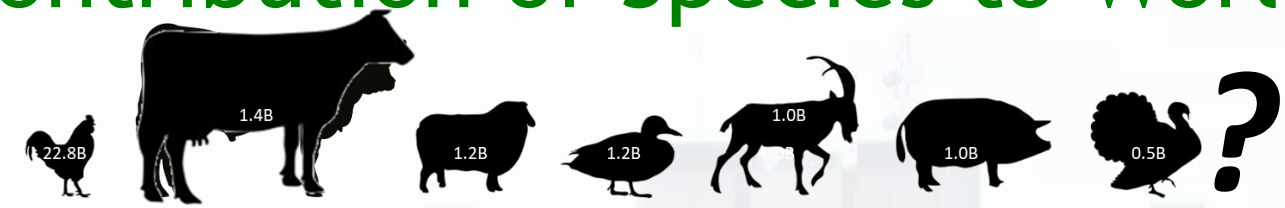
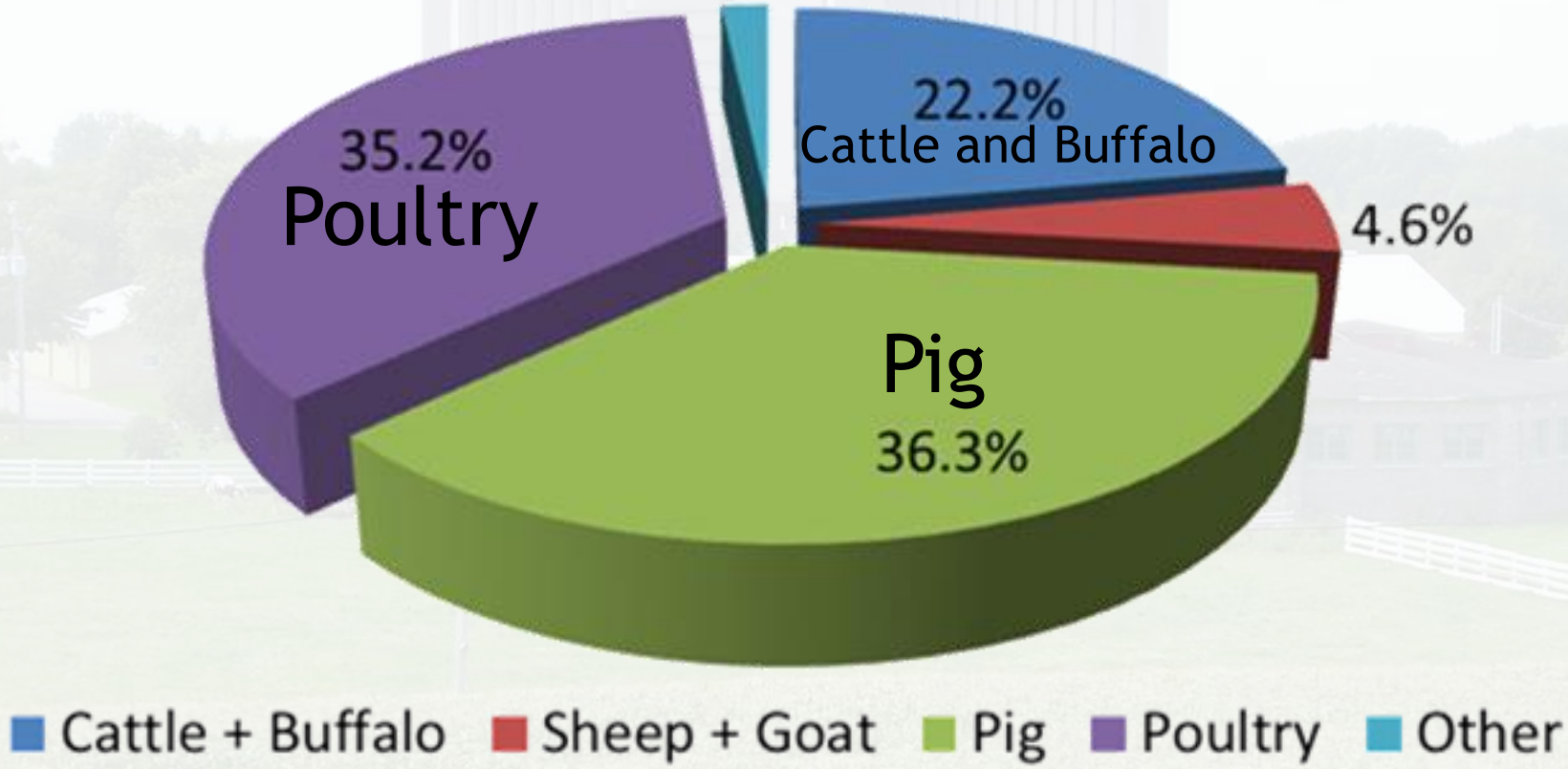
Hundreds of starving wild monkeys scrambled for a single piece of food in Lopburi, Thailand. The primates are normally well fed by tourists, but visitors have plummeted because of the global COVID-19 outbreak (March 23, 2020).

