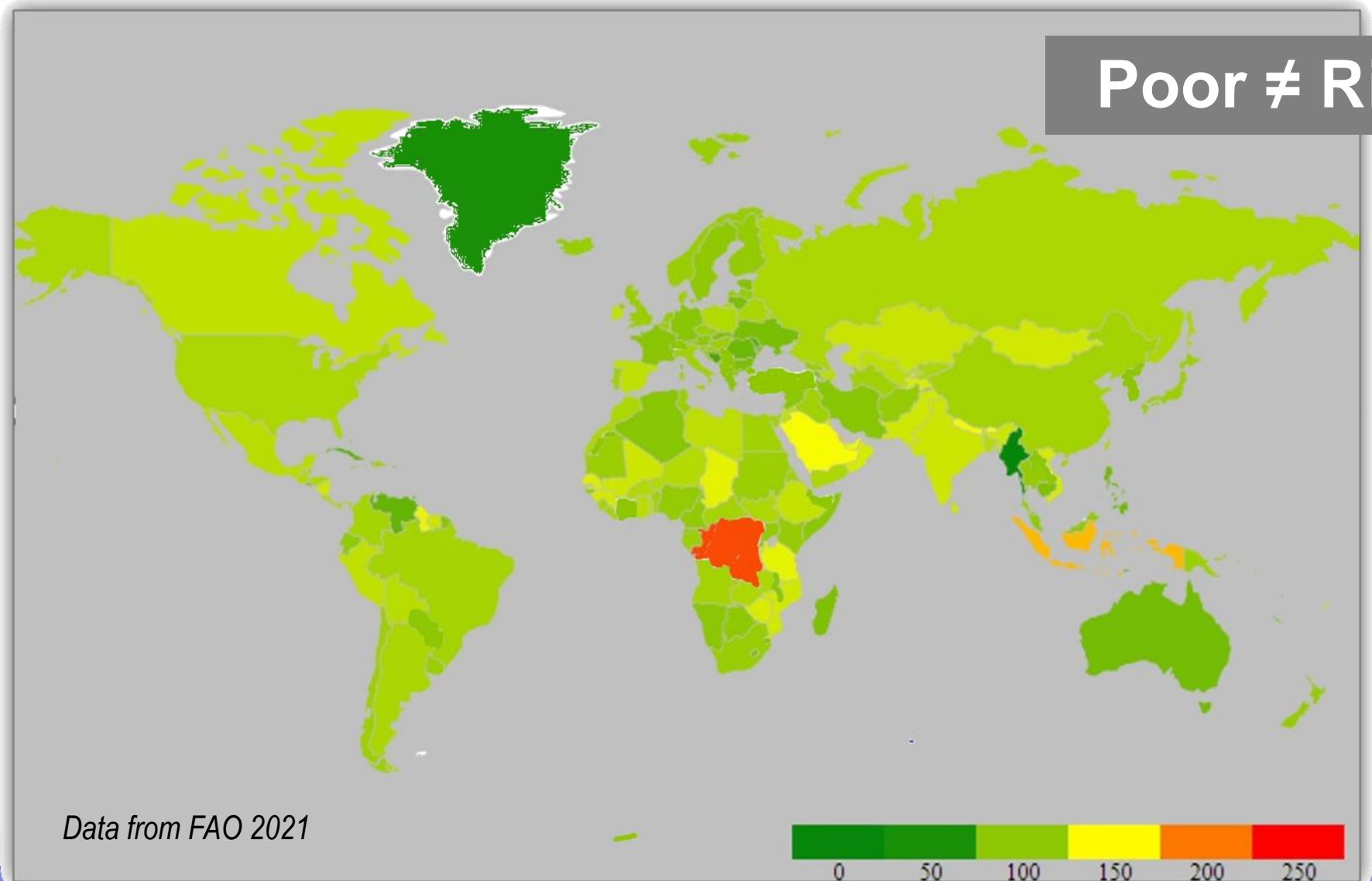
FUTURE CHALLENGE:

**Produce and consume PROTEIN PRODUCTS in a way that
REDUCES its environmental IMPACTS.**

Distribution of Domestic Animals used for Livestock Farming Worldwide

(Heads of domestic animals x 10⁶)

