

**Table 1.** 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  |   |

**Table 2.** Definitions of indices used in the DRIs-J

| Indices   | Definition   |
|---|--|
| For energy<br>Estimated Energy Requirement (EER)                      | The intake value at which the risks of both deficiency and excess intake are minimized   |
| For nutrients<br>Estimated Average Requirement (EAR)                  | The mean requirement value for Japanese (stratified by gender and age) was estimated based on requirement values determined from specific population group studies. It is the estimated daily intake level which would meet the requirement of 50 percent population of a particular gender and age group.   |
| Recommended Dietary Allowance (RDA)                                   | RDA is defined as the estimated daily intake level that is considered to meet the requirement of most (97 to 98%) of a particular gender and age group.<br>$RDA = \text{mean EAR} + 2 \times \text{standard deviation (of EAR)}$   |
| Adequate Intake (AI)  | When the sufficient scientific basis to compute EAR and RDA cannot be obtained, this the AI is a quantity that is sufficient to maintain a satisfactory nutritional status of a particular gender and age group. In general, the AI is decided determined based on epidemiological studies worked on estimating nutritional intake of healthy individuals.   |
| Tentative Dietary Goal for Preventing Lifestyle-related Diseases (DG) | DG is defined as the intake level (or range) that Japanese should currently aim to consume primarily to prevent lifestyle-related diseases.<br>In the DRIs, 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. |
| Tolerable Upper Intake Level (UL)                                     | The maximum intake level that shows the indicates an 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.  |

- Emphasis should be placed on prevention of lifestyle-related diseases. To meet this, it is necessary to indicate a "range of intake" and adopt an idea that keeping one's intake in the range could reduce the risk of lifestyle-related diseases.
- Clearly indicate that excessive intake beyond the range increases the risk of developing health problems due to excessive intake.

Based on these concepts, one index for energy and five indices for nutrients are presented below. These indices are collectively called "Dietary Reference Intakes (DRIs)" (Table 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 expenditure are balanced, causing no changes in body weight (for adults). Figure 1 illustrates that, with an increase in habitual intake, the risk of deficiency is reduced and that of excess intake increases. The intake at which both risks are lowest is Estimated Energy Requirement (EER).

The double-labeled water (DLW) is a method 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 DRIs for estimating energy expenditure. Due to the financial and technical constraints, the EER for an

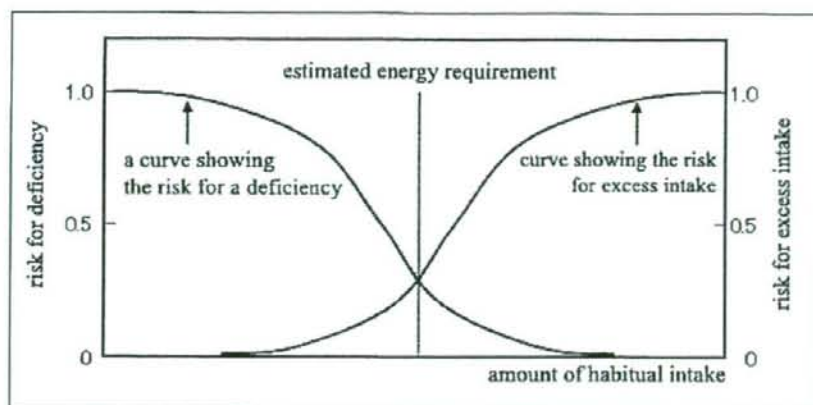


Figure 1. A model to understand the Estimated Energy Requirement (EER)

adult was calculated from his/her Basal Metabolic Rate (BMR) (= reference Basal Metabolic Rate  $\times$  reference body weight) and Physical Activity Level (PAL).

$EER \text{ for adults (kcal/day)} = BMR \times PAL$

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 lactating mothers, additional energy values due to fetal growth and lactating were added to complete the EER.

#### Nutrients

For 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.

The Adequate Intake (AI) was computed for nutrients for which insufficient data were available to determine EAR and RDA. For certain nutrients, the DRIs-J were determined for the primary prevention of lifestyle-related diseases. For which these nutrients a "Tentative Dietary Goal for Preventing Life-style Related Diseases (DG)" was set as the index to show the quantity of intake that the modern Japanese should aim to consume for the primary prevention of lifestyle-related diseases. Whilst other indices are same as the ones used in other countries, DG is a unique index in Japan. The relationship between the type of DG vis-à-vis the content and nutrients is shown in Table 3.

The Upper Intake Level (UL) was set to prevent adverse health conditions that would be caused by an excessive intake of certain nutrients. However, there are nutrients for which an UL could not be established due to a lack of sufficient scientific data. Figure 2 represents the general concept of these indices.

Table 4 shows those nutrients for which DRIs 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.

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)<br>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

#### BASIC POINTS TO BE NOTED IN DESIGNING THE DRIS-J

##### Age groups

The age groups employed in the current design are; Age 0 to 5 months, 6 to 11 months, 1 to 2 years, 3 to 5 years, 6 to 7 years, 8 to 9 years, 10 to 11 years, 12 to 14 years, 15 to 17 years, 18 to 29 years, 30 to 49 years, 50 to 69 years, 70 years and older, pregnant women, and lactating mothers. 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.

##### Reference physiques

For the 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

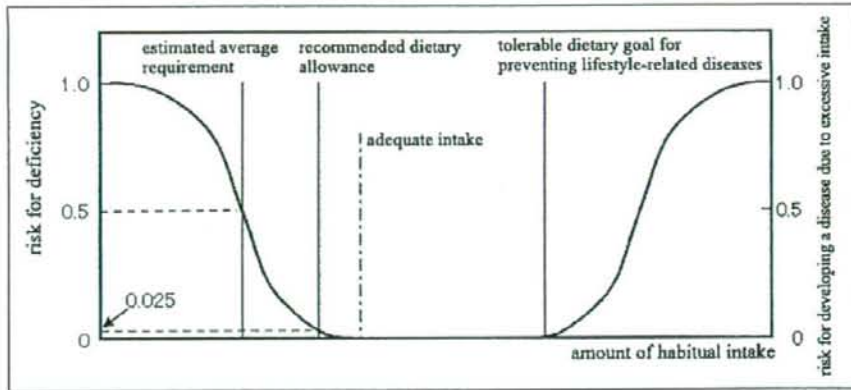


Figure 2. A model to understand the indices for DRIs (Estimated Average Requirement, Recommended Daily Allowance, Adequate Intake and Tolerable Upper Intake Level). The figure shows the risk of deficiency exist for 0.5 (50%) for EAR and 0.02 to 0.03 (mean, 0.025, 2 to 3% or 2.5%) for RDA. Note that there 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 4. Nutrients for which DRIs have been established and its indices (aged  $\geq 1$  year)<sup>1</sup>

|                        |                         | EAR | RDA | AI | DG | UL             |
|------------------------|-------------------------|-----|-----|----|----|----------------|
| Proteins               |                         | ○   | ○   | -  | ○  | -              |
|                        | Total fats              | -   | -   | -  | ○  | -              |
|                        | Saturated fatty acids   | -   | -   | -  | ○  | -              |
| Lipids                 | n-6 fatty acids         | -   | -   | ○  | ○  | -              |
|                        | n-3 fatty acids         | -   | -   | ○  | ○  | -              |
|                        | Cholesterol             | -   | -   | -  | ○  | -              |
| Carbohydrates          |                         | -   | -   | -  | ○  | -              |
| Dietary fibers         |                         | -   | -   | ○  | ○  | -              |
|                        | Vitamin B <sub>1</sub>  | ○   | ○   | -  | -  | -              |
|                        | Vitamin B <sub>2</sub>  | ○   | ○   | -  | -  | -              |
|                        | Niacin                  | ○   | ○   | -  | -  | ○              |
| Water-soluble vitamins | Vitamin B <sub>6</sub>  | ○   | ○   | -  | -  | ○              |
|                        | Folic acid              | ○   | ○   | -  | -  | ○ <sup>2</sup> |
|                        | Vitamin B <sub>12</sub> | ○   | ○   | -  | -  | -              |
|                        | Biotin                  | -   | -   | ○  | -  | -              |
|                        | Pantothenic acid        | -   | -   | ○  | -  | -              |
|                        | Vitamin C               | ○   | ○   | -  | -  | -              |
| Oil-soluble vitamins   | Vitamin A               | ○   | ○   | -  | -  | ○              |
|                        | Vitamin E               | -   | -   | ○  | -  | ○              |
|                        | Vitamin D               | -   | -   | ○  | -  | ○              |
|                        | Vitamin K               | -   | -   | ○  | -  | -              |
| Minerals               | Magnesium               | ○   | ○   | -  | -  | ○ <sup>2</sup> |
|                        | Calcium                 | -   | -   | ○  | ○  | ○              |
|                        | Phosphorus              | -   | -   | ○  | -  | ○              |
|                        | Chromium                | ○   | ○   | -  | -  | -              |
|                        | Molybdenum              | ○   | ○   | -  | -  | ○              |
|                        | Manganese               | -   | -   | ○  | -  | -              |
| Trace elements         | Iron                    | ○   | ○   | -  | -  | ○              |
|                        | Copper                  | ○   | ○   | -  | -  | ○              |
|                        | Zinc                    | ○   | ○   | -  | -  | ○              |
|                        | Selenium                | ○   | ○   | -  | -  | ○              |
|                        | Iodine                  | ○   | ○   | -  | -  | ○              |
| Electrolytes           | Sodium                  | ○   | -   | -  | ○  | -              |
|                        | Potassium               | -   | -   | ○  | ○  | -              |

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. <sup>1</sup>Including when the DRIs were defined for only certain age groups.

<sup>2</sup>Defined as intake from other than normal food.