Relative Contribution of Species to World's Meat Supply

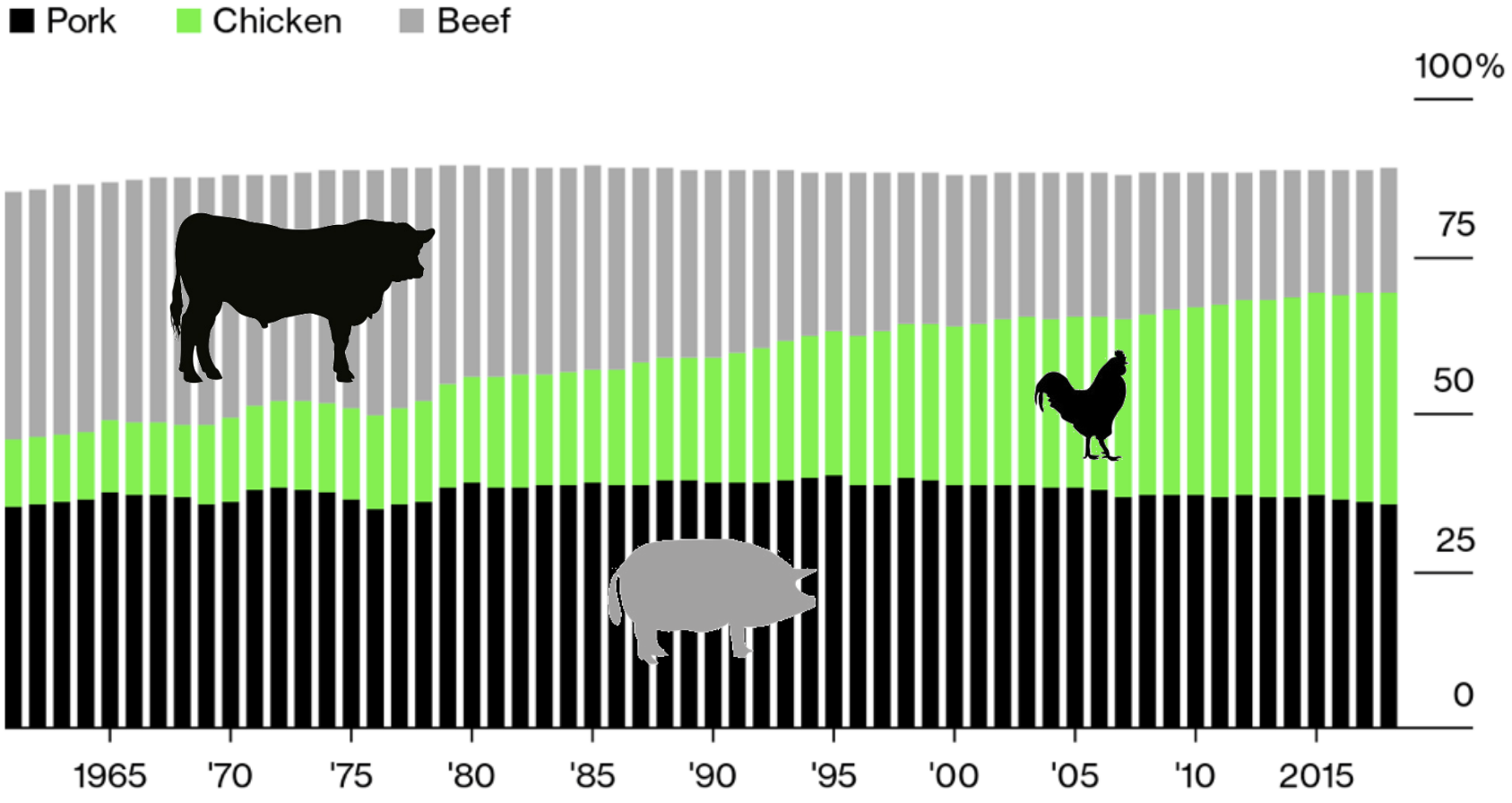




FAO 2012

Remarkably Steady

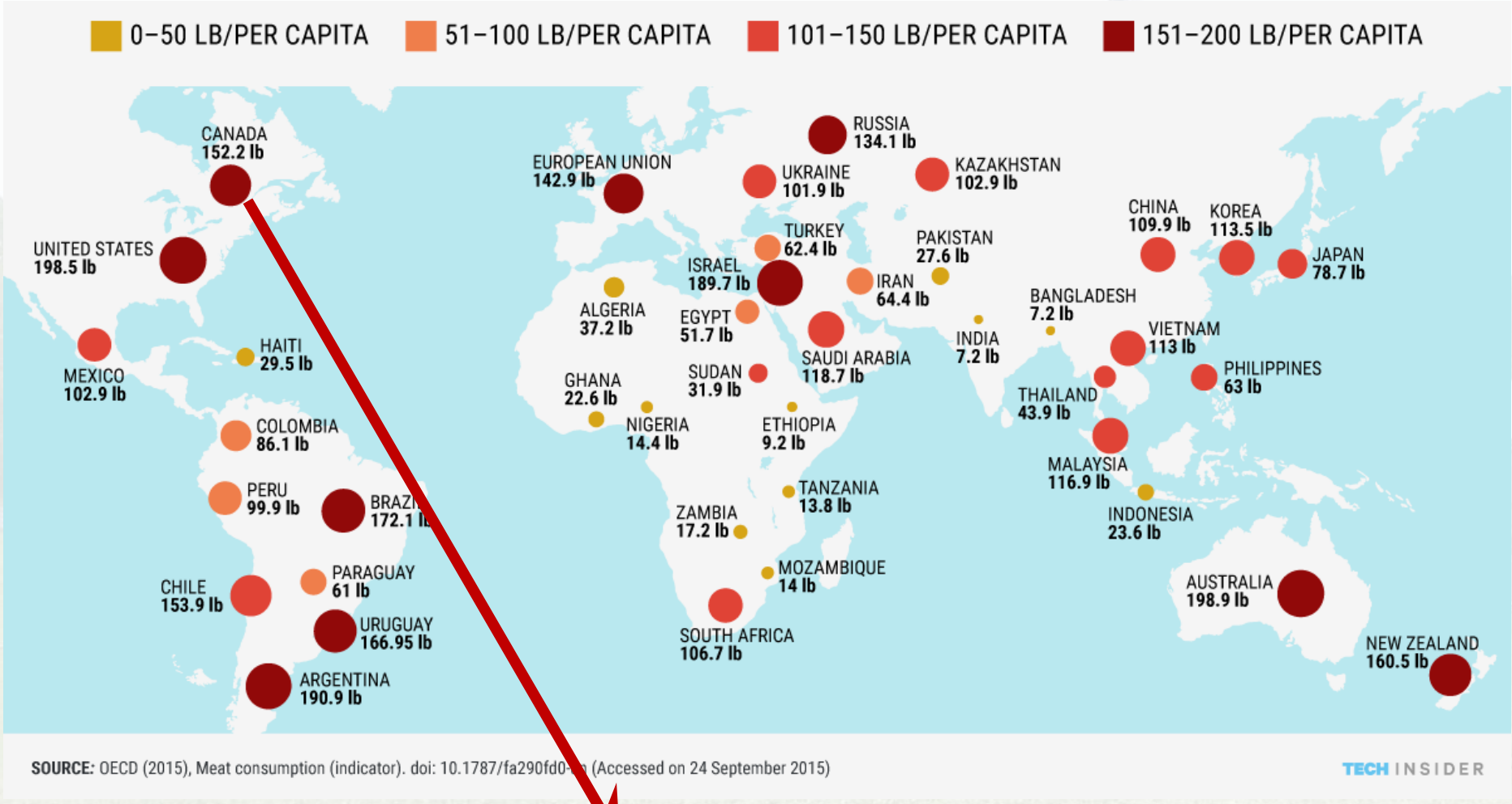
Pork, chicken, and beef production as a percent of all meat production



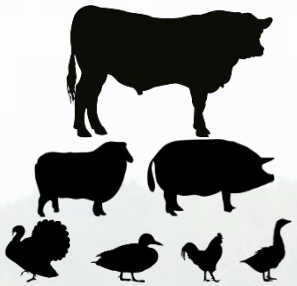
Source: Food and Agriculture Organization