Poor ≠ Rich



Data from FAO 2021

Underdeveloped Countries

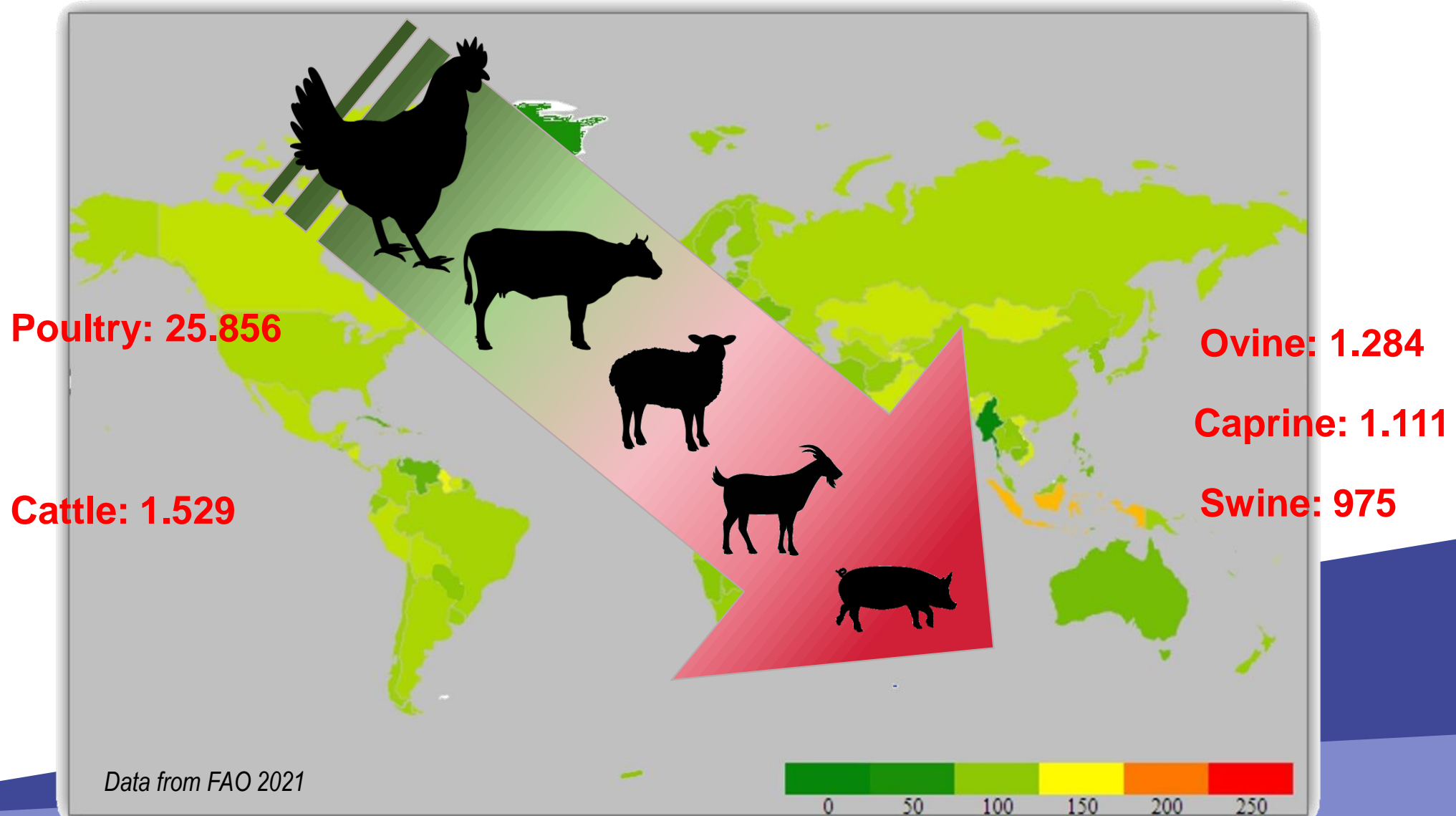
- **Subsistence**, they are a way of life
 - Familiar systems
 - Large herds (exports) (*Ex. beef cattle in South America*)
- **Native breeds** with low productions
- **Small ruminants** (sheep and goats) predominate
- Productions **dependent on climate and health**
 - Pasture production
 - Associated diseases (*Ex. Trypanosomiasis*)
- Influence of **social and religious factors**
 - Muslims don't eat pork
 - Hindus do not slaughter cows
- **Countries in the process of development**: more intensive systems and larger herds owned by big capitals.

Developed Countries

- **Lower proportion of subsistence livestock**, only in more depressed areas.
- Other **aspects** prevail:
 - Quality of the products
 - Animal welfare
 - Respect for the environment and maintenance of natural ecosystems
- **Entrepreneurial** character of production
- Specialized **breeds**
- Predominance of **cattle, pigs and poultry** over small ruminants.
- Medium-high **technological** level
- Greater **training** of farmers

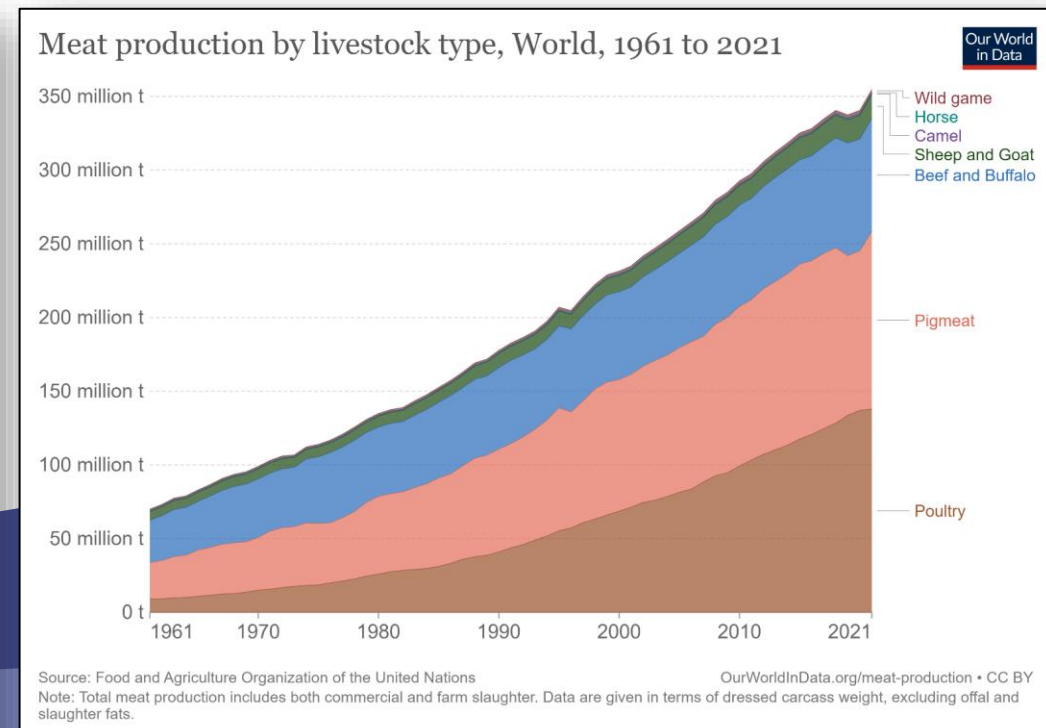
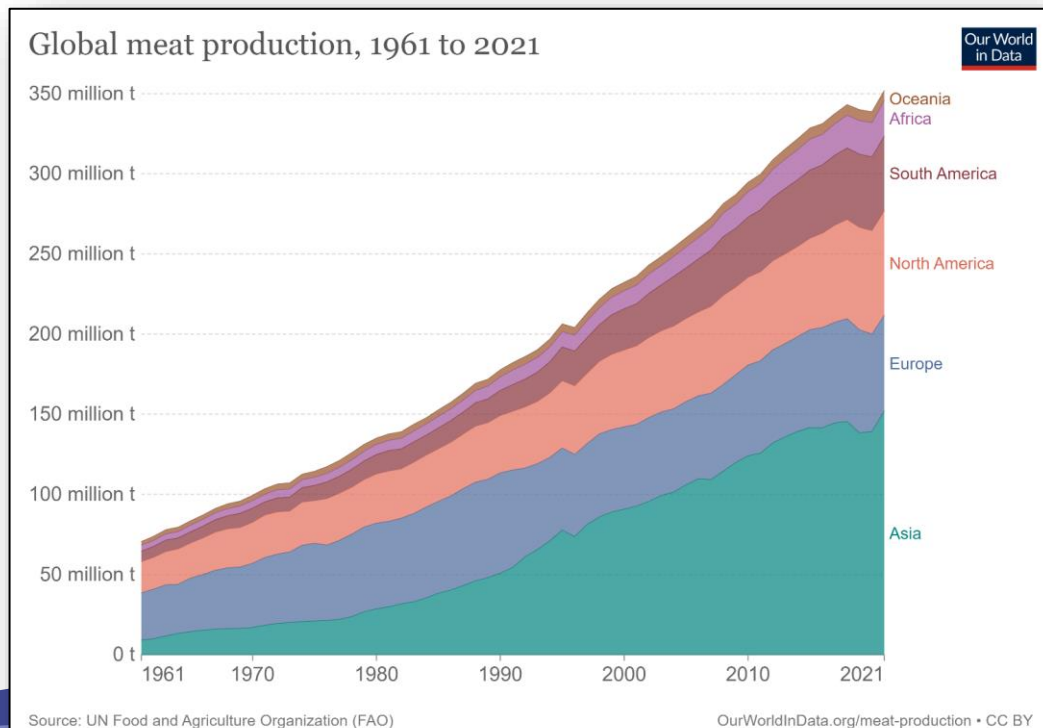
Distribution of Domestic Animals used for Livestock Farming Worldwide

