

TICAD8 IFPRI Side Event  
Sept 28 2022

# **Innovations embodied in Japan's school lunch program**

Nobuko Murayama, PhD.  
University of Niigata Prefecture  
The Japanese Society of Nutrition and Dietetics

Contact: Dr. Nobuko Murayama  
E-mail: [murayama@unii.ac.jp](mailto:murayama@unii.ac.jp)

# **Strong points of Japanese school lunch program**

**1. There is long history to innovate school lunch program.**

**2. School lunch program is based on laws and standards by government and they include school lunches and nutrition education.**

**3. School lunch program is implemented for nearly all school students (high coverage) and it is financially sustainable system.**

**4. There is monitoring system for school lunches and children's growth.**

**5. There are evidences that school lunches reduce nutrition disparity and prevent obesity among children**

# History of school nutrition program

3

| Year | Event                                                                                                 |
|------|-------------------------------------------------------------------------------------------------------|
| 1889 | Free lunch is first offered to poor schoolchildren at a primary school in Yamagata Prefecture         |
| 1932 | A government-funded school lunch program for poor students is implemented nationwide                  |
| 1946 | A new school lunch policy is established to cover all schoolchildren                                  |
| 1947 | The school lunch program begins providing lunch for about 3 million schoolchildren across the country |
| 1950 | The complete-meal school lunch program is started, using wheat flour donated by the US                |
| 1954 | <b>The School Lunch Act is enacted</b>                                                                |
| 1976 | Cooked rice is formally introduced                                                                    |
| 2005 | <b>The Shokuiku Basic Act is enacted</b>                                                              |
| 2009 | Revised School Lunch Act is implemented                                                               |



**School lunches were at risk of being cancelled in 1951 by the suspension of U.S. funding.**

**A nationwide movement to demand the continuation of school lunches with government subsidies is developed nationwide.**

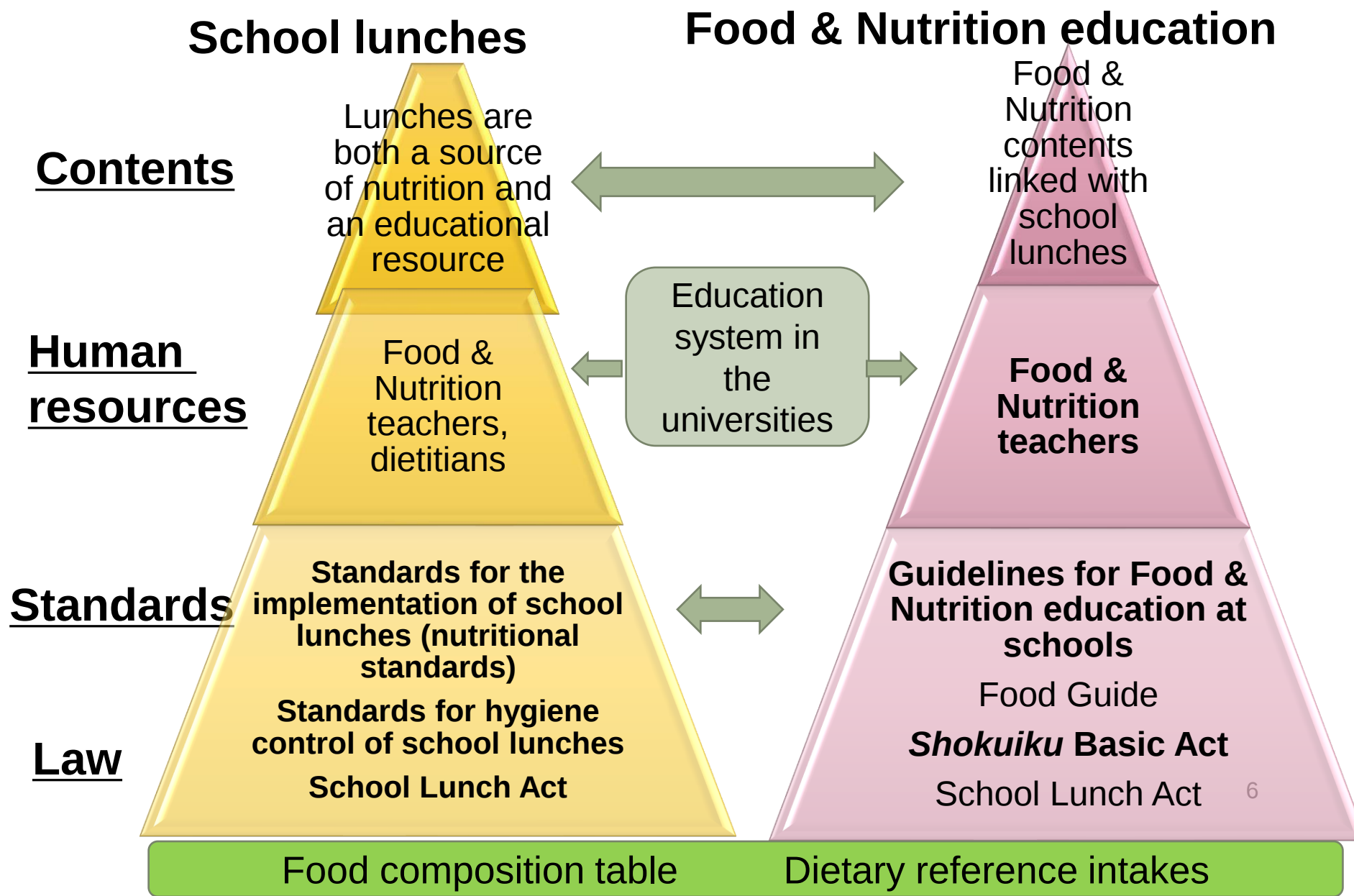
**Signature activity** —→



# **Strong points of Japanese school lunch program**

- 1. There is long history to innovate school lunch program.**
- 2. School lunch program is based on laws and standards by government and they include school lunches and nutrition education.**
- 3. School lunch program is implemented for nearly all school students (high coverage) and it is financially sustainable system.**
- 4. There is monitoring system for school lunches and children's growth.**
- 5. There are evidences that school lunches reduce nutrition disparity and prevent obesity among children**

# Structure of school lunches and food & nutrition education



Enacted in 1954, last revised in 2009

## Benefits of providing school lunches

- School lunches contribute to the development of the minds and bodies of schoolchildren
  - School lunches help schoolchildren learn about a proper diet and make appropriate food choices
- The school lunch program is implemented as part of *shokuiku* education

## Main contents:

- 7 objectives of the school lunch program
- Standards for the implementation of school lunches
- Standards for hygiene control of school lunches
- Food & Nutrition education

(revised August 2018)

- The dietary reference intake per meal per person is indicated
- Based on “The Dietary Reference Intakes for Japanese (2015 edition)”
- Formulated based on the results of the schoolchildren’s dietary life survey and dietary circumstances survey

| Nutrients                  | % of intake with DRIs                    | Standard values (8-9y) |
|----------------------------|------------------------------------------|------------------------|
| Energy                     | 33% of estimated energy requirement      | 650 kcal               |
| Protein                    | 13% to 20% energy                        | 13% to 20% energy      |
| Fat                        | 20% to 30% energy                        | 20% to 30% energy      |
| Sodium chloride equivalent | <33% of tentative dietary goal           | <2 g                   |
| Calcium                    | 50% of the recommended dietary allowance | 350 mg                 |
| Iron                       | 40% of the recommended dietary allowance | 3 mg                   |
| Vitamin A                  | 40% of the recommended dietary allowance | 200 µgRAE              |
| Vitamin B1                 | 40% of the recommended dietary allowance | 0.4 mg                 |
| Vitamin B2                 | 40% of the recommended dietary allowance | 0.4 mg                 |
| Vitamin C                  | 33% of the recommended dietary allowance | 20 mg                  |
| Dietary fiber              | 40% of the recommended dietary allowance | >5 g                   |

# Current status of school lunches in Japan

9

- School dietitians plan lunch menus according to the **“Nutritional Standards”**
- School lunches are served individually, and children receive the same types and portions of food on their own tray



(Harlan C. On Japan's school lunch menu: a healthy meal, made from scratch. Washington Post. January 27, 2013)

# Current status of school lunches in Japan

10

Typical school lunch menu in Japan consists of a Staple food, Main dish, Side dish, Soup and Milk.