Bloomberg Green

Consumption of Animal-origin Protein in Different Countries



equivalent to 69kg



World Average
34 kg / capita / year

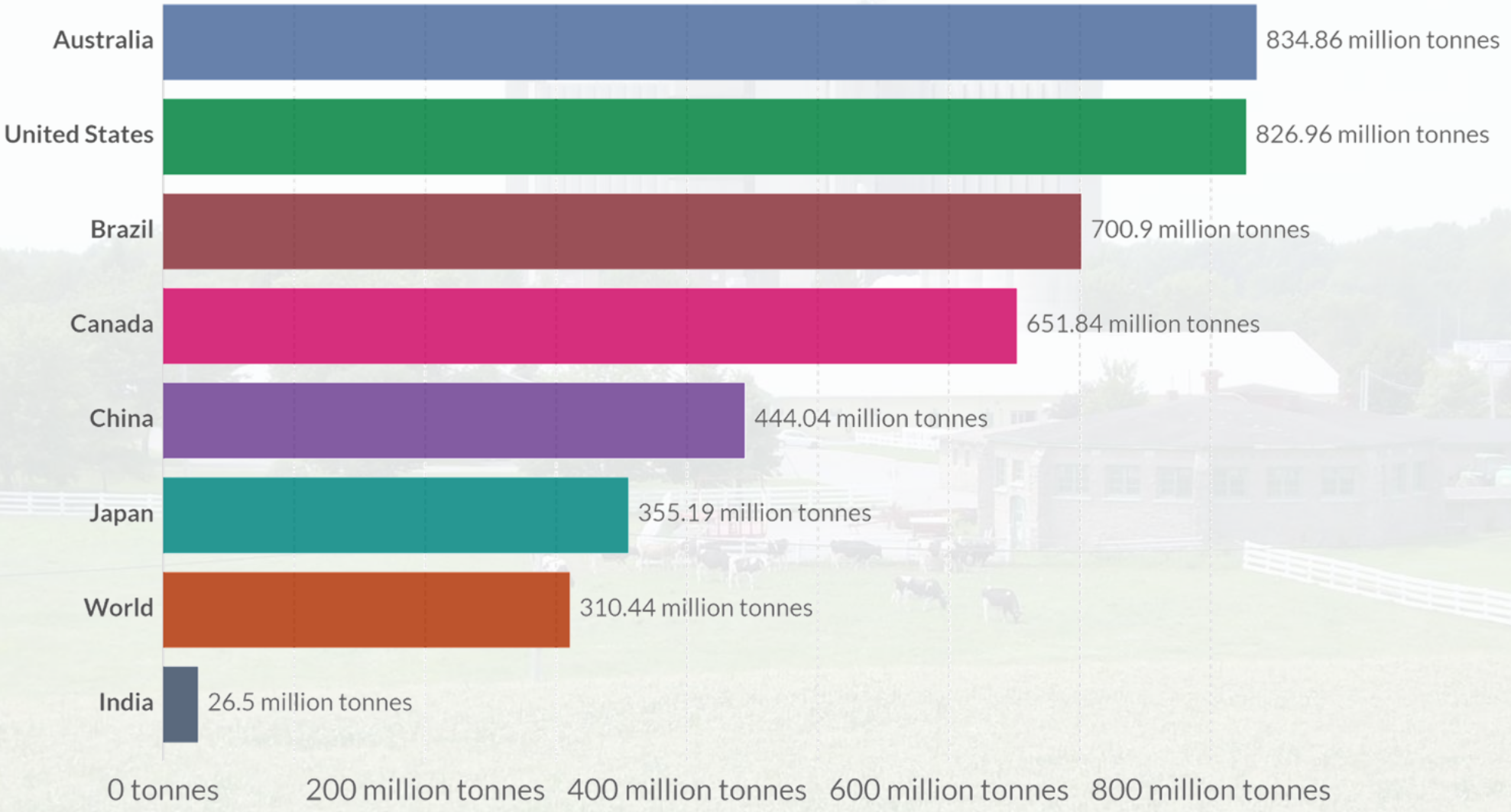
>255 million tonnes

FAO has predicted that we will need 470 million tonnes by 2050

Global meat demand if everyone ate like the average citizen of..., 2013

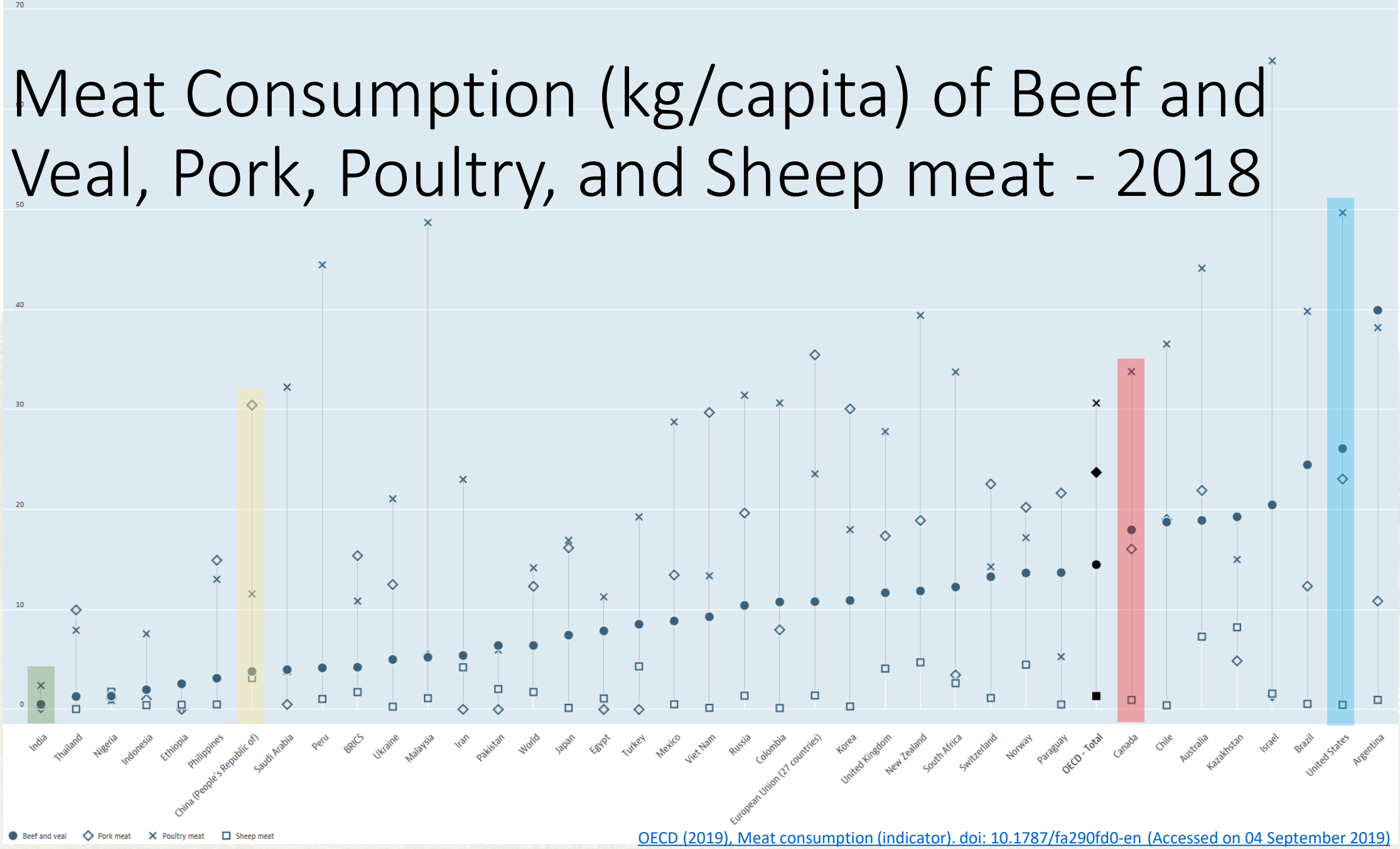
Our World in Data

Hypothetical global meat demand if everyone in the world ate the same quantity as the average citizen of a given country, e.g. data for the USA in 1990 hypothesises global meat demand if everyone in the world consumed the same amount of meat as the average US citizen in 1990. Actual global meat production in 2013 was 310 million tonnes.

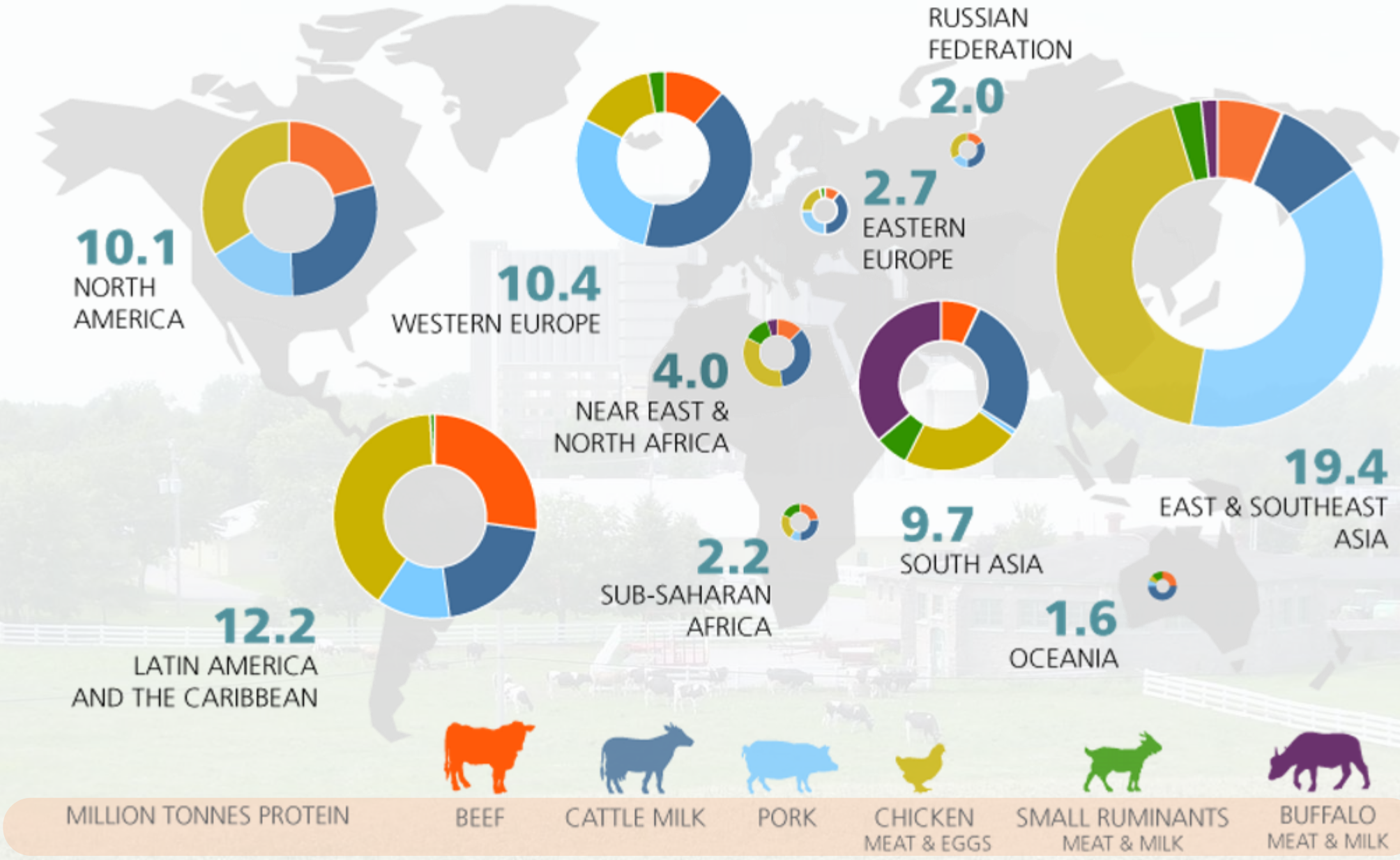


Source: OWID based on FAO & UN

Meat Consumption (kg/capita) of Beef and Veal, Pork, Poultry, and Sheep meat - 2018

