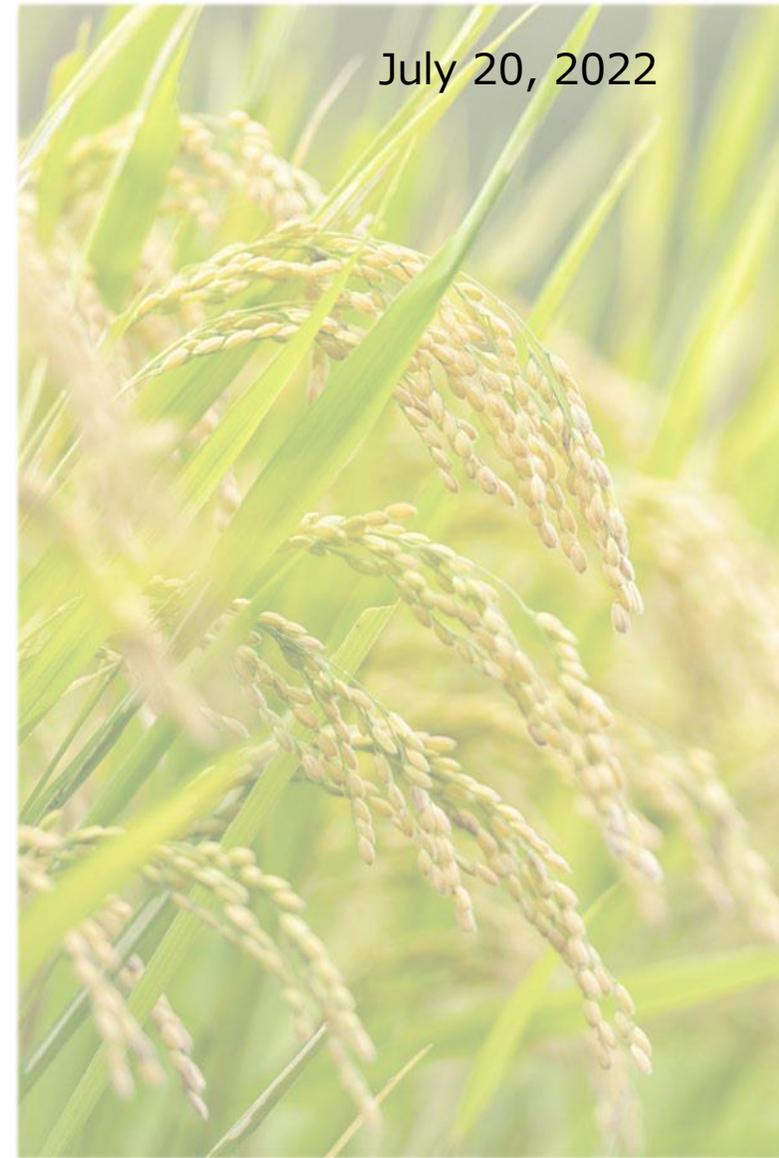


July 20, 2022

# Global & Japanese Food Security under the Protracted Crisis in Ukraine

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## Contact

Part 1  
Part 2  
Part 3

Ruan Wei  
Miwa Kobari  
Kosei Hasegawa

[wei@nochuri.co.jp](mailto:wei@nochuri.co.jp)  
[kobari@nochuri.co.jp](mailto:kobari@nochuri.co.jp)  
[hasegawa@nochuri.co.jp](mailto:hasegawa@nochuri.co.jp)

**農林中金総合研究所**  
Norinchukin Research Institute Co.Ltd.



## Part 1

### Intensifying Situation of Global Food Supply

-The Invasion of Ukraine is Not the Only Cause for Concern-

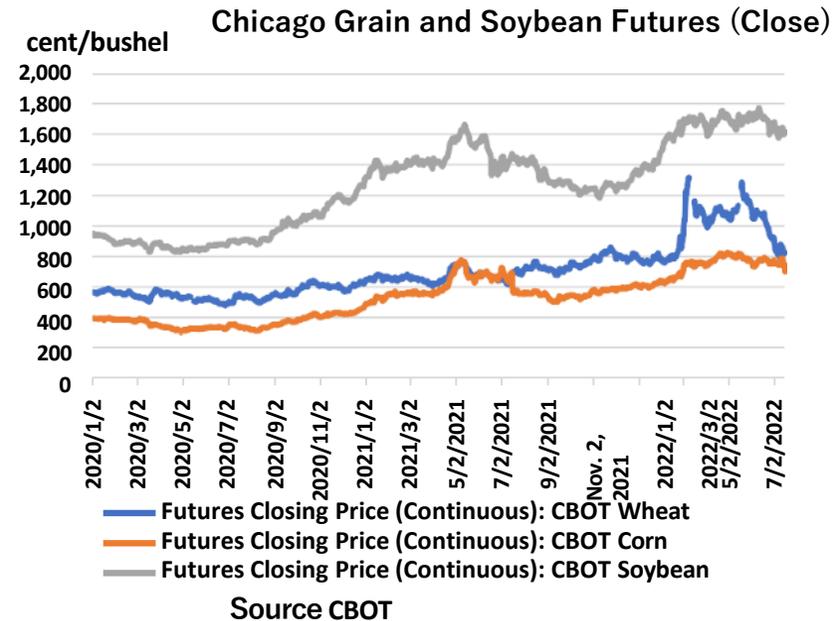
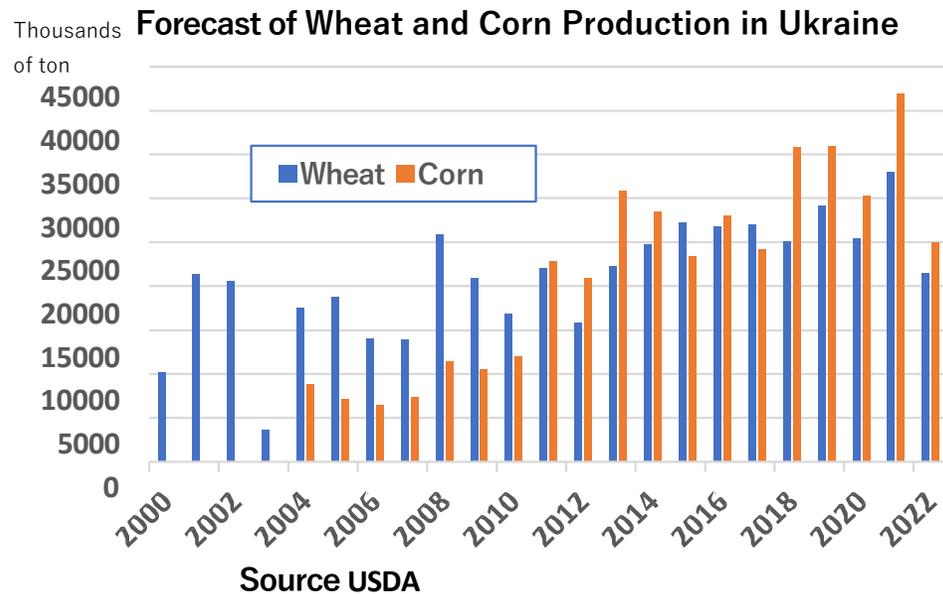


## Key Takeaways for Part 1

1. Grain Prices to Remain High in 2022/2023 with Risk of Sharp Decline
2. The Biggest Food Crisis since World War II due to Human Factors
3. Background of Absence of Social Turmoil like the "Arab Spring"
4. African Agriculture in Decline due to Grain Exports from Developed Countries

# 1 Grain Prices to Remain High with Risk of Sharp Fall in FY2022/2023

- Chicago futures prices for 7/15/2022 (cent/bu): wheat 781, corn 694 (7/14), soybeans 1470  
Wheat -7.0%, corn 8.2%, soybeans -2.9% compared to 2/22 before war.  
However, compared to 2021/7/15, wheat +16.2%, corn +23.4%, soybeans +1.6%, all still higher.
- Factoring in a significant decline in Ukraine's wheat exports in 2022/23.
- Projections for FY2022/23 (USDA 2022/7/12) - Grain in Ukraine in FY2022/23
  - Wheat: production 19.5 million tons (-40% YOY), exports 10 million tons (-46.8%, or less by 8.8 million tons)
  - Corn: production 25 million tons (-40%), exports 9 million tons (-60%, or less by 14 million tons)
  - Global wheat production -0.9%, exports +2.7%
- Lifting the Black Sea blockade would lead to a sharp recovery in Ukraine's exports.



## Russian Wheat Production and Exports USDA July 12, 2022

Marketing year 2021/22 (July-June)

-Wheat production was 75.16 million tons, -11.9% YOY (or less by 10.19 million tons).

Damage due to winter dieback occurred from February to March 2021.

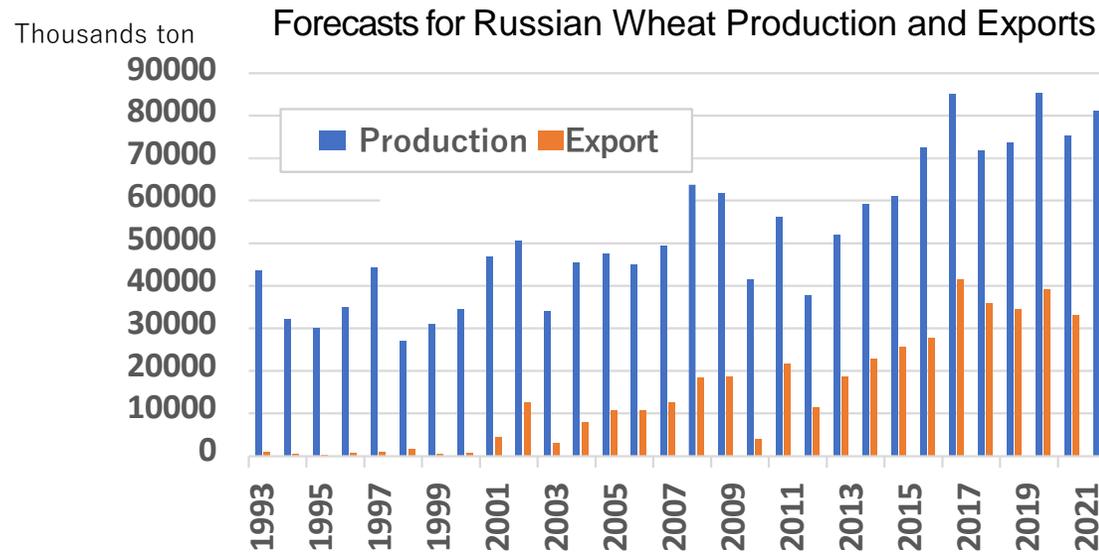
→Refreezing due to a drop in temperature after thawing due to a rise in temperature

-Wheat exports totaled 33 million tons, less by 6.1 million tons, or -15.6% YOY.

Forecast for MY 2022/2023

Wheat production up 7.8%, or more by 5.84 million tons, exports up 21.2%, or more by 7.0 million tons

If sanctions are lifted, exports will increase → Prices will fall further



Source USDA

## Unstable export system

- The basis of Russia's food policy is to ensure food security and stability of basic food supplies.

- The quota system, a control system for grain exports

  - Subject: Wheat, rye, barley and corn

  - Total export volume restrictions outside the Eurasian Economic Union

    - (Armenia, Belarus, Belarus, Belarus, Belarus, Belarus, Kazakhstan, Kyrgyzstan, Russia)

    - 7 million tons from April to June 2020, 17.5 million tons from February to June 2021

    - 8 million tons of wheat from February to June 2022 (banned to former Soviet Union countries from March)

- Introduction of "Variable Export Duty" on grain exports as a permanent measure, from June 2021.

  - Variable Export Duty: The amount of duty fluctuates in accordance with the export price of grain.

  - Objective: To prevent international price increases from spreading to the domestic market and to promote grain production.

  - Variable export tariffs for wheat, barley and corn, calculated and published weekly.

    - For example, base price per ton and export tariffs for June 15-22, 2022

      - Wheat (\$386.4, \$131.6), Barley (\$317.6, \$84.0) Ref: Wheat tariff in last week of 2021: \$94/t

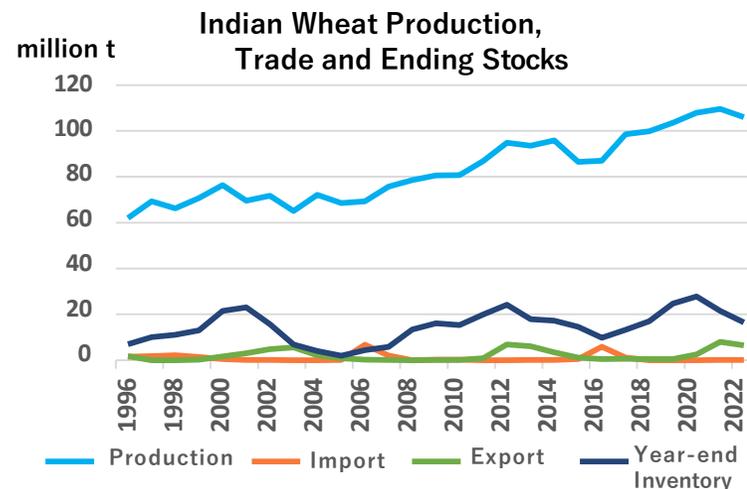
Grain imports and exports are positioned as an adjustment of excesses and deficiencies in domestic supply and demand.

- Indian wheat wholesale market prices have risen from late 2021
- Once-in-a-century heatwave, drought in April 2022 may reduce wheat production
- Wheat prices may rise further

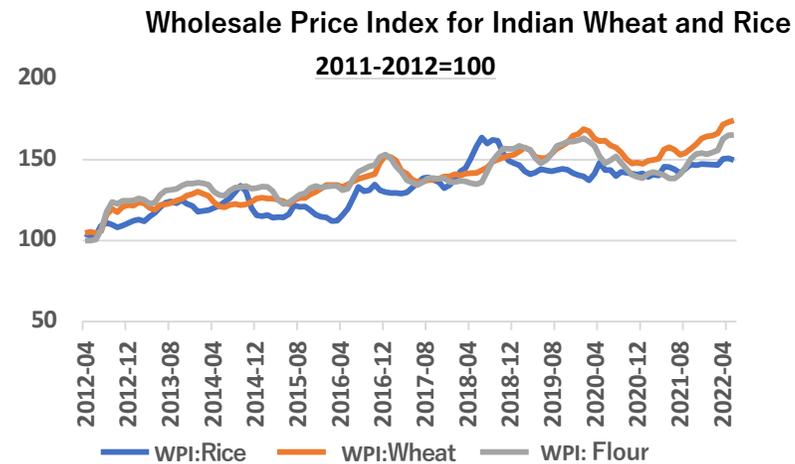
India has 170 million people living below \$1.9/day in 2015.

- According to the 2021 Global Hunger Index (GHI) Report, **India ranks 101 out of 116 countries**, down from 2019.
- Even lower than Bangladesh (76th) and Pakistan (92nd).

Export ban on May 14 to supply cheap wheat to the huge impoverished population



Source USDA



Source: Ministry of Commerce and Industry of India

# Feed Grain Barley Supplies at Risk of Decline

World production: 145.01 million tons in 2021

- EU27 35.8% or 51.97 million tons, Russia 12.1% or 17.51 million tons, Ukraine 6.8% or 9.92 million tons

Export : 3.409 million tons (23.5% of production volume) in 2021

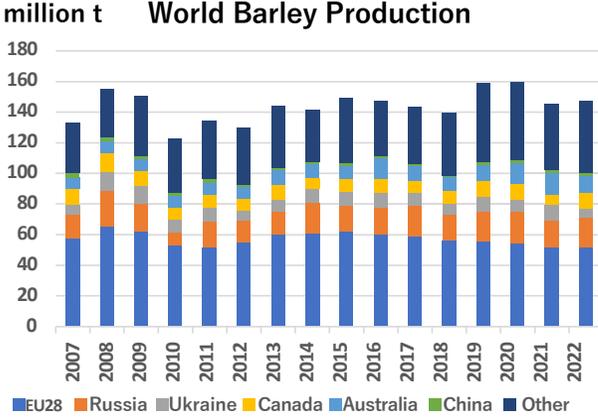
- EU27 22.0% or 7.5 million tons, Russia 11.7% or 4.0 million tons, and Ukraine 17% or 5.8 million tons.

Feed consumption: 70% of production

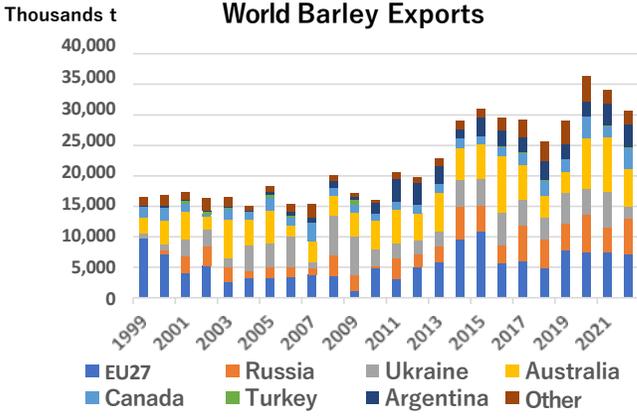
Food processing and industrial consumption: 30% of total production

USDA forecasts of exports in 2022/23

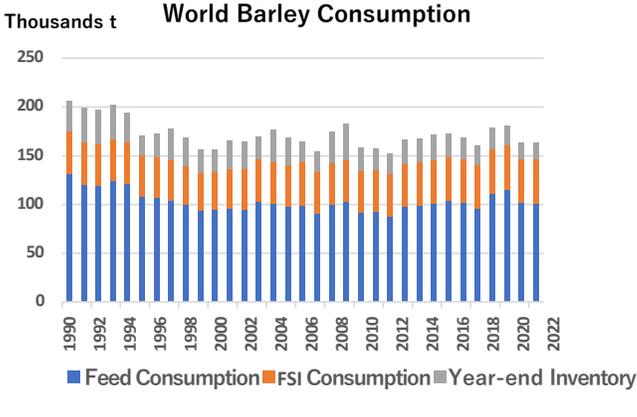
Ukrainian export : 1.8 million, down 69.0% YOY; Russia export : 6.0 million tons, up 50.0% YOY



Source USDA



Source USDA



Source USDA

# Fertilizer Prices Remain High with Risk of Plunge

Nitrogen prices fell sharply, falling to October 2021 levels in early July 2022

Phosphorus and potash prices remain high; resources unevenly distributed around the world

-Securing fertilizer is crucial for India and Brazil

Nitrogen production is not geographically constrained, and there are many new entrants such as India, limiting price increases

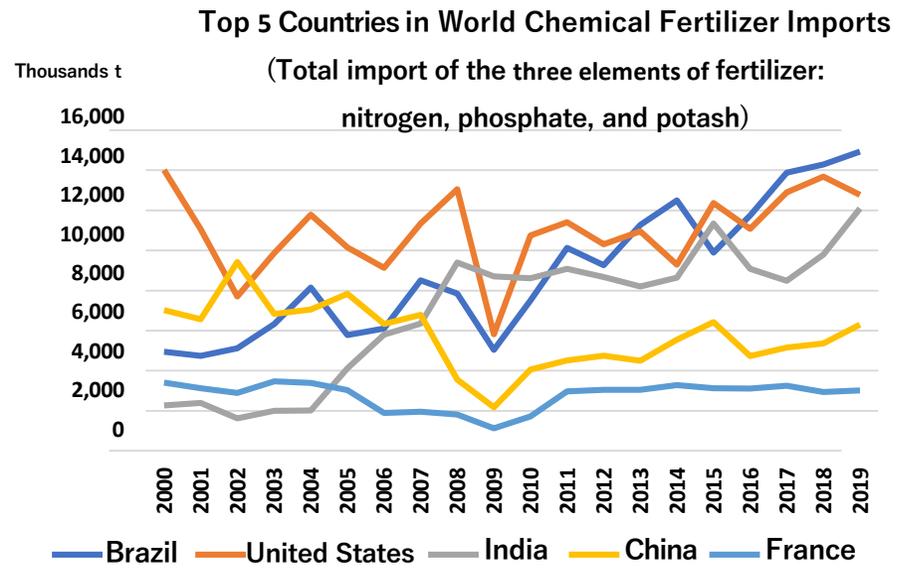
Risk of decline if sanctions are lifted

-Of total exports of nitrogen, phosphate and potash in 2019, Russia exported 16%, the highest in the world, and Belarus 7%.

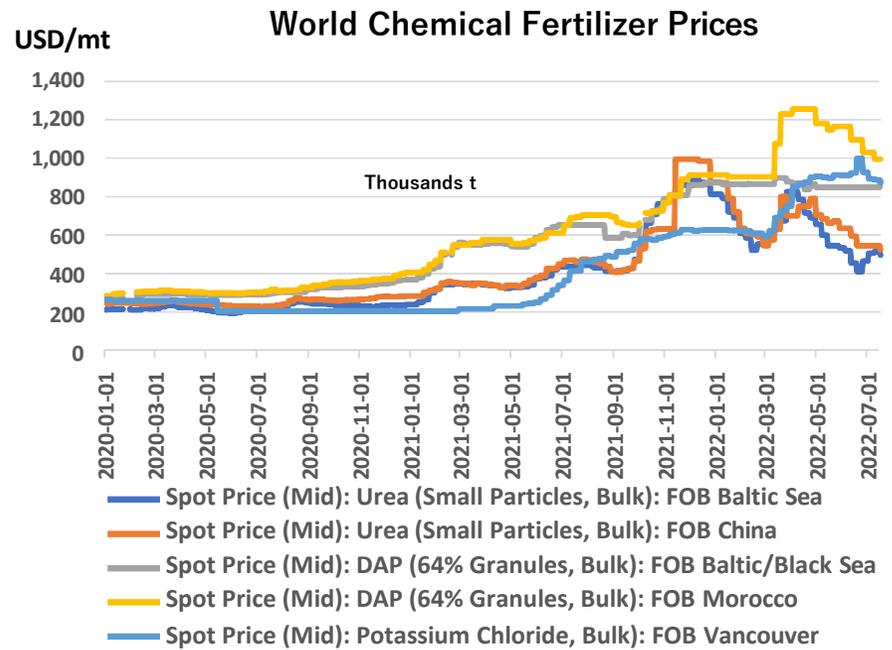
Chemical fertilizer prices are influenced by energy prices.

-Stagnant investment in oil and natural gas development due to the "decarbonization" trend = supply shortages

-Russia's natural gas exports at risk of falling



Source FAOSTAT

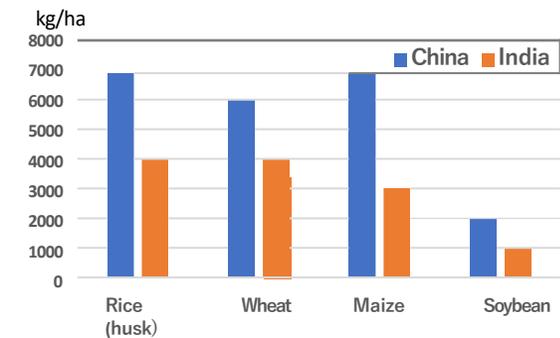


Source: [www.oilchem.net](http://www.oilchem.net)

# Implications of Chemical Fertilizers in World Food Production

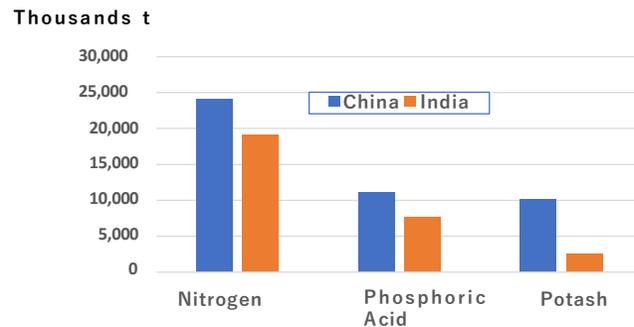
- Half a century to 2019.
  - World grain production has increased 2.5 times more, chemical fertilizer use 3.1 times, population 2.1 times
- **The increased population is fed by increased grains thanks to the increased application of chemical fertilizers.**
- China and India's food production increase is outstanding.
  - In the half-century to 2019, China's population grew by 72.4% and India's by 151.6%.
  - Grain production in China and India increased 3.5 times and 3.1 times, respectively, during the same period.
  - Grain planted area increased by 5.3% in China and only 1.7% in India
  - Chemical fertilizer use has led to a 14-fold increase in production in China and a staggering 20.9-fold increase in India
- India's yield is 56.3%, 59.8% and 48.4% of that of China for rice, wheat and corn, respectively.
  - India's chemical fertilizer use in the agriculture is 79.2% for nitrogen, 68.5% for phosphorus, and 25.8% for potash of that of China.
  - May increase food production by increasing chemical fertilizers.
- Demand for chemical fertilizers in developing countries is high.

Comparison of Grain Yields between China and India (2020)

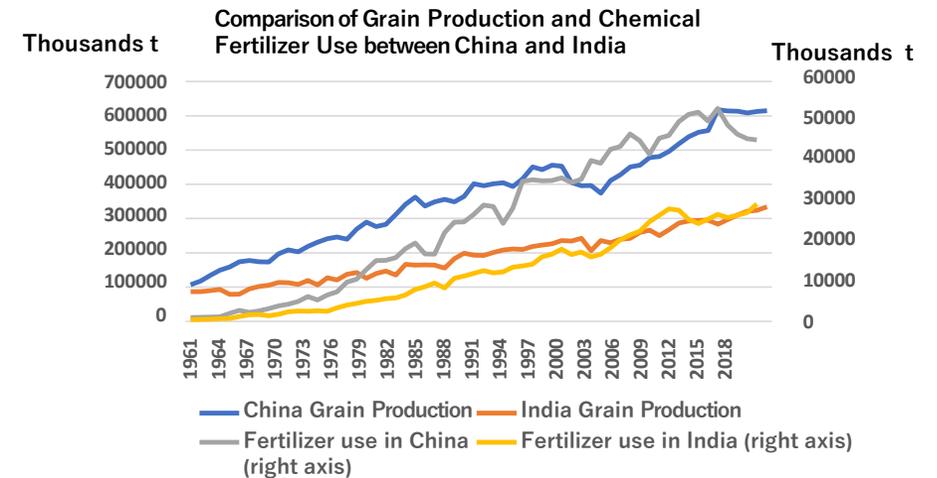


Source FAOSTAT

Comparison of Chemical Fertilizer Use in Agricultural Sector between China and India (2019)



Source: International Fertilizer Association



Note The total amount of nitrogen, phosphate and potash used in the agricultural sector. Sources FAOSTAT, International Fertilizer Association

# Consequences of Banning Chemical Fertilizers

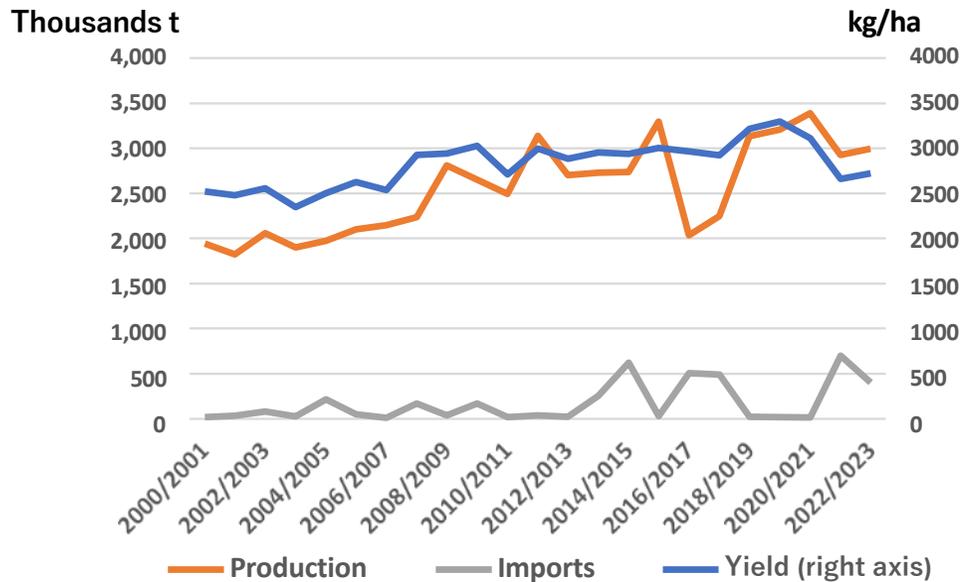
Sri Lanka banned the use and import of chemical fertilizers, pesticides and herbicides across the country in April 2021.

- Concerns about groundwater contamination and health hazards due to excessive use of chemical fertilizers.
- Promotion for organic farming throughout the country.

