Nutrition Society of Malaysia
The 37th Scientific Conference

2022.6.21

Nutrition interventions to combat NCDs and COVID-19 health threats – experiences in Japan

Hisanori Kato
Project Professor, The University of Tokyo
Chair, Organizing Committee of the 22nd IUNS-ICN

1. The Situation of NCDs in Japan and Measures to Address Them

2. Status of COVID-19 in Japan and Measures to Combat It

3. Precision Nutrition in Dealing with NCDs and COVID-19

4. 22nd IUNS-International Congress of Nutrition (ICN)

Population Pyramids for Japan

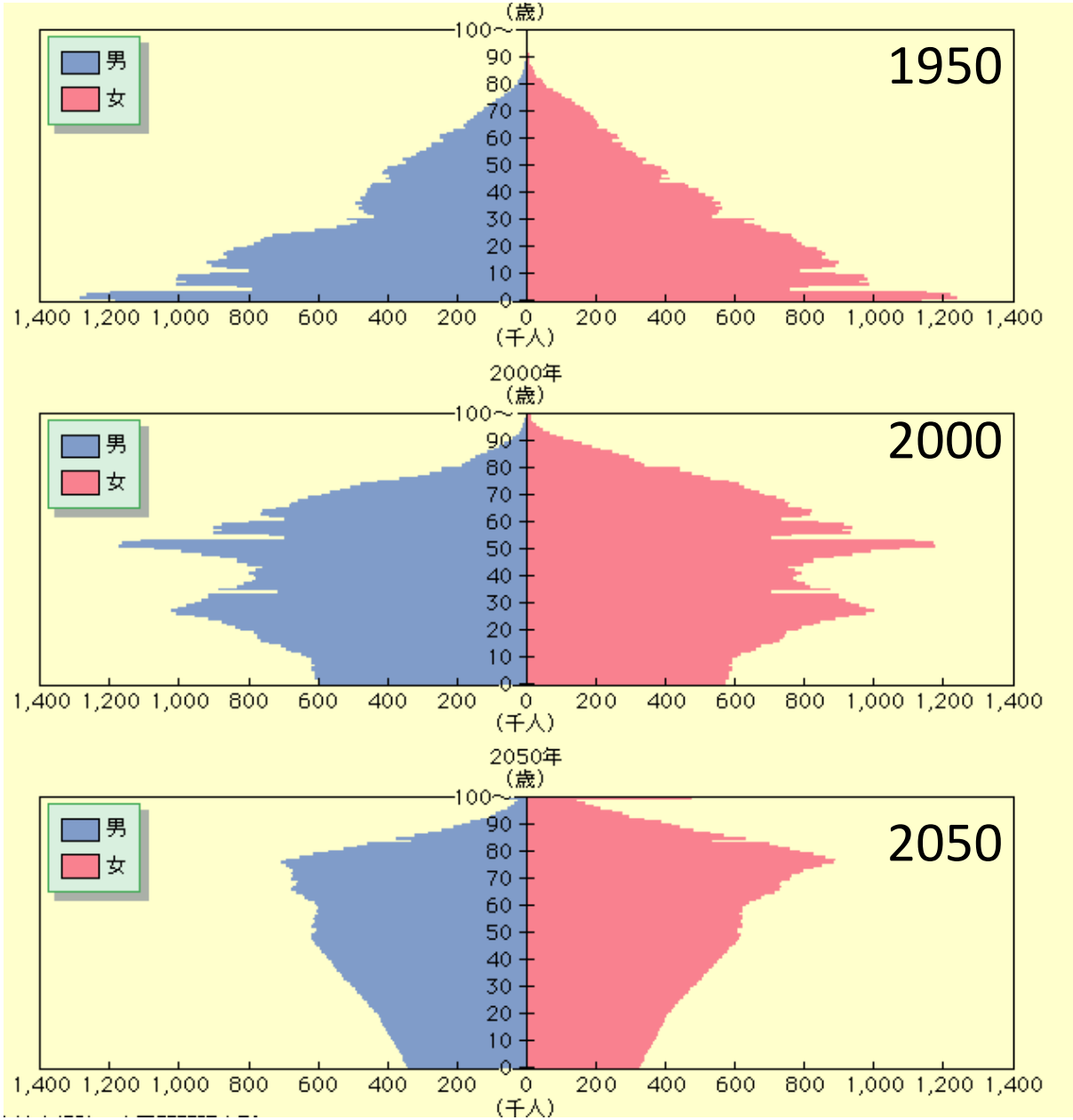
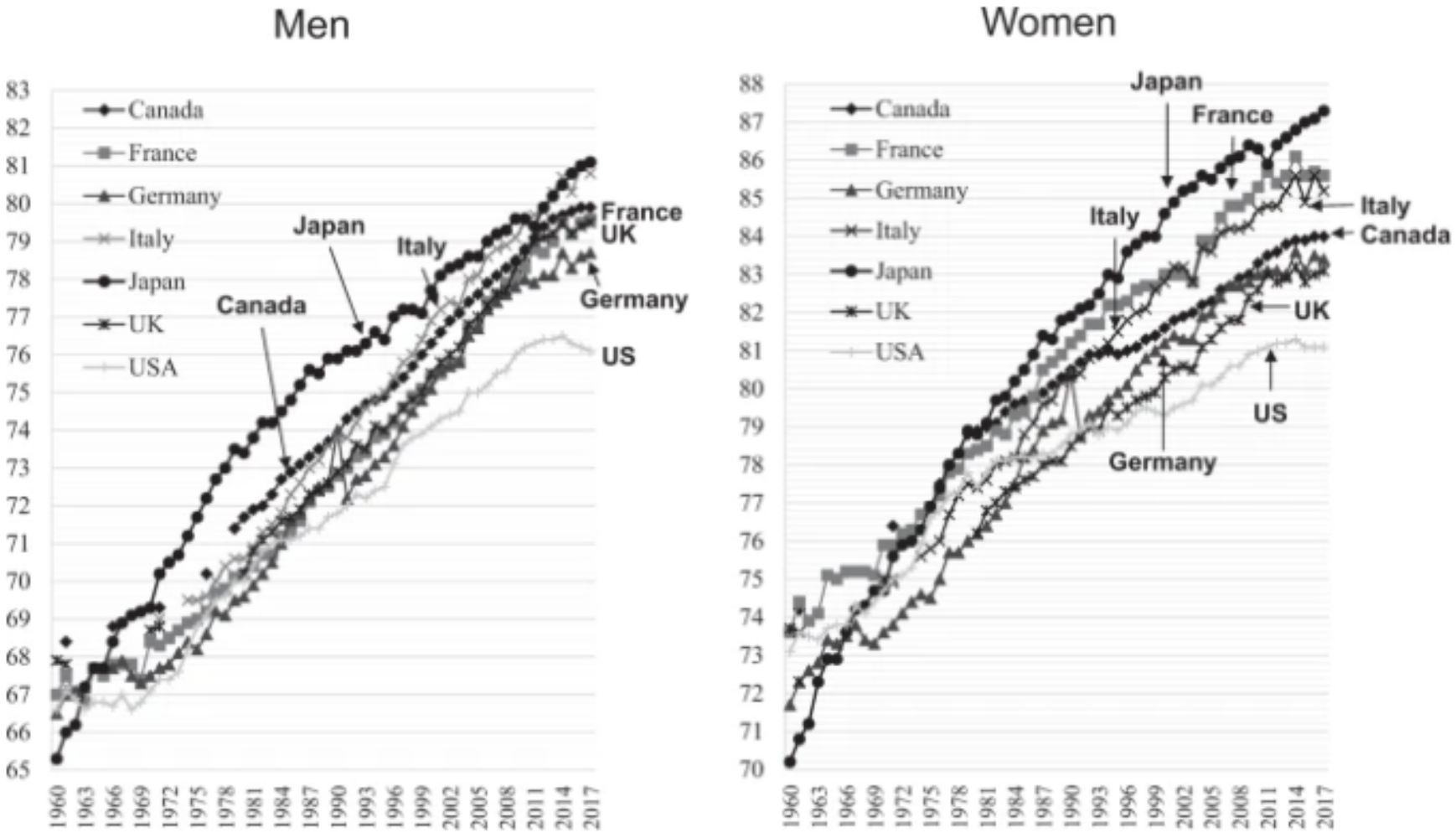


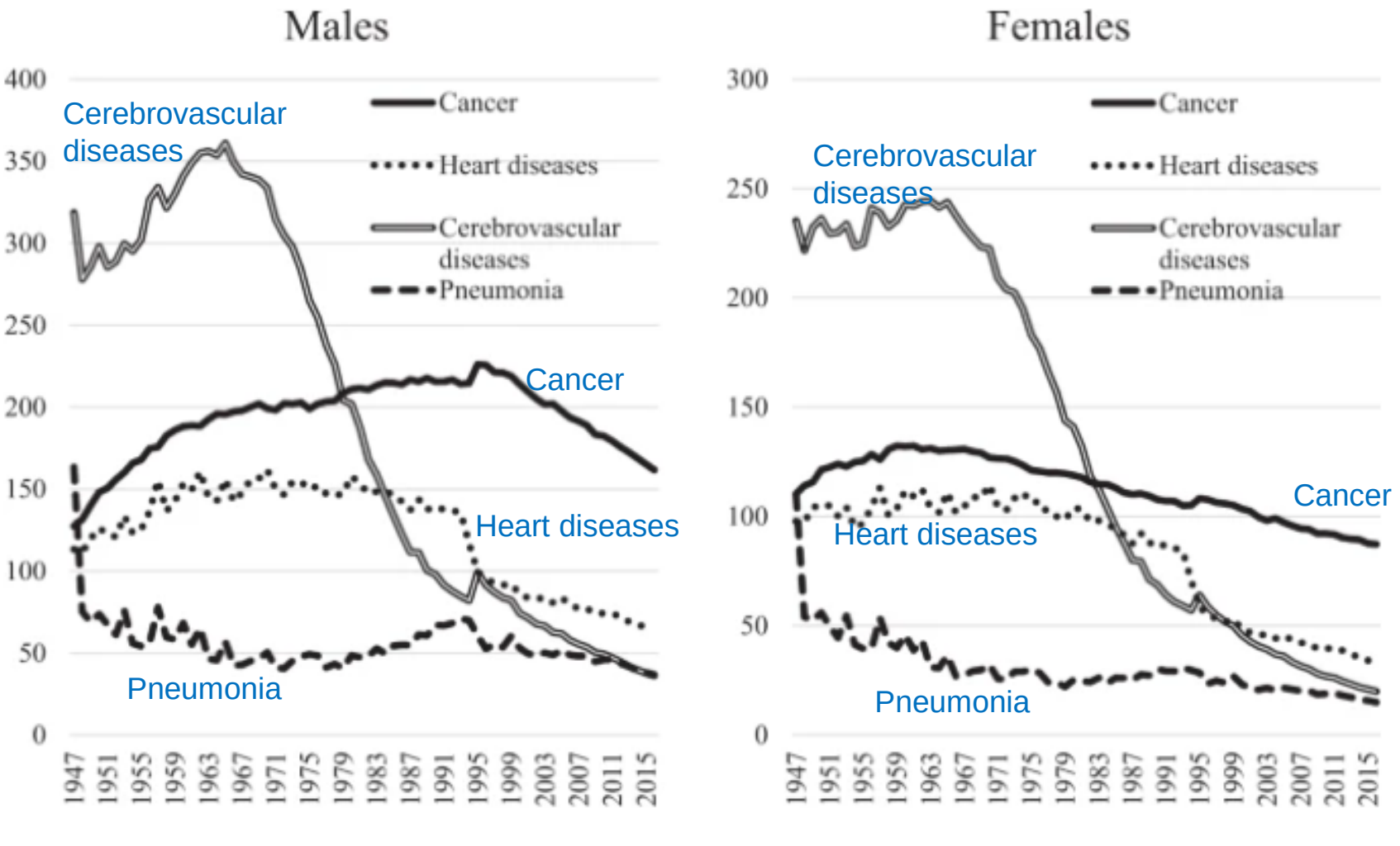
Fig. 1: Annual trends of life expectancy at birth (years) in selected countries.



The figure was prepared by the author using datafrom "OECD Health Statistics 2019" (https://www.oecd.org/health/health-data.htm).

