



Avoiding Malthus 2.0: Why Food Pessimism Leads Nowhere

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Opinion

Planet Earth's natural resources, such as land, freshwater, raw materials etc., have to be shared among an increasing number of people (and farm animals). Moreover, human life expectancy has continuously increased. Consequently, more people consume for longer, leading to fears whether there is enough for all of them, now and in particular in the future.

One particular concern is about human diets and their resource implications. Globally, agriculture accounts already for up to 40% of global land use and 70% of freshwater withdrawals [1]. Moreover, food systems contribute 19-29% of global anthropogenic greenhouse gas (GHG) emissions of which agricultural production, including indirect emissions resulting from land-cover change, contributes 80-86% of total food system emissions [2]. In 2013, food represents 97% of world agricultural production (value) and 23% of world food production was exported, according to FAOSTAT Production and Trade databases (online). The question is whether humankind can go on consuming food and drink as it currently does.

While food security fears have been with humans for their entire existence, the British scholar Thomas Malthus, at the turn of the 18th century, introduced the notion of the "population trap". Rapid population growth would eventually outstrip agricultural production thus leading to shortages of food supply and starvation. The much more recent concerns about food system sustainability add fears that current agricultural production practices damage environmental ecosystems and world climate, thus threatening the natural resource base of future generations. The current perception is that the very activity of food production that is meant to keep humans alive kills them eventually in the long run.

The definition of diet sustainability is complex since it comprises multiple criteria. However, dietary diversity is a key recommendation for healthy food intake [3,4] while a low

consumption of animal products is considered to have minimum negative environmental and climate consequences [5,6].

The UN Food and Agriculture Organization provides data that allow tracking the evolution of both mentioned measures over time. Using FAOSTAT Food Balance Sheets and the indicator food supply (in kcal/capita/day), it is possible to investigate changes in the sustainability of the world's average diet between 1961 and 2013. One measure is the share of daily per capita calorie intake derived from vegetable/plant products (ranging from 0 to 1). The other indicator is the variety of vegetable/plant products consumed, measured by the Simpson diversity index [7] (ranging from 0 = no to 1 = maximum variety).

The numbers show that during the last 50 years the world's average diet became more based on animal products and remained virtually unchanged regarding the variety of vegetable products consumed. The share of kcal in daily food intake derived from vegetable products decreased from 84.6% (1961) to 82.2% (2013), while plant product variety decreased slightly from a Simpson index score of 0.888 to 0.881. Both changes are comparatively small. At the same time, total world calorie consumption more than tripled (from 2.48×10^{15} kcal per year to 7.59×10^{15} kcal per year).

During the same period, global average life expectancy rates steadily improved. According to [8] and WHO (online), the mean lifespan increased by 48% from 48 years (1950) to 70.8 years (2013). It is clear that life expectancy is an imperfect human health measure. Nevertheless, it is also a very fundamental one, which cannot be ignored. Moreover, life expectancy depends on multiple factors. Suboptimal diets only account for about 20% of deaths globally [9].

World per capita agricultural GHG emissions have actually decreased from 890 kg CO₂ equivalents in 1961 to 719 kg CO₂eq in

2013, a drop of 19%, according to the FAOSTAT Emissions database (online). This decrease occurred while simultaneously the share of kcal in daily food intake derived from animal products increased by 2.4% (as shown above).

Assuming data reliability and method validity, the presented numbers suggest that the nexus between diets and health and climate outcomes is not fully evident at the global level. Therefore, we should avoid Malthus 2.0 – i.e., scientific food pessimism. The world currently produces more food than almost 8 billion people can consume, with a significant share of food calories used as animal feed or as a source for biofuels and still there is food left to be wasted or to be overconsumed, leading to obesity. Not having enough to eat for everyone is a serious problem and a system failure. Not avoiding food surpluses or not using them responsibly and reasonably is just a big shame.

Hence, maybe food system GHG emissions are better tackled at the supply side by tightening production standards in particular for ruminant products, which would cause their costs and prices to rise and their demand and consumption to fall. Moreover, the limitations of dietary contributions to overall health should perhaps be more widely acknowledged. Blaming the good that keeps us alive in the first place for the misery of our actions leads nowhere.

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