



The Great Food Transformation 2019 – 2050



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The Great Food Transformation

On the 16th January 2019, The Lancet published the report '**Food in the Anthropocene: the EAT-Lancet Commission on healthy diets from sustainable food systems**'.

The report contains radical recommendations on the global public's diet that take on board both health and environmental sustainability, also dubbed '*win-win diets*'.

Healthy Diets.

The authors state in their opening words that '*unhealthy diets pose a greater risk to morbidity and mortality than does unsafe sex, alcohol, drug and tobacco use combined.*' With unhealthy diets are meant: **Undernutrition, Malnutrition, and Overnutrition.**

- 821 million people are undernourished. (10.9% of the world's population(WP))
- 2.1 billion adults are overweight or obese as a result from high-calorie diets. (27.6% of WP)

Sustainable food systems.

'Strong evidence indicates that food production is among the largest drivers of global environmental change by contributing to climate change, biodiversity loss, freshwater use, interference with the global nitrogen and phosphorus cycles, and land-system change'

- Despite the Paris agreement, in 2017 GHG emissions from Agriculture in the EU increased by 0.4%.

Dairy-related summary

Below we are summarising the report with a focus on Dairy and are adding our comments.

In absence of already existing scientific targets for achieving healthy diets from sustainable food systems, the authors describe a universal healthy reference diet to provide a basis for estimating the health and environmental effects of adopting an alternative diet to standard current diets.

This healthy reference diet largely consists of vegetables, fruits, whole grains, legumes, nuts, and unsaturated oils, includes a low to moderate amount of dairy, seafood and poultry, and includes no or a low quantity of red meat, processed meat, added sugar, refined grains, and starchy vegetables.

The scientific targets for healthy diets and sustainable food systems are integrated into a common framework, the ***Safe Operating Space*** for food systems, so that ***win-win diets*** (ie, healthy and environmentally sustainable) can be identified. The authors propose that this framework is universal for all food cultures and production systems in the world, with a high potential of local adaptation and scalability

Application of this framework to future projections of world development indicates that food systems can provide healthy diets (ie, reference diet) for an estimated global population of about 10 billion people by 2050 and remain within a safe operating space. However, even small increases in consumption of red meat or dairy foods would make this goal difficult or impossible to achieve.

Food production is the largest cause of global environmental change. Agriculture occupies about 40% of global land and food production, is responsible for up to 30% of global greenhouse-gas emissions and 70% of freshwater use. Conversion of natural ecosystems to croplands and pastures is the largest factor causing species to be threatened with extinction.

The global food system needs to be transformed to reduce its effect on human health and environmental stability and begin reversing current trends. However, this transformation will not be achieved without people changing how they view and engage with food systems. This change in thinking should recognise the inextricable link between human health and environmental sustainability and integrate these separate concerns into a common global agenda to achieve healthy diets from sustainable food systems.

Transitioning to food systems that can provide negative emissions (ie, ***function as a major carbon sink instead of a major carbon source***) and protecting carbon sinks in natural ecosystems are both required to reach this goal.