**Main dish: Fish, Meat,  
Egg, Soybean supply  
Protein**

**Side dish: Vegetable,  
Seaweed supply  
Vitamin and Minerals**

Milk

**Staple food:  
Rice, Bread,  
Noodles  
supply  
Carbohydrate**

Soup



School lunch menus are “educational materials”

Names of dishes

ひょう



Ingredients

平成23年

| 日曜 | し         | の              | の              | お                                                       |
|----|-----------|----------------|----------------|---------------------------------------------------------|
| 7  | スパゲティ     | えびとポテトのチーズやき   | えびとポテトのチーズやき   | グリーンアスパラ、ホールトマト、セリ、たまねぎ、ホールコーン、トマトにんにく、にんじん、パセリ、マッシュルーム |
| 木  | ぎゅうにゅう    | アスパラサラダ        | アスパラサラダ        | ティ、じゃがいも、バター、あぶら                                        |
| 8  | ごはん       | にくだんごのあますあん    | にくだんごのあますあん    | りく、たまご、うにゅう、ミート、ール                                      |
| 金  | ぎゅうにゅう    | たまごスープ         | たまごスープ         | こめ、でんぶん、さと、う、あぶら、こまあぶら                                  |
| 11 | たけのこごはん   | さばのしおやき        | さばのしおやき        | さき、あぶらあげ、さ、かまぼこ、いとまぼこ、とりく、うにゅう                          |
| 月  | ぎゅうにゅう    | かぼちゃのいとこにすましじる | かぼちゃのいとこにすましじる | こめ、さとう、あぶら                                              |
| 12 | マーブルしよくパン | かじきのしよくやき      | かじきのしよくやき      | かぼちゃ、こまつな、たけのこ、ばんのうねぎ、にんじん、ほししいたけ                       |
| 火  | ぎゅうにゅう    | さんしよくソテー       | さんしよくソテー       | じき、ペーコン、うにゅう                                            |
|    |           | ABCスープ         | ABCスープ         | ABCマカロニ、さとう、あぶら、バター、                                    |

## The Three-Color Classification System for Food Groups



Groups

Definitions

Food items

Red group

Dietary sources of protein

Fish, meat, soybeans, eggs, milk

Yellow group

Dietary sources of carbohydrates

Grains (wheat, rice), potatoes, oils, sugar

Green group

Dietary sources of vitamins and minerals

Vegetables, fruits, seaweed

**Food & Nutrition teachers** were added to school faculties in 2005 to provide both nutritional and educational services.

## Purpose

Improve schoolchildren's nutritional knowledge so they can make better dietary choices

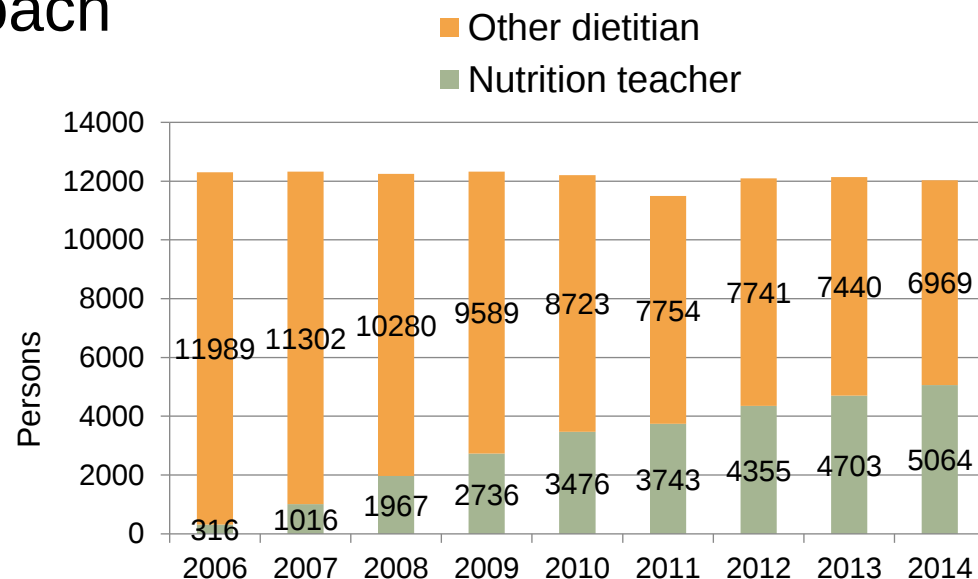
## Responsibilities

### Education

- High-risk approach (individual approach)
- Class and population approach
- Family and community

### Food service management

- Nutrition management
- Hygiene control
- Food control



# **Strong points of Japanese school lunch program**

- 1. There is long history to innovate school lunch program.**
- 2. School lunch program is based on laws and standards by government and they include school lunches and nutrition education.**
- 3. School lunch program is implemented for nearly all school students (high coverage) and it is financially sustainable system.**
- 4. There is monitoring system for school lunches and children's growth.**
- 5. There are evidences that school lunches reduce nutrition disparity and prevent obesity among children**

# Coverage of school lunches in Japan

|                                             | Primary schools         | Secondary schools       |
|---------------------------------------------|-------------------------|-------------------------|
| No. of schools providing school lunches     | 19,350<br>/19,635       | 8,791<br>/10,151        |
| Percentage                                  | 98.5%                   | 86.6%                   |
| No. of schoolchildren having school lunches | 6,352,201<br>/6,427,867 | 2,569,439<br>/3,253,100 |
| Percentage                                  | 98.8%                   | 79.0%                   |

Includes complete school lunches (staple, fish/meat, vegetable, and milk)

Excludes school which supply only milk or incomplete school lunches

Ministry of Education, Culture, Sports, Science and Technology (MEXT)

School Lunch Implementation Survey (2018)

# Financial system

Facility equipment and personnel expenses shall be borne by the establisher of compulsory education schools, and other expenses, such as food staffs, shall be borne by the guardian. (School Lunch Act.)

## School lunch fee paid by guardian (public schools)

|                   | No. of meals/year | Cost/month | Cost/meal** |
|-------------------|-------------------|------------|-------------|
| Primary schools   | 191               | ¥4,343     | ¥250        |
| Secondary schools | 186               | ¥4,941     | ¥292        |

\*Cost includes food materials only; does not include overhead, human resources, and fuel for cooking, etc.

