

Food Supplies and the World Population

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In the late 1700's, a British economist named Thomas Malthus developed a theory linking the dependence of the world's population to food production. At that time, there were fewer than one billion people on Earth, but he anticipated problems in the coming years.

Malthus reasoned that population growth was exponential, indicating that it would double in a given number of years. However, he saw the ability to increase the production of food as an arithmetic process, which meant that gradual incremental improvements could be made; but never on the same scale as the growth in population. The conclusion was rather pessimistic – eventually, the world would not have sufficient food supplies to feed its citizens.

Fortunately, there were some things that Malthus could not foresee as having a significant impact on his model of the global situation. Improved agricultural practices, new crop varieties with higher yields and better tolerance to environmental factors, plus other new technologies brought on by the Green Revolution, pushed food production far beyond what was imaginable in 1798. As a result, the global population has risen to just over seven billion.

Sadly, we are now faced with food shortages giving rise to hunger and malnutrition in various parts of the world. This begs a number of questions: Is the Malthusian Model coming back to haunt us? Do we have sufficient capacity to feed a growing population? Where can we find more food?

One of the areas being examined as a means of increasing food supplies is in the reduction of losses currently being experienced. Routinely, we see estimates that one-quarter to one-third of the food produced in the world today spoils before it can be consumed. Whether or not these figures are accurate, or simply "guesstimates", is not the issue here. What is important is that so much of the food we produce is actually lost.

If you want some sobering reading, a 2012 paper by Dana Gunders will certainly provide it. Ms. Gunders is a Staff Scientist with the Natural Resources Defense Council in the United States. The title of her paper, available on-line, says it all; "Wasted: How America is Losing Up to 40 Percent of Its Food from Farm to Fork to Landfill". Included in her report is a table summarizing "Food Consumed versus Food Loss" for the USA,

Canada, Australia, and New Zealand in 2011. In those four countries, the loss of fruits and vegetables was a shocking 52%!

In September 2015, the United States Department of Agriculture (USDA) announced an initiative to reduce food waste. They estimated that 60 billion kilograms (or 133 billion pounds) of food is being lost or wasted annually in the US, while nearly 50 million people are considered to be food insecure. The press release goes on to say that each year, the average American family of four wastes about \$1,500 worth of food with a nutritional value of more than two million calories. If this is the situation in the country with the world's leading economy, it is not much of a stretch to imagine what is happening in many other nations.

One of the things that I found interesting was the potential impact of food wastes on climate change. Much of the wasted food ends up in landfills where its decomposition generates methane – a harmful greenhouse gas. Reducing food losses would ultimately help lower methane emissions.

Let's do a bit of hypothetical number crunching to see what could happen if food losses were reduced. Suppose that food losses are currently at a level of 30%, and further suppose that they could be reduced by one-third. Such a reduction would translate into an increase of almost 15% in available food over what we are currently using (see the accompanying diagram based on 100 tonnes of food at the start).

The impact of this "recovered" food is staggering! It could feed an additional billion people, or feed our current population of seven billion better.

Of course, it is easy to do some simple mathematics and say that all we need to do is work better with what we already have. However, it's not so easy to make it happen - and it certainly won't happen overnight.

So, how do we go about reducing food losses? The first step is to identify where the losses are occurring. In and of itself, this is no simple task. The next steps of taking action to address the problems are even more complex. Once again, you may want to take a look at Ms. Gunders' paper for some insight.

Rather than ignoring the situation and waiting for someone else to solve the problem, perhaps we could all make a conscious effort at the personal level to address this global issue.