(Heads of domestic animals x 10⁶)



MEAT PRODUCTION

- The dominant livestock types are poultry, cattle (which includes beef and buffalo meat), pig, and sheep & goat to a lesser extent.
- Distribution of meat types varies significantly across the world.
- In relative terms the share of global meat types have changed significantly over the last 50 years.
 - Poultry meat has tripled from 12% in 1961 to 35% in 2013.
 - Beef and buffalo meat has nearly halved, now accounting for around 22%.
 - Pigmeat has remained more constant at 35-40%.

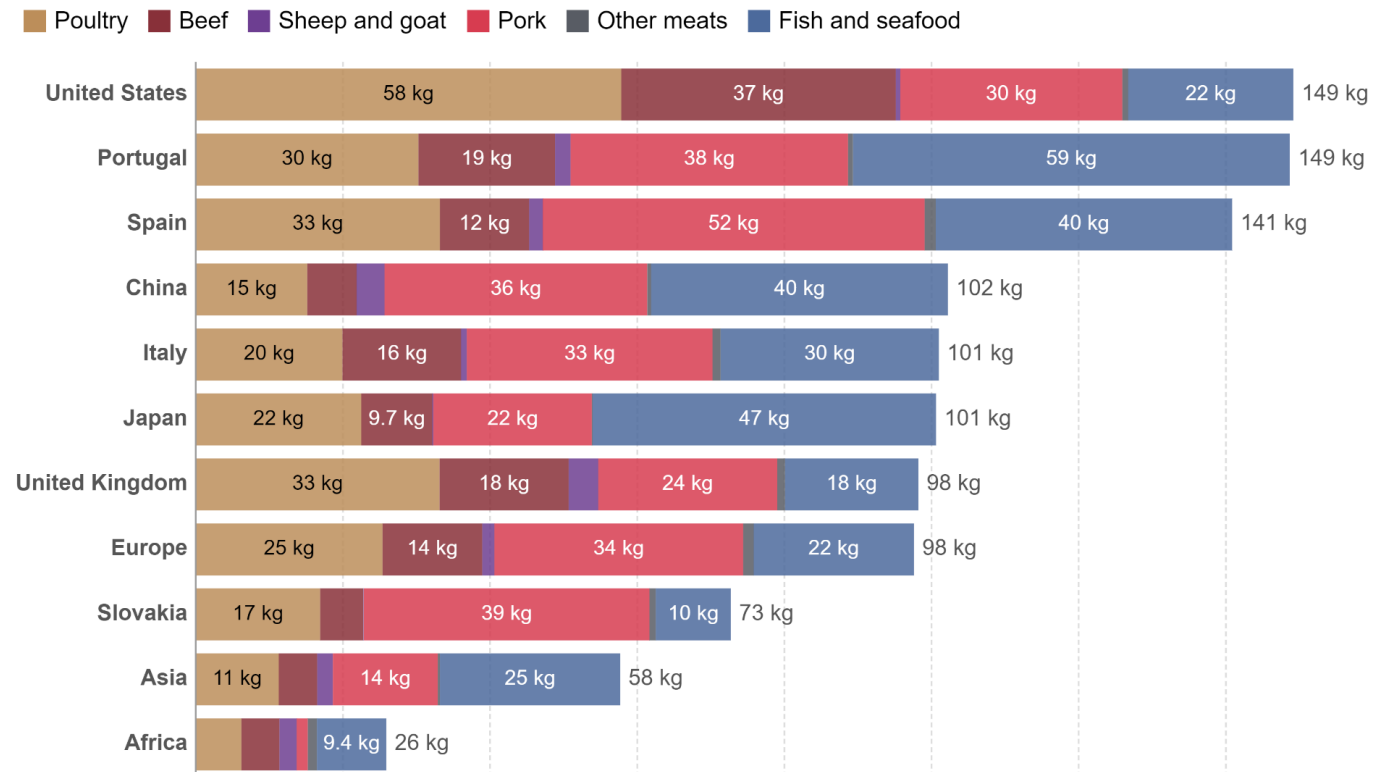


PREFERENCES ON TYPES OF MEAT

- **Pigmeat** is the most preferred.
- In **2013** the average person consumed around **16kg of pigmeat, 15kg of poultry, 9kg of beef/buffalo meat, 2kg of mutton & goat** and only a fraction of other meat types.