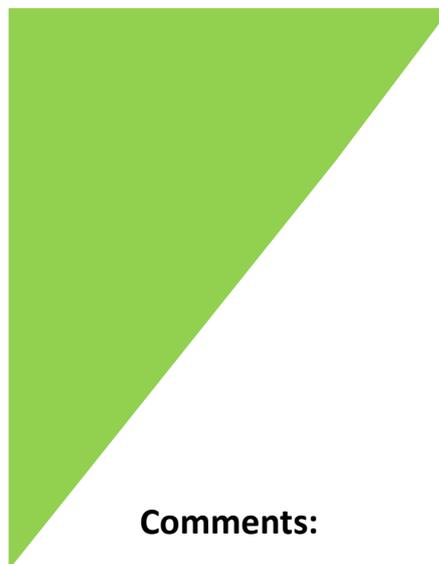
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	Macronutrient intake (possible range), g/day	Caloric intake, kcal/day
Whole grains*		
Rice, wheat, corn, and other†	232 (total grains 0–60% of energy)	811
Tubers or starchy vegetables		
Potatoes and cassava	50 (0–100)	39
Vegetables		
All vegetables	300 (200–600)	..
Dark green vegetables	100	23
Red and orange vegetables	100	30
Other vegetables	100	25
Fruits		
All fruit	200 (100–300)	126
Dairy foods		
Whole milk or derivative equivalents (eg, cheese)	250 (0–500)	153
Protein sources‡		
Beef and lamb	7 (0–14)	15
Pork	7 (0–14)	15
Chicken and other poultry	29 (0–58)	62
Eggs	13 (0–25)	19
Fish§	28 (0–100)	40
Legumes		
Dry beans, lentils, and peas*	50 (0–100)	172
Soy foods	25 (0–50)	112
Peanuts	25 (0–75)	142
Tree nuts	25	149
Added fats		
Palm oil	6.8 (0–6.8)	60
Unsaturated oils¶	40 (20–80)	354
Dairy fats (included in milk)	0	0
Lard or tallow	5 (0–5)	36
Added sugars		
All sweeteners	31 (0–31)	120

For an individual, an optimal energy intake to maintain a healthy weight will depend on body size and level of physical activity. Processing of foods such as partial hydrogenation of oils, refining of grains, and addition of salt and preservatives can substantially affect health but is not addressed in this table.

*Wheat, rice, dry beans, and lentils are dry, raw. †Mix and amount of grains can vary to maintain isocaloric intake. ‡Beef and lamb are exchangeable with pork and vice versa. Chicken and other poultry is exchangeable with eggs, fish, or plant protein sources. Legumes, peanuts, tree nuts, seeds, and soy are interchangeable. §Seafood consist of fish and shellfish (eg, mussels and shrimps) and originate from both capture and from farming. Although seafood is a highly diverse group that contains both animals and plants, the focus of this report is solely on animals. ¶Unsaturated oils are 20% each of olive, soybean, rapeseed, sunflower, and peanut oil. ||Some lard or tallow are optional in instances when pigs or cattle are consumed.

Table 1: Healthy reference diet, with possible ranges, for an intake of 2500 kcal/day

