

Telling porkies

The big fat lie about doubling food production

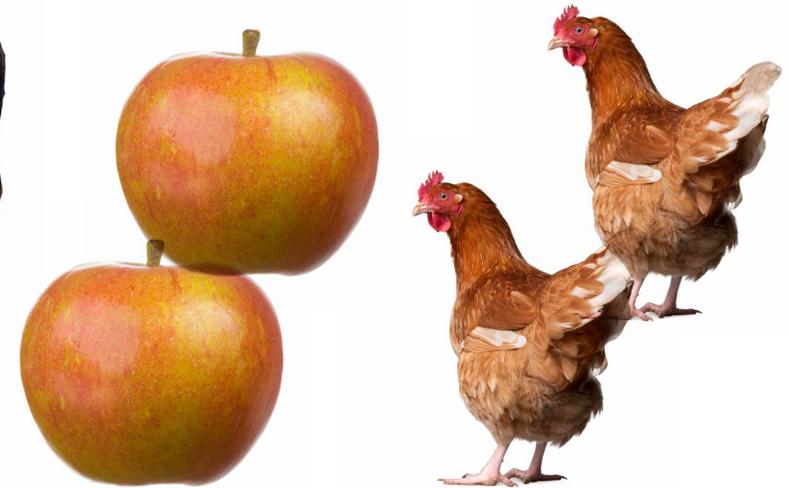
Introduction



In the last couple of years, two statistics about the need to increase global food production by **50% by 2030** and for it to **double by 2050**, to meet future demand, have been widely used by scientists, politicians and agriculture and GM industry representatives alike. These figures have come to play a significant role in framing current UK and international policy debates about the future direction of global agriculture.



These apparently scientific statistics are dominating the policy and media discourse about food and farming, leading almost everyone to assume we need vast increases in agricultural production to feed a population of 9 billion by 2050 (in the context of needing also drastically to reduce greenhouse gas emissions). Many commentators are using this to justify the need for more intensive agricultural practices and, in particular, the need for further expansion of GM crops.¹



This briefing paper reports our investigations into the sources and basis of these figures. It outlines the assumptions upon which they are based and shows that, among others, the Government's Chief Scientist, the President of the National Farmers' Union, Syngenta, Monsanto, Government Ministers and the Conservative Party have all got their facts wrong.

Executive summary

The two figures on increasing global food production (50% by 2030 and doubling by 2050) are being widely used by key individuals in current agricultural policy debates. The figures are claimed to be the increases in food production that scientists say are needed to feed the world's growing population.

However, when the Soil Association looked into the reported sources for these figures, none of the sources actually stated that global food production needs to increase by 50% by 2030, or to double by 2050, to meet global demand.

Indeed, in the case of the 50% by 2030 figure, the authors of the paper where it supposedly originally appeared would not provide us with a copy of their report, and instead pointed us to more recent publications which do not repeat the 50% claim.

Recent calculations show that the key source for the 'doubling' claim, the FAO (2006) report, implies that for 2006–2050 there would need to be an increase of around 70%, not 100%. As the Government itself states, the difference between 100% and 70% is significant.

What the reports on which the claims are based do say is that certain sectors, in certain parts of the world, may have to increase food production by significant amounts. For example, for cereals, there is a projected increase of 1 billion tonnes annually over the 2 billion tonnes of 2005, a 50% increase by 2050, mainly to feed animals. For meat, in developing countries only (except China), the reports say that some of the growth potential (for increased per capita meat consumption) will materialise as effective demand, and their per capita consumption

could double by 2050. So this is a projected doubling of meat consumption in some developing countries – not a doubling of global food production.

These projections are based on the following assumptions:

- ▶ Increases in global population and economic growth.
- ▶ Increased per capita consumption of calories in developing countries.
- ▶ Continuing growing imports of food by developing countries.
- ▶ Structural change in diets of people in the developing world (nutrition transition) to include more meat and dairy products.