As a result of the sudden ban on chemical fertilizers while organic farming was not established, rice harvest in FY2021 was 2.92 million tons, -13.7% YOY; yield: -14.5% YOY, imports: 700,000 tons, up 50-fold YOY.

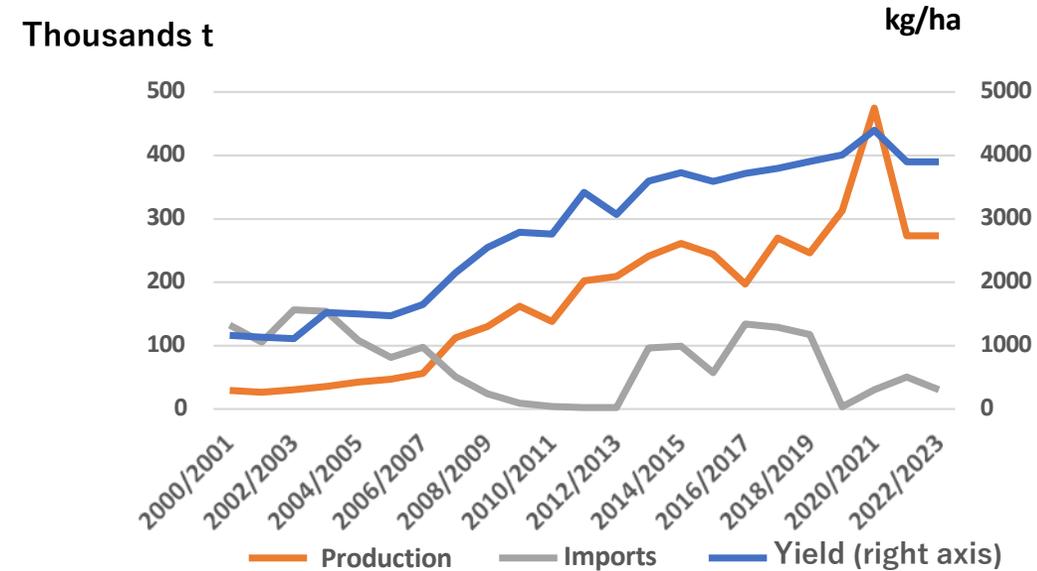
- Tea harvest, the largest export, at a 13-year low in February 2022, quality also declined.
- Food prices soaring, farmers' incomes declining, protests frequent (and debt problems, etc.)
- Bans on chemical fertilizers and pesticides use and imports were terminated in November 2021.

Rice Production in Sri Lanka



Source USDA

Corn Production in Sri Lanka



Source USDA

# Farmers May Use Less Chemical Fertilizers for Profitability

- According to the Food Outlook published by FAO on June 9, 2022,
- Agricultural production input cost indices, including chemical fertilizers, remain at record high.
- Chemical fertilizers cost averaged +6% MOM over the past year, well above the average food price of +2%.
- The current high food prices have led to a decline in farmers' real take-home pay, which has led to a reduction in production expenditure.
- International Rice Research Institute (IRRI) Warning: Global Rice Harvest at Risk of 10% Decline in Next Rice Harvest Season

- Securing chemical fertilizers is important for India and Brazil.
  - Brazil secured imports from Russia and other countries in March 2022 and April.
  - Indianexpress, June 30:.
  - India to import 350,000 tons of phosphoric acid from Russia at \$920-925/t including transportation costs
  - Cheaper than China, Saudi Arabia, Morocco, etc.

Prime Minister Modi at the G7 summit on June 27.

- The focus should be on the availability of fertilizers. "We are trying to increase the production of fertilizers in India and seek cooperation from G7-countries in this regard"

Brazil, "National Fertilizer Plan 2022-2050" (March 11)

Import share of fertilizer from current 85% to 45% in 2050

	Mar-21	Apr-21	Mar-22.	Apr-22
			Unit Thousands of metric tons	
<b>world</b>	<b>2,916</b>	<b>1,885</b>	<b>2,700</b>	<b>3,249</b>
<b>Russian federation</b>	<b>604</b>	<b>502</b>	<b>686</b>	<b>660</b>
<b>Canada</b>	<b>214</b>	<b>190</b>	<b>228</b>	<b>377</b>
<b>China</b>	<b>413</b>	<b>117</b>	<b>476</b>	<b>289</b>
<b>Egypt</b>	<b>58</b>	<b>22</b>	<b>37</b>	<b>255</b>
<b>Israel</b>	<b>66</b>	<b>32</b>	<b>71</b>	<b>249</b>
<b>Morocco</b>	<b>184</b>	<b>193</b>	<b>102</b>	<b>203</b>
<b>United States of America</b>	<b>178</b>	<b>119</b>	<b>120</b>	<b>198</b>
<b>Germany</b>	<b>107</b>	<b>50</b>	<b>37</b>	<b>159</b>
<b>Belarus</b>	<b>195</b>	<b>187</b>	<b>230</b>	<b>131</b>
<b>Saudi Arabia</b>	<b>97</b>	<b>16</b>	<b>45</b>	<b>111</b>
<b>Qatar</b>	<b>189</b>	<b>95</b>	<b>64</b>	<b>108</b>
<b>Nigeria</b>	<b>53</b>	<b>20</b>	<b>159</b>	<b>85</b>
<b>Spain</b>	<b>16</b>	<b>10</b>	<b>33</b>	<b>65</b>
<b>Chile</b>	<b>25</b>	<b>39</b>	<b>54</b>	<b>58</b>
<b>Netherlands</b>	<b>105</b>	<b>31</b>	<b>46</b>	<b>49</b>
Source ITC				

## 2. Human Factors, War and Sanctions

International prices for wheat, corn and soybeans remain high due to "war and sanctions"

- The blockade of the Black Sea, and international sanctions such as the exclusion of SWIFT from Russia
- Inventory is ample and production is on track

FAO, WFP and 3 other organizations, "The State of World Food Security and Nutrition, 2022" (July 6, 2022).

- Prices rose from 2021 due to port congestion and transport delays caused by the pandemic
- The starved population was about 828 million, or 9.8% of the world's total in 2021, up 150 million from 2019

WFP: 276 million people face acute hunger in early 2022, up 126 million from 2019

WFP-supported 81 countries will see an increase of 47 million people in acute hunger if the conflict in Ukraine is not resolved.

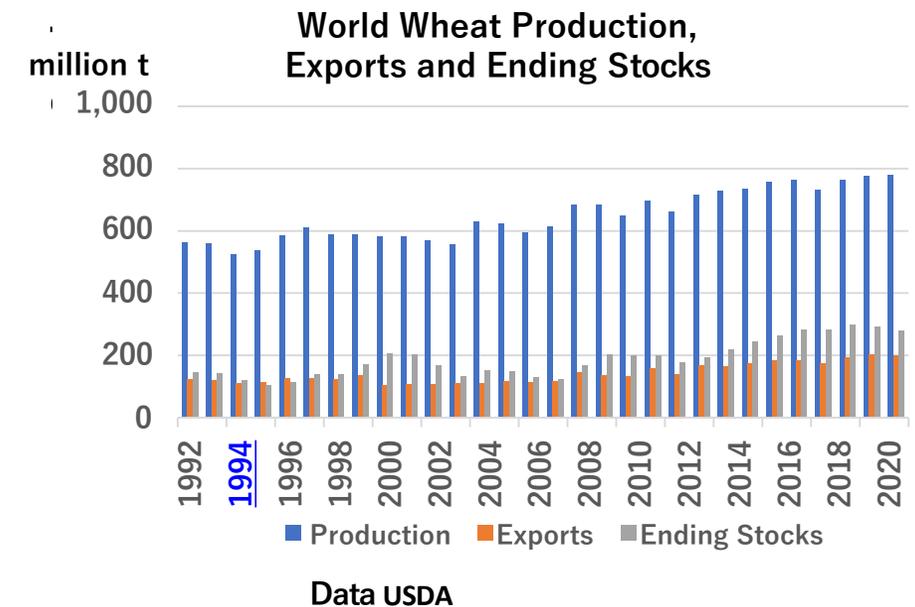
<https://ja.wfp.org/stories/ukurainazhazhengyiqiankaraguoquzuidanonisushiliaoweijiniguansurubaogaoshu>

The international community, including developed countries, has been cold to the hunger crisis in developing countries.

-WFP at a June 15 press conference, "When we look to Ukraine, we don't have enough money."

-\$1,763.5 million, or 80% of the amount needed for aid to Ukraine, was raised, but only \$472 million, or about 28% of the requested amount, was contributed to support South Sudan (UN)

Developing countries such as Africa and the Middle East are suffering from man-made crises.



# Worsening Food Insecurity in the Middle East and Africa

## Grain exports share of Russia and Ukraine

<Wheat> **Both countries'** wheat exports to **account for 27.9% of world** exports in 2020

Russia: 37.27 million tons, No. 1 globally (18.8% share); Ukraine: 18.06 million tons, No. 5 (9.1% share)

<Corn> Ukraine 27.95 million metric tons of corn, **4th in the world (14.5%)**

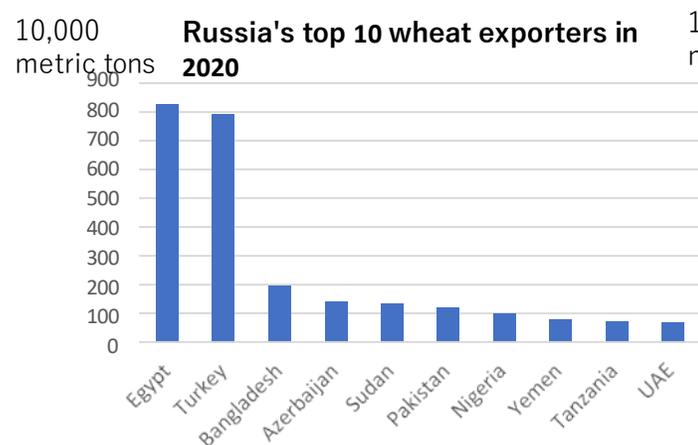
**About 1.5 billion people depend on grain and chemical fertilizers from both countries, UN**

•Russia and Ukraine export wheat to the Middle East, Africa and Asia.

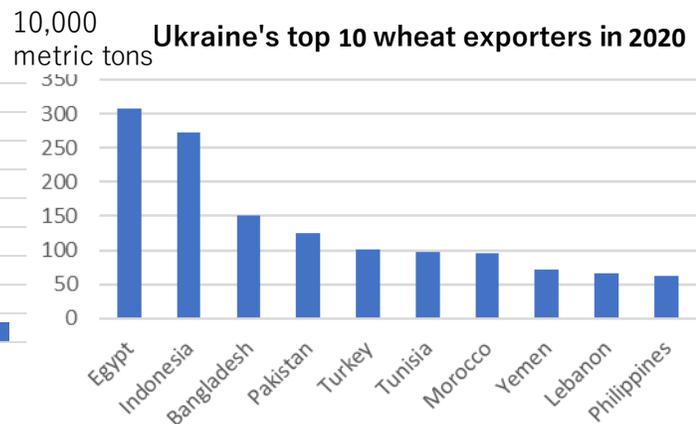
Dependency for the both countries : Egypt: 70%, Lebanon: 60%, Tunisia 80 % (FAO)

•Some developing countries are facing a permanent, structural food crisis due to income inequality, political corruption, civil war, and drought.

•Russia's invasion of Ukraine was an additional blow.



Source FAOSTAT



Source FAOSTAT

Top 10 Wheat Importers in 2020

Rank	Country	Import Volume (million tons)	Share (%)
1	Indonesia	1030	5.1
2	Turkey	966	4.8
3	Egypt	904	4.5
4	China	815	4.0
5	Italy	799	4.0
6	Algeria	705	3.5
7	Brazil	616	3.0
8	Philippines	615	3.0
9	Bangladesh	601	3.0
10	Nigeria	590	2.9
	<b>World</b>	<b>20235</b>	<b>100.0</b>

Source FAOSTAT

### 3. Why Were There No Food Riots like the Arab Spring?

- Starving population surged in Middle East and Africa as grain imports fall, but disruption is limited  
There have been no riots like the Arab Spring of 2011.
- **Misperception of harvest and export timing as the background**

Ukrainian and Russian wheat exports in 2021/22 are on track -> almost shipped before invasion

→Wheat harvest season in both countries is from July to August, while exports are from August to November.

-Ukraine's grain exports to May 2021/22 (USDA 10 June 2022 announcement)

--All wheat and 90% of the expected corn has been exported.

- "Reuters, June 22, Kyiv" reports.

Ukraine's grain exports for 1-22 June 2022 totaled 907,000 t (-48% YOY), of which 803,000 t corn, 78,000 t wheat, and 21,000 t barley.

1.7 million tons of grain exported in May 2022

<https://jp.reuters.com/article/ukraine-crisis-grain-export-idJPKBN2O30Q7>

The import situation in Egypt, the world's largest importer of wheat, is stable.

-In March 2022, 479,000 t of wheat were imported from Russia (up 24% YOY).

<https://europe.nna.jp/news/show/2320487>

-In May, Egypt plans to import 500,000 tons of wheat from India

<https://www.newsweekjapan.jp/headlines/world/2022/05/387009.php>

Ukraine's grain export ports on the Black Sea were blockaded.

Alternative routes

- By truck or rail from the port cities in northern Poland to the Baltic Sea by cargo ship.
- Railways have different gauges and require transloading
- Train from Odessa to Port on the Danube in Romania → Romanian export port Constanta by barge → Black Sea
- Europe and the U.S. set up grain warehouses along the border with Poland and others.
- Transport capacity to 3 million tons per month

In 2021, transport capacity via the Black Sea were average 5 million tons per month

→ Alternative routes are limited in quantity and high in cost

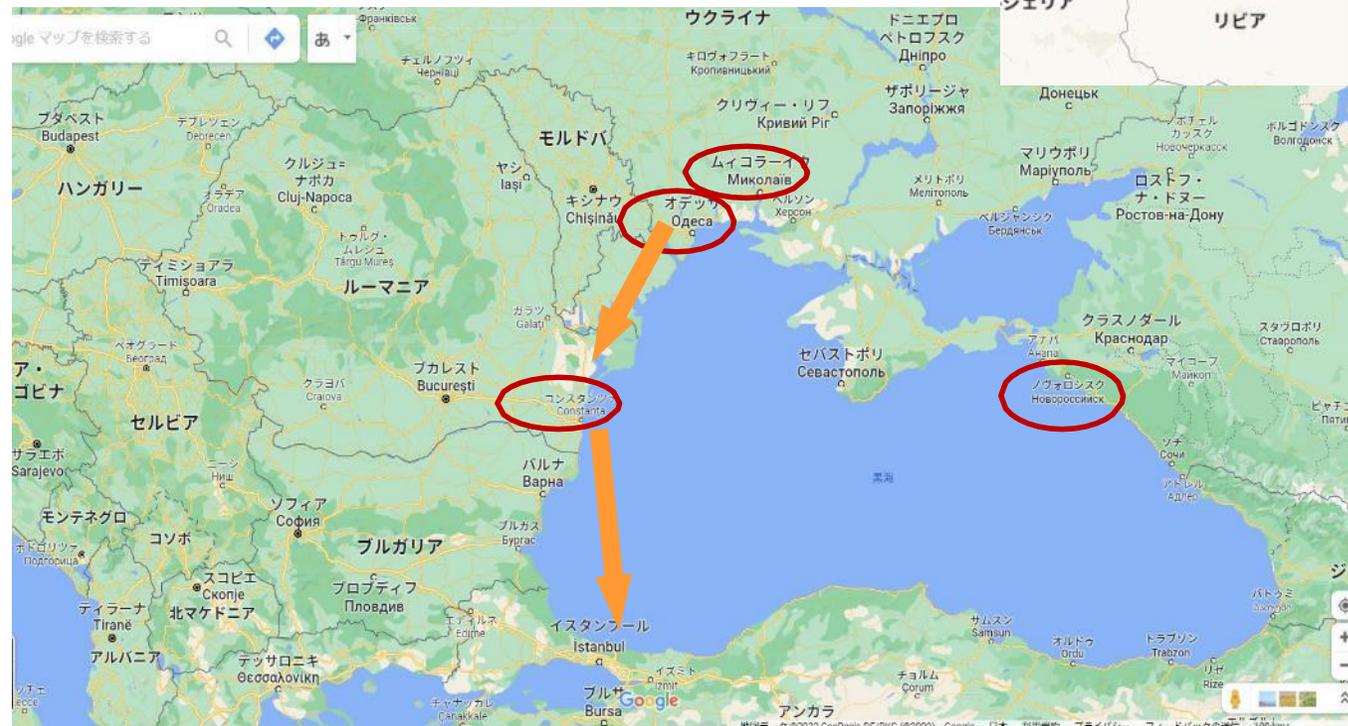
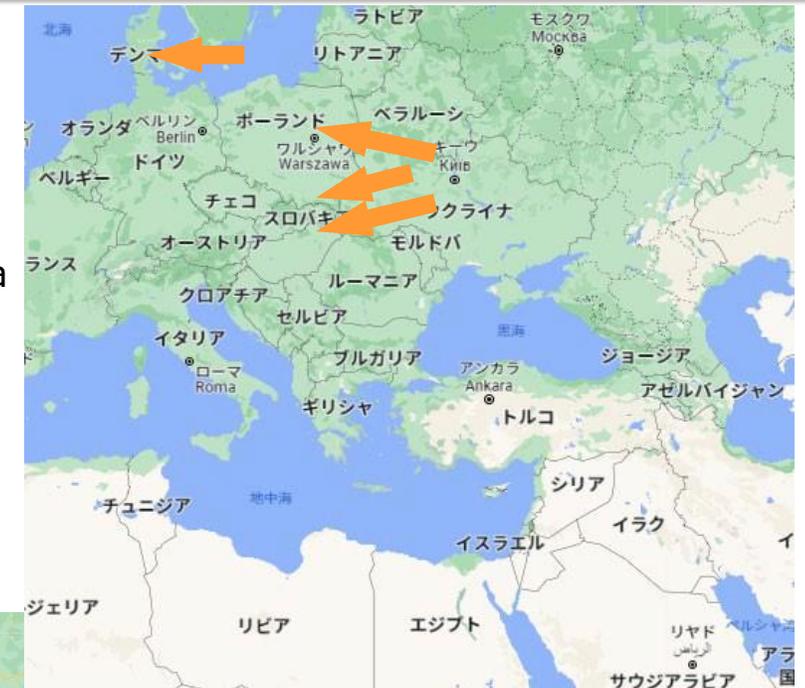


Photo by Google map

# Acute Hunger Population at Record High, but Rice Prices not Rising

Asian rice supply and demand, unaffected by the Black Sea blockade, is stable, with no price fluctuations.

The historic price crossing between rice and wheat is noteworthy.

- In March 2022, wheat prices exceeded rice prices for the first time since 1960.

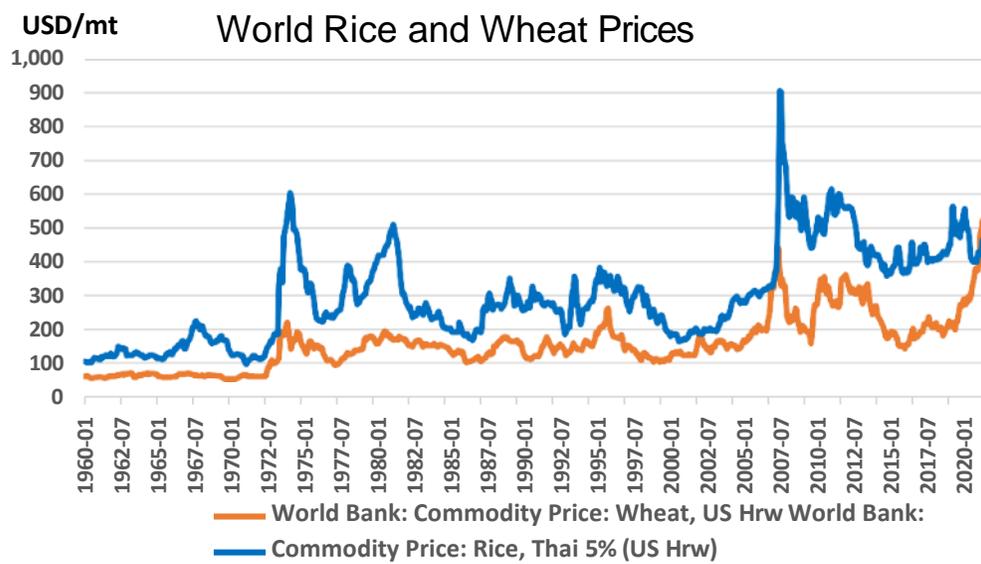
- Rice prices in June 2022 remained below the same month last year (-4.7%).

Wheat prices in 22/6 were 60.9% higher than in the same month last year

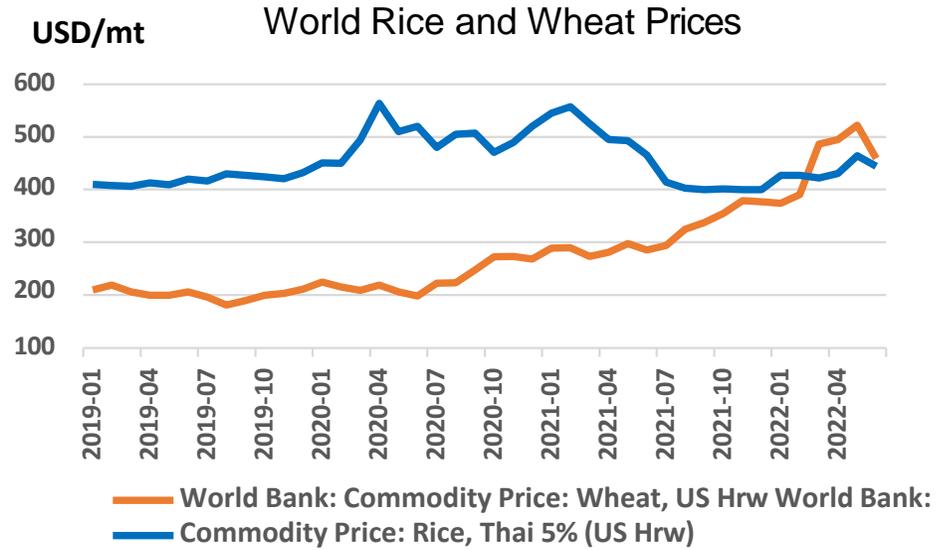
Rice rose sharper than wheat when commodities surged in 2008.

According to USDA, rice inventories at the end of FY2022 will be 2.1% lower than the previous year and remain high.

→Food management systems for rice production, distribution, and stockpiling established by Asian countries are functioning.



Source: World Bank



Source: World Bank

# Moderate Expansion of World Rice Exports

Export prices in India, which accounts for about 40% of the world's exports, are stable at low levels (currency depreciation / dollar appreciation are contributing somewhat)

Even with high U.S. rice export prices, many U.S. rice farmers are losing money.

-Texas A&M University study finds two-thirds of rice farmers will lose money this year

---FINANCIAL TIMES "Outdated Rice Agriculture" July 1, 2022 on Nikkei

USDA estimated global rice exports in 2021 to have increased by 1.98 million tons to 52.91 million tons.

In 2022, +1.29 million tons YOY, to 54.2 million tons.

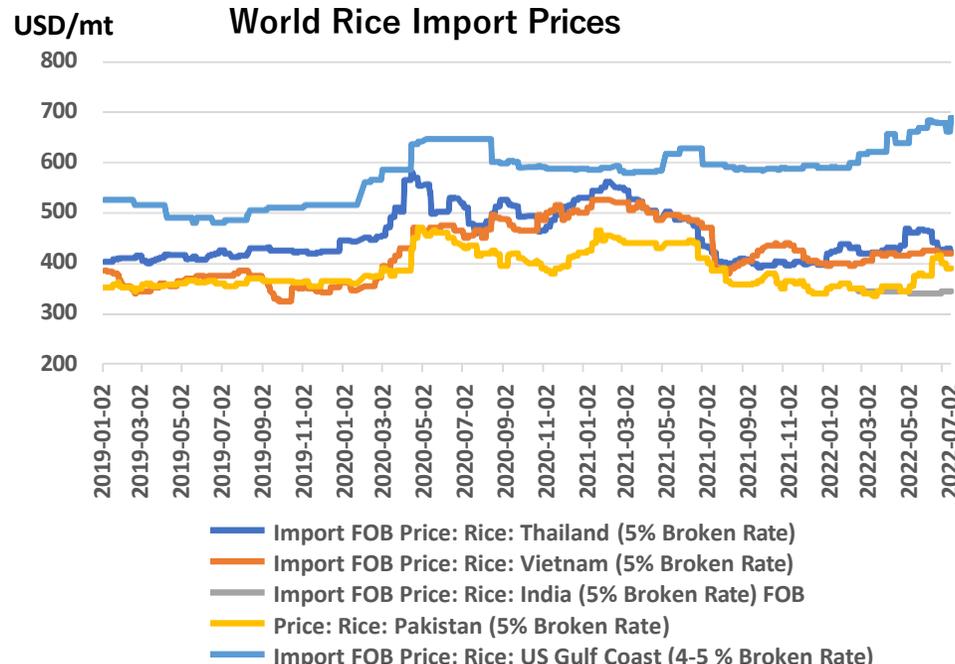
-Rice inventories at the end of FY2022 were 2.1% below the previous year's level but still remain high.

Example, Thailand increases rice exports:

--in 2020: approx. 6 million tons

--in 2021: 6.11 million tons.

--in 2022: Over 8 million tons



Source: China National grain and Oil Information Center

# Why Rice Prices Have not Risen?

Egypt imported 500,000 t of wheat from Russia in March 2022 and 500,000 t from India in May.

Egypt's domestic wheat harvest to began in mid-April, government tightened control

→ Combined of imports and domestic production secured enough wheat for 9 months of domestic consumption as of April

[https://www.arabnews.jp/article/middle-east/article\\_62670/](https://www.arabnews.jp/article/middle-east/article_62670/)

The shift from wheat to rice is not going to happen quickly in the Middle East and Africa.

→Consumption structure is different between rice that needs to be cooked at home and bread that are pre-cooked.

Government aid programs for wheat-consuming developing countries

→The generous Egyptian bread subsidy system is typical.

For 100%-wheat flat hollow bread "Eish", government controls raw material procurement, bread production and retail.



Photo from the Egyptian Embassy

\*"Eish" means "life" in Arabic.

Available t about one-twentieth of production cost thanks to subsidies → huge fiscal burden on government

<Egypt's regime experienced pain from pan>

In 1977, Sadat's regime cut subsidies for flour and other products. → Pressure from citizens and riots reversed the action.

In 2010, at the end of the Mubarak administration, market-oriented reforms were once again stalled due to the Arab Spring.

The current Sisi administration is focused on domestic stability.

-- Excluded 500,000 middle- and upper-income earners from beneficiary, but forego fundamental "Eish" reforms.

## 4. African Agriculture in Decline due to Grain Exports from Developed Countries

The U.S. had the Agricultural Trade and Development Assistance Act of 1954, Public Law No. 480 (PL480).

- Changed the name to the Food for Peace Act in 1966.

- Converted from food aid of surplus agricultural products -> to low-cost wheat exports through subsidies

World Bank, IMF offered financial support to African countries on favorable terms

- In return, they demanded lower tariff rates on grains and forced imports of wheat from developed countries.