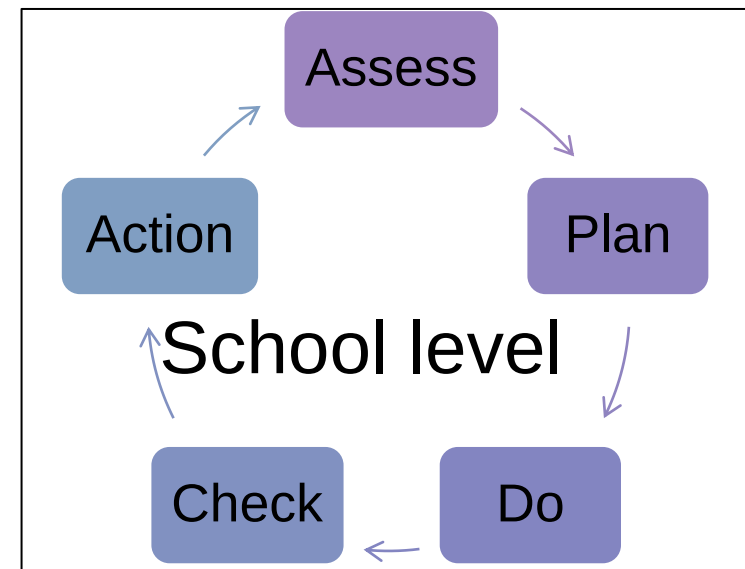
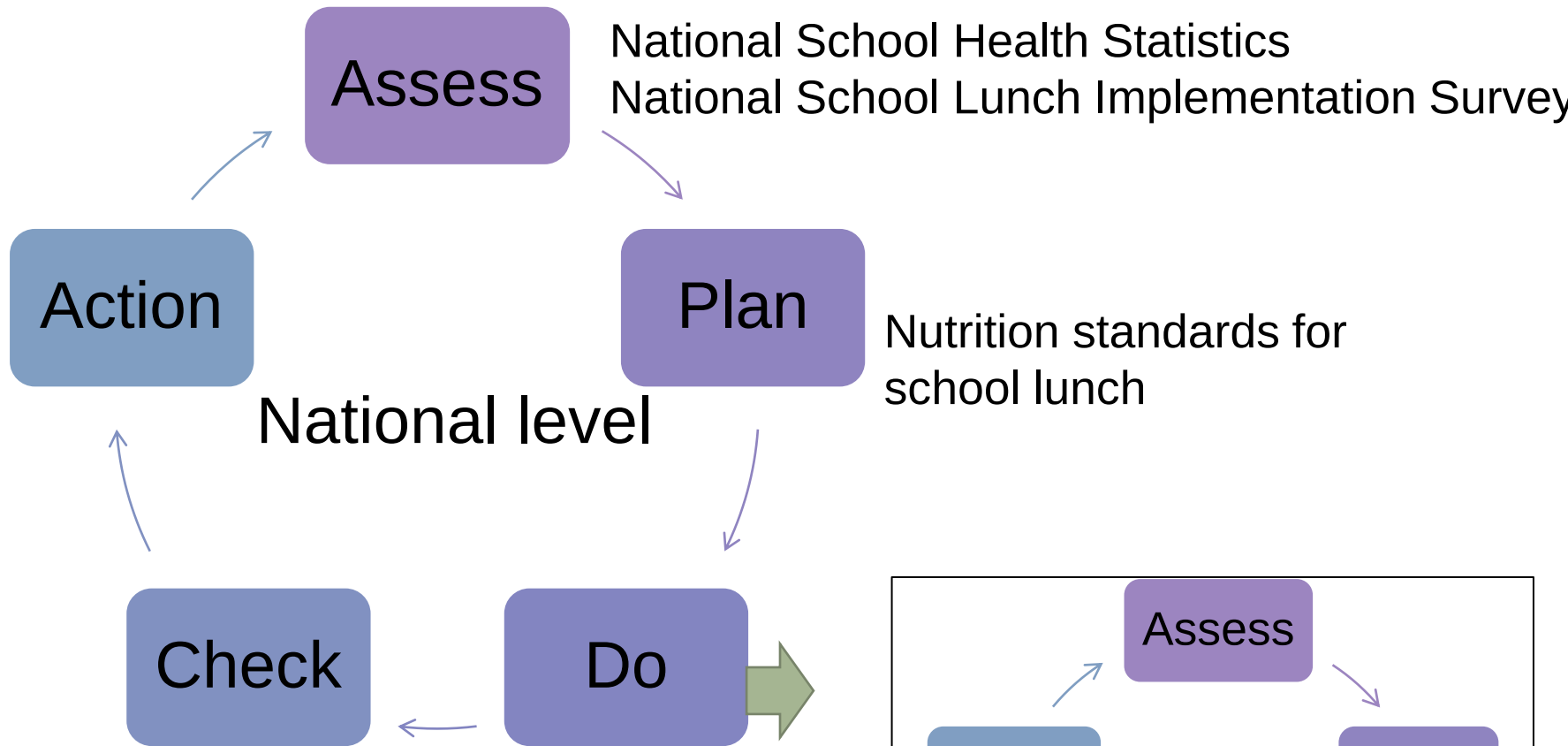
\*\*Cost/meal = (cost/month × 11) ÷ number of meal/year

Ministry of Education, Culture, Sports, Science and Technology (MEXT)  
School lunch implementation survey (2018)

# **Strong points of Japanese school lunch program**

- 1. There is long history to innovate school lunch program.**
- 2. School lunch program is based on laws and standards by government and they include school lunches and nutrition education.**
- 3. School lunch program is implemented for nearly all school students (high coverage) and it is financially sustainable system.**
- 4. There is monitoring system for school lunches and children's growth.**
- 5. There are evidences that school lunches reduce nutrition disparity and prevent obesity among children**

# Monitoring and evaluation system



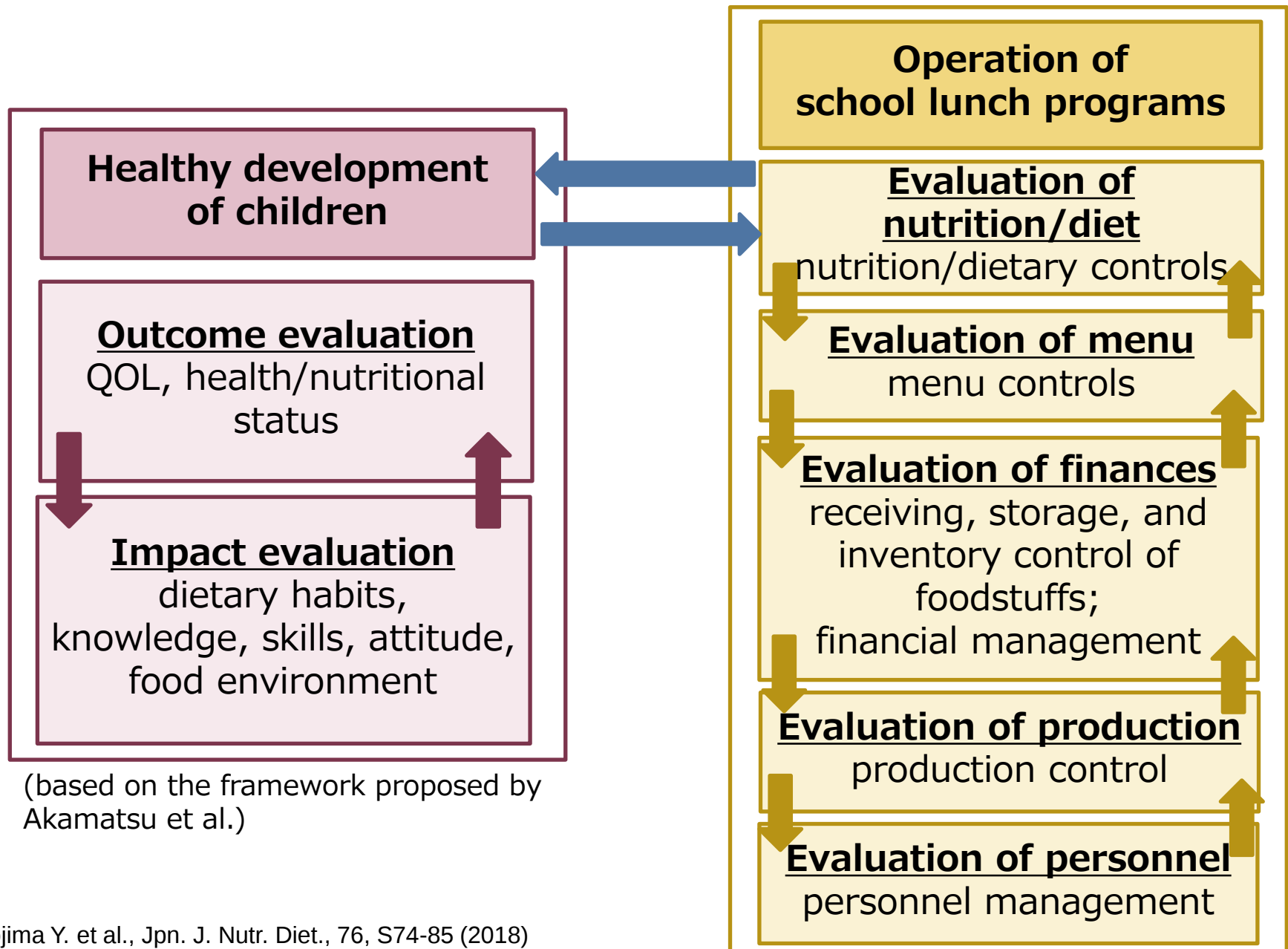
## Process evaluation:

National School Lunch Implementation Survey  
Nutrition Report on School Lunches

## Outcome evaluation:

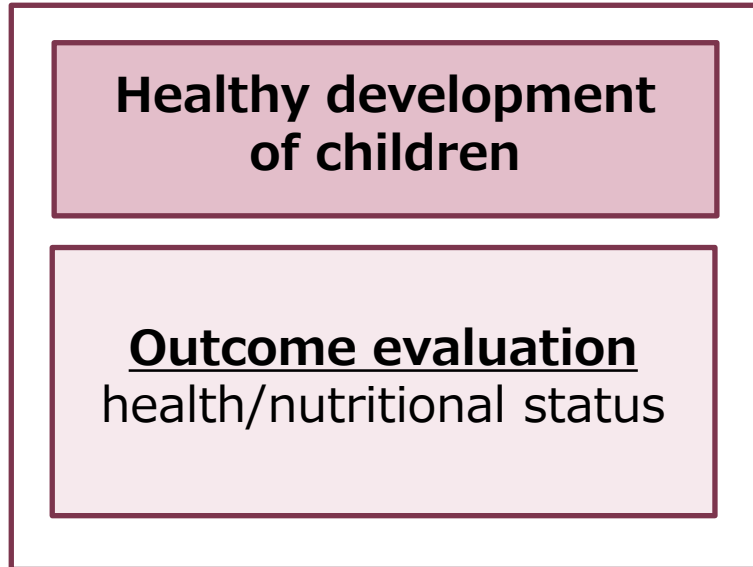
National School Health Statistics

# Monitoring and evaluation at the **school level**

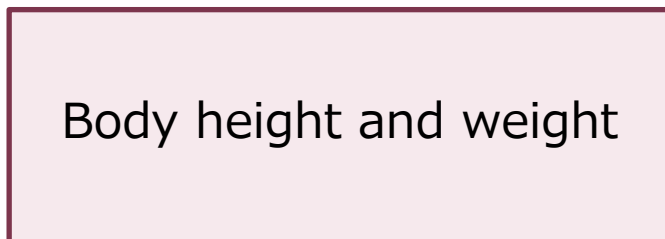


# Monitoring and evaluation at the **national level**

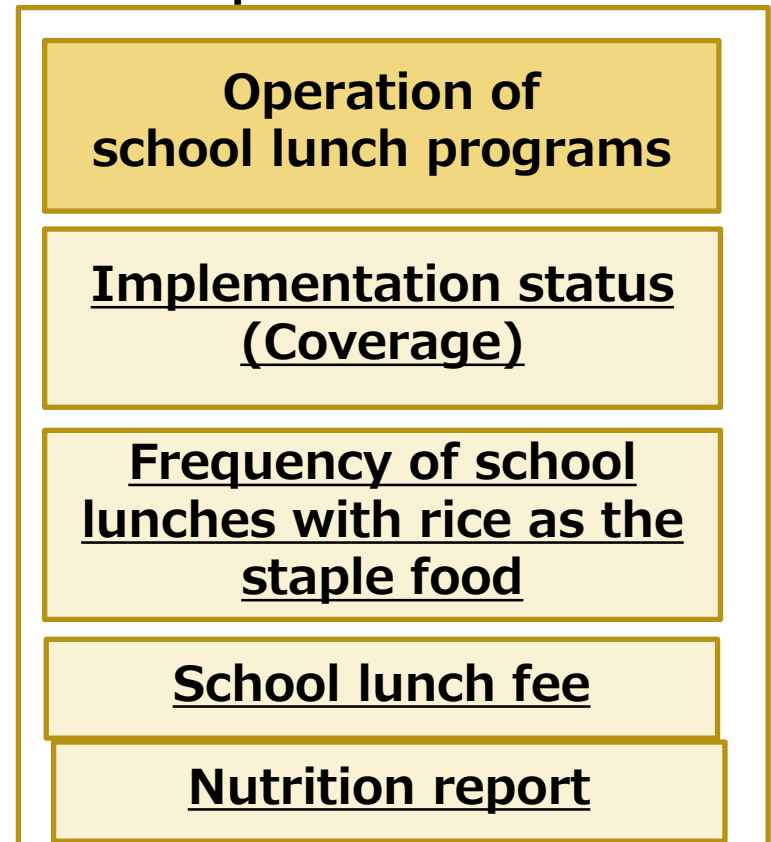
## National School Health Statistics



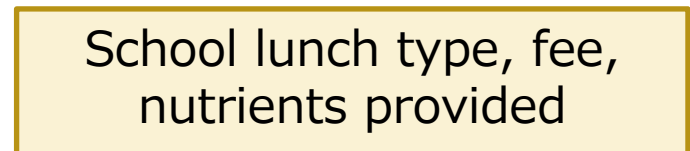
**School** → **Prefecture**



## School Lunch Implementation Survey Nutrition Report on School Lunches



**School** → **Prefecture**



# Nutrition report of school lunches

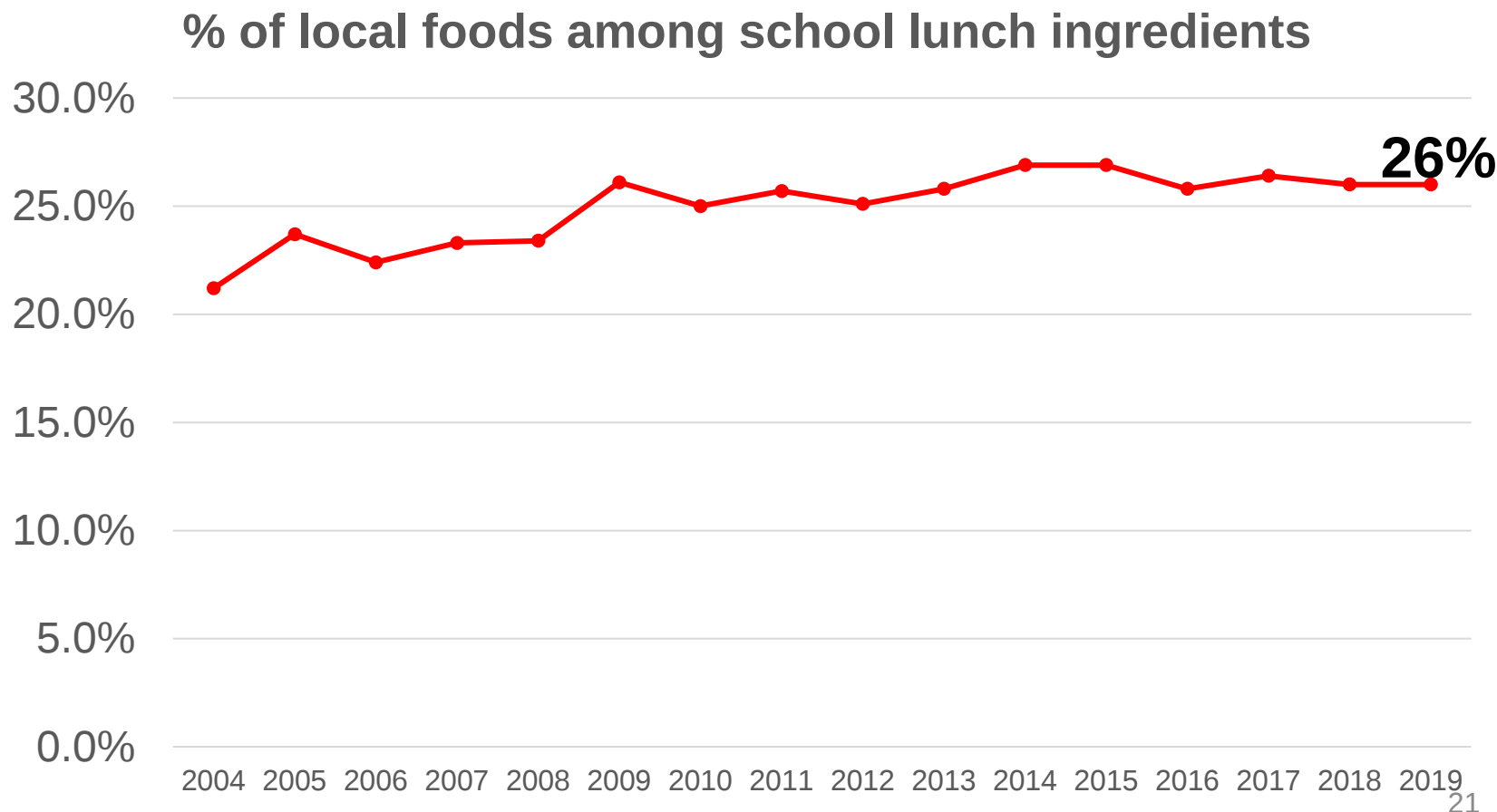
Nutrient intakes (average)

(MEXT 2017)

|                            |      | Primary schools | Secondary schools |
|----------------------------|------|-----------------|-------------------|
| Energy                     | kcal | 626.0           | 781.4             |
| Protein                    | g    | 25.2            | 30.4              |
| (animal protein)           | g    | 13.6            | 16.0              |
| Fats                       | g    | 20.0            | 23.6              |
| (animal fats)              | %    | 28.7            | 27.1              |
|                            | g    | 12.3            | 13.7              |
| Sodium chloride equivalent | g    | 2.5             | 3.1               |
| Calcium                    | mg   | 341.2           | 380.2             |
| Magnesium                  | mg   | 94.6            | 118.3             |
| Zinc                       | mg   | 2.5             | 3.3               |
| Iron                       | mg   | 3.0             | 3.6               |
| Vitamin A                  | μgRE | 253.4           | 326.4             |
| Vitamin B1                 | mg   | 0.7             | 0.8               |
| Vitamin B2                 | mg   | 0.5             | 0.6               |
| Vitamin C                  | mg   | 29.7            | 36.0              |
| Dietary fiber              | g    | 4.6             | 5.9               |

# Use of local foods among ingredients of school lunches

Japanese government promote to use local products in the school lunch. In 2019, 26% of foods used in the school lunch produced in their prefecture.