There are four key problems with these projections:

- ▶ Our diet in the developed world is causing serious disease and obesity problems and these are now starting to increase in the developing world.
- ▶ The data used to measure food security focuses attention on the level of agricultural production without considering access to food, distribution, and affordability which are all important in ensuring that people do not go hungry.
- ▶ The projections assume that the developing world continues to import growing quantities of staple food stuffs – in fact, increasing local production of staple foods is vital in ensuring food security.
- ▶ According to these scientists, meeting these projected food demand targets will not solve food insecurity anyway.

All those using these figures appear to be ready to contemplate changes in diet in developing countries that are likely to cause major new epidemics of diet-related ill-health, including heart disease, some cancers and Type 2 diabetes. Many of those misusing the statistics in the FAO paper to argue for massive increases in food production in both UK and globally, appear to be unaware that they are in effect condemning many in developing countries to ill-health and early deaths.

In addition, the FAO projections endorsed by all these commentators assume a huge rise in numbers of livestock, in particular that there will be over a billion extra beef and dairy cattle by 2050, which would cause catastrophic increases in methane emissions – methane is an extremely powerful greenhouse gas, 23 times more potent than CO₂.

A recent scoping study examined how we can feed and fuel a world of 9 billion people in 2050 sustainably, fairly and humanely. Significantly, the report provides evidence "that organic agriculture can probably feed the world population of 9.2 billion in 2050, if relatively modest diets are adopted, where a low level of inequality in food distribution is required to avoid malnutrition".

In summary, all those claiming that we need to double global food production by 2050, or increase global food production by 50% by 2030, are wrong about the figures, are wrong about what the figures apply to, and are wrong to claim that achieving these figures will mean that we are feeding the hungry or halting starvation.

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Who has been using these statistics?

Professor John Beddington, the Government's Chief Scientific Advisor and Professor Bob Watson, DEFRA Chief Scientific Advisor, have both publicly said that food production needs to increase by 50%, by 2030.² Watson is also reported to have said that food output needs to double within the next 25–50 years³ and is joined by the Government's former Chief Scientific Adviser, Sir David King who has also spoken of the need to double food production by 2050.⁴ This claim has also been made by the Secretary of State for the Environment, Hilary Benn MP,⁵ and appears in the Conservative Party's recently published agenda for British farming.⁶

Peter Kendall, President of the NFU has talked of the need to double worldwide agricultural output over the next 40 years or by 2050,⁷ whilst the same claims have been made by the GM industry. At a recent conference, James Barkhouse, Managing Director for Syngenta Crop Protection is reported to have talked of how farmers will have to deliver a doubling of food production by 2050.⁸ Monsanto have also used this statistic.⁹

As this paper demonstrates, all of them are making claims for which there is no scientific evidence, and which are contradicted by the scientific research that they claim to be relying on.

What are the original sources of these figures?

The Government's Chief Scientist, Professor John Beddington informed the Soil Association that he took the 50% by 2030 statistic from a speech given by UN Secretary-General, Ban Ki-Moon.¹⁰ We have asked Professor Bob Watson what the source to the statistics he used was, but we have not yet heard from him.

Indeed, both the 50% by 2030 and doubling by 2050 figures can be traced back to two speeches given at the United Nations at the UN's Food and Agriculture Organisation (FAO) High-Level Conference on World Food Security in June 2008. Ban Ki-moon, Secretary-General of the UN said that "The world needs to produce more food. Food production needs to rise by 50% by the year 2030 to meet the rising demand".¹¹ At the same event, Jacques Diouf, Director-General of the FAO stated that "Global food production must be doubled to feed a world population currently standing at 6 billion and expected to rise to 9 billion by 2050".¹²

However, it is not immediately clear where they sourced the figures from. The House of Commons Environment, Food and Rural Affairs Committee have looked into this issue in its report *Securing food supplies up to 2050: the challenges faced by the UK*.¹³ This report states that the source of the 50% by 2030 figure was *Future Scenarios for Agriculture: Plausible Futures to 2030 and Key Trends in Agricultural Growth*¹⁴ whilst the source of the doubling by 2050 figure was an FAO report *World*

Agriculture: Towards 2030/2050.¹⁵ These were cited as the principal sources in e-mail correspondence between the Committee and the UK Department for International Development (DfID).