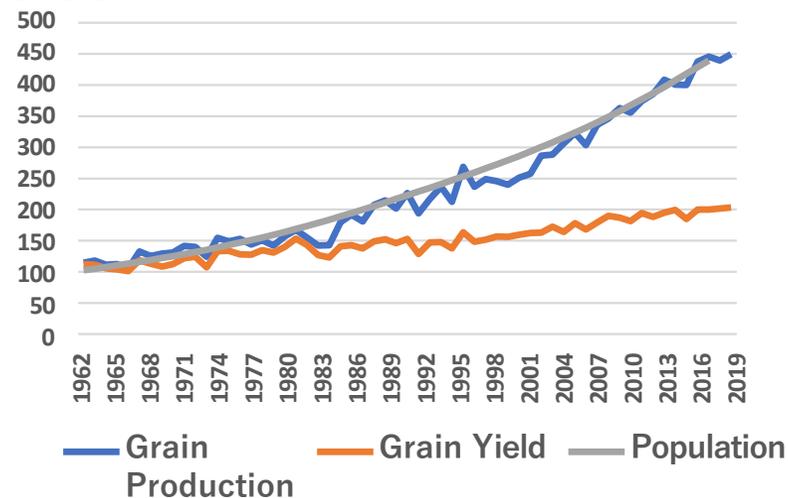
Agricultural revival in Africa → Increased grain production especially since 2008

### Average annual growth rate of grain and population (1961-2011)

Africa: Grains up 2.57% < Population up 2.64%, Asia: Grains up 2.75% > Population up 1.85%

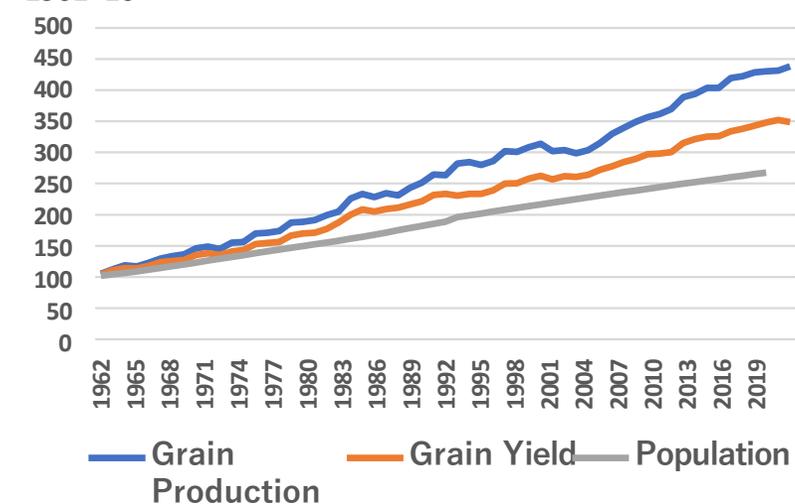
Africa's grain production growth is the key to solving food problems caused by population growth

1961=1 Grain Production and Population Growth in Africa



Source FAO

1961=10 Grain Production and Population Growth in Asia



Source FAO

# Africa's Challenge is its Dependence on Food Imports

Africa's net imports of wheat in 2020 was 47.4 million ton, equivalent to 187.9% of production.

Rice net imports was 14.86 million tons, 58.8% of production

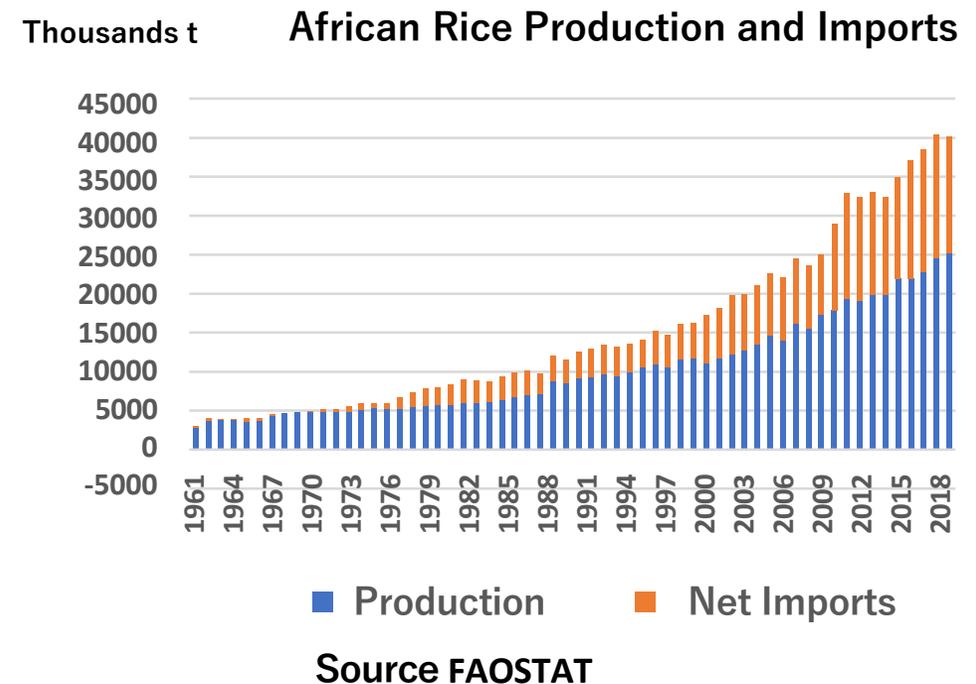
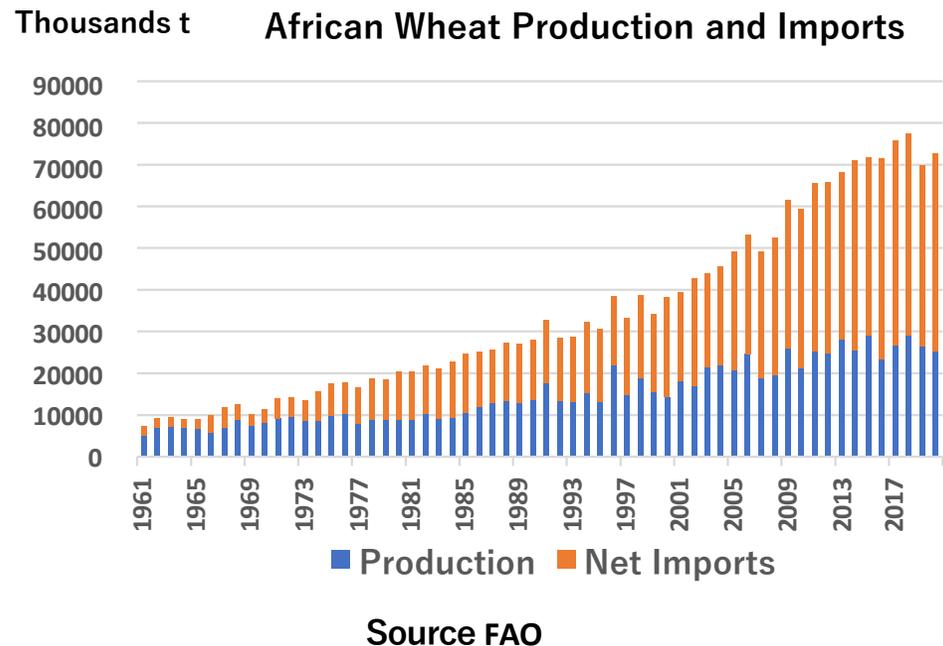
→ Combined imports of rice and wheat are 62.2 million tons... Import dependence is a serious problem.

-If the annual grain consumption per person is 100 kg, that equals to the staple food for **622 million** people.

→ Enough to feed Africa's **urban population of 550 million** (2018)

→ Insufficient for Africa's total population of about 1.4 billion people (in 2022)

...potential hunger risk in rural areas → agricultural reform for self-sufficiency is essential



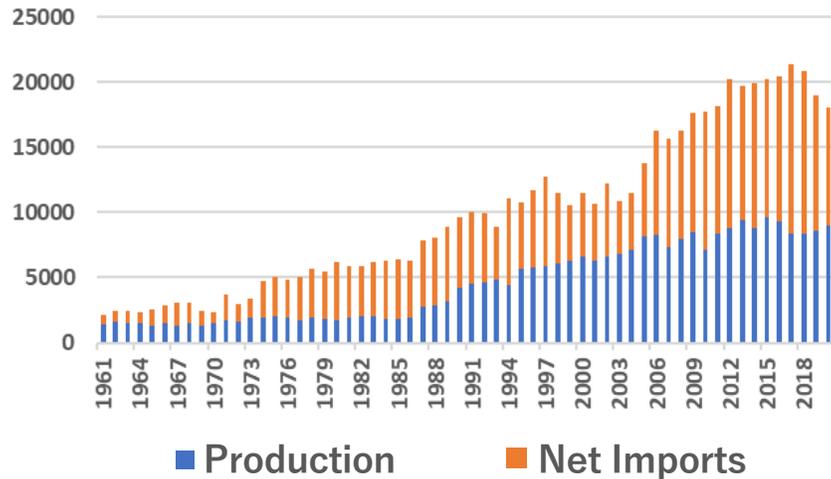
# Egypt Switches Wheat Imports from US to Russia

- Egypt became a destination of U.S. surplus wheat, and wheat imports increased  
→Agriculture in the fertile Nile Delta, which supported ancient Egypt, is in decline.  
Since the 1970s, imports of wheat have consistently exceeded domestic production.
- Egypt has been moving away from the U.S. since the 2010 Arab Spring
- The military-backed Sisi government closed distance to Russia ... and the Sisi-Putin honeymoon.  
→Since 2014, Russia has replaced the U.S. as the largest wheat importer

Imports of wheat have been more than 10 million tons per year for the last 10 years.

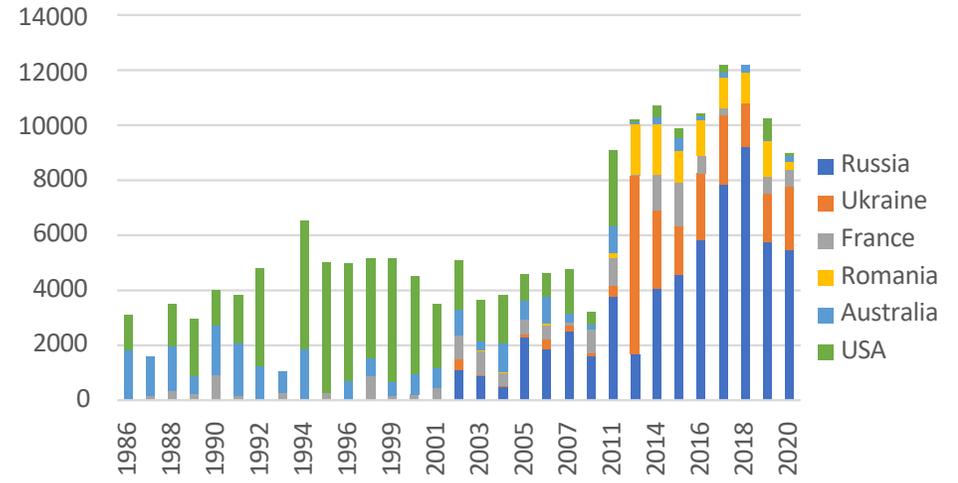
-100 kg of wheat consumption per person per year feeds the entire population of Egypt, about 100 million people.

Thousands t **Egypt's Wheat Imports by Country**



Source FAO

Thousands t **Egypt's Wheat Imports by Country**



Source FAOSTAT

# Nigeria's Wheat Imports Surge, Mirroring Africa's Changes

Nigeria, Africa's most populous country, has surpassed 200 million people

Modernization has led to a decline in consumption of traditional foods such as millet, sorghum and other cereals, and yams and other potatoes.

→Wheat consumption, which was not part of the food culture, is increasing, and 5.9 million metric tons will be imported in 2020.

Food imports made possible by increased oil and natural gas revenues, not by international aid

Nigeria started to increase rice production after experiencing high grain prices in 2008 and 2011.

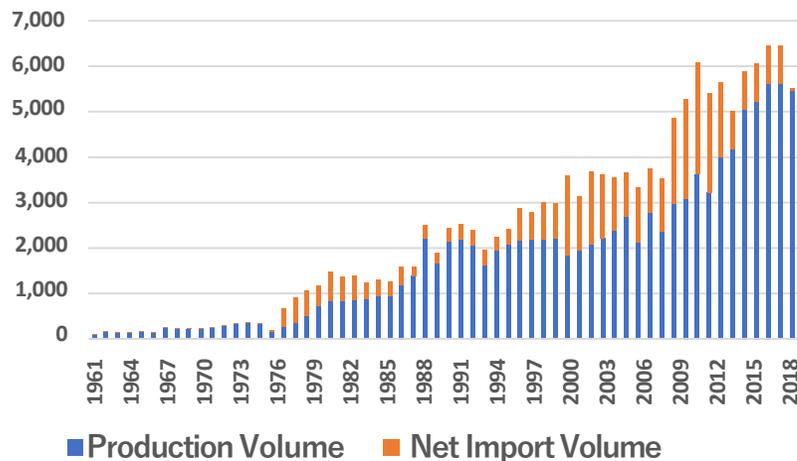
-Foreigners to take concrete measures for food self-sufficiency.

Imports were effectively banned in June 2015 for rice, vegetables, meat and other products.

-Rice production to increase by 36.1% from 4.0 million t in 2015 to 5.45 million t in 2020

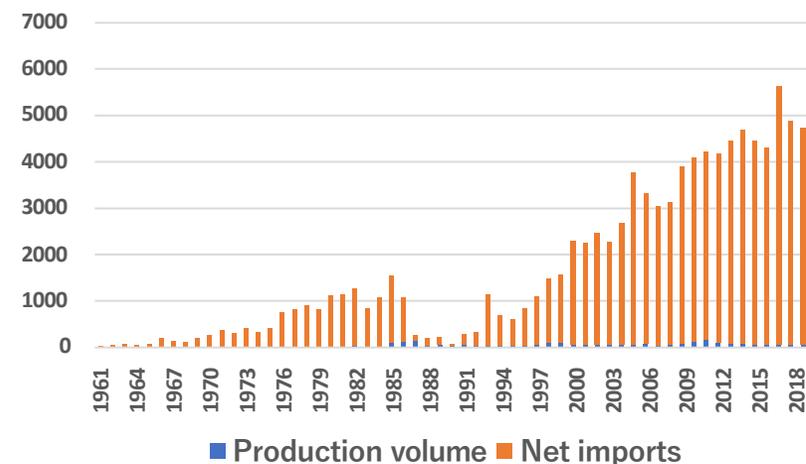
→Rice imports will plummet from a peak of 1.64 million metric tons in 2014 to 60,000 metric tons in 2020.

Thousands t **Nigeria's rice production and imports**



Source FAO

Thousands t **Nigeria's wheat production and imports**



Source FAO

Tanzania, Mozambique

November and December 2010

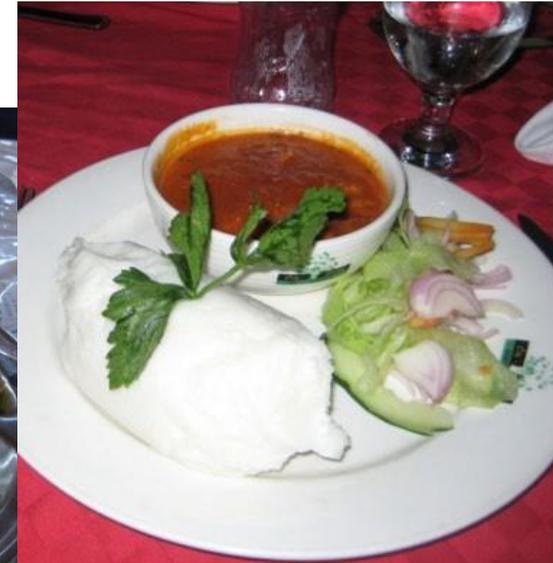
"Ugari."

-Cassava Flour

-Corn Flour

Rice

Cooking banana



A Supermarket in  
Dar es Salaam



Suburbs only a few dozen kilometers away, roads undeveloped



# How to Assure Food Security

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## Reinforcement of stockpiling

- State stockpiles of rice, wheat and chemical fertilizers → 3-5 months of domestic demand
- Can the stockpiling system of Japan Oil, Gas and Metals National Corporation (JOGMEC) be a model?
  - Replace regularly, and tap the reserve when the price rises

## Food Pooling Systems in Asia and Africa

- Strengthening the food version of the Chiang Mai Initiative in the financial sector
- The state reserve of food and fertilizer is to be urgently transferred to other countries.
- Global food security is in Japan's interest.

## Support for increased food production in Africa

- Towards cash-generating agriculture for small-scale farmers in Africa
- Establishment of post-harvest systems, including harvesting, warehousing, processing, and distribution

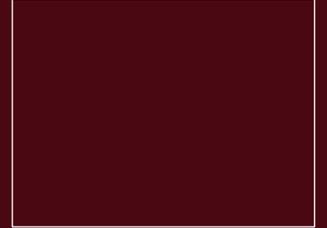
## World to reduce dependence on chemical fertilizers as a target of the SDGs

- How to make low-cost and highly effective compost and how to spread its use
  - Establishment of a locally-recycled fertilizer supply system through collaboration between crop farming and livestock
- .....

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## Part 2

# The Impact of Ukrainian Crisis on Japanese Agriculture (Crop Farming)



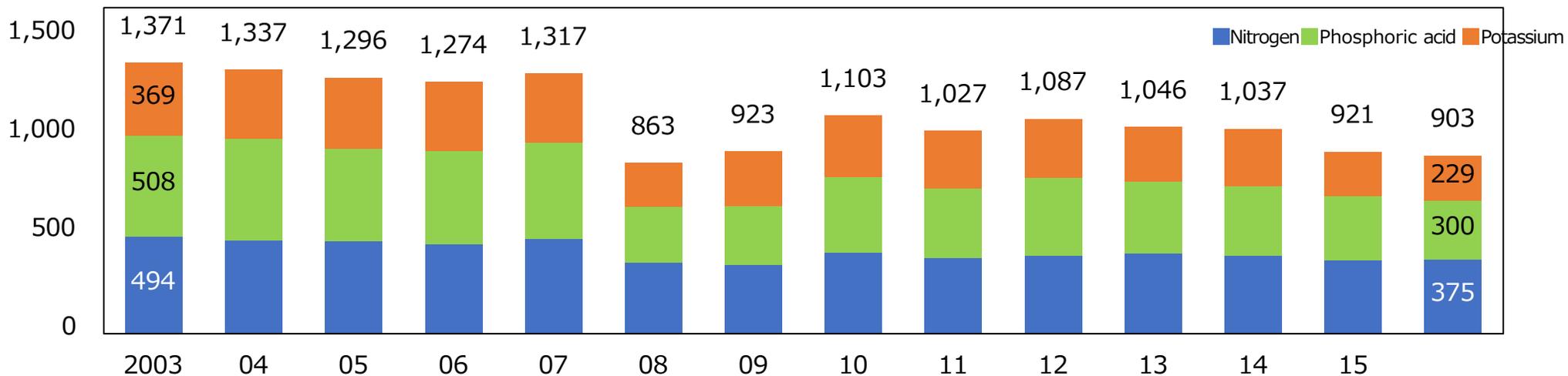
- The fall in rice prices has worsened the profitability of rice farming operations, and the high cost of fertilizers has further increased the burden on rice farmers.
- Measures to reduce the burden of price hikes are necessary on the premise that farmers are making efforts to reduce fertilizer use.
- In the medium term, it is desirable to reduce dependence on imported fertilizers by establishing a domestic resource recycling system.

# (1) Fertilizer Situation

## Demand for Fertilizers is Declining. The Majority is Used in Paddy Farming.

- Domestic demand for chemical fertilizers is 903,000 tons in terms of ingredient volume (2016 fertilizer year)
  - Fertilizer demand continues to decline as cultivated area and input per unit of land decrease
- Fertilizer demand fell sharply, especially for phosphate and potash, when fertilizer prices soared in 2008 (promotion of low PK)
- Rice cultivation (paddy field cultivation) accounts for more than half of fertilizer use by application.

(Thousands ton) Domestic Demand for Chemical Fertilizers (Net Component Equivalent)

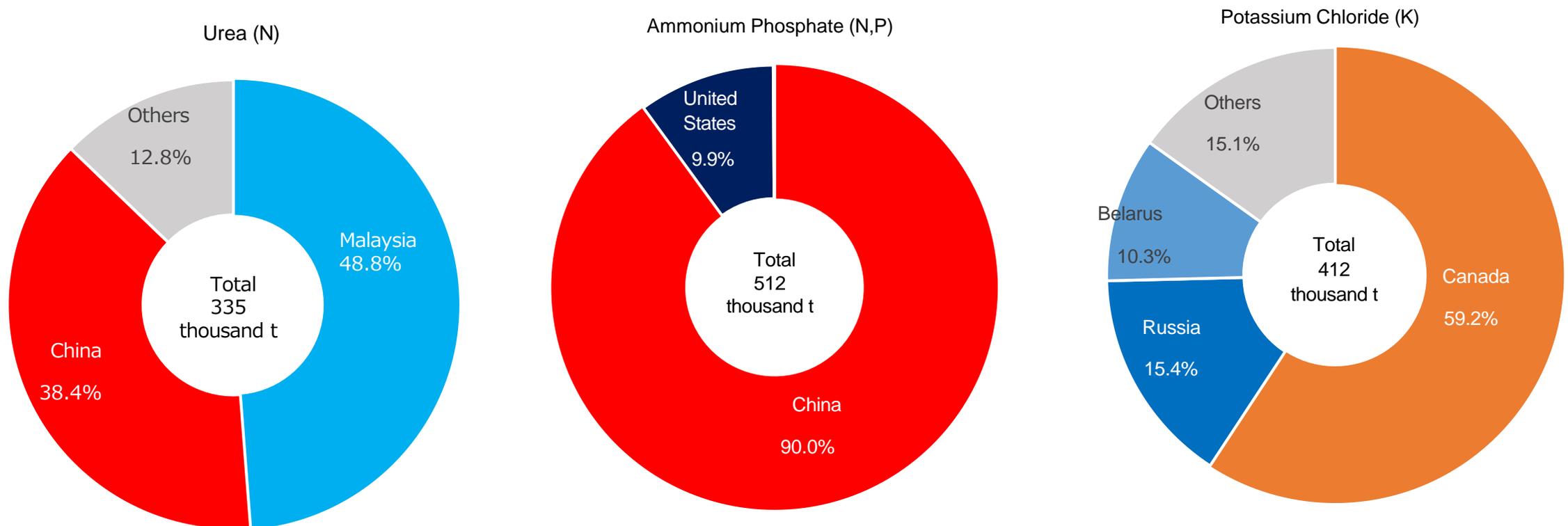


2016 (Fertilizer year)  
Source: "Pocket Fertilizer Handbook" (in Japanese)

# Japan Relies on Imports for Raw Materials for Chemical Fertilizers

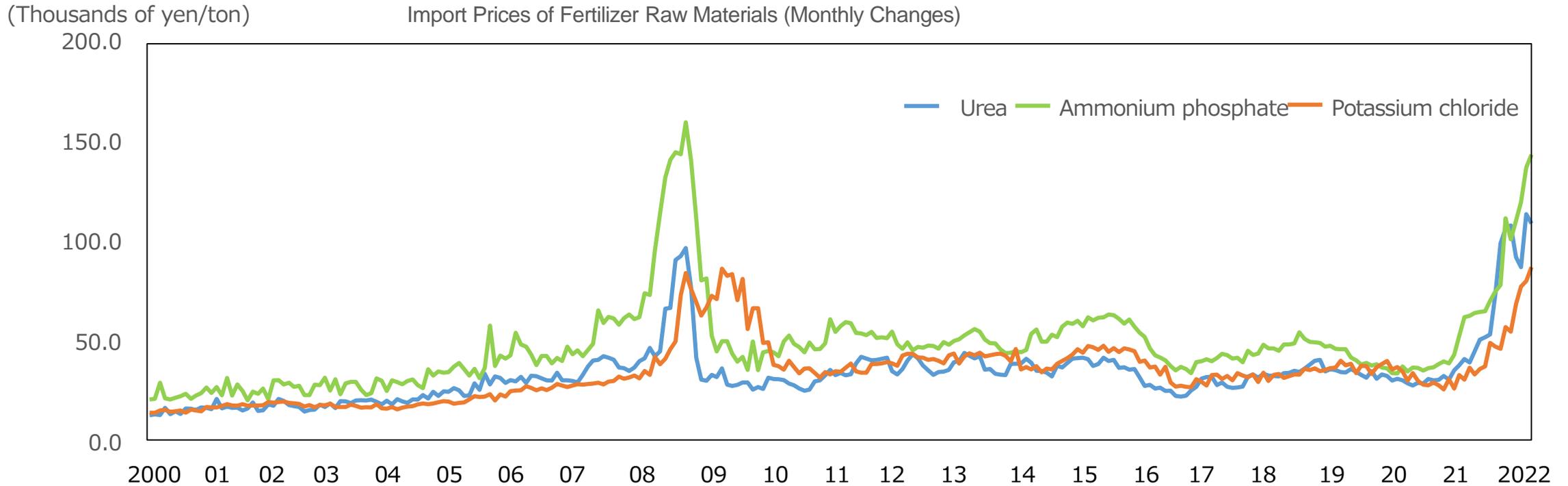
- As raw materials for fertilizers are unevenly distributed in certain regions, Japan, with no natural resources, have to import them.
- Among the major importing countries in 2020, Malaysia accounted for the largest share of 48.8% of urea imports, followed by China with 38.4%.
- 90% of ammonium phosphate is imported from China
- Canada accounted for 60% of potassium chloride. Russia and Belarus accounted for 15.4% and 10.3% of imports respectively, and 1/4 collectively

Main Fertilizer Raw Material Procuring Countries (2020 Fertilizer Year)



## Fertilizer Raw Material Prices are on an Upward Trend from 2021, Rising Sharply from the Second Half of 2021

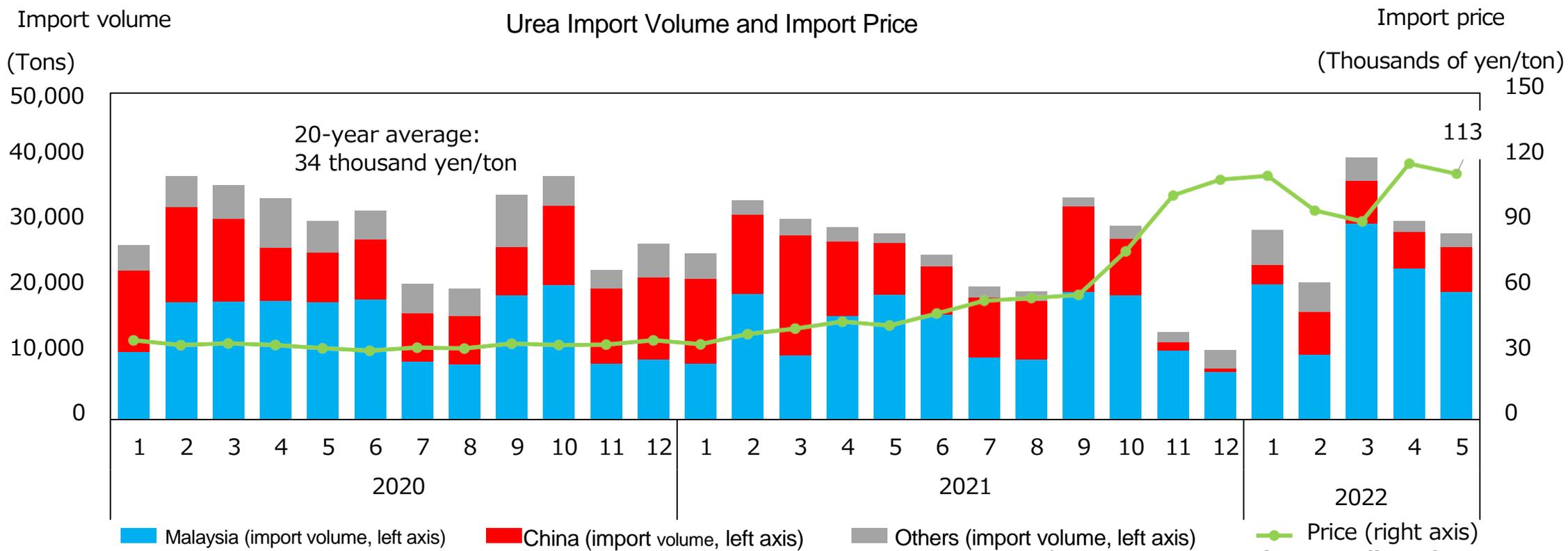
- From mid-2021, international prices of fertilizer raw materials had soared due to increased demand for grains and rising prices of crude oil and natural gas.
- Prices at levels not seen since 2008 when fertilizer prices soared last time.
  - Urea and potassium chloride prices exceeded the price levels of 2008 and reached record highs
  - Ammonium phosphate is also approaching 2008 levels.
- The rapid depreciation of the yen since 2022 has also been a factor in higher import prices.



Source: Trade Statistics, Ministry of Foreign Affairs of Japan  
 Note: Import prices are calculated as import value/import volume.