Per capita meat consumption by type, 2020

Our World
in Data



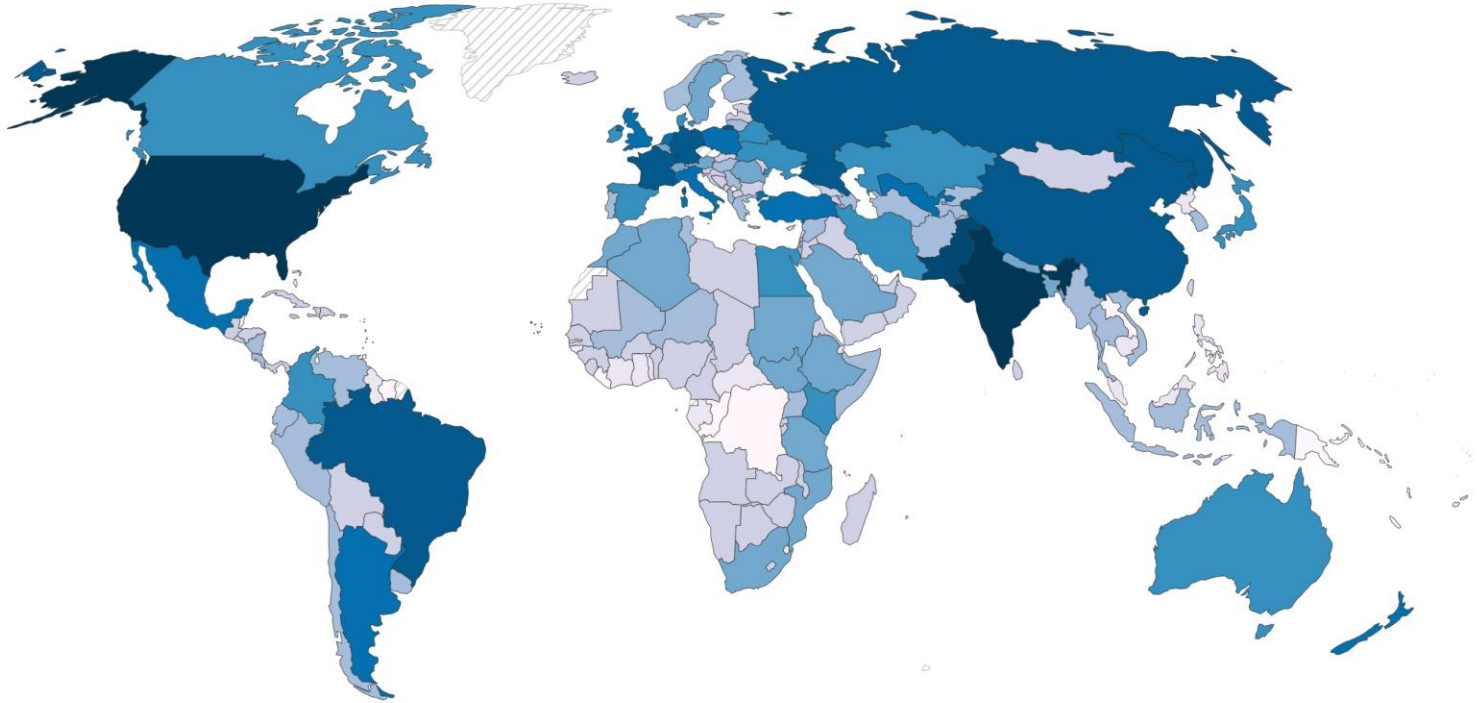
Source: Food and Agriculture Organization of the United Nations

OurWorldInData.org/meat-production • CC BY

Note: Data refers to meat 'available for consumption'. Actual consumption may be lower after correction for food wastage.

MILK PRODUCTION

Milk production, 2021



Source: Food and Agriculture Organization of the United Nations

OurWorldInData.org/meat-production • CC BY

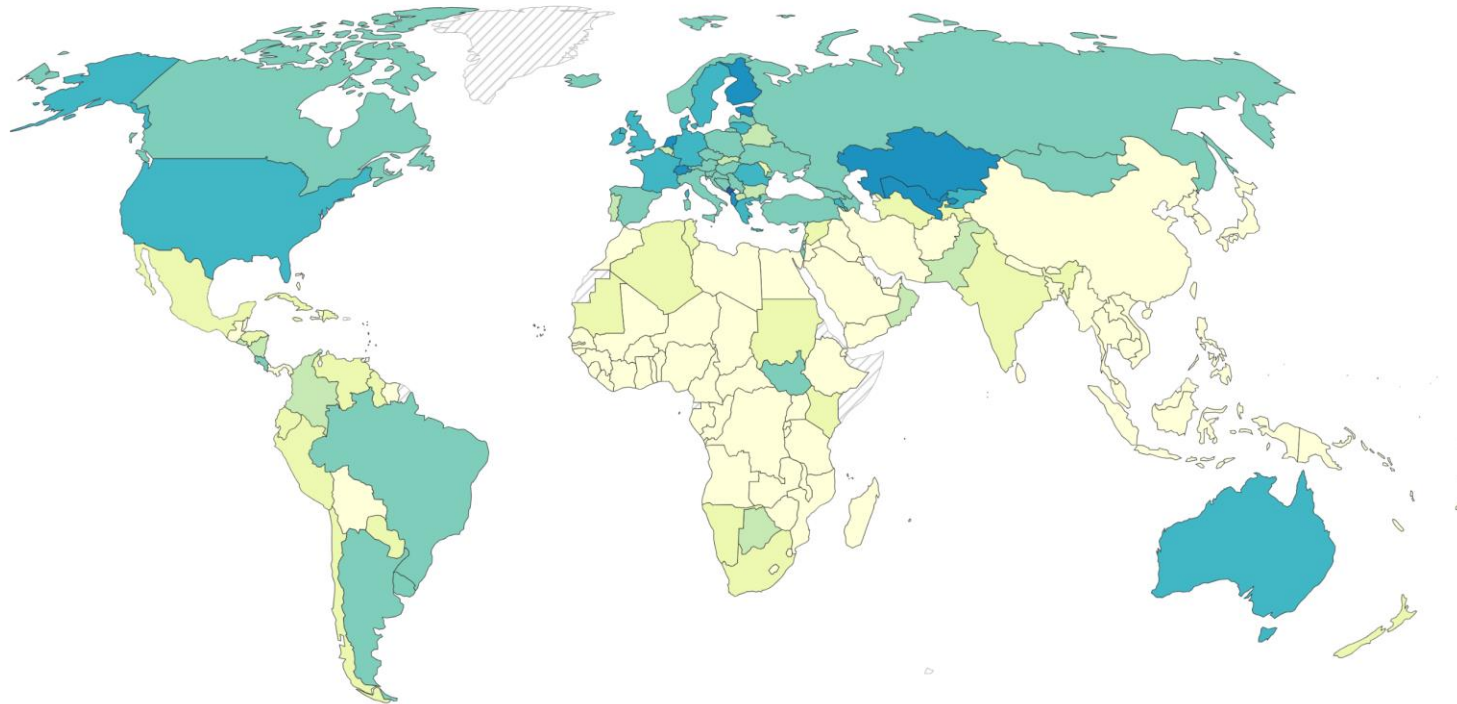
Note: Data on milk production relate to total production of whole fresh milk, excluding the milk sucked by young animals but including amounts fed to livestock.