The latter report¹⁶ was easily found on-line but we had problems tracking down the former. Publication Services at the International Food Policy Research Institute (IFPRI), the authors of the report, informed us that "the paper you requested is currently not available." The authors suggested we instead look at two other documents¹⁷ which "provide updates from the IMPACT model compared to when the [WDR background] paper was produced".¹⁸ We asked the Clerk of the House of Commons Environment, Food and Rural Affairs Committee but they did not have a copy.¹⁹ They suggested we contacted the Department for International Development (DfID). DfID did not have a copy of the report themselves but have asked the publishers directly.²⁰ We are still currently waiting to hear back from DfID as to whether have been successful in obtaining a copy.

What are experts actually saying about future food demand?

The supposed source of the doubling by 2050 figure, the FAO report *World Agriculture: Towards 2030/2050* does not contain the statement that total global food production needs to double by 2050 to meet demand. Rather, it contains the rather more complex and nuanced message that there will be a decline in the rate of growth of consumption in the future,

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although this still results in large overall absolute increases in production needed. The only specific statements about large percentage increases in demand are focused on the developing world (where the increases in population will be) and concerned only with meat and cereal production, not all food.

The largest projected increases in food demand are for cereals and for meat and dairy products. For cereals, there is a projected increase of 1 billion tonnes annually over the 2 billion tonnes of 2005, a 50% increase in cereals by 2050. The report acknowledges that the bulk of the consumption increases will occur in the developing countries where animal feed will be required to support the projected expansion of livestock production.²¹

For meat specifically, the report states "The rest of the developing countries [aside from China] still have significant scope for growth, given that their annual per capita meat consumption is still a modest 16kg. Some of this growth potential will materialise as effective demand and their per capita consumption could double by 2050, ie. faster than in the past".²² In the specific case of India, it is argued that "Overall, the force of growth of poultry meat consumption has the potential of raising India's average consumption of all meat to more than double present levels by 2030 and more by 2050".²³

In this report, other food groups play a much less significant role in their relative contribution to food demand than meat and dairy products. However, the potential exists for further growth in consumption of vegetable oils, and the same for sugar, although it will not be as vigorous as in the past. It is predicted

that there will be reversal in the decline of roots, tubers and plantains whilst the consumption of pulses will stay approximately the same.²⁴

The references provided by IFPRI in place of the original source for the 50% by 2030 claim, paint a similar picture. Chapter 5 of the *IAASTD report*,²⁵ in its 'reference world' model, sees a rapid growth in meat and milk demand with increased diversification of diets. Total cereal demand is projected to grow by 1,305 million tonnes, or by 70%. Of this, 42% is for animal feed. The global population of bovines is projected to increase from some 1.5 billion animals in 2000 to 2.6 billion in 2050 (73% increase). Poultry numbers are projected to more than double by 2050. The ACIAR report²⁶ states that changes in cereal and meat consumption per capita vary significantly among regions. For example, per capita meat demand is projected to more than double in the South Asia and sub-Saharan Africa region. Total cereal demand is projected to grow by 56% (of this, 41% for animal feed).

The mystery over the source and basis of these figures has not gone un-noticed by the Government. In their response to The Environment, Food and Rural Affairs Committee report on *Securing food supplies up to 2050: the challenges faced by the UK*, the Government say they are further investigating the headline figures that have been used in international fora.²⁷ They have looked at FAO (2006) projection and argue that if 2000 is considered the starting point then the "FAO projections roughly correspond to the Conference figure" (56% over the period 2000-2030 and 87% increase over the period

2000-2050).²⁸ They calculate that for the period 2006-2050 this would be an increase of around 70%. This figure has recently been confirmed in this year's OECD-FAO *Agricultural Outlook, 2009-2018*²⁹ and *The Resource Outlook to 2050*, both published in June 2009. The latter argues that in developing countries this increase will be nearly 100% (97%).³⁰

The Government acknowledge³¹ that "The difference between 100% and 70% is not trivial: it is more than the food production of the whole American continent. So claims around food production needing to increase 50/100% need to be treated with care."