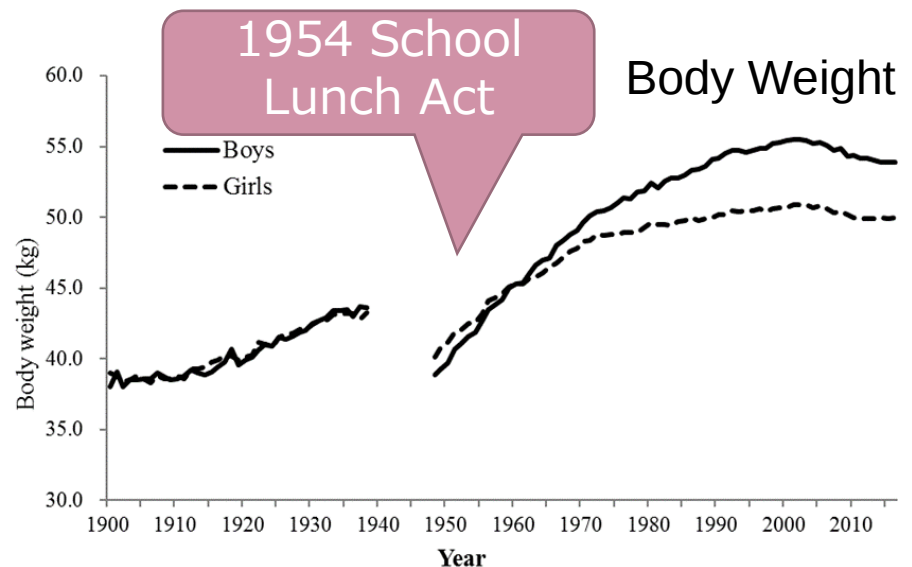
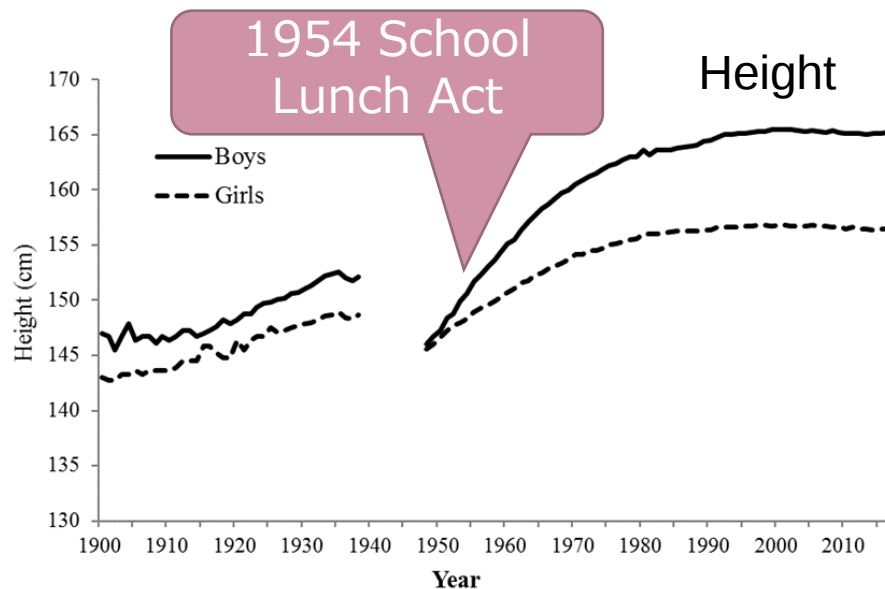
# Healthy development of children

The height and weight of children improved after the School Lunch Act was implemented following World War II

## School health statistics (MEXT)

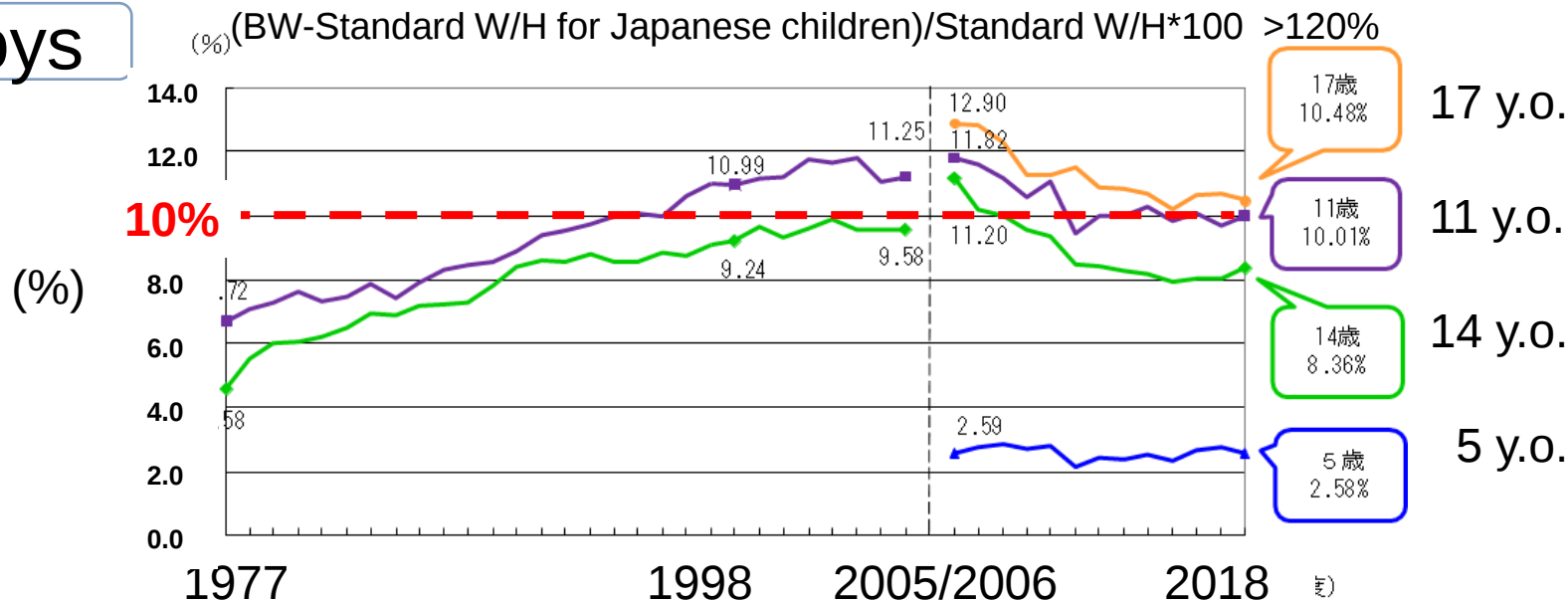
The height and weight of all elementary school and junior high school students has been measured annually since 1900.

