

How Will Rising Income Affect the Structure of Food Demand?

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As China has over one-fifth of the world's consumers and an economy growing at 7-8 percent annually, the country's rising consumption of food has the potential to significantly impact world food demand. In past decades, policymakers in China were concerned primarily with supplying enough grain to meet basic nutritional needs of China's huge population. Now, however, the emphasis is shifting from quantity of food demanded to the changing composition of food demand. Strong income growth and rapid urbanization are diversifying the Chinese diet and creating demands for high-value and specialty food products.

Population Growth Slowing

With the world's largest population (nearly 1.3 billion in 2000), China plays an important role in world food demand. U.S. Census Bureau projections show that China may add another 100 million consumers between 2000 and 2010. In future decades, however, population growth will diminish due to the rapid decline in birth rates stemming from population control policies implemented by the government in the 1970s. The Census Bureau projects that China's population will peak near 1.5 billion and begin to decline between 2030 and 2040. As population growth slows, China's population will age rapidly. The need to support the growing retired population may increase savings rates but slow future growth in disposable income. In Japan, research has found that seniors consume more rice, fruits and vegetables, while younger generations consume more beef and beer (Regmi; Mori). Similar generational differences may also affect China's food consumption.

Urban Diets: More Meat, Less Grain

Most of China's population still lives on farms in rural villages, where they grow much of their own food and have less access to markets, stores, processed foods, and refrigeration. Grain is the major component of the rural diet, and households grow much of it themselves. In 1999, rural Chinese households consumed an

average of 247 kg of grain per person and purchased only 42 kg. In 2000, rural per capita food spending was just 464 yuan (\$56) annually, compared with 1,958 yuan (\$236) for urban residents. The difference reflects lower incomes and more self-production of food in rural areas, as well as less eating out in restaurants and fewer purchases of processed foods. Purchases of perishable foods in rural areas are limited by access to refrigeration. Only 12 percent of rural households had a refrigerator in 2000.

China is expected to undergo mass urbanization during the 21st century, which could have dramatic effects on food consumption. According to China's population census, only 36 percent of the population lived in cities and towns in 2000. This urbanization rate was 10 percentage points below the world average and lower than the rate in many other countries at similar development levels. China's policymakers are placing a high priority on urbanization, and analysts project a 50-percent urban population share by 2020. Assuming total population growth of 15 percent from 2000 to 2020, a rise in China's urban population share from 36 to 50 percent would mean an increase in urban population of 270 million.

When people move to cities or towns, they tend to consume more meat, processed foods, and restaurant meals, and less grain. In 2000, China's household surveys showed that per capita red meat consumption in urban areas was 40 percent higher than in rural areas. Per capita fish consumption in urban areas was 3 times higher, and egg and poultry consumption was more than 2.5 times higher than in rural areas. Urban per capita grain consumption was only one-third the rural average. Urban residents are more likely to shop in modern supermarkets and frequently patronize restaurants. Rising living standards in urban areas are boosting demand for high-quality grain, meats, and processed foods. Imports of fragrant rice, quality wheat for breads and cake mixes, special cuts of meat, and palm oil for instant noodles are in high demand by the urban market segment.

A hypothetical calculation shows how a higher urban population share in China could slow the growth in food grain consumption and speed up growth in demand for meats and fish. If China's total population remained constant, but its rate of urbanization increased from 36 to 50 percent, China's total food grain (rice and wheat) consumption would be 12 percent lower (table C-1). Red meat consumption would rise 5 percent if urbanization rose to 50 percent, while poultry and egg consumption would rise 14 percent and fish consumption would rise 16 percent. Consumption of vegetables and edible oils would be relatively unaffected since urban and rural consumption levels are similar.

Rising Living Standards

Within the urban market segment in China, incomes vary greatly. An emerging middle class of relatively high-income consumers is based largely in Beijing, Shanghai, Guangzhou, Shenzhen, and other wealthy coastal cities. Other urban residents, including many residents of inland cities, the unemployed, and growing numbers of migrants from rural areas and retirees, have much lower incomes. High-income urban residents consume more of most foods on a per capita basis, especially milk, fruit, beer, poultry, meat, fish, eggs, and vegetables (table C-2). Consumption of grains and fats and oils is similar for high- and low-income urban residents.

Table C-1—Estimated China food consumption for alternative urbanization rates, selected food items, 2000

Food item	Urbanization rate		Consumption change
	36 percent	50 percent	
	— Million tons —		Percent
Food grains	239.1	209.5	-12
Vegetables	139.1	140.5	1
Edible oils	9.3	9.5	2
Pork, beef, mutton	20.5	21.5	5
Poultry	5.6	6.5	14
Eggs	9.3	10.6	14
Fish	8.5	9.9	16

Note: Total consumption estimated as the product of per capita consumption and population. Urban and rural totals computed separately then summed to obtain a national total. The "36 percent" column uses the population totals from China's 2000 census, which reported 36 percent urban population. The "50 percent" column assumes the urban population is 50 percent of the total 2000 population. Derived demand for feed grains is not included in the table.

Source: ERS calculations using data from China National Bureau of Statistics, *China Statistical Yearbook 2001*.

