

World Food Supply and Demand Projection to 2028

– Projection results by the World Food Supply and Demand Model, and differences in future projections due to recent revised China's statistics –

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1. World Food Supply and Demand Projection

In the global economy, while relatively high economic growth rates are maintained in a part of emerging economies, such as India, and developing countries, there is a tendency that the growth is slowing down in developed countries. Furthermore in developing countries, including emerging economies such as China, Russia and Brazil, it is expected that the growth becomes slower than ever before, and the trend of the world food supply and demand behind such the global economy is not only a matter of concern in various countries, but also an important basis of implementing food security policies in Japan.

In PRIMAFF (Policy Research Institute, Ministry of Agriculture, Forestry and Fisheries), we developed the “World Food Supply and Demand Model”, and after 2008, we are performing projections and analysis of the trend of world food supply and demand in the next decade, and releasing those results every year. In the last year, in March 2019, we published “World Food Supply and Demand Projection to 2028” (in the following “World Food Supply and Demand Projection”). In this analysis, in addition to an overview of the latest World Food Supply and Demand Projection, we explain an overview of an “addendum”, in which projections based on statistical data before the “significant revision” of China's statistics in November 2018 are described. For these details, they can be referred to the following materials about World Food Supply and Demand Projection and PRIMAFF project research report series that were to be published in summer 2019 (<http://www.maff.go.jp/primaff/seika/jyukyu.html>).

2. Features of the World Food Supply and Demand Model, and latest World Food Supply and Demand Projection

The World Food Supply and Demand Model is “a large-scaled simultaneous equations model for food supply-demand balance”, in which supply and demand in various commodities are balanced worldwide every year through each price, for 20 agricultural commodities including main grains and livestock products, based on some assumptions such as about the population growth rates and the economic growth rates in the future, and this model is composed of more than 6 thousand equations. The projection items of each commodity in the World Food Supply and Demand Model are consumption, production, and net trade by commodity and area, and real/nominal international prices by commodity.

In “World Food Supply and Demand Projection” at this report, we set the target year to be 2028, and the base year to be 2016. Note that the quantities and values in the base year are the three-year average from 2015 to 2017, to level the base-year data that may contain an outlying observation in a certain year.

3. Projection results for the year 2028

In the following, we explain only a part of commodities in the projection results of “World Food Supply and Demand Projection”, due to limited space in this brief report.

(1) International reference prices of grains and oilseed crops transitioning with a bearish tendency

In the future to the target year, as the growth of the world economy further slows down, the growth of additional demand of grains and oilseed crops (major crops and oilseeds such as soybean) slows down in some parts of emerging economies, such as China, Brazil and developing countries. However, there will be ongoingly an increase of additional demand of food and livestock feed in other emerging economies and developing countries, in which there will be a continuous increase of total population and a slow increase of the income level behind it. It is expected that the worldwide demand of grains and oilseed crops slowly increases, even though there is a tendency that the growth of the demand slows down.

On the other hand, regarding supply, it is expected that the growth of the increase of harvest areas almost levels off, but there is an increase of the production of grains and oilseed crops owing to the increase of their yields. As a result, the increase of the world demand of grains and oilseed crops is almost balanced with the increase of the world supply of those to the next decade. It is expected that international reference prices of grains and oilseed crops almost level off with a slightly bearish tendency, even though they will not sink to the lower level than the prices as before the year 2006, which was before the skyrocketing prices of resources and agricultural crops. It is expected that the growth of international prices of maize and soybeans especially remains 0-2% in real terms to the year 2028, and real prices of wheat and rice slightly decrease.

(2) Wheat

In 2028, in South and Central America, Middle East, and Africa, the consumption of wheat will increase more than the production, and it is expected that net imports increase in each country, and the growth of net imports becomes large especially in Middle East and

Africa. In Asia, even though net imports in China is projected to level off compared with those in the base year, net imports are expected to increase in many Asian countries including Indonesia, and net imports in Asia will increase up to 57.62 million tons.

In contrast, in North America and Europe, even though harvest areas are expected to decrease a bit, the growth rate of production will become greater than the growth rate of consumption, because of the increase of the yield. In North America and Europe, net exports are expected to increase up to 48.06 million tons and 88.75 million tons, respectively. In Europe, even though there is uncertainty of weather in Russia and Ukraine as Europe area, the growth of the production of wheat will be much greater than the growth of consumption, and net exports in both countries are expected to reach to 62.09 million tons (Table 1).

4. Differences in future projections due to the revision of statistics in China

(1) China's big revision of statistics of agricultural production and World Food Supply and Demand Projection

In "World Food Supply and Demand Projection", we made projections in 2028 for food supply and demand in various items in China based on the production statistics of grains, livestock products, and so on in China, which were significantly revised in November 2018 by the Chinese government. On the other hand, we also simulated supply and demand of main grains and oilseed crops in 2028 based on the statistics in China before "the significant revision" as previous statistics, using the World Food Supply and Demand Model in the same way. We briefly showed the differences between the both projections based on the statistics before and after the revision as a reference. In particular, we made projections of supply and demand of wheat, maize and rice in China up to 2028, using the statistics before the revision, and we measured differences between the both results.

