Development of a Japanese Version Nutrient Profile Model for Dishes and Its Applicability Across Asia

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Presentation Contents

1. Background to the development of the Japanese version of the Nutrition Profiling Model for Dishes (NPM-DJ (1.0)), and the purpose and significance of the model

2. Concept and Design of NPM-DJ (1.0)

3. Applicability of NPM-DJ(1.0) Concept Across Asia

4. Key Messages

Presentation Contents

Background: Japanese meal and dishes

- Japanese meals consist of "**dishes**" that **combine multiple foods** flavored using **traditional seasonings**

- Compared to Western meals, **Japanese meals**, which **combine dishes**, are low in fat, animal protein, and sugar, but **high in sodium**
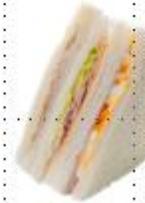
What kind of Nutrient Profiling（NP）model is needed in Japan?

Excessive salt intake is the most important **nutritional issue** for the **Japanese population**

Target and Current Salt Intake Levels (g/day)

66% 10% 7% 5% 4% 8%
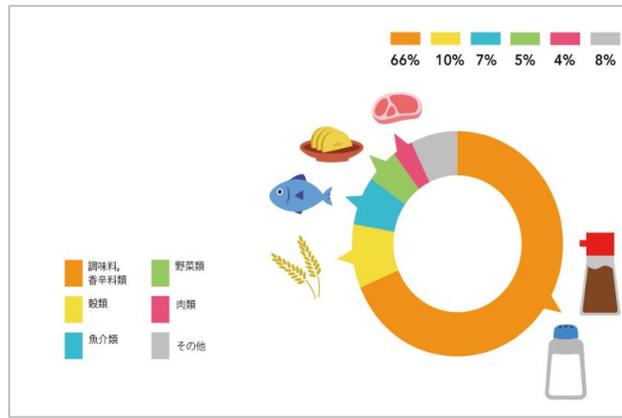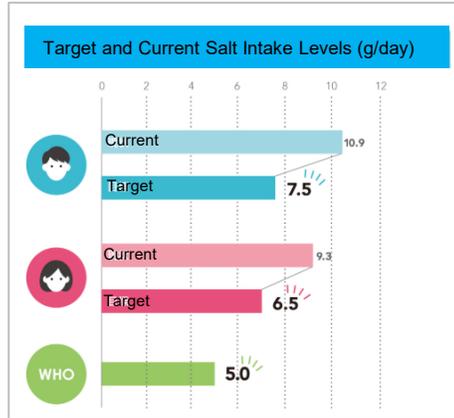
- **About 70% of sodium intake** among **Japanese** people comes from **seasonings**

- Among them, **soy sauce**, **miso**, and **salt** account for a large proportion.

- On the other hand, **miso** and **soy sauce** are **essential to the Japanese diet** and are an **important** part of **Japanese food culture**.

This information is quoted from the Ministry of Health, Labour and Welfare's "Healthy and Sustainable Food Environment Strategy Initiative" website.（https://sustainable-nutrition.mhlw.go.jp/contents/sodium）

Various **nutrient profile (NP) models** are used around **the world**

Health Star Rating（HSR） NUTRI-SCORE Keyhole

Nutrient profiling:
the science of classifying or ranking **foods** according to their nutritional composition.

Existing NP models, which are mainly designed for Western processed foods, are not suitable for evaluating Japanese foods and dishes

How should seasonings and cooking oils in dishes be assessed?

Development of a Nutrient Profile Model for Dishes in Japan Version

【Purpose】

● To **encourage food business operators** to **develop** and **reformulate healthier dishes**

● To support **consumers** in **choosing healthier dishes**

▲

A **public** and **neutral model** to support the development of a healthy food environment*

