

# A Survey of Infant and Young Child Feeding in Hong Kong:

## Diet and Nutrient Intake

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## List of Abbreviations

AAP	American Academy of Pediatrics
ANCOVA	Analysis of Covariance
AR	Average Requirement
BF	Breastfed
BMI	Body Mass Index
CHR	Child Health Registry
CHS	Child Health Survey
CHSS	Child Health Service System
CI	Confidence Interval
DNS	Survey on Diet and Nutrient intake
EAR	Estimated Average Requirement
FAO	Food and Agricultural Organization
FF	Formula Fed
FITS	Feeding Infants and Toddlers Study
g	Gram
HK	Hong Kong
IOM	Institute of Medicine
kcal	Kilocalories
kg	Kilogram
m	Meter
MCHC	Maternal and Child Health Centre
ml	Milliliter
mg	Milligram
RA	Research Assistant
RNI	Reference Nutrient Intake
SD	Standard Deviation
SDS	Standard Deviation Score
SPSS	Statistical Package for the Social Sciences
UK	United Kingdom
UL	Tolerable Upper Intake Level
WHO	World Health Organization

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## **Executive Summary**

### **Background**

It is known that a healthy diet is associated with reduced risk of obesity and associated chronic diseases. The first five years of life is the period when eating habits become established. Previous local studies on the food and nutrient intake of children aged 0 to 5 years were conducted more than 20 years ago and they were limited by small sample size and convenient sampling method, with limited information on daily nutrient intake and food source of nutrients.

The aim of this survey was to examine the current status of diet and nutrient intake of children aged 0 to 5 years in Hong Kong. This was the first large-scale survey of diet and nutrient intake on this population.

### **Methods**

This was a cross-sectional survey. Children of six age groups (6-7 months, 9-10 months, 12-13 months, 18-19 months, 24 months and 48 months) were recruited from Maternal and Child Health Centres (MCHCs) from January to September 2010. To be eligible for inclusion, both parents should be Hong Kong citizens, ethnic Chinese, be able to speak Cantonese or Putonghua, and read and write Chinese. In addition, the index child should be born at gestational age of 37 weeks or above. The exclusion criteria were chronic medical illness, or major congenital abnormalities requiring specialist care or long-term follow up in the index child. Participating families were selected using simple random sampling with the MCHC register as the sampling frame.

A 3-day dietary record was used to assess children's diet. The 3-day period included two weekdays and one day of a weekend. Parents or caregivers were asked to record all foods and beverages consumed by their children over the three days. A 'food portion size and utensils guide' was provided to parents or caregivers to facilitate completion of the dietary record. Daily nutrient intakes from the dietary records were analyzed using the nutritional analysis software CompEat Pro Version 5.8.0 (United Kingdom), and a food composition table of foods compiled by the Centre for Food Safety containing foods from China and Hong Kong. Chemical analyses of nutrient contents were also performed for selected formulae and baby foods commonly consumed among infants and children in Hong Kong.

Assessment of the nutrient adequacy of the studied children was made by comparison with the Estimated Average Requirement (EAR) (or the average individual requirement if the EAR is not available), and the Reference Nutrient Intake (RNI) of the World Health Organization/Food and Agricultural Organization (WHO/FAO). Other overseas dietary recommendations were also applied if daily requirement of a nutrient is not available from the WHO/FAO. The daily consumption of the various food groups was calculated and compared with local recommended intakes for children aged 12 months and above.

Body weight and length/height of the studied children were measured using standardised methods and the body mass index (BMI) was calculated. Demographic

characteristics of their parents were also collected. Weight, height and BMI were transformed to age-sex standardised z-score based on the WHO Child Growth Standard and the Hong Kong growth reference. The proportion of children with wasting (BMI for age z-score below -2), stunting (height or length for age z-score below -2), underweight (weight for age z-score below -2), 'possible risk of overweight' (BMI for age z-score between 1 and 2) and 'overweight or obesity' (BMI for age z-score over 2) was estimated with reference to the WHO Child Growth Standard.

