present study, although the association disappeared after further adjustment for rice intake, suggesting that the association is largely due to an inverse association between rice intake and constipation. The positive association between dietary fiber and constipation may be because subjects suffering from constipation might increase their dietary fiber intake. This is particularly prevalent in the present study because the subjects are dietetic students and therefore may be highly health conscious. However, women with current dietary counseling were excluded from the present analysis. Additionally, not only was intentional dietary change, self-reported in DHQ, not significantly associated with constipation, but also the analyses, further adjusted for intentional dietary changes or after excluding the subjects who reported intentional dietary change within one year, provided identical results (data not shown). Another explanation of the positive association between dietary fiber and constipation is that dietary fiber intake was too low to have a protective effect for constipation for most women. The amount of dietary fiber estimated in the present study (mean: 12.0 g/day), however, was comparable with that observed in women aged 18–29 years in the Japanese National Nutrition Survey in 2001 (12.8 g/day) (Ministry of Health and Welfare, 2003) and 2002 (12.0 g/day) (Ministry of Health and Welfare, 2004), which has been available since 2001.

As a result of this unexpected association between dietary fiber and constipation and the possibility that subjects suffering from constipation might increase their dietary fiber intake and hence change their diet, the findings regarding foods, particularly those significantly associated with constipation in the present study (rice, confectioneries, Japanese and Chinese tea, and coffee), should be interpreted with great caution. We cannot deny that the association between these foods and constipation merely reflects dietary behaviors changed after, not before, suffering from constipation, although the findings on these foods were independent of dietary fiber intake and these foods are generally unlikely to be recognized as those having an influence of constipation. As mentioned above, however, previous studies have shown similar findings on rice (Wong *et al.*, 1999; Nakaji *et al.*, 2002), Japanese and Chinese tea (Wong *et al.*, 1999), and coffee (Dukas *et al.*, 2003). Unfortunately, these are all cross-sectional findings; prospective research on this area is required.

Findings regarding dietary factors also need to be cautiously interpreted in terms of dietary assessment methodology. First, the DHQ measures only the memory and perception of usual diet, although we used a previously-validated questionnaire (Sasaki *et al.*, 1998a, b; 2000b). Second, selective under- and/or overestimation of dietary intake, which may affect the energy-adjusted intake in a biased way, is a serious problem in many populations (Livingstone and Black, 2003) as well as the women examined here (Okubo and Sasaki, 2004). However, a repeated analysis presented in Tables 2 and 3 after excluding 400 subjects with implausible reported energy intake (women with the ratio of reported energy intake to basal metabolic rate, estimated using the FAO/WHO/UNU equation (FAO/WHO/UNU, 1985), of <1.2 or >2.5 (Black *et al.*, 1996)) provided the similar results. We thus believe that the associations in the present study are not spurious associations created by inaccurate dietary data.

Constipation has been associated with smoking status (Dukas *et al.*, 2003), alcohol drinking (Nakaji *et al.*, 2002; Dukas *et al.*, 2003; Sanjoaquin *et al.*, 2004), and BMI (Sandler *et al.*, 1990; Dukas *et al.*, 2003; Sanjoaquin *et al.*, 2004) in previous studies, but we observed no significant association of constipation with these variables. These null associations may be due to the large proportions of women without habits of smoking (94%) or alcohol drinking (78%) and with a normal BMI (78%). Physical activity has also been associated with constipation in several studies (Everhart *et al.*, 1989; Sandler *et al.*, 1990; Dukas *et al.*, 2003; Sanjoaquin *et al.*, 2004); we, however, did not find the association. This may be because of our relatively rough assessment of physical activity because we classified the subjects only into two groups according to the frequency of participating sports club activities without consideration of other kinds of activities.

In the present study, the assessment of constipation was based strictly on self-reporting, although subjects who were considered to be 'constipated' had significantly fewer bowel movements than did other subjects. The proportion of the subjects who were considered 'constipated' in the present study seemed to be relatively high (26%); some of those may not be classified as 'constipated' according to symptom-based criteria such as Rome I and Rome II criteria (Thompson *et al.*, 1999). In fact, the prevalence of self-reported constipation was much higher compared with the prevalence based on Rome I and Rome II criteria in a study of Spain (30 vs 19 and 14%) (Garrigues *et al.*, 2004). Thus, whether the same associations we observed would hold for constipation according to symptom-based criteria is not known, which should be addressed in future studies.