Tsugane, S. *Eur. J. Clin. Nutr.* 75, 921-928 (2021)

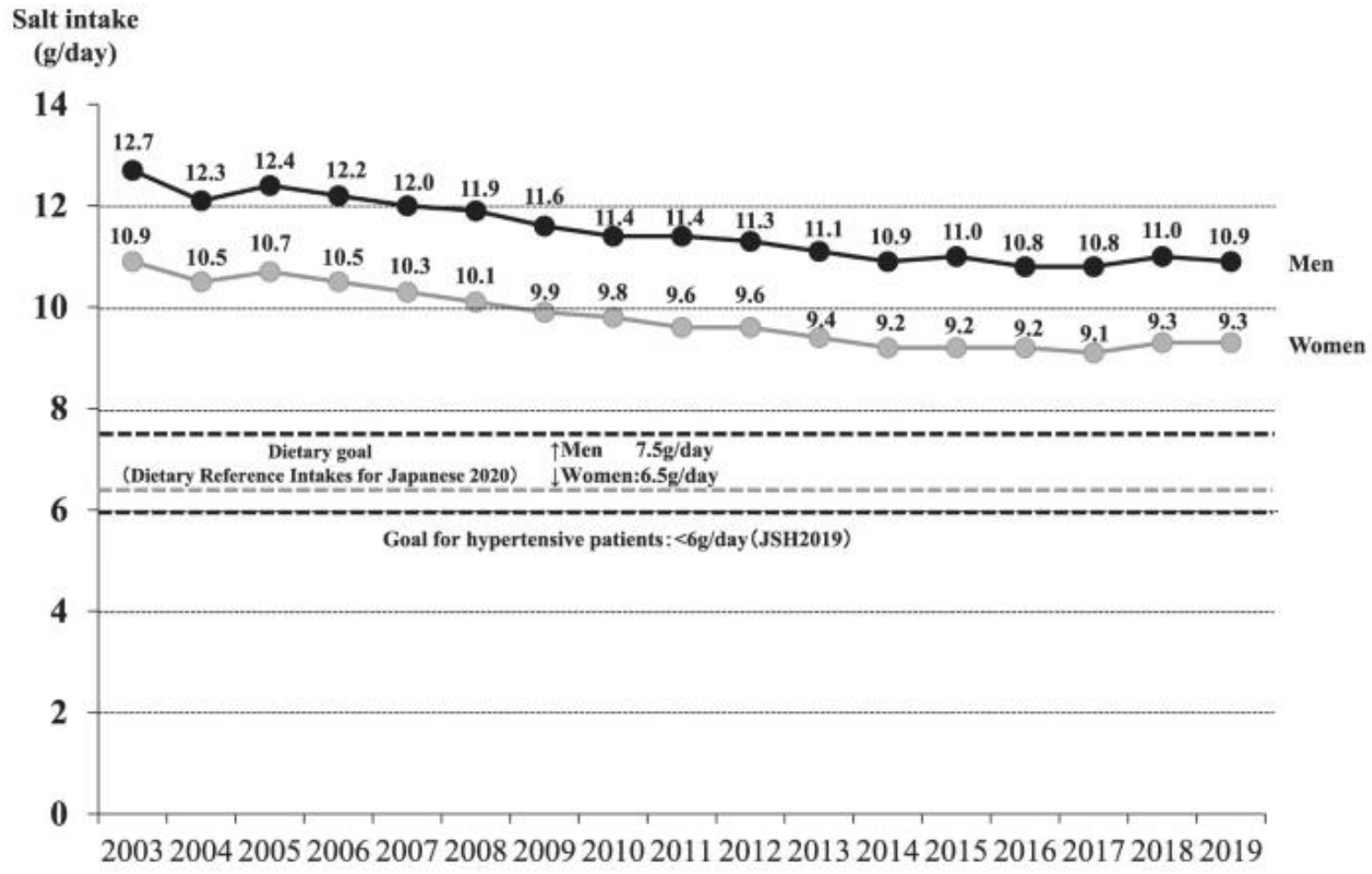
Fig. 4: Annual trends in age-standardized mortality rate per 100,000 Japan 1985 model population for leading causes of death.



Tsugane, S. *Eur. J. Clin. Nutr.* 75, 921-928 (2021)

Trends of Salt Intake in Japan

Fig. 1



Trends of salt intake in Japan. Report from the National Health and Nutrition Survey in Japan [12]

Tsuchihashi, T. *Hypertens. Res.* 45, 748-757 (2022)

Tokyo Declaration Promoting Salt Reduction by the Japanese Society of Hypertension (2019)

Fig. 3

Tokyo Declaration Promoting Salt Reduction by the Japanese Society of Hypertension-the JSH Tokyo Declaration [24]

Policies and Actions in Japan

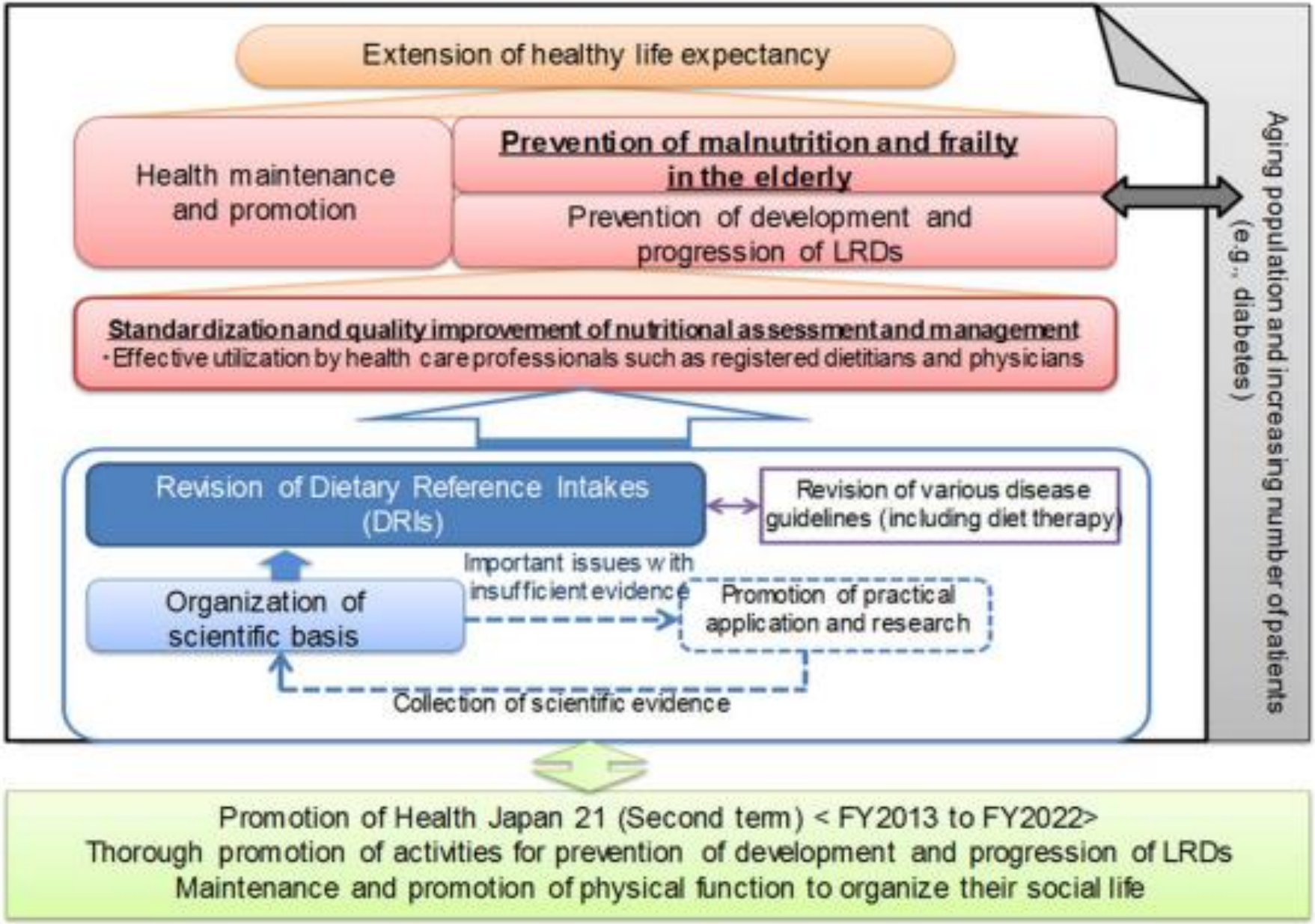
- National Health and Nutrition Survey [1)]
- Dietary Reference Intakes (DRI) [1)]
- Health Japan 21 [1)]
- Special Health Checkups and Special Health Guidance [1)]
- Dietary Guidelines for Japanese [1,2)]
- Food and Nutrition Education (Shokuiku) [1-4)]
- FOSHU (Food for Specified Health Uses) [1,5)]
- Food with Functional Claims[5)]
- Strategic Initiative for a Healthy and Sustainable Food Environment[1)]

(1) Ministry of Health, Labour and Welfare
(2) Ministry of Agriculture, Forestry and Fisheries
(3) Cabinet Office
(4) Ministry of Education, Culture, Sports, Science and Technology
(5) Consumer Affairs Agency

Policies and Actions in Japan

- National Health and Nutrition Survey (1947-)
- Dietary Reference Intakes (DRI) (1970- , now 2020 version)
- Health Japan 21 (2000-, now the 2nd term)
- Special Health Checkups and Special Health Guidance (2008-)
- Dietary Guidelines for Japanese (2005-)
- Food and Nutrition Education (Shokuiku) (2005 enacted by Law)
- FOSHU (Food for Specified Health Uses) (1991-)
- Food with Functional Claims (2015-)
- Strategic Initiative for a Healthy and Sustainable Food Environment (2021-)

Basic concepts of DRIs for Japanese (2020)

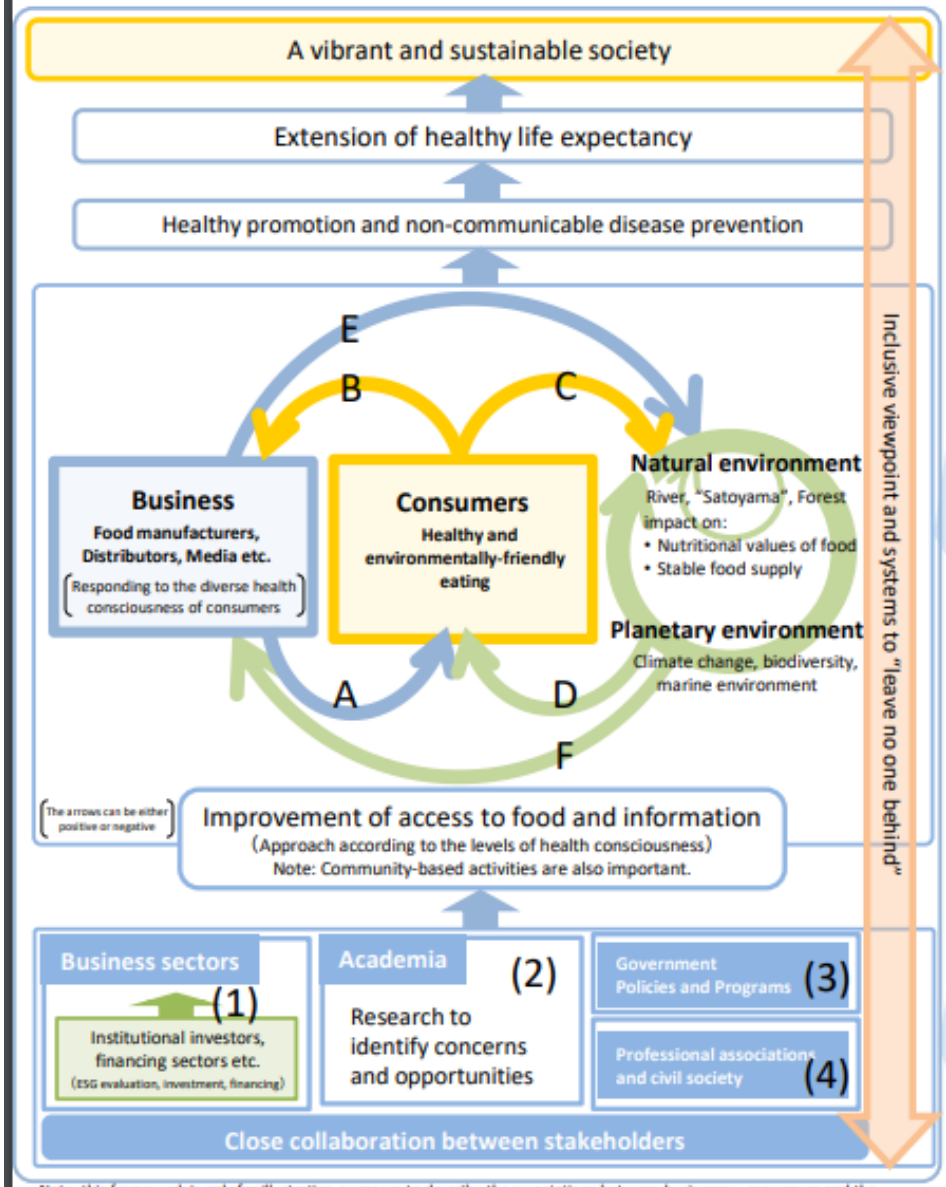


Purposes and types of nutrition indices

< Purpose >	< Type >
Avoidance of inadequacy	EAR, RDA * Alternative index where EAR and RDA cannot be determined: AI
Avoidance of adverse health effects due to excessive intake	UL
Prevention of life-style related diseases (LRDs)	DG

EAR: Estimated Average Requirement
RDA: Recommended Dietary Allowance
AI: Adequate Intake
UL: Upper Intake Level
DG: Dietary Goal (Fat, Carbohydrate, Salt, Fiber)

Framework of the current initiative for promoting a healthy and sustainable food environment



Note: this framework is only for illustration purposes to describe the associations between businesses, consumers and the environment, and does not intend to illustrate the physical placement of these actors.