### **Key findings**

Among 2,849 parents sampled, 1,893 were contactable and 1,581 consented to participate. The participation and response rate were 55.5% and 83.5% respectively. A total of 1,272 children (50.8% boys and 49.2% girls) with complete data were included in the final analysis. Key findings of the survey are as follows:

#### *Growth status*

Based on the WHO Child Growth Standard and cut-offs as described above, 12.7% and 2.7% of the studied children were classified as "having possible risk of overweight" and 'overweight or obese' respectively. The proportion of 'overweight or obese' children increased from 1.2% in the 12-month group to 3.8% in the 24- and 48-month groups. The prevalence of underweight and wasting was low, being 1.3% and 1.6% respectively, and 2.8% of the studied children were stunted in height.

#### *Energy and nutrient intake*

The mean energy intake of the children was found to be close to or above the WHO EAR for energy, and the protein intake was adequate. Only 0.2% had protein intake less than the average requirement, and 99.0% had an intake above the safe intake level. The mean protein intake of the group was approximately two to three times higher than the average requirement. Protein accounted for 10 to 16% of energy intake across all age groups. This was within the range recommended by the Institute of Medicine of the National Academies, USA (such recommendation was not available in the WHO/FAO reference). Regarding dietary fibre intake, over 80% of children of the 2- and 4-year-old groups had fibre intake lower than the recommended level.

The median dietary calcium intake of all age groups was above the age-specific RNIs, except for the 48-month one. There were more children (between 10.7% and 36.2%) in the age groups 18 months and above with intake below the EAR than the younger age groups (between 3.4% and 8.5%), possibly due to a lower intake of calcium-rich foods in children aged 18 months and above.

The median intake of dietary iron of all age groups was above the age-specific RNIs. Lower intake of dietary iron was mainly seen in children below 12 months, with 22.0% and 16.5% of the 6- and 9-month groups respectively having dietary iron intake below the calculated intake level that meets the median total absolute requirement of the WHO/FAO recommendation. They were mostly breast fed children. It should be noted that though

breastmilk is low in iron, the bioavailability of iron in breastmilk is much higher than that in formula milk.

The median intake of dietary zinc of all groups was above the age-specific RNIs, and 6.4% had zinc intake below the EAR. This proportion of zinc inadequacy was low compared to the Population Zinc Inadequacy Indicator of > 25% as defined by the International Zinc Nutrition Consultative Group. There were more children in the 9-month group with intake below the EAR than other age groups.

Overall, less than 10% of children aged 18 months or younger had dietary sodium intake higher than the recommended intake. The proportion of children with sodium intake higher than that recommended increased to 26.1% and 31.0% respectively in the 24- and 48-month groups. However, caution should be taken when interpreting the data on sodium intake since the estimation of intake of salt and other condiments are subject to bias towards underestimation.

#### Types of milk consumed

The survey showed that the use of formula milk was prevalent among children at all age groups and the breastfeeding rate at 6 months and beyond was low. Among the 6-month group, 6.8% consumed breastmilk as the sole source of milk; 13% consumed both breastmilk and formula milk and 80.2% took formula milk only. Among the 12- to 24-month groups, over 90% drank formula only. For the 48-month group, 77% still drank formula milk.

#### Food consumption pattern

The survey showed that our children's diet was unbalanced. The food consumption pattern of children 12 months and above was characterized by inadequate intake of vegetables and fruits, high intake of protein-rich foods and formula milk. Over 60% had vegetable intake and over 30% had fruit intake below the recommended level. The proportion of children with meat/fish/egg/legume intake higher than the recommended level increased with age, from 12.9% in the 12-month group, to 34.3% in the 48-month group. The survey revealed a high consumption of milk by children, with 69.6% in 12-month group, 47.6% in 18-month group, 35.7% in 24-month group and 9.9% in 48-month group consuming more than the recommended amount of 2 cups (480 ml) per day. It was also found that children who drank more milk (mainly formula milk) than the recommended volume generally consumed a smaller amount of grains, vegetables and fruits.