*While the primary target of this model is the proactive development and mainstreaming of nutritionally and environmentally conscious products by food business operators, it is also expected to be used in collaboration with government and academic sectors to support healthy food environment development and public nutrition in the future.
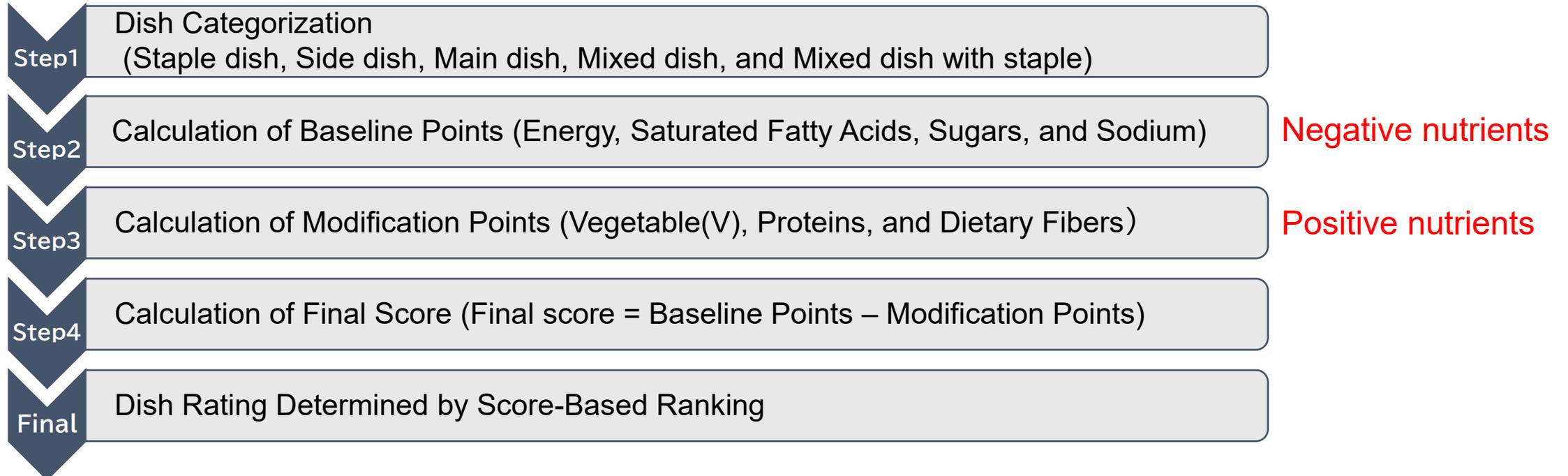
Presentation Contents

1. Background to the development of the Japanese version of the Nutrition Profiling Model for Dishes (NPM-DJ (1.0)), and the purpose and significance of the model

2. **Concept and Design of NPM-DJ (1.0)**

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Steps to assess the Nutrient Profile Model for Dishes in Japan Version 1.0 (NPM-DJ (1.0)

Target Population: Adults aged 18 and over
The aim：food business operators (improving and reformulating dishes),
            consumers（selecting healthier dishes）

Step1	Dish Categorization (Staple dish, Side dish, Main dish, Mixed dish, and Mixed dish with staple)	
Step2	Calculation of Baseline Points (Energy, Saturated Fatty Acids, Sugars, and Sodium)	Negative nutrients
Step3	Calculation of Modification Points (Vegetable(V), Proteins, and Dietary Fibers）	Positive nutrients
Step4	Calculation of Final Score (Final score = Baseline Points – Modification Points)	
Final	Dish Rating Determined by Score-Based Ranking	

- **Assessed by amount per serving of dish**
- Baseline points were the total values of energy, saturated fatty acids, sugars[*1], and sodium.
  ([*1] Sugars included the total values of glucose, fructose, galactose, sucrose, maltose, lactose, and trehalose from the carbohydrate composition table.)
- The modification points were total values of the vegetable(V), protein, and dietary fiber points.
- The final score was calculated by subtracting the modification points from baseline points.

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Step1. Deciding the Classification of Dishes

Dish category	Staple Dish	Side Dish	Main Dish	Mixed Dish	Mixed Dish with Staple
Unit: per serving of dish Category Characteristics	Contains two-thirds (by weight) or more of the following main ingredients: Rice products, bread, noodles, or other grains	Contains two-thirds (by weight) or more of the following ingredients: Vegetables, potatoes, non-soy legumes, mushrooms, seaweed, and nuts/seed	Contains two-thirds (by weight) or more of the following ingredients: Meat, fish, eggs, soybeans, or soybean products	• No ingredient accounts for two-thirds (by weight) or more of the dish. • Staple food content is less than 0.5 servings (SV).	• No ingredient accounts for two-thirds (by weight) or more of the dish. • Staple food content is 0.5 servings (SV) or more.

- Dish category was developed based on the framework of **the Japanese Food Guide Spinning Top** and by utilizing data from **the National Health and Nutrition Survey (NHNS).**
  *The concept of dish category was based on the dietary survey method used in NHNS.

- **New dish categories**
  By incorporating **Mixed dishes** and **Mixed dishes with staple,** the model accommodates a wide range of dishes consumed in Japan.

> **the National Health and Nutrition Survey:**
> This survey is conducted nationwide every year. Daily food records are recorded using the Food Weighting Method. The weight of food consumed is accurately measured and recorded, and nutrient and food intakes are calculated. The subjects were households (approximately 6,000 households) and household members (approximately 18,000 people aged 1 year or older as of November 1st of the survey year) in 300 unit districts selected by stratified random sampling.

Japanese Food Guide Spinning Top

1. In the "Health Japan 21" initiative, the goal of promoting a healthy dietary lifestyle includes the recommendation to consume **"meals consisting of a staple dish, a main dish, and a side dish"**.

