

Recipe for Change: Can We Feed the World?

As the population continues to rise and the planet faces drought and lagging agricultural productivity, food price volatility has soared. Can innovation and technology come to the rescue?



In 2012, the global population surpassed 7 billion as the planet faced severe droughts, soaring commodity prices, and lagging agricultural productivity. Food price volatility is at its highest amplitude in more than 50 years, according to the International Food Policy Research Institute, while prices have reached levels not seen since the 1970s (see figure 1 on page 3). Are we facing an epic food and population disaster as English economist Thomas Malthus predicted in 1798, or will innovation and technology come to the rescue? The reality is too complex for a simple Malthusian calculus to answer, but we do know that the next decade will be a volatile and disruptive era for the food industry and consumers. Changes in weather, consumption, and global trade will fundamentally alter traditional operating models for most companies.

Are we facing an epic food and population disaster as Thomas Malthus predicted in 1798, **or will innovation and technology come to the rescue?**

This paper is the first of a series in which A.T. Kearney will examine disruptive changes in food supply and security, explore strategic responses taken by companies today, and outline potential future industry scenarios.

A Shift in What We Eat

Staggering economic growth in developing countries (averaging 6.3 percent per year between 2000 and 2010) has lifted millions out of poverty and created a new global middle class. China, which in 2000 had just 3 million households with disposable income over \$10,000, now has nearly 60 million households in this class and will have 230 million by the end of this decade (see figure 2 on page 3).¹

Newly affluent shoppers in the developing world are increasingly shifting from a subsistence-level diet, based primarily on simple grains and vegetables, to one that incorporates more meat and poultry. The United Nations Food and Agricultural Organization (FAO) estimates that, from 1999 to 2030, meat consumption will rise from 38 million tons to 59 million tons in Asia and from 21 million to 35 million tons in the Middle East and North Africa. Because producing one pound of protein requires the production of seven pounds of grains, increases in meat consumption alone will require a nearly 100 percent increase in global grain production from 2000 levels by 2030. Current forecasts for 2011-2012 indicate that we have covered just 20 percent of this projected need.

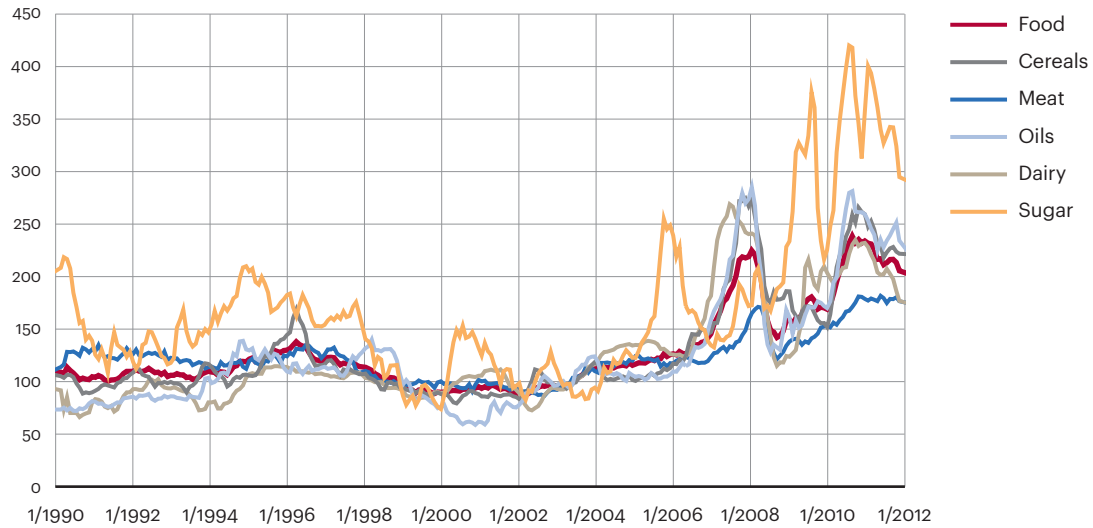
While developing world consumers will continue to demand additional meat and protein as they enter the global middle class, it would be a mistake to assume that they will demand a basket of goods identical to Western consumers, as rising middle-class consumers carry many traditional tastes and preferences with them. In fact, what constitutes a Western diet is likely to undergo substantial revision in coming years. Even as emerging market consumers place more meat in their shopping baskets, consumers in the developed world are shifting toward other

¹ All monetary figures are in U.S. dollars.