Cycle around actions by businesses and consumers

A. Businesses to consumers

- Developing and mainstreaming healthier and environmentally friendly products
- Providing healthy food at affordable prices to address nutritional disparities
- Supporting behavioral change by providing information

B. Consumers to businesses

- Increasing the use of healthier and environmentally friendly products
- Improving the image of participating businesses

Cycle around consumers' actions and the environment

C. Consumers to the environment

- Practicing environmental conservation activities in daily life, including diet

D. The environment to consumers

- Reducing the risk of natural disasters
- Improving the quality of life in its various aspects, including health

Cycle around businesses' actions and the environment

E. Businesses to the environment

- Developing and mainstreaming healthier and environmentally friendly products
- Acceleration of other environmental conservation efforts

F. The environment and business

- Stable procurement of raw materials
- Reduced risk of natural disasters

Main actions expected from each sector

(1) Business sectors

- Food manufacturers: Development and mainstreaming of healthier and environmentally friendly products as well as company-wide commitment to nutritional and environmental issues
- Food distributors: Sales promotion of the above products
- Media: Provision of information on how to practice healthier and sustainable diets

(2) Academia

- Research to improve the food environment from a neutral position
- Appropriate support for the business sectors and provision of appropriate information to consumers
- Training of professionals such as dietitians who will play a key role

(3) Government (Ministry of Health, Labour and Welfare)

- Development of overall program and coordination among stakeholders
- Improvement of the environment for promoting health/nutrition research

(4) Professional associations and civil society

- Constructive suggestions to businesses and appropriate mediation between consumers and industry

https://www.mhlw.go.jp/stf/shingi/newpage_19522.html Chair: Prof. Yukari Takemi

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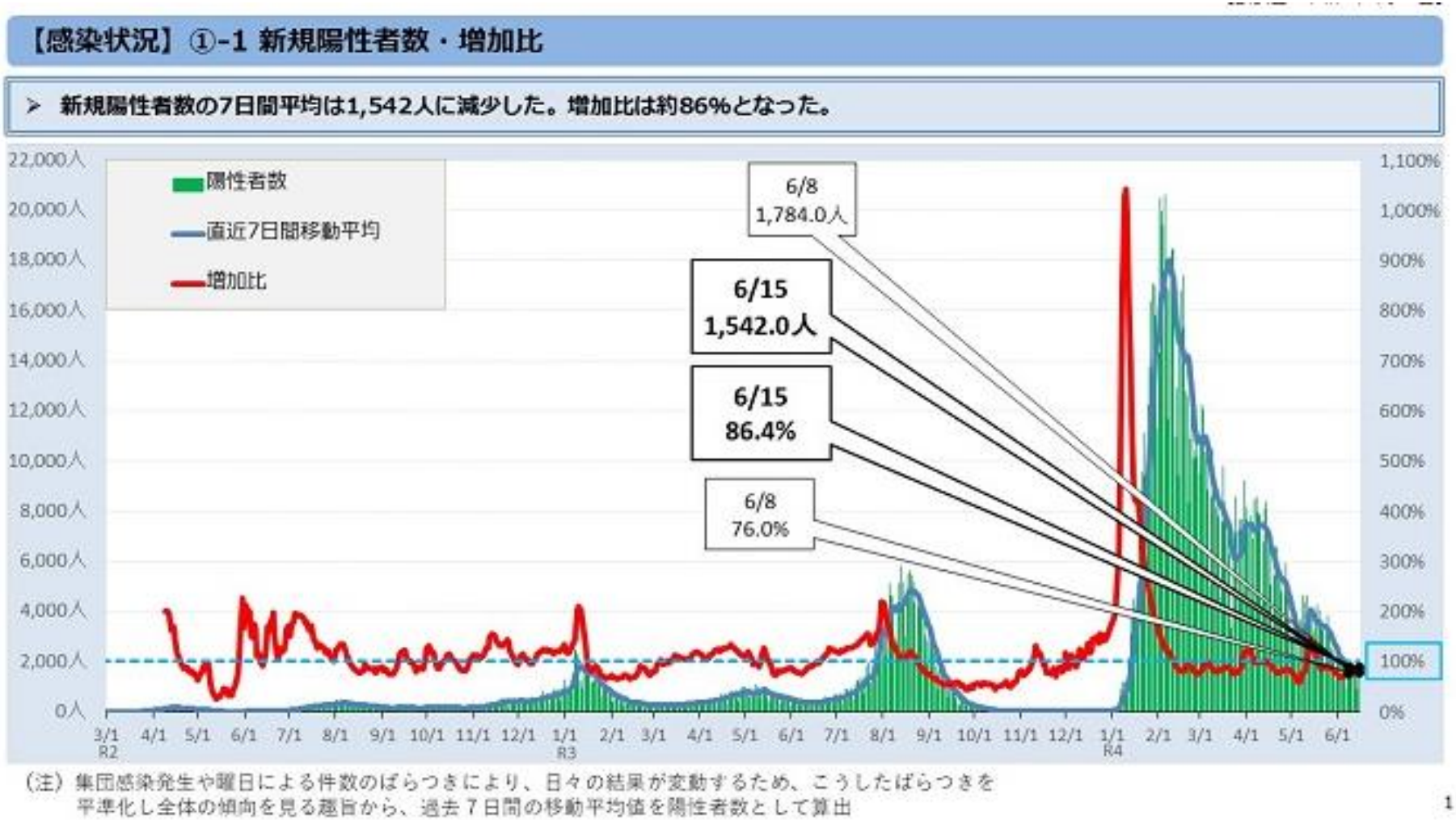
No. of Confirmed Cases and Rate of Increase in Tokyo

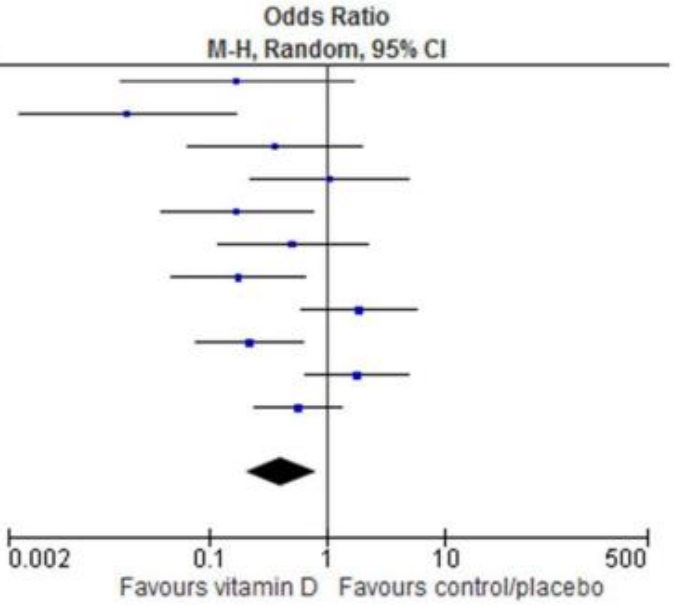


（注）集団感染発生や曜日による件数のばらつきにより、日々の結果が変動するため、こうしたばらつきを平準化し全体の傾向を見る趣旨から、過去７日間の移動平均値を陽性者数として算出

Vitamin D Intervention and COVID-19 Mortality and Severity Rates

Study or Subgroup	Vitamin D Events	Vitamin D Total	Control/Placebo Events	Control/Placebo Total	Weight	Odds Ratio M-H, Random, 95% CI
Jevalikar et al. (2021)	1	128	3	69	5.6%	0.17 [0.02, 1.70]
Entrenas Castillo et al. (2020)	1	50	13	26	6.1%	0.02 [0.00, 0.17]
Lakkireddy et al. (2021)	2	44	5	43	7.8%	0.36 [0.07, 1.98]
Hernandez et al. (2020)	2	19	20	197	8.5%	1.04 [0.22, 4.84]
Annweiler C et al. (2020)	10	57	5	9	8.8%	0.17 [0.04, 0.75]
Annweiler G et al. (2020)	3	16	10	32	8.9%	0.51 [0.12, 2.19]
Cangiano et al. (2020)	3	20	39	78	9.6%	0.18 [0.05, 0.65]
Murai et al. (2021)	9	119	5	118	10.6%	1.85 [0.60, 5.69]
Alcala-Diaz et al. (2021)	4	79	90	458	11.0%	0.22 [0.08, 0.61]
Cereda et al. (2021)	7	18	40	152	11.1%	1.78 [0.65, 4.91]
Giannini et al. (2021)	14	36	29	55	12.0%	0.57 [0.24, 1.34]
Total (95% CI)		**586**		**1237**	**100.0%**	**0.41 [0.20, 0.81]**
Total events	56		259			

Heterogeneity: $Tau^2 = 0.85$; $Chi^2 = 29.42$, df = 10 (P = 0.001); $I^2 = 66\%$
Test for overall effect: Z = 2.56 (P = 0.01)



- Pai R et al. Vitamin D supplementation and clinical outcomes in COVID-19: a systematic review and meta-analysis. *J Endocrinol Invest* 2022; 45: 53–68

Immuno-modulating food factors: protein, Arg, omega-3 FA, Zn, vitamins A, D, C, etc.

Japan Society of Nutrition and Food Science
公益社団法人 日本栄養・食糧学会

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修正・新規集録用語
組織英文名称（PDF）

データベース

ホーム > お知らせ > 新型コロナウイルス感染症への栄養面での対処～日本栄養・食糧学会からのお願い～

新型コロナウイルス感染症への栄養面での対処～日本栄養・食糧学会からのお願い～

新型コロナウイルス感染症の拡大は留まることなく続き、医療崩壊が危惧されることを踏まえ、政府は緊急事態宣言によって、対象となる自治体の感染拡大を抑止し、感染者の治療体制の再構築を図ることを決めました。今後も外出の自粛が続き、長く住居内で過ごさざるをえず、栄養状態の悪化が懸念されます。これを防ぐために、以下のことに注意をお願いします。

正確な情報に基づく適切な行動を

日常の食糧需給体制は確保されています
言飛語に惑わされず、正確な情報に基づ
た場合、その都度正しい情報を発信致し

食事前の手洗い・消毒を励行する

新型コロナウイルスの主要な感染経路は
する事例の報告はありません。しかし、
す。食事前には、手洗い・消毒を心がけ
てください。

Japan Society of Nutrition and Food Science (JSNFS) "Nutritional Tips for New Coronavirus Infections - Petitions from JSNFS"

規則正しい生活の中でバランスのよい食事を摂る

一日中家の中で生活することによって、食事を摂る時間が乱れることが想定されます。朝食を抜き、夕食が遅くなるなど、食事の時間帯が不規則になりがちです。食材も調理の必要のない出来合いのものやインスタント食品を選びがちになります。このことによって、揚げ物が増え、食物繊維が不足するなど、栄養のバランスを崩すことになります。とりわけ、学校給食が無くなると子どもたちでは、お菓子などの間食が増え、運動不足から体重が増加することも心配されます。規則正しい食事時間と栄養素のバランスをとるよう心がけて下さい。糖尿病などの生活習慣病をお持ちの方に、特に注意が必要です。

高齢者のフレイルを予防する

Japan Society of Nutrition and Food Science (JSNFS) "Nutritional Tips for New Coronavirus Infections - Petitions from JSNFS"

- Take appropriate action based on accurate information
- Encourage hand washing and disinfection before meals
- Eat a well-balanced diet with regularity
- Prevent frailty in elderly
- Others

Details

By living in the house all day, it is expected that meal times will be disrupted Meal times tend to be irregular, with breakfast skipped and dinner eaten late. Foods tend to be ready-made or instant foods that do not require cooking. This leads to an increase in fried foods, lack of dietary fiber, and other nutritional imbalances. In particular, when school lunches are eliminated, children tend to snack on sweets and other snacks, which may lead to weight gain due to lack of exercise. Please make sure to maintain regular meal times and a good balance of nutrients. Special attention should be paid to those with lifestyle-related diseases such as diabetes.

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PRECISION NUTRITION

Definition?

Personalized nutrition depending on not only characteristics but also condition at the moment of each individual such as:

age, life-stage, gender, genome, epigenome, microbiota,

sleep, rest, exercise, activity, circadian rhythm,

constitution, hormonal factors, clinical history, stress,

mental condition, dietary history, food preference

"Doctors have always recognized that every patient is unique, and doctors have always tried to tailor their treatments as best they can to individuals. You can match a blood transfusion to a blood type — that was an important discovery. What if matching a cancer cure to our genetic code was just as easy, just as standard? What if figuring out the right dose of medicine was as simple as taking our temperature?"