Table 5. Reference physique (reference height and reference weights)

| Sex<br>Age | Males                 |                        | Females <sup>1</sup>  |                        |
|------------|-----------------------|------------------------|-----------------------|------------------------|
|            | 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                   |

<sup>1</sup> Excluding pregnant women.

corresponding gender and age that were obtained at the time of the 2001 National Nutrition Survey in Japan<sup>3</sup> 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<sup>4</sup> were used. These are called the "reference physiques" (reference heights and reference weights) (Table 5).

#### Notes for each life stage

**Infant.** Experiments cannot be conducted on infants less than 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, 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.<sup>41</sup> Therefore the standard quantity consumed by a healthy infant was set at 0.78 L/day for the DRIs.

For infants ages 6 through 11 months, consumption of food other than human milk (or other milk products prepared for infants) must be taken into consideration; however, valid, accurate data are scarce. The values for infants aged 0 through 5 months and/or those 1 through 2 years were extrapolated.

**Children.** Very few studies are available that would be sufficient to set DRIs for children. When sufficient data were not extant, the values were estimated by employing the extrapolation method to those values of adults.

Because of the scarcity of information, it was often not able to set ULs. It should be noted that the absence of UL does not necessarily assure freedom from developing health problems when the intake becomes excessive.

**Elderly.** For the aged, weakening of their masticatory function, deterioration of digestive and absorptive function, and a reduction in food intake due to less physical activities exist. Characteristics of this age group include frequent and wide variation of their individual food intake

and the fact that many aged individuals are affected by an illness. Sufficient attention should be directed not only to the age but also to individual characteristics.

**Pregnant and Lactating Women.** First, the DRIs for non-pregnant and non-lactating women are computed for their specific age category, and then a certain amount is added for pregnancy and lactation.

The typical duration of pregnancy was assumed to be 280 days and the cumulative effect for fetal growth was expressed in terms of volume per day. If it is necessary to divide the duration of pregnancy, the following 3 divisions were proposed: early stage (less than 16 weeks); mid-stage (16 to less than 28 weeks); and late stage (28 weeks and thereafter).

For the lactating stage, data on lactation is necessary; no reliable data for Japanese women were available; so the amount of maternal milk ingested by an infant (0.78 L/day)<sup>4</sup> was used as the daily volume of lactation.

Because of the paucity of data on UL for pregnant and lactating women, many nutrients are without UL. The absence of UL does not necessarily assure that one is free from developing health problems due to excessive intake. It is convenient as a rule to refer to the UL for non-pregnant or non-lactating women of comparable age; however, these values did not incorporate any consideration about the effect on the fetus during pregnancy or the milk during the lactating period which may be associated with a certain risk. Thus, close attention should be paid to the UL for these women. Because the scientific basis related to these problems is not available, no quantitative reference could be provided.

#### BASIC APPROACH FOR APPLICATION

##### Basic concept of DRI-J Use

The DRIs are used for various purposes but their application may be roughly classified into the following: for the "assessment of the current state of nutrient intake" and "for designing dietary plans (including planning for dietary consultation, public nutrition and food service)." The application is further divided by whether it is for "individuals" or "groups."

**Table 6.** Concept of Dietary Reference Intakes uses for dietary assessment (excluding energy requirements)<sup>1-3</sup>

|                 | For an Individual  | For a Group   |
|-----------------|--|---|
| EAR             | If the habitual intake is less than EAR, the probability for deficiency is more than 50%; the probability increases as the habitual intake is reduced below EAR. | The percentage of those with a habitual intake less than EAR is generally equal to that suffering from insufficient intake.   |
| RDA             | When the habitual intake exceeds the EAR and approaches RDA, the probability for deficiency is reduced. When it reaches RDA, the probability becomes low (2.5%). | Not used.   |
| AI              | If the habitual intake exceeds AI, the probability for deficiency becomes very low.  | When the median intake of the group is more than AI, the percentage of those suffering from a deficiency is small. If the median intake is less than AI, the percentage cannot be determined. |
| DG <sup>4</sup> | If the habitual intake has reached DG or within the range indicated, the risk for lifestyle-related disease <sup>6</sup> is very unlikely.                       | The percentage of those not achieving DG or those with an intake outside the range corresponds to those having a risk of developing a lifestyle-related disease. <sup>6</sup>                 |
| UL <sup>5</sup> | As the habitual intake exceeds the upper limit and continues to increase, the risk for developing a disease <sup>6</sup> related to excessive intake increases.  | The percentage of those with habitual intake exceeding UL corresponds to the percentage of those having a risk for developing a disease <sup>6</sup> due to excessive intake.                 |

EAR, estimated average requirement; RDA, recommended dietary allowance; AI, adequate intake; DG, tentative dietary goal for preventing lifestyle-related diseases; UL, tolerable upper intake level. <sup>1</sup> The assessment based on intake is meant to be used for screening. To know the true nutritional state, it is necessary to obtain clinical information, results of biochemical determinations and physiological data. <sup>2</sup> It has been reported in American and European studies that the energy intake (although the extent may vary in the method of survey or study subjects) is often underreported by 5 to 15%.<sup>41</sup> Among Japanese, it is also known that the mean for a group be underreported by 8% than actual intake.<sup>51</sup> The tendency is particularly notable when the subjects are obese,<sup>20</sup> but the quantitative relationship has not been elucidated. For the nutrients, underreporting, such as seen for energy, is suspected but details are not known. <sup>3</sup> It is desirable that the habitual intake be estimated as accurately as possible. (Refer to 4-3.) <sup>4</sup> The nutrient intake and related risk for developing a lifestyle-related disease are ongoing events and should be regarded carefully. The "high" and "low" risks are relative concepts. <sup>5</sup> There are some nutrients for which no UL is indicated because there is no sufficient scientific basis to determine the actual value. It by no means assures safety from excessive intake. <sup>6</sup> The "risk" here means the probability of developing a lifestyle-related disease or disorder due to excessive consumption of the nutrient in question.

**Table 7.** Concept of Dietary Reference Intakes uses for dietary planning<sup>1</sup> (excluding energy requirements)

|                 | For an Individual   | For a Group   |
|-----------------|---|---|
| EAR             | Not used  | The percentage of those with a habitual intake below EAR should be brought down to less than 2.5% |
| RDA             | Those whose habitual intake is less than EAR should try to achieve the RDA.                   | Not used  |
| AI              | One should try to bring his/her habitual intake close to AI.                                  | The goal is to bring the mean of the group to AI.   |
| DG <sup>2</sup> | One should strive to bring his/her habitual intake close to DG or within the range indicated. | Reduced the percentage of those whose habitual intake is below DG or outside the range.           |
| UL <sup>3</sup> | One should bring the habitual intake below UL.  | The percentage of those whose habitual intake exceeds UL should be brought to zero (0)            |

EAR, estimated average requirement; RDA, recommended dietary allowance; AI, adequate intake; DG, tentative dietary goal for preventing lifestyle-related diseases; UL, tolerable upper intake level. <sup>1</sup> It is important to design and implement a plan tailored to the subject, based on a dietary assessment (using not only the dietary intake but also biochemical and physiological data). The numerical indices are not to be followed faithfully. The dietary assessment, which constitutes the basis of planning, is used for screening purposes. To understand one's true nutritional status, clinical information, results of biochemical tests and physiological data are needed. <sup>2</sup> The nutrient intake and related risk for developing a lifestyle-related disease are ongoing events and should be regarded carefully. The "high" and "low" risks are relative concepts. The "risk" here means the probability of developing a lifestyle-related disease or disorder due to excessive consumption of the nutrient in question. <sup>3</sup> There are certain nutrients for which no UL are indicated because there is no sufficient scientific basis to determine the actual value. It by no means guarantees safety from excessive intake.

Excluding energy requirements, basic handling of all nutrients is shown in Table 6 (dietary assessment) and Table 7 (dietary planning). In preparing these tables, the concept adopted in the DRIs of the United States and Canada was used as a reference.<sup>5</sup>

It is essential that a dietary plan be prepared and implemented, based on a dietary assessment (not only the intake but also biochemical indices and physical measurements). It should be noted that the value indicated by the DRIs are estimates and not necessarily the amount that are applicable to all circumstances in real life.

**Notes for applying DRIs**

1. The subjects to whom the Dietary Reference Intakes are applied are, as a rule, healthy individuals or groups that are composed of healthy individuals. The healthy individuals here may include those who have some mild conditions such as hypertension, hyperlipidemia and hyperglycemia but enjoy a normal life and no specific dietary guidance is being given or diet therapy or diet restriction is imposed.
2. Although the unit used in DRIs is "per day", it is a value for which average habitual intake is converted into a daily intake level.
3. When applying DRIs to nutritional consultation, lunch programs and others, it is especially desirable to consider the following: energy, lipids, proteins, vitamin A, vitamin B, vitamin C, calcium, iron, sodium and dietary fibers.
4. Fundamentally, RDA, AI and DG should be fulfilled through a balanced diet that is composed of normal food in daily life.
5. Regarding UL, adverse health conditions are not brought about just because the UL is exceeded temporarily through meals consisting of normal foods.
6. For aged, weakening of their masticatory function, deterioration of digestive and absorptive function, and a reduction in food intake due to less physical activities exist. This age group often has a marked variation in their individual intake and many aged individuals are affected by an illness. Thus, sufficient attention should be directed not only to the age but also to individual characteristics.

**DRIS OF ENERGY AND NUTRIENTS**

DRIs of energy and each nutrient in the current DRIs-J are shown in the tables of Appendix.

**FUTURE ISSUES OF DRIS-J**

This is the first dietary reference intake report in Japan, which applied evidence-based approach with a systematic review process. Only a few articles from within Japan and other Asian countries could be used for their establishment. The project to establish the DRI-J revealed a severe lack of scientific publications focused upon establishing DRIs for Japanese. Further research is therefore required prior to the next revision scheduled in 2010.