Change in the height and weight of 14-year-old students by sex

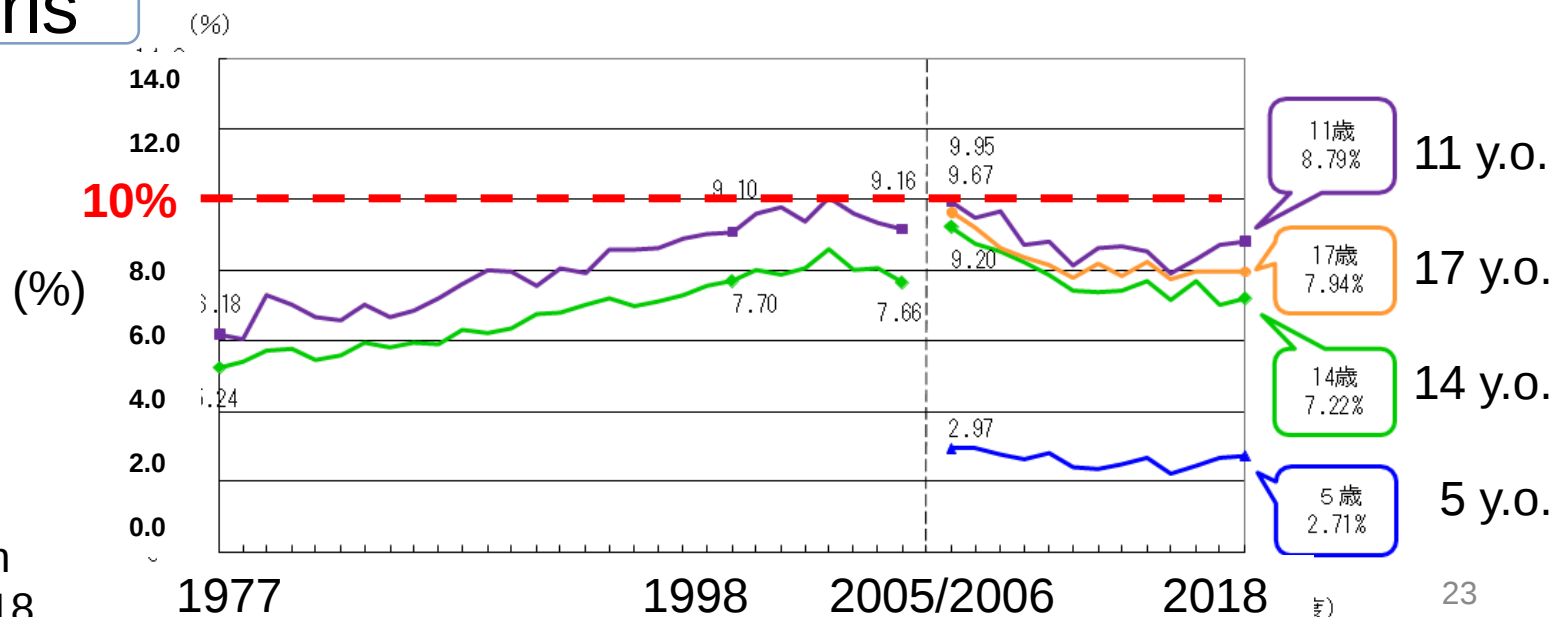


# Prevalence of overweight students

## Boys

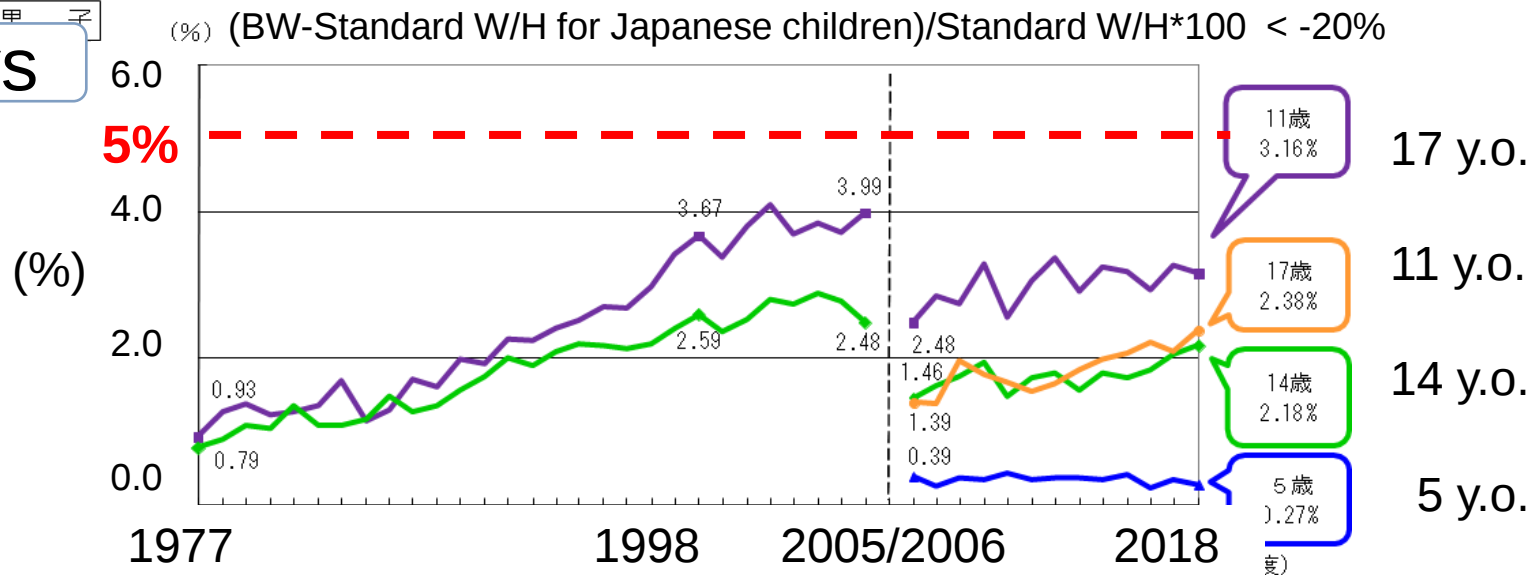


## Girls

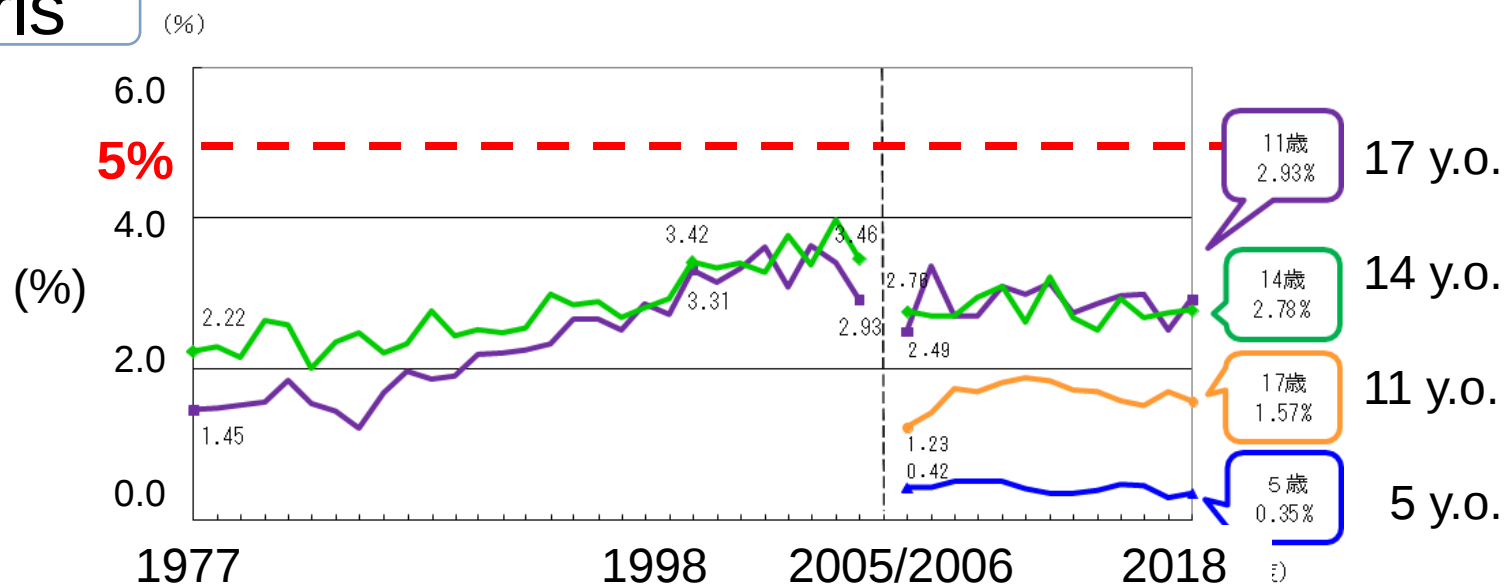


# Prevalence of underweight students

## Boys



## Girls



# **Strong points of Japanese school lunch program**

- 1. There is long history to innovate school lunch program.**
- 2. School lunch program is based on laws and standards by government and they include school lunches and nutrition education.**
- 3. School lunch program is implemented for nearly all school students (high coverage) and it is financially sustainable system.**
- 4. There is monitoring system for school lunches and children's growth.**
- 5. There are evidences that school lunches reduce nutrition disparity and prevent obesity among children**