- President Obama, January 30, 2015 State of the Union address

ELSEVIER

Current Opinion in Biotechnology

Volume 44, April 2017, Pages 103-108

Precision nutrition — review of methods for point-of-care assessment of nutritional status

Balaji Srinivasan [1, 2], Seoho Lee [3], David Erickson [1, 2, 3] ✉, Saurabh Mehta [1, 2] ✉

[1] Institute for Nutritional Sciences, Global Health, and Technology (INSiGHT), USA

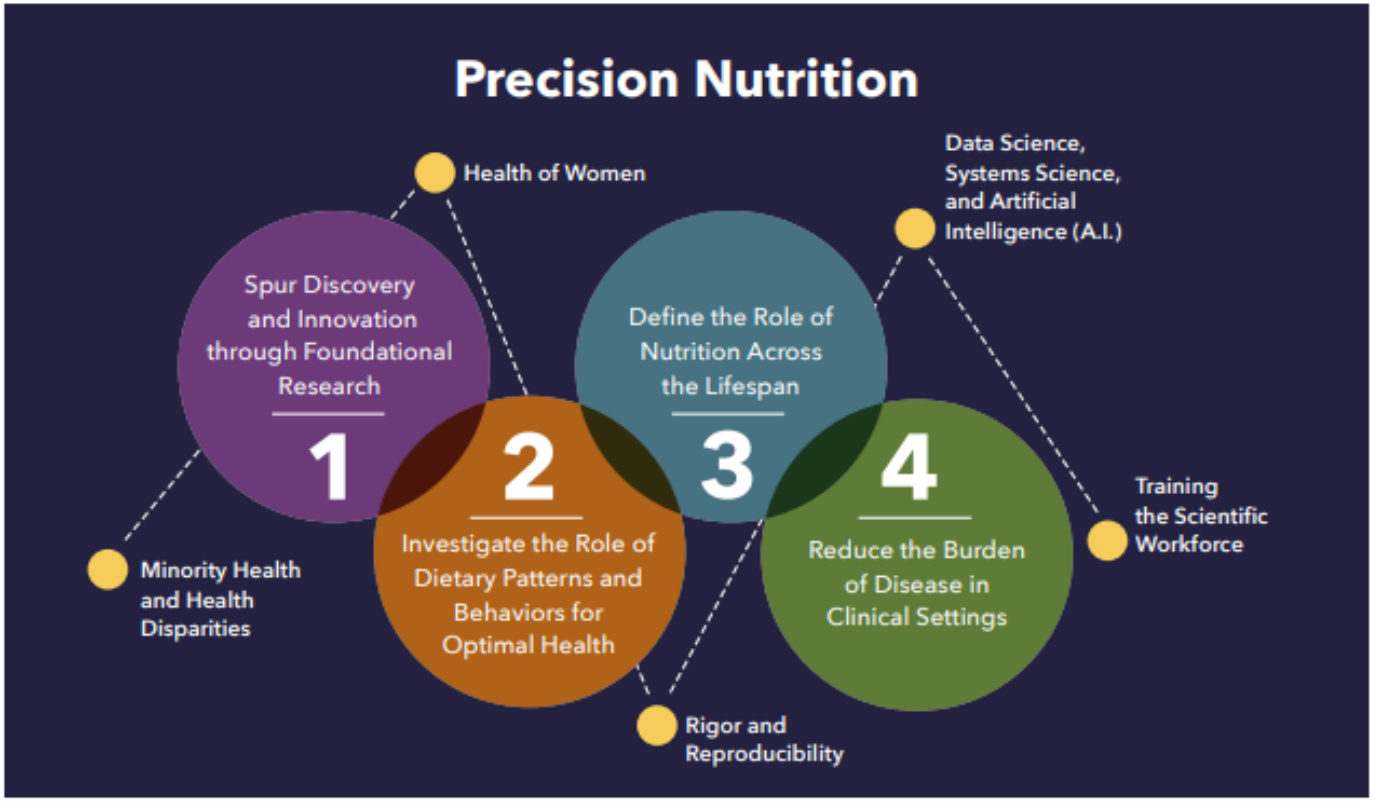
[2] Division of Nutritional Sciences, Cornell University, Ithaca, USA

[3] Sibley School of Mechanical and Aerospace Engineering, Cornell University, Ithaca, USA

Available online 30 December 2016.

Media Advisory Wednesday, May 27, 2020

NIH releases strategic plan to accelerate nutrition research over next 10 years



This Plan is organized around a central unifying vision of Precision Nutrition research. Progress in each of the four Strategic Goals, as well as the five Cross-Cutting Research Areas, are essential to achieve this vision.

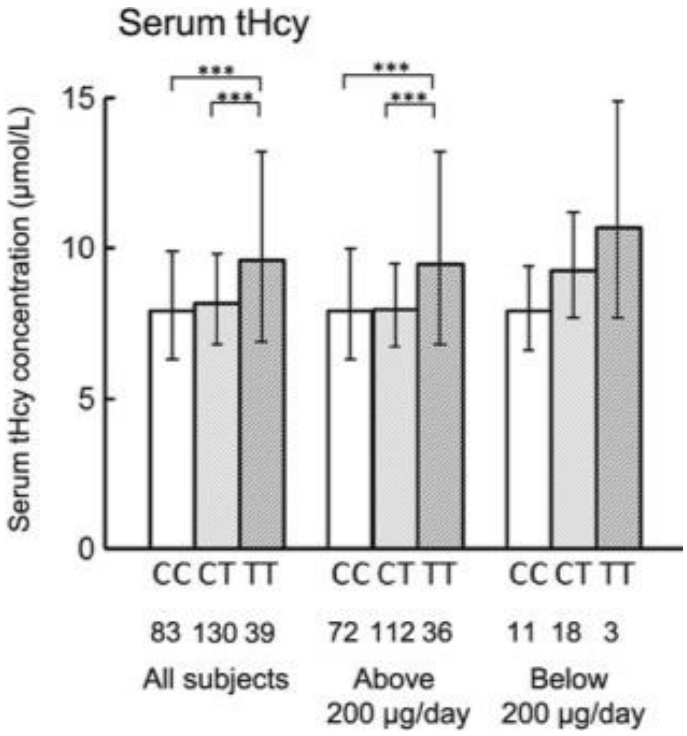
Some Examples

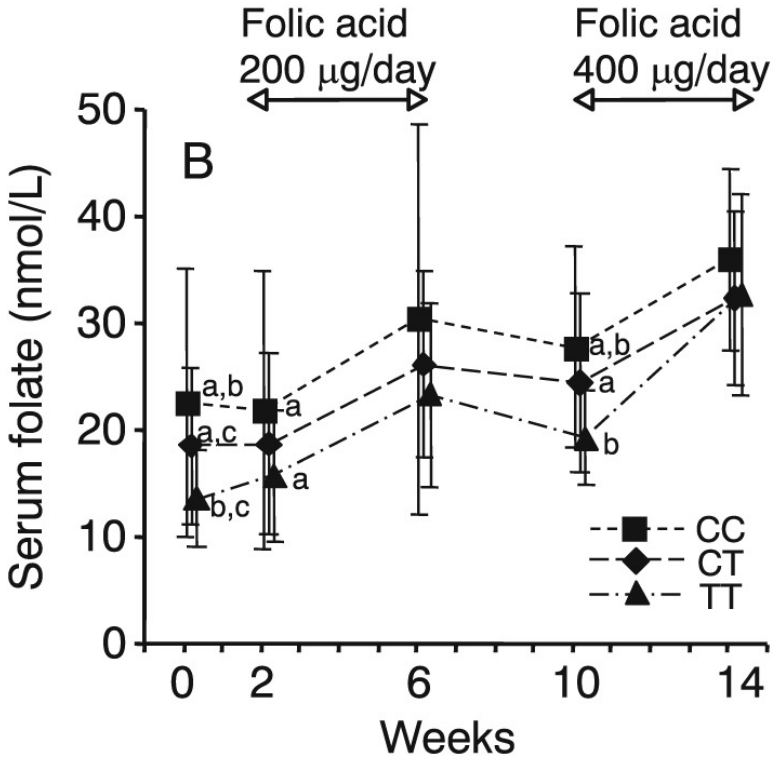
Genome and Epigenome

An Example of Nutrition-Related SNPs (single nucleotide polymorphisms)

Homocysteine (Hcy): a risk factor for atherosclerosis, cardiovascular disease, stroke, and cognitive impairment

MTHFR: A folate metabolizing enzyme and its TT genotype results in higher total Hcy with lower serum folate

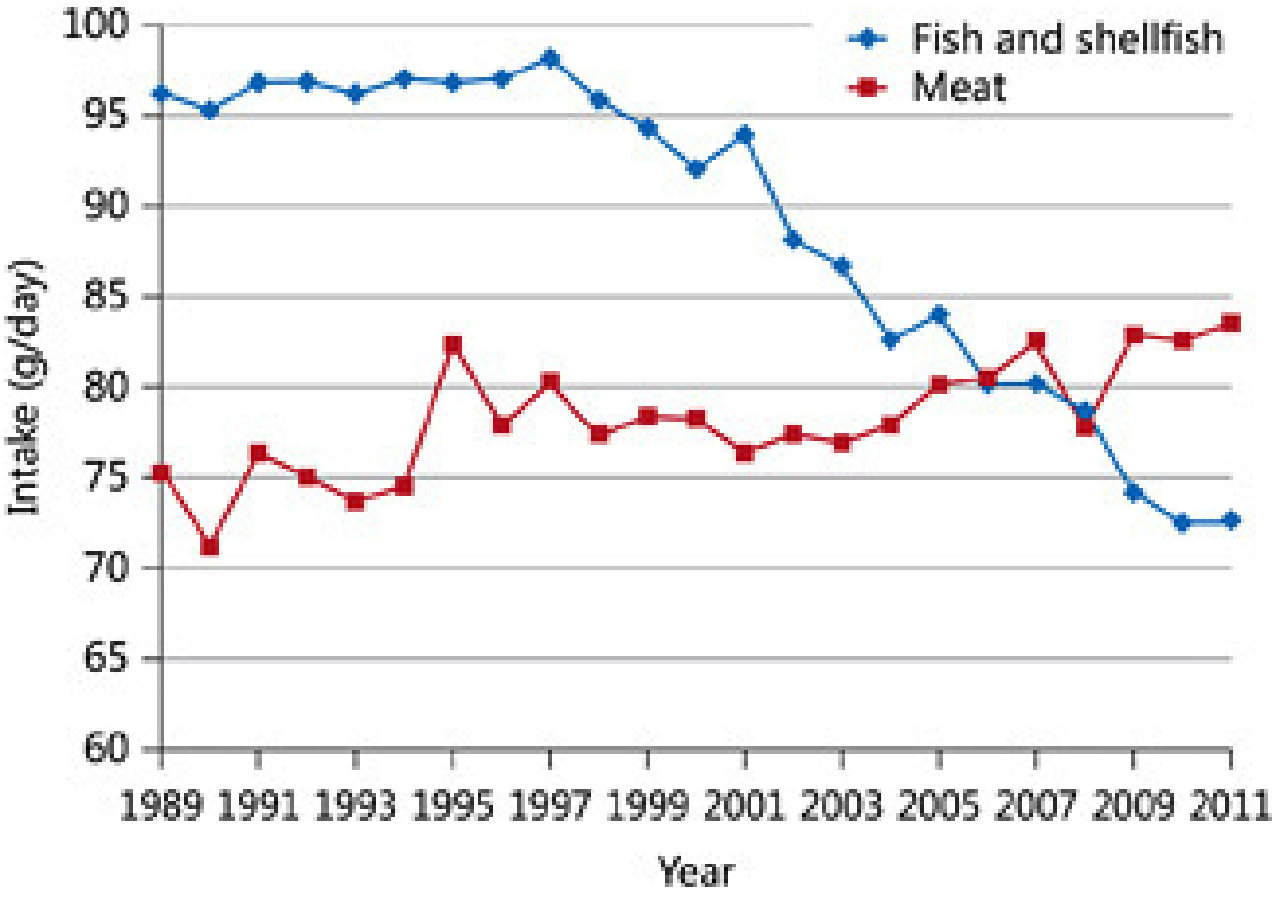




Hiraoka M, Kagawa Y. et al., Biochem Biophys Res Commun 316:1210–1216 (2004)