**AUTHOR DISCLOSURES**

Satoshi Sasaki, no conflicts of Interest

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## [APPENDIX]

Dietary Reference Intakes (DRIs) for energy: Estimated Energy Requirements (EERs) (kcal/day)

| Sex                                  | Males |       |       | Females |       |       |
|--------------------------------------|-------|-------|-------|---------|-------|-------|
|                                      | I     | II    | III   | I       | II    | III   |
| PAL                                  |       |       |       |         |       |       |
| 0-5 months infants                   | -     |       | -     | -       |       | -     |
| Breastfed                            | -     | 600   | -     | -       | 550   | -     |
| Formula-fed                          | -     | 650   | -     | -       | 600   | -     |
| 6-11 months                          | -     | 700   | -     | -       | 650   | -     |
| 1-2 years                            | -     | 1,050 | -     | -       | 950   | -     |
| 3-5                                  | -     | 1,400 | -     | -       | 1,250 | -     |
| 6-7                                  | -     | 1,650 | -     | -       | 1,450 | -     |
| 8-9                                  | -     | 1,950 | 2,200 | -       | 1,800 | 2,000 |
| 10-11                                | -     | 2,300 | 2,550 | -       | 2,150 | 2,400 |
| 12-14                                | 2,350 | 2,650 | 2,950 | 2,050   | 2,300 | 2,600 |
| 15-17                                | 2,350 | 2,750 | 3,150 | 1,900   | 2,200 | 2,550 |
| 18-29                                | 2,300 | 2,650 | 3,050 | 1,750   | 2,050 | 2,350 |
| 30-49                                | 2,250 | 2,650 | 3,050 | 1,700   | 2,000 | 2,300 |
| 50-69                                | 2,050 | 2,400 | 2,750 | 1,650   | 1,950 | 2,200 |
| ≥ 70 <sup>1</sup>                    | 1,600 | 1,850 | 2,100 | 1,350   | 1,550 | 1,750 |
| Pregnant women:                      |       |       |       |         |       |       |
| Early-stage (amount to be added)     |       |       |       | +50     | +50   | +50   |
| Mid-stage (amount to be added)       |       |       |       | +250    | +250  | +250  |
| Late-stage (amount to be added)      |       |       |       | +500    | +500  | +500  |
| Lactating women (amount to be added) |       |       |       | +450    | +450  | +450  |

PAL: Physical activity level. <sup>1</sup>For adults, the following formula was used for computation: Estimated Energy Requirement=Basal Metabolic Rate (kcal/day) × PAL. For those between 18~69 years, the PALs were designated as I=1.50, II=1.75 or III=2.00. For those 70 years or older, the following were used instead: I=1.30, II=1.50, III=1.70. The seeming discrepancy in Estimated Energy Requirements for the 50~69 and over 70 year group is mostly explained by this.

(Reference 1)

The description and duration of physical activity levels (ages 15 through 69 years)<sup>1</sup>

| PAL <sup>2</sup>   | Low (I)   | Moderate (II)  | High (III)  |     |
|--|---|--|---|-----|
|  | 1.50<br>(1.40~1.60)   | 1.75<br>(1.60~1.90)  | 2.00<br>(1.90~2.20)   |     |
| Details of daily activities                              | Subjects remain sedentary most of the time and engage mainly in less energetic activities.  | Subjects remain sedentary most of the time but the activities include any of the following: move within the work site, work performed while standing, interacting with customers, commuting, shopping, housekeeping, and light sport activities. | Subjects engage in work that require moving or remain standing; or they customarily engage in active athletic activities. |     |
| Classification of each activity (hours/day) <sup>2</sup> | Sleeping (1.0)  | 8  | 7   |     |
|  | Sedentary or being still while standing (1.5 : 1.1~1.9)   | 13~14  | 11~12   | 10  |
|  | Low-intensity activities such as slow walking and house-keeping (2.5 : 2.0~2.9)   | 1~2  | 3   | 3~4 |
|  | Mid-intensity activities such as exercise or labor that can be sustained for an extended period (includes normal speed walking) (4.5 : 3.0~5.9) | 1  | 2   | 3   |
|  | Highly-intensity activities, such as exercise or labor that requires frequent rest (7.0 : >6.0)   | 0  | 0   | 0~1 |

PAL, Physical activity level. <sup>1</sup> Representative values. The range is shown in parentheses. <sup>2</sup> Data in parentheses is an activity factor (Af: intensity per unit time of each physical activity, expressed in a multiple of the basal metabolism). (Representative value: lower threshold~upper threshold).

(Reference 2)

Examples of physical activity classifications

| Classification of physical activities (within the range of Af <sup>1</sup> )                                      | Examples of physical activities   |
|---|---|
| Sleeping (1.0)  | Sleeping  |
| Sedentary activities while sitting or standing (1.1~1.9)  | Lying down, sit in a relaxed manner (reading books, writing, and watching television), carrying on a conversation (while standing), cooking, dining, toileting activities (dressing, face-washing, and using the toilet facilities), sewing (hand-sewing and operating a sewing machine), engaging in a hobby or entertainment (flower arrangement, tea ceremony, mah-jong, playing musical instrument), driving, desk work (book-keeping and operating a word processor and OA equipment). |
| Low-intensity activities, such as slow walking or household chores (2.0~2.9)                                      | Standing in a train or bus. Walk slowly for shopping or just enjoy a walk (45 m/min.). Doing laundry (using a washing machine). House cleaning (using a vacuum cleaner).  |
| Mid-intensity exercise or labor that can be sustained for an extended period (including normal walking) (3.0~5.9) | Tend a home vegetable garden. Play gate-ball. Normal walking (71 m/min.). Bathing. Cycling (at a normal speed). Walking with a child on one's back. Playing catch-ball. Playing golf. Dancing (light). Hiking (on level ground). Climbing up and down stairs. Lifting or taking down bedding. Normal walking (95 m/min). Gymnastics (following radio or television instructions).   |
| High-intensity activities such as exercise or labor that require frequent rest (>6.0)                             | Muscle training, aerobic dancing (active), rowing, jogging (120 m/min), tennis, badminton, volleyball, skiing, basketball, soccer, skating, jogging (160 m/min), swimming, running (200 m/min).   |

<sup>1</sup> Activity factor (Af) is computed from the relative metabolic rate cited by Numajiri<sup>45</sup> as follows: Af=energy metabolic rate+1.2. Each physical activity was based on the mean during the time of activity. The data during rest and interruption were excluded.



## Dietary Reference Intakes (DRIs) for protein

| Sex                                     | Males       |             |            |                            | Females     |             |            |                            |
|---|-------------|-------------|------------|----------------------------|-------------|-------------|------------|----------------------------|
|   | EAR (g/day) | RDA (g/day) | AI (g/day) | DG (% energy) <sup>1</sup> | EAR (g/day) | RDA (g/day) | AI (g/day) | DG (% energy) <sup>1</sup> |
| 0-5 months infants<br>Breastfed         | -           | -           | 10         | -                          | -           | -           | 10         | -                          |
|   | -           | -           | 15         | -                          | -           | -           | 15         | -                          |
| 6-11 months infants<br>Breastfed        | -           | -           | 15         | -                          | -           | -           | 15         | -                          |
|   | -           | -           | 20         | -                          | -           | -           | 20         | -                          |
| 1-2 years                               | 15          | 20          | -          | -                          | 15          | 20          | -          | -                          |
| 3-5                                     | 20          | 25          | -          | -                          | 20          | 25          | -          | -                          |
| 6-7                                     | 30          | 35          | -          | -                          | 25          | 30          | -          | -                          |
| 8-9                                     | 30          | 40          | -          | -                          | 30          | 40          | -          | -                          |
| 10-11                                   | 40          | 50          | -          | -                          | 40          | 50          | -          | -                          |
| 12-14                                   | 50          | 60          | -          | -                          | 45          | 55          | -          | -                          |
| 15-17                                   | 50          | 65          | -          | -                          | 40          | 50          | -          | -                          |
| 18-29                                   | 50          | 60          | -          | <20                        | 40          | 50          | -          | <20                        |
| 30-49                                   | 50          | 60          | -          | <20                        | 40          | 50          | -          | <20                        |
| 50-69                                   | 50          | 60          | -          | <20                        | 40          | 50          | -          | <20                        |
| ≥ 70                                    | 50          | 60          | -          | <25                        | 40          | 50          | -          | <25                        |
| Pregnant women<br>(amount to be added)  |             |             |            |                            | +8          | +10         | -          | -                          |
| Lactating women<br>(amount to be added) |             |             |            |                            | +15         | +20         | -          | -                          |

<sup>1</sup> The TGs (upper threshold) were set as protein energy ratio (%). EAR, estimated average requirement, RDA, recommended dietary allowance; AI, adequate intake; DG, tentative dietary goal for preventing life-style related diseases

## Dietary Reference Intakes (DRIs) for fat

|                   | Total fat (% energy) |          |         |          | Saturated fatty acids (% energy) |            |            |
|-------------------|----------------------|----------|---------|----------|----------------------------------|------------|------------|
|                   | Male                 |          | Females |          | Males                            | Females    |            |
|                   | AI                   | DG       | AI      | DG       | AI                               | AI         |            |
| 0-5 months        | 50                   | -        | 50      | -        | -                                | -          |            |
| 6-11              | 40                   | -        | 40      | -        | -                                | -          |            |
| 1-2 years         | -                    | 20<, <30 | -       | 20<, <30 | -                                | -          |            |
| 3-5               | -                    | 20<, <30 | -       | 20<, <30 | -                                | -          |            |
| 6-7               | -                    | 20<, <30 | -       | 20<, <30 | -                                | -          |            |
| 8-9               | -                    | 20<, <30 | -       | 20<, <30 | -                                | -          |            |
| 10-11             | -                    | 20<, <30 | -       | 20<, <30 | -                                | -          |            |
| 12-14             | -                    | 20<, <30 | -       | 20<, <30 | -                                | -          |            |
| 15-17             | -                    | 20<, <30 | -       | 20<, <30 | -                                | -          |            |
| 18-29             | -                    | 20<, <30 | -       | 20<, <30 | 4.5<, <7.0                       | 4.5<, <7.0 |            |
| 30-49             | -                    | 20<, <25 | -       | 20<, <25 | 4.5<, <7.0                       | 4.5<, <7.0 |            |
| 50-69             | -                    | 20<, <25 | -       | 20<, <25 | 4.5<, <7.0                       | 4.5<, <7.0 |            |
| ≥ 70 <sup>1</sup> | -                    | 15<, <25 | -       | 15<, <25 | 4.5<, <7.0                       | 4.5<, <7.0 |            |
| Pregnant women    |                      |          | -       | 20<, <30 |                                  |            | 4.5<, <7.0 |
| Lactating women   |                      |          | -       | 20<, <30 |                                  |            | 4.5<, <7.0 |

AI, adequate intake; DG, tentative dietary goal for preventing life-style related diseases. Saturated fatty acid: C4:0, C6:0, C8:0, C10:0, C12:0, C14:0, C15:0, C16:0, C17:0, C18:0, C20:0, C22:0, C24:0. Note: When the subject is ≥10 years old and the blood LDL cholesterol level is high, the arteriosclerotic process may progress. Treatment that includes restriction on saturated fatty acids is desired.