Figure 1
After 20 years of stability... a future of volatility

FAO Food Price Index

(2002–2004 = 100)

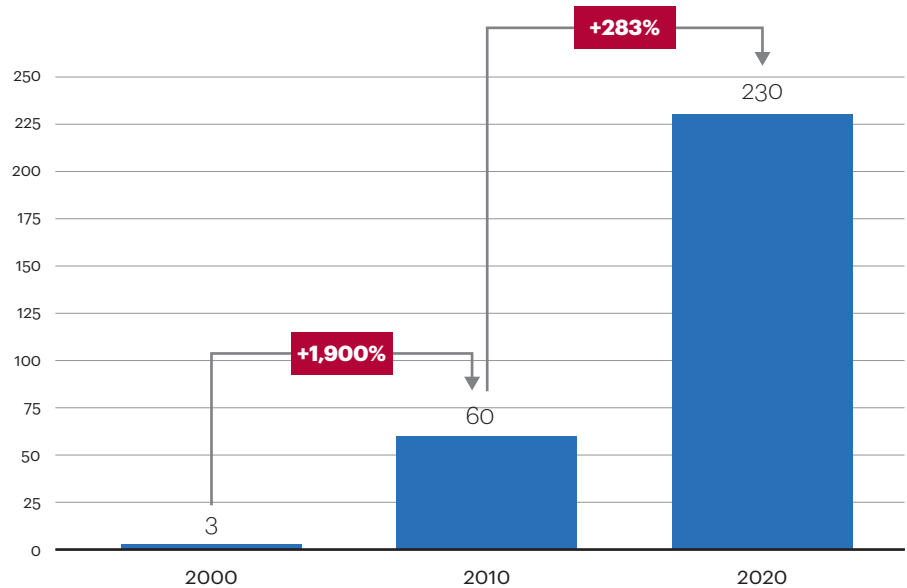


Note: FAO is the United Nations Food and Agriculture Organization.
 Source: FAO

Figure 2
More households in China are entering the middle class

Chinese households with income greater than \$10,000

(million)



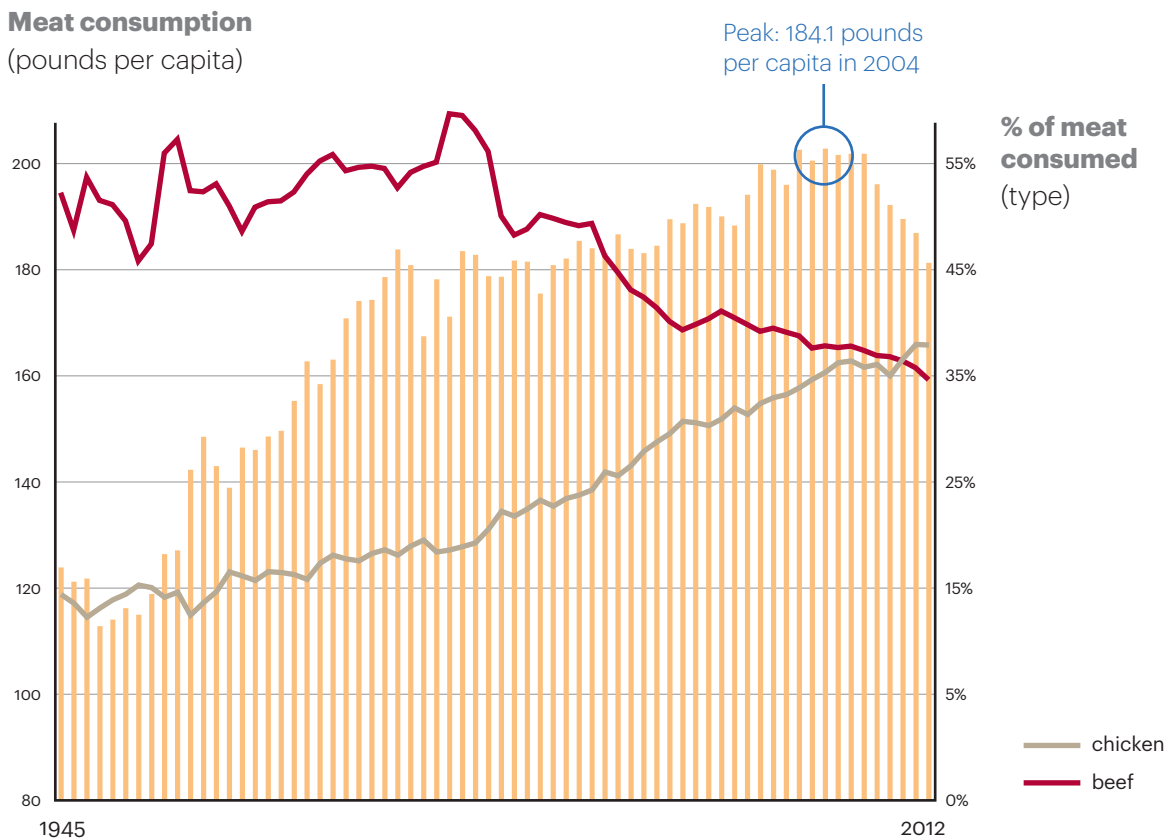
Source: Economist Intelligence Unit, A.T. Kearney analysis