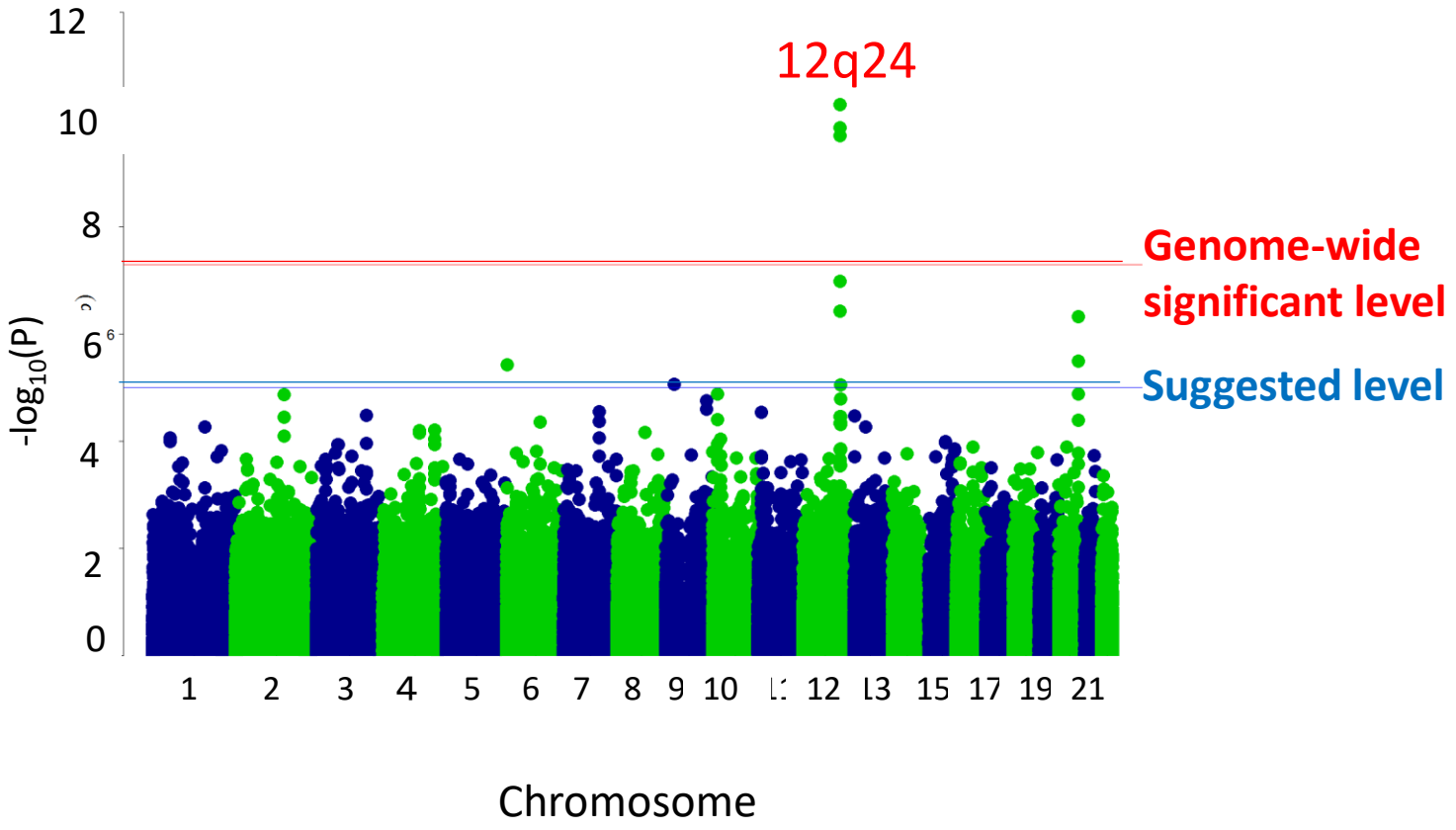
Decreasing Consumption of Fish in Japanese Population

Ministry of Health, Labour, and Welfare, Japanese Government



Koletzko, BV, et al, Annals Nutr. Metab. 65, 49-80 (2014)

Genome Wide Association Study of Fish Consumption



We discovered SNPs associated with fish intake frequency

Igarashi *et al. Genes & Nutrition* (2019) 14:21
https://doi.org/10.1186/s12263-019-0646-6

Genes & Nutrition

RESEARCH Open Access

Identification of the 12q24 locus associated with fish intake frequency by genome-wide meta-analysis in Japanese populations

Maki Igarashi[1,2], Shun Nogawa[3], Kaoru Kawafune[3], Tsuyoshi Hachiya[3,4], Shoko Takahashi[3], Huijuan Jia[1], Kenji Saito[1,3] and Hisanori Kato[1*]

Abstract

Background: Japan is traditionally a country with one of the highest levels of fish consumption worldwide, although the westernization of the Japanese diet has resulted in the reduction of fish consumption. A recent meta-analysis of genome-wide association studies (GWASs) on Western populations has identified a single nucleotide polymorphism (SNP) associated with fish intake frequency. Here, we examined the genetic basis for fish intake frequency among Japanese individuals.

Results: We conducted a meta-analysis of a GWAS including 12,603 Japanese individuals and identified a susceptibility locus for fish intake frequency at 12q24 (lead variant was rs11066015, $P = 5.4 \times 10^{-11}$). rs11066015 was in a strong linkage disequilibrium with rs671, a well-known SNP related to alcohol metabolism. When adjusted for alcohol drinking, the association between rs11066015 and fish intake frequency was substantially attenuated. Subgroup analysis revealed that the effect of the 12q24 variant on fish intake frequency was stronger in males than in females (P for interaction = 0.007) and stronger in the older subgroup than in the younger subgroup (P for

and sweet taste preference.

Journal of Human Genetics (2020) 65:939–947
https://doi.org/10.1038/s10038-020-0787-x

ARTICLE

Strong association between the 12q24 locus and sweet taste preference in the Japanese population revealed by genome-wide meta-analysis

Kaoru Kawafune[1] · Tsuyoshi Hachiya[1,2] · Shun Nogawa[1] · Shoko Takahashi[1] · Huijuan Jia[3] · Kenji Saito[1,3] · Hisanori Kato[3]

Received: 29 July 2019 / Revised: 7 May 2020 / Accepted: 7 May 2020 / Published online: 22 June 2020

Abstract

The sweet taste preference of humans is an important adaptation to ensure the acquisition of carbohydrate nutrition; however, overconsumption of sweet foods can potentially lead to diseases such as obesity and diabetes. Although previous studies have suggested that interindividual variation of human sweet taste preference is heritable, genetic loci associated with the trait have yet to be fully elucidated. Here, we genotyped 12,312 Japanese participants using the HumanCore-12+ Custom BeadChip or the HumanCore-24 Custom BeadChip microarrays. The sweet taste preference of the participants was surveyed via an internet-based questionnaire, resulting in a five-point scale of sweet taste preference. The genome-wide meta-analysis of the Japanese participants revealed a strong association between the 12q24 locus and sweet taste preference scale ($P = 2.8 \times 10^{-70}$). The lead variant rs671 is monoallelic in non-East Asian populations and is located in the aldehyde dehydrogenase (*ALDH2*) gene, encoding an enzyme involved in alcohol metabolism. The association between the minor allele of rs671 and sweet taste preference was attenuated by adjusting for alcohol drinking. The subgroup analysis showed that the effect of rs671 on sweet taste preference was greater in males than in females. In conclusion, we found an association between the 12q24 locus and sweet taste preference in the Japanese population, and showed that the adjustment for drinking

Male

12q24

rs671 ?? ??

9 times/year↓

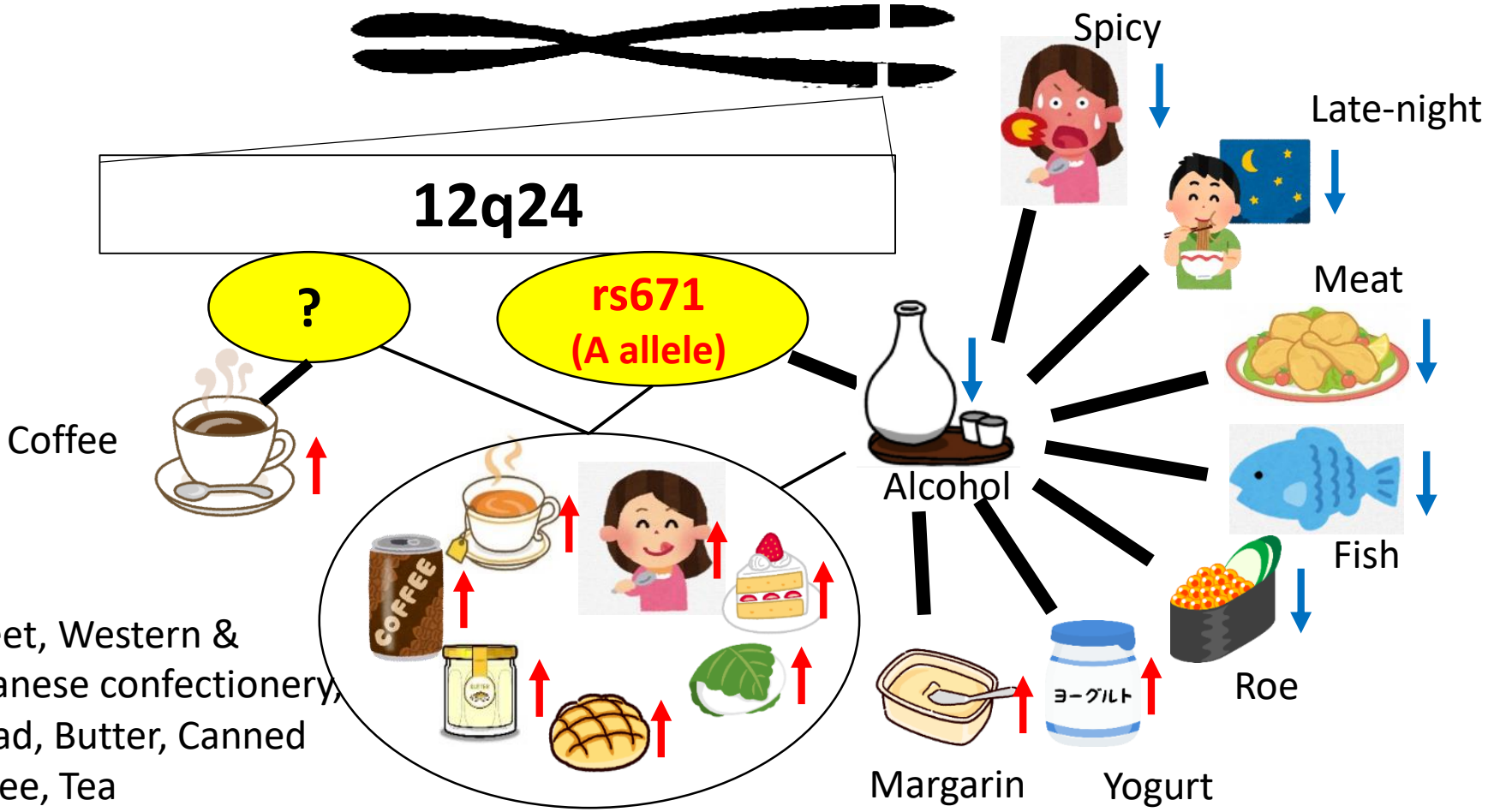
Like

15 cups/year↑ 92 cups/year ↑

7q21

52 cups/year↑

Association between 12q24 and dietary behaviors or preferences

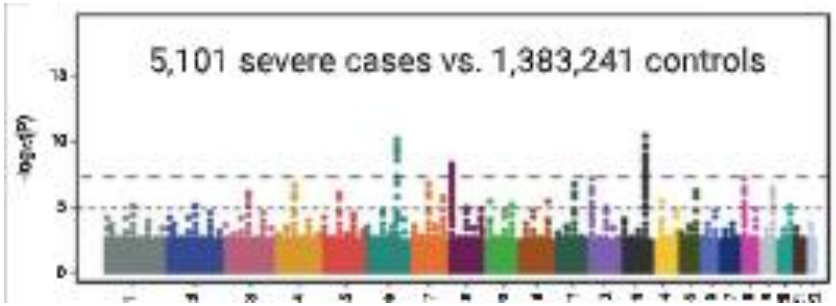


Cell Systems

Multiomic analysis reveals cell-type-specific molecular determinants of COVID-19 severity

Highlights

- Machine learning combines GWAS with single-cell omics to discover COVID-19 risk genes
- The discovered severe COVID-19 risk genes account for 77% of the observed heritability
- Genetic risk for severe COVID-19 is focused within NK cells and T cells
- Mendelian randomization and single-cell multiomics highlight CD56^{bright} NK cells



Authors

Sai Zhang, Johnathan Cooper-Knock, Annika K. Weimer, ..., Mark M. Davis, Philip S. Tsao, Michael P. Snyder