On what basis are these projections calculated?

Global population increases and economic growth

The FAO (2006) report states that "the exogenous economic growth assumptions used here, together with the growth of population, are the major determinants of projected food consumption, though by no means are they the only ones".³² It uses population growth figures from the UN (2004) – which predicts that by 2050 world population may reach 8.9 billion. Income growth projections are based on World Bank projections (2004 and 2006) to 2030 and 2020-2050 based on the author's projections. The model describes a 'normal evolutionary path' with food consumption growing faster with economic growth and subsequently slowing down, and eventually levelling off, as high levels of around 3000kcal/person/day were achieved.³³

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Increased per capita Kcal consumption in developing countries

These projected increases in demand for food are driven by increased per capita food consumption in the developing countries whose average will have risen from the present 2650kcal to over 3000kcal in 2050.³⁴

However, as stated in FAO (2006) "Many other factors besides population and average GDP growth influence the apparent levels and commodity composition of food consumption and have to be taken into account in the process of all phases of analytical and evaluation work".³⁵ These include:

- ▶ **Continuing growing imports by developing countries:** FAO (2006) describes how the growing imports of, mainly, cereals, livestock products, vegetable oils and sugar, by many developing countries has resulted in the group of developing countries as a whole turning from net agricultural exporters to net importers in most years after the early 1990s.³⁶ The structural factors underlying these trends are likely to continue. For example, in the case of cereals, the projections assume that the past trends of ever growing net cereal imports of the developing countries should continue to grow to some 300 million tonnes by 2050, as 2.7-fold increase over the 112 million tonnes of 1999/2001.³⁷
- ▶ **Structural change in diets of people in the developing world (nutrition transition):** From the perspective of the Soil Association, this is one of the most controversial assumptions made in these

papers. The projections reflect a continuing pattern of structural change in the diets of people in developing countries with a rapid increase in livestock products (meat, milk, eggs), vegetables oils and to a smaller extent, sugar, as sources of food calories. These three food groups now provide 29% of total food consumption of the developing countries (in terms of calories) and their share is projected to rise further to 35% in 2030 and 37% in 2050.³⁸

What are the problems with these projections?

There are four key problems with these projections:

Health impacts of the nutrition transition: Exporting our Western diet

First, related to the point above, there are widespread concerns about the health impacts that the structural changes in diet have already had in the developed world, and that are increasingly occurring in the developing world. Whilst animal foods are important sources of protein, energy and nutrients (such as iron, calcium, vitamin B123 and Zinc), they are also major sources of saturated fats in the human diet. In addition to other behaviours such as physical inactivity and tobacco use, such diets are a leading cause of non-communicable diseases (NCDs) including cardiovascular disease, some cancers and Type 2 diabetes.³⁹

The UK Cabinet Office acknowledged in 2008

that "existing patterns of food consumption will result in our society being loaded with a heavy burden of obesity and diet-related ill health and existing patterns of food production are not fit for a low-carbon resource-constrained future".⁴⁰ In 2007 in the UK, 24% of adults, 17% of boys and 16% of girls (under 15) were obese. The costs of treating the consequences of obesity were approximately £1 billion in 2002, predicted to rise to £5.3 billion by 2025.⁴¹

Friel *et al* (2009) found that for the UK population, a 30% decrease intake of saturated fats from animal sources could reduce the total burden from ischaemic heart disease by 15% in disability-adjusted-life-years (DALYs), by 16% in years of life lost, and by 17% in number of premature deaths.