## Dietary Reference Intakes (DRIs) for fat

|                   | n-6 fatty acids <sup>1</sup> |                       |               |                       | n-3 fatty acids <sup>2</sup><br>(g/day) |      |         |      | Cholesterol <sup>3</sup><br>(mg/day) |         |
|-------------------|------------------------------|-----------------------|---------------|-----------------------|---|------|---------|------|--------------------------------------|---------|
|                   | Males                        |                       | Females       |                       | Males                                   |      | Females |      | Males                                | Females |
|                   | AI<br>(g/day)                | DG<br>(% en-<br>ergy) | AI<br>(g/day) | DG<br>(% en-<br>ergy) | AI                                      | DG   | AI      | DG   | DG                                   | DG      |
| 0-5 months        | 4.0                          | -                     | 4.0           | -                     | 0.9                                     | -    | 0.9     | -    | -                                    | -       |
| 6-11              | 5.0                          | -                     | 5.0           | -                     | 1.0                                     | -    | 1.0     | -    | -                                    | -       |
| 1-2 years         | 6.0                          | -                     | 6.0           | -                     | 1.1                                     | -    | 1.0     | -    | -                                    | -       |
| 3-5               | 8.0                          | -                     | 7.0           | -                     | 1.5                                     | -    | 1.5     | -    | -                                    | -       |
| 6-7               | 9.0                          | -                     | 8.5           | -                     | 1.6                                     | -    | 1.6     | -    | -                                    | -       |
| 8-9               | 9.0                          | -                     | 10            | -                     | 1.9                                     | -    | 2.0     | -    | -                                    | -       |
| 10-11             | 11                           | -                     | 11            | -                     | 2.1                                     | -    | 2.1     | -    | -                                    | -       |
| 12-14             | 13                           | -                     | 10            | -                     | 2.6                                     | -    | 2.1     | -    | -                                    | -       |
| 15-17             | 14                           | -                     | 11            | -                     | 2.8                                     | -    | 2.3     | -    | -                                    | -       |
| 18-29             | 12                           | <10                   | 10            | <10                   | -                                       | >2.6 | -       | >2.2 | <750                                 | <600    |
| 30-49             | 11                           | <10                   | 9.5           | <10                   | -                                       | >2.6 | -       | >2.2 | <750                                 | <600    |
| 50-69             | 10                           | <10                   | 9.0           | <10                   | -                                       | >2.9 | -       | >2.5 | <750                                 | <600    |
| ≥ 70 <sup>1</sup> | 8.0                          | <10                   | 7.0           | <10                   | -                                       | >2.2 | -       | >2.0 | <750                                 | <600    |
| Pregnant women    |                              |                       | 9.0           | <10                   |   |      | 2.1     | -    |                                      |         |
| Lactating women   |                              |                       | 10            | <10                   |   |      | 2.4     | -    |                                      |         |

AI, adequate intake; DG, tentative dietary goal for preventing life-style related diseases. <sup>1</sup>N-6 fatty acids: C16:3, C18:2, C18:3, C20:2, C20:3, C20:4, C22:2, C22:5. No goal was computed for children; but by using the values set for an adult, it is desirable to avoid excessive intake. <sup>2</sup>N-3 fatty acids: C18:3, C18:4, C20:4, C20:5, C22:5, C22:6. <sup>3</sup>When the subject is ≥10 years-old and the blood LDL cholesterol level is high, the arteriosclerotic process may progress. Treatment that includes restriction on cholesterol intake is desired.

## Dietary Reference Intakes (DRIs) for carbohydrates (% energy)

| Sex                                     | Males |     |    |          |    | Females |     |    |          |    |
|---|-------|-----|----|----------|----|---------|-----|----|----------|----|
| Age                                     | EAR   | RDA | AI | DG       | UL | EAR     | RDA | AI | DG       | UL |
| 0-5 months                              | -     | -   | -  | -        | -  | -       | -   | -  | -        | -  |
| 6-11                                    | -     | -   | -  | -        | -  | -       | -   | -  | -        | -  |
| 1-2 years                               | -     | -   | -  | -        | -  | -       | -   | -  | -        | -  |
| 3-5                                     | -     | -   | -  | -        | -  | -       | -   | -  | -        | -  |
| 6-7                                     | -     | -   | -  | -        | -  | -       | -   | -  | -        | -  |
| 8-9                                     | -     | -   | -  | -        | -  | -       | -   | -  | -        | -  |
| 10-11                                   | -     | -   | -  | -        | -  | -       | -   | -  | -        | -  |
| 12-14                                   | -     | -   | -  | -        | -  | -       | -   | -  | -        | -  |
| 15-17                                   | -     | -   | -  | -        | -  | -       | -   | -  | -        | -  |
| 18-29                                   | -     | -   | -  | 50<, <70 | -  | -       | -   | -  | 50<, <70 | -  |
| 30-49                                   | -     | -   | -  | 50<, <70 | -  | -       | -   | -  | 50<, <70 | -  |
| 50-69                                   | -     | -   | -  | 50<, <70 | -  | -       | -   | -  | 50<, <70 | -  |
| ≥ 70                                    | -     | -   | -  | 50<, <70 | -  | -       | -   | -  | 50<, <70 | -  |
| Pregnant women<br>(amount to be added)  |       |     |    |          |    | -       | -   | -  | -        | -  |
| Lactating women<br>(amount to be added) |       |     |    |          |    | -       | -   | -  | -        | -  |

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

Dietary Reference Intakes (DRIs) for dietary fibers (g/day)

| Sex                                     | Males |     |    |    |    | Females |     |    |    |    |
|---|-------|-----|----|----|----|---------|-----|----|----|----|
| Age                                     | EAR   | RDA | AI | DG | UL | EAR     | RDA | AI | DG | UL |
| 0-5 months                              | -     | -   | -  | -  | -  | -       | -   | -  | -  | -  |
| 6-11                                    | -     | -   | -  | -  | -  | -       | -   | -  | -  | -  |
| 1-2 years                               | -     | -   | -  | -  | -  | -       | -   | -  | -  | -  |
| 3-5                                     | -     | -   | -  | -  | -  | -       | -   | -  | -  | -  |
| 6-7                                     | -     | -   | -  | -  | -  | -       | -   | -  | -  | -  |
| 8-9                                     | -     | -   | -  | -  | -  | -       | -   | -  | -  | -  |
| 10-11                                   | -     | -   | -  | -  | -  | -       | -   | -  | -  | -  |
| 12-14                                   | -     | -   | -  | -  | -  | -       | -   | -  | -  | -  |
| 15-17                                   | -     | -   | -  | -  | -  | -       | -   | -  | -  | -  |
| 18-29                                   | -     | -   | 27 | 20 | -  | -       | -   | 21 | 17 | -  |
| 30-49                                   | -     | -   | 26 | 20 | -  | -       | -   | 20 | 17 | -  |
| 50-69                                   | -     | -   | 24 | 20 | -  | -       | -   | 19 | 18 | -  |
| ≥ 70                                    | -     | -   | 19 | 17 | -  | -       | -   | 15 | 15 | -  |
| Pregnant women<br>(amount to be added)  | /     |     |    |    |    | -       | -   | -  | -  | -  |
| Lactating women<br>(amount to be added) |       |     |    |    |    | -       | -   | -  | -  | -  |

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

Dietary Reference Intakes (DRIs) for vitamin B<sub>1</sub> (mg/day)<sup>1</sup>

| Sex                                     | Males |     |     |    | Females |      |     |    |
|---|-------|-----|-----|----|---------|------|-----|----|
| Age                                     | EAR   | RDA | AI  | UL | EAR     | RDA  | AI  | UL |
| 0-5 months                              | -     | -   | 0.1 | -  | -       | -    | 0.1 | -  |
| 6-11                                    | -     | -   | 0.3 | -  | -       | -    | 0.3 | -  |
| 1-2 years                               | 0.4   | 0.5 | -   | -  | 0.4     | 0.5  | -   | -  |
| 3-5                                     | 0.6   | 0.7 | -   | -  | 0.6     | 0.7  | -   | -  |
| 6-7                                     | 0.7   | 0.9 | -   | -  | 0.7     | 0.8  | -   | -  |
| 8-9                                     | 0.9   | 1.1 | -   | -  | 0.8     | 1.0  | -   | -  |
| 10-11                                   | 1.0   | 1.2 | -   | -  | 1.0     | 1.2  | -   | -  |
| 12-14                                   | 1.2   | 1.4 | -   | -  | 1.0     | 1.2  | -   | -  |
| 15-17                                   | 1.2   | 1.5 | -   | -  | 1.0     | 1.2  | -   | -  |
| 18-29                                   | 1.2   | 1.4 | -   | -  | 0.9     | 1.1  | -   | -  |
| 30-49                                   | 1.2   | 1.4 | -   | -  | 0.9     | 1.1  | -   | -  |
| 50-69                                   | 1.1   | 1.3 | -   | -  | 0.9     | 1.0  | -   | -  |
| ≥ 70                                    | 0.8   | 1.0 | -   | -  | 0.7     | 0.8  | -   | -  |
| Pregnant women<br>(amount to be added)  | /     |     |     |    | -       | -    | -   | -  |
| early-stage                             |       |     |     |    | +0      | +0   | -   | -  |
| mid-stage                               |       |     |     |    | +0.1    | +0.1 | -   | -  |
| late-stage                              |       |     |     |    | +0.2    | +0.3 | -   | -  |
| Lactating women<br>(amount to be added) | /     |     |     |    | +0.1    | +0.1 | -   | -  |