Correspondence

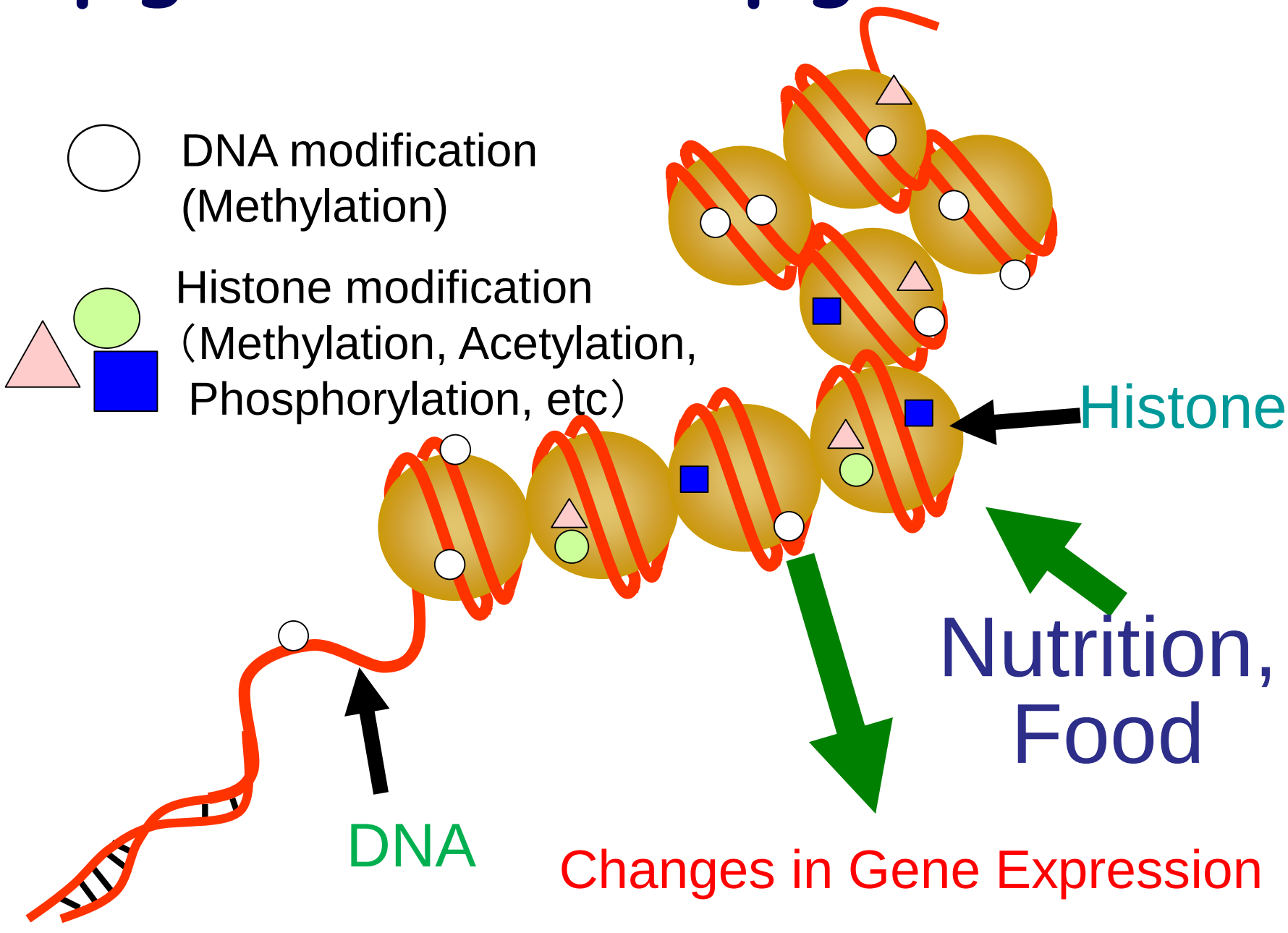
ptsao@stanford.edu (P.S.T.), mpsnyder@stanford.edu (M.P.S.)

In brief

Zhang et al. apply a machine learning method that integrates single-cell multiomics with GWAS summary statistics for gene discovery. Application to severe COVID-19 identifies >1,000 risk genes, which account for 77% of the observed heritability. Genetic risk is focused within NK cells, CD56^{bright} cytokine-producing NK cells in particular, highlighting the dysfunction of these cells as a determinant of severe disease.

Zhang et al., Cell Systems 13 August 17, 2022
https://doi.org/10.1016/j.cels.2022.05.007 (available online)

Epigenetics and Epigenomics



The Concept of Developmental Origins of Adult Health & Disease (DOHaD)

Under or Over Nutrition

Endocrine Disorders

Psychological Stress

Critical Periods During Development

Epigenetic Alterations (Programming)

Lifelong Metabolic Changes

Adult Environment

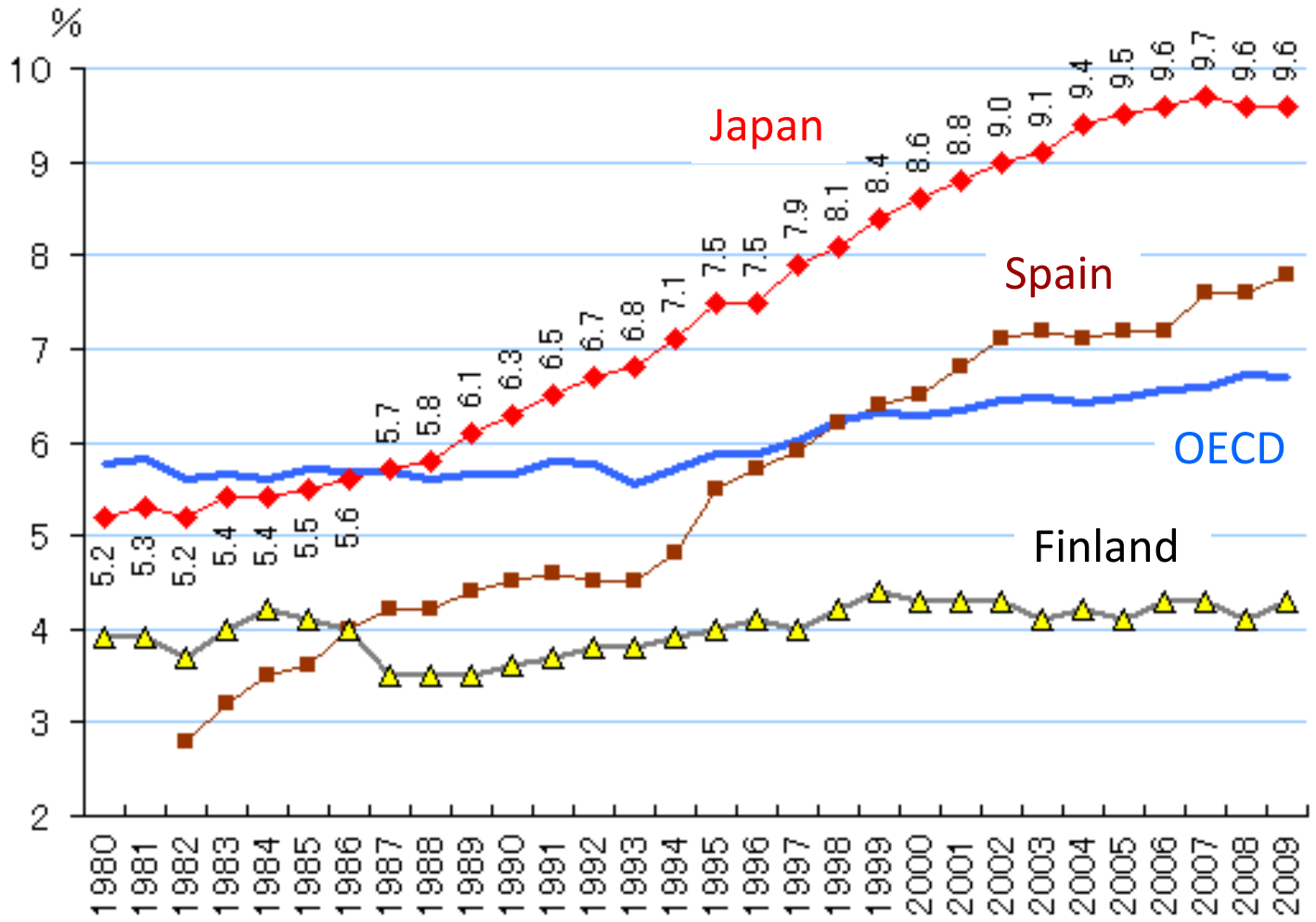
Genetic Factors

Increased Risk for Cardiovascular and Metabolic Diseases

"Nutrition during Pregnancy Has Impact on Baby's Health for Long Time"

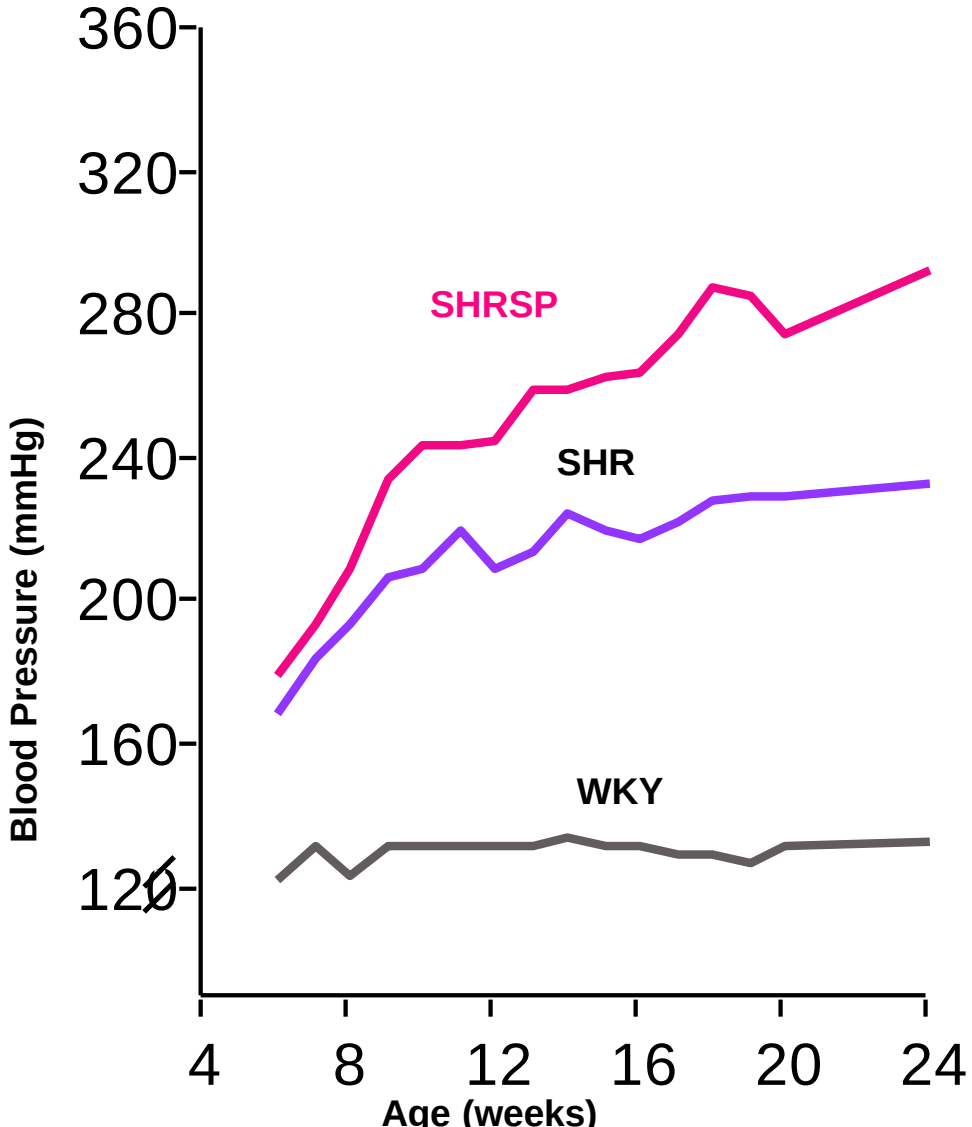
Increase in Underweight Newborn in Japan