Although the use of medications may be associated with constipation (Wong *et al.*, 1999; Dukas *et al.*, 2003; Talley *et al.*, 2003), this variable was not assessed in the present study. We, however, analyzed only the data of apparently healthy women without any disease at the time of study to minimize the confounding by medication usage. Additionally, our results might not be representative because the subjects were selected female dietetic students.

In conclusion, intake of rice and coffee was inversely and intake of confectioneries and Japanese and Chinese tea was positively associated with self-reported constipation in a group of young Japanese women. As a result of the cross-sectional nature of the present study, which precludes any causal inferences, several limitations, particularly possibility that subjects suffering from constipation might increase their dietary fiber intake and hence change their diet and the use of self-reported constipation, and the lack of biological explanation for the associations we observed, however, further observational (favorably, prospective) and experimental studies are required to clarify these relationships.

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DIETARY REFERENCE INTAKES FOR JAPANESE (2005)

(THE REPORT FROM THE SCIENTIFIC COMMITTEE OF "DIETARY REFERENCE INTAKES FOR JAPANESE -- RECOMMENDED DIETARY ALLOWANCE --")

OCTOBER, 2004

MINISTRY OF HEALTH, LABOUR AND WELFARE, JAPAN

NOTE

This English translation was a part* of the report.

(*General Theories, Energy, and Outline)

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CONTENTS

I. GENERAL THEORIES

1. Characteristics of Designing Policies

Dietary Reference Intakes for Japanese, 2005 (DRIs-J) was prepared for healthy individuals or groups and designed to show reference intake values of energy and each nutrient to maintain and promote health and prevent lifestyle-related diseases. DRIs-J have been prepared not only to prevent energy or nutrient deficiency that may be caused by inadequate nutrient intake: it is also designed for the primary prevention of lifestyle-related diseases and illnesses caused by excess consumption of energy and nutrients.

The current DRIs-J have followed an approach of DRIs-J's concept which was introduced in the prior revision (the 6th revised Recommended Dietary Allowance and Dietary Reference Intake for Japanese, 1999) and the concept was thoroughly implemented in this revision. It is desired that those who use this DRIs-J should not become too preoccupied with the values presented; but should understand the concept of the DRIs-J thoroughly and apply them correctly.

The DRIs-J were prepared on a scientific basis as much as possible. Domestic and overseas academic papers and obtainable scientific data were utilized to the maximum. Furthermore, those dissertations and academic materials that were used in the revision of the prior edition were also reevaluated.

2. Basic Concept

2-1. General Concept

The traditional approach based on the concept of providing only the minimum requirements to avoid nutrient deficiencies is not sufficient to respond to the aim of prevention of lifestyle-related diseases and dysfunctions due to excess intake of nutrients. It is necessary to indicate a "range of intake" and introduce an idea that ones intake should stay within the range. It must also be shown clearly that if one were to consume any of the nutrients in excess of its range, it may lead to a risk of disease due to the excessive intake. This is the first basic concept in establishing DRIs-J.

In reality, "true" optimal intake varies among individuals and within an individual. Therefore, the 'true' optimal intake cannot be measured or estimated. This fact leads to a need of a probability approach in their computation or application. This is the second basic concept behind the DRIs-J, which uniquely characterizes this revision.

Based on these two concepts, one index for energy and five indices for nutrients are presented below. These indices are comprehensively called "Dietary Reference Intakes (DRIs-J)."

2-2. Energy

Energy must be computed based on a concept that is different from those used for nutrients. An adult requires a fixed amount of energy to maintain his/her body weight: if his/her intake does not meet the requirement, weight losses, emaciation, and protein energy malnutrition may ensue; if the intake exceeds the required intake, weight gain or obesity may occur. It is understood that the optimum state of energy intake is achieved when energy intake and consumption are balanced, causing no changes in body weight.

