

The Batsheva de Rothschild Workshop on "Avoiding the coming food security crisis:
Novel solutions at the intersection of agriculture, environment and health"

Measuring Food Security in Japan: Introducing Democracy Indexes of Import Countries for Risk Assessment

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Thursday, November 10, 2022. 13:00 – 15:00

In Session 5: Nutritional security, science and semantics (Chair: Aron Troen, Hebrew University)

Ha-Tsrif Cultural Center, Tzuba Hotel, Jerusalem, Israel

Today's Agenda

- **Introduction:**
- **Japan's food consumption & self-sufficiency ratios**
- **Food Security Policy Framework in Japan**
- **Japan's EPA/FTA**
- **Risk Map for Stable Food Supply in Japan**
- **Degree of democracy: Voice & Accountability Index from WGI**
- **Democracy Indexes of Import Countries for Risk Assessment**
- **Summary & Discussion**

Introduction: Japan's food consumption & self-sufficiency ratios, FY2021

Legend: **DOMESTIC** **IMPORTED FEED** **IMPORT**

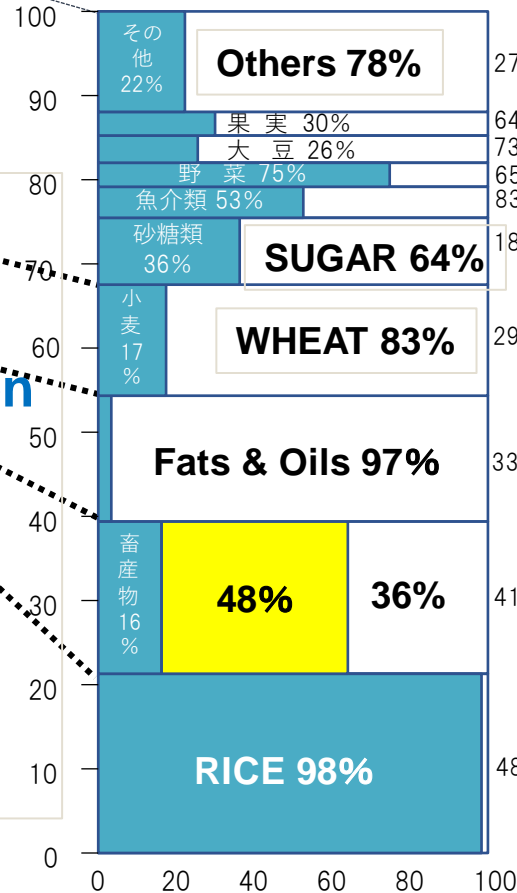
Total Supply Calories **2,265kcal /Capita /Day**
 Domestic Supply Calories **860kcal /Capita /Day**

Consumption Amount **15.4 tril. JPY**
 Domestic Production **10.4 tril. JPY**

Japan's food security depends on

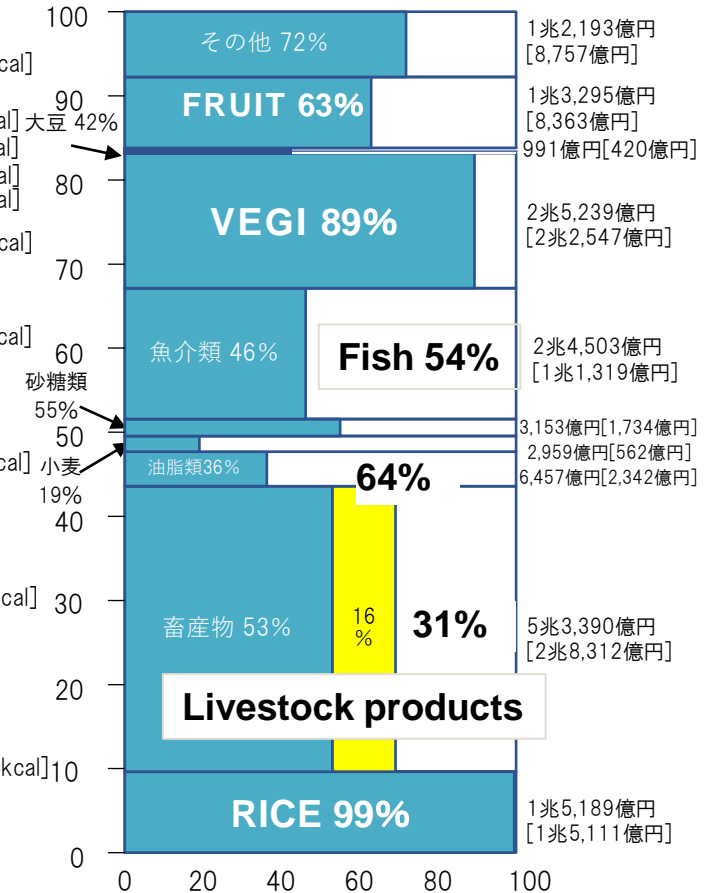
- i) Promoting domestic production
- ii) Stable & flexible imports of agricultural products & agricultural materials.