<sup>1</sup> Computed using the Estimated Energy Requirement for PAL II. EAR, estimated average requirement; RDA, recommended dietary allowance; AI, adequate intake; UL, tolerable upper intake level; PAL, physical activity level

Dietary Reference Intakes (DRIs) for vitamin B<sub>2</sub> (mg/day)<sup>1</sup>

| Sex                                     | Males |     |     |    | Females |      |     |    |
|---|-------|-----|-----|----|---------|------|-----|----|
| Age                                     | EAR   | RDA | AI  | UL | EAR     | RDA  | AI  | UL |
| 0-5 months                              | -     | -   | 0.3 | -  | -       | -    | 0.3 | -  |
| 6-11                                    | -     | -   | 0.4 | -  | -       | -    | 0.4 | -  |
| 1-2 years                               | 0.5   | 0.6 | -   | -  | 0.4     | 0.5  | -   | -  |
| 3-5                                     | 0.7   | 0.8 | -   | -  | 0.6     | 0.8  | -   | -  |
| 6-7                                     | 0.8   | 1.0 | -   | -  | 0.7     | 0.9  | -   | -  |
| 8-9                                     | 1.0   | 1.2 | -   | -  | 0.9     | 1.1  | -   | -  |
| 10-11                                   | 1.2   | 1.4 | -   | -  | 1.1     | 1.3  | -   | -  |
| 12-14                                   | 1.3   | 1.6 | -   | -  | 1.2     | 1.4  | -   | -  |
| 15-17                                   | 1.4   | 1.7 | -   | -  | 1.1     | 1.3  | -   | -  |
| 18-29                                   | 1.3   | 1.6 | -   | -  | 1.0     | 1.2  | -   | -  |
| 30-49                                   | 1.3   | 1.6 | -   | -  | 1.0     | 1.2  | -   | -  |
| 50-69                                   | 1.2   | 1.4 | -   | -  | 1.0     | 1.2  | -   | -  |
| ≥ 70                                    | 0.9   | 1.1 | -   | -  | 0.8     | 0.9  | -   | -  |
| Pregnant women<br>(amount to be added)  | /     |     |     |    |         |      |     |    |
| early-stage                             |       |     |     |    | +0      | +0   | -   | -  |
| mid-stage                               |       |     |     |    | +0.1    | +0.2 | -   | -  |
| late-stage                              |       |     |     |    | +0.3    | +0.3 | -   | -  |
| Lactating women<br>(amount to be added) | /     |     |     |    | +0.3    | +0.4 | -   | -  |

EAR, estimated average requirement; RDA, recommended dietary allowance; AI, adequate intake; UL, tolerable upper intake level; PAL, physical activity level

Dietary Reference Intakes (DRIs) for niacin (mg NE/day)<sup>1</sup>

| Sex                                     | Males |     |    |                 | Females |     |    |                 |
|---|-------|-----|----|-----------------|---------|-----|----|-----------------|
| Age                                     | EAR   | RDA | AI | UL <sup>2</sup> | EAR     | RDA | AI | UL <sup>2</sup> |
| 0-5 months <sup>3</sup>                 | -     | -   | 2  | -               | -       | -   | 2  | -               |
| 6-11                                    | -     | -   | 3  | -               | -       | -   | 3  | -               |
| 1-2 years                               | 5     | 6   | -  | -               | 4       | 5   | -  | -               |
| 3-5                                     | 7     | 8   | -  | -               | 6       | 7   | -  | -               |
| 6-7                                     | 8     | 10  | -  | -               | 7       | 9   | -  | -               |
| 8-9                                     | 9     | 11  | -  | -               | 9       | 10  | -  | -               |
| 10-11                                   | 11    | 13  | -  | -               | 10      | 12  | -  | -               |
| 12-14                                   | 13    | 15  | -  | -               | 11      | 13  | -  | -               |
| 15-17                                   | 13    | 16  | -  | -               | 11      | 13  | -  | -               |
| 18-29                                   | 13    | 15  | -  | 300 (100)       | 10      | 12  | -  | 300 (100)       |
| 30-49                                   | 13    | 15  | -  | 300 (100)       | 10      | 12  | -  | 300 (100)       |
| 50-69                                   | 12    | 14  | -  | 300 (100)       | 9       | 11  | -  | 300 (100)       |
| ≥ 70                                    | 9     | 11  | -  | 300 (100)       | 7       | 9   | -  | 300 (100)       |
| Pregnant women<br>(amount to be added)  | /     |     |    |                 |         |     |    |                 |
| early-stage                             |       |     |    |                 | +0      | +0  | -  | -               |
| mid-stage                               |       |     |    |                 | +1      | +1  | -  | -               |
| late-stage                              |       |     |    |                 | +2      | +3  | -  | -               |
| Lactating women<br>(amount to be added) | /     |     |    |                 | +2      | +2  | -  | -               |

NE, niacin equivalents; EAR, estimated average requirement; RDA, recommended dietary allowance; AI, adequate intake; UL, tolerable upper intake level; PAL, physical activity level. <sup>1</sup> Computed using the Estimated Energy Requirement for PAL II. <sup>2</sup> Quantity (mg) for the upper threshold of nicotinamide. The value in parentheses is the quantity (mg) of nicotinic acid. <sup>3</sup> Unit, mg/day

Dietary Reference Intakes (DRIs) for vitamin B<sub>6</sub> (mg/day)<sup>1</sup>

| Sex<br>Age                              | Males |     |     |                 | Females |      |     |                 |
|---|-------|-----|-----|-----------------|---------|------|-----|-----------------|
|   | EAR   | RDA | AI  | UL <sup>2</sup> | EAR     | RDA  | AI  | UL <sup>2</sup> |
| 0-5 months                              | -     | -   | 0.2 | -               | -       | -    | 0.2 | -               |
| 6-11                                    | -     | -   | 0.3 | -               | -       | -    | 0.3 | -               |
| 1-2 years                               | 0.4   | 0.5 | -   | -               | 0.4     | 0.5  | -   | -               |
| 3-5                                     | 0.5   | 0.6 | -   | -               | 0.5     | 0.6  | -   | -               |
| 6-7                                     | 0.7   | 0.8 | -   | -               | 0.6     | 0.7  | -   | -               |
| 8-9                                     | 0.8   | 0.9 | -   | -               | 0.8     | 0.9  | -   | -               |
| 10-11                                   | 1.0   | 1.2 | -   | -               | 1.0     | 1.2  | -   | -               |
| 12-14                                   | 1.1   | 1.4 | -   | -               | 1.0     | 1.3  | -   | -               |
| 15-17                                   | 1.2   | 1.5 | -   | -               | 1.0     | 1.2  | -   | -               |
| 18-29                                   | 1.1   | 1.4 | -   | 60              | 1.0     | 1.2  | -   | 60              |
| 30-49                                   | 1.1   | 1.4 | -   | 60              | 1.0     | 1.2  | -   | 60              |
| 50-69                                   | 1.1   | 1.4 | -   | 60              | 1.0     | 1.2  | -   | 60              |
| ≥ 70                                    | 1.1   | 1.4 | -   | 60              | 1.0     | 1.2  | -   | 60              |
| Pregnant women<br>(amount to be added)  |       |     |     |                 | +0.7    | +0.8 | -   | -               |
| Lactating women<br>(amount to be added) |       |     |     |                 | +0.3    | +0.3 | -   | -               |

EAR, estimated average requirement; RDA, recommended dietary allowance; AI, adequate intake; UL, tolerable upper intake level. PAL, physical activity level. <sup>1</sup> Computed using the Estimated Energy Requirement for PAL II. <sup>2</sup> Quantity as pyridoxine.

Dietary Reference Intakes (DRIs) for folic acid (µg/day)<sup>1</sup>

| Sex<br>Age                              | Males |     |    |                 | Females |      |    |                 |
|---|-------|-----|----|-----------------|---------|------|----|-----------------|
|   | EAR   | RDA | AI | UL <sup>2</sup> | EAR     | RDA  | AI | UL <sup>2</sup> |
| 0-5 months                              | -     | -   | 40 | -               | -       | -    | 40 | -               |
| 6-11                                    | -     | -   | 60 | -               | -       | -    | 60 | -               |
| 1-2 years                               | 80    | 90  | -  | -               | 80      | 90   | -  | -               |
| 3-5                                     | 90    | 110 | -  | -               | 90      | 110  | -  | -               |
| 6-7                                     | 110   | 140 | -  | -               | 110     | 140  | -  | -               |
| 8-9                                     | 140   | 160 | -  | -               | 140     | 160  | -  | -               |
| 10-11                                   | 160   | 200 | -  | -               | 160     | 200  | -  | -               |
| 12-14                                   | 200   | 240 | -  | -               | 200     | 240  | -  | -               |
| 15-17                                   | 200   | 240 | -  | -               | 200     | 240  | -  | -               |
| 18-29                                   | 200   | 240 | -  | 1,000           | 200     | 240  | -  | 1,000           |
| 30-49                                   | 200   | 240 | -  | 1,000           | 200     | 240  | -  | 1,000           |
| 50-69                                   | 200   | 240 | -  | 1,000           | 200     | 240  | -  | 1,000           |
| ≥ 70                                    | 200   | 240 | -  | 1,000           | 200     | 240  | -  | 1,000           |
| Pregnant women<br>(amount to be added)  |       |     |    |                 | +170    | +200 | -  | -               |
| Lactating women<br>(amount to be added) |       |     |    |                 | +80     | +100 | -  | -               |

EAR, estimated average requirement; RDA, recommended dietary allowance; AI, adequate intake; UL, tolerable upper intake level. <sup>1</sup> Intake of 400 µg/day is desired for women who are planning to get pregnant or may be pregnant to reduce the risk of neural tube closure. <sup>2</sup> Quantity as pteroyl-monoglutamic acid (intake from sources other than ordinary food).