The double-labeled water (DLW) method is used to determine energy expenditure by healthy individual who maintain normal daily activities. The United States and Canada were the first in the world to adopt this technique in their dietary reference intakes for estimating energy expenditure. Due to the cost of the DLW (150,000 yen/person) and urine cell analyzer and the technical skill for the operation, sufficient numbers of samples are not available to compute Estimated Energy Requirement (EER) in Japan. For this reversion, the EER for an adult was computed from his/her Basal Metabolic Rate (BMR) (= reference BMR x reference body weight) and Physical Activity Level (PAL).

EER for adults (kcal/day) = BMR x PAL

Based on the data of DLW studies, the PAL was divided into 3 levels for an adult: level I (low, 1.50), level II, (normal, 1.75), and level III (high, 2.00).

For infants and children in the growth stage, the EER includes that needed to maintain the current body weight plus that which is necessary for growth. For pregnant women and nursing mothers, additional energy values due to fetal growth and lactating were added to complete the EER.

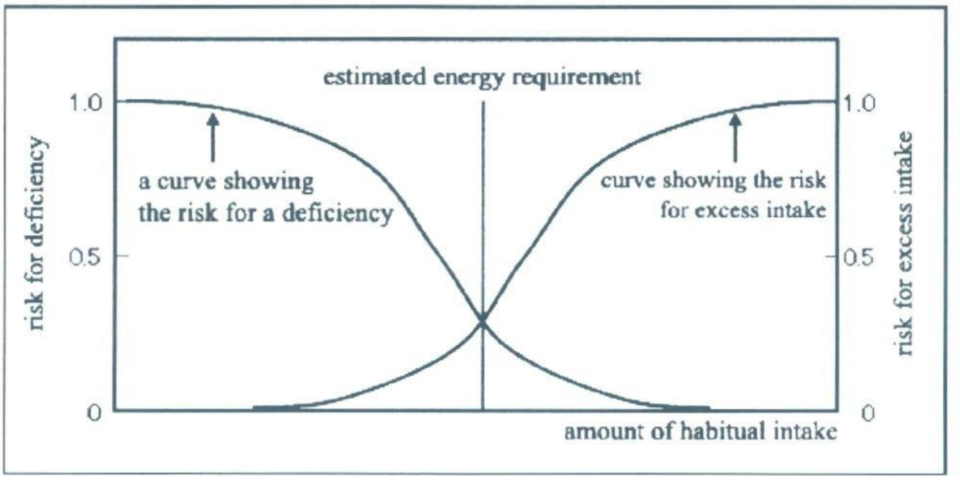

Fig. 1 A model to aid in the comprehension of Estimated Energy Requirement (EER)
With an increase in habitual intake, the risk for insufficiency is reduced and that for excessive intake increases. The intake at which both of these risks are the lowest is EER.

2-3 Nutrients

2-3-1. Indices

For the nutrients, Estimated Average Requirements (EAR) and Recommended Dietary Allowance (RDA) were selected as indices for the presence (or absence) of a deficiency and its extent.

Adequate Intake (AI) was computed for nutrients that were unable to determine EAR and RDA. For certain nutrients, DRIs-J have been defined for the primary prevention of lifestyle-related diseases. For these, "the quantity that the modern Japanese must consume for the primary prevention of lifestyle-related diseases" is indicated: it is called Tentative Dietary Goal for Preventing Life-style Related Diseases (DG).

Upper Intake Level (UL) was set to prevent diseases that would be caused by an excessive intake of certain nutrients. However, there are nutrients refrained from setting UL due to a lack of sufficient scientific data. Fig. 2 represents the general concept of these indices.

Table 1 shows those nutrients for which DRIs-J have been set and the indices that have been provided for ages one year and over. Thirty-four nutrients were investigated. For infants (ages 0 through 11 months), the adequate intake was set for twenty-eight nutrients, excluding saturated fatty acids, cholesterol, carbohydrates, dietary fibers and chromium.