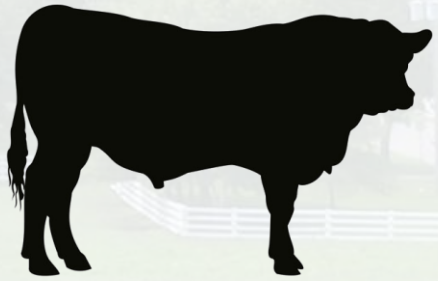


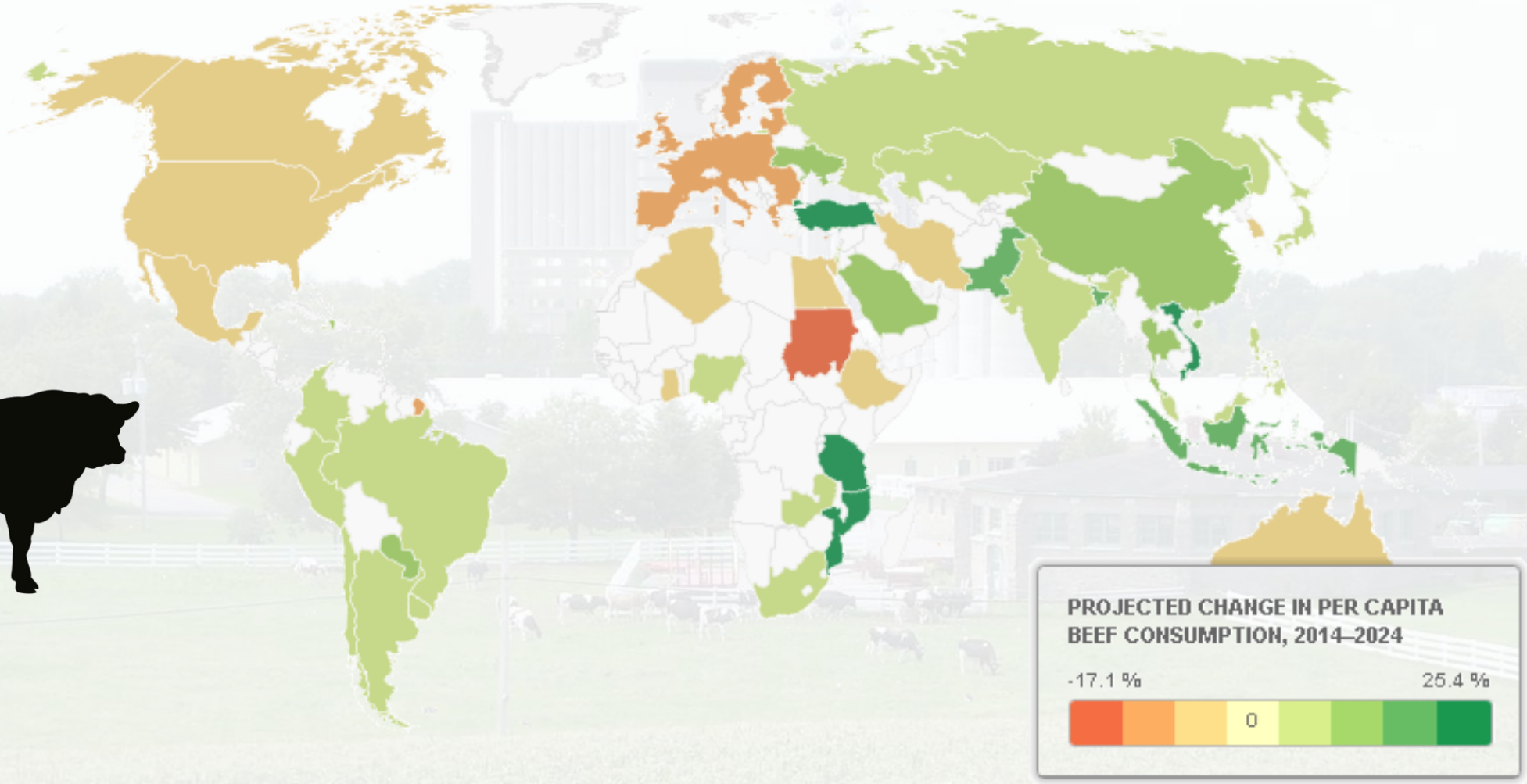
OECD (2019), Meat consumption (indicator). doi: 10.1787/fa290fd0-en (Accessed on 04 September 2019)



Global livestock production by region (milk and eggs expressed in protein terms) (FAO, CC BY-ND).
October 2018

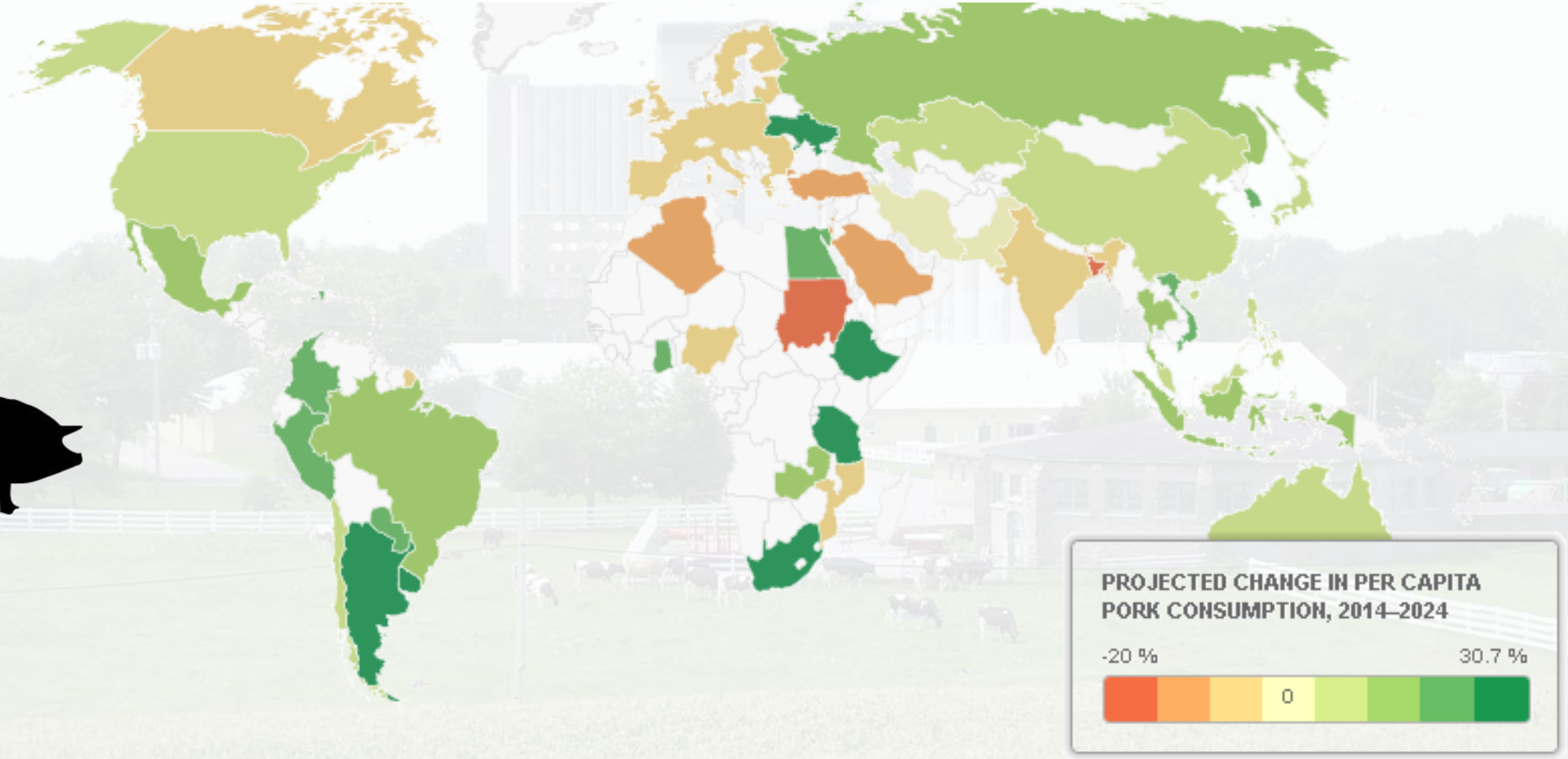
Predicted change in meat consumption (kg/capita): 2014 - 2024