items. In the United States, annual per capita meat consumption peaked in 2004 at 184 pounds and has steadily fallen to an estimated 166 pounds in 2012, a level more consistent with the 1970s (see figure 3). An equally important shift is the move away from beef, long the preferred meat of U.S. shoppers, to chicken. In 2010, U.S. chicken consumption exceeded beef consumption for the first time.

This shift is considered positive news for the planet because producing meat (especially beef) is more resource-intensive than other staples, but also for the health of consumers. Indeed, rising concerns about health and wellness certainly play a role in consumers' shifting preferences, with roughly one-third of American adults, one-quarter of British adults, and one-fifth of many continental Europeans clinically obese, according to the World Health Organization (and many more are overweight). Governments are also increasingly active in shaping consumers preferences toward healthier (or at least smaller) choices, as New York City's recent prohibition on large-format sugary soft drinks demonstrates.

Consumers' preferences are likely to continue to shift in even more unanticipated ways as companies introduce new products, from artificial meat to edible biocultures. What other new innovations could we see from the food industry? While it is difficult to say in terms of specific products, we can safely say that just as today's processed foods would have been inconceivable to a shopper a century ago, tomorrow's popular products are not yet on store shelves.

Figure 3
U.S. meat consumption has dropped steadily since 2004



Source: International Food Policy Research Institute, U.S. Department of Agriculture, U.S. Census Bureau, A.T. Kearney analysis

In addition to consumption pressures on food and feed, biofuels are increasingly used for energy production and as chemical feedstocks. In the United States, for example, the Renewable Fuel Standard mandates 15 billion gallons of biofuel production by 2015, most of which will be corn-based ethanol. U.S. ethanol refiners came close to that goal in 2011, producing 13.9 billion gallons. To produce this fuel, refineries consumed 40 percent of the 12.36 billion bushels of corn grown by U.S. farmers (though on a gross basis, refiners argue that the net figure is lower).

At first glance, it seems that we may finally be reaching the limits to growth that Malthus and his intellectual successors forecast. As the planet moves from 7 billion to a projected 9 billion inhabitants by 2050, and ever more of these join the global middle class, what will the global food market of the future look like? What levers do companies and policymakers have to achieve secure supply continuity and resource access?

In the middle of this push-and-pull dynamic between supply constraints and changing consumer tastes, **the global food supply network is getting more scrutiny.**

Historically, demand increases have been met by an expansion of supply—either by increasing the amount of land under cultivation or by improving crop yields. For example, corn crop yields have risen over 260 percent per acre over the past 50 years. However, the annual rate of agricultural productivity increases has been slowing, from 3.2 percent in 1960 to around 1.5 percent at the beginning of the 21st century. Meanwhile, the amount of remaining arable land available for cultivation is dwindling, subject to the pressures of increasing urbanization, and in some cases, climate change. Some studies have indicated that, with current crop yield increases slowing and land-use competition increasing, 70 percent of the necessary supply to meet projected demand increases will need to come from innovation. While many have used the term innovation, few have provided specifics around the potential sources of that innovation—an indicator of the lack of certainty around a solution to solve this growing crisis (see sidebar: Four Possible Future Scenarios on page 6).

The Role of the Private Sector and the Global Food Network

In the middle of this push-and-pull dynamic between supply constraints and changing consumer tastes and preferences is the global food supply network, a space that commands more interest and scrutiny by the public at large. While the world is home to more than 7 billion consumers, each with diverse tastes and preferences, and millions of farmers and producers of raw materials and commodities, just 300 to 500 companies manage a significant portion of the supply network. Consumer and environmental activists have frequently criticized the global food industry for its positions on everything from childhood obesity to genetically modified organisms and animal

rights. This group of retailers, brand manufacturers, traders, and processors rarely acts as a uniform group but is vitally positioned with influence on both the supply and demand sides of the food value chain. By 2020, few companies will control the vast majority of food supply, farmers and producers are more likely to be corporations, and consumers will be serviced by large global retail and restaurant chains (see figure 4 on page 7).