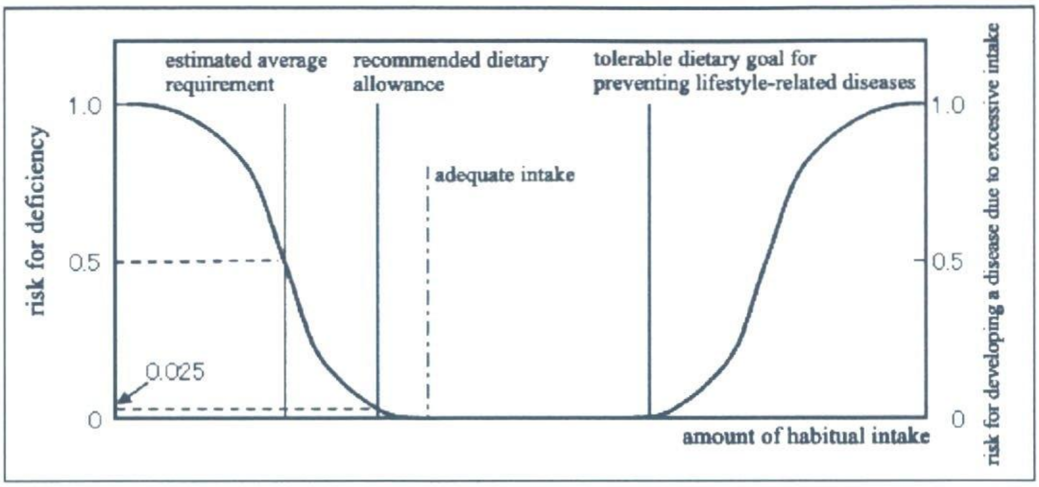

Fig. 2 A model to aid in understanding the indices for DRIs-J (Estimated Average Requirement, Recommended Daily Allowance, Adequate Intake and Tolerable Upper Intake Level)

The figure shows the risk of deficiency exist for 0.5 (50%) for EAR and 0.02 to 0.03 (mean, 0.025, 2 to 3% or 2.5%) for RDA. Note that there is a potential risk of developing a disease from adverse effects due to excessive intake when the amount exceeds UL. It can also be seen that when the intake is between RDA and UL, the risk of a deficiency or developing a disease due to excessive intake is near zero (0).

An AI is not in a fixed relationship with EAR or RDA. If it is possible to compute the last two simultaneously, the estimated intake is believed to be greater than RDA (on the right side in the figure). The estimated intake was added for reference.

Because the DG is determined from the EDA or AI and the median of the current intake, it cannot be displayed here.

Table 1 Nutrients for which DRIs-J have been established and its indices (ages 1 year and over)[1]

		EAR	RDA	AI	DG	UL
Proteins		○	○	-	○	-
Lipids	Total fats	-	-	-	○	-
	Saturated fatty acids	-	-	-	○	-
	n-6 fatty acids	-	-	○	○	-
	n-3 fatty acids	-	-	○	○	-
	Cholesterol	-	-	-	○	-
Carbohydrates		-	-	-	○	-
Dietary fibers		-	-	○	○	-
Water-soluble vitamins	Vitamin B_1	○	○	-	-	-
	Vitamin B_2	○	○	-	-	-
	Niacin	○	○	-	-	○
	Vitamin B_6	○	○	-	-	○
	Folic acid	○	○	-	-	○[2]
	Vitamin B_{12}	○	○	-	-	-
	Biotin	-	-	○	-	-
	Pantothenic acid	-	-	○	-	-
	Vitamin C	○	○	-	-	-
Oil-soluble vitamins	Vitamin A	○	○	-	-	○
	Vitamin E	-	-	○	-	○
	Vitamin D	-	-	○	-	○
	Vitamin K	-	-	○	-	-
Minerals	Magnesium	○	○	-	-	○[2]
	Calcium	-	-	○	○	○
	Phosphorus	-	-	○	-	○
Trace elements	Chromium	○	○	-	-	-
	Molybdenum	○	○	-	-	○
	Manganese	-	-	○	-	○
	Iron	○	○	-	-	○
	Copper	○	○	-	-	○
	Zinc	○	○	-	-	○
	Selenium	○	○	-	-	○
	Iodine	○	○	-	-	○
Electrolytes	Sodium	○	-	-	○	-
	Potassium	-	-	○	○	-

DRIs-J, Dietary Reference Intakes for Japanese; EAR, estimated average requirement; RDA, recommended dietary allowance; AI, adequate intake; DG, tentative dietary goal for preventing life-style related diseases; UL, tolerable upper intake level

[1] Including when the DRIs-J were defined for only certain age groups.