# Urea Has been Significantly Affected by Substantial Export Restrictions by China

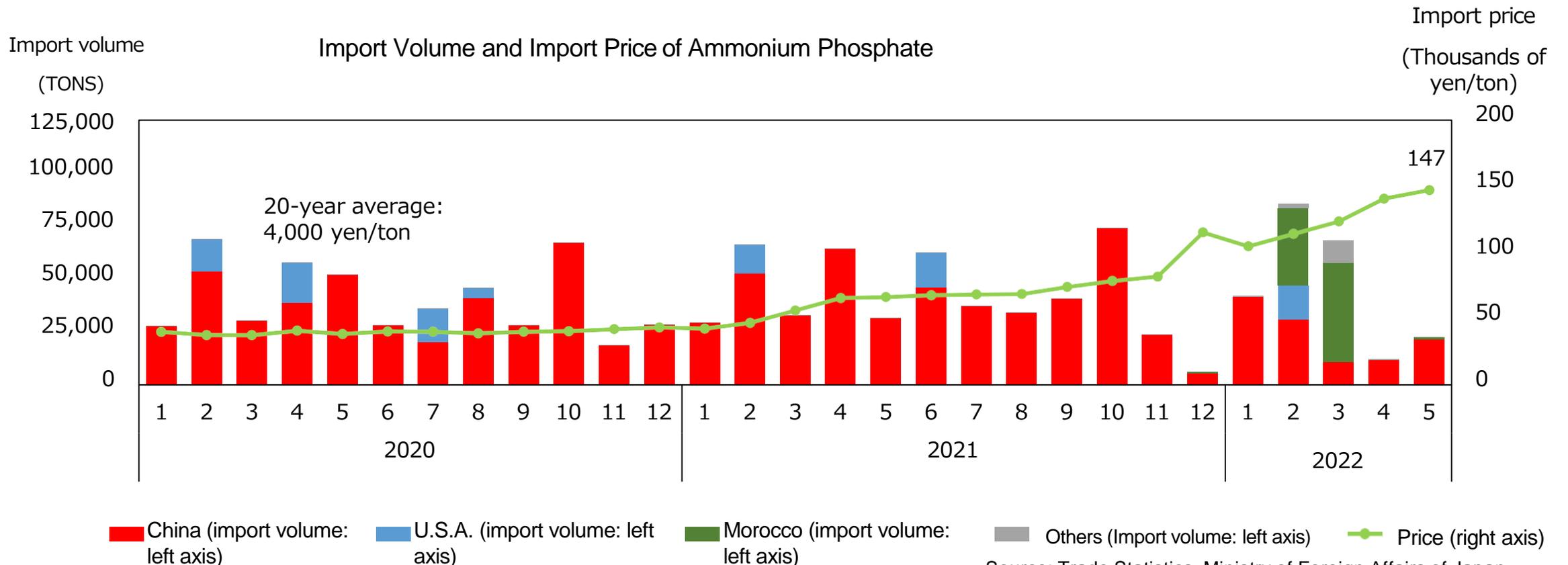
- The Chinese government has decided to launch a China Inspection Quarantine (CIQ) on fertilizers including urea on October 15, 2021. Effectively restricting exports.
- Import volume from China dropped sharply in November and December 2021. It has recovered somewhat since then, but has not returned to previous volumes.
- Imports from Malaysia increased to compensate for the decline in imports from China
- Import prices had been on an upward trend since the beginning of 2021, and prices rose sharply in October and remained high thereafter.
  - May 2022: 113,000 yen/ton, 3.3 times the 20-year average (34,000 yen/ton)



Source: Trade Statistics, Ministry of Foreign Affairs of Japan  
 Note: Import prices are calculated as import value/import volume.

# Ammonium Phosphate, like Urea, is Also Heavily Affected by China's Export Restrictions 30

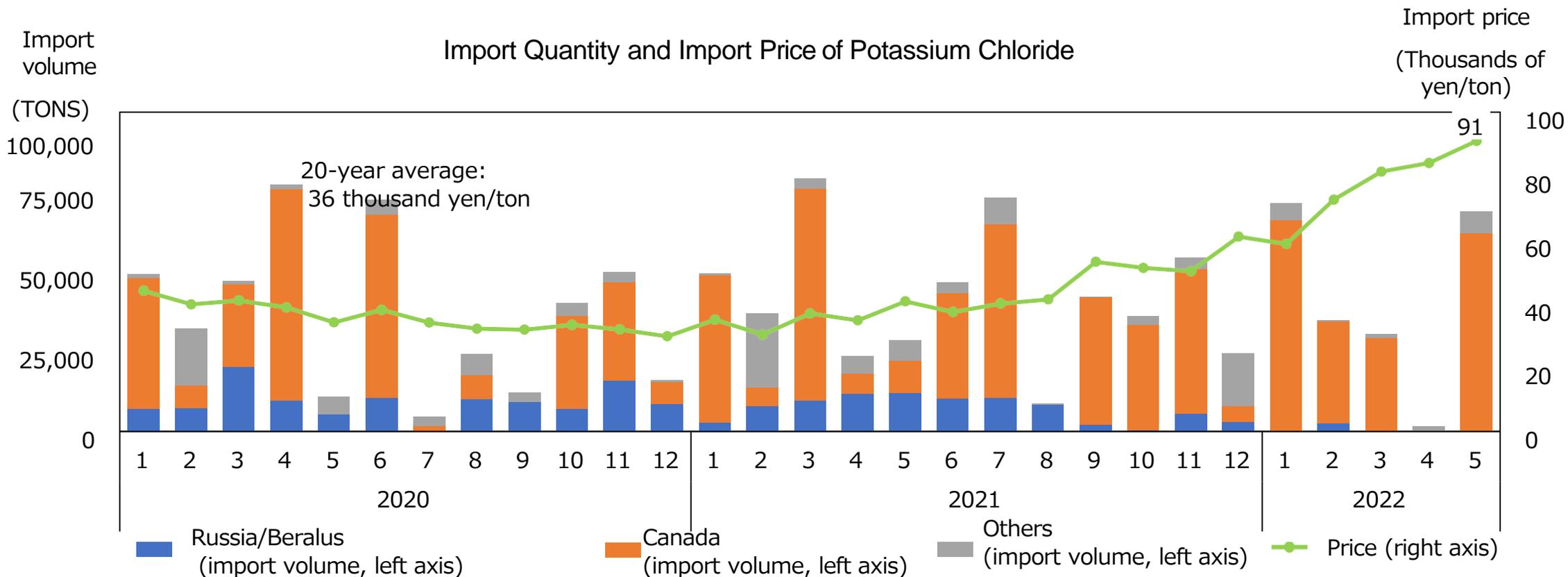
- Like urea, imports of ammonium phosphate also fell sharply in November 2021 due to China's virtual export restrictions
- Imports from Morocco increased in 2022
  - Logistics costs are higher than from China
- Import prices have been on an upward trend since November 2021
  - May 2022: 147,000 yen/ton, 3.6 times the 20-year average (40,000 yen/ton)



Source: Trade Statistics, Ministry of Foreign Affairs of Japan  
 Note: Import prices are calculated as import value/import volume.

# Potassium Chloride Imports from Russia and Belarus Decreased in 2022, While Imports from Canada Increased

- In the 2020 fertilizer year, imports from Russia and Belarus accounted for about 1/4 of the total
- Imports from Russia and Belarus almost stopped in 2022. Increased sourcing from Canada.
- Import prices have been on an upward trend since 2021
  - May 2022: 91,000 yen/ton, 2.5 times the 20-year average (36,000 yen/ton)

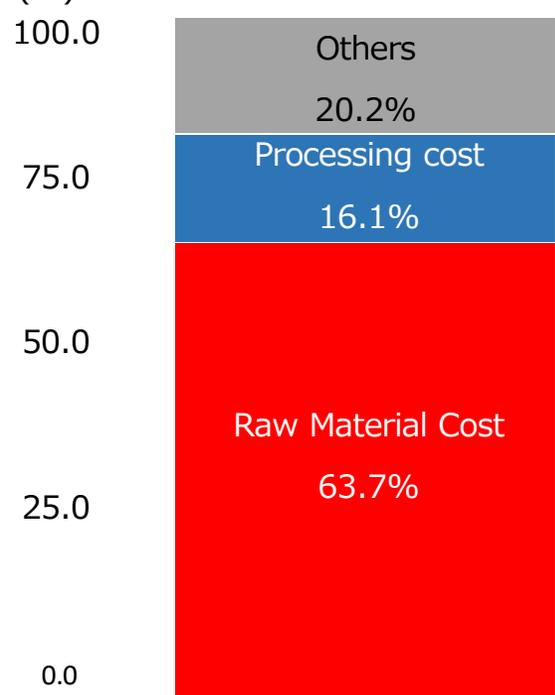


Source: Trade Statistics, Ministry of Foreign Affairs of Japan  
 Note: Import prices are calculated as import value/import volume.

# In 2022 ("Autumn Fertilizer"), Domestic Fertilizer Prices Rose 60% YOY.

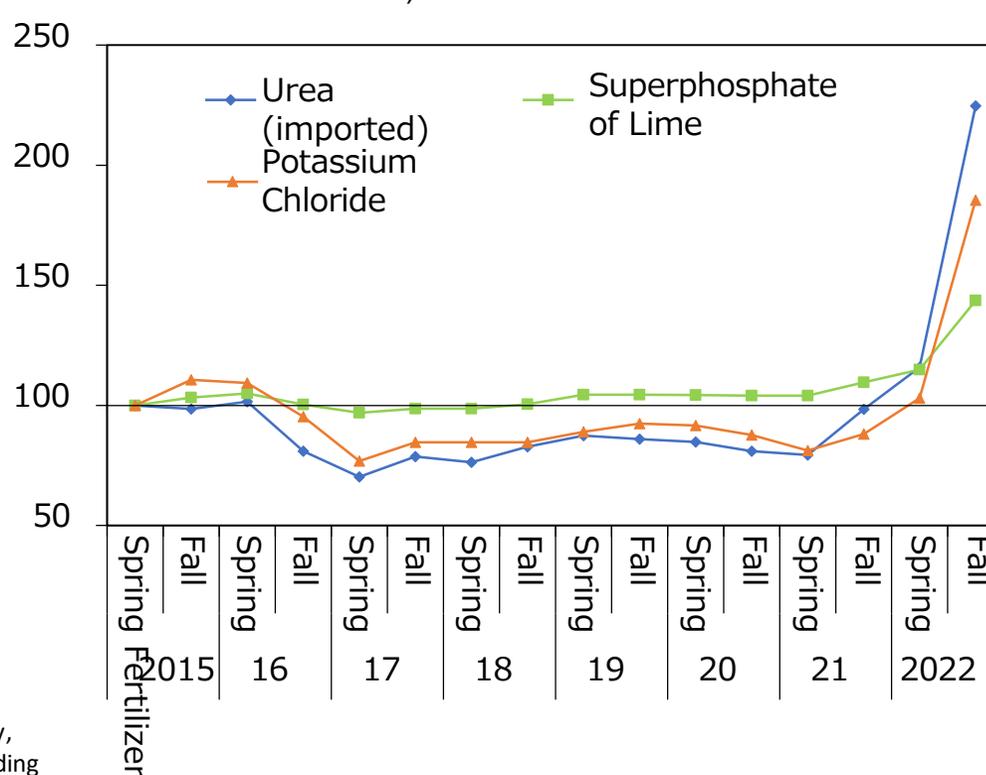
- More than 60% of the production cost of chemical fertilizers is the cost of raw materials. Therefore, a rise in the price of imported raw materials directly leads to a rise in domestic fertilizer prices.
- In 2022 (autumn fertilizer), prices of urea (imported, large granule) rose 94% and fertilizer prices overall rose 60% from the previous year.
- Rising fertilizer prices will have a negative impact on all crop farming
  - Fertilizer costs as a percentage of production costs vary by product, but are generally around 10%.
  - The impact is greater for crops that demand more fertilizer (such as strong wheat with high protein content, which accounts for more than 20% of production costs).

Cost Structure of Advanced Chemical Fertilizers (%)



Source: Ministry of Economy, Trade and Industry, "Fiscal 2012 Medium-Scale Business Support Fact-Finding Survey on Chemical Fertilizer Production in Japan" (in Japanese)

(Spring fertilizer for FY 2015=100) Trends in the Zen-Noh Fertilizer Price (Single Fertilizer) Index



Percentage Change in the Price of Autumn Fertilizer (June-October) in the 2022 Fertilizer Year

Classification /Item		Ingredients (%)	Change from previous period (vs. Spring fertilizer)	
Simple	Nitrogen	Urea (imported, large granule)	46	94%
		Urea (domestic, fine granule)	46	73%
		Ammonium sulfate (powder)	21	45%
	Phosphate	Superphosphate of lime	17	25%
		Multi Phosphate	35	25%
	Potash	Potassium chloride	60	80%
Potassium silicate		20	36%	
Compound	Advanced Chemical (Standard)	15-15-15	55%	

Source : Zen-Noh Press Release

## (2) Impact on Rice Farmers

Business Confidence of Crop Farmers, Especially of Rice, Deteriorated even before the Situation in Ukraine Became Tense.

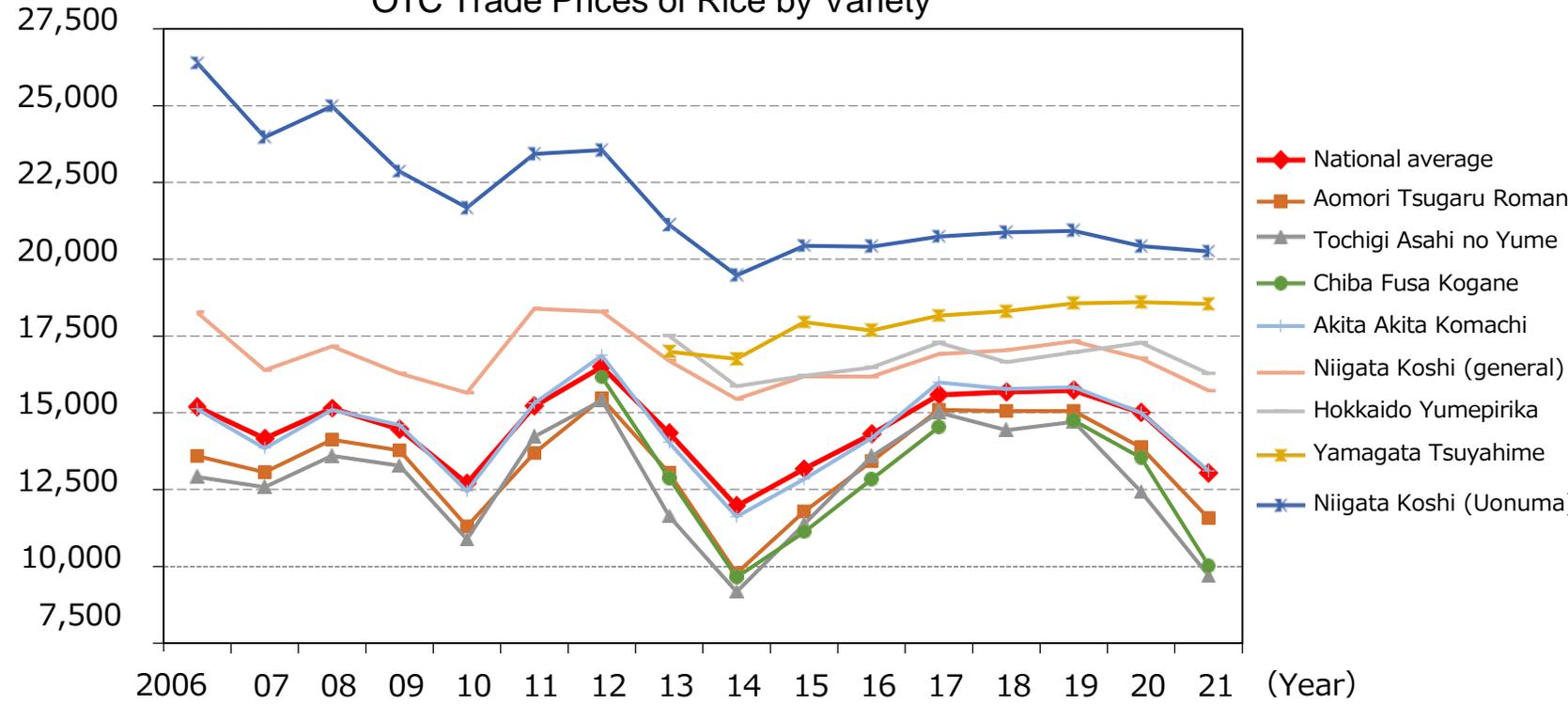
- Business confidence of crop farmers generally worsened
  - Rice crop turned negative in 2020, and even deeper thereafter.
- Rice prices have been on a downward trend since the 2008 crop, and dropped sharply in the 2021 crop
  - The decline was particularly large for brands for B2B, due in part to the Corona disaster.

Business Confidence of Crop Farmers  
(DI for Business Conditions)

	2017	2018	2019	2020	2021
Agriculture as a whole	21.2	▲ 11.1	6.0	▲ 24.9	▲ 29.6
Rice (Hokkaido)	39.7	▲ 51.8	26.5	▲ 3.6	▲ 55.2
Rice (Non Hokkaido)	10.3	▲ 10.7	11.4	▲ 33.4	▲ 55.9
Upland	34.8	▲ 22.7	31.6	▲ 32.3	0.2
Outdoor Vegetables	7.5	▲ 3.4	▲ 9.3	▲ 32.8	▲ 21.4
Indoor Vegetables	15.0	▲ 1.4	▲ 22.4	▲ 28.1	▲ 32.3
Tea	26.5	▲ 14.5	▲ 53.1	▲ 78.0	▲ 0.9
Fruit Tree	21.8	20.6	7.5	▲ 16.8	11.9

(Yen/60kg)

OTC Trade Prices of Rice by Variety



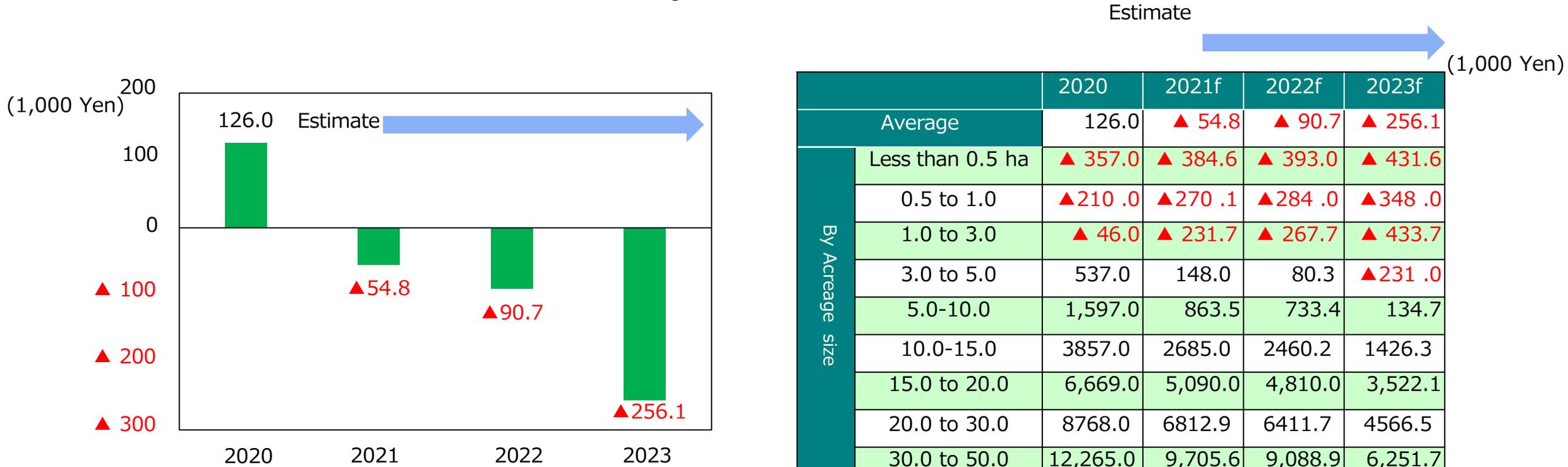
Source: Japan Finance Corporation, Survey of Agricultural Business Conditions (January 2022)  
(Note) The DI for business conditions is the percentage of respondents who answered that agricultural management "has improved or will improve" minus the percentage who answered that it "has worsened or will worsen."

Source: Ministry of Agriculture, Forestry and Fisheries website, "OTC trade prices and volumes, contracts and sales, and private-sector inventories of rice."  
(Note) Consumption tax is 5% until March 2002 and at 8% from April 2002 onwards.

# In 2023, even 3 to 5 ha Rice Farmers may Fall Deficit.

- The average farm income of rice farmers is estimated to have turned into a deficit in 2021 due to fall in rice price. The deficit will widen in 2022 and 2023 due to higher fertilizer prices.
- By size, even 3 to 5 ha farmers will be in the red in 2023 and 5 to 10 ha farmers will have almost no farm income left.

Estimated Change in Farm Income of Rice Farmers



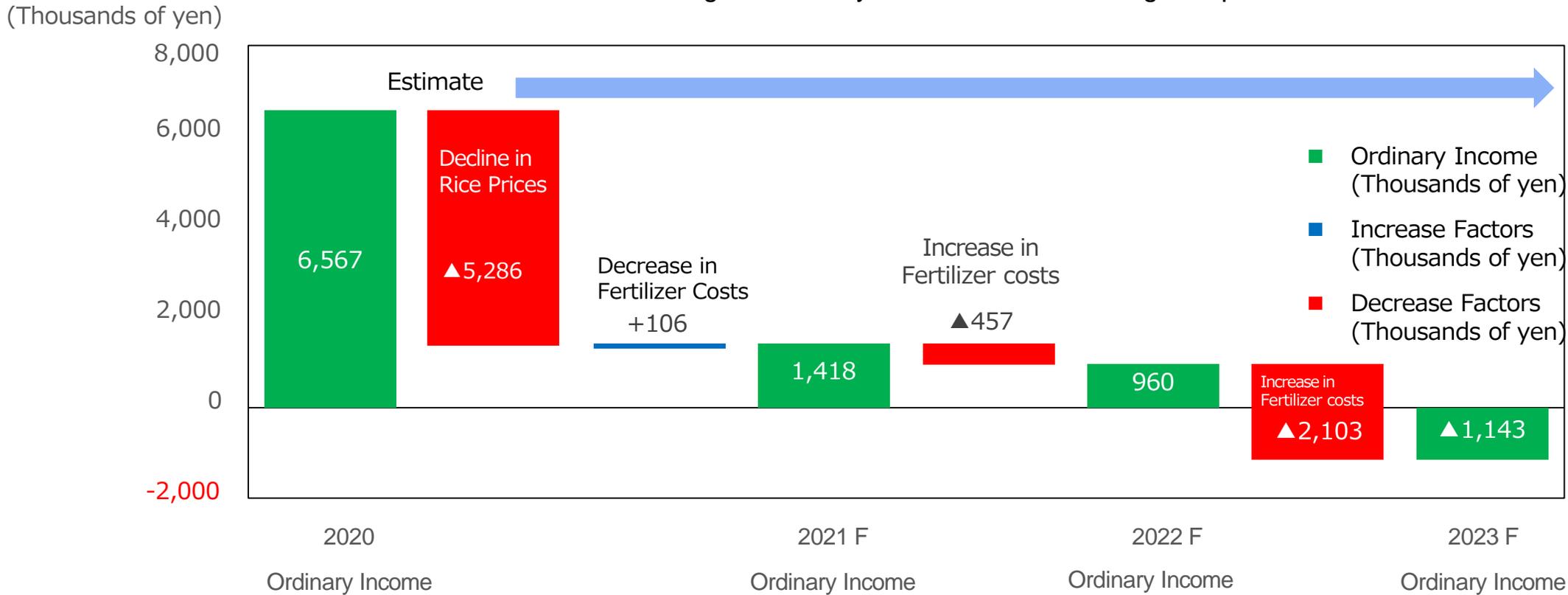
Source: Ministry of Agriculture, Forestry and Fisheries, "Management Statistics by Farming Type," "Report on Rice Trade".

Source: Ministry of Agriculture, Forestry and Fisheries, "Management Statistics by Farming Type," "Report on Rice Trade".

# Rice Farming Companies' Ordinary Income Fell Sharply, and will Post a Loss in 2023. 36

- The average size of rice farming companies in 2020 is as below, paddy rice acreage is 36.3 ha, sales are 67.35 million yen, and ordinary income is 6.57 million yen.
- In 2021, ordinary income is estimated to have fallen sharply by 80% due to the decline in rice prices
- Ordinary income in 2023 will be in the red due to the price surge of fertilizer.

Estimated Change in Ordinary Income of Rice Farming Companies



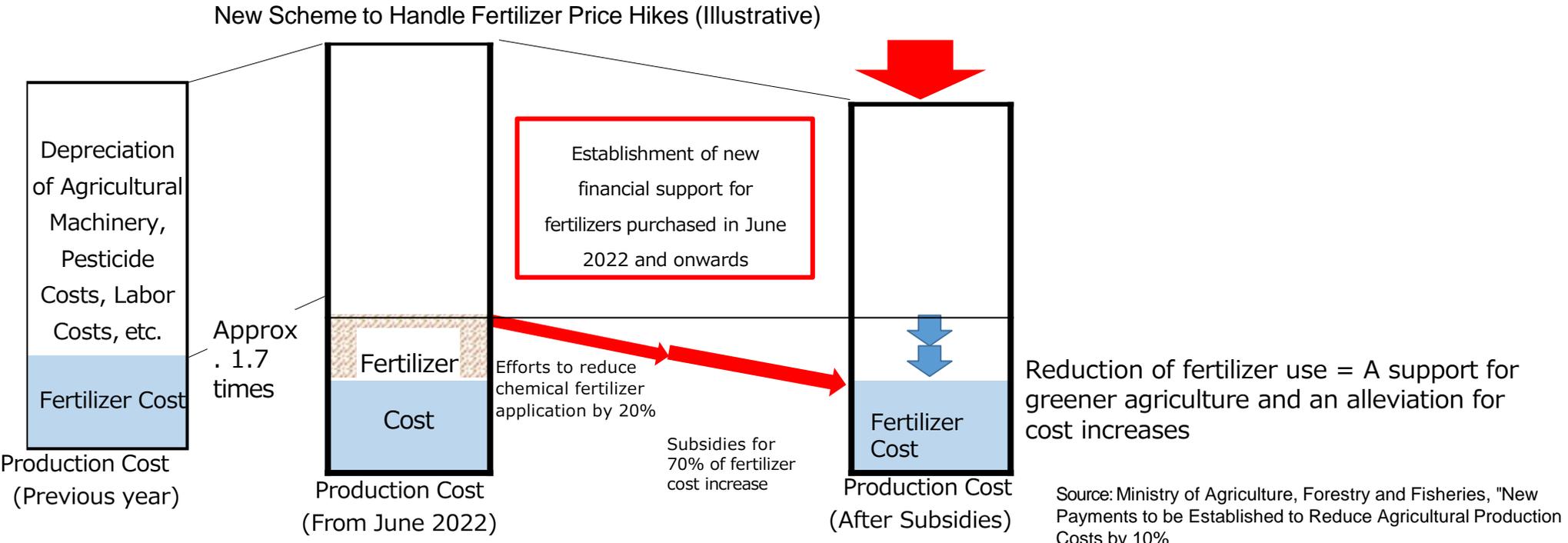
Source: Japan Finance Corporation, "Results of Analysis of Agricultural Management Trends," various years

(Note) Sales include direct payment subsidies (volume portion) for field crops such as wheat and soybeans.

# (3) Countermeasures Required

## Policy Support is also Needed for Cost Increases that cannot be Avoided

- Short-term measures to prevent the rising price of fertilizer on a producer basis include reducing the amount of fertilizer applied through farm management innovations.
  - Avoiding excessive fertilizer application based on soil diagnosis
  - Switching to inexpensive fertilizer brands
  - Switching from region-specific fertilizers to general-purpose fertilizers
  - Changing from high-fertilizer-intensive crops to low-fertilizer-intensive crops
- Policy support is needed for cost increases that cannot be avoided
  - Revenue insurance and management stability measures related to cultivated crops, such as "Narashi", cannot handle the cost increases due to soaring input material prices, etc.
  - In the case of rice cultivation, the sharp rise in fertilizer prices will have a significant impact when procuring fertilizer for the 2023 crop. Actions need to be taken in accordance with the timing of planting season.
  - Each region is required to review the fertilizer line up for next Spring in a way to encourage the reduction of chemical fertilizers, etc.
- MAFF announced the creation of a new support scheme to subsidies 70% of the increased cost of fertilizer if farmers reduce the use of chemical fertilizers by 20%.
  - Supporting farmers who are taking the lead in reducing fertilizer costs due to the recent sharp price rise and are contributing to hit the 2030 target of chemical fertilizer reduction by 20%.