Low birth weight infant; <2,500 g

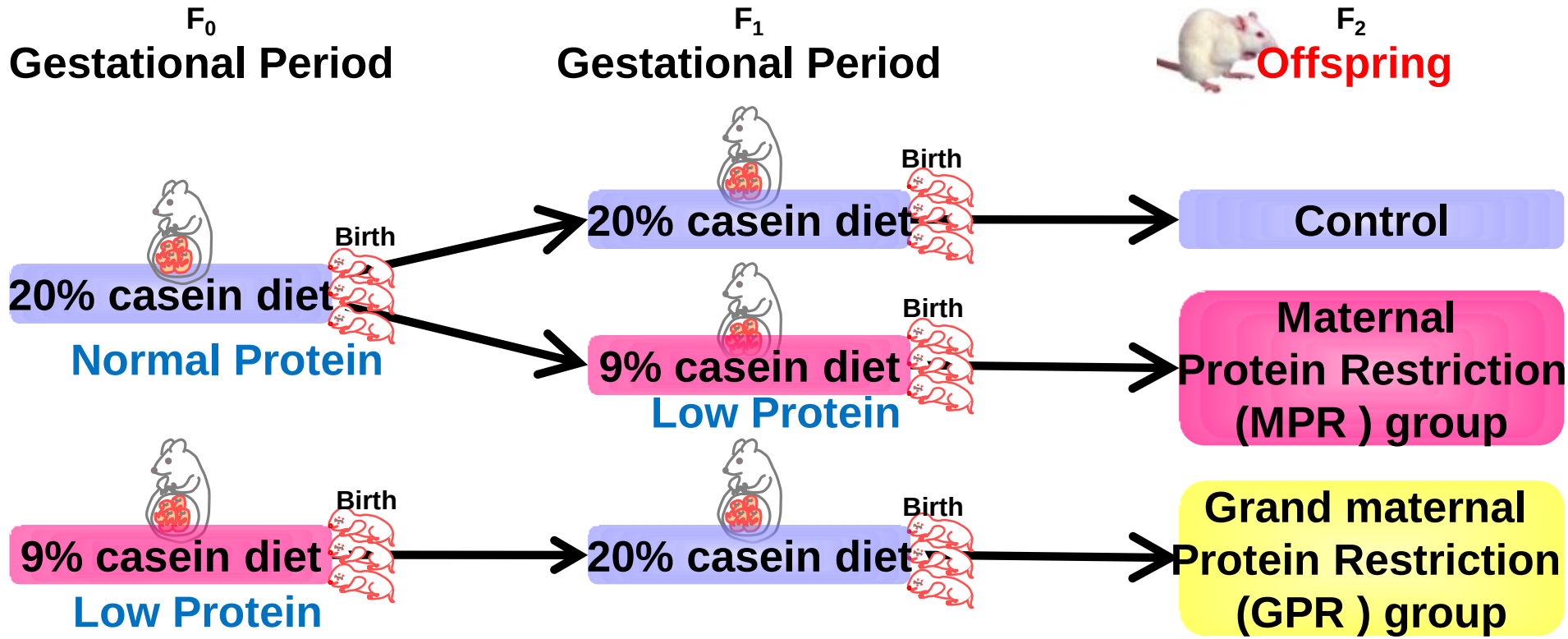


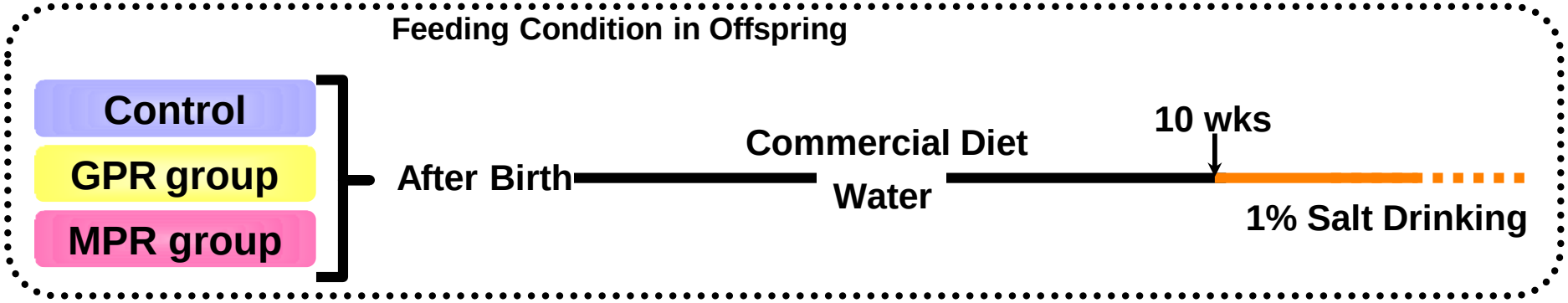
出典）http://www2.ttcn.ne.jp/~honkawa/2246.html

Spontaneously Hypertensive Stroke-Prone Rats (SHRSP)

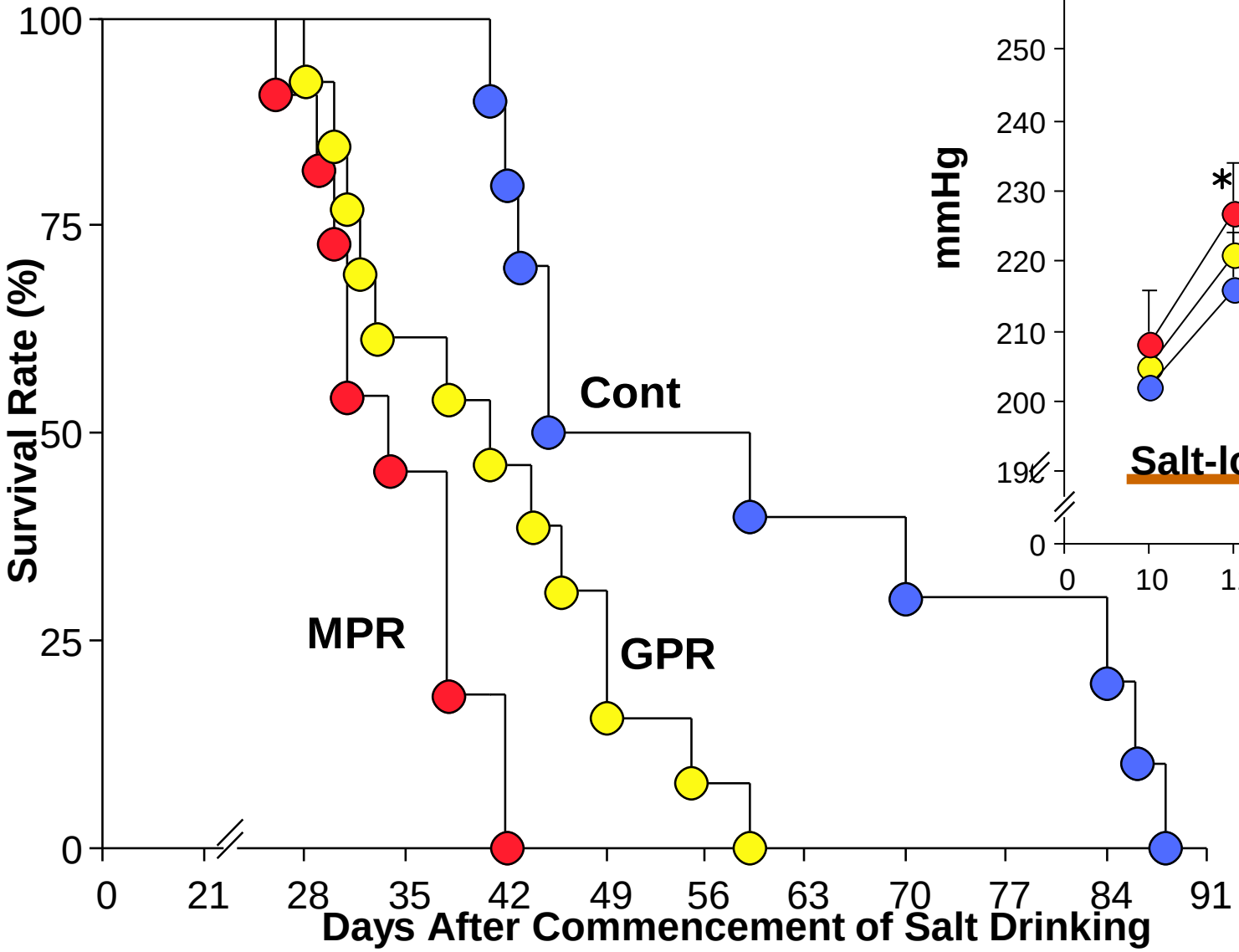


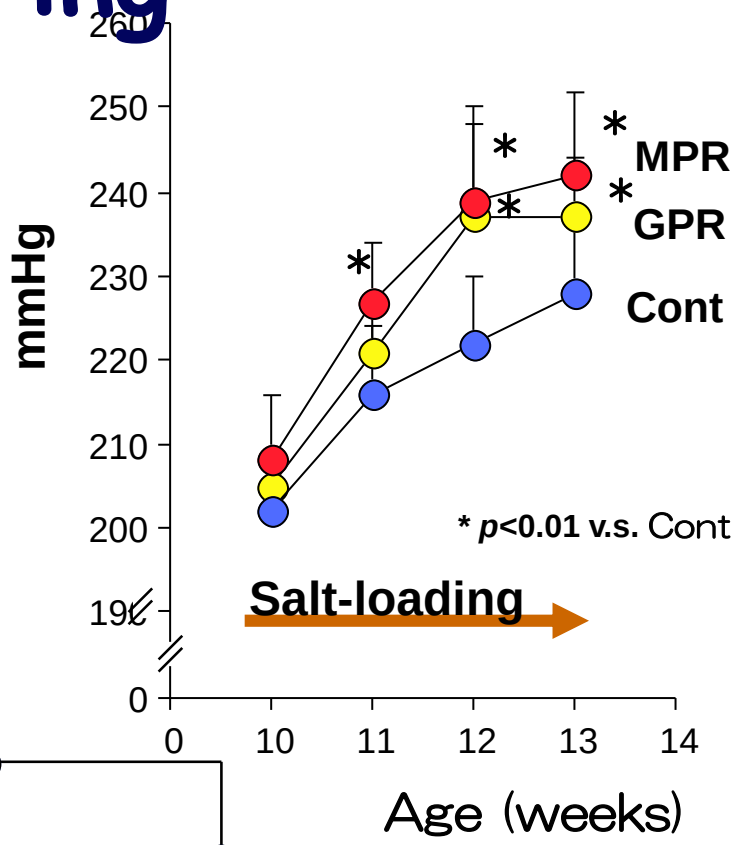
Protein Malnutrition during Pregnancy





Survival Rates and Blood Pressure of Offspring





Methylome Analysis (11 weeks)

(genome-wide DNA methylation analysis by NGS)

Methylome analysis of kidney DNA revealed that maternal protein restriction affected methylation of around 1000 regions, the vicinity of which contained 23 genes.

Genes Differentially Methylated

No.	Chr.	Feature	Description	Orientation	#
1	1	*Irx2*	Iroquois related homeobox 2	overlapping	36
2	1	*Zfp787*	zinc finger protein 787	overlapping	39
3	1	*Nkpd1*	Protein Nkpd1	overlapping	11
4	1	*Clasrp*	CLK4-associating serine/arginine rich protein	overlapping	36
5	1	*RYR1*	Ryanodine receptor 1	overlapping	27
6	1	*Olr1768*	olfactory receptor Olr1768	upstream	120
7	1	*Du*		ing	33
8	3	*Sdc*		ing	6
9	3	*Inp*		m	3
10	3	*Pm*		ing	1
11	3	*Kc*		ing	74
12	5	*Dm*		ing	21
13	6	*Po*		ing	8
14	6	*Bc*		ing	6
15	7	*Lingo3*	leucine-rich repeat and immunoglobulin-like domain-containing nogo receptor-interacting protein 3 precursor	overlapping	46
16	7	*Fam108a1*	Abhydrolase domain-containing protein FAM108A	overlapping	22
17	7	*Cacng2*	Voltage-dependent calcium channel gamma-2 subunit	upstream	29
18	9	*RGD1561662*	Protein RGD1561662	overlapping	13
19	14	*Gal3st1*	galactosylceramide sulfotransferase	overlapping	44
20	19	*Ptger1*	Prostaglandin E2 receptor EP1 subtype	overlapping	18
21	19	*Chst5*	carbohydrate sulfotransferase 5	overlapping	20
22	20	*Foxo3*	forkhead box protein O3	overlapping	20
23	X	*Dmrtc1b*	No description	upstream	8

Methylation around *Ptger1* gene was identified to be altered in kidney.

***Ptger1* encodes the prostaglandin E2 receptor, which is involved in Na^+ retention.**

#: Number of CpGs

Some Examples

Genome: Dietary behavior and food preference are related with genetic background.

Epigenome: Nutrition at very early stage of life, such as fetal period, affects the risk of NCDs.

PRECISION NUTRITION
Perspective (1)

What is needed?

1. Analytical Methods

   Key Words: Physical condition, Dietary record, Lifestyle, Real-time monitoring, Wearable device, Omics (genome, epigenome, proteome, metabolome, microbiome), etc.