Findings of the survey revealed the emergence of some unhealthy dietary patterns in older children. The number of children consuming desserts, snacks, sweets, processed meat, fruit and carbonated drinks greatly increased at four years of age. Among the 48-month group, approximately 90% consumed desserts, snacks and sweets, and nearly 50% included processed meat in their diet. Over 40% of children had fruit drinks whereas a total of 17.8% of children consumed carbonated drinks.

### Use of health supplements and Chinese herbal remedies

Approximately one-third of the children used health supplements and Chinese herbal remedies. At 18 months or above, fish liver oil was the most common type of health supplement used, followed by pure vitamins and/or minerals.

### **Conclusions and recommendations**

This survey showed that the energy intake of 6-month to 48-month-old children was comparable to that recommended by the WHO/FAO. The dietary intake of protein was adequate and low protein intake was extremely rare. Though the dietary intake of calcium, iron and zinc was adequate as a whole, a higher proportion of children had a low intake of iron and zinc before 12 months and the intake of calcium may need to be improved in those aged 48 months. Fibre intake was low among the studied children. In addition, the proportion of children with sodium intake higher than the recommended level increased greatly after the age of two. With reference to the WHO Child Growth Standard, there was a low prevalence of wasting, underweight or stunting among the children. The data also suggested that overweight or obesity started to increase from 24 months onwards. These findings suggested that there was a tendency towards over- rather than under-nutrition among our children. The major dietary problem identified was dietary imbalance, characterized by a high intake of protein-rich foods, over dependence on formula use, and inadequate intake of plant-based foods.

### Importance of parental roles in helping infants and young children develop a healthy eating habit

Low fibre intake and inadequate consumption of fruits and vegetables have been suggested as risk factors for constipation in preschool and school children in Hong Kong. Accumulating evidence has shown an association between high intake of fruits and vegetables and reduction of chronic diseases, such as cardiovascular diseases, diabetes, and certain cancers. Establishing healthy eating habits during the early years is critical to reducing the burden of chronic diseases. During the period from 6 months to 2 years, there is radical shift in the pattern of food consumption where infants are expected to transition from a milk-based diet to an adult diet consisting of a variety of foods. Parents should foster healthy eating habits in children by providing a balanced diet with variety. Such a diet should contain plenty of fresh vegetables, fruits and grains (with some whole grain food); appropriate amount of protein-rich foods including meat, fish, egg and legumes; and an appropriate amount of milk. Iron-rich food, for example, meat, fish, some dark green vegetables and legumes should be introduced as early as the child starts solid food at around 6 months. With a varied diet, zinc intake can also be ensured. For children who dislike milk and older children who tend to reduce their milk consumption, parents can consider providing a variety of food which are good sources of bioavailable calcium, such as dark green vegetables, fortified soy milk and soy products (e.g. tofu).

### Types of milk recommended for children over one year of age

When choosing the different types of milk for young children, it is important to consider the composition of their total diet. With increasing age, children will be able to eat a diet of increasing variety and, therefore, be able to obtain essential fatty acids and energy from food

sources other than milk. Children over the age of one may continue breastfeeding or take whole (full-fat) cow milk along with a variety of foods until they are two years. Toddlers who are eating well can take reduced fat / semi-skimmed milk from two years onwards. Skimmed milk should not be given to children under five years. Specific advice on when to introduce low fat milk to children should also be based on the individual child's growth and needs.