CALORY [%] **38%**



Calorie-based SSR by com.(%)

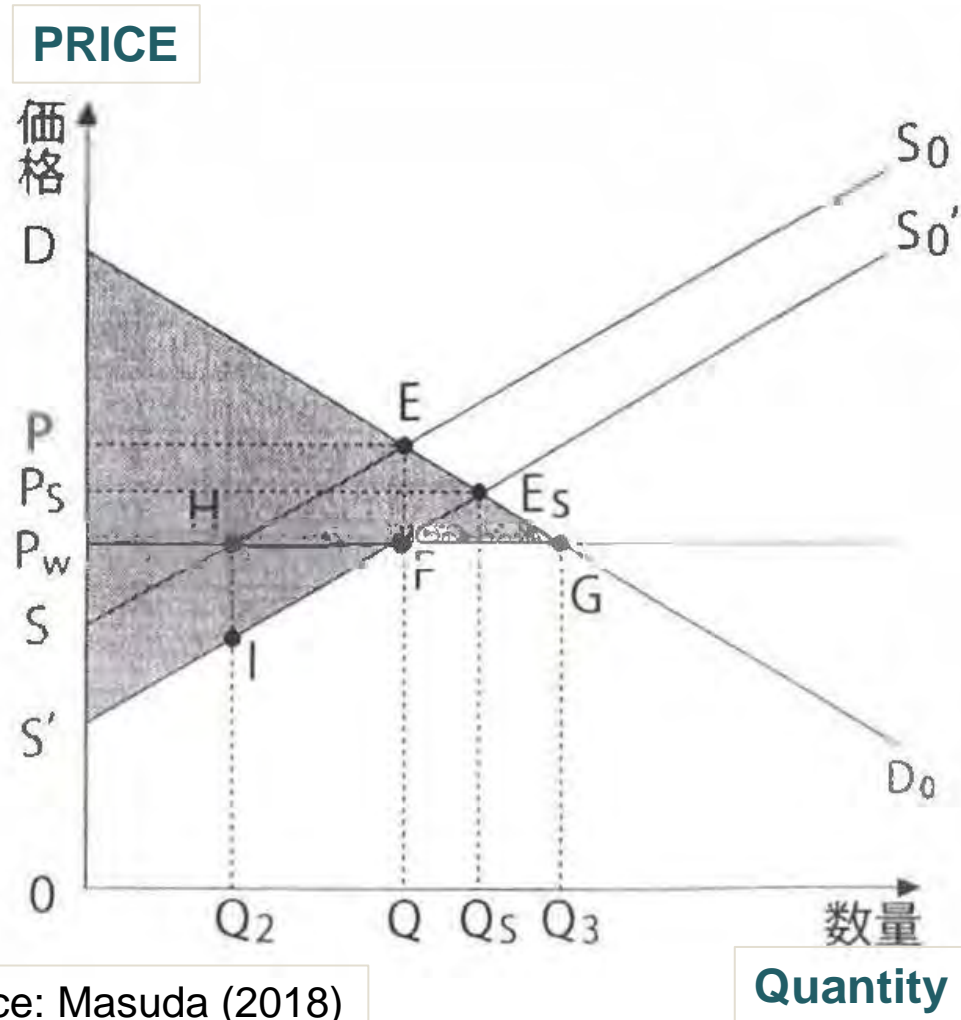
AMOUNT (%) **68%**



Value-based SSR by commodity (%)

Source: MAFF Japan, arranged by author.

