Charting Growth in Food Demand

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Recommended Citation
Available at: http://lib.dr.iastate.edu/iowaagreview/vol14/iss3/4

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The recent large increases in the prices of agricultural commodities have focused the world’s attention on the price and availability of food to an extent not seen for the last 30 years. The low prices that have been with us since the mid-1980s lulled most of us all into forgetting about the urgency of the task that the world faces in expanding agricultural production enough to meet projected food demand.

Although there are large amounts of uncultivated land in Brazil, Africa, and underutilized land in Ukraine, Belarus, and Russia, much of the increase in food production will come about from increased agricultural productivity. Increased crop yields and livestock feed efficiencies are largely responsible for the fact that we have been able to sharply reduce malnutrition rates in the world over the last 40 years. The problem facing the world in the next 40 years is not whether we can produce enough calories for a growing population but whether we can produce the type of food that people with rising incomes will want to eat at an affordable price.

As incomes grow, people move away from a diet consisting largely of staple food crops (such as rice, wheat, corn, vegetable oil, and legumes) into a diet that includes more fish, meat, dairy products, and eggs. This higher-income diet requires the feeding of livestock. Cattle and sheep can be fed grass or grain. Hogs, poultry, and fish must be fed grains and protein meal. Thus, it is likely that the next 40 years will require increasing amounts of grazing land and much higher production of feed grains and oilseeds to meet increasing demands for a higher-protein diet. The accompanying graph shows the implications of this increased demand.

The graph shows three measures of the past and likely future growth in food demand. All three measures are calibrated to have a value of 100 in 1966. The bottom line simply measures the increase in food demand from a growing population. This is an accurate measure for food demand if the world’s diet stays constant at its 1966 level. As shown, food demand measured by population growth nearly doubled from 1966 to the present. It is projected to increase another 39 percent by 2050.

However, food demand will grow by more than population growth. Many people did not consume an adequate amount of calories in 1966. Per capita calorie consumption increased by 23 percent from 1966 to the present because of higher incomes and lower food prices. This increase in per capita caloric consumption despite a doubling of the world’s population is a major success story. Because much of the world consumes an adequate number of calories today, the next 40 years should see only a modest growth in per capita caloric consumption. But a greater proportion of calories will be consumed in the form of animal protein. Because it takes many calories of feed to make a calorie of animal protein, the demand for food as measured in terms of feed grain equivalents will grow much more rapidly than either growth in population or caloric consumption.

If in 2050 people in low-income countries, including China and India, consume as much meat and dairy as was consumed per person in the United States and Europe in 1966, and if feed conversion efficiencies improve at the same rate from 2009 to 2050 as they did from 1966 to 2008, then demand for feed grains will more than double between now and 2050. This last measure is perhaps the most useful indicator of the task that faces us.