Four Possible Future Scenarios

While many possible futures can exist, we have designed four scenarios based on potential future events in both the global economy and the volatility of agricultural commodities. These are not predictions, but rather plausible future alternatives that companies need to consider when planning for the future.

The scenarios in this series are designed to assist companies with making present-day decisions by exploring the implications of different strategies in each scenario (see figure).

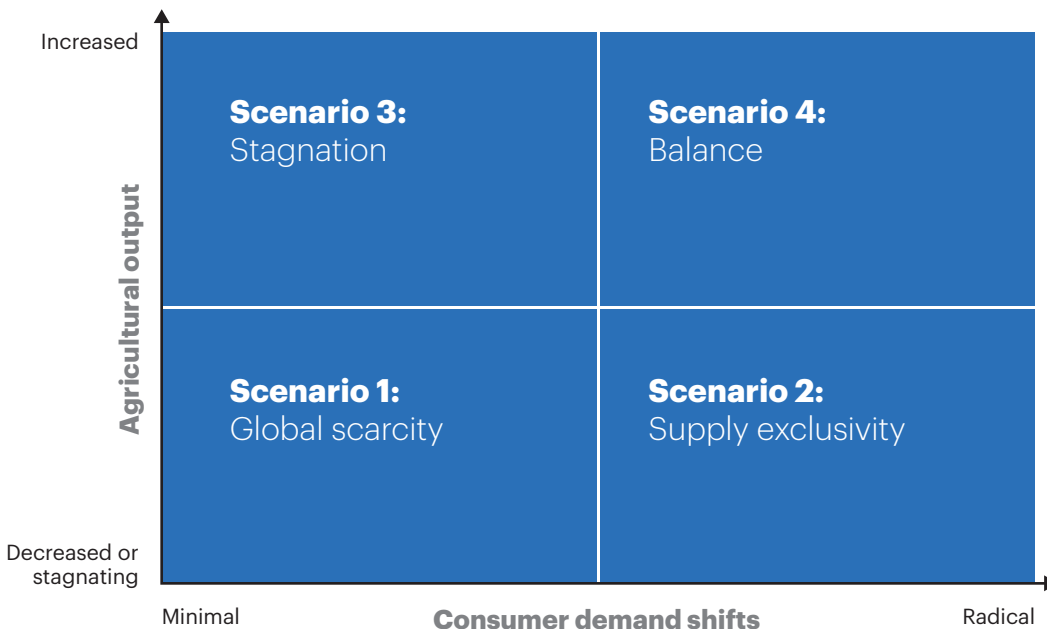
Scenario 1: Global scarcity. Current trends continue to create a world in which the gap between the haves and have-nots widens, supply shocks are common, and price volatility is even more pronounced. Food companies are in reactive positions, and resiliency and risk management are crucial success factors.

Scenario 2: Supply exclusivity. Rather than competing on the basis of price or quality, companies compete on the basis of assured supply continuity. Food companies hold the keys to meeting global demand based on the effectiveness of their networks.

Scenario 3: Stagnation. The balance between supply and demand continues roughly as it is today: not quite enough supply to meet demand but not so great a shortfall to create a panic. Food companies must stress efficiency to be competitive and meet new demand.

Scenario 4: Balance. Governments and companies develop policies that manage to balance supply and demand in a predictable and equitable manner. Flexibility is the crucial success factor to meet changing consumer tastes in a more plentiful global environment.