*Volume of milk recommended for children over one year of age*

Excessive milk drinking may be a cause of low appetite at main meals. Children aged over one year should be eating a diet of increasing variety and adapting to eating family foods. The food they consume should be nutrient-rich, in particular iron-rich, and provide adequate energy. While milk remains a good source of energy and key nutrients such as protein, calcium, riboflavin and vitamin B12, the amount of milk intake can be reduced. An intake of 360 to 480 ml of milk per day is recommended for children aged over one year. This recommended intake level is based on several considerations, namely, the adequacy of calcium intake among children in this study with milk intake within this range, the higher fractional calcium absorption of Chinese children, the variety of calcium-rich foods in traditional Chinese diet and the better calcium bioavailability in these foods.

## **Chapter 1: Introduction**

In the Survey of Infant and Young Child Feeding in Hong Kong, the children's diet and nutrient intake was studied . This chapter provides the background and the objectives of the survey (DNS).

### **1.1 Importance of diet and nutrition at early life on long-term health**

The interaction of genetics and environment is the foundation for all health and diseases (Simopoulos 2010, Zhang et al 2010). Although genetics define one's susceptibility to a disease or condition, lifestyle factors such as diet and exercise determine who among the susceptible individuals will develop the disease or condition (Simopoulos 2010). Diet is one of the modifiable lifestyle factors of major importance. There is a wealth of evidence suggesting that a healthy dietary pattern is associated with reduced risk of obesity and other chronic diseases, such as diabetes and cardiovascular diseases (Hu et al 2000, Manios et al 2010, Schroder 2007). Diet rich in vegetables, fruits, whole grains and soy are also linked with lower mortality from chronic diseases (Brunner et al 2008, Lockheart et al 2007, Osler et al 2001, Shimazu et al 2007). Numerous reports have documented a tracking of obesity and other cardiovascular risks from childhood to adulthood (Freedman et al 2008, Starc and Strel 2010, Virdis et al 2009). Therefore, ensuring a healthy diet and an optimal nutrient intake at early childhood is of great importance to long-term health.

### **1.2 Role of diet and nutrition survey in public health nutrition**

"Public health nutrition focuses on the promotion of good health through nutrition and the

primary prevention of diet related illness in the population.” (Margetts and Nelson 1997)

Nutritional epidemiology research provides scientific evidence to support an understanding of the role of nutrition in the causes and prevention of diseases. Assessment of food consumption and nutrient intake together with anthropometric status is therefore of great value. Such findings can help assess the nutritional status and its association with disease development and prevention. Moreover, the information collected can be used as the basis or national standards for measurements, such as height and weight, and help develop public health policy, health programmes and services.

### **1.3 Existing studies of diet and nutrition of Hong Kong children aged 0 to 5 years**

Several studies have been done to assess food consumption and nutrient intake of Hong Kong children aged 0 to 5 years. However, most of these studies were conducted in the 1980s and early 1990s and were limited by small sample size and convenient sampling method. Moreover, majority of them focused on frequency of food consumption and lacked information on daily nutrient intake and food source of nutrients. These research constraints may limit their uses from the perspective of public health nutrition.

In a longitudinal study on assessing the growth and nutrient intake of 173 Hong Kong children from birth to 7 years, Hong Kong children were found to have a lower energy intake compared to their Australian counterparts, but higher level of protein intake over the first 5 years. Intake of vitamin C and minerals were generally comparable to the United States Recommended Daily Allowance (US RDA) (Leung et al 2000). Results of blood measurements of this cohort showed that iron deficiency and vitamin D deficiency were not common during

infancy (Leung et al 1988, Leung et al 1989).

Detailed analysis of calcium intake for this cohort at 5 years showed that milk (43.5%) was the chief source of calcium. Cereals and vegetables were the next two important sources of calcium, contributing 16.6 and 12.5% respectively to the total calcium intake. Over 90% of the children continued to drink milk. The types of milk consumed by the children were powdered milk fortified with vitamins A and D, fresh milk, and ultra-heat treated milk. In addition, follow-on milk formulas were still being consumed by a few children (Lee et al 1993).