Table C-2—Major food items purchased by high- and low-income urban residents, 1999

Items	Residents		Ratio of purchases ¹
	Low-income	High-income	
	— Kilograms —		Percent
Rice	49.0	47.0	0.96
Wheat flour	19.9	16.3	0.82
Breads, fine grain products	13.6	19.7	1.45
Coarse grains	2.3	3.7	1.60
Oils and fats	7.9	8.2	1.05
Vegetables	99.4	133.9	1.35
Fruits	32.8	72.0	2.19
Pork	13.4	19.6	1.47
Beef	1.2	2.3	1.88
Mutton	0.7	2.0	2.77
Poultry meat	3.2	6.1	1.89
Fish and shrimp	3.9	6.3	1.63
Milk, fresh	3.1	12.4	3.98
Eggs	9.3	13.2	1.42
Sugar	1.7	1.9	1.17
Beer	3.8	7.6	2.03

Note: High- and low-income groups were defined as the average of the highest and lowest two income classes, respectively, of the existing eight income categories.

¹Ratio of high-income to low-income average.

Source: China National Bureau of Statistics, *Urban Household Survey, 2000*.

Income growth may affect both the quantity and the mix of foods demanded in China. Demand analysis indicates that both rural and urban residents in China increase their purchases of all major food items as their incomes grow while holding prices constant. For most food items, the growth in demand is slower than the growth in income, as consumers tend to save or spend their income gains on nonfood items. Thus, the share of expenditures devoted to food tends to fall as incomes rise.

Income elasticities estimated by Chern illustrate how the response to income varies across food items (table C-3). China's urban residents increase their purchases of fish, poultry, and pork at rates faster than their growth in income. Some studies have concluded that grain is an inferior good, but Chern's estimates indicate that consumers increase grain purchases, although at a slow rate, as incomes rise.¹ Rural residents also increase their purchases of all items as their incomes rise, but the increase in purchases is proportionately

¹ An inferior good is one whose demand falls when consumer income rises.

Table C-3—Estimated income and price elasticities in China

Item	Income elasticities		Price elasticities	
	Urban ¹	Rural ²	Urban ¹	Rural ²
Fish	3.41	.95	-.67	-.35
Poultry	3.12	.70	-1.28	-.50
Pork	1.68	.67	-1.59	-.66
Beef and mutton	NA	.65	NA	-.38
Eggs	.55	.41	-1.81	-.91
Vegetable oil	.38	.34	-.41	-.58
Vegetables	.20	.36	-.43	-.48
Fruit	.21	.62	-.88	-.94
Grain	.11	.32	-.16	-.37

Note: NA = not available.

¹ Based on pooled provincial-level data from 30 cities and provinces, 1993-96.

²Based on rural household survey data from Jiangsu province (976 households) in 1994.

Source: Chern, 2000.

less than the increase in income. For rural households, the largest increases occur for fish, poultry, pork, beef and mutton, and fruit.

Sensitive to Price Changes

As China integrates with the world economy, some food prices in China could rise while others fall. Price elasticities of demand indicate that China's consumers are sensitive to food prices, suggesting that realignments of prices could have important effects on food demand. Urban consumers are especially sensitive to prices of pork, poultry, and eggs. Effects of changing prices could offset or reinforce effects of income growth. If, for example, meat prices were to rise after China's World Trade Organization accession, the price effect might slow the growth in meat demand stimulated by rising income.

Rural consumers still make up the majority of China's population, and more information is needed about their complex, interrelated production and consumption responses to price changes. For example, rural consumers both grow and consume grain. Thus, an increase in grain prices would not only increase a rural household's cost of consuming grain but also increase the household's income and incentive to produce grain. A higher grain price could induce more production and possibly more on-farm consumption. Households also hold substantial on-farm grain stocks, and price changes can induce households to sell off or add to their stocks.

What We Need to Know

How does the joint nature of farmers' production and consumption decisions alter conventional approaches to market analysis? How much farm grain production enters commercial channels?

How will increases in away-from-home food consumption and the aging of the population affect the mix of foods demanded? Does the aging of the population offset some of the consumption effects of income growth and urbanization?

Will consumers accept genetically modified food products? What quality attributes will consumers demand in foods?

Demand for Food Attributes Unknown

Little is known about how China's consumers will respond to newly developed food items and product ingredients, such as genetically modified foods, which could play an important role in China's future consumption and trade. Also, Chinese consumers may become more health conscious and pay more attention to food safety issues because the application of agricultural chemicals is poorly regulated in China and industrial pollutants are common in the soil, water, and air. Market analysts and policymakers need to know how much Chinese consumers are willing to pay for foods with specific attributes, such as high-quality ingredients, nutrition content, or brand names. Chinese consumers' willingness to pay for food attributes has implications for labeling policies for genetically modified foods and the viability of costly, identity-preserved food marketing and "green" and "organic" production methods.

China's consumption statistics are becoming less useful because they were designed to measure at-home consumption of basic commodities (see "China's Statistics: Are They Reliable?" in this report). Chinese consumers are eating more meals in restaurants, cafeterias, and dining halls, and these meals are not captured in consumption surveys. Statistics probably understate urban consumption of foods that are consumed away from home. Chinese consumers now differentiate rice and wheat according to quality and attributes, including stickiness, fragrance, and gluten and protein content, with widely varying prices. While the broad category of rice may have a low income elasticity, high-quality rice may have a high elasticity,

but this effect cannot be investigated with current statistics that do not differentiate among types of rice.

Further Reading

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