Source:
Ministry of Health, Labour and Welfare (https://www.mhlw.go.jp/bunya/kenkou/eiyou-syokuji.html)Ministry of Agriculture, Forestry and Fisheries (https://www.maff.go.jp/j/balance_guide/)

Dish Classification and Concept of the Japanese Food Guide Spinning Top

Category	Main Foods/Nutrients	Standard for 1 Serving (SV)
Staple Dish	**Carbohydrate sources** such as rice, bread, and noodles	40 g of carbohydrates derived from grain-based main ingredients
Side Dish	**Sources of vitamins, minerals, and dietary fiber** such as vegetables, mushrooms, potatoes, and seaweed	70 g of main ingredients: vegetables, mushrooms, potatoes, legumes (excluding soybeans), or seaweed
Main Dish	**Protein sources** such as fish, meat, eggs, soybeans, and soybean products	Approximately 6 g of protein derived from the main ingredients: fish, meat, eggs, soybeans, or soybean products
Milk and Dairy Products	**Sources of calcium** such as milk and dairy products	Approximately 100 mg of calcium derived from milk or dairy-based main ingredients
Fruits	**Sources of Vitamin C and Dietary Fiber**	Approximately 100g of fruit as the main ingredient

2. Adherence to **the Japanese Food Guide Spinning Top is associated with a reduced risk** of all-cause mortality and **cardiovascular disease** mortality, particularly from cerebrovascular disease, among Japanese adults. (kurotani et al. BMJ. 2016 Mar 22:352:i1209.)

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Target Dishes: 105 dishes listed in the Food Guide Servings (SV) Quick Reference Table

農林水産省.実践食育ナビHPより引用
(https://www.maff.go.jp/j/syokuiku/zissen_navi/balance/chart.html?utm_source=chatgpt.com)

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Step 1 　 Chart for Determining Dish Categories

Food Group Classification of Ingredients　　　　Dish Category　　　Serving（SV）

Does the total weight of the ingredients on the right **exceed 2/3 of the total weight of the dish?**

Yes

No

Rice, bread, noodles, or other grains → **Staple Dish** → 1SV：40g of carbohydrate derived from the main ingredient.

Vegetables, potatoes, legumes other than soybeans, mushrooms, seaweed, and nuts and seeds → **Side Dish** → 1SV: the weight of the main ingredients is 70 g.

meat, fish, eggs, soybeans, and soybean products → **Main Dish** → 1SV: 6 g of protein from the main ingredient

Staple less than 0.5 SV?

Yes

No

Staple ＜ 0.5 SV + Main dish and side dish both ≧ 0.5 SV → **Mixed Dish**

Staple ≧ 0.5 SV + At least one of the main dish and side dish is ≧ 0.5 SV. → **Mixed Dish with Staple**

Step 2, 3, 4 Calculation of Baseline points, Modification points and Final score

Dish Example: Simmered Hijiki Seaweed

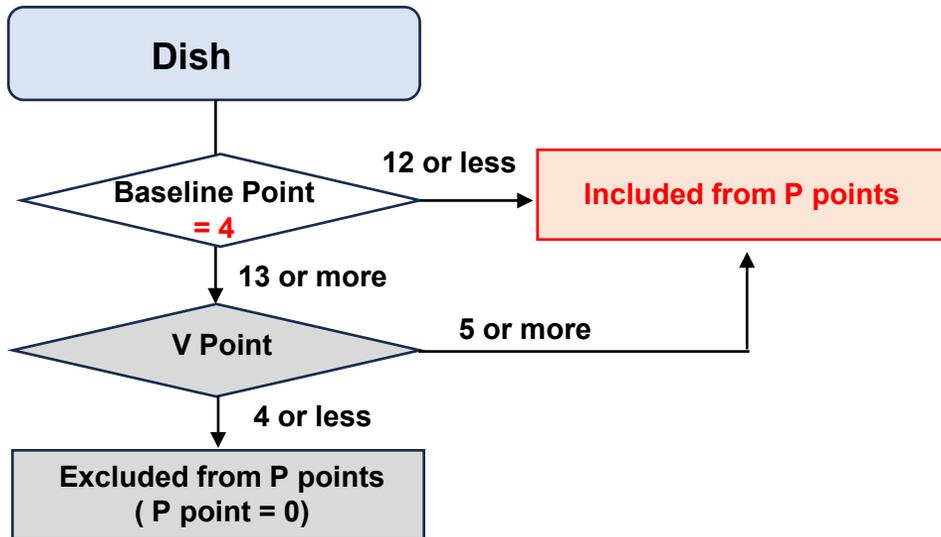| Nutrients	Contents		point	Remarks
Energy	54	Kcal /dish	0	Reading from the score table
Saturated fatty acids	0.24	g/dish	0	Reading from the score table
Sugars	3.8	g/dish	1	Reading from the score table
Sodium	398	mg/dish	3	Reading from the score table
Vegetables(V)	83	%	5	Reading from the score table
Protein	2.7	g/dish	0	Reading from the score table
Dietary fiber	4.2	g/dish	5	Reading from the score table