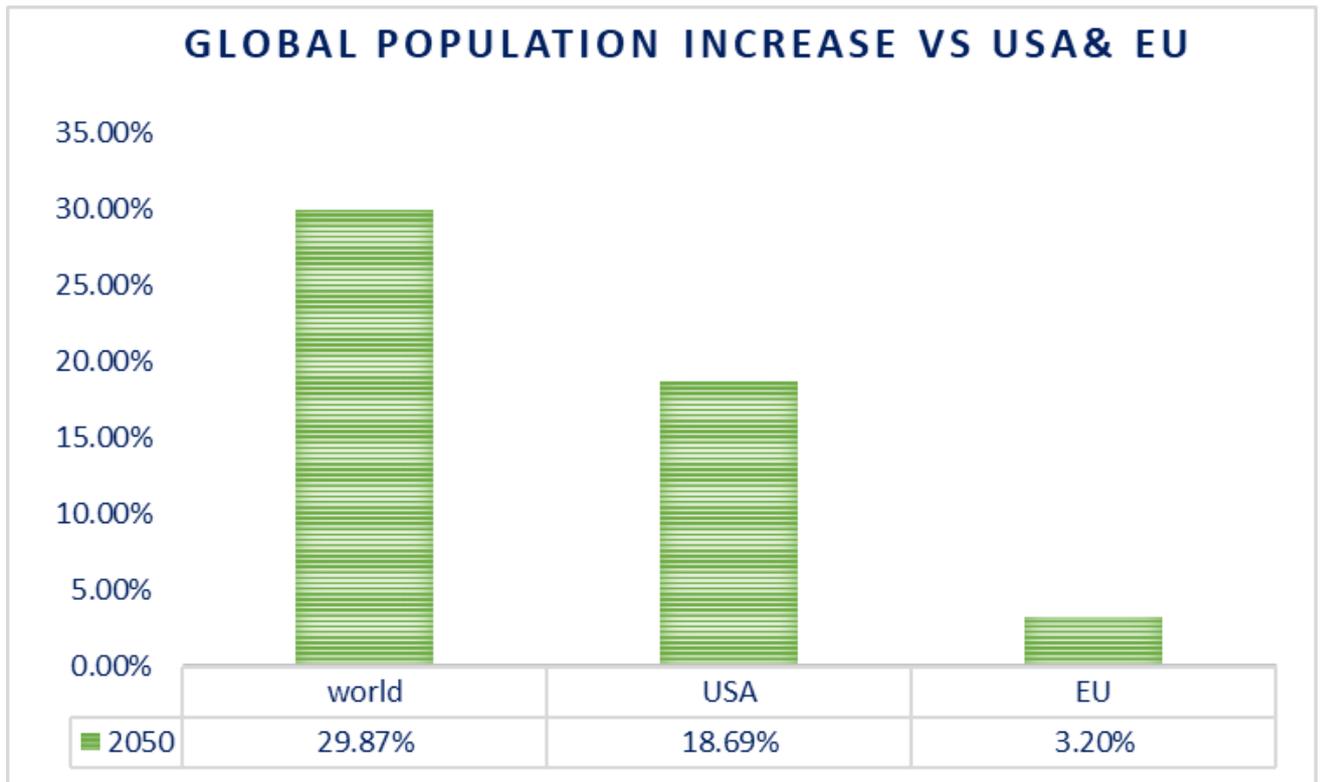


Comments:

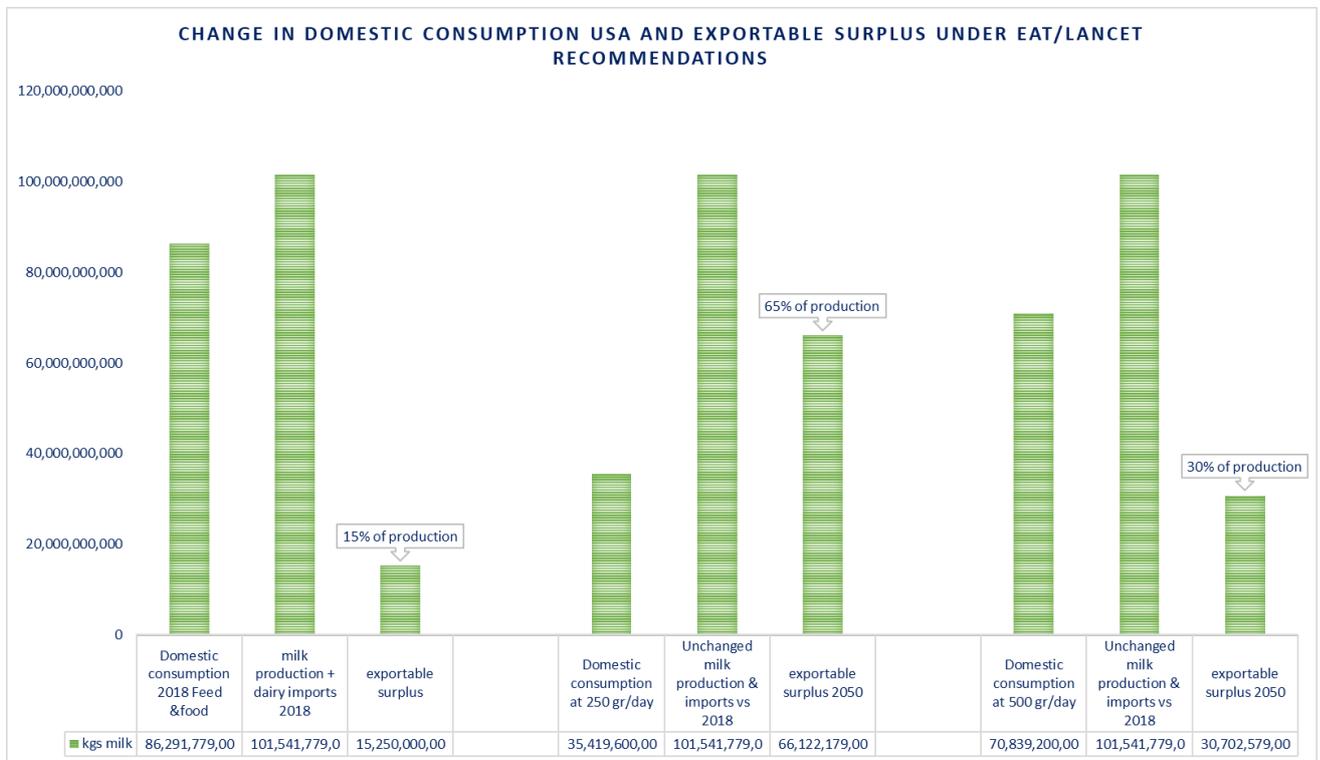
- Dairy intake is recommended at 0-500 gram whole milk or equivalent per day. The Cheese equivalent to 250 grams whole milk is a little over 50 grams of Cheese.
- A simple calculation of milk production + imports, minus exports and animal feed consumption learns that in EU, current per capita consumption lies at 634 grams/day. For the USA consumption is 724 grams/day
- While global population will have grown 30% by 2050, +30% vs 2018, USA & EU growth in comparison will stay far behind with respectively 18.69% and 3.20%:

Table: Reference Diet EAT/ the Lancet

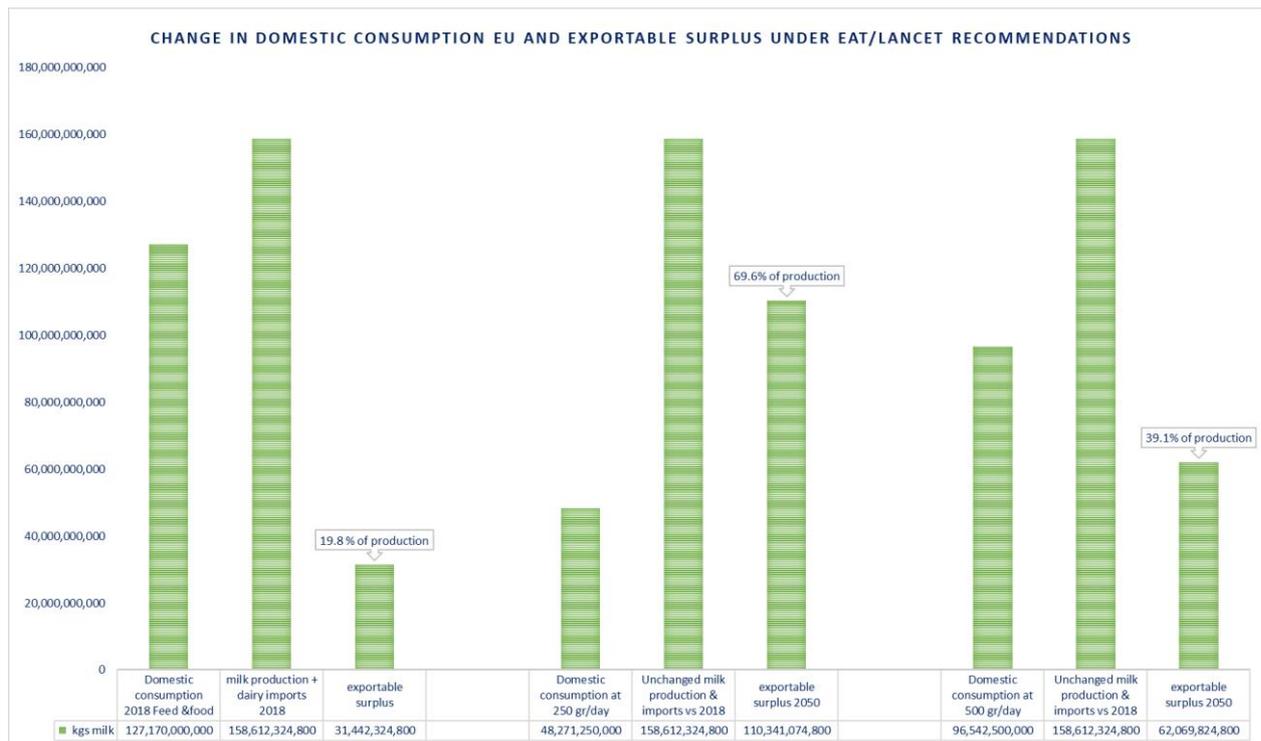
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Would the recommended diet be implemented, the implications for the USA and EU Dairy industries are significant and require a strong increase in exports.