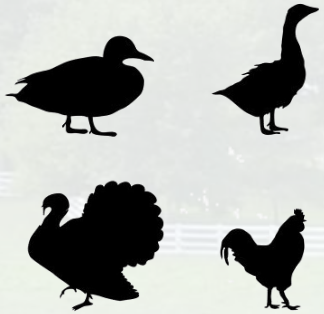
Todd Reubold, Ensia (2015)

Predicted change in meat consumption (kg/capita): 2014 - 2024



Todd Reubold, Ensia (2015)

Predicted change in meat consumption (kg/capita): 2014 - 2024



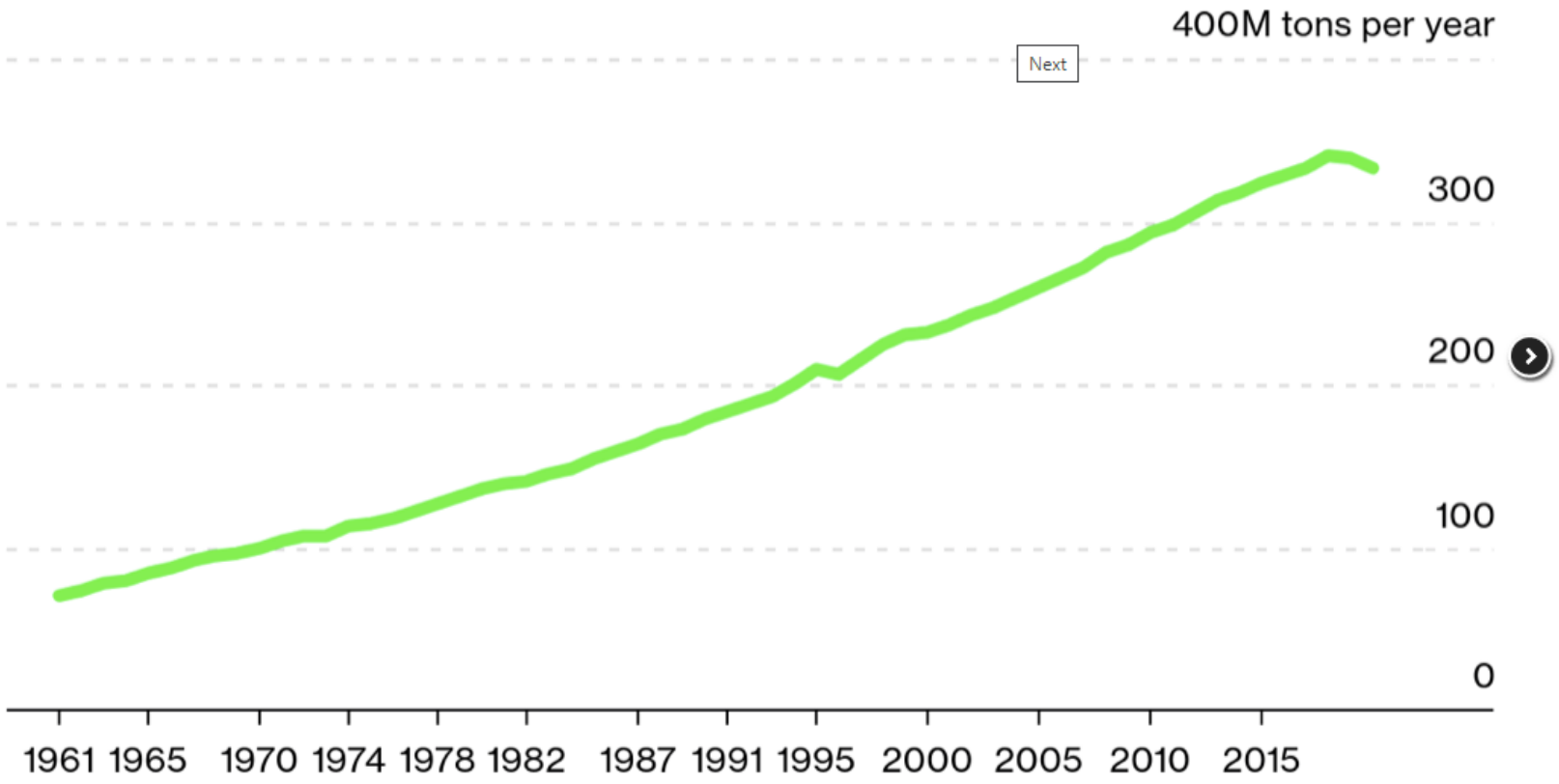
Todd Reubold, Ensia (2015)

Predicted change in meat consumption (kg/capita): 2014 - 2024

Todd Reubold, Ensia (2015)

Meat, Peaked?

Global meat production

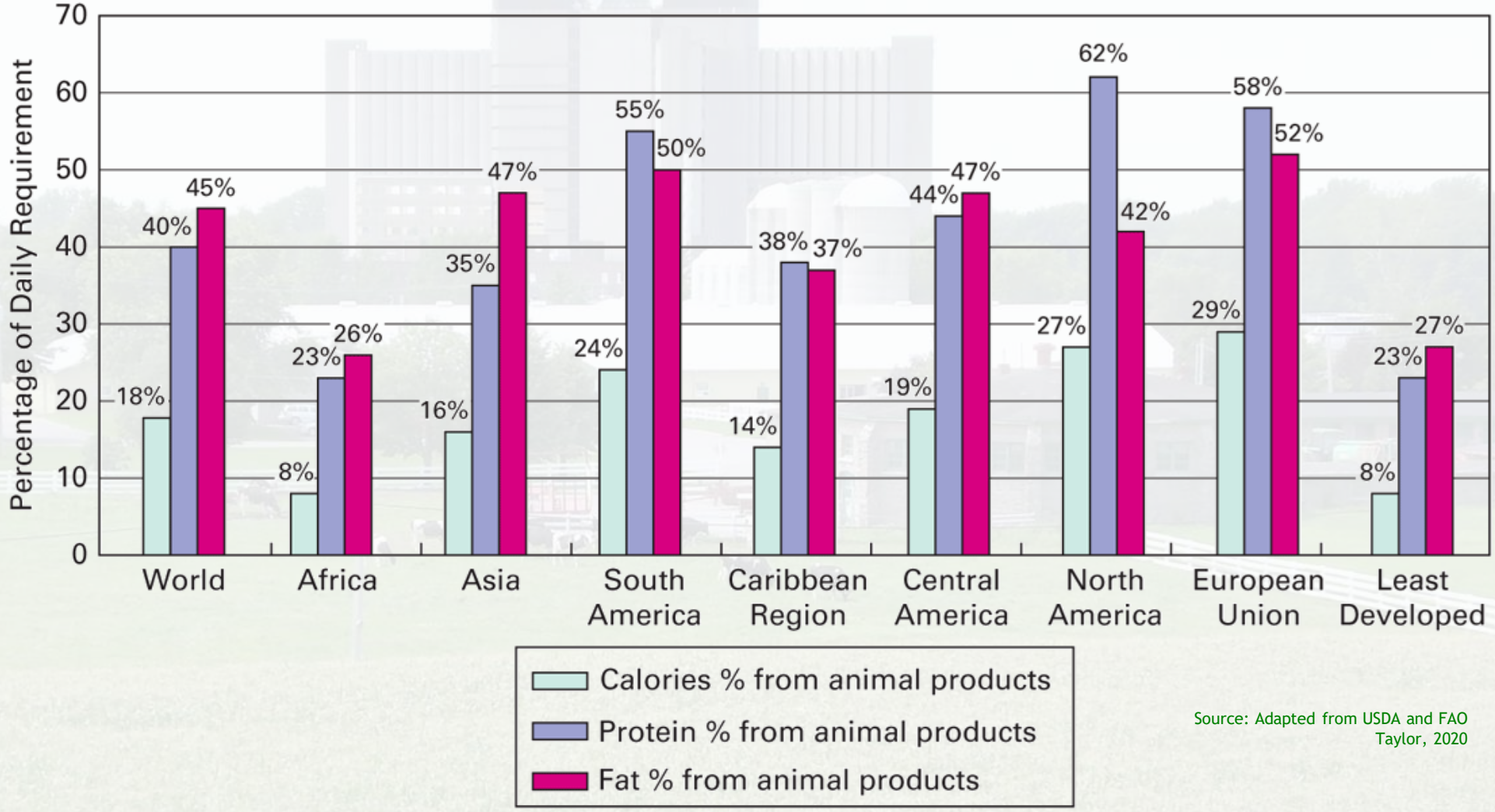


Source: Food and Agriculture Organization
Note: 2019 estimate. 2020 forecast.