MILK PRODUCTION

Per capita milk consumption, 2020

Average per capita milk consumption, measured in kilograms per person per year. This includes the milk equivalents of dairy products made from milk ingredients, but excludes butter.

Our World
in Data



Source: Food and Agriculture Organization of the United Nations

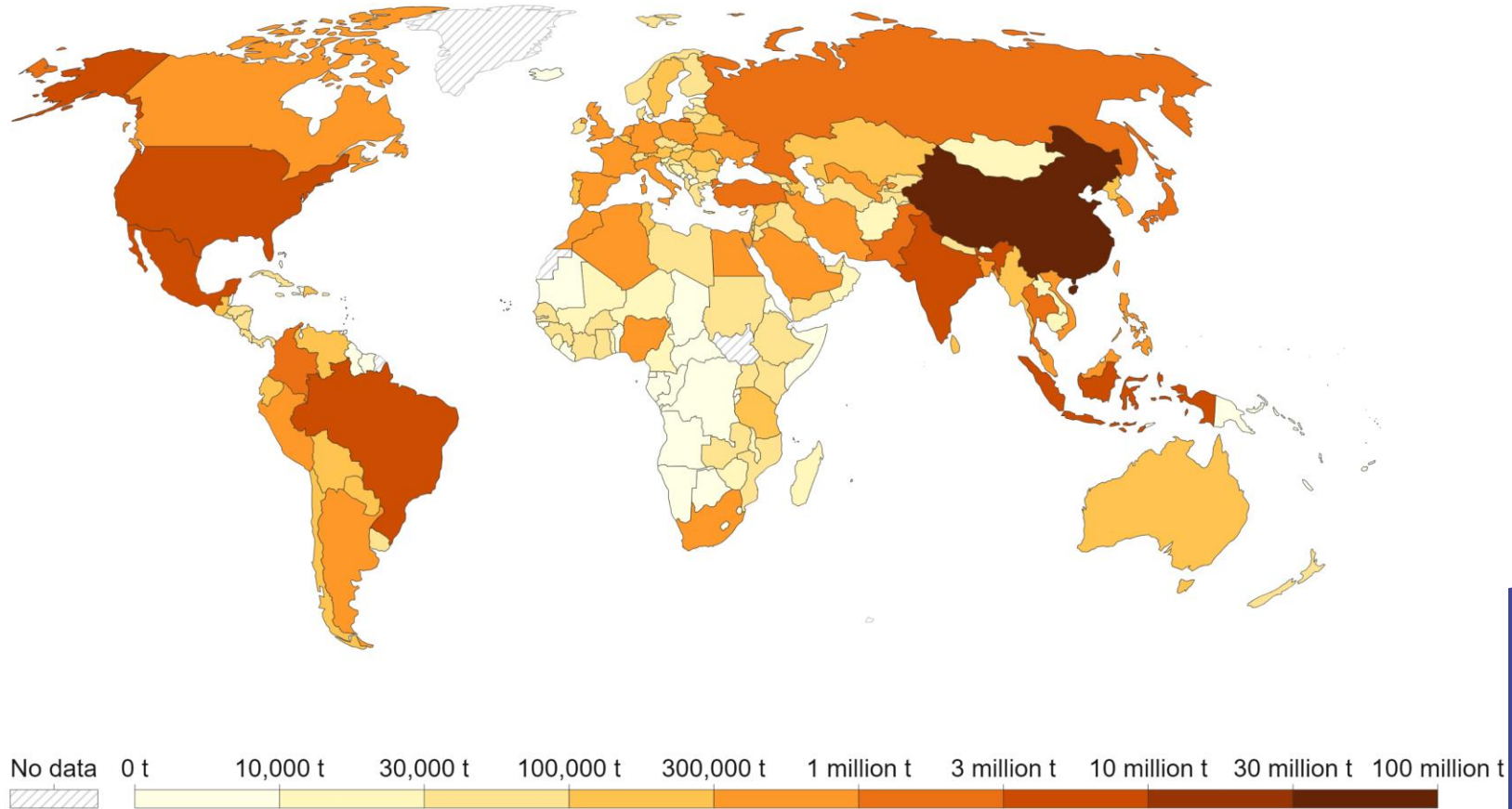
OurWorldInData.org/meat-production • CC BY

Note: Data is based on per capita food supply at the consumer level, but does not account for food waste at the consumer level.