(2) Differences between projections based on statistics before and after the revision

The following shows the main result considering measured differences between the projections based on statistics before the revision (in the following, "projections before the revision") and the baseline projections (i.e., "World Food Supply and Demand Projection", in the following, we call it "baseline"), which are projected based on the statistics after the revision. Regarding the net trade in China in 2028 in the projections before the revision, wheat is expected to be 4.22 million tons, which is 0.33 million tons smaller than the net imports in the baseline, but there is no significant difference from the baseline. Rice is projected to be 3.24 million tons, which is 2.25 million tons larger than the net imports in the baseline. This is because the production in the projection before the revision is about 2% lower than that in the baseline, and the food use is expected to be the same level as that in the baseline, which makes net imports be higher than the baseline. For maize, net imports will reach to be 33.81 million tons, which is 28.82 million tons larger than the net imports in the baseline. The reason why the net imports in the projection before the revision are expected to be significantly larger than those in the baseline, because production is projected to be lower than that in the baseline and the feed crops is not efficiently used compared to the baseline. Therefore, the additional increase of the feed use cannot be covered by domestic production.

Also, looking at the production in China in 2028 in the projections before the revision (Figure 1), we found that wheat is projected to be 2.8% lower than the baseline, maize is expected to be 21.0% lower than the baseline, and rice is simulated to be 1.6% lower than the baseline. All of these results take over the differences from the statistics before the revision, and these differences are reflected.

5. Summary

In general, China's official announcements of food supply and demand, in particular, the consumption and stocks of grains and oilseeds are limited, and in many cases, they are discussed based on estimated values and quantities of their demand-supply balance and so on released by USDA (United States Department of Agriculture). The announcement of the revised statistics in November 2018 by Chinese government is mainly about production, and we have shown in this report a part of results projected based on differences in statistics due to the revision. It is thought that one of the causes for the differences in the statistics before and after the revision would be generated in some demand side reasons including unclear stock quantities that have been hardly announced by the government. Maize has shown the largest correction in the main grains, and the statistics of maize before the revision are significantly different from the actual ones of the current feed use and stock quantities. Therefore it is thought that, as a result, the Chinese government had no other choice but to revise the statistics to their actual situations. As shown in the above, in this report, we introduced "World Food

Table 1. Projection results of wheat

(Unit: million ton)

	Production		Consumption		Net exports (or imports)	
	2015-2017	2028	2015-2017	2028	2015-2017	2028
World total	752.4	865.7	733.9	865.1	0.0	0.0
North America	85.4	92.1	40.3	43.9	42.4	48.1
Latin America	28.9	33.9	40.1	47.0	-9.8	-13.1
Oceania	25.6	29.3	8.2	9.3	17.2	20.0
Asia	285.8	331.4	320.0	388.7	-51.0	-57.6
Middle East	40.9	50.2	59.8	72.9	-18.3	-22.8
Europe	260.5	295.2	189.4	206.4	70.6	88.7
Africa	25.4	33.6	75.6	96.3	-50.6	-62.7
(Reference)						
EU	152.5	168.8	129.5	142.2	22.4	26.5
Russia	72.9	85.3	40.7	44.1	30.9	41.2
Canada	29.9	34.3	9.2	10.9	21.2	23.4
United States	55.4	57.8	31.1	33.1	21.2	24.7
Australia	25.1	28.9	7.3	8.2	17.8	20.7
Ukraine	27.0	32.1	10.8	11.2	17.6	20.9
China	133.4	134.6	119.2	139.0	-3.2	-4.5
India	90.7	115.3	93.9	116.1	-1.9	-0.9
Indonesia	0.0	0.0	10.1	11.6	-10.1	-11.6

Note: Table 1 and Figure 1 cited "the latest World Food Supply and Demand Projection".

Supply and Demand Projection” and a part of differences in the both projections due to the revised statistics in China. In PRIMAFF, we plan to obtain better food outlooks that are useful to observe food supply and demand in Japan in the future, under the newest preconditions based on analyses of agricultural and food policies in each country and area.

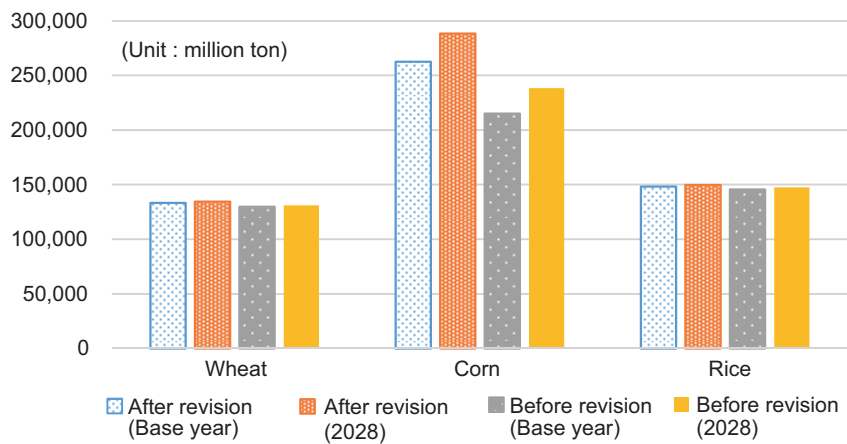


Figure 1. Differences of production in the base year and 2028