Food Security Policy-Mix Framework in Japan



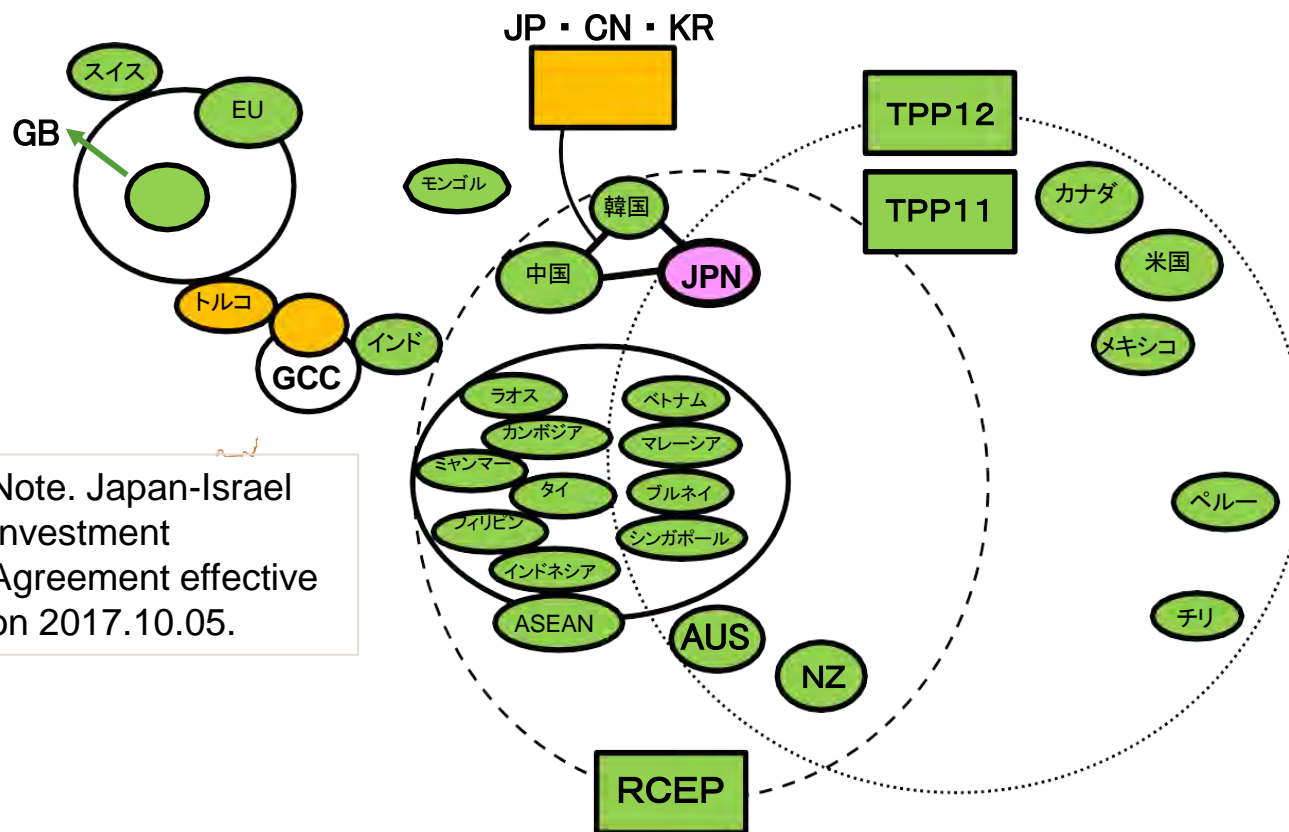
Source: Masuda (2018)

- Maximize Total Surplus (TS) = Consumer Surplus (CS) + Producer Surplus (PS),
- **1. Trade Liberalization Policy**
 - Expand bi/multilateral FTAs
 - CS: $\triangle DEP \rightarrow \triangle DGP_w$
 - Overseas Risk
- **2. Domestic Ag. Promotion Policy**
 - Direct Payment Scheme
 - PS: $\triangle SEP \rightarrow \triangle S'FP_w$