# In the Medium- to Long-Term, It is Essential to Reduce Dependence on Imports of Fertilizer Raw Materials and Strengthen the Recycling of Domestic Resources. 39

- The recent surge in fertilizer prices has once again highlighted the challenges of fertilizers that Japan's crop farming is facing.
- Global demand for fertilizers will increase as food supplies rise in response to population growth.
  - Currently, Japan is securing fertilizer raw materials in sufficient quantities, but procurement of fertilizer raw materials itself may become even more difficult in the future.
- It is essential to reduce dependence on imports and strengthen domestic resource recycling
  - Improvement and dissemination of technology to increase soil fertility (the inherent power of the soil)
  - Utilization of unused resources as raw materials for fertilizers
  - Reinforcement of arable-livestock cooperation

## Background to the Revision of the Fertilizer Control Law

### Issue 1: Unstable procurement of imported fertilizer raw materials



Increase in global demand for fertilizers plus decline in Japan's international competitiveness

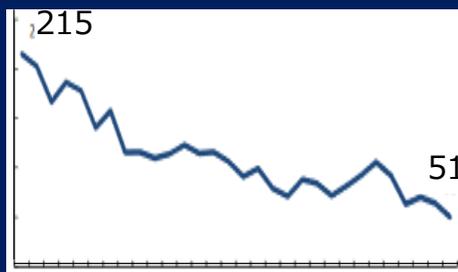
### Issue 2: Livestock Production Environmental Issues

Reinforcement of Livestock Environmental Measures  
Cooperation between farmers and ranchers



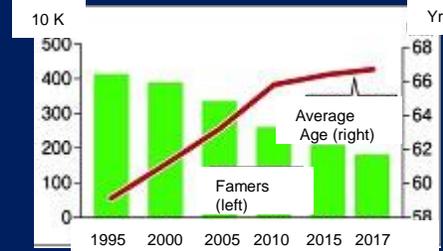
Safe use of compost and fertilizers derived from industrial by-products

Production of fertilizers that meet the needs of farmers



Compost use in rice paddies has decreased by a quarter compared to 30 years ago, and soil fertility has declined due to dependence on chemical fertilizers.

### Issue 3: Decrease in the amount of compost used and decline in soil fertility



### Issue 4: Decrease, aging and consolidations of farmers

## (4) Summary

- Ukrainian Crisis' Impact on Japanese Crop Farming
  - Imports of fertilizer raw materials from China have been significantly decreasing since autumn 2021 due to virtual export restrictions imposed by China. Although we have been able to secure fertilizer raw materials by switching to alternative countries, the domestic fertilizer cost is directly affected by the sharp rise in the global market.
  - In terms of the impact on rice farming operations, there are concerns that the sharp rise in fertilizer prices will further hit farmers financially, which already have been deteriorating due to the decline in rice prices.
  - Even if the Ukrainian situation settles down, fertilizer prices are likely to remain at a higher level. In addition, geopolitical risks and wild swings in prices due to inflows of speculative money are expected to pose an even greater risk to the stable supply of fertilizer raw materials.
  - In the short term, measures should be taken to alleviate the cost burden of unavoidable price hikes, along with measures and support for farmers to reduce fertilizer use.
  - In the medium- to long-term, it will be essential to reduce dependence on imported fertilizer materials and strengthen domestic resource recycling. Efforts to establish circular agriculture must be accelerated by improving and disseminating technologies to enhance the soil's natural soil fertility, utilizing unused resources as raw materials for fertilizers, and strengthening cooperation between arable and livestock farming.



## Part 3

# The Impact of Ukrainian Crisis on Japanese Agriculture (Livestock Production)



- The impact of high feed prices on farm profitability is apparent in dairy farming.
- Concerns over deteriorating profitability of cattle and pigs from the second half of the fiscal year
- In the medium to long term, effective measures to improve feed self-sufficiency are required.

# (1) Pre-Crisis Situation

The Incorporated Entities' Production Share on the Rise. Majority of Layers, Pigs, and Beef Cattle (Fattening) with Corporations.

- The incorporated farmers' production share of animals was 94.2% for layers and 87.7% for pigs as of 2020, which tends to be higher for smaller animals.
- The number of corporations managing beef cattle, both breeding and fattening, increased from 2015 to 2020. The share of beef cattle fattened by corporations rose significantly to just under 70%.
- Overall, the corporations' share of production is increasing, but those of dairy farming (36.9%) and beef cattle (breeding) (24.8%) are low, with family-run farms accounting for the majority of production.

Number of Agricultural Enterprises in the Livestock Sector for Marketing Purposes, Number of Heads/Feathers and the Shares of Corporations (2020)  
(1,000 management units, 1,000 head and 1,000 feathers)

	Number of Enterprises		Number of Animals		Corporate Share	
	Total [1]	Corporations [2]	Total [3]	Corporations [4]	Number of Enterprises [3]/[1]	Number of Animals [4]/[3]
Dairy (Farm)	13.3	1.7	1,283	474	13.0	36.9
Beef Cattle	36.7	2.2	1,784	961	6.1	53.9
Breeding	32.5	1.4	571	142	4.2	24.8
Fattening	9.6	2.0	1,213	820	20.6	67.6
Pig Farming	2.7	1.4	7,658	6,714	50.2	87.7
Layers	3.0	1.1	174,165	163,991	35.0	94.2

Change in Number of Incorporated Livestock Entities for Marketing Purpose, and Change in Corporate Share of Animals Kept (2015, 2020)

	Number of Incorporated Entities (Thousands of entities, %)			Corporate Share of Animals Kept (% , points)		
	2015 [1]	2020 [2]	% Change (([2]-[1])/[1])	2015 [3]	2020 [4]	Share Change [4]-[3]
Dairy (Farm)	1.4	1.7	25.7	24.7	36.9	12.3
Beef Cattle	1.6	2.2	36.0	43.3	53.9	10.6
Breeding	0.9	1.4	54.1	16.3	24.8	8.5
Fattening	1.6	2.0	23.5	54.4	67.6	13.2
Pig Farming	1.4	1.4	0.8	80.3	87.7	7.4
Layers	1.1	1.1	△ 2.1	90.0	94.2	4.1

Source: Census of Agriculture and Forestry, Ministry of Agriculture, Forestry and Fisheries

(Note 1) In this table, beef cattle "female cattle for calving" are labeled as "breeding".

(Note 2) The sum of breeding and fattening enterprises is not equal to the total because some beef cattle enterprises are breeding and fattening integrally.

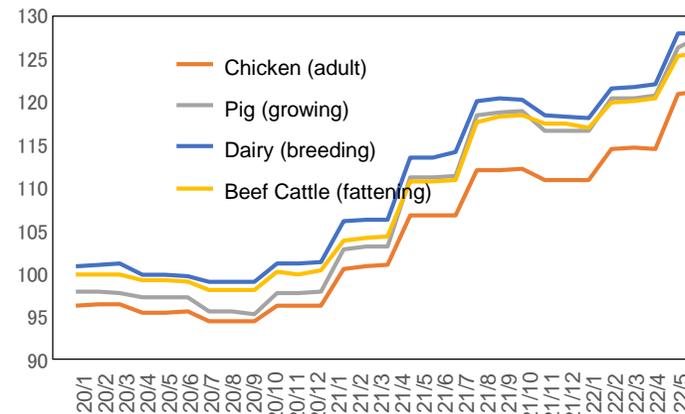
# Livestock Farming Business has Deteriorated since 2020 due to the Corona Disaster and the Rising Feed Prices from 2021.

- Business confidence of livestock producers has deteriorated since around 2020 due to changes in demand in the corona disaster and other factors.
- The business environment surrounding them has further worsened as gasoline and formula feed prices have been on an upward trend since 2021 due to increased demand associated with the global economic recovery from the Corona disaster.
- The DI for livestock business confidence in 2021 was negative outside layers, and the DI for the full year outlook for 2022 was negative for all species.

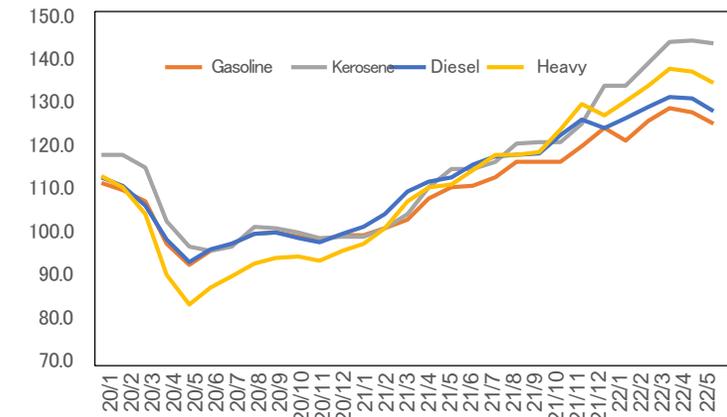
Change in DI for Agricultural Business Conditions

	2016	2017	2018	2019	2020	2021	2022 Outlook
All Agriculture	20.0	21.2	▲ 11.1	6.0	▲ 24.9	▲ 29.6	▲ 28.7
Dairy Farming (Hokkaido)	57.6	44.8	25.0	30.3	▲ 19.3	▲ 32.8	▲ 54.7
Dairy Farming (Non Hokkaido)	52.2	12.6	2.5	8.4	▲ 16.4	▲ 39.5	▲ 47.1
Beef Cattle	50.3	17.5	4.7	▲ 0.2	▲ 43.9	▲ 3.1	▲ 12.0
Pig Farming	26.2	59.4	▲ 27.2	▲ 4.1	44.3	▲ 36.4	▲ 43.0
Layers	40.8	32.7	▲ 61.2	▲ 38.9	▲ 43.8	22.6	▲ 58.3
Broilers	27.4	55.3	15.9	14.7	6.4	▲ 2.1	▲ 20.4

Price Index for Formula Feed (2015 = 100)



Gasoline and other Price Indices (2015 = 100)

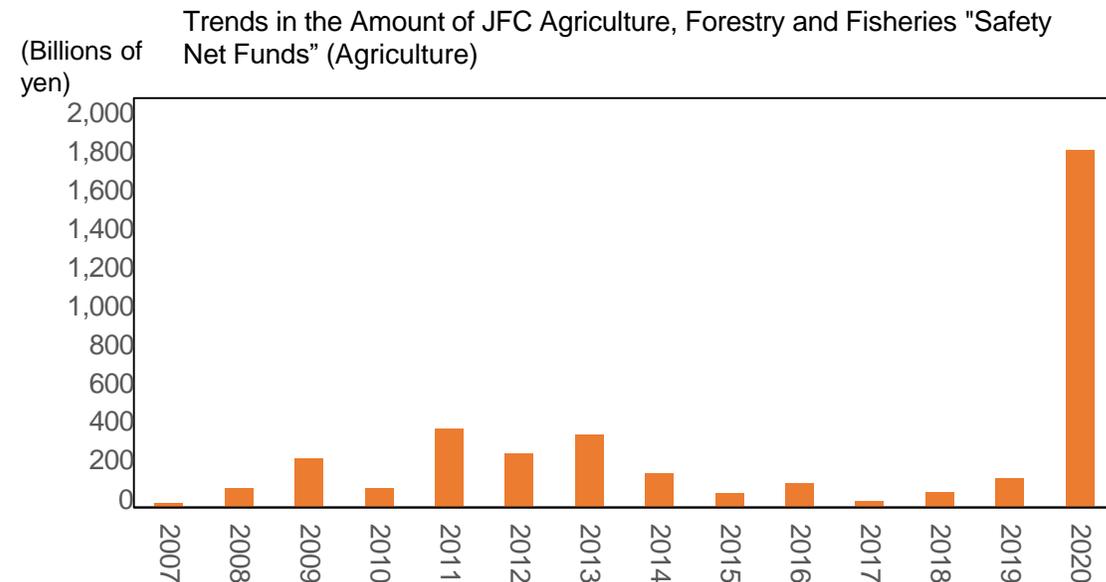
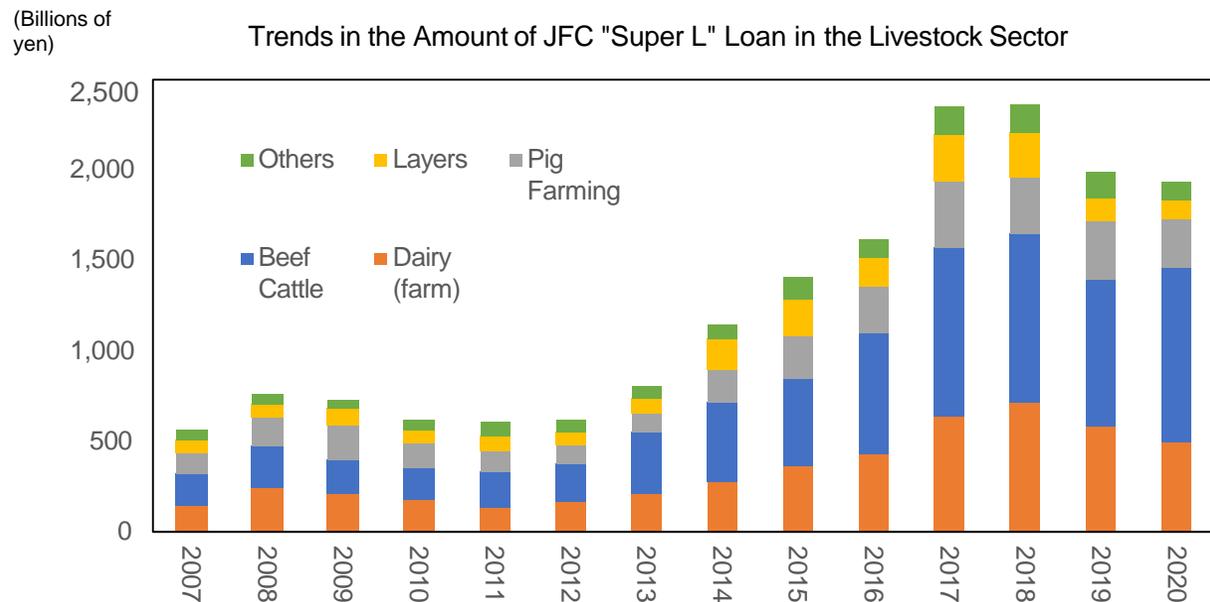


Source: Survey of Agricultural Prices, Ministry of Agriculture, Forestry and Fisheries

Source: Japan Finance Corporation, Survey of Agricultural Business Conditions (January 2022)  
 (Note) The DI (diffusion index) for business conditions is the percentage of respondents who answered that agricultural management "has improved or will improve" minus the percentage who answered that it "has worsened or will worsen."

# Aggressive Investments Associated with the "Livestock Cluster" Projects and the FY2020 "Safety Net Fund" Borrowing Lead to a Heavy Burden of Reimbursement

- To improve the profitability of livestock management in each region, investment by livestock management companies has become more active in line with the government's Livestock Production Cluster Project, which supports the development of facilities for livestock management companies who play a central role in the Livestock Production Cluster Plan. The amount of JFC "Super L" loans increased significantly from FY2013 to FY2018.
- Given the sudden change in demand for food services, including inbound demand, etc., in the early stages of the Corona disaster, there was a sharp increase in borrowing from JFC's Agriculture, Forestry and Fisheries "Safety Net Fund" (with a grace period of three years or less) to secure funding in FY2020.
- With feed prices recently soaring, there is concern that the burden of reimbursement on livestock producers will increase.



# On the Demand Side, there is a Shift from Beef to Chicken and Pork, and a Partial Shift to Domestic Meat due to Soaring Import Prices.

- Estimated beef supply declined in both 2020 and 2021 due to sluggish demand for imported beef caused by the slowdown in eating out in the Corona disaster, and the same trend continues in the January-April 2022 period. On the other hand, pork and chicken meat supplies continue to increase.
- As to household consumption, there was a large increase in overall meat consumption in 2020 due to eating-at-home demand, followed by a reactionary fall in 2021. In 2022, while only beef consumption declined, pork and chicken consumption continued to increase. With import prices expected to remain at high levels, the shift to inexpensive chicken and pork is accelerating, and there is a possibility that the slump in beef demand will become the norm.
- The market price of imported meat used for restaurant and ready-to-eat meals is on the rise due to soaring global feed prices. According to interviews and newspaper reports, some consumers are switching to domestically produced meat.

Estimated Meat Supply (million tons, %)

	2020		2021		January – April 2022	
	Supply	% Change YOY	Supply	% Change YOY	Supply	% Change YOY
Beef	92.4	△ 2.9	90.2	△ 2.4	28.8	△ 2.0
Domestic	33.0	2.2	32.5	△ 1.4	10.8	4.6
Import	59.4	△ 4.0	57.7	△ 3.0	18.0	△ 5.6
Pork	181.8	0.4	184.3	1.4	62.4	0.9
Domestic	91.3	2.3	91.9	0.6	31.3	0.6
Import	90.5	△ 1.4	92.5	2.2	31.1	1.1
Chicken	219.9	0.3	227.1	3.3	75.1	2.4
Domestic	165.4	1.5	166.5	0.6	56.1	4.1
Import	54.4	△ 3.2	60.6	11.3	19.0	△ 2.3

Change in the Quantity of Beef Purchased by Households

	% Change YOY			% Change against Pre-Covid		
	2020	2021	Jan-Apr 2022	2020	2021	Jan-Apr 2022
Beef	9.9	△ 6.2	△ 8.0	8.7	1.9	△ 3.2
Pork	8.6	△ 1.9	0.4	8.6	6.6	7.3
Chicken	11.0	△ 2.6	0.2	12.4	9.6	11.1

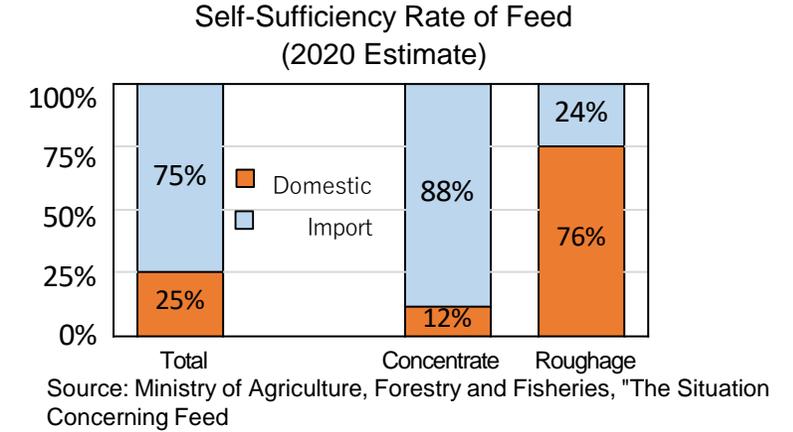
Source: Ministry of Internal Affairs and Communications, Household Survey (Note: Households of two or more persons. Pre-Covid is average for 2017-2019 before the Corona disaster.)

Source: Website of the Japan Agriculture and Livestock Industries Corporation (Japanese only)  
(Note) Estimated Supply is the estimated by the Japan Agriculture and Livestock Industries Corporation. It is the estimated quantity circulated for domestic consumption by adding production and imports to the estimated beginning inventory, and subtracting exports and estimated ending inventory.

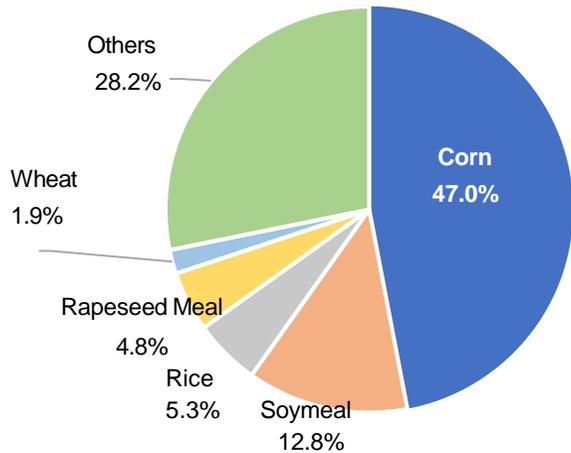
## (2) Feed Situation

### Feed Self-Sufficiency Rate is 25%. Mainly Corns Imported from the U.S. and Brazil.

- Japan's overall feed self-sufficiency rate is 25%.
  - The self-sufficiency rate of concentrate feed is 12% and that of roughage is 76%.
- Most imported feed is corn
  - Corn accounts for 47% of the ingredients in compounded and mixed feeds and 87.6% of feed grain imports.
- Most of Japan's corn imports come from the United States and South America.
  - 69% from the U.S.; 18% from Brazil; 9% from Argentina.
  - 10,000 tons or 0.09% from Russia, and 0.03 million tons or about 0.003% from Ukraine.



Ingredients for Compound and Mixed Feeds (2021)



Source: Ministry of Agriculture, Forestry and Fisheries, "Regional Briefing on Agriculture, Forestry and Fisheries Policy under the Rising Prices of Production Materials and Raw Materials"

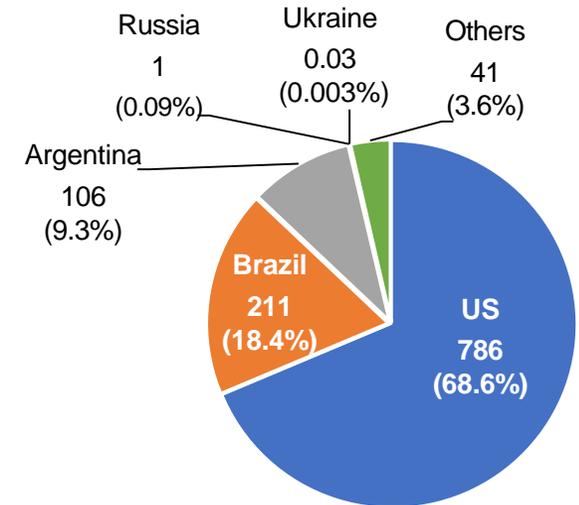
Feed Grain Imports

(million tons, %)

Crops	2020 Confirmed	2021 Preliminary
Corn	1,155 (87.9)	1,136 (87.6)
Barley	95 (7.3)	102 (7.9)
Wheat	34 (2.6)	38 (2.9)
Sorghum	25 (1.9)	16 (1.2)
Others	5 (0.4)	5 (0.4)
Total	1,314	1,297

(Note: Numbers in brackets are share to the total)

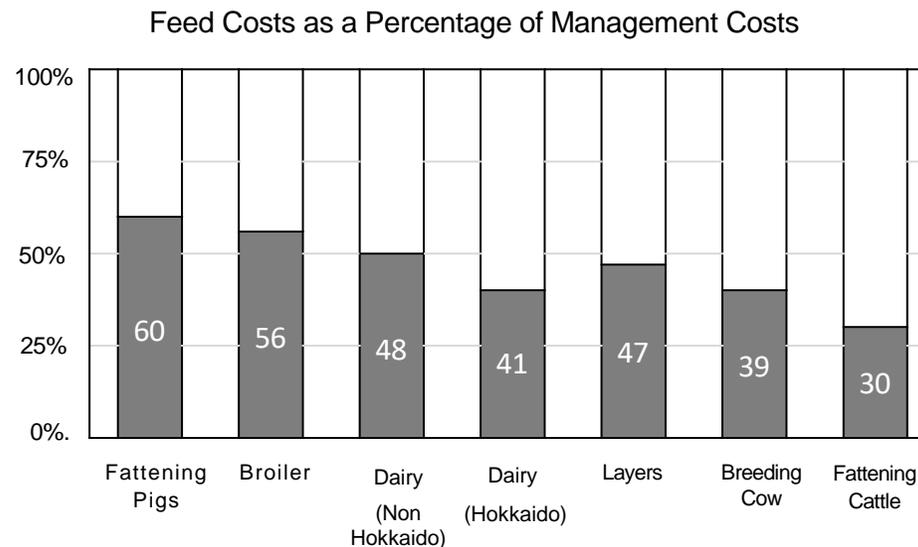
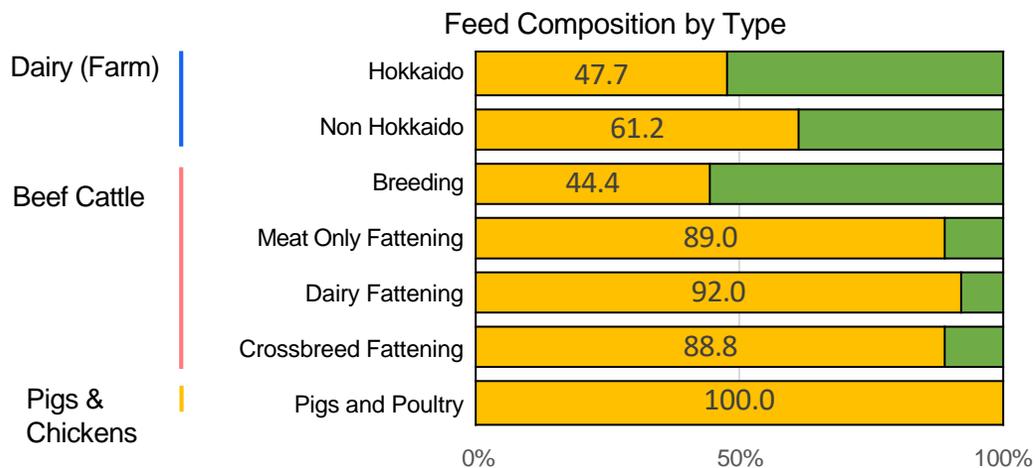
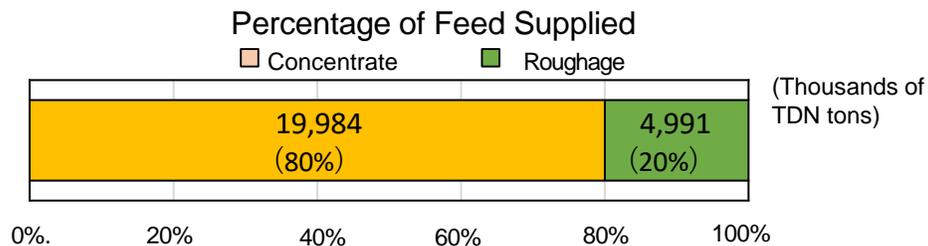
Feed Corn Imports (2021)



Note:  
Country Name  
Imports (Ten K tons)  
(% Share)

# 80% of the Domestic Supply is Concentrate Feed. Feed Costs' Shares are Higher in Poultry and Pig Farming

- 80% of Japan's feed supply is concentrate feed, 20% is roughage
- Concentrate and roughage utilization ratios vary by livestock species
- Poultry, pigs and fattening cattle eat more concentrate feed, while dairy cows and breeding cattle consume more roughage.
- Feed costs as a percentage of management costs are higher in fattening pigs, broilers, dairy farms, layers, breeding cattle, and fattening cattle, in this order.
- The impact on management costs is likely to be greater in pig and broiler operations with a higher usage of concentrate feed and a higher feed share to all costs.



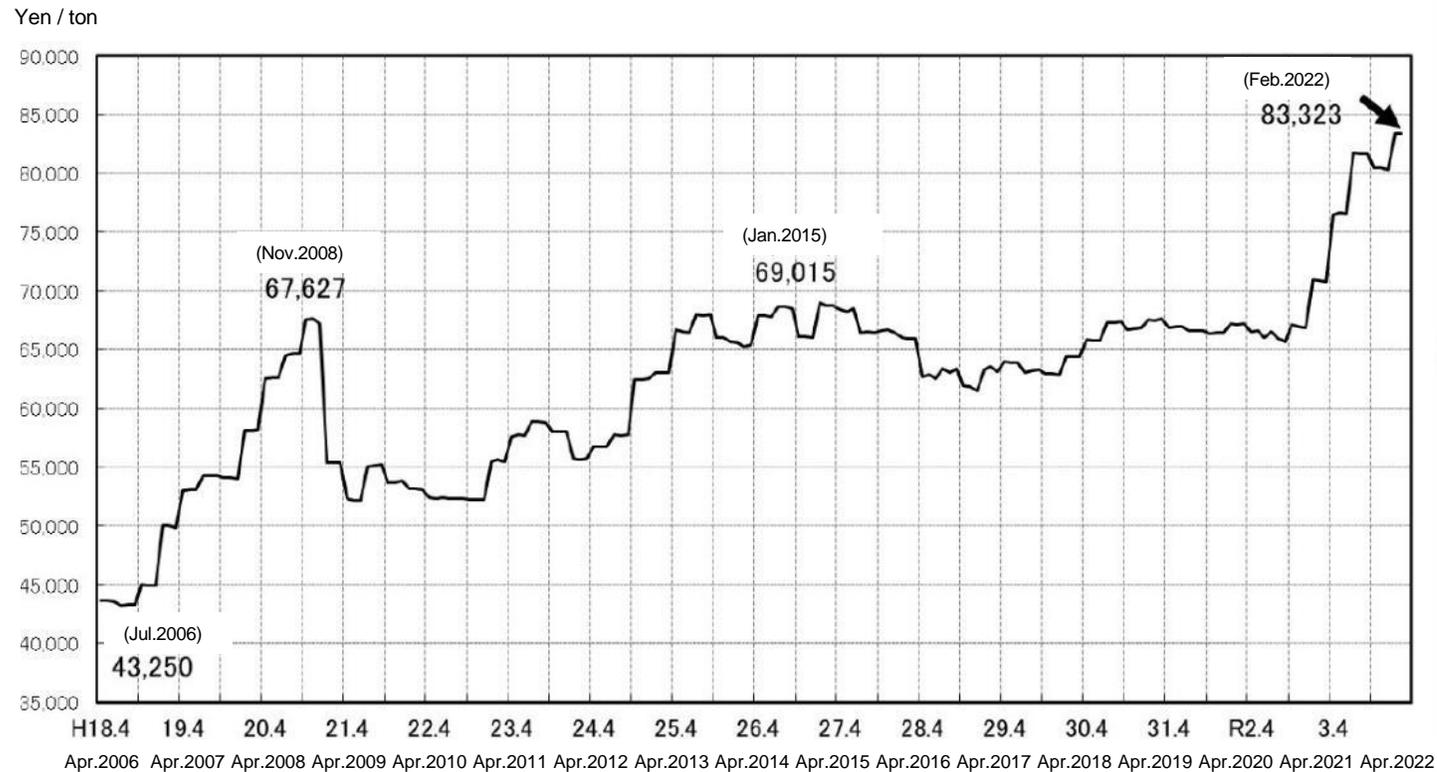
Source: Ministry of Agriculture, Forestry and Fisheries, "The Situation Concerning Feed"

Source: Ministry of Agriculture, Forestry and Fisheries, "The Situation Concerning Feed"

# Domestic Formula Feed Prices Rise above 2008 Surge

- Domestic compound feed price trends relatively stable from 2016-2020, but increased from 2021.
- The price hike since 2021 is due to increased feed demand from China, where pig herds were rebuilding.
- The Ukrainian crisis has further pushed up prices in 2022, approaching 1.5 times the level of 2020.
  - A combination of factors are driving up feed prices, including soaring raw material prices (corn and soybeans), rising transportation costs, and the ongoing depreciation of the Japanese yen.