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All the above figures for EU and USA refer to Cow's milk but the EAT/Lancet report does not distinguish between Cow's milk and milk derived from other species. For EU, Buffalo, Goat and Sheep's milk add an additional 4 billion kgs to the exportable surplus. For the USA the addition of Goat and Sheep's milk is approximately 0.8 billion kgs.

Worldwide, the total volume of milk produced from Cow, Buffalo, Sheep, Goat & Camel was 867 billion kgs in 2017 (source: IFCN).

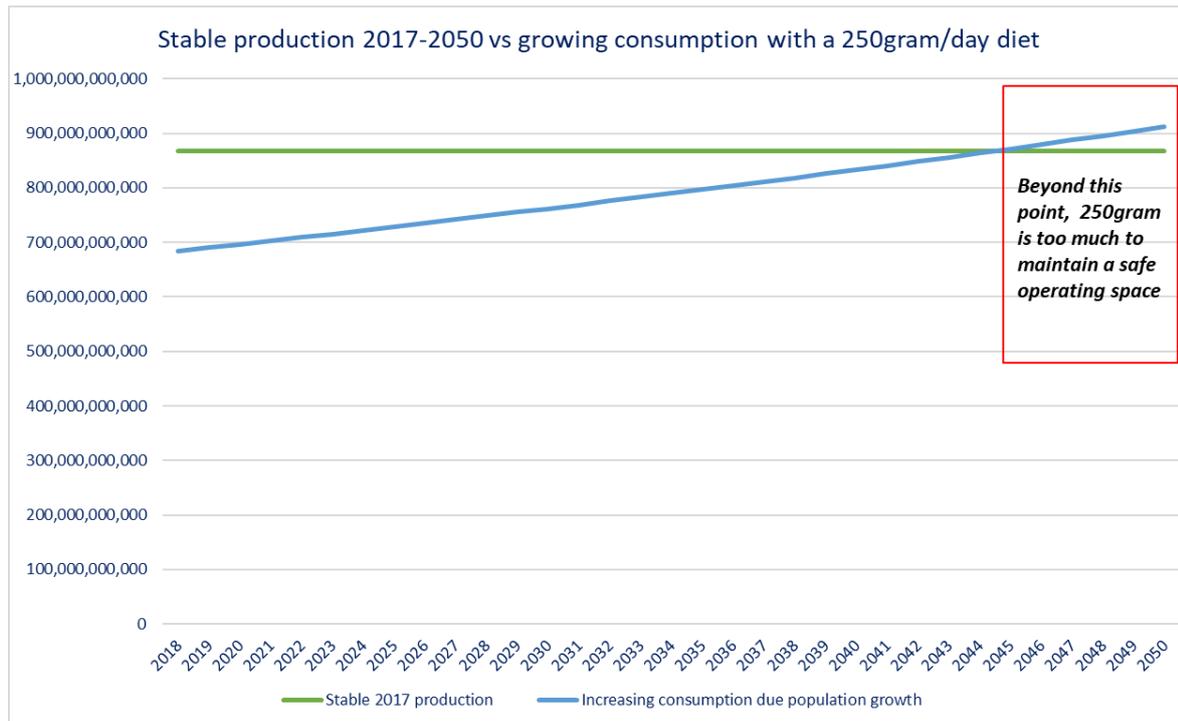
In this report, we will assume no stock positions and will consider that production equals consumption in any given period.

The Global average consumption per capita/day was 320 grams in 2017.

The implication of the EAT/Lancet recommendations is that the world is already **oversupplied** by 28% of milk in the 250gram/day scenario. **That is 242 billion kgs of milk.**

When milk production remains stable through 2050, it would take until 2044 before world production is in balance with a world population that consumes 250 grams per capita/day:

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It is unlikely that consumers instantly change consumption habits to the recommended Eat/Lancet diet.