EGG PRODUCTION

Egg production, 2021

Our World
in Data



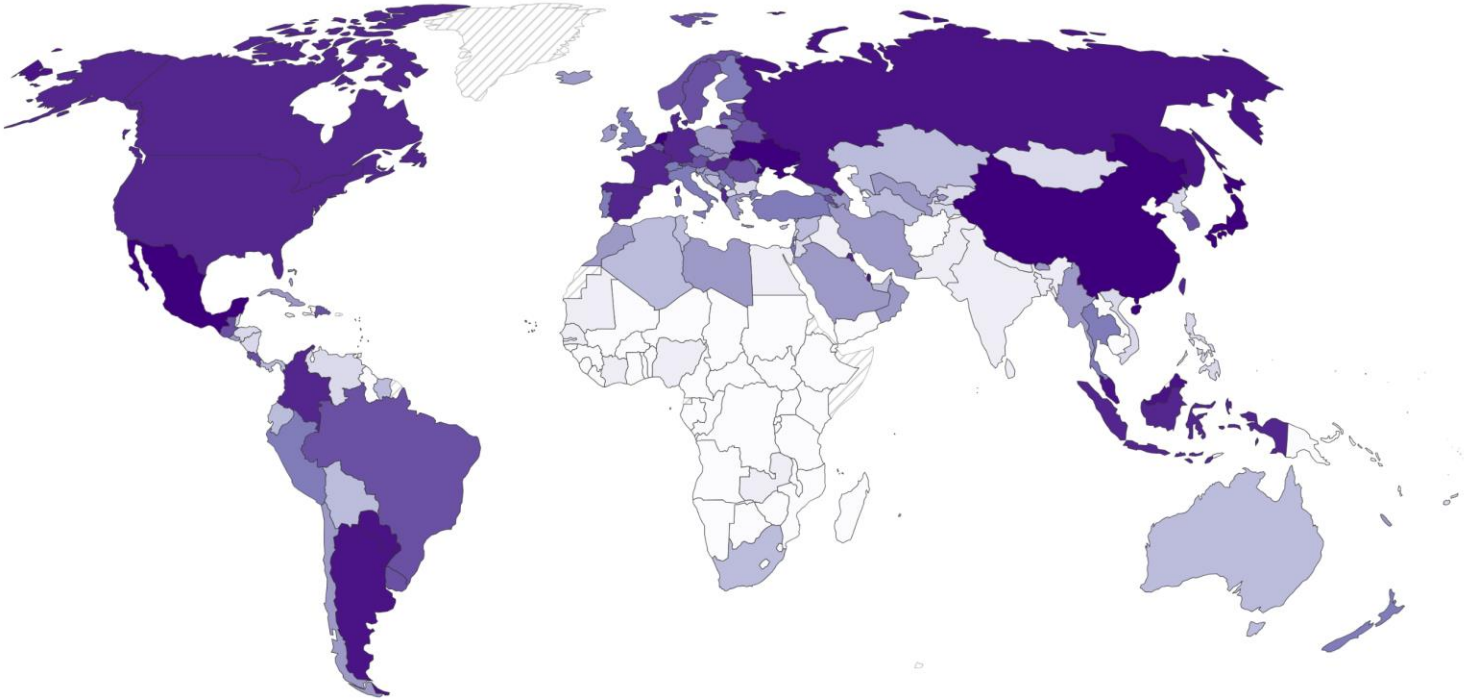
Source: Food and Agriculture Organization of the United Nations
Note: Figures include eggs derived from all domesticated or farmed birds.

OurWorldInData.org/meat-production • CC BY

EGG PRODUCTION

Per capita egg consumption, 2020

Average per capita egg consumption, measured in kilograms per year (in shell weight).



Source: Food and Agriculture Organization of the United Nations
OurWorldInData.org/meat-production • CC BY
Note: Data refers to average per capita food supply at the consumer level, but does not correct for any wastages at the household level.

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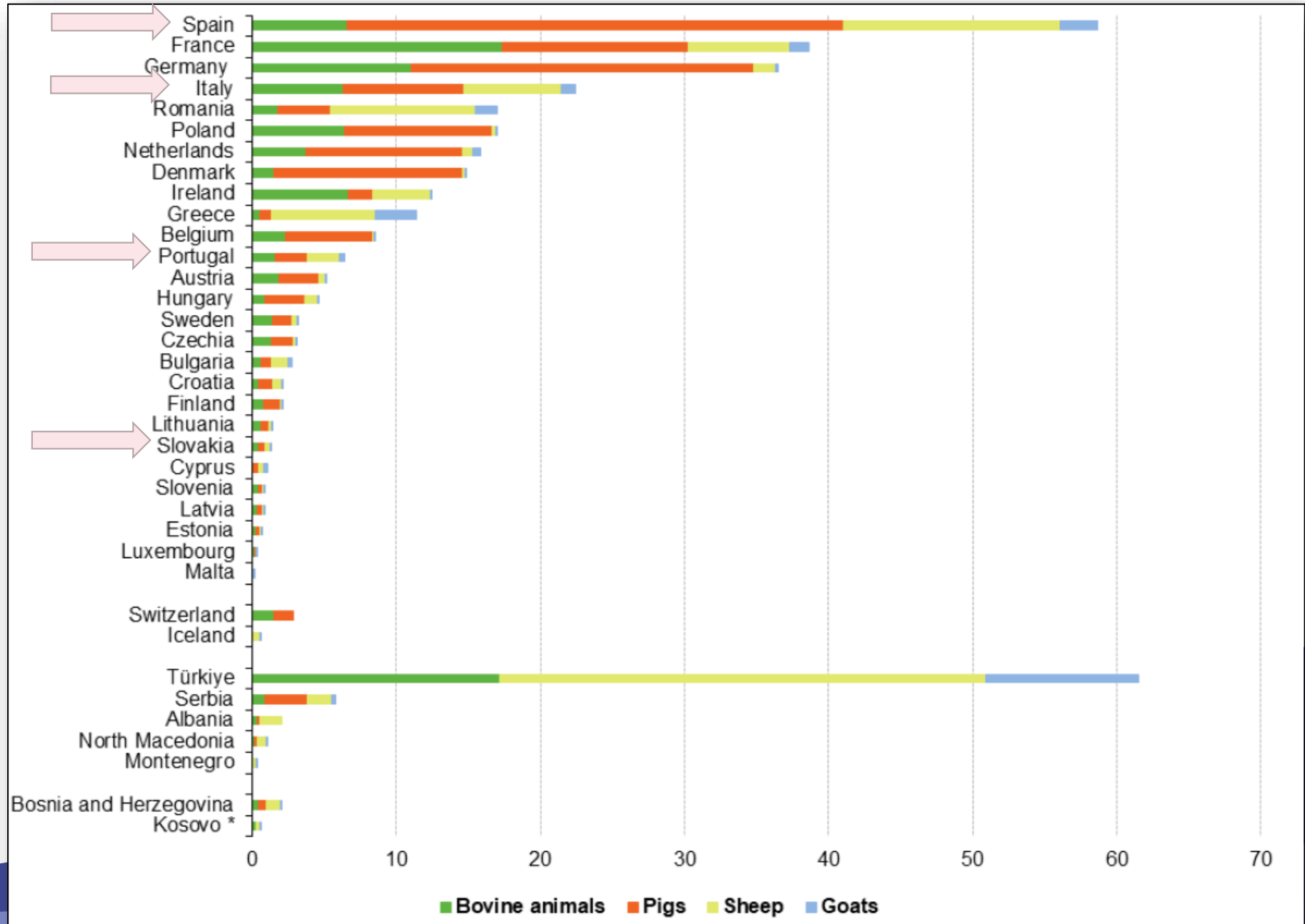
European Framework (data from Eurostat, 2022)