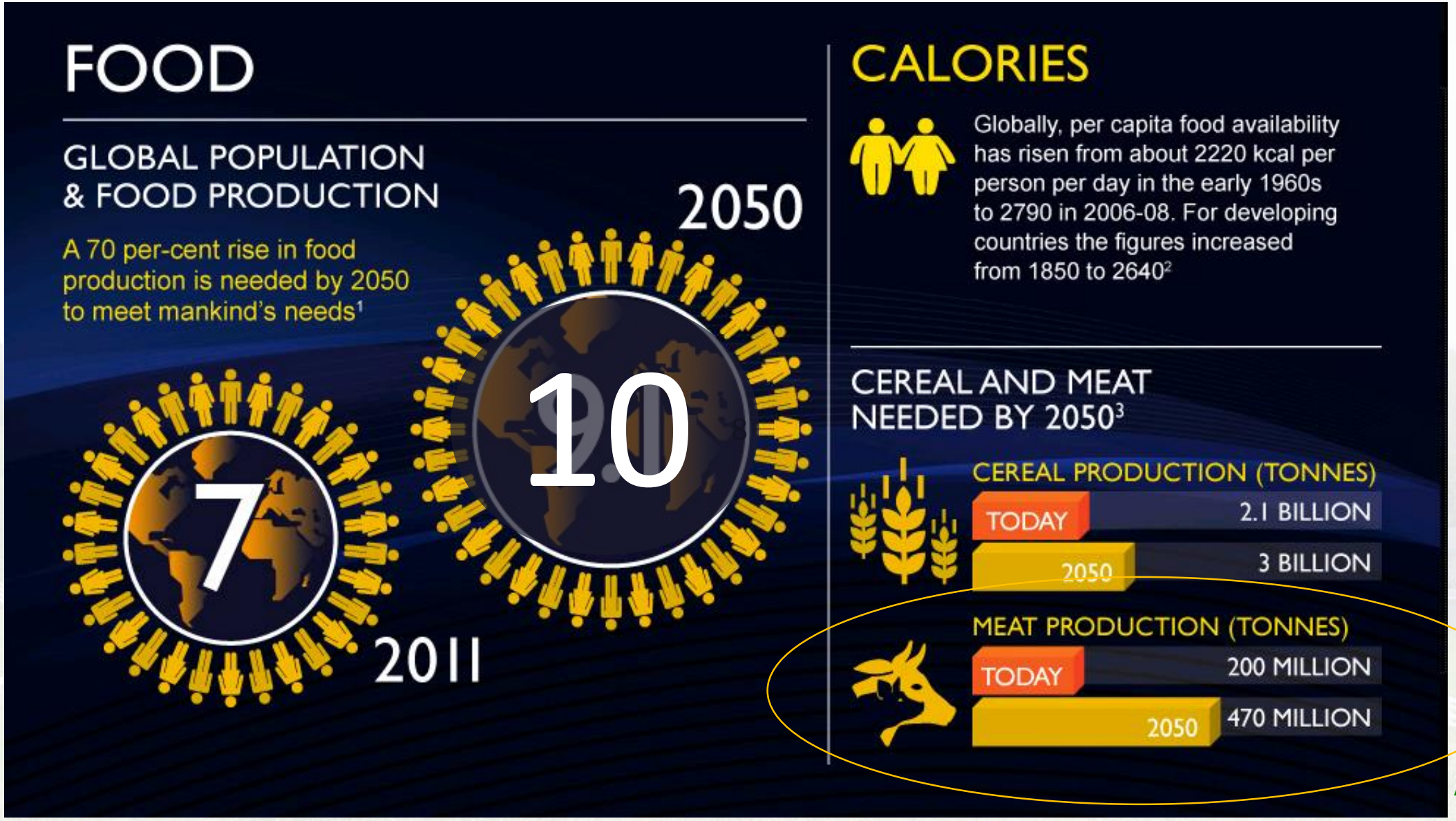
Bloomberg Green

https://www.tappcoalition.eu/nieuws/14456/fao--global-meat-production-decline-in-2019-and-2020

Caloric, protein, and fat intake from animal products.

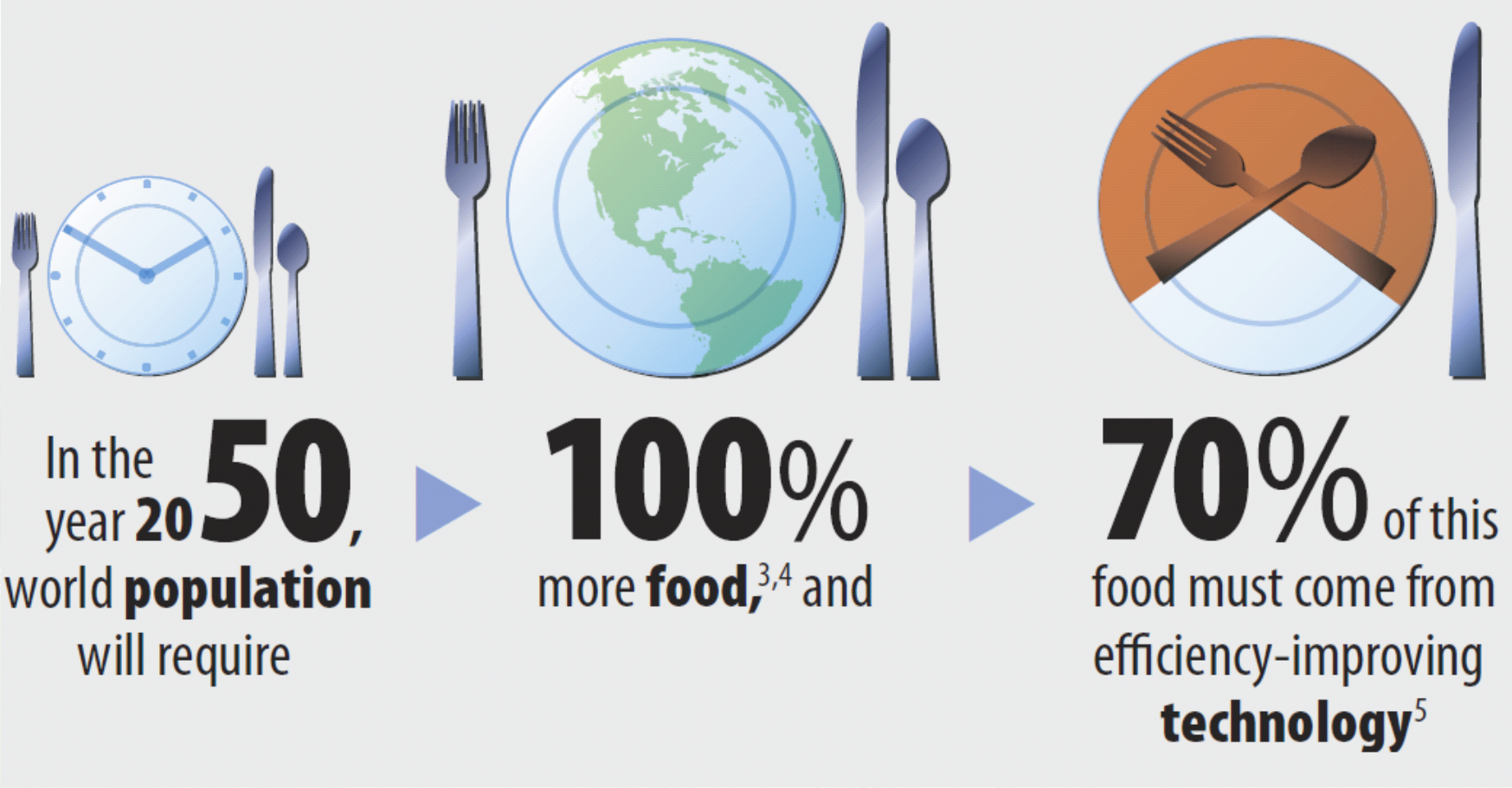


Source: Adapted from USDA and FAO
Taylor, 2020



BBC Horizons
Adapted from FAO

Where can the needed increases come from?