The continuation of dietary transition in developing countries, as predicted by FAO (2006), is likely to cause worsening health problems. Diet-related heart disease and stroke have already taken over as the two leading causes of death in low and middle-income countries.⁴² The report itself admits that: "These rises are not always an unmixed blessing as the diet transitions experienced by many countries imply changes in diets towards energy-dense ones high in fat, particularly saturated fat, sugar and salt and low in unrefined carbohydrates." The report further acknowledges that "In combination with lifestyle changes, largely associated with rapid urbanisation, such transitions, while beneficial in many countries with still inadequate diets, are often accompanied by a corresponding increase in diet-related chronic Non-communicable diseases (NCDs)".⁴³

Commentators in the UK, such as the Secretary of

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State and the Government Chief Scientist, appear to be ready to contemplate changes in diet in developing countries that may cause major new health problems, and costs. Many of those misusing the statistics in the FAO paper to argue for massive increases in food production in both UK and globally, appear to be unaware that they are in effect condemning many in developing countries to ill-health and early deaths.

Measuring food security: Focus on availability and agricultural production

As Amartya Sen famously wrote "starvation is the characteristic of some people not *having* enough food to eat. It is not the characteristic of there *being* not enough food to eat. While the latter can be a cause of the former, it is but one of many *possible* causes".⁴⁴ His argument has made some inroads into current thinking about food security. Today, food security is commonly conceptualised as resting on three pillars – of availability (total amount of agricultural production); access (what can be afforded given income and food prices, what safety nets exist, or what people can grow themselves); and utilisation (for example, are the foods prepared in sanitary conditions, or is the person well enough to obtain the full nutritional value).⁴⁵

However, the measure used in the report (standard for FAO) is based on per capita food consumption in calories to calculate undernourishment and is based on the availability criterion (supply-side) only.⁴⁶ Crude food availability measures (like the FAO's) enable frequent and geographically broad estimates,

but at the expense of neglecting waste, and the inevitably unequal distribution and uses of food within a population. Data obtained from individual and household surveys on a national scale provides disaggregated data that allows more accurate prediction of who is most likely to be affected adversely by potentially harmful shocks such as food price increases, drought, or slumping demand for wage labour.⁴⁷

The way that food insecurity is measured is important because it influences the policy response. Historically, reliance on national food availability estimates has focused attention on agricultural production strategies to increase food supplies in the long term. Aggregate food availability is a poor predictor of other food insecurity indicators: The undernourished population has increased by 9% globally despite a 12% rise in global food production per capita since 1990.⁴⁸

Thus, the FAO report and the wider debate over feeding the world through increased food production fails to acknowledge that: "The continuing, large-scale problem of food insecurity is primarily a distributional issue, a matter of getting available food to people who need it, when they need it, and of ensuring their regular, appropriate, affordable access to food".⁴⁹

This is even acknowledged by the UK Government: "But simply increasing food production will not end hunger. Even when food was at its cheapest in 2000, there were still 800 million people without enough food to eat. There are huge problems in terms of access to food, distribution, and affordability".⁵⁰

Assumptions about trade patterns: Need for local staple food production for food security

The projections contained within the FAO report assume a continuing pattern of developing countries being net importers of cereals and livestock products (as well as vegetable oils and sugar). For example it is argued that "Not all countries will be able to increase cereals production *pari passu* with their consumption. Therefore, past trends of ever growing net cereal imports of the developing countries should continue and grow to some 300 million tonnes by 2050, a 2.7-fold increase over the 112 million tonnes of 1999/01".⁵¹

A recent Christian Aid report from July 2008⁵² noted that this trend of increasing imports of main food stuffs has left developing countries more at risk from high food prices, as they have come to depend more on buying food on world markets rather than growing their own. With the opening up of markets, cash crops for exports have been promoted, and the most productive land is then used to grow these crops, squeezing out domestic food producers. They argue that whilst the intention has been to raise the incomes of marginal producers, it has reduced agricultural diversity and countries have been left importing staples from abroad. Christian Aid state that "investing equally in staple crop production would have reduced the risks of food shortages and enhanced opportunities for development."