Majority of livestock populations concentrated in just a few countries

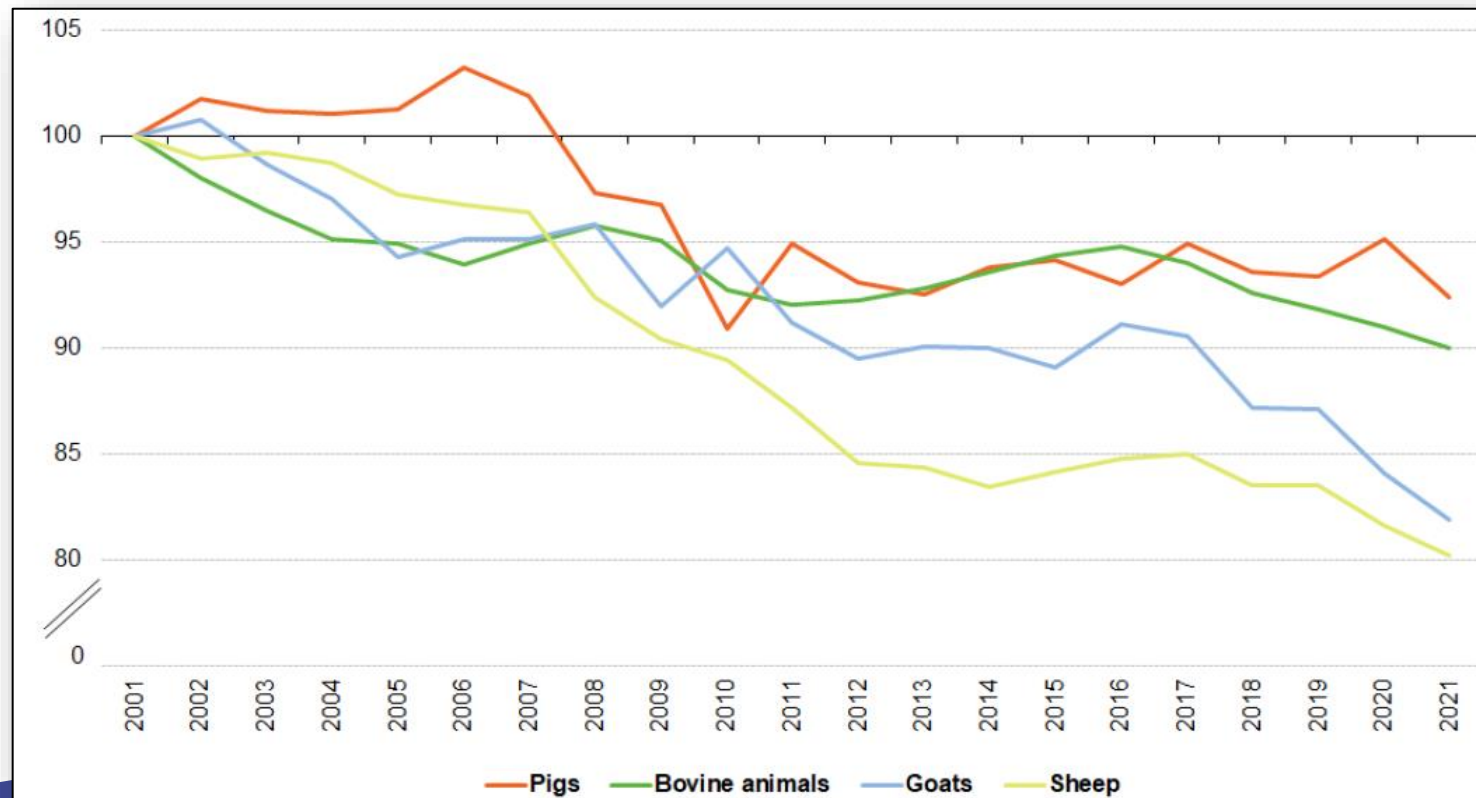
- The EU has a sizeable livestock population: at the end of 2021, there were 142 million head of pigs, 76 million head of bovine animals and 71 million head of sheep and goats.
- A majority of the EU's livestock is held in just a few of the Member States.
- Some of the EU Member States are relatively specialised in terms of livestock farming.
 - Ireland accounted for 8.8 % of the EU's bovine animals in 2021 (slightly more than in Spain and Italy)
 - Denmark accounted for 9.3 % of the EU's pig population (slightly more than in France).
- After Spain, the second and third largest sheep populations in the EU were in Romania (16.7 % of the EU total) and Greece (12.1 %).

European Framework

Livestock Populations.
(million heads, 2021)
Source Eurostat, 2022.