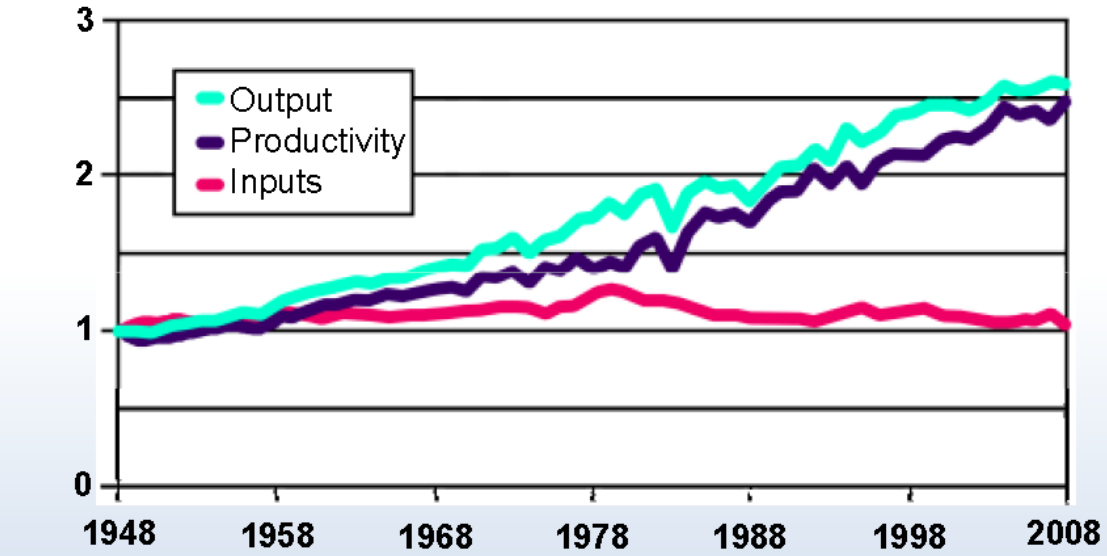


Simmons, J. (2011). Making safe, affordable and abundant food a global reality. Elanco Animal Health White Paper AI11192.

The benefits of technology

U.S. agricultural output, inputs, and total factor productivity, 1948-2008

Index, 1948=1



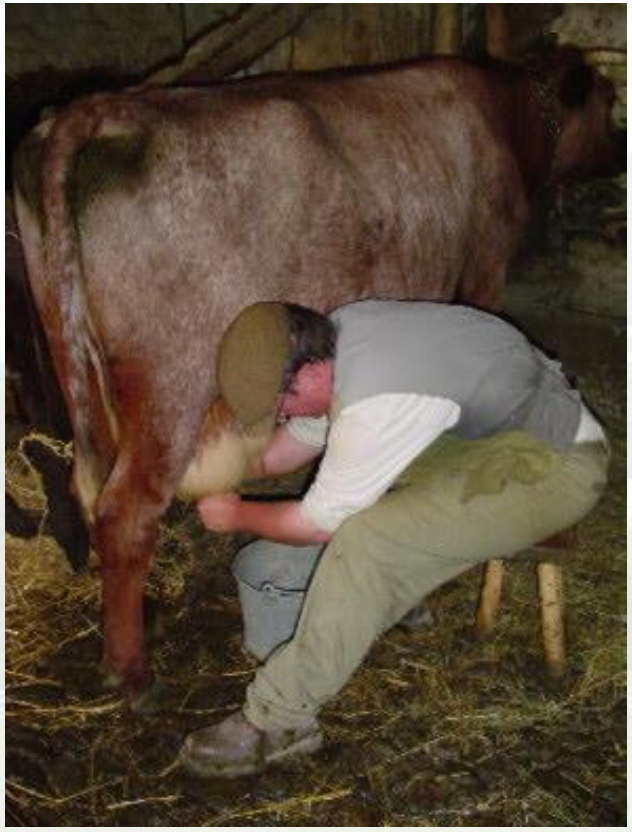
- 60 years
- 150%+ output
- Same input

Source: ERS data product, Agricultural Productivity in the United States.

The Three Rights: Food, Choice, Sustainability

Rob Aukerman, President U.S. Operations, Elanco Animal Health

We've already come a long way!



1960
2,800 litres / cow / year

2019
10,675 litres / cow / year
(10,909 for Holsteins)

Statistics: Agriculture & Agri-food Canada (2015)

Dairy Breeds in Canada - 2019

Average Milk Production Weight and Component Percentage by Breed

Holstein
93% of national herd
10,909 kg milk per cow
3.98% fat, 3.27% protein

Ayrshire
2% of national herd
8,159 kg milk per cow
4.15% fat, 3.41% protein

Jersey
4% of national herd
7,106 kg milk per cow
5.13% fat, 3.87% protein

Brown Swiss
8,982 kg milk per cow
4.22% fat, 3.55% protein

Milking Shorthorn
7,335 kg milk per cow
3.99% fat, 3.31% protein

Guernsey
7,276 kg milk per cow
4.74% fat, 3.51% protein

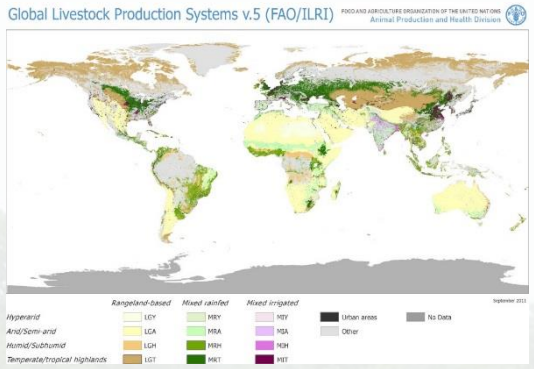
Canadienne
6,065 kg milk per cow
4.29% fat, 3.60% protein

TABLE 1.7 Productivity Changes in Several Farm Animal Species in the United States

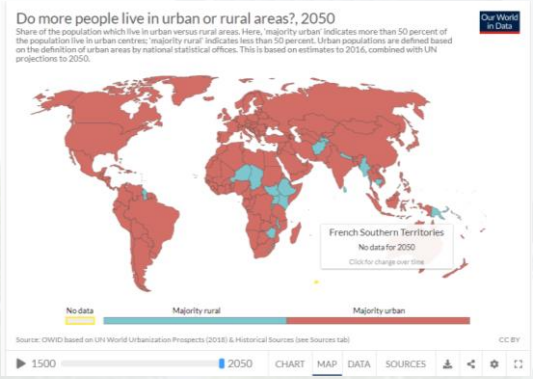
Species and Measure of Productivity	1925	1950	1975	1990	1995
Beef cattle					
Carcass weight (per year) marketed per breeding female (lb)	220	310	482	524	540
Sheep					
Liveweight marketed per breeding female (lb)	60	90	130	145	145
Dairy cattle					
Milk marketed per breeding female (lb)	4,189	5,313	10,500	14,000	16,400
Swine					
Liveweight marketed per breeding female (lb)	1,600	2,430	2,850	3,500	4,590
Broiler chickens					
Age to market weight (weeks)	15.0	12.0	7.5	7.4	7.3
Feed per pound of gain (lb)	4.0	3.3	2.1	1.9	1.8
Liveweight at marketing (lb)	2.8	3.1	3.8	4.5	5.09
Turkeys					
Age to market weight (weeks)	34	24	19	16	16
Feed per pound of gain (lb)	5.5	4.5	3.1	2.6	2.5
Liveweight at marketing (lb)	13.0	18.6	18.4	21.1	23.1
Laying hens					
Eggs per hen per year (no.)	112	174	232	250	254
Feed per dozen eggs (lb)	8.0	5.8	4.2	4.0	3.2

Source: Adapted from *Food from Animals*, CAST Report 82.

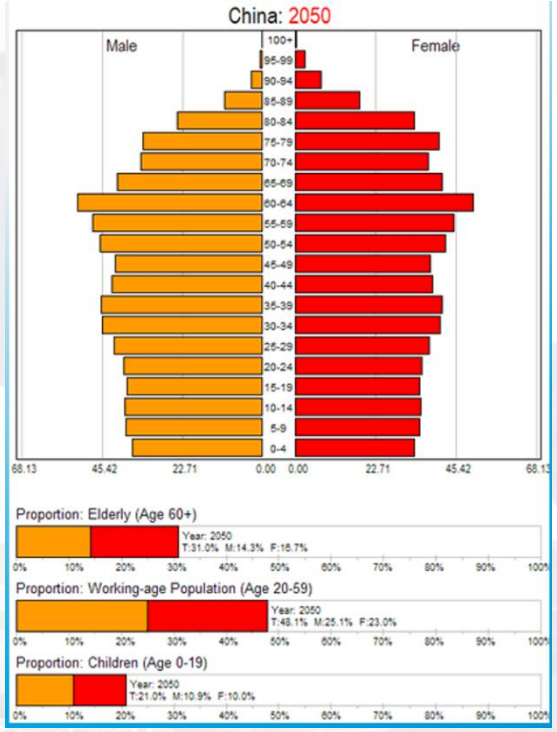
Challenges in our ability to feed the world!