In another study on children aged 2 to 7 years recruited from day nurseries and kindergartens in Hong Kong in early 1990s, among 3,028 questionnaires returned out of 220,000 distributed, as many as 70% of these children were not eating sufficient vegetables and 30% were not eating the recommended amount of fruit (Hong Kong Dietitians Association 1995). A more recent study further showed that increased prevalence of constipation in 368 preschool children was attributable to under-consumption of plant foods. Fruit intake and total plant foods intake were significantly lower in the constipated than non-constipated children. Significantly lower intakes of dietary fibre and micronutrients including vitamin C, folate and magnesium were also observed in constipated children than non-constipated counterparts (Lee et al 2008).

In 2003/2004, a Child Health Survey (CHS) was commissioned by the Department of Health and it was the first of population health survey conducted in children aged 14 and below in Hong Kong (Department of Health 2009a). The CHS collected information on diet and physical activities, including nutrition, eating behaviour, breastfeeding, weaning, physical activities and sedentary activities in 7,393 children aged 14 and below in Hong Kong. The



results indicated that Hong Kong children aged 2 to 5 years consumed quite high amount of protein foods per day. A total of 96.9% and 94.7% of young children ate meat and fish per meal respectively and the median amount of meat and fish consumed was around 2 taels per meal. About 75% of young children drank at least one cup of cow's milk per day. With regard to consumption of vegetables, 83.2% of young children ate half bowl or less per meal. As for fruit intake, 89.2% ate one unit or less of fruit per day. Approximate 15% of young children drank at least one cup of soft drink per day whereas 12.6% of them ate junk food at least once a day. With regard to infant feeding practice, 45.5% of children aged 0 to 5 had ever been breastfed. Among them, 28.3% had been exclusively breastfed for 6 months or more and the median duration of exclusive breastfeeding was 2.0 months. Among children who had ever been breastfed, 71.3% consumed infant formula milk, 47.0% consumed water or glucose water, 36.7% consumed cow's milk and 36.3% consumed milk substitute before 6 months old. As for weaning, 7.4% of children aged 0 to 5 were given solid food regularly before 4 months old, 41.1% between 4 to 6 months old and 39.6% after 6 months old.

#### **1.4 The Survey on Diet and Nutrient Intake (DNS)**

In view of scanty data on diet and nutrition of infant and young children in Hong Kong and the study limitations mentioned above, the DNS was designed to collect and analyze data on a broad range of topics related to infant and toddler nutrition. The DNS is the first large-scale survey on diet and nutrient intake conducted in children aged 5 and below in Hong Kong and was carried out jointly by the Family Health Service of the Department of Health, and the Department of Medicine and Therapeutics and the Centre for Nutritional Studies, Faculty of

Medicine, The Chinese University of Hong Kong.

The objectives of this survey are to elucidate current status of diet and nutrient intake of children aged 0 to 5 years in Hong Kong, and to support evidence-based decision-making in health policy and provision of health services and programmes.

The scope of the survey includes the following:

- To collect data on the amount of different foods consumed by infants and young children in Hong Kong;
- To provide information on the intake of different nutrients and the food sources contributed to the major nutrients in infants, toddlers and preschool children in Hong Kong;
- To describe the dietary pattern of infants and children in Hong Kong with reference to dietary recommendations.

## **Chapter 2: Methods**

This section presents the methods of the DNS and is described in the following subsections to give an overview of the design of the DNS: (1) sample selection; (2) sample size estimation; (3) subject recruitment; (4) survey instruments; (5) training of research assistants; (6) data collection methods; (7) data coding, data entry and data cleaning; (8) confidentiality; (9) ethical approval; and (10) analysis plan.

### **2.1 Sample selection**

Children of 6 months to preschool age vary greatly in their nutritional needs, developmental, feeding abilities, and behaviours. Parental concerns and interactions at mealtime also differ with children's stage of development. At birth the infants are breastfed or fed by formula milk through bottles. Introduction of complementary feeding begins at 6 months. The transition to adult diet usually completes by 18 to 24 months old.