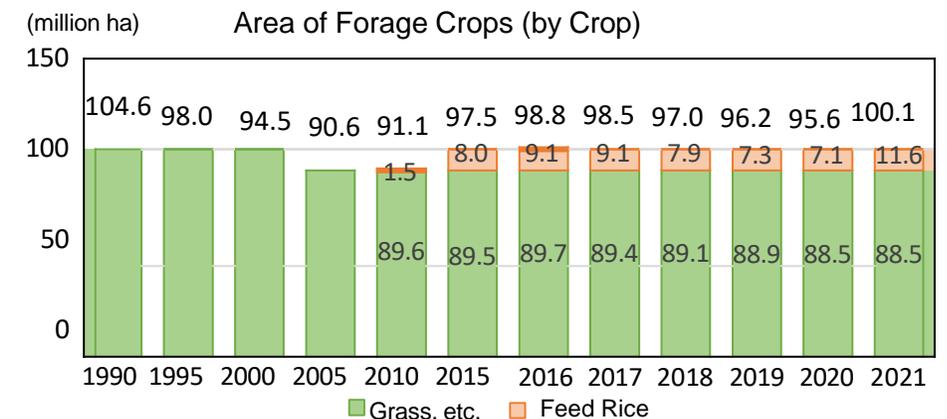
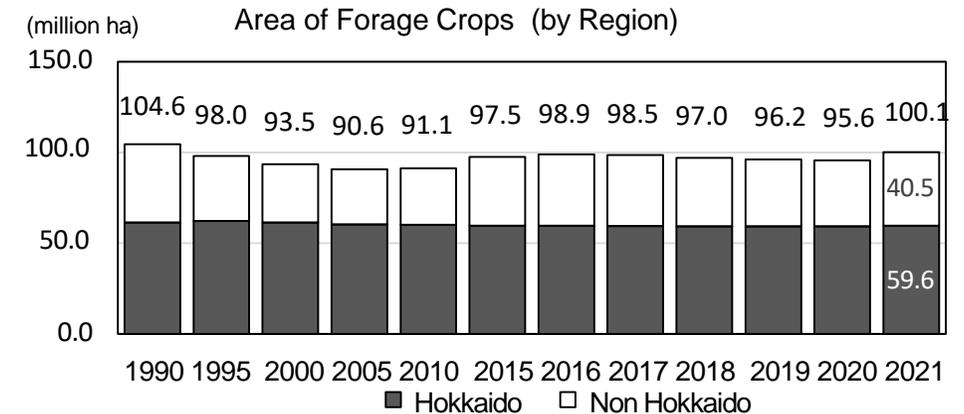
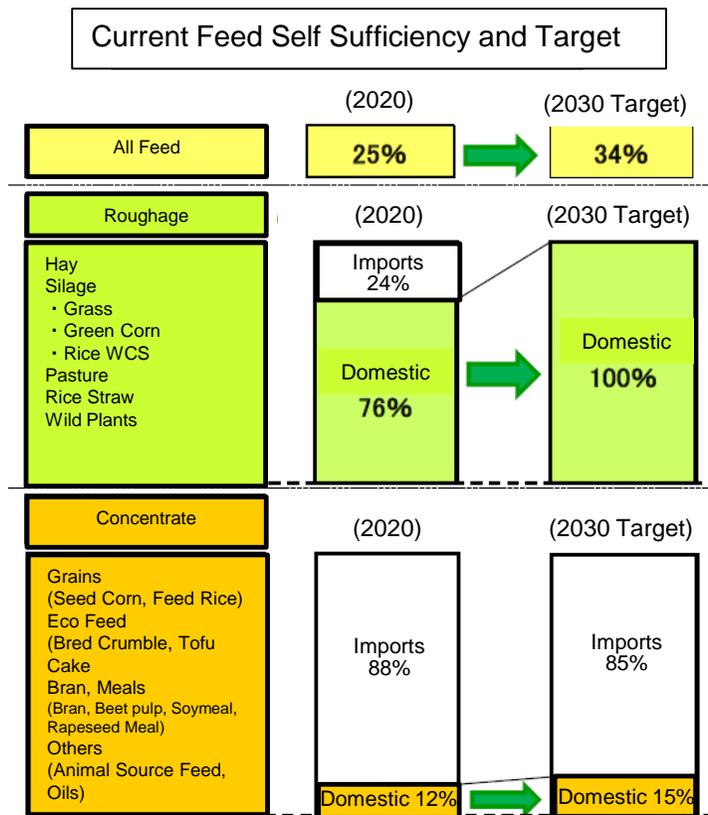
Ex-factory Price of Formula Feed



Source: Formula Feed Stable Supply Mechanism “Feed Monthly”  
 Note: Formula feed price is an weighted average for all animals (Apr 2022 is preliminary)

# Governments has Promoted Domestic Feed, but Planting Remains Flat

- The government aims to produce 34% of feed domestically by 2030, 100% of roughage and 15% of concentrate.
  - Promote the planting of feed crops (seed corn, green corn, rice WCS, feed rice), the spread of external support organizations (contractors, TMR centers), and the use of unused resources (domestic rice straw, eco-feed).
- Main forage crop is grass. The planted acreage has almost unchanged.
  - Hokkaido accounts for 60% of domestic feed crop plantings by region. By crop, grass accounts for just under 90%.
  - Planting has expanded since 2006 due to soaring compound feed prices and enhanced management income stabilization measures, but has leveled off in recent years.

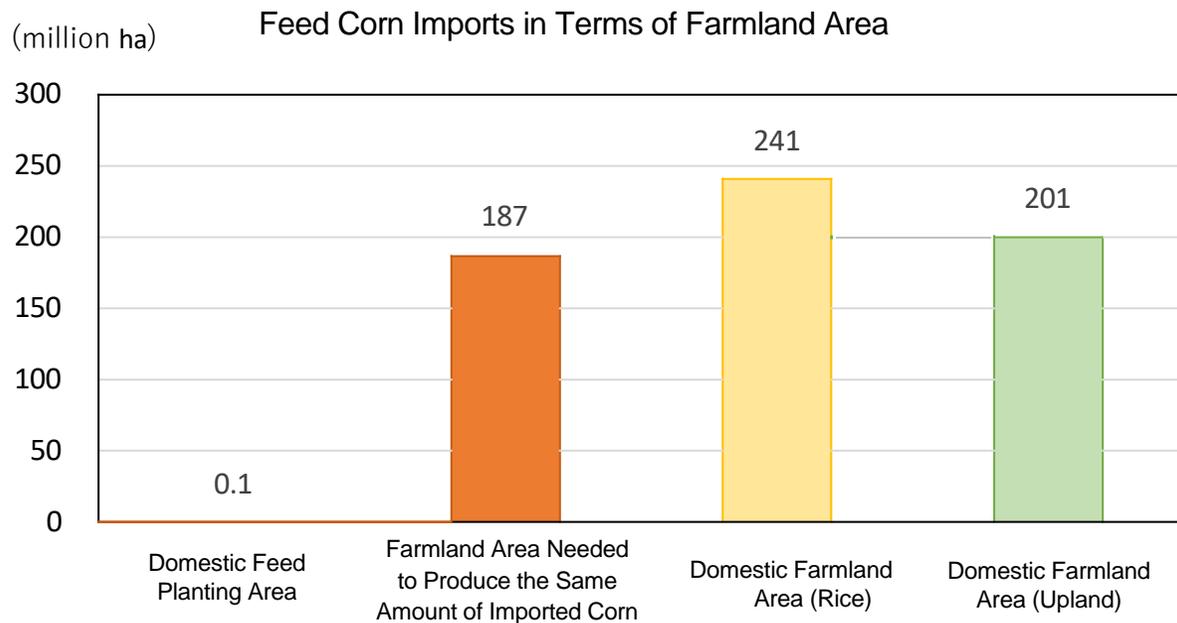


Source: Ministry of Agriculture, Forestry and Fisheries, "The Situation Concerning Feed"

Source: Ministry of Agriculture, Forestry and Fisheries, "The Situation Concerning Feed"

# Feed Self-Sufficiency is a Challenge and Requires Long-Term Efforts

- If all imported corn (concentrate feed) were to be supplied domestically, 1.87 million hectares would be required.
  - More than 1,000 times the area currently under fodder crops in the country.
  - Not just corn, but a wide range of concentrate feed ingredients, such as barley and ecofeed, need to be expanded.
  
- Some livestock producers are cautious about using domestic feed
  - In terms of cost reduction, labor reduction is a high priority.
  - Feed ingredients affect the quality of products, so livestock farmers are reluctant to use those grown on converted-from-paddy upland.
  - It is important to have a long-term and stable cooperation mechanism between crop and animal farmers.



## Farmer's Voices on Domestically Produced Feed

- *I am afraid that the feed from food residues may not contain ingredients as desired.*
- *Feed affects meat quality. It is not something that can be changed without careful consideration.*
- *We have been reducing labor by introducing automatic feeders and other measures. Changing compound feed is a last resort.*
- *Farmers currently working on fodder crops are those who have shifted crops with attractive subsidies. It is not sure if they can produce good quality feed. We need farmers who continue to produce fodder crops willingly.*

Source: Speakers' Hearing

(Note) The conversion of imported corn into farmland area is calculated using the amount of corn imported for feed use in FY2021 and domestic seed corn unit yields.

Source: MAFF "Risk Assessment on Stable Food Supply (2022)" and Norinchukin Research Institute

### (3) Impact of the Prolonged Ukraine Crisis

#### a. Impact Estimates / Dairy Farmers' Profitability are Estimated to be Significantly Affected.

- Based on the results of JFC's analysis of agricultural business trends (actual results for 2020), the impact of high feed prices and high crude oil prices on profitability is estimated, taking into account changes in prices of livestock products. (Note: This study was only for "Super L" loan borrowers, who are relatively well managed, large corporations)
  - Estimation method: Changes in "fuel and power costs" and "feed costs" are estimated by multiplying the actual "fuel and power costs" in 2020 by the rate of change of 29.0% and 26.7% between May 2020 and May 2022 in the Survey of Agricultural Prices, MAFF, and "sales" by the rate of change of each livestock produce prices in the same survey for the same period. As this survey covers only "material costs", feed costs were estimated by multiplying the feed costs as a percentage of agricultural management costs in the Survey of Agricultural Business Statistics of the Ministry of Agriculture, Forestry and Fisheries (MAFF) by the rate of increase or decrease in agricultural commodity prices. The change in ordinary income is estimated based on these figures.
  - Changes in other items (various subsidies such as MARUKIN, and calves costs for beef cattle fattening, etc.) are not taken into account.
- According to the results of the above estimation, comparing May 2020 to May 2022, given the prices of livestock products were -4.1% for dairy farming, +10.4% for beef cattle fattening and +10.1% for pig farming, the impact of higher feed prices on beef cattle and pig farming was mitigated by higher sales due to higher market prices in the Corona disaster. However, as we will see later (Sheet 59 - ), there are concerns about the future impact on both beef cattle and swine. Dairy farms posted negative recurring profit, indicating that its impact is more significant among livestock operations.

Impact of High Crude Oil Prices, High Formula Feed Prices, and Sales Price Changes on the Management of Agricultural Corporations (Estimates Based on 2020 Results) (Millions of yen)

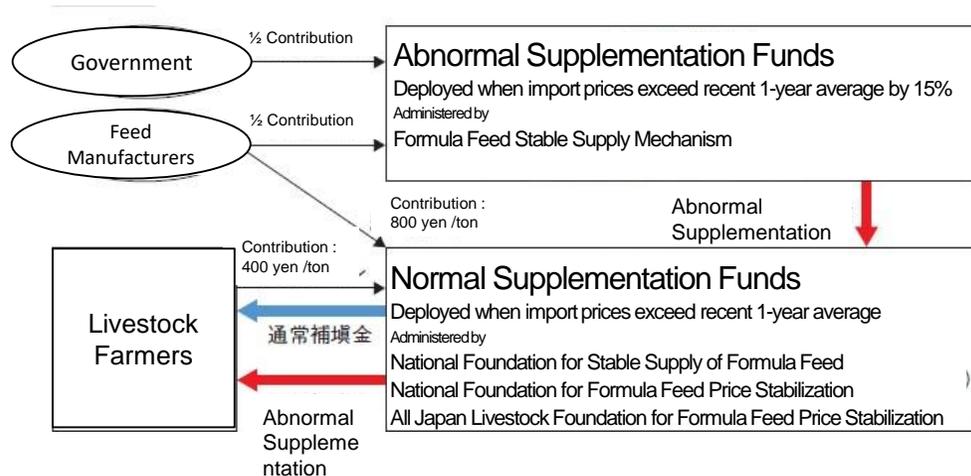
	Hokkaido Dairy			Non Hokkaido Dairy			Beef Cattle Fattening			Pig Farming			Layers			Broiler		
	2020 (Actual)	Estimated after impact	Change	2020 (Actual)	Estimated after Impact	Change	2020 (Actual)	Estimated after Impact	Change	2020 (Actual)	Estimated after Impact	Change	2020 (Actual)	Estimated after Impact	Change	2020 (Actual)	Estimated after Impact	Change
Sales	267	256	-11	262	251	-11	672	741	70	681	749	68	1,259	1,634	375	349	357	8
Cost of Goods Sold	210	222	12	211	224	13	616	653	37	512	550	38	986	1,080	94	316	353	36
Materials	103	114	11	113	125	12	437	473	36	275	311	36	694	787	92	228	263	35
Fuel and Power	3	3	1	2	3	1	4	5	1	7	9	2	6	8	2	3	4	1
Gross Profit	57	34	-23	51	27	-24	56	88	32	168	199	31	274	554	281	32	4	-28
Selling, General and Administrative Expenses	56	56	0	52	52	0	66	66	0	110	110	0	273	273	0	29	29	0
Operating Profit	1	-22	-23	-1	-25	-24	-10	23	32	58	89	31	1	281	281	3	-25	-28
Non-operating Income	14	14	0	8	8	0	17	17	0	3	3	0	5	5	0	3	3	0
Ordinary Income	15	-8	-23	7	-16	-24	8	40	32	61	92	31	6	286	281	6	-22	-28

## b. Support Measures by the Government

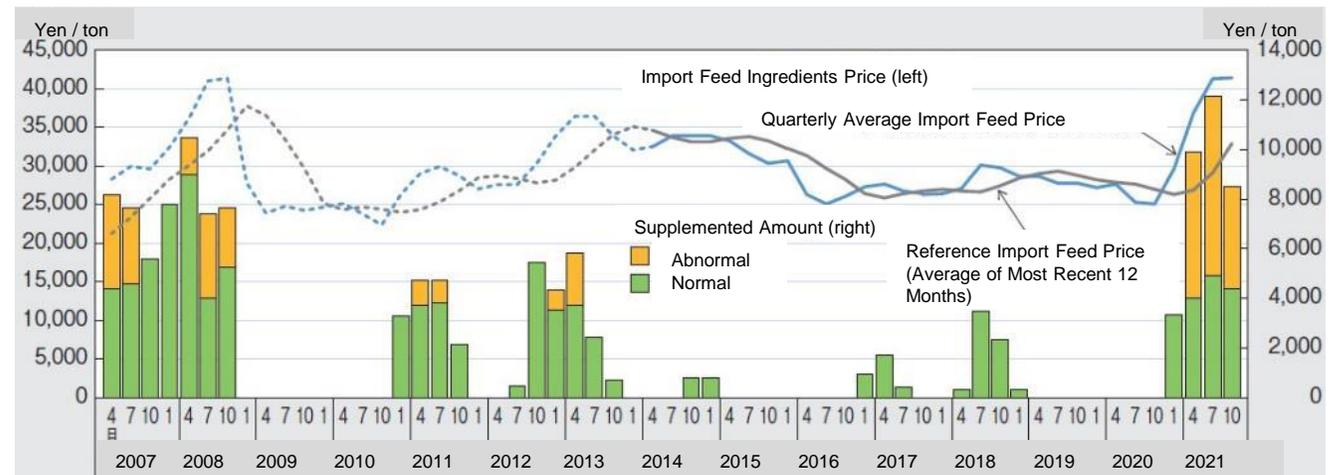
### Support Measures to Cope with Soaring Feed Prices (National)

- Emergency measures to cope with soaring formula feed prices
  - There are two funds for compensation: "normal supplementation," which is accumulated by producers and feed manufacturers, and "abnormal supplementation," which is accumulated by the government and feed manufacturers.
  - The total of 66.5 billion yen will be added by the supplementary budget for FY2021 and by the comprehensive emergency measures for crude oil price and price hikes.
  - As a special measure for Q1-Q2 FY2022, the triggering threshold was lowered from 115% to 112.5%.
  
- Expansion of feed grain stockpiling and distribution rationalization projects
  - Expand subsidies for the wide-area distribution of roughage beyond prefectural boundaries.
  
- In addition to the above, the government is also working to help farmers secure working capital, support calves and piglets, and assist in reducing feed costs.
  
- If the impact is prolonged, support by management stabilization measures such as "Cattle Marukin" and "Pig Marukin".
  - Neither large corporations (with capital of 300 million yen or more or with 300 or more full-time employees) nor management entities in which large corporations hold the majority of voting rights, is eligible.

#### Outline of the Formula Feed Price Stabilization System



Trends in Imported Feed Material Prices and the Status of Supplementation under the Formula Feed Stabilization System



# Support Measures to Cope with Soaring Feed Prices (Prefectures)

- From May to June, prefectures formulated supplementary budgets for fiscal 2022. Many included measures to cope with soaring feed prices utilizing the national government's grants for "Comprehensive Emergency Measures to Cope with Soaring Crude Oil Prices and Prices in the Corona Disaster".
- Many were to supplement the national government measures or to subsidize the farmers' contribution to the Formula Feed Price Stabilization System.
- Support for the production of self-sufficient, locally-sourced feed, encouragement to bring in livestock consultants, and measures to stimulate demand for livestock products from their own prefectures have also been announced.
- Some municipalities are also providing their own support to further supplement the national and prefectural systems.

## List of Measures Taken by Prefectures to Cope with Feed Price Hikes



Source: Websites of Prefectures

- Opinions from farms (based on interviews with speakers)
  - The prefectural government has also launched a support program, but it is far from enough to cover the steep rise in feed prices.
  - There is a concern that the number of operators with little cash on hand and need some form of financing due to skyrocketing feed price payments will increase rapidly.
  - I would like to see more support for passing on higher feed prices to sales prices.

# c Dairy Farming

## Scale up and Higher Concentrate Level with Capital Investment

- The number of dairy cows has decreased over the past 20 years, however the average herds size has increased.
- The policy target for FY2018 to FY2030 is the increase of raw milk production from 7.28 million tons to 7.8 million tons.
- *The Livestock Cluster projects* increased the number of dairy cows by 54,396 since FY2018. Large-scale firms made capital investments.
  - In Hokkaido, the number of milking parlors units installed or renewed increased from FY 2017 onward.
  - The number of farms installed milking robots increased in order to cover labor shortage and to expand their business.
- To increase production, the level of concentrate feed has been getting higher. Average roughage feeding rate was 49.1% in FY2000, but it went down to 47.0% by FY2020. Also average feed self-sufficiency ratio went down from 33.9% to 31.9% over the same period.

Milking Robot



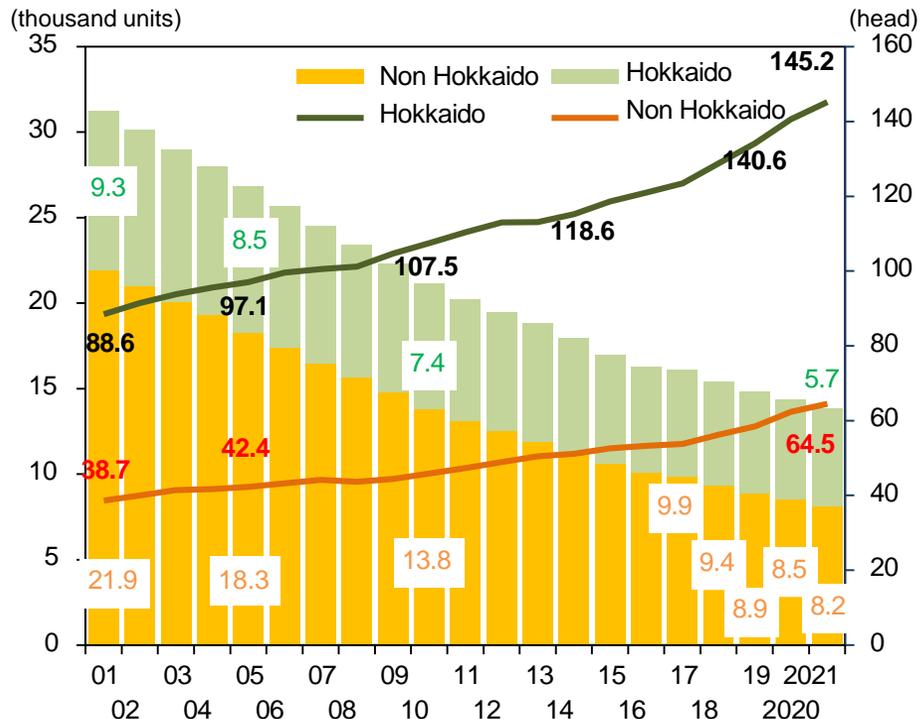
Photos by Norinchukin Research Institute (Mione, GEA)

Number of Milking Parlors Installed and Renewed in Hokkaido (Milking Robots and Others)

	Total	
	Total	Milking Robot
FY2005	62	9
2010	44	4
15	46	31
16	42	32
17	95	68
18	89	72
19	88	65
20	58	51

Source: Hokkaido Agricultural Policy Department, Livestock Production Promotion Division, "The state of diffusion of the new milking system".

Number of Dairy Cows over 2 Years Old and Average Number of Cows per a farm



Source: Ministry of Agriculture, Forestry and Fisheries Web site

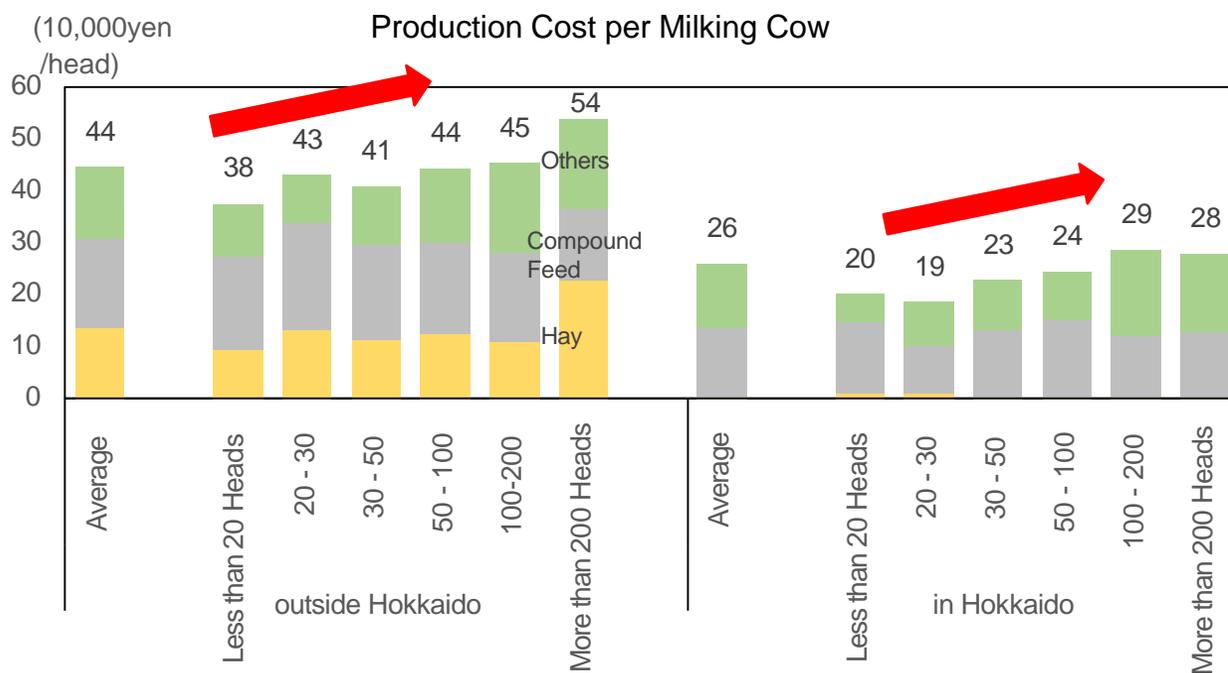
Trends in Roughage Feeding Rate and Percentage of Dairy Farmers Feeding Self-Supplied Feed (on TDN basis) (%)

		2000	2005	2010	2016	2017	2018	2019	2020
Roughage Feeding Rate	National	49.1	46.6	47.4	47.5	47.5	46.6	47.2	47.0
	Hokkaido	58.1	55.5	55.6	56.1	52.9	52.2	53.3	52.3
	Non Hokkaido	41.7	38.1	38.5	37.7	39.5	38.8	37.8	38.8
Self-Sufficiency	National	33.9	33.4	33.8	30.2	31.0	31.7	32.9	31.9
	Hokkaido	54.4	52.6	50.1	45.1	47.8	49.6	51.1	49.9
	Non Hokkaido	17.2	15.4	16.3	13.2	14.2	13.8	14.1	13.1

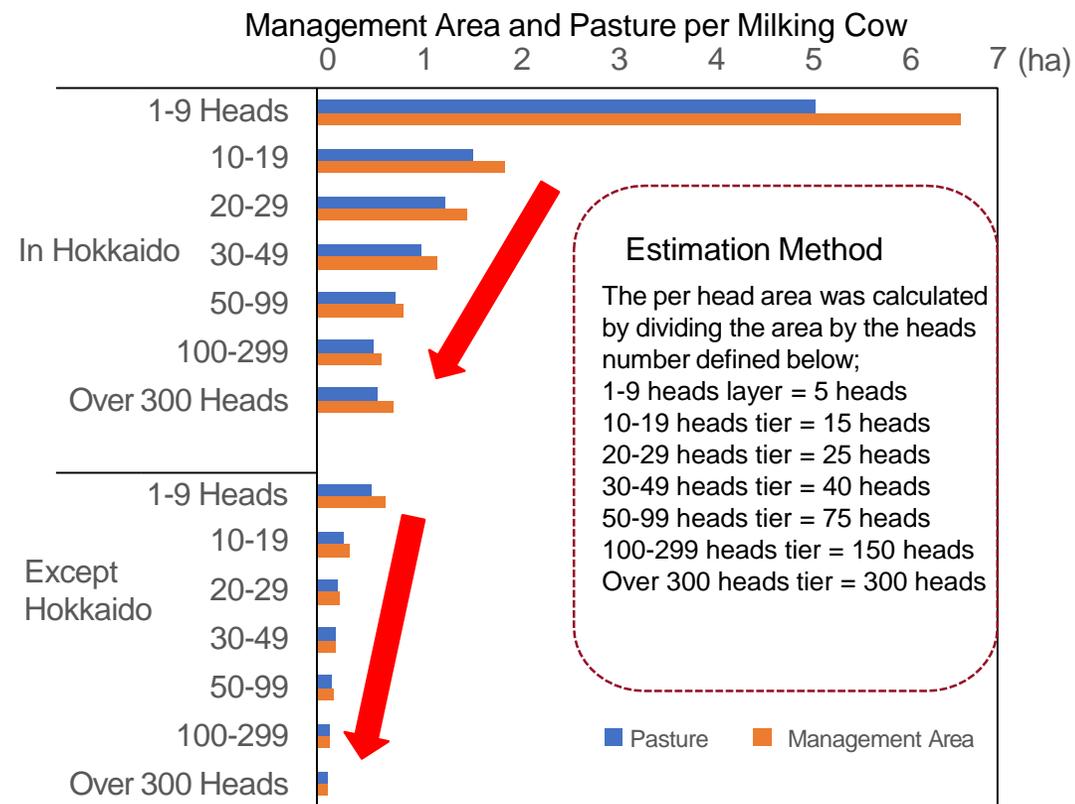
Source: Ministry of Agriculture, Forestry and Fisheries Web site

# Mega-Farms and Giga-Farms, who Depend on Purchased Roughage, may be Hit More Seriously than those do not. 54

- In Japan, the roughage (hay) and the compound feed account for a large proportion of production costs per milking cow. Japanese farmers except Hokkaido are highly dependent on the purchased hay. Only in Hokkaido hay's self-sufficient is high. Ca.70% of hay in value is imported from the U.S. According to UN Comtrade data, the CIF price of grass (HS1214) went from 37.1 yen/kg in January 2021 to 49.9 yen/kg in March 2022.
- The average production cost per milking cow is 440,000 yen(except Hokkaido) and 260,000 yen in Hokkaido. The larger in scale, the higher in cost. Many dairy farms in Hokkaido are self-sufficient in hay, who can keep production costs low.
- However, with the estimation of farm area per milking cow, even in Hokkaido, the pasture area per cow is smaller in the large scale layer, and in this layer, the feed self-sufficiency is afraid to be significantly low.