Dietary Reference Intakes (DRIs) for vitamin B<sub>12</sub> ( µg/day)

| Sex                                     | Males |     |     |                 | Females |      |     |                 |
|---|-------|-----|-----|-----------------|---------|------|-----|-----------------|
| Age                                     | EAR   | RDA | AI  | UL <sup>1</sup> | EAR     | RDA  | AI  | UL <sup>1</sup> |
| 0-5 months                              | -     | -   | 0.2 | -               | -       | -    | 0.2 | -               |
| 6-11                                    | -     | -   | 0.5 | -               | -       | -    | 0.5 | -               |
| 1-2 years                               | 0.8   | 0.9 | -   | -               | 0.8     | 0.9  | -   | -               |
| 3-5                                     | 0.9   | 1.1 | -   | -               | 0.9     | 1.1  | -   | -               |
| 6-7                                     | 1.2   | 1.4 | -   | -               | 1.2     | 1.4  | -   | -               |
| 8-9                                     | 1.4   | 1.6 | -   | -               | 1.4     | 1.6  | -   | -               |
| 10-11                                   | 1.6   | 2.0 | -   | -               | 1.6     | 2.0  | -   | -               |
| 12-14                                   | 2.0   | 2.4 | -   | -               | 2.0     | 2.4  | -   | -               |
| 15-17                                   | 2.0   | 2.4 | -   | -               | 2.0     | 2.4  | -   | -               |
| 18-29                                   | 2.0   | 2.4 | -   | -               | 2.0     | 2.4  | -   | -               |
| 30-49                                   | 2.0   | 2.4 | -   | -               | 2.0     | 2.4  | -   | -               |
| 50-69                                   | 2.0   | 2.4 | -   | -               | 2.0     | 2.4  | -   | -               |
| ≥ 70                                    | 2.0   | 2.4 | -   | -               | 2.0     | 2.4  | -   | -               |
| Pregnant women<br>(amount to be added)  |       |     |     |                 | +0.3    | +0.4 | -   | -               |
| Lactating women<br>(amount to be added) |       |     |     |                 | +0.3    | +0.4 | -   | -               |

EAR, estimated average requirement; RDA, recommended dietary allowance; AI, adequate intake; UL, tolerable upper intake level. <sup>1</sup>The ULs were not set; even if it is taken in excess, the intrinsic factor secreted from the stomach becomes saturated and excess vitamin B<sub>12</sub> is not absorbed.

## Dietary Reference Intakes (DRIs) for biotin (µg/day)

| Sex                                    | Males |     |    |    | Females |     |    |    |
|--|-------|-----|----|----|---------|-----|----|----|
| Age                                    | EAR   | RDA | AI | UL | EAR     | RDA | AI | UL |
| 0-5 months                             | -     | -   | 4  | -  | -       | -   | 4  | -  |
| 6-11                                   | -     | -   | 10 | -  | -       | -   | 10 | -  |
| 1-2 years                              | -     | -   | 20 | -  | -       | -   | 20 | -  |
| 3-5                                    | -     | -   | 25 | -  | -       | -   | 25 | -  |
| 6-7                                    | -     | -   | 30 | -  | -       | -   | 30 | -  |
| 8-9                                    | -     | -   | 35 | -  | -       | -   | 35 | -  |
| 10-11                                  | -     | -   | 40 | -  | -       | -   | 40 | -  |
| 12-14                                  | -     | -   | 45 | -  | -       | -   | 45 | -  |
| 15-17                                  | -     | -   | 45 | -  | -       | -   | 45 | -  |
| 18-29                                  | -     | -   | 45 | -  | -       | -   | 45 | -  |
| 30-49                                  | -     | -   | 45 | -  | -       | -   | 45 | -  |
| 50-69                                  | -     | -   | 45 | -  | -       | -   | 45 | -  |
| ≥ 70                                   | -     | -   | 45 | -  | -       | -   | 45 | -  |
| Pregnant women<br>(amount to be added) |       |     |    |    | -       | -   | +2 | -  |
| Lactating women<br>(additional value)  |       |     |    |    | -       | -   | +4 | -  |

EAR, estimated average requirement; RDA, recommended dietary allowance; AI, adequate intake; UL, tolerable upper intake level

## Dietary Reference Intakes (DRIs) for pantothenic acid (mg/day)

| Sex<br>Age                              | Males |     |    |    | Females |     |                |    |
|---|-------|-----|----|----|---------|-----|----------------|----|
|   | EAR   | RDA | AI | UL | EAR     | RDA | AI             | UL |
| 0-5 months                              | -     | -   | 4  | -  | -       | -   | 4              | -  |
| 6-11                                    | -     | -   | 5  | -  | -       | -   | 5              | -  |
| 1-2 years                               | -     | -   | 4  | -  | -       | -   | 3              | -  |
| 3-5                                     | -     | -   | 5  | -  | -       | -   | 4              | -  |
| 6-7                                     | -     | -   | 6  | -  | -       | -   | 5              | -  |
| 8-9                                     | -     | -   | 6  | -  | -       | -   | 5              | -  |
| 10-11                                   | -     | -   | 6  | -  | -       | -   | 6              | -  |
| 12-14                                   | -     | -   | 7  | -  | -       | -   | 6              | -  |
| 15-17                                   | -     | -   | 7  | -  | -       | -   | 5              | -  |
| 18-29                                   | -     | -   | 6  | -  | -       | -   | 5              | -  |
| 30-49                                   | -     | -   | 6  | -  | -       | -   | 5              | -  |
| 50-69                                   | -     | -   | 6  | -  | -       | -   | 5 <sup>1</sup> | -  |
| ≥ 70                                    | -     | -   | 6  | -  | -       | -   | 5              | -  |
| Pregnant women<br>(amount to be added)  |       |     |    |    | -       | -   | +1             | -  |
| Lactating women<br>(amount to be added) |       |     |    |    | -       | -   | +4             | -  |

<sup>1</sup> The values were smoothed in relation to those of the preceding and succeeding age groups. EAR, estimated average requirement; RDA, recommended dietary allowance; AI, adequate intake; UL, tolerable upper intake level

## Dietary Reference Intakes (DRIs) for vitamin C (mg/day)

| Sex<br>Age                              | Males |     |    |    | Females |     |    |    |
|---|-------|-----|----|----|---------|-----|----|----|
|   | EAR   | RDA | AI | UL | EAR     | RDA | AI | UL |
| 0-5 months                              | -     | -   | 40 | -  | -       | -   | 40 | -  |
| 6-11                                    | -     | -   | 40 | -  | -       | -   | 40 | -  |
| 1-2 years                               | 35    | 40  | -  | -  | 35      | 40  | -  | -  |
| 3-5                                     | 40    | 45  | -  | -  | 40      | 45  | -  | -  |
| 6-7                                     | 50    | 60  | -  | -  | 50      | 60  | -  | -  |
| 8-9                                     | 55    | 70  | -  | -  | 55      | 70  | -  | -  |
| 10-11                                   | 70    | 80  | -  | -  | 70      | 80  | -  | -  |
| 12-14                                   | 85    | 100 | -  | -  | 85      | 100 | -  | -  |
| 15-17                                   | 85    | 100 | -  | -  | 85      | 100 | -  | -  |
| 18-29                                   | 85    | 100 | -  | -  | 85      | 100 | -  | -  |
| 30-49                                   | 85    | 100 | -  | -  | 85      | 100 | -  | -  |
| 50-69                                   | 85    | 100 | -  | -  | 85      | 100 | -  | -  |
| ≥ 70                                    | 85    | 100 | -  | -  | 85      | 100 | -  | -  |
| Pregnant women<br>(amount to be added)  |       |     |    |    | +10     | +10 | -  | -  |
| Lactating women<br>(amount to be added) |       |     |    |    | +40     | +50 | -  | -  |

EAR, estimated average requirement; RDA, recommended dietary allowance; AI, adequate intake; UL, tolerable upper intake level

Dietary Reference Intakes (DRIs) for vitamin A ( $\mu\text{g RE/day}$ )

| Sex<br>Age                              | Males |                  |                 |                 | Females |                  |                 |                 |
|---|-------|------------------|-----------------|-----------------|---------|------------------|-----------------|-----------------|
|   | EAR   | RDA <sup>1</sup> | AI <sup>1</sup> | UL <sup>2</sup> | EAR     | RDA <sup>1</sup> | AI <sup>1</sup> | UL <sup>2</sup> |
| 0-5 months                              | -     | -                | 250             | 600             | -       | -                | 250             | 600             |
| 6-11                                    | -     | -                | 350             | 600             | -       | -                | 350             | 600             |
| 1-2 years                               | 200   | 250              | -               | 600             | 150     | 250              | -               | 600             |
| 3-5                                     | 200   | 300              | -               | 750             | 200     | 300              | -               | 750             |
| 6-7                                     | 300   | 400              | -               | 1,000           | 250     | 350              | -               | 1,000           |
| 8-9                                     | 350   | 450              | -               | 1,250           | 300     | 400              | -               | 1,250           |
| 10-11                                   | 400   | 550              | -               | 1,550           | 350     | 500              | -               | 1,550           |
| 12-14                                   | 500   | 700              | -               | 2,220           | 400     | 550              | -               | 2,220           |
| 15-17                                   | 500   | 700              | -               | 2,550           | 400     | 600              | -               | 2,550           |
| 18-29                                   | 550   | 750              | -               | 3,000           | 400     | 600              | -               | 3,000           |
| 30-49                                   | 550   | 750              | -               | 3,000           | 450     | 600              | -               | 3,000           |
| 50-69                                   | 500   | 700              | -               | 3,000           | 450     | 600              | -               | 3,000           |
| $\geq 70$                               | 450   | 650              | -               | 3,000           | 400     | 550              | -               | 3,000           |
| Pregnant women<br>(amount to be added)  |       |                  |                 |                 | +50     | +70              | -               | -               |
| Lactating women<br>(amount to be added) |       |                  |                 |                 | +300    | +420             | -               | -               |

RE=retinol equivalents. EAR, estimated average requirement; RDA, recommended dietary allowance; AI, adequate intake; UL, tolerable upper intake level.  $1 \mu\text{g RE} = 1 \mu\text{g retinol} = 12 \mu\text{g } \beta\text{-carotene} = 24 \mu\text{g } \alpha\text{-carotene} = 24 \mu\text{g } \beta\text{-cryptoxanthin}$ . <sup>1</sup> Includes provitamins and carotenoids. <sup>2</sup> Does not include provitamins or carotenoids.