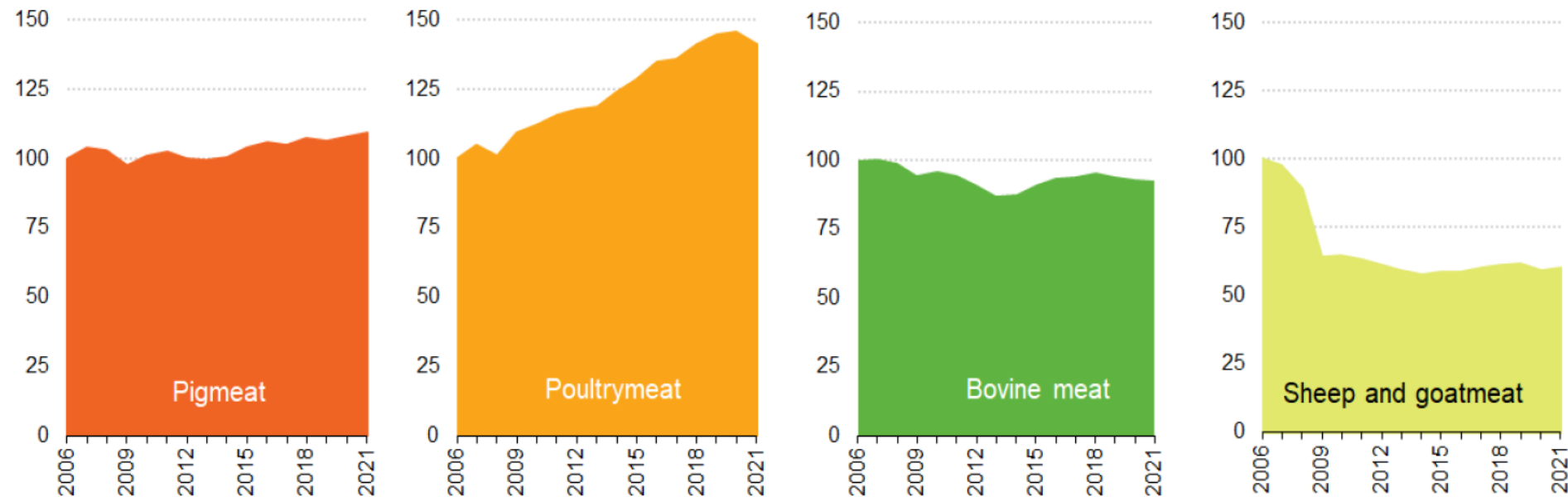


- Between 2001 and 2021, the **number of head of each livestock population decreased**:
 - The **sharpest declines** in percentage terms were recorded for the number of **sheep and goats** (20 %)
 - The **smallest rate of decline** was in **pig** numbers (8 %).
 - The **population of bovine animals in the EU decreased** by 1.1 %
 - **Sharper rates of decline** for **sheep** (down 1.7 %), **goats** (down 2.6 %) and **pigs** (down 2.9 %).



Developments of livestock populations (index 2001=100 based on heads of animals, EU, 2001-2021)
Source Eurostat, 2022.

Better animal welfare improves animal health and food quality. Within the context of the EU's Farm to Fork Strategy, the European Commission plans to revise legislation concerning the slaughter of animals so that it is aligned with scientific evidence, broadening its scope, making it easier to enforce, and ultimately ensuring a higher level of animal protection/welfare. Data is collected on the number and weight of carcasses at slaughterhouses, whose meat is deemed fit for human consumption.



Developments of the quantity of meat production (2006 = 100 based on tonnes, EU, 2006-2021)
Source Eurostat, 2022.

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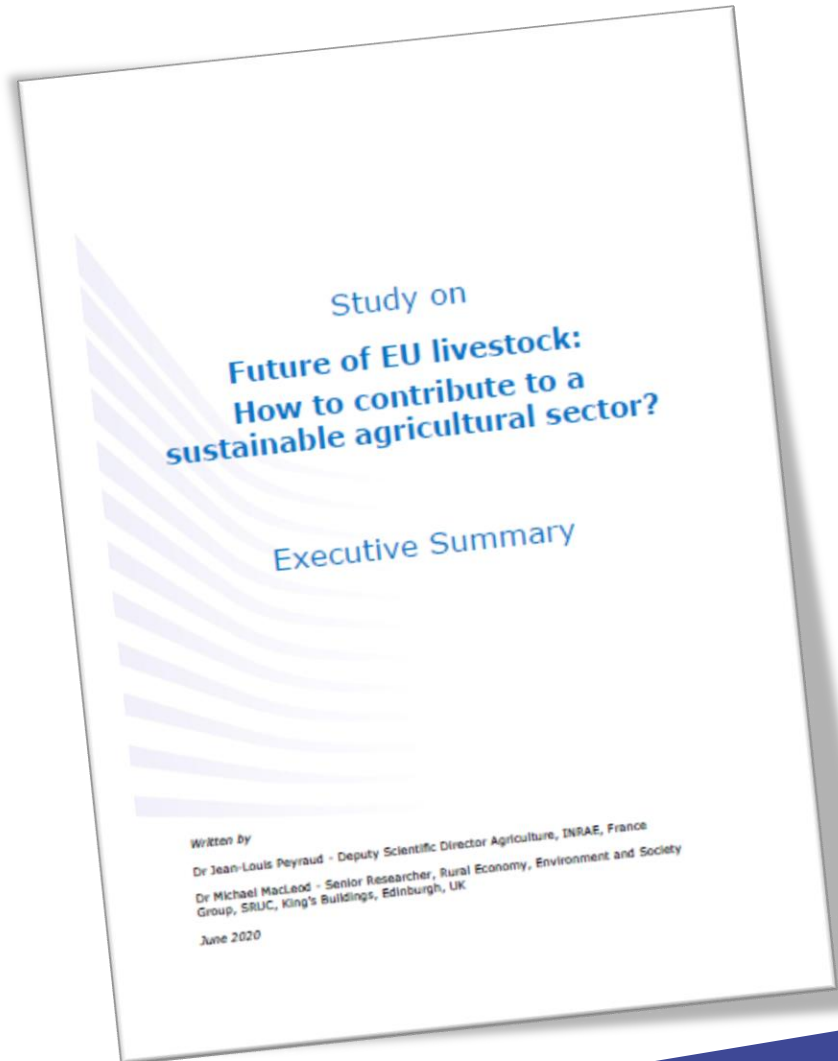
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- **Increased meat consumption** in **developing** countries
- **Decline meat consumption** in **developed** countries
- **Quality** Production
- Respect for the **environment**
- Animal **Welfare**
- Improvement in technologies for the **use of by-products**
- **Sustainable** Production

Worldwide Situation



Executive summary developed by the **European Commission** for the evaluation of the agricultural and livestock sector, in 2020.



Executive Summary – European Commission

Pathways to improved livestock sustainability

3 main ways to increase livestock sustainability:

I. Increasing efficiency

- Precision livestock farming (PLF)
- Increase efficiency without compromising resilience of production systems

II. Substituting high impact inputs with lower impact alternatives

- Use of efficient N-fixing legumes and livestock manure to reduce fertilizers
- Replace protein rich feeds with alternative protein sources.
- Management of microbial communities to improve health through preventive approaches.

III. Redesigning agricultural systems from linear to circular approaches.

- Ability of livestock to use a diversity of plants and recycle non-edible plant material in the food chain.
- Use manure bio-refineries
- Biogas production to obtain renewable energy
- Development of “*Certified emission reduction units*” to implement GHG mitigation projects on farms.



Source: "Can we create the "perfect" farm?" Brent Loken – Ted-Ed Talk youtube video.

Link: <https://youtu.be/xFqecEtdGZO> (7:09 min)

Thank you