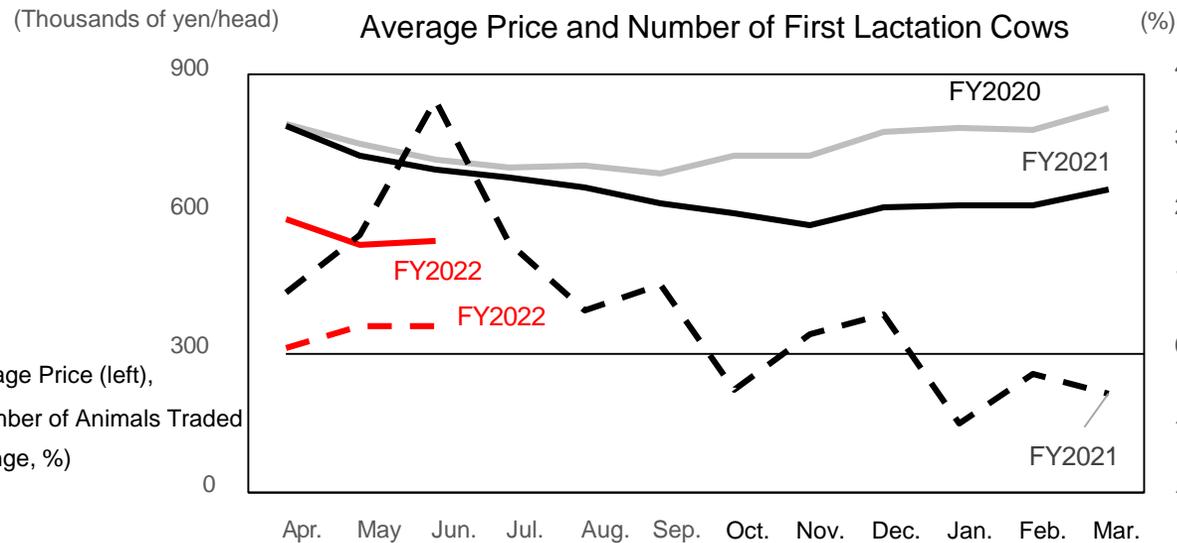
Source: Livestock Production Cost Statistics, Ministry of Agriculture, Forestry and Fisheries



Source: Census of Agriculture and Forestry, Ministry of Agriculture, Forestry and Fisheries

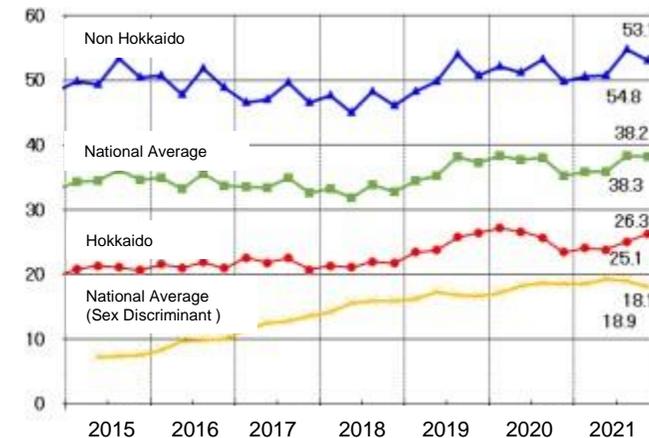
# Current Dairy Cows Population Suggests Continued Increase in Production

- According to *J Milk*, since FY2019 the ratio of 2-4 year old in the number of dairy herds has increased, which is with the highest production capacity, and the number of successor cows under 2 years old is also expected to increase, so the momentum of production expansion is not expected to stop.
- In FY 2022, the Japan Dairy Council has newly introduced the measures for the balancing supply and demand, while improving farm management as well as. As dairy farmers are struggling severe economic condition due to the prolonged sluggish demand by Covid-19 and the soaring feed and fuel prices, it aims to preserve farmers by the measures to reduce inventories and to stimulate dairy consumption.
- The average price of heifer has been declining since FY2021. The number of cows traded was on a down trend in FY2021, but turned positive in FY2022 compared to the previous year.
- Breeding Holstein females to Wagyu bull is on an upward trend in FY2021 due to the easing of supply and demand of milk.



Source: Hokuren Federation of Agricultural Cooperatives "Hokuren Livestock Market Information".

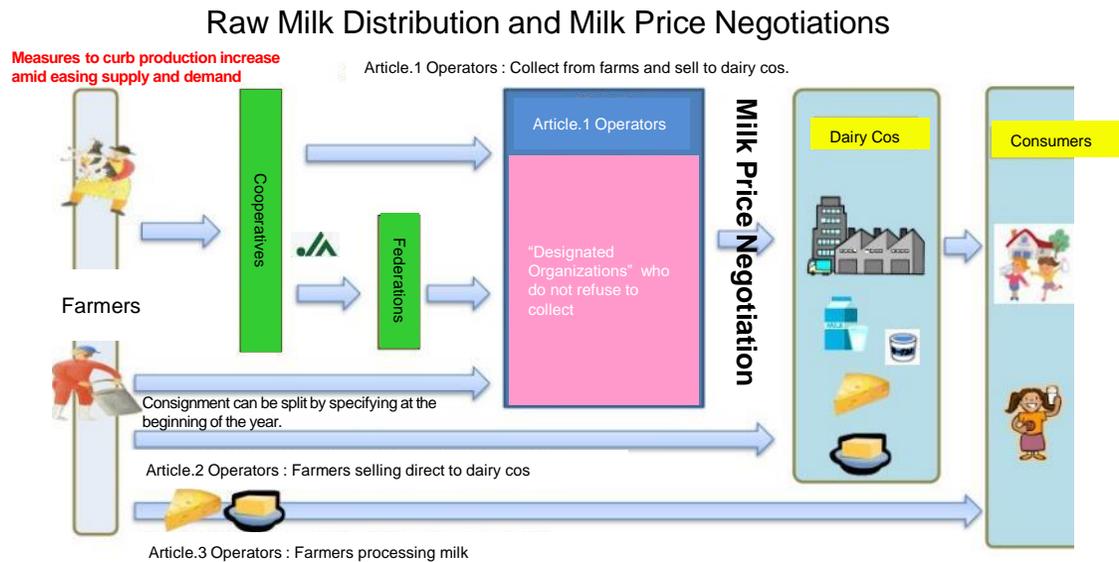
Crossbreeding of Black Wagyu and Sex-Discriminant Semen to Dairy Cows



Source: Japan Livestock Artificial Insemination Specialists Association Web site

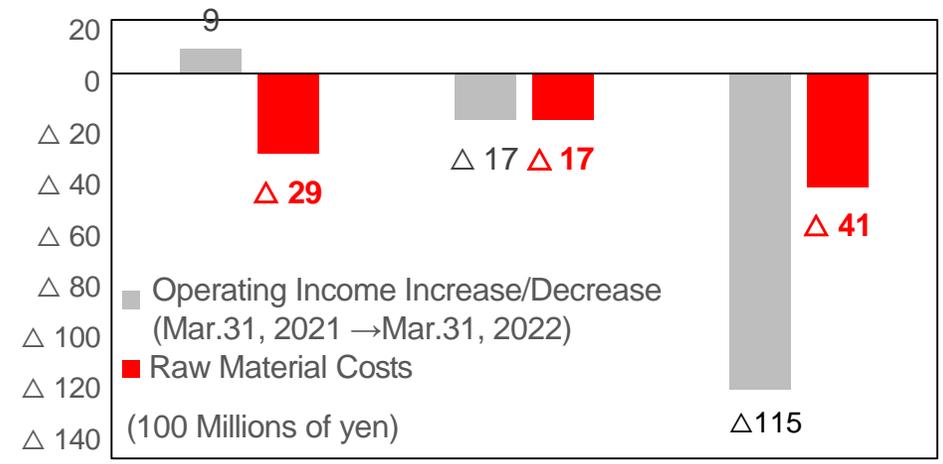
# Milk Price collective negotiation is taking place at unusual timing

- From the end of May 2022, the *Designated dairy farmers' organizations* (Hereafter "designated organizations") started collective negotiations for raw milk prices for drinking milk in 2022. Negotiations on milk prices are being conducted between the designated organizations and larger dairy processors for each bloc excluding Hokkaido area. At the end of June, *Hokuren*, the designated organization of Hokkaido, started negotiations on milk prices for dairy products (Non-drinking). Although the amount demanded differs among the designated organizations, requested increase in drinking milk price is ca. 15 yen/kg.
- It is problematic when milk price increase, it will bring the impact on raw milk supply and demand. If the price is transferred, consumption should fall, then the supply and the demand might further ease, at the end dairy processors should build up inventories.
- The institutional reform of the designated organizations in 2018 brought the situation where dairy farmers can free-ride of the system, and at the same time it becomes the hurdle of the collective action of farmers
- The change in operating profit of the three larger dairy processors in March 2022 was +0.9 billion yen for *Morinaga*,  $\Delta 1.7$  billion yen for *Megmilk Snow Brand*, and  $\Delta 4.1$  billion yen for *Meiji HD* (food division). All of them were greatly affected by the rising cost of raw materials, and it is not easy for them to accept further price hikes.



Source: Ministry of Agriculture, Forestry and Fisheries Web site

Change in Operating Income of Major Dairy Companies

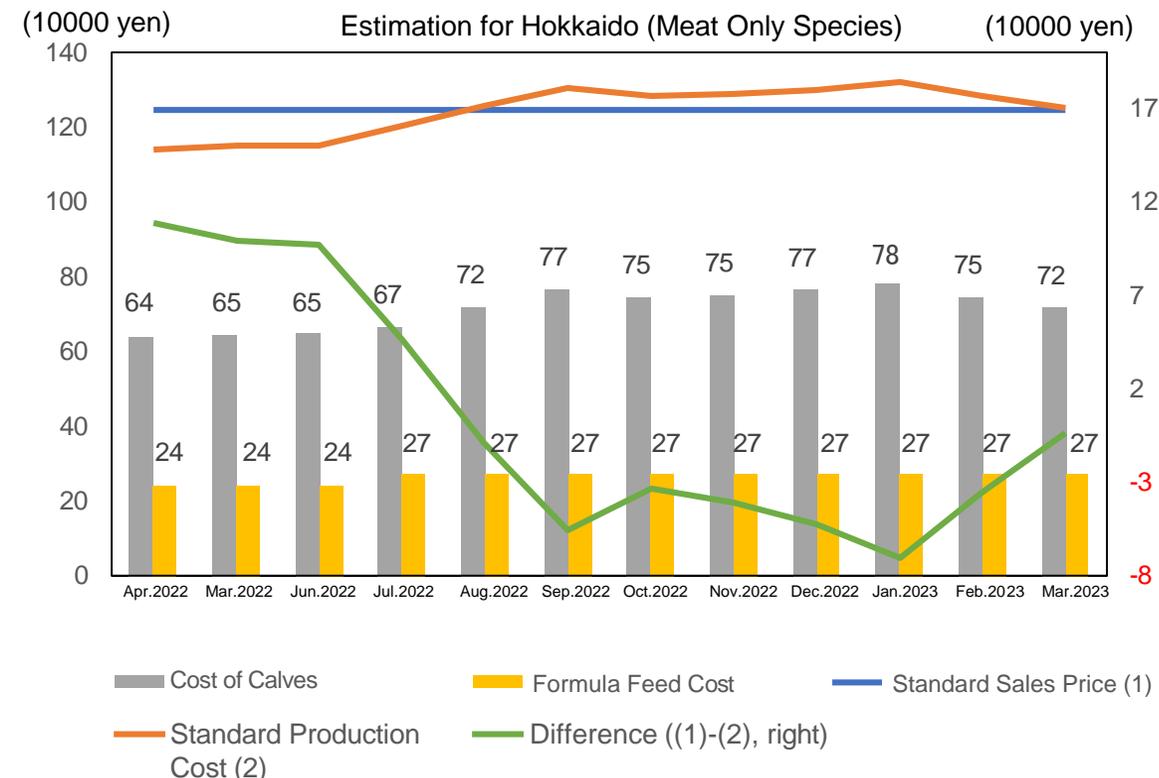
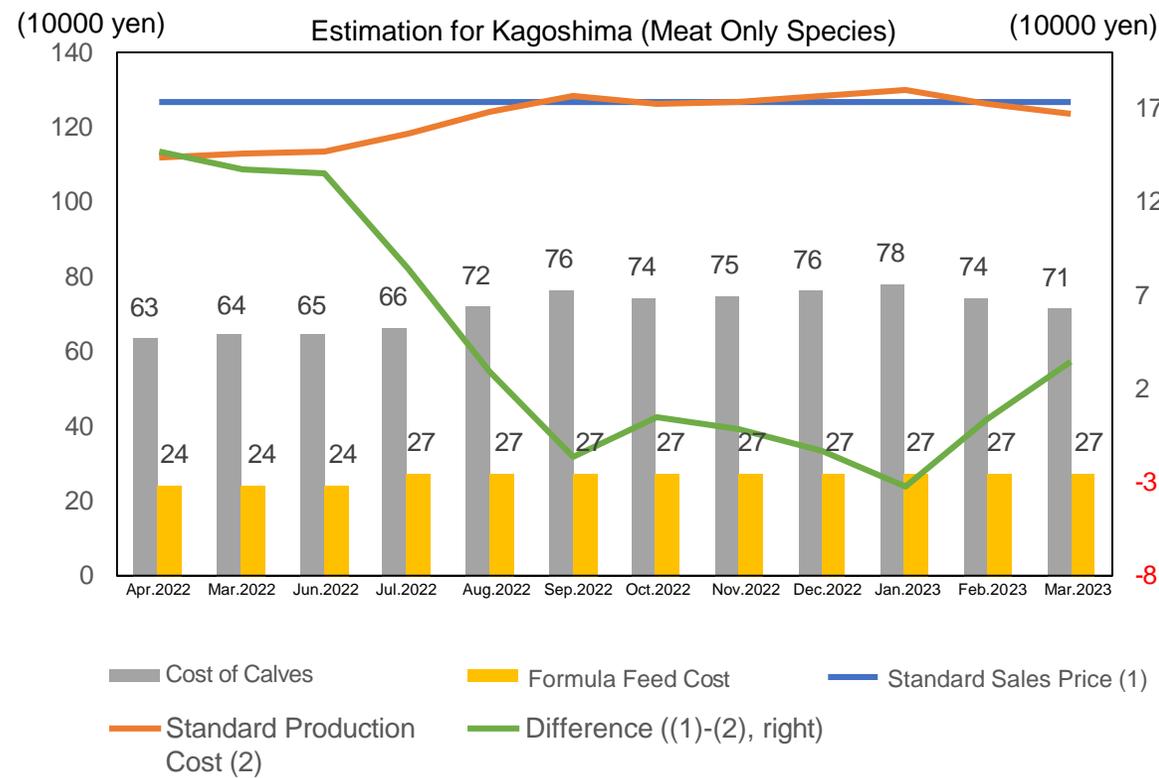


Source: Websites of Major Dairy Companies



# d Beef Cattle / Profitability per Cow may Deteriorate in the 2nd Half of the Year as the Shipment Progress of Cattle Introduced when Calves Prices were High

- The Beef Cattle Fattening Management Stabilization Grant (Beef Marukin) provides beef cattle producers with 90% of the difference between the standard sales price and the standard production cost, and the standard sales price (gross profit) and standard production cost (production cost) per cow are announced on a monthly basis.
- The time around April 2022 was when calves introduced at the time when calf prices plummeted at the beginning of the Corona disaster were being shipped out. In the **future, calves introduced at a time when calf prices recovered to a higher price range will be shipped, and the margin is expected to decrease significantly or become negative.**
  - Estimation method: Livestock costs in April 2022 are based on the beef calf prices 21 months earlier (July 2020), and from May 2022 onwards, applying the increase rate of the average calf prices on the right of the next page after August 2020. Assuming that the increase rate for April - June 2022 to July - September 2022 will continue, formula feed costs are estimated by multiplying JA Zen-Noh's formula feed supply prices by the rate. Changes in sales prices and other production costs are not taken into account here.

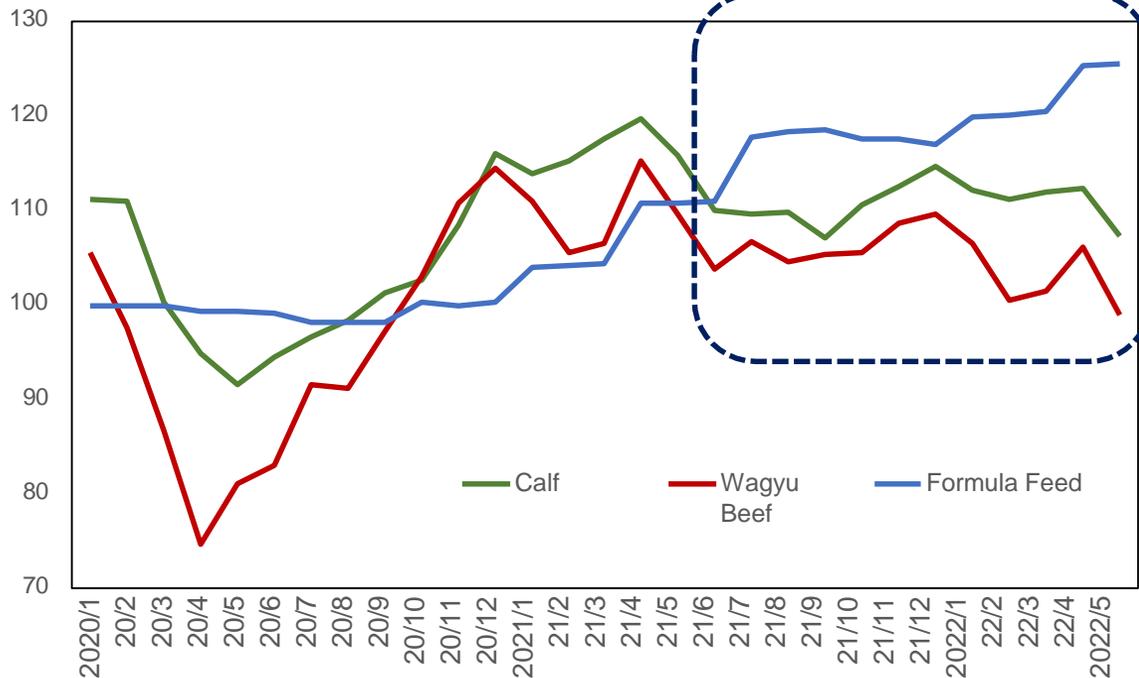


Source: Estimated based on the Japan Agricultural and Livestock Industries Corporation (ALIC).

# Feed Price Hike are not Passed on Wagyu Meat Prices, rather Make Calf Prices Plunge

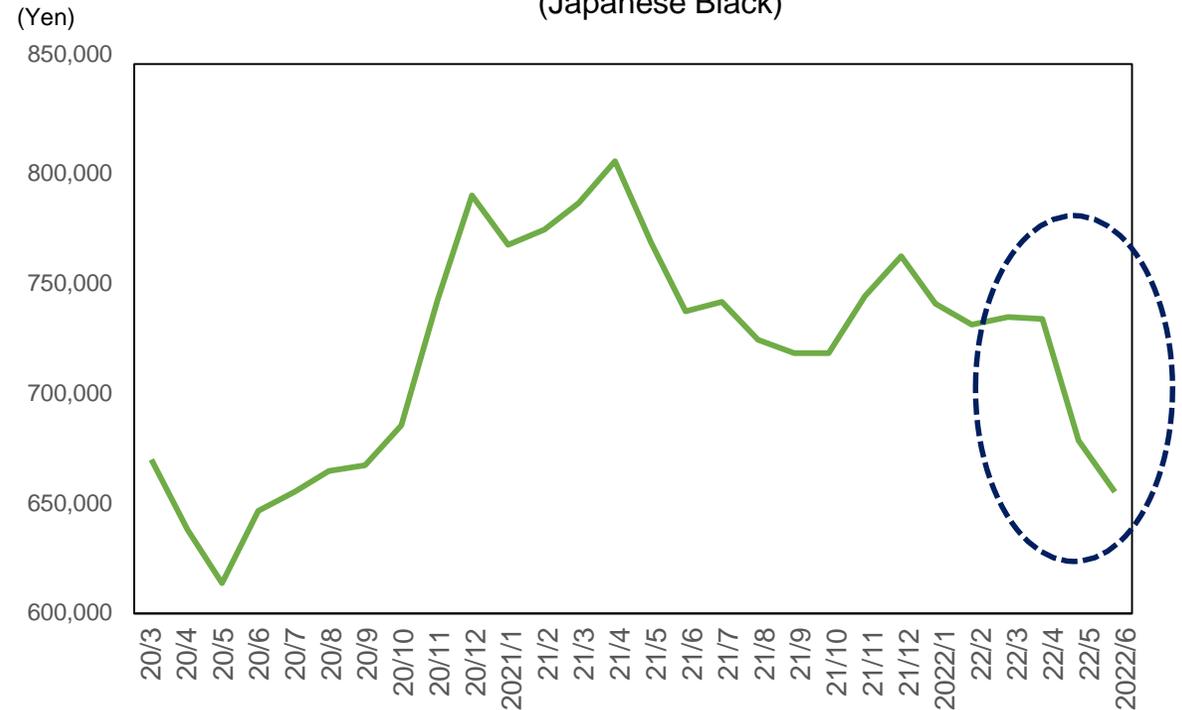
- Formula feed prices have continued to rise since 2020. On the other hand, Wagyu cattle prices have been mostly flat since May 2021 and have been soft since 2022. While domestic demand is weak, Wagyu market prices are barely supported by exports and government support for frozen inventories,, so prices have not been able to be passed on.
- Against this backdrop, calf prices have plummeted since May 2022. It can be interpreted that fattening enterprises are trying to mitigate the effects of the steep rise in feed prices by reducing their costs of producing cattle. However, there are concerns that if this continues for a prolonged period, it will discourage breeders to produce calves, and this in turn will have an impact on the future calf supply.

Price Indices for Beef Cattle Calves, Wagyu Beef, and Formula Feed (2015 = 100)



Source: Survey of Agricultural Prices, Ministry of Agriculture, Forestry and Fisheries  
(Note) Calf prices are for beef cattle calves (castrated), Wagyu cattle prices are for beef cattle (castrated fattened Wagyu), and formula feed prices are for beef cattle (fattened).

Nationwide Average Transaction Price of Beef Cattle Calves (Japanese Black)



Source: Japan Agriculture and Livestock Industry Corporations, "Beef Calf Transaction Information".  
(Note) Average transaction price of the total of male and female of Black Japanese breed. Consumption tax included.

# Voices from Farms on Beef Cattle (Wagyu) Production (1)

- A JA in prefecture X
  - ❑ Financial constraints have limited support for cooperative members. Support measures of the prefectural government are far from enough to cover the steep rise in feed prices.
  - ❑ So far, in Prefecture X, they have been working with arable farmers to promote self-sufficiency in roughage, and their self-sufficiency rate is high.
  - ❑ When the price of formula feed rose sharply in 2008, we implemented the consolidation of formula feed brands after several years of demonstration trials, while taking into consideration the impact on meat quality and increase in body size, etc. Further consolidation is not possible. Feed design cannot be changed immediately because of a rise in formula feed prices.
  - ❑ Under these circumstances, we believe it is necessary to strengthen sales (especially exports).
- The Livestock Public Corporation of prefecture X
  - ❑ Producers may have felt that the impact of high feed prices was less severe than it actually was because they had been shipping calves for the past several months that were introduced during the early days of the Corona disaster when the calf market was in a steep decline. From now on, calves introduced when the calf market was recovering will be shipped and the loss will be clear. There is concern that the number of operations that have little cash on hand and need some form of financing due to high feed price payments will increase rapidly.
- A Wagyu fattening corporation in prefecture X
  - ❑ The farm has 850 heads of cattle and is financially within the top 10% of the JA fattening division. The average carcass weight is among the highest in the prefecture. They are almost self-sufficient in roughage.
  - ❑ Since the beginning of FY2022, the business has been barely breaking even due to high feed prices. Up until now, the "Marukin" subsidy has been used to pay for the rising feed prices. If feed prices rise further, it will become even tougher to break even. However, the recent decline in the market price of calves has eased the impact.
  - ❑ Feed design cannot be changed considering the current buyers. In order to improve the unit sales price, the JA Fattening Department start to ship to new consumer markets 2022 (planned before the Corona disaster and finally implemented). Expectations are high for exports.
  - ❑ Judging from the business performance of their own corporations, nearly half of the members of the Fattening Dept. are finding it difficult to make a profit and some members may give up farming. The Fattening Dept. is requesting JA to establish a low-interest fund.
  - ❑ They are willing to expand the herd but are waiting to see how it goes due to high feed prices. If cash flow is secured, they would like to increase the number of cows because calf prices are declining.