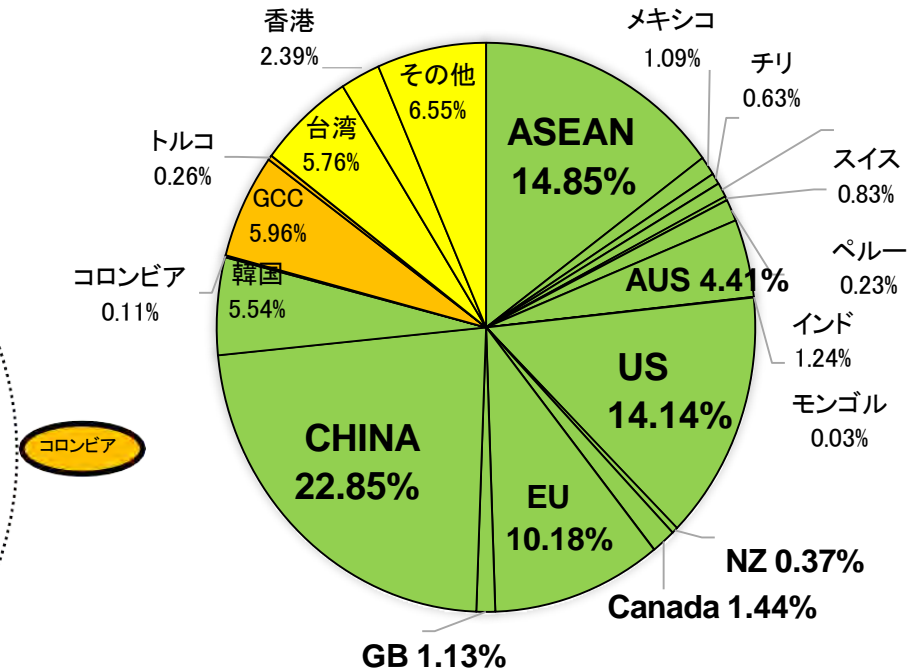
Japan's Economic Partnership Agreement / FTA

● Effective and/or Signed.
 ● Negotiating

Ratio of country/region trade value to Japan's total trade value



Note. Japan-Israel Investment Agreement effective on 2017.10.05.



Effective, Signed	: 79.0%
Negotiating	: 6.3%
TOTAL	: 85.3%

Source: MFA Japan as of 2022.06, arranged by author.

Risk Map for Stable Food Supply in Japan

1.1. Domestic, Long-run Production: <ul style="list-style-type: none">- Climate Change	2.1. Overseas, Long run Production: <ul style="list-style-type: none">- Climate Change
1.2. Domestic, Short-run Production: <ul style="list-style-type: none">- Disasters/abnormal weather- Livestock/crop disease epidemics- New infectious diseases such as COVID-19- Accidents and incidents related to food safety Supply Chain: <ul style="list-style-type: none">- Disruption of supply chains due to accidents/incidents	2.2. Overseas, Short-run, Temporary or Sudden Production: <ul style="list-style-type: none">- Disasters/abnormal weather- Locust damage- Livestock/crop disease epidemics Supply chain: <ul style="list-style-type: none">- Export disruptions/regulations, damage to production & supply chains due to policy changes, political instability, terrorism, and/or war Demand: <ul style="list-style-type: none">- demand competition in the international market, due to population increase & economic growth, bio-energy
Source: MAFF Japan, arranged by author.	