[2] Defined as intake from other than normal food.

2-3-2. Estimated Average Requirement (EAR)

Estimated Average Requirement (EAR) is defined as estimated mean value of requirement of a general population (e.g., men ages 30 through 49 years) computed based on date of distribution of the "requirement" determined in a certain group. In other words, it is defined as estimated requirement which would fulfill 50 percent of the group.

2-3-3. Recommended Dietary Allowance (RDA)

Recommended Dietary Allowance (RDA) is defined as the amount that would fulfill almost all (97 to 98 percent) of the individuals in the general population which is computed based on the distribution of the "requirement" determined in subject groups.

By using the standard deviation (SD) of person-to-person variation in the experimentally derived requirements as the estimated standard deviation of inter-individual differences of the requirement in the general group, the RDA can be theoretically computed as the "mean of estimated requirement + 2 x SD of estimated requirement." In actual practice, however, an accurate standard deviation for the estimated requirement is rarely obtained from experimental data. In many instances, one has to rely on the estimated value. The standard deviations used in computing the recommended dietary allowance in the current updated version are listed as coefficients of variation (CV: standard deviation/average value) in Table 2.

RDA = EAR x coefficient for RDA

Table 2 Coefficients of variation (CV) for person-to-person variations used to estimate the Recommended Dietary Allowance (RDA) from Estimated Average Requirements (EAR)

Variation coefficient	Coefficient for calculating RDA	Nutrients
10%	1.2	Vitamin B_1, vitamin B_2, vitamin B_6, niacin, folic acid, vitamin C, magnesium, iron (for adults and 15-17 years old), molybdenum, zinc, selenium
12.5%	1.25	Proteins
15%	1.3	Copper
20%	1.4	Vitamin A, iron (for 1-14 years old), iodine

2-3-4. Adequate Intake (AI)

Adequate Intake (AI) is defined as a sufficient quantity to maintain a certain nutritional state in a specific group. It is set at the level which only a few would develop a deficiency. It is set only when the RDA cannot be established. In general, AI is decided based on epidemiological studies worked on nutritional intake of healthy individuals.

AI is based on one of the following three concepts, depending on the nutrients or an individual's gender or age group.

(1) Established based on a value which is estimated intake level that shows nearly no deficiency, based on health status from biological and other indices and intake survey of the concerned nutrient conducted simultaneously. The median of the nutrient intake is used as AI when there is only a few individual with deficiency.

(2) Established based on the median for the nutrient intake when health status cannot be confirmed by using biological markers and similar indicators but representative nutrient distribution among Japanese can be obtained.

(3) Established based on intake level of healthy infants fed by human milk. The product of nutrient concentration of human milk and volume of consumed is used as AI.

2-3-5. Tentative Dietary Goal for Preventing Lifestyle-related Diseases (DG) for Modern Japanese

DG is set mainly for the primary prevention of lifestyle-related diseases. The quantity is designed to achieve that nutritional state at which the risk of developing diseases or the biological markers (substitute markers) are reduced. It is based on knowledge from epidemiological studies with some input from the findings obtained in experimental nutritional studies. However, the relationship between nutritional intake and the risk for developing lifestyle-related diseases is continuous in nature and quite often there is no threshold. In such an instance, it is difficult to propose a certain quantity or threshold as an optimum value. Therefore, considering intake, food composition, and food preferences of the modern Japanese, as well as foreign dietary reference intakes and guidelines for disease prevention, it was decided putting emphasis on feasibility.

In the DRIs-J, particular emphasis was placed on the primary prevention of cardiovascular diseases (e.g., hypertension, hyperlipidemia, stroke, and myocardial infarction), cancer (in particular, stomach cancer), fractures, and osteoporosis. Specifically, it was directed toward the intake of proteins, lipids (fatty acids), cholesterol, carbohydrates, dietary fiber, calcium, sodium (table salt), and potassium.