The importance of developing local agriculture is actually noted by the FAO (2006) report: "Unless local agriculture is developed and/or other income earning opportunities open up, the food insecurity

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determined by limited local production potential will persist, even in the middle of potential plenty at the world level. The need to develop local agriculture in such situations as the condition sine qua non for improved food security cannot be overemphasised".⁵³ So to reduce the risks of malnutrition and starvation, we need to move to a position where developing countries increase the local production of staple foods, and import less grain and livestock products from developed countries, not more, as the FAO report assumes.

Meeting these projected food demand targets will not solve food insecurity

Perhaps most significantly, even if the increases in food production were achieved, this would not solve problems of food insecurity. FAO (2006) itself indicates there will still be several countries in which the per capita food consumption will not increase to levels allowing significant reductions in the numbers undernourished from the very high levels currently prevailing. Based on the projections outlined in Table 2.2 in FAO (2006), in 2030 12% of the developing country population (810 million people) will still be living in countries with low levels of food consumption (under 2500 kcal) and the number will still be 130 million in 2050. Indeed as FAO (2006)⁵⁴ states the reductions in the prevalence of under-nourishment in developing countries would be "rather modest". The 810 million of 1999/2001 (17.2% of the population) may become 580 million in 2015 (10.1%), 460 million in 2030 (6.9%) and 290 million (3.9%) by 2050.

The approach of the FAO report is positive rather

than normative. That is, its assumptions and projections reflect the authors' vision of the "most likely future"⁵⁵ but not necessarily the most desirable one.

A recent scoping study⁵⁶ examined how we can feed and fuel the world sustainably, fairly and humanely. It explored the feasibility of feeding 9 billion people in 2050 under different diet scenarios and agricultural systems. It recommended that "any effective measures to reduce the level of consumption of animal products (including those derived from eggs and milk) are beneficial in terms of environmental impacts, animal welfare, biodiversity and bioenergy potential".⁵⁷

The report acknowledged that for a 'western high meat diet' to be 'probably feasible' "would require a combination of massive land use change, intensive livestock production systems and intensive use of the arable land".⁵⁸ This would have negative impacts for animal welfare and led to further destruction of natural habitats like rainforests. Significantly, the report provides evidence "that organic agriculture can probably feed the world population of 9.2 billion in 2050, if relatively modest diets are adopted, where a low level of inequality in food distribution is required to avoid malnutrition".⁵⁹

Conclusion

It is clear that there is considerable uncertainty about the sources of the two figures. We were not even able to get hold of the supposed source of the '50% by 2030' figure, and the reference we were provided with for the 'doubling global food production by 2050' (the FAO 2006 report) did not contain this statistic. In fact, it is now calculated that the data provided in the FAO report shows that the increase between 2006 and 2050 might be 70% not 100%.

In any event, the modelling work used in the FAO report assumes very large increases in cereal (nearly half of it for animal feed) and meat demand in the developing world. These are based on assumptions that include a continuing dietary shift to higher meat and dairy consumption in the developing world. Such shifts have drawn considerable concern over the health impacts. The data used to measure food security focuses attention on one aspect, not necessarily the most significant, namely levels of agricultural production, and does not consider access to food, distribution, and affordability. The projections are based on the assumption that the developing world will continue to import their main food stuffs. Others have argued that increasing local production of staple foods is vital in ensuring food security.

However, it is perhaps the biggest irony that the widely used figures for increasing food supply, based by those that use them on the need to 'feed the world', will not only be bad for the health of growing numbers of people in developing countries, but will not even ensure they get enough food to eat. These calls are based on a report where the authors set out what they thought would be the most likely future, but not the most desirable one. Our food and farming policy should be based on a strategy that aims to ensure no one in the world is going hungry by 2050, not a future of continuing hunger, growing diet-related ill-health and huge increases in greenhouse gas emissions from livestock.

Endnotes

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