Dietary Reference Intakes (DRIs) for vitamin E ( $\text{mg/day}$ )<sup>1</sup>

| Sex<br>Age                              | Males |     |    |                  | Females |     |    |     |
|---|-------|-----|----|------------------|---------|-----|----|-----|
|   | EAR   | RDA | AI | UL               | EAR     | RDA | AI | UL  |
| 0-5 months                              | -     | -   | 3  | -                | -       | -   | 3  | -   |
| 6-11                                    | -     | -   | 3  | -                | -       | -   | 3  | -   |
| 1-2 years                               | -     | -   | 5  | 150              | -       | -   | 4  | 150 |
| 3-5                                     | -     | -   | 6  | 200              | -       | -   | 6  | 200 |
| 6-7                                     | -     | -   | 7  | 300              | -       | -   | 6  | 300 |
| 8-9                                     | -     | -   | 8  | 400              | -       | -   | 7  | 300 |
| 10-11                                   | -     | -   | 10 | 500              | -       | -   | 7  | 500 |
| 12-14                                   | -     | -   | 10 | 600              | -       | -   | 8  | 600 |
| 15-17                                   | -     | -   | 10 | 700              | -       | -   | 9  | 600 |
| 18-29                                   | -     | -   | 9  | 800              | -       | -   | 8  | 600 |
| 30-49                                   | -     | -   | 8  | 800 <sup>2</sup> | -       | -   | 8  | 700 |
| 50-69                                   | -     | -   | 9  | 800              | -       | -   | 8  | 700 |
| $\geq 70$                               | -     | -   | 7  | 700              | -       | -   | 7  | 600 |
| Pregnant women<br>(amount to be added)  |       |     |    |                  | -       | -   | +0 | -   |
| Lactating women<br>(amount to be added) |       |     |    |                  | -       | -   | +3 | -   |

EAR, estimated average requirement; RDA, recommended dietary allowance; AI, adequate intake; UL, tolerable upper intake level. <sup>1</sup> Computation was made on  $\alpha$ -tocopherol. Vitamins E other than  $\alpha$ -tocopherol are not included. <sup>2</sup> The value was smoothed in relation to those for the preceding and succeeding age groups.



Dietary Reference Intakes (DRIs) for vitamin D ( $\mu\text{g}/\text{day}$ )

| Sex<br>Age                              | Males |     |         |    | Females |     |         |    |
|---|-------|-----|---------|----|---------|-----|---------|----|
|   | EAR   | RDA | AI      | UL | EAR     | RDA | AI      | UL |
| 0-5 months <sup>1</sup>                 | -     | -   | 2.5 (5) | 25 | -       | -   | 2.5 (5) | 25 |
| 6-11 <sup>1</sup> .....                 | -     | -   | 4 (5)   | 25 | -       | -   | 4 (5)   | 25 |
| 1-2 years                               | -     | -   | 3       | 25 | -       | -   | 3       | 25 |
| 3-5                                     | -     | -   | 3       | 25 | -       | -   | 3       | 25 |
| 6-7                                     | -     | -   | 3       | 30 | -       | -   | 3       | 30 |
| 8-9                                     | -     | -   | 4       | 30 | -       | -   | 4       | 30 |
| 10-11                                   | -     | -   | 4       | 40 | -       | -   | 4       | 40 |
| 12-14                                   | -     | -   | 4       | 50 | -       | -   | 4       | 50 |
| 15-17                                   | -     | -   | 5       | 50 | -       | -   | 5       | 50 |
| 18-29                                   | -     | -   | 5       | 50 | -       | -   | 5       | 50 |
| 30-49                                   | -     | -   | 5       | 50 | -       | -   | 5       | 50 |
| 50-69                                   | -     | -   | 5       | 50 | -       | -   | 5       | 50 |
| $\geq 70$                               | -     | -   | 5       | 50 | -       | -   | 5       | 50 |
| Pregnant women<br>(amount to be added)  | -     | -   | -       | -  | -       | -   | +2.5    | -  |
| Lactating women<br>(amount to be added) | -     | -   | -       | -  | -       | -   | +2.5    | -  |

EAR, estimated average requirement; RDA, recommended dietary allowance; AI, adequate intake; UL, tolerable upper intake level.  
<sup>1</sup>Adequate intakes for an infant who is exposed to appropriate sunlight. The value in parentheses is adequate intakes for those with less sunlight exposure.

Dietary Reference Intakes (DRIs) for vitamin K ( $\mu\text{g}/\text{day}$ )

| Sex<br>Age                              | Males |     |    |    | Females |     |    |    |
|---|-------|-----|----|----|---------|-----|----|----|
|   | EAR   | RDA | AI | UL | EAR     | RDA | AI | UL |
| 0-5 months                              | -     | -   | 4  | -  | -       | -   | 4  | -  |
| 6-11                                    | -     | -   | 7  | -  | -       | -   | 7  | -  |
| 1-2 years                               | -     | -   | 25 | -  | -       | -   | 25 | -  |
| 3-5                                     | -     | -   | 30 | -  | -       | -   | 30 | -  |
| 6-7                                     | -     | -   | 40 | -  | -       | -   | 35 | -  |
| 8-9                                     | -     | -   | 45 | -  | -       | -   | 45 | -  |
| 10-11                                   | -     | -   | 55 | -  | -       | -   | 55 | -  |
| 12-14                                   | -     | -   | 70 | -  | -       | -   | 65 | -  |
| 15-17                                   | -     | -   | 80 | -  | -       | -   | 60 | -  |
| 18-29                                   | -     | -   | 75 | -  | -       | -   | 60 | -  |
| 30-49                                   | -     | -   | 75 | -  | -       | -   | 65 | -  |
| 50-69                                   | -     | -   | 75 | -  | -       | -   | 65 | -  |
| $\geq 70$                               | -     | -   | 75 | -  | -       | -   | 65 | -  |
| Pregnant women<br>(amount to be added)  | -     | -   | -  | -  | -       | -   | +0 | -  |
| Lactating women<br>(amount to be added) | -     | -   | -  | -  | -       | -   | +0 | -  |

EAR, estimated average requirement; RDA, recommended dietary allowance; AI, adequate intake; UL, tolerable upper intake level

## Dietary Reference Intakes (DRIs) for magnesium (mg/day)

| Sex<br>Age                              | Males |     |    |                 | Females |     |    |                 |
|---|-------|-----|----|-----------------|---------|-----|----|-----------------|
|   | EAR   | RDA | AI | UL <sup>1</sup> | EAR     | RDA | AI | UL <sup>1</sup> |
| 0-5 months                              | -     | -   | 21 | -               | -       | -   | 21 | -               |
| 6-11                                    | -     | -   | 32 | -               | -       | -   | 32 | -               |
| 1-2 years                               | 60    | 70  | -  | -               | 55      | 70  | -  | -               |
| 3-5                                     | 85    | 100 | -  | -               | 80      | 100 | -  | -               |
| 6-7                                     | 115   | 140 | -  | -               | 110     | 130 | -  | -               |
| 8-9                                     | 140   | 170 | -  | -               | 140     | 160 | -  | -               |
| 10-11                                   | 180   | 210 | -  | -               | 180     | 210 | -  | -               |
| 12-14                                   | 250   | 300 | -  | -               | 230     | 270 | -  | -               |
| 15-17                                   | 290   | 350 | -  | -               | 250     | 300 | -  | -               |
| 18-29                                   | 290   | 340 | -  | -               | 230     | 270 | -  | -               |
| 30-49                                   | 310   | 370 | -  | -               | 240     | 280 | -  | -               |
| 50-69                                   | 290   | 350 | -  | -               | 240     | 290 | -  | -               |
| ≥ 70                                    | 260   | 310 | -  | -               | 220     | 270 | -  | -               |
| Pregnant women<br>(amount to be added)  |       |     |    |                 | +30     | +40 | -  | -               |
| Lactating women<br>(amount to be added) |       |     |    |                 | +0      | +0  | -  | -               |

EAR, estimated average requirement; RDA, recommended dietary allowance; AI, adequate intake; UL, tolerable upper intake level. <sup>1</sup>When the nutrient is obtained from ordinary food, no upper threshold is set. When the nutrient is obtained from a source other than ordinary food, the upper threshold is set at 350 mg/day for adults and 5 mg/kg weight/day for children.