Regarding calcium, DG is not set as a prevention of lifestyle-related disease. Its AI was set by another method and DG was based on the AI. The calcium balance was determined by a factorial method. Because of this difference in computation, special attention is required in its application. Specifically, it is not intended simply to prevent a lifestyle-related disease: it is for the maintenance of each nutrient in the body.

Protein, lipids, and carbohydrates are nutrients that generate energy. Because the balance (ratios) among them is important, their percentage to energy (% energy) was used as intake units. The DG was designed only for adults.

The DG may be set to bring one's habitual intake as close to this dietary goal as possible or it may be within the indicated threshold. The relationship between the type of DG vis-à-vis the content and nutrients is shown in Table 3.

Table 3 Type of DG relative to the contents and its relations to the nutrients

Types of DG relative to the contents	Nutrients
Nutrients defined to bring their intake close to DG	Dietary fiber, n-3 fatty acids, calcium, potassium (with the intake increase desired)
	Cholesterol, sodium (with reductions in intake increase desired)
DG is defined within a range and nutrients intake is designed to be within this defined range	Total fats, saturated fatty acids, carbohydrates
EAR, RDA, or AI are given but only UL is listed for DG	Proteins, n-6 fatty acids

DG, tentative dietary goal for preventing life-style related diseases; EAR, estimated average requirement; RDA, recommended dietary allowance; AI, adequate intake; UL, tolerable upper intake level

2-3-6. Tolerable Upper Intake Level (UL)

UL is defined as the quantity that shows the upper limit of the habitual intake that is considered to be free of the risk of causing a disease due to excessive intake. If the intake exceeds this level, it is believed that a latent risk for developing a disease increases (Fig. 3). One should be reminded that the disease in this section is that caused by excessive intake of nutrients (an excess intake disease) and not a disease due to insufficient intake (deficiency disease).

Theoretically speaking, the true "UL" is the maximum value (no observed adverse effect level: NOAEL) of "the quantity that is known not to cause a disease," according to studies that were conducted on humans (Fig. 3). However, studies of NOAEL on humans are extremely limited or conducted on specific populations. To be on the safe side, therefore, the UL was obtained by subtracting the "uncertain factor (UF)" from NOAEL in many instances (Fig. 3). In doing so, an appropriate number between 1 and 5 was selected as UF.

On the other hand, when minimum of the "amount that is known to cause health problem" (lowest observed adverse effect level: LOAEL) is obtained from specific populations known to have consumed excessive amounts of certain nutrient or on cases that developed a health problem due to excessive intake of certain supplements or similar sources, UF is set at 10 and the estimated NOAEL is obtained by subtracting 10 from LOAEL. Considering occurrence frequency and extent of health problems due to excessive intake, UF was exceptionally set low for magnesium, calcium and zinc.

Diseases in humans caused by excessive intake of nutrients are rarely reported. Needless to add, one cannot conduct studies on humans to find the dose-response relationship and other details to establish NOAEL or LOAEL. The UL must be estimated from NOAEL or LOAEL that is obtained from animal experiments in which a disease (intoxication) is induced or in some instances from *in vitro* experiments. If only the LOAEL is reported, NOAEL is estimated as a rule by subtracting a UF of 10 from this LOAEL. If NOAEL obtained from animal experiments is to be extrapolated to estimate UL in humans, such NOAEL is usually subtracted by UF 10.

There is not sufficient scientific data to set UF and therefore has not necessarily reached consensus among professionals. Consequently, as described above, an appropriate number for UF was selected in range of 1 to 5 for reports based on humans, and in range of 10 to 100 for those based on animals. When NOAEL is used for computation, a smaller UF is chosen and when LOAEL is used, a larger value was selected. Furthermore, UF was determined by giving due consideration to the characteristics of each nutrient, severity of the projected disease caused by excessive intake, quality and number of the studies reporting on NOAEL and LOAEL, characteristics of the subjects or cohorts observed (sex, age, and health status), group characteristics, and the number of subjects. UF used in the computation is shown in Table 4 for nutrients that have UL.