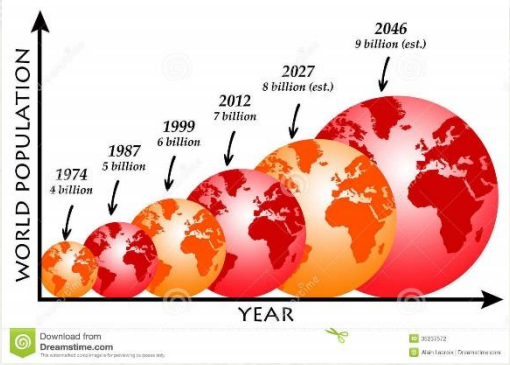
Only 10% Arable Land



Already 56% Urban



Changing Demographics



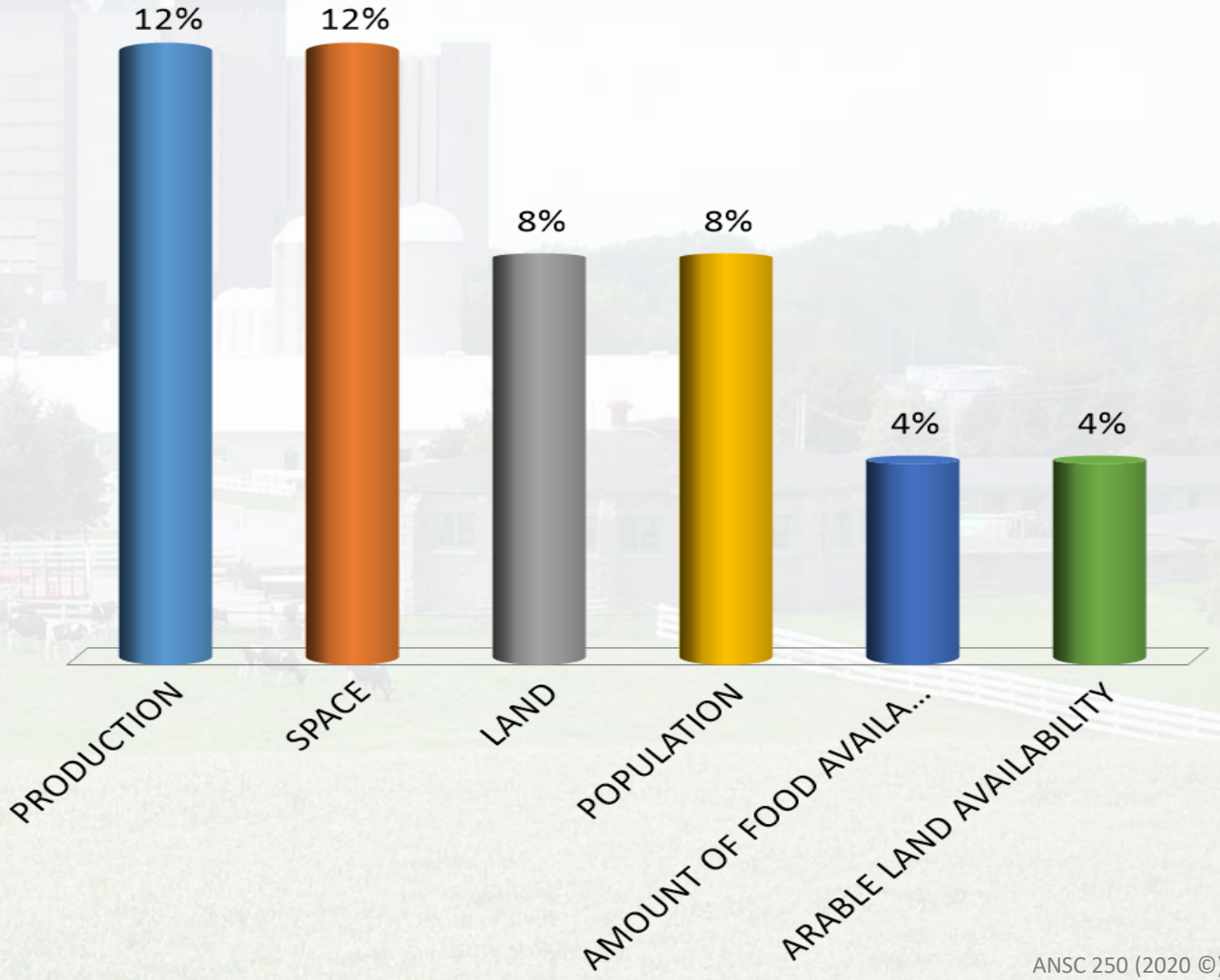
10 Billion by 2050

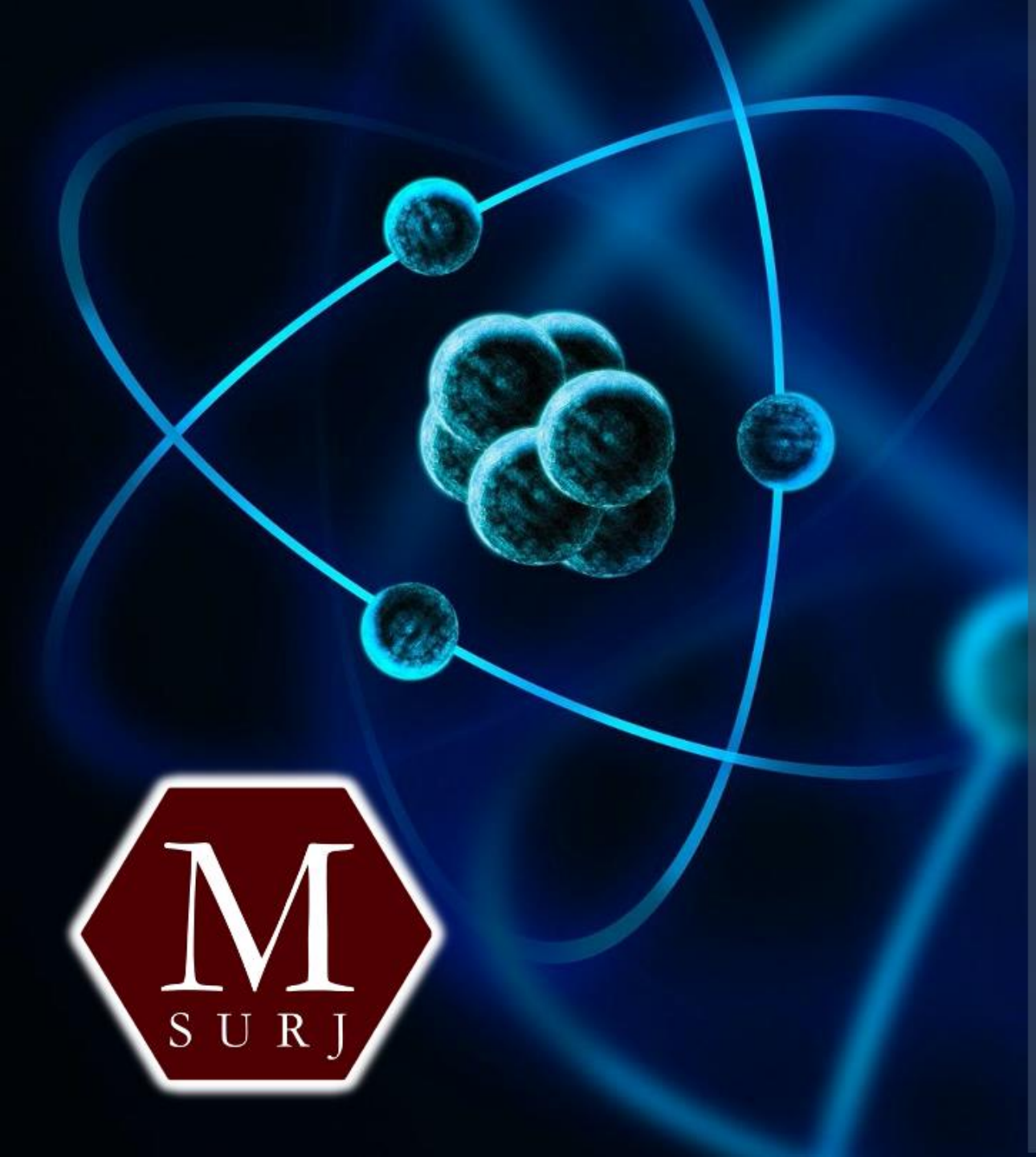
Megacities

Consumer Attitudes

What is our biggest challenge to feeding the World of 2050?

Class of 2019…





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