2. Informatics

   Integration of big data

3. Output

   Education, Motivation, Behavior change

PRECISION NUTRITION
Perspective (2)

Planetary Precision Nutrition

Precise strategy for sustainability, Protect the globe

Population Precision Nutrition

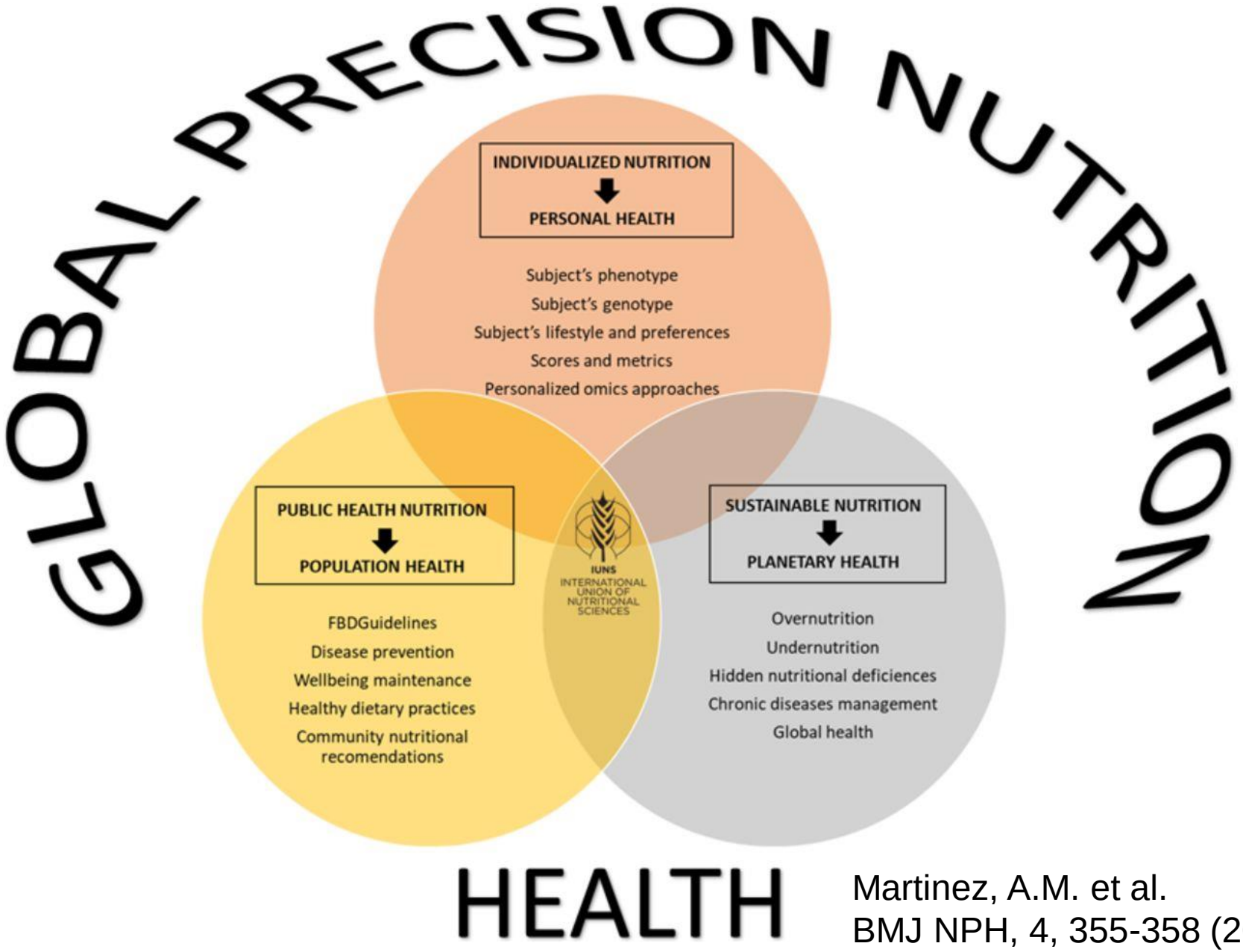
Tailored for various populations

Elderly, Pregnant women, High risk groups, Athlete, Emergency, Astronaut, Genotype group, etc.

Personalized Precision Nutrition

Tailored for each individual

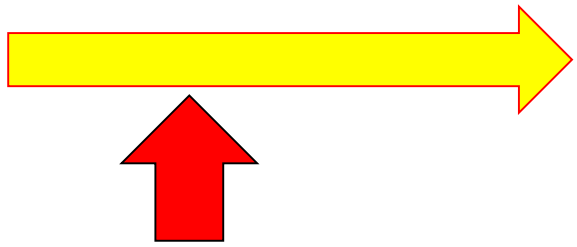
IUNS Task Force “Precision Nutrition”



Martinez, A.M. et al.
BMJ NPH, 4, 355-358 (2021)

World Population

2021
7.9 billion



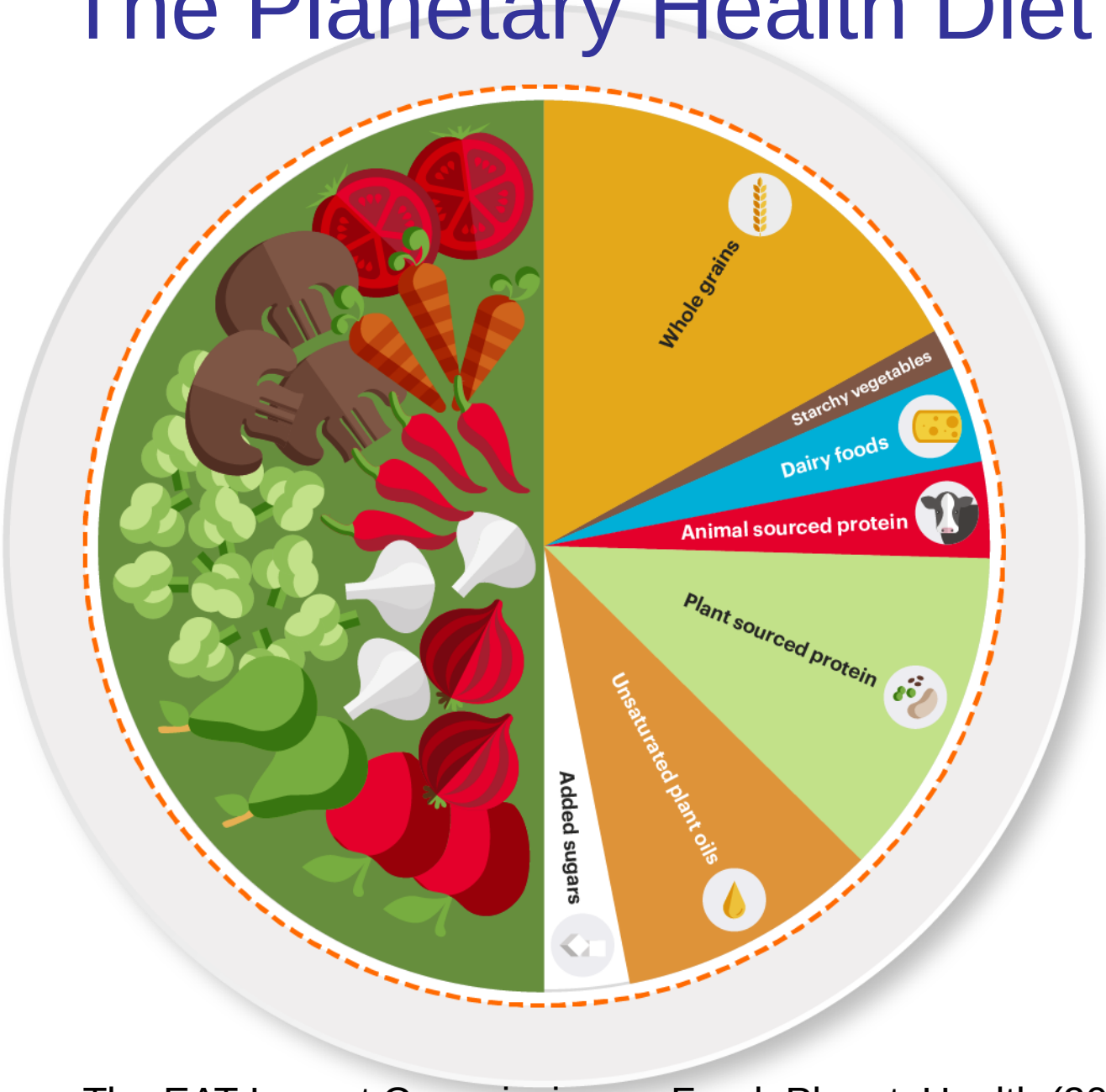
2050
9.7 billion

2030?

Protein Crisis?

Protein Demand > Supply

The Planetary Health Diet



The EAT-Lancet Commission on Food, Planet, Health (2019)

nutrients

MDPI

Review

COVID-19 Pandemic Is a Call to Search for Alternative Protein Sources as Food and Feed: A Review of Possibilities

Piotr Rzymski [1,2,*], Magdalena Kulus [3], Maurycy Jankowski [4], Claudia Dompe [5], Rut Bryl [4], James N. Petitte [6], Bartosz Kempisty [3,4,7,*] and Paul Mozdziak [6,*]

Nutrients, 13, 150 (2021)

1 Department of Environmental Medicine, Poznan University of Medical Sciences, 60-806 Poznań, Poland
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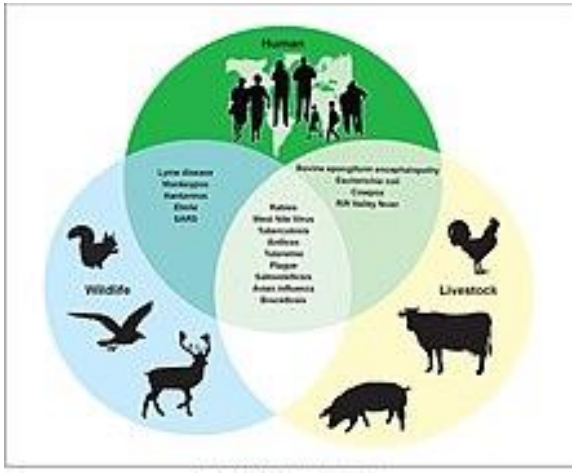
5 The School of Medicine, Medical Sciences and Nutrition, University of Aberdeen, Aberdeen AB25 2ZD, UK;

Plant-based food, Plant-based protein substitute, Insect-based food, Cultured meat

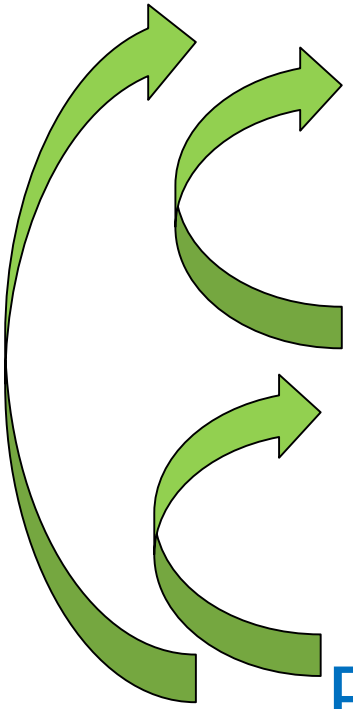
are ecologically better than meat.

are good in reducing the risk of zoonotic diseases.



Perspective (3)

Effective Re-distribution of Resources



Planetary Precision Nutrition

Population Precision Nutrition

Personalized Precision Nutrition

1. The Situation of NCDs in Japan and Measures to Address Them

2. Status of COVID-19 in Japan and Measures to Combat It

3. Precision Nutrition in Dealing with NCDs and COVID-19

4. 22nd IUNS-International Congress of Nutrition (ICN)

22nd IUNS-International Congress of Nutrition

December 6-11, 2022
Tokyo International Forum

Hisanori Kato (Chair, Organizing Committee of the 22nd IUNS-ICN)

Opening Lectures

Prof. Tasuku Honjo
(Kyoto University, Japan / Nobel Prize laureate in Physiology or Medicine in 2018)
“Serendipities of acquired immunity”

Dr. Naoko Yamamoto
(World Health Organization, Switzerland)
“Achieving healthier populations in changing global food and nutrition environment”

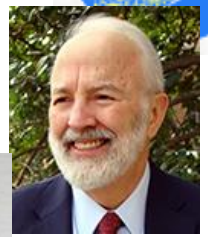
Closing Lecture

Prof. J. Alfredo Martínez
(IUNS President, IMDEA/UNAV, Spain)

"Personalized, population and planetary nutrition"

Plenary Lectures

Prof. Barry M. Popkin
University of North Carolina Gillings School of Global Public Health, USA



Prof. Masayuki Saito
Hokkaido University, Japan

Prof. Scot R. Kimball
Penn State College of Medicine, USA

Prof. Sian M. Robinson
Newcastle University, UK

Prof. Walter C. Willett
Harvard T.H. Chan School of Public Health, USA

Prof. Keiko Abe
The University of Tokyo, Japan

Prof. Pekka M. Puska
Finnish Institute for Health and Welfare , Finland

Prof. Marcus J. Post
Maastricht University and Mosa Meat, B.V., The Netherlands

PROGRAM

32 Special Lectures

130 Symposia

2,250 Oral/Poster Presentations

Call for Late-Breaking Abstract
August 1 – August 29, 2022
(Poster presentation)

Sponsored Symposia

Important Dates

▼Early Brid Registration

June 6, 2022 - August 4, 2022

▼Regular Registration

August 5, 2022 - October 20, 2022

▼Late Registration

October 21, 2022 - November 21, 2022

See You in Tokyo!

- Website *https://icn22.org*