Degree of democracy: Voice & Accountability Index from WGI

Country/Territory	2021 Estimate	Country/Territory	2021 Estimate	Country/Territory	2021 Estimate	Country/Territory	2021 Estimate	Country/Territory	2021 Estimate
Korea, Dem. Rep.	-2.07	Sudan	-1.47	Russian Federation	-1.10	Tanzania	-0.71	Malaysia	-0.15
Eritrea	-1.93	Libya	-1.46	Ethiopia	-1.07	Kuwait	-0.70	Philippines	-0.15
Syrian Arab Republ	-1.92	Cambodia	-1.44	Algeria	-1.01	Nigeria	-0.64	Fiji	-0.15
Turkmenistan	-1.91	Cuba	-1.43	Guinea	-0.99	Lebanon	-0.63	Singapore	-0.14
Somalia	-1.75	Chad	-1.42	Iraq	-0.96	Mozambique	-0.61	Serbia	-0.12
South Sudan	-1.73	Burundi	-1.41	Rwanda	-0.96	Morocco	-0.61	Bolivia	-0.11
Equatorial Guinea	-1.72	Uzbekistan	-1.40	Haiti	-0.95	Kyrgyz Republic	-0.61	Burkina Faso	-0.11
Tajikistan	-1.71	Vietnam	-1.30	Gabon	-0.89	Honduras	-0.59	Nepal	-0.09
Yemen, Rep.	-1.68	Eswatini	-1.30	Türkiye	-0.86	Macao SAR, China	-0.53	Kosovo	-0.08
Lao PDR	-1.68	Djibouti	-1.30	Brunei Darussalam	-0.85	Côte d'Ivoire	-0.47	Mexico	-0.07
Myanmar	-1.66	Nicaragua	-1.29	Angola	-0.84	Guatemala	-0.46	Sri Lanka	-0.07
China	-1.64	Congo, Rep.	-1.24	Pakistan	-0.84	Niger	-0.39	Sierra Leone	-0.06
Venezuela, RB	-1.63	Congo, Dem. Rep.	-1.20	Uganda	-0.82	Zambia	-0.37	El Salvador	-0.06
Saudi Arabia	-1.59	Central African Rep	-1.20	Jordan	-0.80	Kenya	-0.37	Liberia	-0.02
Belarus	-1.58	Oman	-1.19	Togo	-0.79	Bosnia and Herzegovina	-0.31	Lesotho	-0.02
Afghanistan	-1.57	United Arab Emirates	-1.19	Thailand	-0.79	Madagascar	-0.27	Paraguay	0.01
Azerbaijan	-1.53	Qatar	-1.17	Mali	-0.78	Maldives	-0.24	Georgia	0.02
Egypt, Arab Rep.	-1.51	Cameroon	-1.16	Bangladesh	-0.77	Benin	-0.24	Papua New Guinea	0.02
Bahrain	-1.50	Zimbabwe	-1.14	Mauritania	-0.77	Guinea-Bissau	-0.24	Moldova	0.05
Iran, Islamic Rep.	-1.47	Kazakhstan	-1.14	Comoros	-0.74	Hong Kong SAR, China	-0.21	Armenia	0.06

Degree of democracy: Voice & Accountability Index from WGI

Country/Territory	2021 Estimate	Country/Territory	2021 Estimate	Country/Territory	2021 Estimate	Country/Territory	2021 Estimate	Country/Territory	2021 Estimate
Ukraine	0.08	Nauru	0.43	Grenada	0.73	Lithuania	1.04	United Kingdom	1.30
Malawi	0.08	Botswana	0.46	Cayman Islands	0.77	Andorra	1.04	Liechtenstein	1.34
Albania	0.09	Ghana	0.47	Guam	0.78	Palau	1.06	Iceland	1.37
Colombia	0.10	Solomon Islands	0.47	St. Kitts and Nevis	0.78	Japan	1.08	Australia	1.38
Ecuador	0.11	Puerto Rico	0.51	South Africa	0.79	Malta	1.08	Austria	1.40
India	0.11	Panama	0.55	Dominica	0.82	Costa Rica	1.09	Ireland	1.43
North Macedonia	0.14	Belize	0.55	Cyprus	0.87	Italy	1.10	Germany	1.43
Indonesia	0.16	Namibia	0.57	United States	0.90	San Marino	1.10	Canada	1.46
Montenegro	0.17	Poland	0.59	Latvia	0.91	Taiwan, China	1.10	Netherlands	1.50
Peru	0.18	Romania	0.60	American Samoa	0.91	Kiribati	1.10	Sweden	1.51
Tunisia	0.19	Croatia	0.61	Bahamas, The	0.91	Marshall Islands	1.11	Luxembourg	1.51
Senegal	0.19	Argentina	0.62	Slovak Republic	0.91	France	1.12	Switzerland	1.55
Bhutan	0.23	Jamaica	0.63	Slovenia	0.91	Barbados	1.13	Denmark	1.56
Guyana	0.25	Mauritius	0.66	Korea, Rep.	0.93	Tuvalu	1.16	New Zealand	1.62
Brazil	0.28	Trinidad and Tobag	0.67	Greece	0.96	Estonia	1.19	Finland	1.62
Bulgaria	0.29	Israel	0.68	Chile	0.97	Portugal	1.26	Norway	1.75
Dominican Republic	0.30	Vanuatu	0.69	Niue	1.01	Belgium	1.28		
Mongolia	0.32	Monaco	0.71	Spain	1.01	Greenland	1.29		
Suriname	0.38	Samoa	0.73	Czech Republic	1.02	French Guiana	1.29		
Hungary	0.40	Tonga	0.73	Aruba	1.03	Uruguay	1.30		

