World Food Supply and Demand Projections for 2026
— Projection Results from the World Food Supply and Demand Model —

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1. Introduction

Japan as a net food importer greatly has depended on the global markets of food and agricultural products. World food supply and demand projection by utilizing own original analysis based on econometric methods is crucial for policy implication designed to ensure food security in Japan. The Policy Research Institute of the Ministry of Agriculture, Forestry and Fisheries has responded by creating and releasing the world food supply and demand projection to movements on the global food markets every year since 2008. The projection looks ahead 10 years into the future, using a model developed by the institute called the World Food Supply and Demand Model. The latest projection, released in March 2017, is entitled "World Food Supply and Demand Projections to 2026" and uses the year of 2014 as the base year. This paper provides an overview of the projection. For more information on the projection, see the publicly released material available at (http://www.maff.go.jp/primaff/seika/jyukyu.html) in Japanese.

2. Characteristics of the World Food Supply and Demand Model

The World Food Supply and Demand Model is based on a number of assumptions, such as the rate of population change and the economic growth rate in the future. It is a "large-scaled simultaneous equation method for supply and demand equilibrium model" in which the demand and supply for each commodity, which are intermediated by price and with the entire world as one market, are consistent up to the target year for the projections. It consists of a system of approximately 6,000 equations. Please refer to No.72 of this journal (July 2016) for a detailed description of this model. The model targets a total of 20 commodities: 6 crops (wheat, corn, rice, other coarse grains, soybeans, and other oilseeds), 5 livestock products (beef, pork, chicken, mutton, and eggs), 4 processed crops (soybean meal, other oil meal, soybean oil, and other vegetable oil), and 5 dairy products (raw milk, butter, skimmed-milk powder, cheese, and whole-milk powder). The projection items in the World Food Supply and Demand Model are: consumption volume by commodity, by area, and by country; production volume; net import and export volumes; and real and nominal international prices by commodity.

3. Assumptions for the projections

Since the projections looks 10 years ahead, it uses 2026 as the target year and 2014 as the base year. However, in order to even-out abnormal yearly values, the 2014 base year are averages of the three-year period from 2013 to 2015. The projections use the following estimates. The global population in 2026 is projected to reach 8.22 billion (up 13.1%), mainly through population growth in the emerging economies and developing countries of Asia, Africa, and elsewhere. The real per-capita GDP is projected to rise to $12,502 (up 25.0%). Despite perceived slowdowns in some developed and emerging countries, continued moderate global economic growth is projected for the medium term, and thus the general population growth and economic growth rates of emerging and developing countries are expected to continue affecting food supply and demand.
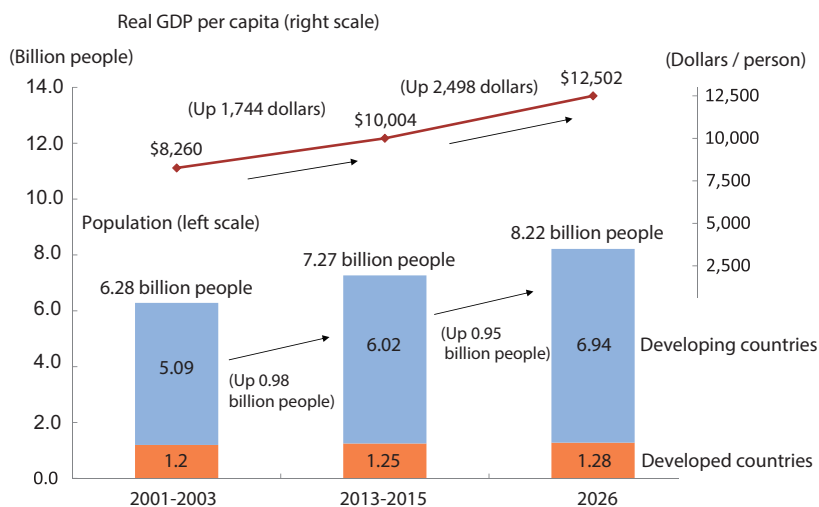

Figure 1. World total population and real GDP per capita

Source: estimated from the World Bank's "World Development Indicators 2016" and the United Nation's "World Population Prospects: The 2016 Revision."
Note. 2001-2003 and 2013-2015 are the 3-year average values (in this section, same below)

4. Projection results

World grain demand volume is forecast to reach 2.85 billion tons. Despite slowing growth in farm product demand in the years ahead, ongoing global population growth and improving income levels will result in growing food and feed demand, mainly among emerging and developing countries. Factors such as growth in meat demand will cause a higher growth rate in demand for feed grain (23%) than in demand for food grain (Figure 2). Grain production volume is projected to grow by 16.1% due to a 16.0% increase in unit yield despite an increase of 0.1% in total harvested land area. The paragraphs below describe the projections for the supply of and demand for each commodity in each region in 2026.

Wheat: It is projected that the present situation will continue and Asia and Europe will account for approximately 70% of the world production volume and consumption volume. It is also projected that the net import volume will increase, mainly in Africa, Asia, and the Middle East, where the production-volume levels are low compared to the consumption volumes, while the net export volume will increase in Europe (mainly in Russia, and the Ukraine), and also in North America and Oceania.

Rice: Asia will constitute more than 80% of the world production volume and consumption volume and that demand in Asia will continue to expand in the future, while in other regions, consumption volume will increase alongside the population growth, particularly in Africa and the Middle East. It is also projected that while the net import volume will increase in Africa and the Middle East, the net export volume will grow in Asia, mainly in India, Vietnam, and Thailand and therefore, trade will expand from Asia to Africa and to the Middle East.