The details for computing UL differ in each nutrient and it is suggested to refer to the particular chapters. For some nutrients, reports that offer a solid basis for computation were scarce and for those nutrients, either the computation was postponed or only tentative values have been indicated.

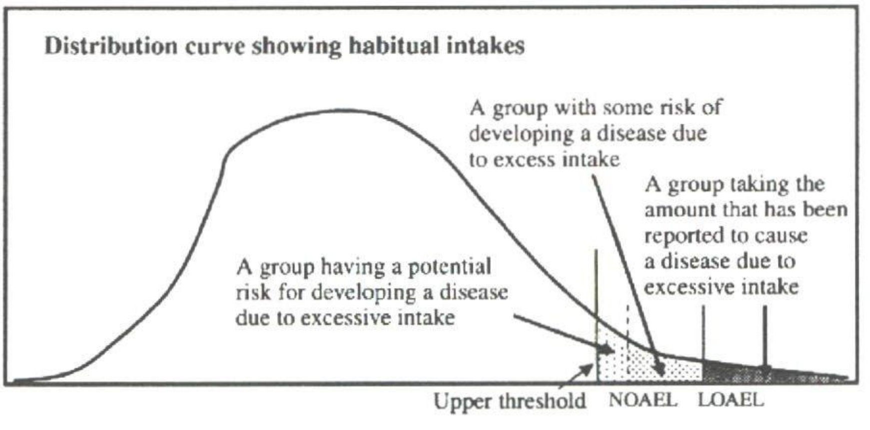

Fig. 3 A model to aid in understanding a cohort that has a risk for developing diseases due to excessive intake

The group of individuals who habitually consume quantities above the upper threshold has a potential risk for developing health problems from excessive intake; those in the group consuming nutrients over LOAEL are in fact consuming the amounts that have been confirmed to produce diseases due to excessive amount of the nutrients in question.

LOAEL, lowest observed adverse effect level; NOAEL, no observed adverse effect level

Table 4 Uncertain factor (UF) used for calculation of Tolerable Upper Intake Level

UF	Nutrients
1	Vitamin D (infants), vitamin E, magnesium, phosphorus, manganese, copper, iodine
1.2	Calcium
1.5	Vitamin A (pregnant women), zinc
2	Vitamin D (adults, children), selenium
5	Vitamin B_6, niacin, folic acid, vitamin A (adults, children)
10	Vitamin A (infants), molybdenum
30	Iron

3. Basic Parameters That Were Noted in Designing the DRIs-J

3-1. Age Groups

The age groups employed in the current design are shown in Table 5. Infants were divided into 2 groups: "after birth to under 6 months (ages 0 through 5 months)" and "6 months to under one year (ages 6 through 11 months)."

Children were defined as those ages 1 through 17 years and adults, those ages 18 years and over. If there is a need for separating the aged from adults, those ages 70 years and over were designated as such.

3-2. Reference Physiques

For DRIs-J, only a single representative value is obtained through computation for each gender and age group, without giving any consideration to physical distinctions (heights and weights) within each group. In other words, the DRIs-J are designed for those in the group with the representative physique. The representative physiques for those ages one year and over were based on the median heights and weights of the corresponding gender and age that were obtained at the 2001 National Nutrition Survey in Japan[1] and for infants ages 0 through 11 months, the median of the group of corresponding age (in months) obtained from the 2000 National Growth Survey in Infancy and Childhood[2] were used. These are called the "reference physiques" (reference heights and reference weights) (Table 5).

Table 5 Reference physique (reference height and reference weights)

Sex	Males		Females[1]	
Age	Reference height (cm)	Reference weights (kg)	Reference height (cm)	Reference weights (kg)
0-5 months	62.2	6.6	61.0	6.1
6-11	71.5	8.8	69.9	8.2
1-2 years	85.0	11.9	84.7	11.0
3-5	103.5	16.7	102.5	16.0
6-7	119.6	23.0	118.0	21.6
8-9	130.7	28.0	130.0	27.2
10-11	141.2	35.5	144.0	35.7
12-14	160.0	50.0	154.8	45.6
15-17	170.0	58.3	157.2	50.0
18-29	171.0	63.5	157.7	50.0
30-49	170.0	68.0	156.8	52.7
50-69	164.7	64.0	152.0	53.2
≥70	160.0	57.2	146.7	49.7

[1] Excluding pregnant women.