Regardless of the Eat/Lancet recommendations, we are already witnessing massive growth in the plant-based alternative Meat and Dairy markets which would suggest that customers are autonomously embracing the new offerings on supermarket shelves worldwide

Increasingly, consumer preferences are fuelled by environmental concerns which go along with the overwhelming amount of research that has been published in recent years, time after time pointing to the enormous amounts of Green House Gas (GHG) emissions of the Dairy and Meat industries relative to plant-based alternatives.

According to GlobalData, in the USA 1% of the population identified as ‘Vegan’ in 2014. In 2017 that number had risen to 6%.

Apart from the group of consumers identifying as ‘Vegan’, there is a further segment of consumers identifying as ‘Flexitarian’.

According to Nielsen :

Nearly 40 percent of Americans are “actively trying to incorporate more plant-based foods into their diets,” and “23 percent wanted to see more plant-based proteins”.

Key takeaways:

- Worldwide, Consumer demand for non-animal sourced food increases strongly, driven by environmental, ideological and health considerations.
- To maintain the 'Safe Operating space' from the Eat/Lancet report, reduced animal sourced food consumption is a hard condition for an environmentally sustainable planet earth, that carries 9.6 billion properly nourished inhabitants.
- While most Alternatives are plant-based, new developments in the field of non-plant/ non-animal Dairy and Meat substitutes are under development and some of those will be launched this year already.
- The Alternatives industry attracts substantial investment funding. In February 2019, Silicon Valley based 'Motif Ingredients', attracted \$ 90 million for 'alternative, bio-based Dairy, and Meat proteins' that it expects to bring on the market in the next two years.
- Increasingly, due to upscaling, production of Dairy and Meat alternatives is becoming more competitive.
- In the near future, Policymakers will enhance this process by tagging a price on GHG emissions, thus making dairy in comparison more expensive., while an increasing group of consumers downright refuses to eat Animal-derived foods.
- Even so, paying for GHG emissions does not solve the issue, it merely functions as a band-aid enabling countries to fund mitigation measures.
 - *Charging for GHG emission will not alter the changing consumer preferences and will leave the traditional industries eventually less competitive.*
 - *The higher the charges on GHG emissions become, the wider the doors are opened to Dairy & Meat Alternatives producers.*

Conclusions:

On all fronts, we live in a time of disruption and the Dairy industry is no exception.

The industry has stood its ground challenging times by conservative bookkeeping and agreeing on low prices in the full expectation that at some point things would change for the better. This way the industry has scaled up and managed to stay competitive while improving efficiency.

The current challenge is different, with the industry having to compete not just on price, but also on Carbon footprint which, based on current research, seems practically impossible.

It is evident the Dairy industry is on the eve of an overall, disruptive transformation as a result of changing customer preferences and imminent policy and tax measures to address GHG emissions the Dairy industry produces.

The challenge to the industry is unprecedented in its proportions and not one that can be easily overcome by accepting lower pay for a period in the same way that challenges were met in the past.

It is unlikely that Dairying will vanish completely but the writings on the wall indicate pruning is imminent in the near future, where only those with truly unique propositions stand a chance to survive.

It is hard to put a timing on events but with mounting pressure to reduce the world's GHG emissions and changing customer preferences, the dairy industry landscape will have changed tremendously in 20 years' time. Some farmers and processors will have exited the business while others will have reinvented themselves.

Some voices say that 'alternative milk' will have taken over completely from traditional cow's milk within the next 20 years. While we wouldn't completely agree with that sentiment, there are certainly indications that a large part of the traditional industry, from farmers to processors will have disappeared in the next two decades. Analog to Coal that will stand no chance against alternative, clean energy sources.

20 years may sound like a very short time to see such a massive turnaround. But then again, who had heard of YouTube, Facebook, Instagram, Twitter, and WhatsApp 20 years ago? They didn't even exist back then.

Combined, over 7 billion customers use these services today.

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Robert Schorsij, March 2019