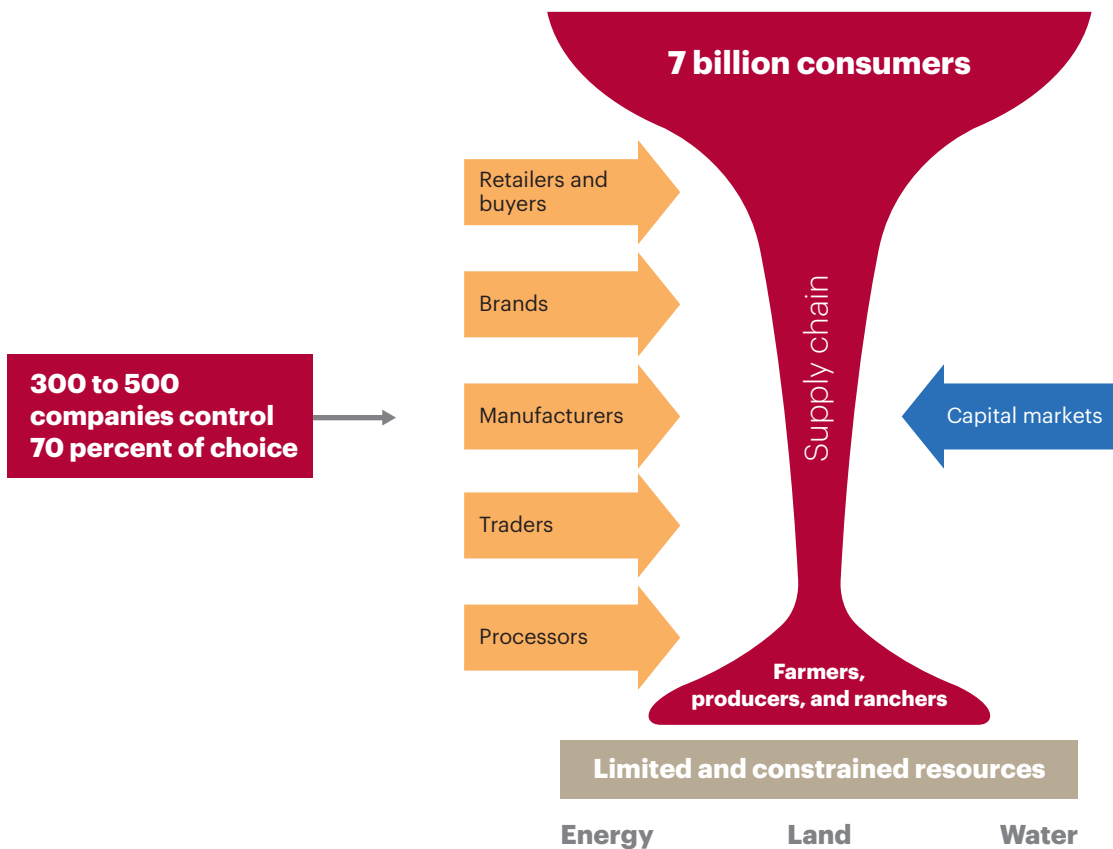
Figure
Scenario planning for the food industry, 2020



Source: A.T. Kearney analysis

Figure 4

The food industry's supply chain bottleneck



Source: Jason Clay, World Wildlife Fund; A.T. Kearney analysis

As such, the industry increasingly needs to act as one to tackle global issues of food security, sustainability, and safety. The interdependence of food manufacturers and retailers on topics such as food safety, sustainability, animal welfare, and labor laws will create a new level of competition that will favor supply-system innovation that takes advantage of the scale and influence of the network. Collaboration and trading partner alliances will become necessary strategic imperatives.

For global food companies, the changing landscape of the next 10 years has several significant implications, as well as opportunities to make a positive commercial and social impact. Consider the following emerging new realities:

- **Faster innovation cycles.** Faster innovation cycles will be needed to meet rapidly changing consumer demands in the developed and developing worlds. Social media proliferation and continued globalization will drive even faster changes in tastes across national and geographical boundaries. Current strategies and R&D organizations are not set up to respond with sufficient speed and cost effectiveness to be successful.

- **Competition.** Competition between supply networks, rather than individual companies, will increase. Rapid shifts in consumer tastes and a constrained supply base will dramatically increase the interdependencies of partners in the supply chain, as will food safety and transparency concerns. Food companies will need to develop new competencies in network management as the struggle to balance supply continuity, price sensitivity, and speed intensifies. Only the strongest networks will be able to successfully meet these challenges.
- **Industry consolidation.** Global scale will become increasingly important in order to meet emerging market demand and secure access to constrained resources. In addition to scale, political influence will also take a larger role to respond to issues raised by non-governmental organizations and restrictive regulations. We can expect increased acquisitions by private equity firms looking for smaller boutique brands that can be repackaged and sold to the large global players and by sovereign funds seeking resource security.

While the demand for food will continue to increase with population growth and shifting diets, the restricted availability of agricultural commodities and ingredients will limit the options available to companies in the global food industry. Companies that realize how to take advantage of their scale and influence in the global market will be able to capitalize on these changes and better adapt to the emerging opportunities.

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