3-3. Nutrient Intakes Used to Establish AI and DG

In certain instances, the baseline of the state of nutrient intake for the population is needed to compute AI and DG. In the DRIs-J, the median and percentile of intake for each gender and age group (ages one year and over) according to the 2001 National Nutrition Survey[1)] were used for computation. During the process of setting the DRIs-J, the results of the 2002 National Nutrition Survey were made public.[3)] The results were not used as the base materials: it was confirmed that the use of the 2001 Survey data constituted no problem.

The age groups for children age 6 through 11 differs between the DRIs-J and the National Nutrition Survey (the age groups of 6 through 7 years, 8 through 9 years, and 10 through 11 years for the former, and the age groups of 6 through 8 years and 9 through 11 years for the latter). Therefore the data reported by the National Nutrition Survey for the age group 6 through 8 years were used for the DRIs-J for the age group 6 through 7 years; the mean of the age groups of 6 through 8 years and 9 through 11 years reported by the National Nutrition Survey was used for the age group of 8 through 9 years for the DRIs-J; and the results of the age group 9 through 11 years of the National Nutrition Survey was used for the age group of 10 through 11 years for the DRIs-J.

It is known that almost all nutritional surveys (including dietary recording method) are plagued with the problem of underreporting. Although varied depending on survey method and subjects, 5 to 15% underreporting of energy intake has been reported by studies conducted in the western world.[4)] Among Japanese also, underreporting of approximately 8% has been reported as a group mean.[5)] The extent of underreporting that occurred in the 2001 National Nutrition Survey, the main data source of the current revision, is unknown. No logical or practical solutions to this problem have been proposed in the western world. In the DRIs-J, it was decided that the values obtained from the 2001 National Nutrition Survey and other related survey would be used as they were.

In establishing AL and DG for the DRIs-J, intake data were used for the following nutrients (Table 6).

Table 6 Nutrients with intake data used to compute their AI and DG

	Nutrients
AI	n-6 fatty acids, n-3 fatty acids, pantothenic acid, biotin[1], vitamin E, vitamin D, phosphorus, manganese[1]
DG	Total fats, saturated fatty acids, n-3 fatty acids, calcium, sodium, potassium

AI, adequate intake; DG, tentative dietary goal for preventing life-style related diseases

[1] Study data other than those from the National Nutrition Survey in Japan were used for references.

3-4. Method to Integrate the Research Results

The DRIs-J were based on the results of as many reliable studies as possible. In doing so, the results were integrated in accordance with the approach that is introduced in Table 7.

Table 7 Method to integrate the research results

Quality of the study	The presence (or absence) of studies on the Japanese	Basic concept in integration
When it is relatively even	When there are studies on Japanese as the research subjects	Priority placed on the results of studies conducted on Japanese
	When there are no studies on Japanese as the research subjects	Use of the overall means
When the quality is highly variable in each study	When there are high-quality studies on Japanese as the study subjects	Priority placed on the results of studies on Japanese
	When there are studies on Japanese as the study subjects but these studies are relatively low in quality in comparison with other studies	Select high-quality studies and use the mean of such studies
	When there are no studies on Japanese as the test subjects	

3-5. Notes for Each Life Stage

3-5-1. Infants

Experiments cannot be conducted on infants less then 6 months old to determine their EAR or RDA. It was assumed that the quality and quantity of human milk consumed by healthy infants would be equivalent to the optimum nutritional requirement for infants. For the infants' DRIs-J, AI was computed: specifically, the product of the nutrient concentration of the human milk and the amount consumed by the infant was used. The mean quantity taken by an infant during this period has been reported to be 0.78 L/day.[6] Therefore the standard quantity consumed by a healthy infant was set at 0.78 L/day for the DRIs-J.