Step 2
Calculate of Negative nutrients
Baseline point = 0 + 0 + 1 + 3 = 4

Step 3
Calculate of Positive nutrient
Modification point = 5 + 0 + 5 = **10**

Determining whether the dish qualifies for a P (Protein) point **Protein Cap**

Dish

Baseline Point = 4
→ 12 or less → **Included from P points**

↓ 13 or more

V Point
→ 5 or more → **Included from P points**

↓ 4 or less

Excluded from P points (P point = 0)

Final Score= Baseline Points − Modification Points = 4 − 10 = **- 6**

▼

Dish Category = Side dish (Reading from the score table)

▼

Rank: 4.5

(From Table, read the rank for a **Side Dish** with a final score of −6)

Step Final   Ranking Dishes Based on Final Score

Evaluation within each dish category

Table 2. Rating by dish category.

Rating *	主食	Side Dish	Main Dish	Mixed Dish	Mixed Dish with Staple
★★★★★	−2	−7	−4	8	13
★★★★☆	0	−6	−1	13	16
★★★★	1	−5	0	13	17
★★★☆	3	−4	1	14	17
★★★	6	−3	2	16	19
★★☆	9	−1	3	18	19
★★	15	1	6	19	21
★☆	18	2	11	22	26
★	20	4	19	25	29
☆	-	-	-	-	-
n	20	34	21	12	18

(Dish Category header spans Side Dish, Main Dish, Mixed Dish, Mixed Dish with Staple)

* A rating of 0.5 to 5 stars is provided depending on the final score for each dish category.
★ means one star, and ☆ means half star.

Dishes are ranked within each dish category based on 10-percentile intervals

Important Notes
- Rankings may vary depending on the number of dishes included and the distribution of points
- The model was evaluated using 105 standard dishes in the study
- Not all dishes commonly consumed in daily life are reflected in the evaluation

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Dish Example: Simmered Hijiki Seaweed

Final Score =
Baseline point － Modification point= 4 － 10 = **- 6**

▼

Dish Category = Side Dish

▼

Rnak = **4.5**
(From Table, read the rank for a Side Dish with a final score of −6)

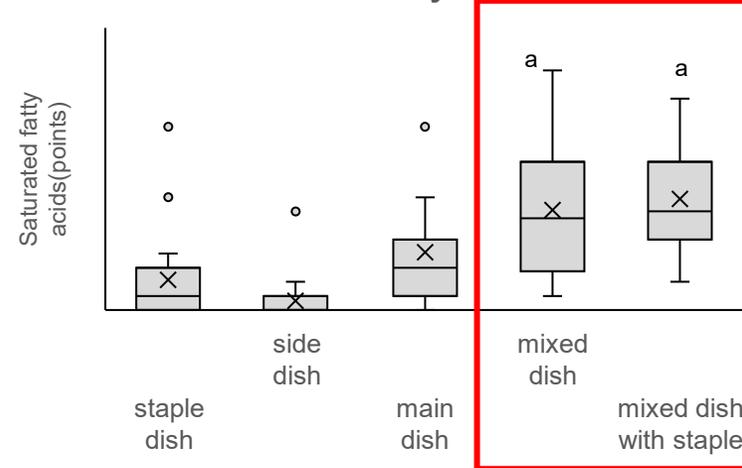## Determination of Rank

Dish Example: Simmered Hijiki Seaweed

Dish Category	Final Score	Rank
Side Dish	≦ -7.0	5.0
	-7.0 < ～ -6.0 ≧	4.5
	-6.0 < ～-5.0 ≧	4.0
	-5.0 < ～ -4.0≧	3.5
	-4.0 < ～ -3.0≧	3.0
	-3.0 < ～ -1.2 ≧	2.5
	-1.2 < ～ 1.0 ≧	2.0
	1.0 < ～ 2.0≧	1.5
	2.0 < ～ 3.7 ≧	1.0
	3.7 <	0.5