Source: World Bank, arranged by author.

Democracy Indexes of Import Countries for Risk Assessment 1

Food Supply FY2020	trillion JPY	million USD	SS&IM%	Dem. Idx
Total	15.4308	106,419		[-1.25,1.25]
Dom. Production	10.4032	71,746	67.4%	1.08
Imports	5.0276	34,673	100.0%	
1 US	1.2272	8,463	24.4%	0.90
2 China	0.4898	3,378	9.7%	-1.64
3 Australia	0.4432	3,057	8.8%	1.38
4 EU	0.4169	2,875	8.3%	1.08
5 Canada	0.4153	2,864	8.3%	1.46
6 Brazil	0.3410	2,352	6.8%	0.28
7 Chile	0.2008	1,385	4.0%	0.97
8 Thailand	0.2007	1,384	4.0%	-0.79
9 Mexico	0.1299	896	2.6%	-0.07
10 Russia	0.1295	893	2.6%	-1.10
99 Others	1.0333	7,126	20.6%	-
	145	JPY=1USD	16.3%	5.3%

Wheat 2021	000 tons	SS&IM%	Dem. Idx
Total	6,470		[-1.25,1.25]
Dom. Production	950	14.7%	1.08
Imports	5,520	100.0%	
1 US	2,653	48.1%	0.90
2 Canada	2,006	36.3%	1.46
3 AUS	841	15.2%	1.38
99 Others	21	0.4%	-
		0.0%	0.0%

Democracy Indexes of Import Countries for Risk Assessment 2

N(Urea) 2021		000 tons	SS&IM%	Dem. Idx
Total				[-1.25,1.25]
Dom. Production				1.08
Imports		296	100.0%	
1 Malaysia		189	63.9%	-0.15
2 China		77	26.0%	-1.64
3 Saudi Arabia		12	4.1%	-1.59
4 Vietnam		9	3.0%	-1.30
99 Others		9	3.0%	-
			33.1%	

K(Potassium chloride)		000 tons	SS&IM%	Dem. Idx
Total				[-1.25,1.25]
Dom. Production				1.08
Imports		491	100.0%	
1 Canada		395	80.4%	1.46
2 Israel		41	8.4%	0.68
3 Belarus		16	3.3%	-1.58
4 Russia		16	3.3%	-1.10
5 Lao PDR		9	1.8%	-1.68
99 Others		14	2.9%	-
			8.4%	

P(Phosphate)2021		000 tons	SS&IM%	Dem. Idx
Total				[-1.25,1.25]
Dom. Production				1.08
Imports		472	100.0%	
1 China		358	75.8%	-1.64
2 Morocco		84	17.8%	-0.61
3 US		16	3.4%	0.90
4 Jordan		11	2.3%	-0.80
99 Others		3	0.6%	-
			96.0%	

Summary, Discussion, Further Study

1. From the viewpoint of Socio-Political Overseas Risk,
 - China is one of the most important Importer. Japan may need to consider the dependence on China for agricultural imports.
 - Needs to pay more attention to agricultural materials.
2. Establish more effective and systematic Risk Assessment Model.
 - How to measure the degree of democracy and how does it affect the food security?

תודה Thank you ありがとう