## Dietary Reference Intakes (DRIs) for calcium (mg/day)

| Sex<br>Age   | Males            |                  |                 | Females          |                  |                 |
|--|------------------|------------------|-----------------|------------------|------------------|-----------------|
|  | AI               | DG               | UL <sup>2</sup> | AI               | DG               | UL <sup>2</sup> |
| 0-5 months   |                  |                  |                 |                  |                  |                 |
| Breastfed infants                                    | 200              | -                | -               | 200              | -                | -               |
| Formula-fed infants                                  | 300              | -                | -               | 300              | -                | -               |
| 6-11 months  |                  |                  |                 |                  |                  |                 |
| Breastfed infants                                    | 250              | -                | -               | 250              | -                | -               |
| Formula-fed infants                                  | 400              | -                | -               | 400              | -                | -               |
| 1-2 years  | 450              | 450 <sup>3</sup> | -               | 400              | 400              | -               |
| 3-5  | 600              | 550              | -               | 550              | 550 <sup>3</sup> | -               |
| 6-7  | 600              | 600              | -               | 650              | 600              | -               |
| 8-9  | 700 <sup>4</sup> | 700              | -               | 800              | 700              | -               |
| 10-11  | 950              | 800              | -               | 950              | 800              | -               |
| 12-14  | 1,000            | 900              | -               | 850              | 750              | -               |
| 15-17  | 1,100            | 850              | -               | 850              | 650              | -               |
| 18-29  | 900              | 650              | 2,300           | 700              | 600 <sup>4</sup> | 2,300           |
| 30-49  | 650              | 600 <sup>4</sup> | 2,300           | 600 <sup>4</sup> | 600 <sup>4</sup> | 2,300           |
| 50-69  | 700              | 600              | 2,300           | 700              | 600              | 2,300           |
| ≥ 70   | 750              | 600              | 2,300           | 650              | 550              | 2,300           |
| Pregnant women<br>(amount to be added) <sup>1</sup>  |                  |                  |                 | +0               | -                | -               |
| Lactating women<br>(amount to be added) <sup>1</sup> |                  |                  |                 | +0               | -                | -               |

AI, adequate intake; DG, tentative dietary goal for preventing life-style related diseases; UL, tolerable upper intake level. <sup>1</sup>No additional value is defined, but it is desirable to achieve the adequate intake. When a subject suffers from a placental dysfunction such as pregnancy toxemia, active efforts should be made to consume calcium. <sup>2</sup>Because sufficient studies have not been conducted on the upper threshold, it is not set for those under 17 years. However, it by no means recommends excessive intake or assures the safety of such an intake. <sup>3</sup>Because the adequate intake and the median value of the current intake are close, the former is adopted. <sup>4</sup>The value was smoothed in relation to those of the preceding and succeeding age groups.

## Dietary Reference Intakes (DRIs) for phosphorus (mg/day)

| Sex<br>Age                              | Males |     |       |       | Females |     |       |       |
|---|-------|-----|-------|-------|---------|-----|-------|-------|
|   | EAR   | RDA | AI    | UL    | EAR     | RDA | AI    | UL    |
| 0-5 months                              | —     | —   | 130   | —     | —       | —   | 130   | —     |
| 6-11                                    | —     | —   | 280   | —     | —       | —   | 280   | —     |
| 1-2 years                               | —     | —   | 650   | —     | —       | —   | 600   | —     |
| 3-5                                     | —     | —   | 800   | —     | —       | —   | 800   | —     |
| 6-7                                     | —     | —   | 1,000 | —     | —       | —   | 900   | —     |
| 8-9                                     | —     | —   | 1,100 | —     | —       | —   | 1,000 | —     |
| 10-11                                   | —     | —   | 1,150 | —     | —       | —   | 1,050 | —     |
| 12-14                                   | —     | —   | 1,350 | —     | —       | —   | 1,100 | —     |
| 15-17                                   | —     | —   | 1,250 | —     | —       | —   | 1,000 | —     |
| 18-29                                   | —     | —   | 1,050 | 3,500 | —       | —   | 900   | 3,500 |
| 30-49                                   | —     | —   | 1,050 | 3,500 | —       | —   | 900   | 3,500 |
| 50-69                                   | —     | —   | 1,050 | 3,500 | —       | —   | 900   | 3,500 |
| ≥ 70                                    | —     | —   | 1,000 | 3,500 | —       | —   | 900   | 3,500 |
| Pregnant women<br>(amount to be added)  | —     | —   | —     | —     | —       | —   | +0    | —     |
| Lactating women<br>(amount to be added) | —     | —   | —     | —     | —       | —   | +0    | —     |

EAR, estimated average requirement; RDA, recommended dietary allowance; AI, adequate intake; UL, tolerable upper intake level

Dietary Reference Intakes (DRIs) for chromium ( $\mu\text{g}/\text{day}$ ): Provisional

| Sex<br>Age                              | Males |     |    |    | Females |     |    |    |
|---|-------|-----|----|----|---------|-----|----|----|
|   | EAR   | RDA | AI | UL | EAR     | RDA | AI | UL |
| 0-5 months                              | -     | -   | -  | -  | -       | -   | -  | -  |
| 6-11                                    | -     | -   | -  | -  | -       | -   | -  | -  |
| 1-2 years                               | -     | -   | -  | -  | -       | -   | -  | -  |
| 3-5                                     | -     | -   | -  | -  | -       | -   | -  | -  |
| 6-7                                     | -     | -   | -  | -  | -       | -   | -  | -  |
| 8-9                                     | -     | -   | -  | -  | -       | -   | -  | -  |
| 10-11                                   | -     | -   | -  | -  | -       | -   | -  | -  |
| 12-14                                   | -     | -   | -  | -  | -       | -   | -  | -  |
| 15-17                                   | -     | -   | -  | -  | -       | -   | -  | -  |
| 18-29                                   | 35    | 40  | -  | -  | 25      | 30  | -  | -  |
| 30-49                                   | 35    | 40  | -  | -  | 25      | 30  | -  | -  |
| 50-69                                   | 30    | 35  | -  | -  | 25      | 30  | -  | -  |
| ≥ 70                                    | 25    | 30  | -  | -  | 20      | 25  | -  | -  |
| Pregnant women<br>(amount to be added)  | -     | -   | -  | -  | -       | -   | -  | -  |
| Lactating women<br>(amount to be added) | -     | -   | -  | -  | -       | -   | -  | -  |

EAR, estimated average requirement; RDA, recommended dietary allowance; AI, adequate intake; UL, tolerable upper intake level

Dietary Reference Intakes (DRIs) for molybdenum ( $\mu\text{g/day}$ ): Provisional

| Sex<br>Age                              | Males |     |    |     | Females |     |    |     |
|---|-------|-----|----|-----|---------|-----|----|-----|
|   | EAR   | RDA | AI | UL  | EAR     | RDA | AI | UL  |
| 0-5 months                              | -     | -   | -  | -   | -       | -   | -  | -   |
| 6-11                                    | -     | -   | -  | -   | -       | -   | -  | -   |
| 1-2 years                               | -     | -   | -  | -   | -       | -   | -  | -   |
| 3-5                                     | -     | -   | -  | -   | -       | -   | -  | -   |
| 6-7                                     | -     | -   | -  | -   | -       | -   | -  | -   |
| 8-9                                     | -     | -   | -  | -   | -       | -   | -  | -   |
| 10-11                                   | -     | -   | -  | -   | -       | -   | -  | -   |
| 12-14                                   | -     | -   | -  | -   | -       | -   | -  | -   |
| 15-17                                   | -     | -   | -  | -   | -       | -   | -  | -   |
| 18-29                                   | 20    | 25  | -  | 300 | 15      | 20  | -  | 240 |
| 30-49                                   | 20    | 25  | -  | 320 | 15      | 20  | -  | 250 |
| 50-69                                   | 20    | 25  | -  | 300 | 15      | 20  | -  | 250 |
| $\geq 70$                               | 20    | 25  | -  | 270 | 15      | 20  | -  | 230 |
| Pregnant women<br>(amount to be added)  | -     | -   | -  | -   | -       | -   | -  | -   |
| Lactating women<br>(amount to be added) | -     | -   | -  | -   | -       | -   | -  | -   |

EAR, estimated average requirement; RDA, recommended dietary allowance; AI, adequate intake; UL, tolerable upper intake level

Dietary Reference Intakes (DRIs) for manganese ( $\text{mg/day}$ )

| Sex<br>Age                              | Males |     |                  |    | Females |     |                  |    |
|---|-------|-----|------------------|----|---------|-----|------------------|----|
|   | EAR   | RDA | AI               | UL | EAR     | RDA | AI               | UL |
| 0-5 months                              | -     | -   | 0.001            | -  | -       | -   | 0.001            | -  |
| 6-11                                    | -     | -   | 1.2              | -  | -       | -   | 1.2              | -  |
| 1-2 years                               | -     | -   | 1.5              | -  | -       | -   | 1.5              | -  |
| 3-5                                     | -     | -   | 1.7              | -  | -       | -   | 1.7              | -  |
| 6-7                                     | -     | -   | 2.0              | -  | -       | -   | 2.0              | -  |
| 8-9                                     | -     | -   | 2.5              | -  | -       | -   | 2.5              | -  |
| 10-11                                   | -     | -   | 3.0              | -  | -       | -   | 3.0              | -  |
| 12-14                                   | -     | -   | 4.0              | -  | -       | -   | 3.5 <sup>1</sup> | -  |
| 15-17                                   | -     | -   | 4.0 <sup>1</sup> | -  | -       | -   | 3.5              | -  |
| 18-29                                   | -     | -   | 4.0              | 11 | -       | -   | 3.5              | 11 |
| 30-49                                   | -     | -   | 4.0              | 11 | -       | -   | 3.5              | 11 |
| 50-69                                   | -     | -   | 4.0              | 11 | -       | -   | 3.5              | 11 |
| $\geq 70$                               | -     | -   | 4.0              | 11 | -       | -   | 3.5              | 11 |
| Pregnant women<br>(amount to be added)  | -     | -   | -                | -  | -       | -   | +0               | -  |
| Lactating woman<br>(amount to be added) | -     | -   | -                | -  | -       | -   | +0               | -  |

EAR, estimated average requirement; RDA, recommended dietary allowance; AI, adequate intake; UL, tolerable upper intake level. <sup>1</sup>The value was smoothed in relation to those of the preceding and succeeding age groups.