Corn: The production and demand volumes of corn are projected to increase in all regions. In particular, the net import volumes in Asia and Africa will rise, while the increase in the net export volume will be from North America and Latin America, driven by the United States and Brazil.

Soybeans: It is projected that the growth in the soybean production volume will be relatively low in Asia and Europe, but that it will become high in Latin America and North America, and that on the other hand, the demand volume will increase mainly in Asia. Therefore, it is projected that the increase in the net import volume in Asia (particularly China) and Europe will be covered by the increase in the net export volume from Latin America, which will be driven by Brazil and Argentina, and from North America, which will be driven by the United States.

As described above, it is expected that the supply and demand of grains and other such commodities will be basically comparable, so the international prices of grains and other such commodities will not return to pre-2006 levels, but in real terms, they will trend within a flat range (Figure 3).
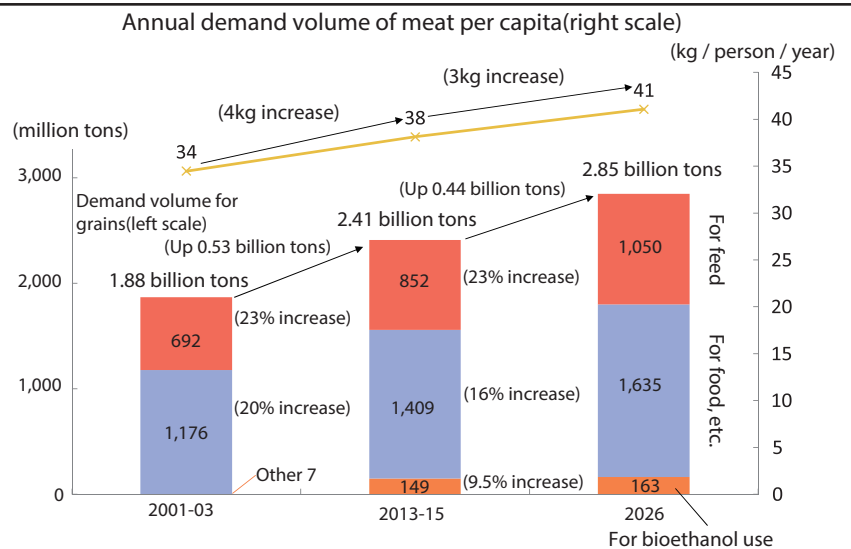

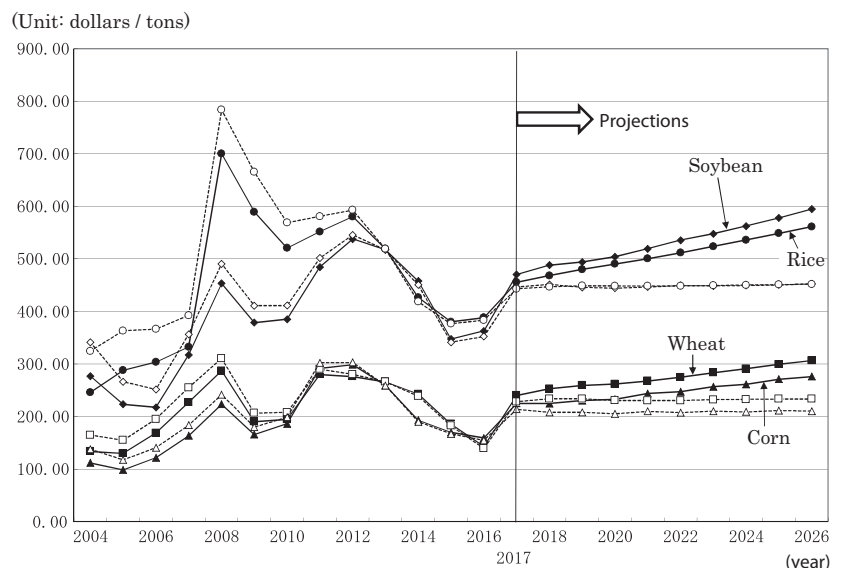Figure 2. Demand volume for grains and annual demand volume of meat per capita

Figure 3. International prices projections for grains and soybean
(solid line: nominal price, dotted line: real price)

Note 1. Prices until 2016 are actual prices. Prices for 2017–2026 are projections.
2. Actual prices and future nominal prices use 2014 (average of three years from 2013 to 2015) as the base year. Wheat, corn, and soybean prices were calculated using the US consumer price index (CPI), and rice prices were calculated using Thailand's CPI (all from IMF data).

There are no major changes to the results of these projections compared to the projections for 2025, which were published in the previous year, because there have been no significant changes to the conditions that constitute the assumptions for them. Within this situation, if we were to cite a difference in the current projections, it is that the prices of grains and other commodities are at a slightly lower level than in the previous projections. The background to this is as follows:
1) The base year has been updated to 2014, with a 3-year average of 2013 to 2015 (previously, it was 2013, with a 3 year average of 2012 to 2014). However, the international agricultural commodities prices have a decreasing trend since 2015, which has newly become part of the base year average, and therefore, for practically all of the commodities, the base-year price has fallen compared to the previous projections.
2) In the current projection, China's real average GDP growth rate per capita was downgraded during the projection period from the previous 6.2% to 6.0%. As a result, when compared to the previous projections, the rate of increase in the demand volume for many commodities fell and the price-increase rate declined slightly.

As described above, this paper introduces the World Food Supply and Demand Projections for 2026. In the future, the Policy Research Institute, Ministry of Agriculture, Forestry and Fisheries, shall continue to make timely, appropriate projections based on the latest assumptions.