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Nutritional Characteristics by Dish Category （Nutrients in the Baseline Points）
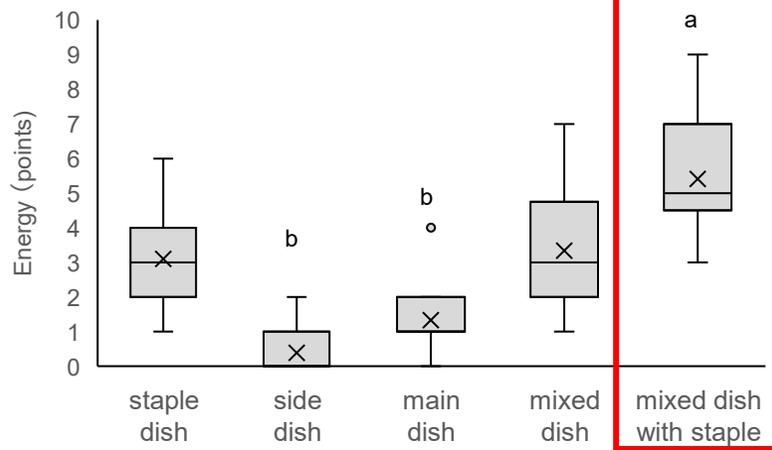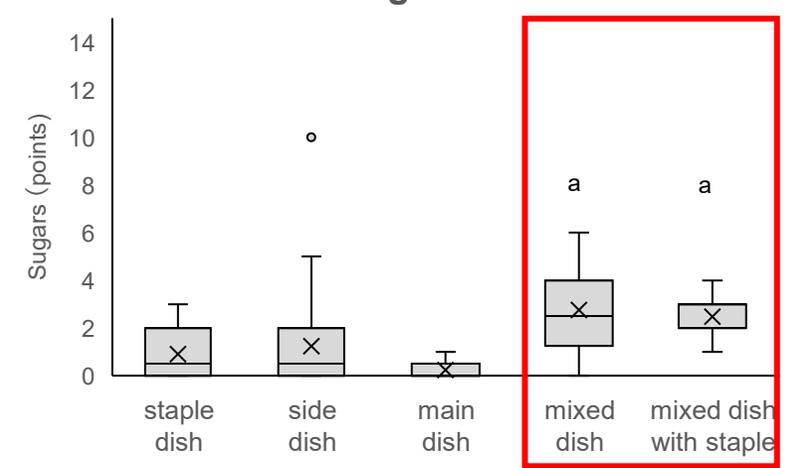