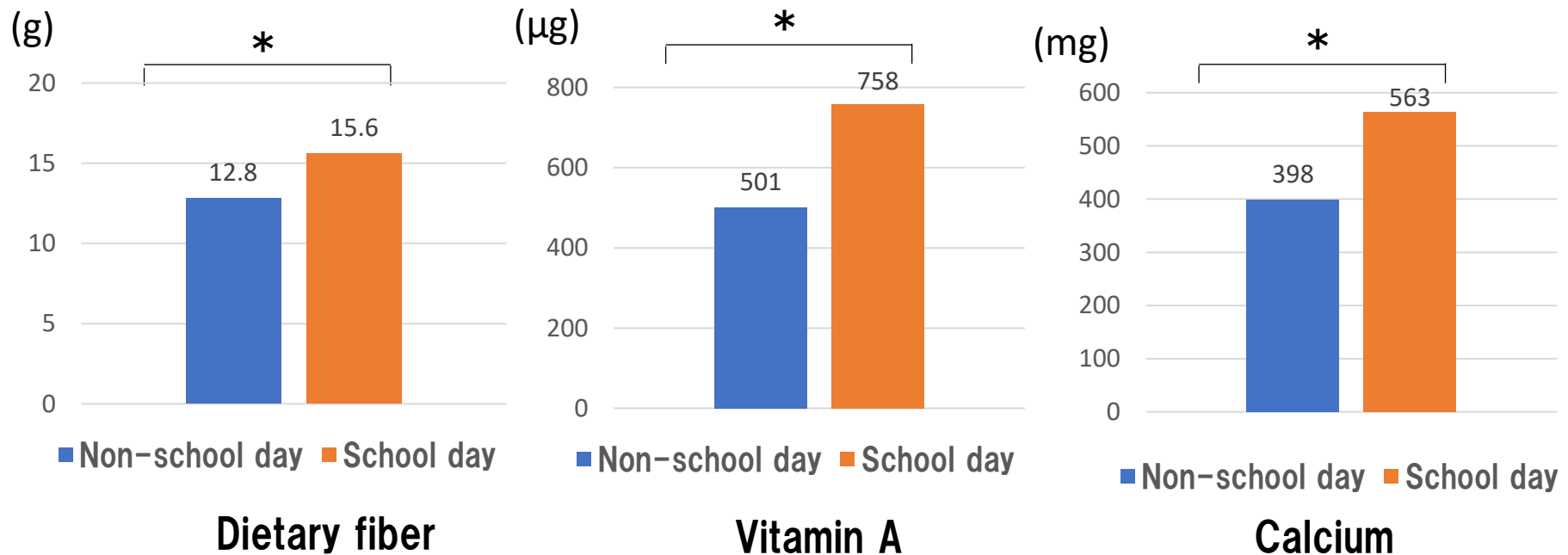
# Monitoring and evaluation

## Diet quality and dietary disparity

**School lunches contribute to overall diet quality, especially vitamin and mineral intake.**

Difference in **nutrient intake** between school days (with school lunches) and non-school days (without school lunches)

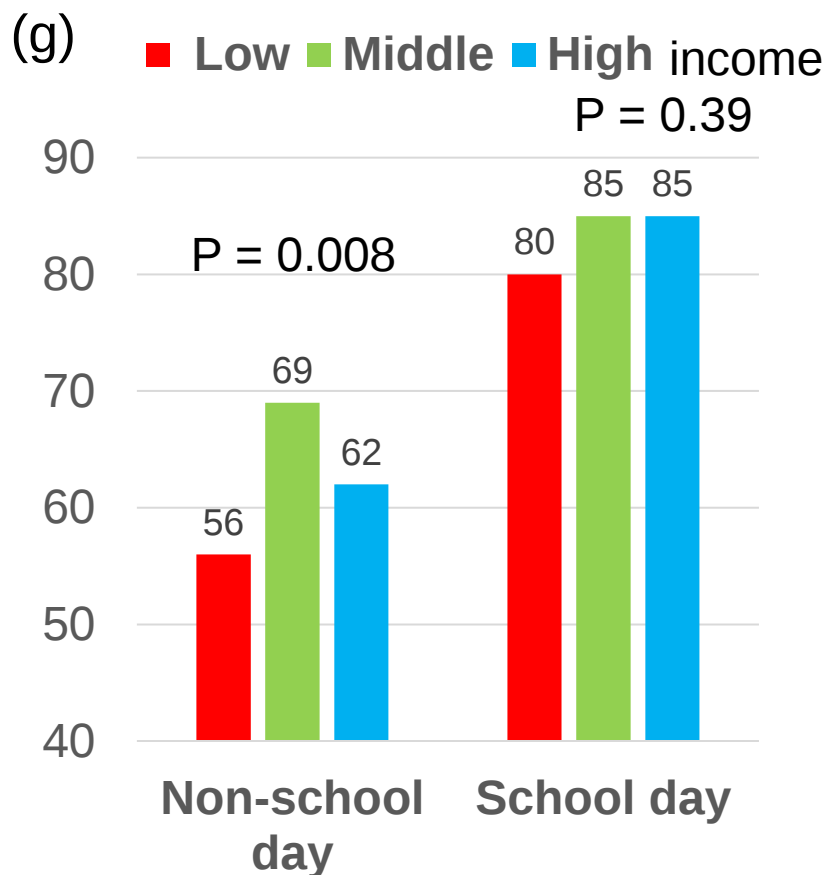
Nutrient intake of 144 boys in the 5th grade (10–11 years)



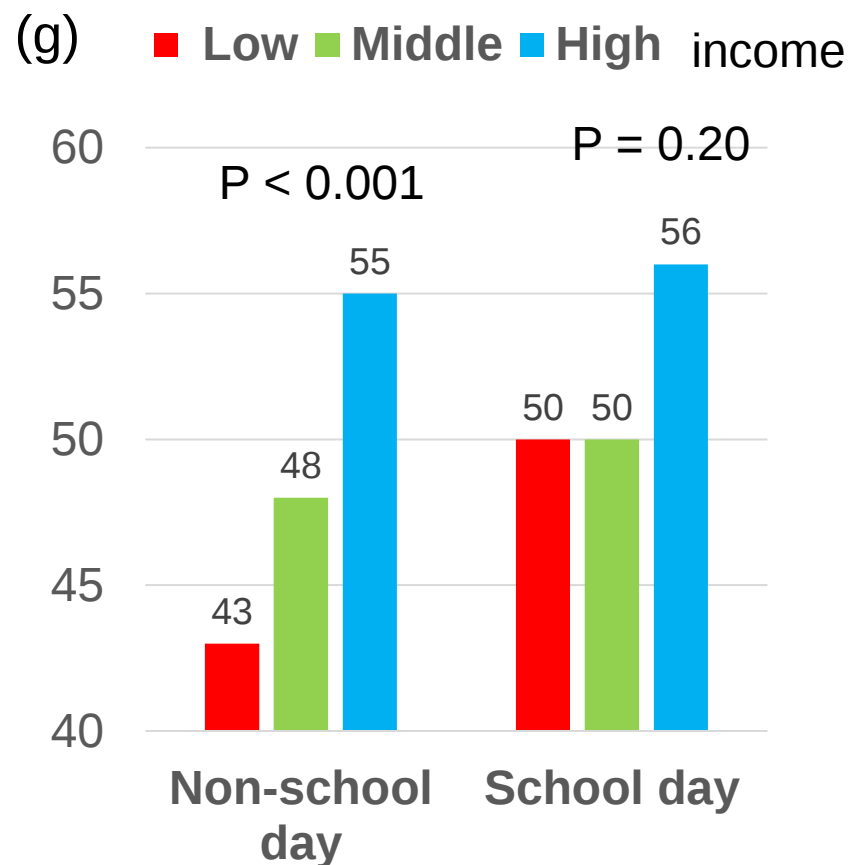
# School lunches reduce disparity of diet by household income levels.