## Voices from Farms on Beef Cattle (Wagyu) Production (2)

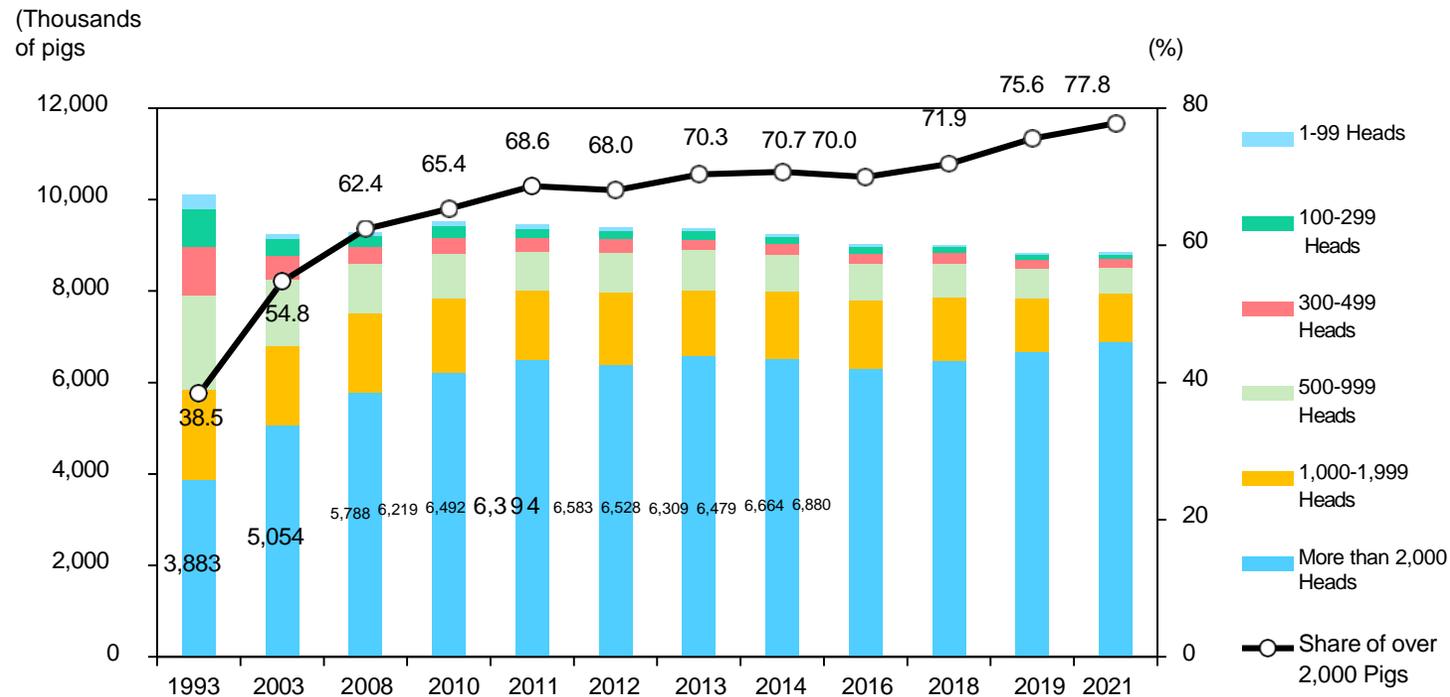
- Efforts to improve carcass market prices in small-scale production areas
  - Before the Corona disaster, demand was mainly from tourists, but after the Corona disaster, the company developed sales channels to large consumption areas outside the island.
  - Focusing on carcass market prices as a countermeasure against rising feed prices. The local government regularly holds events for local residents to sell carcasses at low prices to stimulate consumption. Thanks to so created demand, the local carcass auction results (carcass market price) are about 30% higher than in the Tokyo market.
  - JA also considers that some countermeasures are necessary and is currently studying options.
- As mid- to long-term initiatives, they have started to reduce costs by shortening the rearing period and to produce more reasonably priced Wagyu cattle.
  - In order to meet the needs of consumers for beef that is moderately fat-crossbred and reasonably priced, prefecture Y government is "promoting improvements that focus not only on fat-crossbreeding but also on traits related to meat quantity, such as increase in body mass and yield, as well as the content of monounsaturated fatty acids, such as oleic acid, related to eating quality, such as fat melt in the mouth, while taking into consideration the genetic diversity of Wagyu cattle."
  - The JA system in prefecture Y started demonstration trials several years ago for the stable production of affordable grade 4 beef. The aim is to establish a production system that shortens the fattening period and reduces production costs, but the challenge is how to secure carcass weight to keep profitable. We plan to develop a formula feed that can increase body weight over the next few years and demonstrate the optimal feeding method.

# e Pig Farming

## Small-Scale Farms Keep 10% of Pigs, and are Mostly in Kanto and Kyushu.

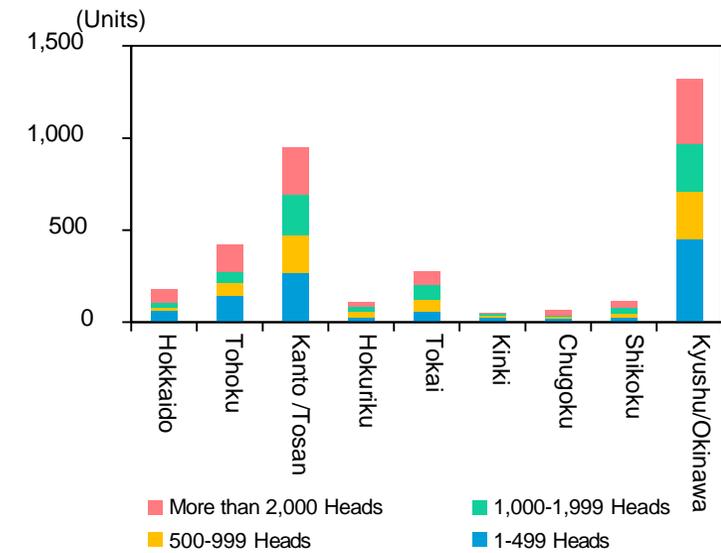
- In the small-scale operations with less than 1,000 head (generally less than 100 sows), the share of head has declined from 40% to over 10% over the past 20 years. On the other hand, in the group with 200 or more pigs (generally 200 or more sows), the share of the number of pigs kept has increased to nearly 80%, and a small number of producers are producing the majority of the pigs.
- The main pig production areas are Kyushu/Okinawa and Kanto/Tosan, and there are also many small-scale operations with less than 1,000 pigs in these two regions.

Number of Hogs by Scale, and Share of Heads in the "2,000 or More Hogs" Group



(Source: Statistics on Livestock Production, Ministry of Agriculture, Forestry and Fisheries)

Number of Pig Farmers by Herd Size (by Region)

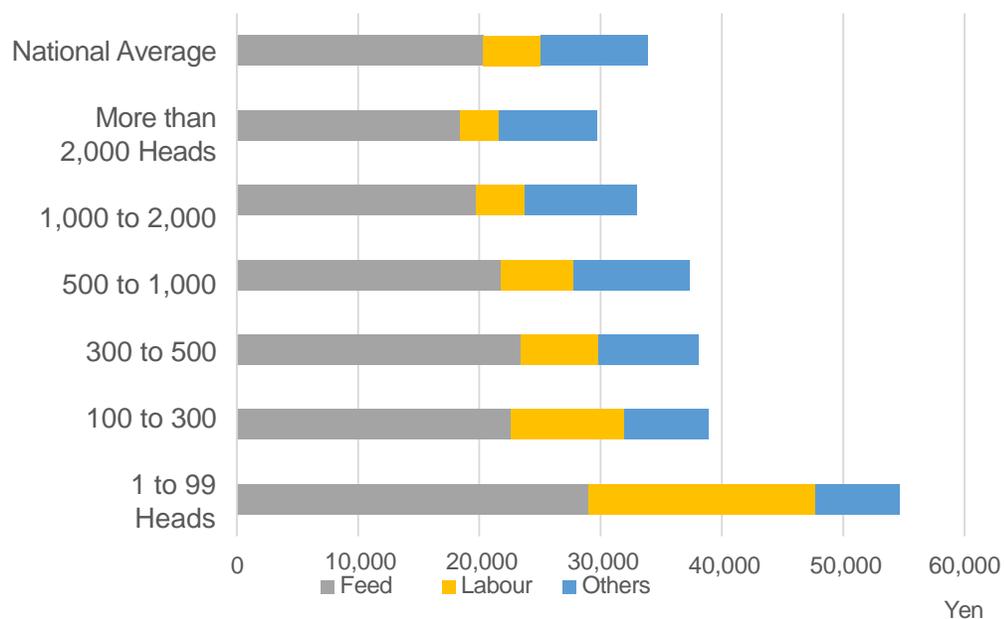


Source: Statistics on Livestock Production, Ministry of Agriculture, Forestry and Fisheries

# Current Carcass Prices are Covering Production Costs, but there are Concerns about the Weaker Market Conditions in the Fall and Beyond

- According to “Livestock Production Cost” stats, for pig farmers with less than 1,000 heads, feed costs are 20-30% higher than for those with 2,000 heads or more, making small-scale farmers’ bottom line more susceptible to the impact of higher costs.
- In particular, for regional brand-name pigs and "Kurobuta" pigs, the reproductive performance of sows is low and in some cases the rearing period is long, which means that sales prices must be raised to compensate for the increased costs.
- According to interviews with related parties, farm production costs in April and May 2022, on operating income basis, including compensation from the Feed Price Stabilization Fund, have risen to around 500 yen per kilogram of carcass meat.
- Wholesale pork carcass prices in June and July hovered above 600 yen due to the seasonally high market prices, and the increase in costs is believed to have been covered. In most years, the market tends to decline from October onwards, so the business conditions will be closely followed from autumn onwards

2020 Fattening Pig Production Costs (per Fattening Pig)



Source: "Livestock Production Cost Statistics", Ministry of Agriculture, Forestry and Fisheries

Basis for Calculation of the Grant for Stabilization of Meat and Swine Management ("Pig Marukin") (Unit: Yen/head)

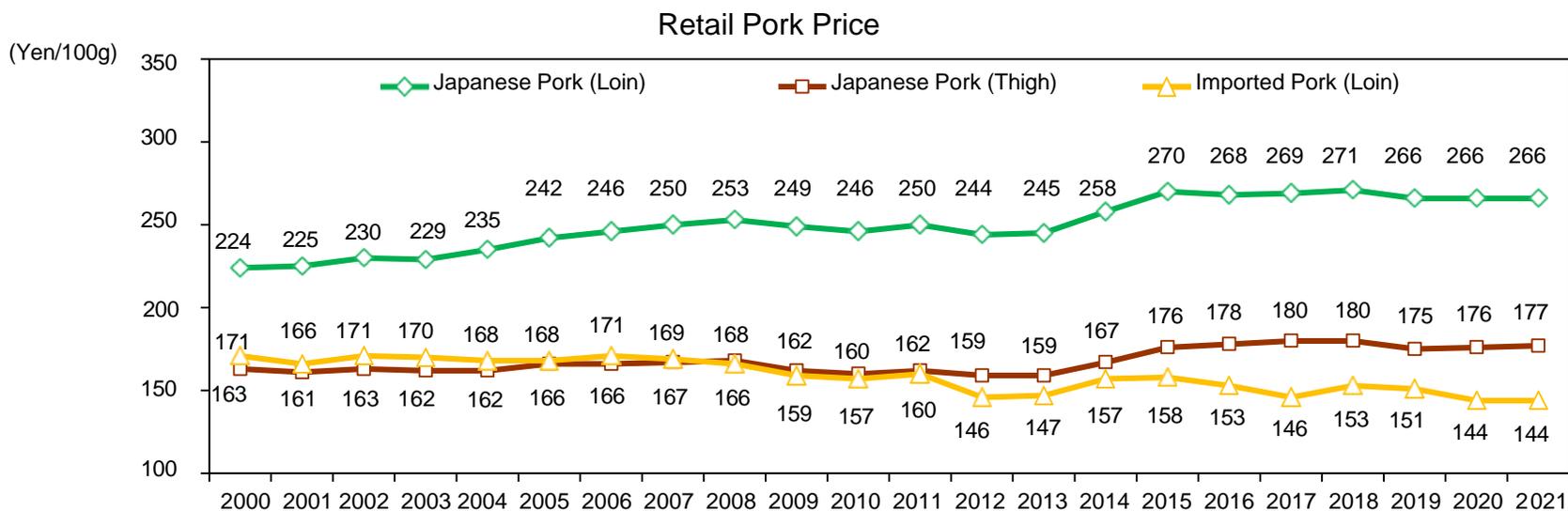
Financial Year	2018	2019	2020	2021	Apr-Jun 2022
Standard Sales Price (A)	35,804	36,284	39,195	37,558	40,812
Average Carcass Price (yen/kg)	458	463	502	480	521
Average Carcass Weight (kg)	76.4	76.6	76.3	76.5	76.6
By-Product Value	813	818	892	838	903
Standard Production Cost (B)	33,511	33,907	32,910	34,925	38,724
Feed Costs	19,552	19,769	18,701	20,085	22,865
Labor Costs	4,280	4,265	4,610	4,767	4,761
Slaughter Expenses	2,153	2,143	2,143	2,154	2,162
Other Expenses	7,526	7,730	7,456	7,919	8,936
Difference (A-B)	2,293	2,377	6,285	2,633	2,088
Equilibrium Carcass Price (yen/kg) (Note)	428	432	420	446	494

(Note: Equilibrium Carcass Price = (Standard Production Cost - By-Product Value) / Average Carcass Weight

Source: Japan Agriculture and Livestock Industries Corporations

# Higher Feed Costs have Reduced Appetite for Capital Investment

- Despite the price difference with imported pork, domestic pork has been supported by consumers as table meat during the Corona Disaster.
- There seems to be emerging two directions for pig farming now: one is a high-quality type that aims to produce delicious pork, such as brand-name pigs that meet Japanese tastes. And the other is a type that seeks to increase the volume of meat and to expand the scale of operations.
- In the face of rising costs, consumers' desire for lower prices, and competition from cheaper sources of protein such as chicken and eggs, management put more importance on efficiency improvement.
- Farms are becoming more expensive to invest in equipment, including disease control and environmental measures, and there are concerns that higher feed costs will reduce their willingness to invest.
- Slaughterhouses, which are the vital link in the meat supply chain, have faced with the labor shortages. If the shipment of pigs declines, slaughterhouse receive fewer slaughter fees, so the consolidation of slaughterhouses may emerge as an issue.

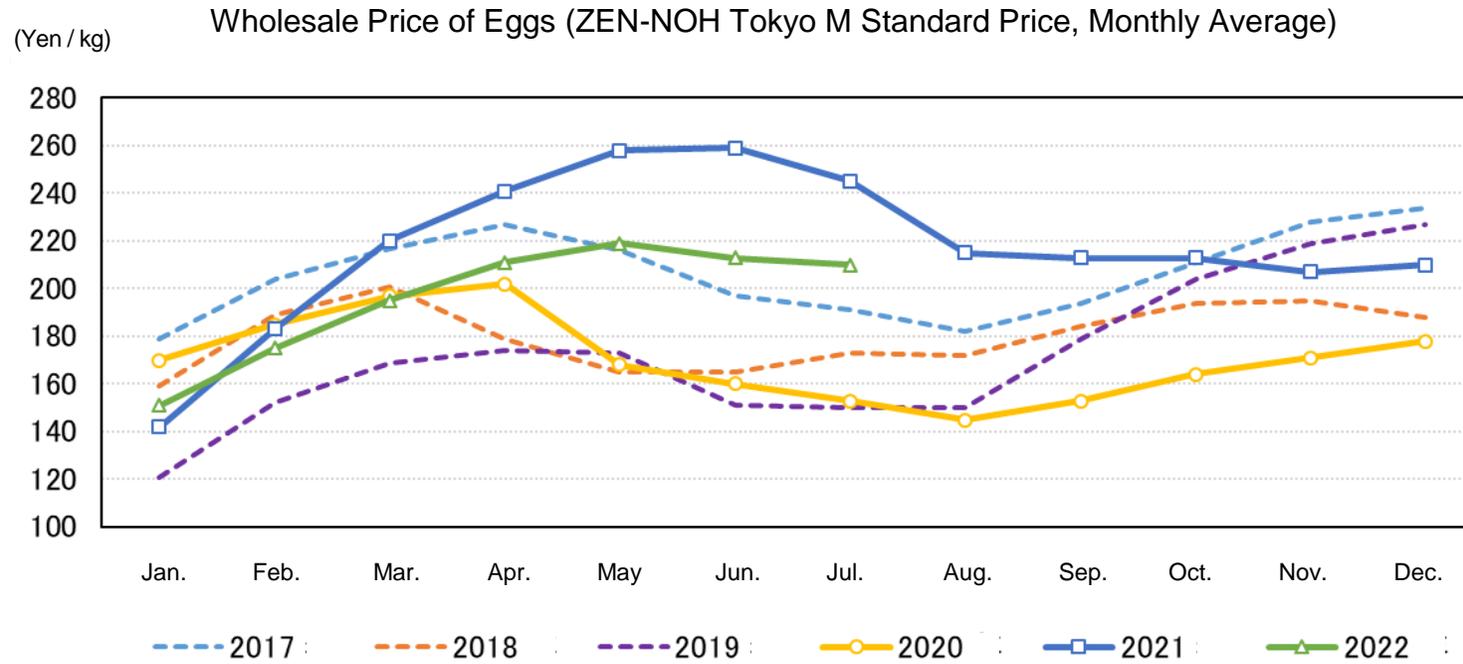


Source: Japan Agriculture and Livestock Industries Corporation  
 (Note 1) Including Consumption Tax.  
 (Note 2) Some of the Stores Surveyed were Changed in April 2012.

# f Layers

## The Current Egg Prices are Not High Enough to Cover the Rising Feed Costs

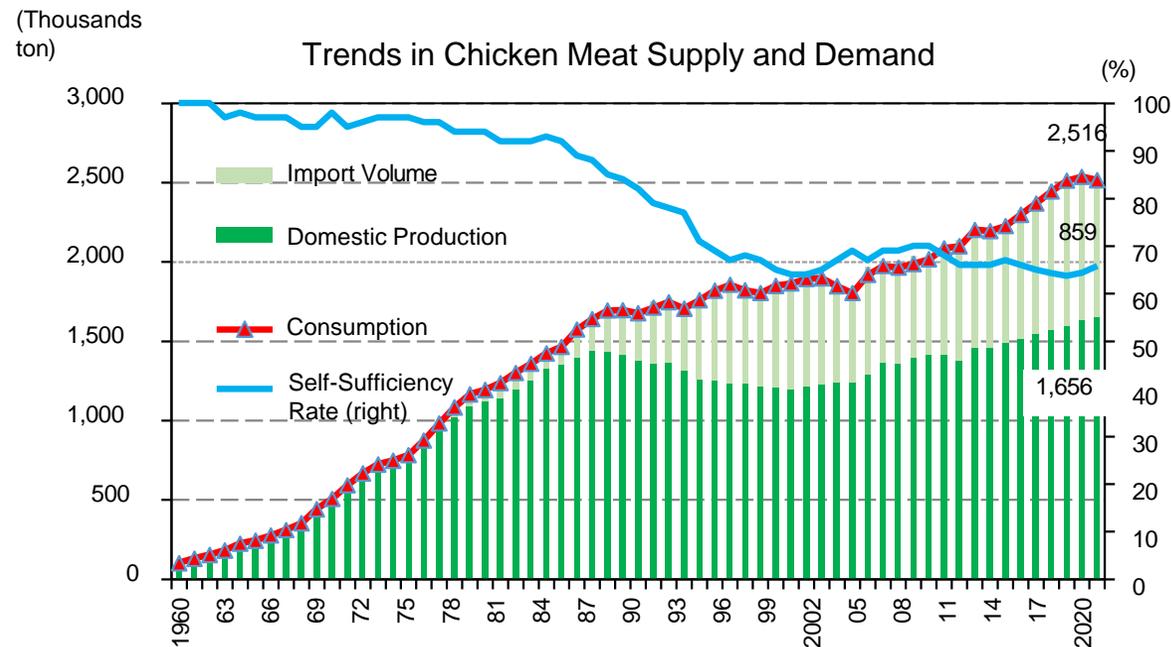
- In 2020, the Corona disaster destroyed demand from the food service sector and other commercial users, and egg prices slumped.
- In 2021, egg prices rose due to a decrease in birds kept due to avian influenza, which gave the business a breathing room.
- In 2022, production is in the process of recovering from the avian influenza outbreak, but according to the related parties, the egg price to break even was 220-230 yen per kilogram at farmgate (before supplementation from the Fund for Formula Feed Price Stabilization) given feed prices during April to June 2022. Considering the increase in feed costs from July onward, the current market situation will make it difficult for layer farmers to break even.



Source : JA Zen-Noh Egg Corporation, "Monthly Egg Quotations"

# g Broilers / Consumption and Production Continue to Increase, with Some Shifts from Imports to Domestic Products

- In recent years, the consumption of chicken meat has been on the rise due to its lower price than other meats and increasing health consciousness, and domestic production, which is largely destined for household consumption, has also been increasing year-on-year.
- Demand for imported chicken meat, which is mostly procured for restaurants and ready-to-eat meal use, has been increasing mainly for Brazilian chicken meat due to the global rise in feed prices, soaring pork prices, and the spread of avian influenza in Europe and the United States, and the market price is also on the rise (see next page). For this reason, there is a move among some restaurant and home-meal service providers to switch to domestically produced chicken meat or to use both imported and domestically produced chicken meat, as seen in Seven-Eleven's switch from Thai to domestic chicken meat for some of its items such as boxed lunches from April 2022.



Chicken Meat Supply-Demand Table (April 2021 - April 2022)

Year-Month	Production		Import		Consumption (Estimated Amount in Circulation)					
	Thousands ton	YOY (%)	Thousands ton	YOY (%)	Imports		Domestic		Thousands ton	YOY (%)
					Thousands ton	YOY (%)	Thousands ton	YOY (%)		
2021-4	140	99.8	50	107.4	192	103.7	55	133.4	137	95.1
5	138	101.9	46	128.0	183	105.6	47	144.0	137	96.7
6	138	100.5	43	84.5	187	100.3	50	108.2	137	97.7
7	137	100.0	45	86.8	189	100.1	53	83.5	137	108.4
8	131	103.2	47	116.4	180	105.6	49	117.8	131	101.7
9	137	104.4	45	109.0	187	107.8	49	116.3	138	105.1
10	146	99.9	51	106.9	195	98.2	51	96.9	145	98.6
11	147	105.4	58	127.5	199	106.0	51	106.5	148	105.9
12	157	103.1	61	142.1	216	107.1	61	122.5	155	102.1
2022-1	137	103.7	54	109.9	183	103.6	45	103.0	138	103.7
2	135	103.2	50	108.9	180	102.6	44	96.0	137	104.9
3	143	101.9	45	81.1	194	102.3	49	97.9	145	103.8
4	141	100.9	44	86.9	195	101.2	52	94.6	142	103.8

Source: Ministry of Agriculture, Forestry and Fisheries, "Food Supply and Demand Chart"  
(Note 1) Bone-in meat base.  
(Note 2) Import Volume Includes processed chicken meat.

Sources: Ministry of Agriculture, Forestry and Fisheries, "Poultry Distribution Statistics" and "Food Supply and Demand Chart"; Ministry of Finance, "Trade Statistics"; Japan Agricultural and Livestock Industries Corporation.  
(Note: Production figures are on a bone-in basis. Including adult chicken meat. Imports do not include poultry meat other than chicken meat.)

# Domestic Chicken Prices are Expected to be Steady, but Some are Shipping Early

- The chicken meat market has weakened year-on-year since the second half of 2021 as the demand for home cooking created by the Corona disaster has calmed down a bit. The market for chicken meat remained steady due to a sharp rise in the price of imported chicken meat. With all kinds of food prices being raised, people are becoming more budget-minded and demand for affordable chicken meat is expected to increase, and regular chicken meat prices are also expected to turn positive YoY from June.
- While domestic chicken production is on an upward trend, the number of birds processed in May and June 2022 is expected to be higher than the previous year, but the weight processed is expected to be lower than the previous year. The poor growth caused by E. coli might be one of reasons, and it is also said that the farmers are shipping lightweight birds on earlier dates in order to save the use of expensive feeds.

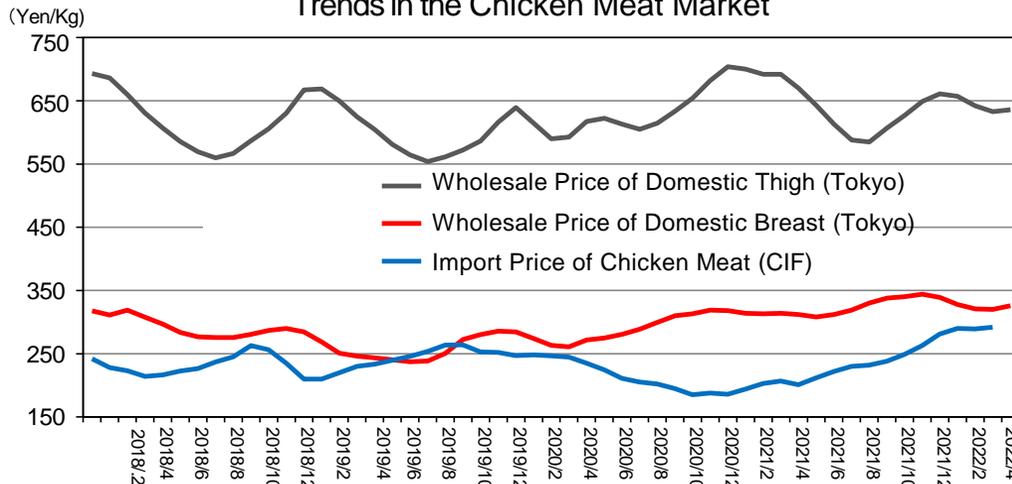
Survey on Trends in Poultry Production and Processing (Japan Poultry Meat Association)

Unit: thousands of birds, thousands of tons, %.

	January 2022 (Estimated)		Feb (Estimated)		March (Estimated)		April (Estimated)		May (Plan)		June (Plan)		July (Plan)	
	Volume	YOY	Volume	YOY	Volume	YOY	Volume	YOY	Volume	YOY	Volume	YOY	Volume	YOY
Introduction of Chicks	6,396	100.5	59,044	99.9	63,886	98.7	65,470	101.8	62,663	100.6	61,035	101.1	63,337	99.2
Processed Birds	59,686	102.4	57,360	100.1	65,348	101.6	62,296	100.5	61,290	100.6	60,573	100.7	58,773	98.0
Processing Weight	180.2	102.7	177.1	101.9	196.7	101.4	188.0	100.0	183.6	98.7	180.6	99.0	173.6	96.6

(Source: Zen-Noh Chicken Foods, "Chicken Meat Information")

Trends in the Chicken Meat Market



Source: Ministry of Agriculture, Forestry and Fisheries, "Market Information on Poultry"

Chicken Market (Nikkei Weighted Average: Tokyo)

Product	Thigh		Breast		Regular	
	Yen/kg	YOY	Yen/kg	YOY	Yen/kg	YOY
January 2022	649	91.3	330	105.1	979	95.5
Feb.	646	92.2	323	105.9	969	96.3
Mar.	631	91.3	316	103.9	947	95.2
Apr.	622	91.7	315	103.3	937	95.3
May	624	94.7	321	105.9	946	98.2
June (Forecast)	615	97.5	330	111.5	945	101.9
July (Forecast)	605	100.8	340	113.0	945	104.9

Source: Zen-Noh Chicken Foods Co.

## (4) Summary

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- Dairy
  - Because the dependency on feed purchased is high not only in non- Hokkaido prefectures but also in the large scale farmers of Hokkaido, the impact of rising feed costs is becoming more serious.
- Beef Cattle and Pigs
  - As to beef cattle business, with the arrival of the shipment of calves introduced during the period of high prices, the future profitability of the fattening business is expected to deteriorate. Changes in feed design will not be easy because of the long-term fattening trials required, and there is a growing awareness of the need to maintain and improve unit sales prices. A recognition is spreading that exports are more important than domestic market in terms of price and meat quality.
  - As to pig farming management of small-scale operations that fatten brand-name pigs in various regions is concerned.
  - There are concerns that small-scale hog and beef cattle farmers may quit, and a decline in shipment may spill over into lower utilization rates and management problems at slaughterhouses in the production areas.
- Egg-laying hens, Broilers
  - The current egg prices are not covering the high feed costs, and some broilers are cutting down on feeding days.
- Upstream operations alone cannot absorb the cost increase limitlessly, so it is necessary to pass the cost increase on to agricultural product prices. In this case, it is important to adjust the entire food value chain without destroying demand.
- Challenges
  - The government and JA are taking various measures to cope with high feed prices. In the short term, it is necessary to prevent farmers from giving up farming because of deteriorating business environment and to avoid production decline due to lowered willingness to build herds.
  - Feed prices are expected to remain high in response to changes in the global feed demand structure and the yen's depreciation. In addition, in livestock farming operations, capital investment associated with disease control and environmental measures will become more expensive, and if investment declines in large-scale operations, it may not be able to make up for small-scale farmers exiting. The switch by some food processing companies to domestically produced livestock products is a tailwind for domestic agriculture, and the maintenance of the domestic production base through measures such as securing farmers will continue to be a challenge.
  - Increasing feed self-sufficiency is essential for reducing food security risks. With the momentum building due to the protracted crisis in Ukraine, concrete measures are required this time.

■ Authors

Part 1 Intensifying Situation of Global Food Supply

Part 2 The Impact of Ukrainian Crisis on Japanese Agriculture  
(Crop Farming)

Part 3

(Livestock Production)

(1) Pre-Crisis Situation

(2) Feed Situation

(3) Impact of the Prolonged Ukraine crisis

a Impact Estimation

b Support Measures by Government

c Dairy Farming

d Beef Cattles

e Pig Farming

f Layers

g Broilers

(4) Summary

Ruan Wei

Miwa Kobari, Ryuta Noba

Kosei Hasegawa

Yu Nagatani

Kosei Hasegawa

Yu Nagatani

Shiho Oda

Kosei Hasegawa

Katsuhiko Kitahara

Katsuhiko Kitahara

Yoshihiko Horiuchi

Kosei Hasegawa

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