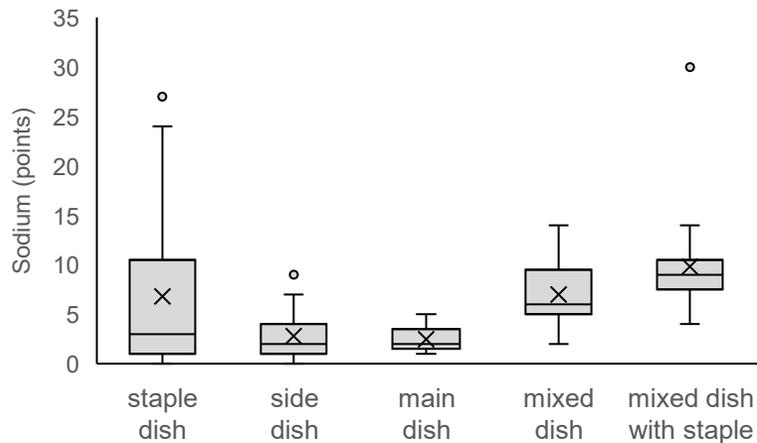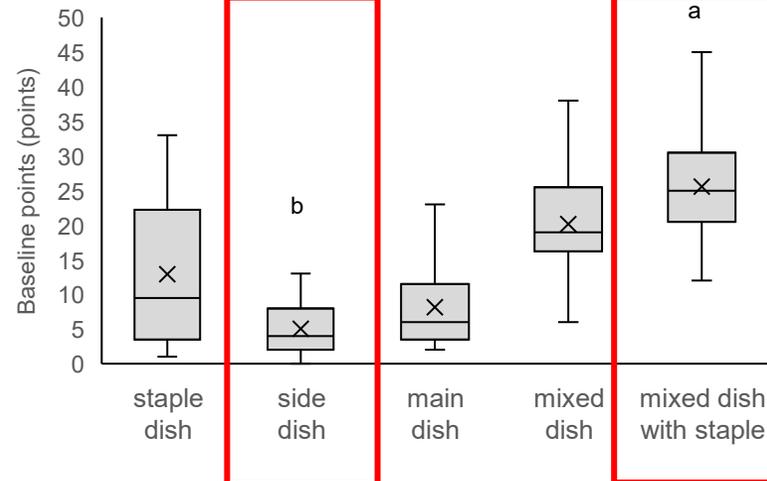
Nutritional Characteristics by Dish Category (Nutrients in the Modification Points) and Final Score