## Amount of food intake by household income

### Green vegetables

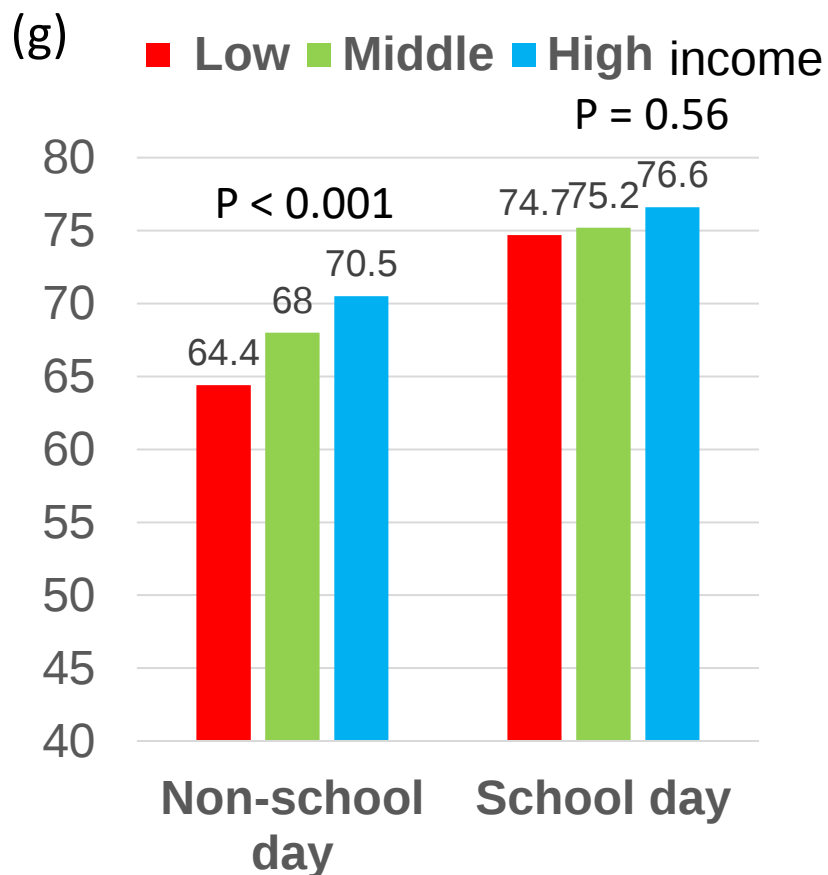


### Fish & Shellfish

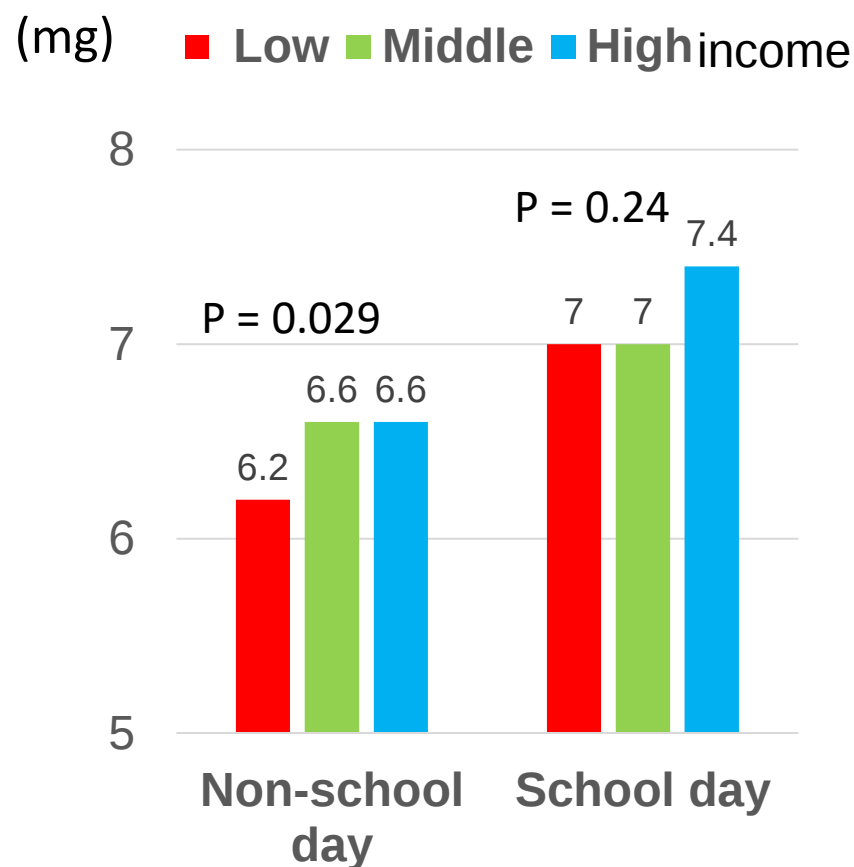


# Amount of nutrient intake by household income

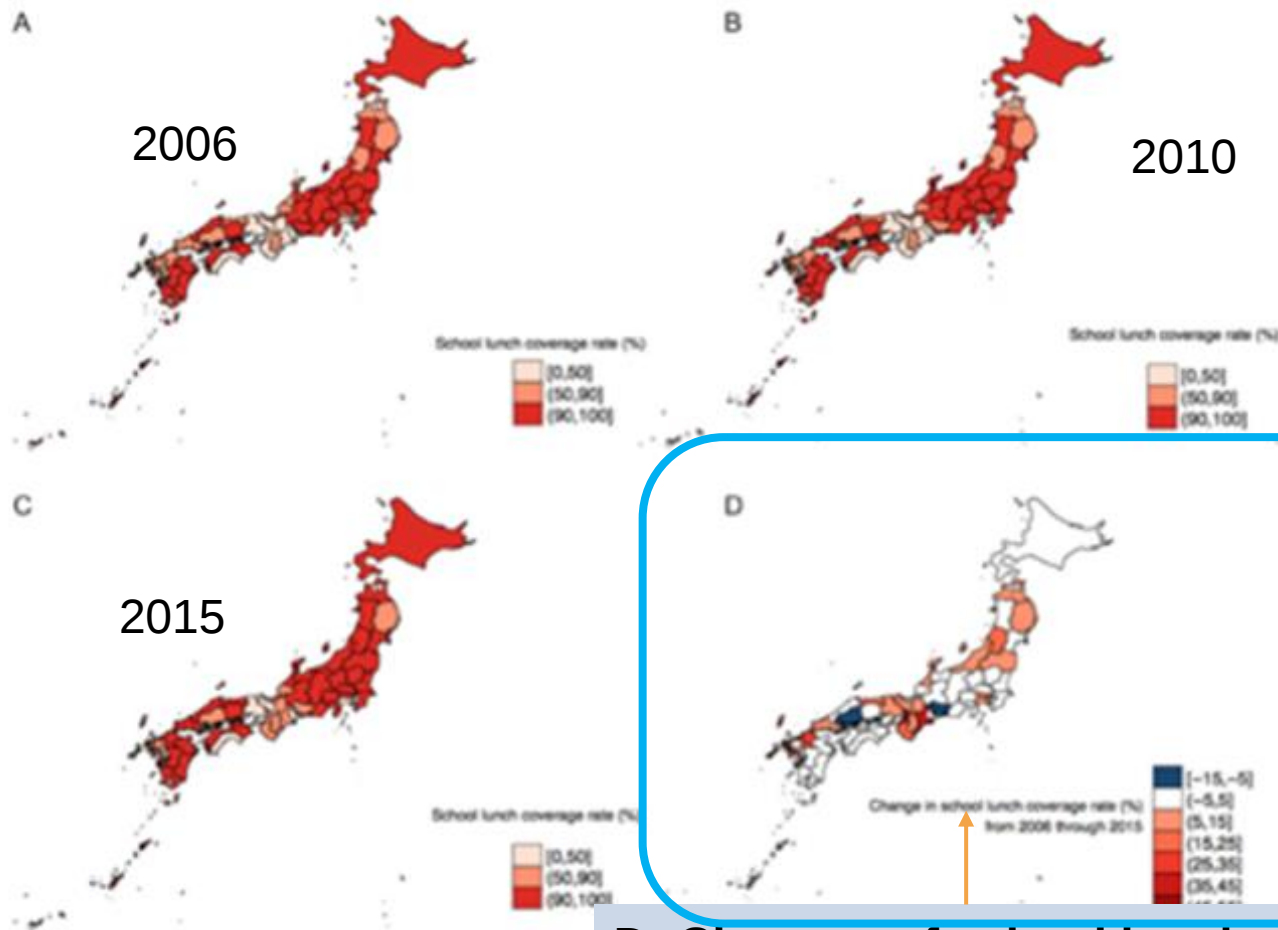
## Protein



## Iron



# Expansion of the school lunch program in secondary school by prefecture



**D: Changes of school lunch coverage from 2006 to 2015 (red color indicate high increase of school lunch coverage)**

# Impact of the school lunch coverage rate on overweight/obese junior high school students

|       |              | Overweight (%) | Obesity (%)    |
|-------|--------------|----------------|----------------|
| Girls | Coefficient  | −0.014         | −0.007         |
|       | 95%CI        | −0.032, 0.005  | −0.018, 0.003  |
|       | R-squared    | 0.592          | 0.531          |
|       | Observations | 1,251          | 1,251          |
| Boys  | Coefficient  | −0.037***      | −0.023**       |
|       | 95%CI        | −0.056, −0.018 | −0.037, −0.010 |
|       | R-squared    | 0.701          | 0.600          |
|       | Observations | 1,251          | 1,251          |

\*\*P < 0.01, \*\*\*P < 0.001

Ordinary least square estimations were applied with adjustment for the lagged dependent variable and dummy variables for prefecture, age, and year.

For overweight/obese percentage, the coefficient indicates the impact of a 1 percentage point change in the school lunch coverage rate on each outcome.

# Summary

- **Japanese school lunch programs include nutrition education. The program has been established based on school lunch law and other guidelines.**
- **Monitoring and evaluation system has been established.**
- **Japanese school lunch programs contribute preventing double burden of malnutrition, reducing socioeconomic disparities of diet, and promoting sustainable food system through using local foods.**