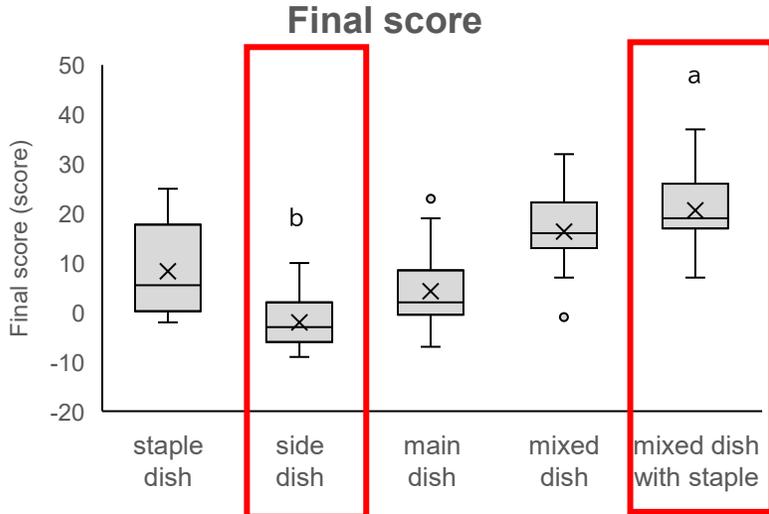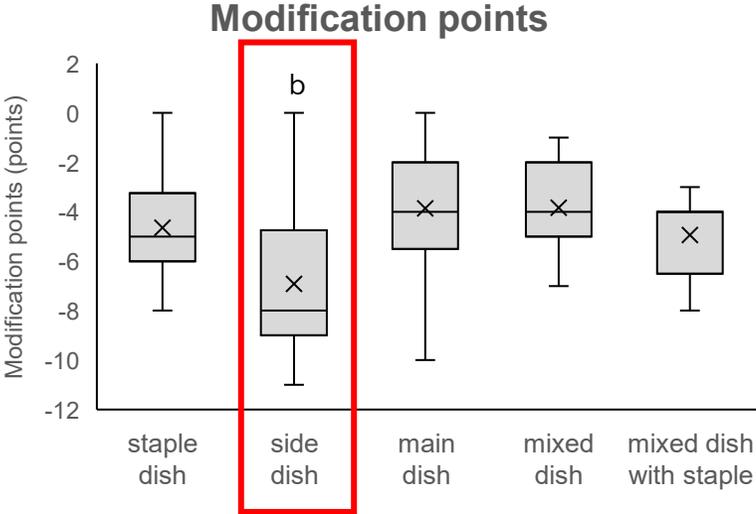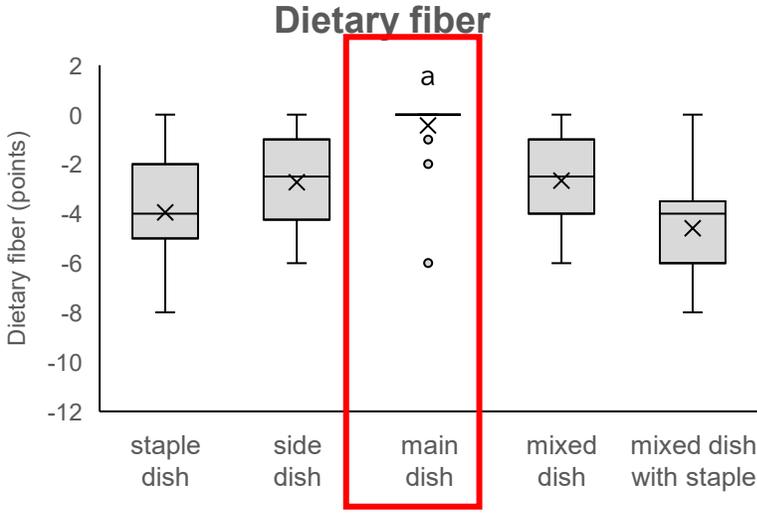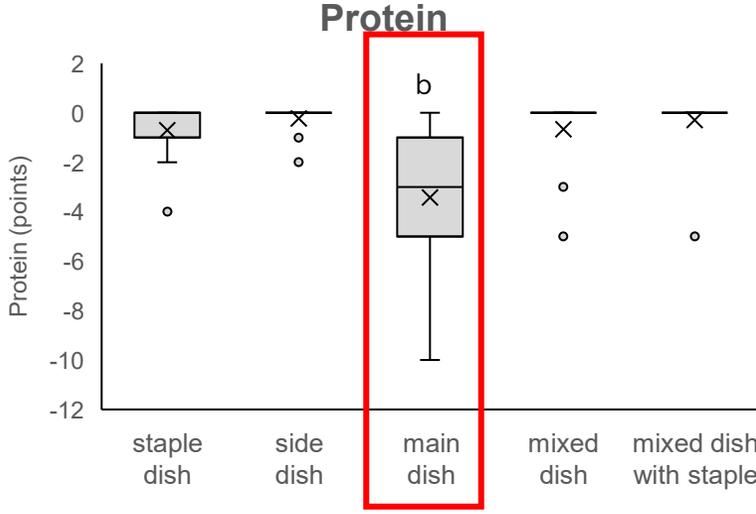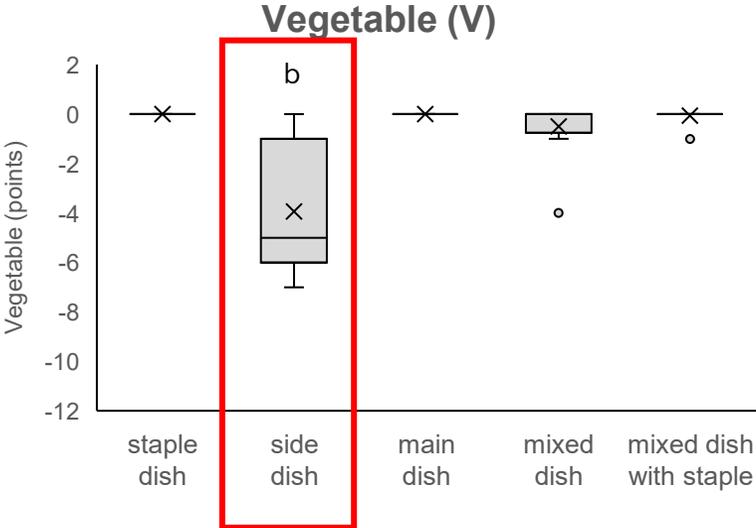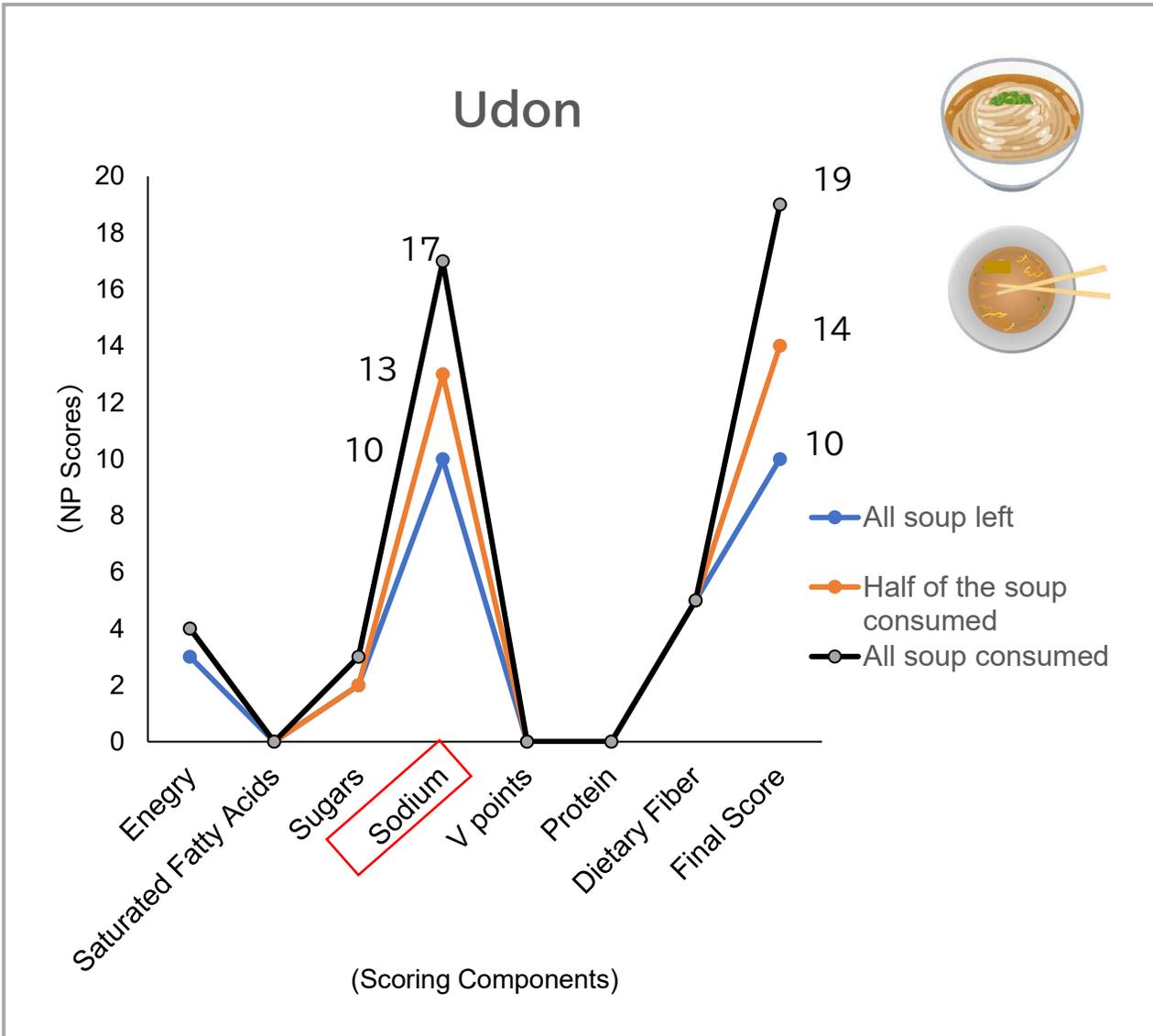

* Modification points are positive points; however, because they are subtracted from the baseline points to calculate the final score, they are shown as negative points

In the case of noodle dishes, the scoring is adjusted based on consumption style
 (e.g., whether the soup is consumed or not)

Udon

(Scoring Components)

Legend:
- All soup left
- Half of the soup consumed
- All soup consumed

Applicable for proposing more appropriate or healthier eating practices

The health impact of different ways of consuming noodle soup can be quantified and compared

Dish Category	Final Score	Rank
	$\leqq$ -2.0	5.0
	-2.0 < ~ -0.0 $\geqq$	4.5
	-0.0 < ~ 1.0 $\geqq$	4.0
	1.0 < ~ 3.0 $\geqq$	3.5
	3.0 < ~ 5.5 $\geqq$	3.0
Staple Dish	5.5 < ~ 9.2 $\geqq$	2.5
	9.2 < ~ 14.9 $\geqq$	2.0
	14.9 < ~ 18.2 $\geqq$	1.5
	18.2 < ~ 20.2 $\geqq$	1.0
	20.2 <	0.5

- When the soup is left:
  Score = 10 → Rank 2.0 ★★

- When the soup is consumed:
  Score = 19 → Rank 1.0 ★

Leaving all the soup in udon increases the rating by ★ (one star)

Highlights of the Japanese Nutrient Profiling Model for Dishes

1. A Model Designed to Address Japan's Nutritional Issues
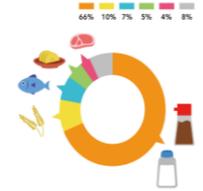
2. Utilized data from the Japanese Food Guide Spinning Top and the National Health and Nutrition Survey

3. Dish-based evaluation allows for realistic assessment of seasonings and oils used in cooking

4. The first dish-based nutrient profiling model developed by a government-affiliated institute in the world

Presentation Contents

Why NPM-DJ Fits Asian Meal Structures

Chinese cuisine

Korean cuisine
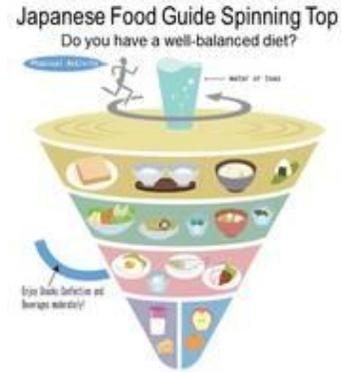

Indian cuisine

Indonesian cuisine

Thai cuisine

Malaysian cuisine

- Meals in many Asian countries consist of multiple dishes.
- This meal structure is similar to the Japanese meal pattern

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Food-based Dietary Guidelines and NPM-DJ

Japan
Japanese Food Guide Spinning Top

Korea
The food balance wheels

China
Chinese Food Guide Pagoda

India
The Indian food pyramid.

Indonesia
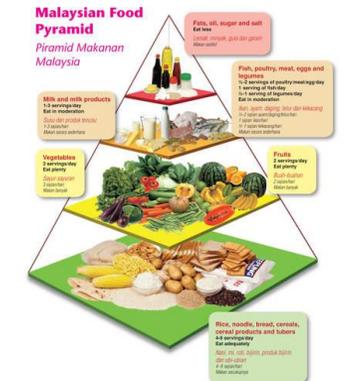Balanced nutrition rounded pyramid

Thailand
The Nutrition flag

Viet Name
Vietnamese food pyramid.

Malaysia
The Malaysian food pyramid.

- Many Asian countries have food-based dietary guidelines
- These guidelines are based on local diets and meal patterns
- They provide a foundation for developing dish-based NPMs

Ref：https://www.fao.org/nutrition/education/dietary-guidelines/regions/asia-pacific/en/

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Applying the NPM-DJ Concept Locally

- **NPM-DJ is not intended to apply Japanese dish categories or thresholds directly when used in another country.**

- **Each country can develop its own dish-based**
  - **using national dietary guidelines**

  - **using national nutrition survey data**

Key Messages

1. Asian meals are based on a combination of dishes

2. The dish-based **NPM-DJ** fits Asian dietary patterns

3. The Japanese **NPM-DJ** can be a reference for country-specific NPMs

4. Collaboration and networking in Asia are key for future development

Thank you very much for your attention

Funding

Acknowledgments