Based on these considerations, six distinct age groups were identified in the DNS: 6-7 months (the predominantly milk feeding group, but complementary food may have been introduced); 9-10 months, 12-13 months and 18-19 months (groups of children in the process of weaning or transition to adult diet), 24 months and 48 months (groups of children complete weaning process and develop self feeding skills). The study targeted at studying children living in Hong Kong and whose parents were Chinese.

The Child Health Registry (CHR), which is embedded in the Child Health Service System (CHSS), comprises of demographic information of all children and their parents who have registered with MCHCs. The registry consisting of the children whose records showed that both

parents were Hong Kong citizens, defined by holders of Hong Kong Identity Cards and Chinese (based on their surname) served as the sampling frame for the study. For practical consideration, children who were registered at the two remote MCHCs, Cheung Chau and Mui Wo, were not included. A simple random sampling was used, with random numbers generated through Statistical Package for the Social Sciences (SPSS) version 16.0 (SPSS Inc., Illinois, US).

## **2.2 Sample size estimation**

The sample size estimation was based on the average daily energy intake reported in a dietary survey study on a cohort of children under 7 years in Hong Kong (Leung et al 2000), the sample size for each age group was estimated with a 95% confidence interval (CI) of 10% of average daily energy intake value. The estimated sample size is shown in Table 2.1.

In deriving the number of children to be sampled, it was assumed that the proportion of parents contactable by the telephone number and correspondent address on the registry was 75% of age groups <12 months, 70% in 12–24 months, and 55% in the 48 months old group. The comparative low proportion was used in 48 months old group due to the registration data was older, and the high probability of change in contact phone number and correspondent address. The overall contactable rate was estimated to be two-third. In addition, it was assumed that the 70% of those contacted would participate, and 90% would complete the 3-day dietary record. The number of children drawn from the CHSS registry is shown in Table 2.1.

**Table 2.1: Estimated sample size of the present study**

Age group	Estimated sample size required	Total number of children drawn from the CHR of CHSS
6 months	168	355
9 months	174	362
12 months	174	397
18 months	219	509
24 months	264	646
48 months	201	580
Total	1,200	2,849

### **2.3 Subject recruitment**

Recruitment was carried out during January to September 2010. Parents of the sampled children were contacted by invitation letter followed by telephone call.

In brief, an invitation letter briefing the purpose and method of the study was sent to parents of randomly sampled individuals before recruitment calls were made. Recruitment calls to parents were made 2 weeks after the invitation letters were sent. The recruitment period typically lasted for 6 weeks before the commencement of the data collection period and 4 weeks before the data collection period ended. Call attempts were made by the research staff from 10am to 8pm on weekdays and 10am to 12pm on Saturdays. When a call was not answered after 10 rings, the staff was instructed to hang up. Subsequent attempts would be made at different times of a day and different days of a week. When the parent was not able to answer the call at that moment, the interviewer would ask for the optimal time to contact that person again. A case was declared as non-contact after at least seven call attempts had been made at different days and times.

When one of the parents was contacted, the research staff would introduce her/himself and state the purpose of the phone call and check whether the parents had received the

invitation letter; if not he/she would brief the parents on what the study was about. A phone interview guideline had been devised for such purpose to unify recruitment process.

After introduction was made, the interviewer checked for the eligibility for recruitment to the study with the parents. To be eligible for inclusion or recruitment, (1) the parents should speak Cantonese or Putonghua, (2) read and write Chinese. In addition, when the index child met the following criteria, they were excluded from recruitment: (1) born before 37 weeks, (2) suffered from any chronic medical illness or major congenital abnormalities requiring specialist care or long-term follow up. The interviewers were given a list of medical conditions for exclusion.

Declined to participate by eligible individuals was defined as the situation in which such person had explicitly told the staff not to call again. In cases of hanging-up without any explicit refusals, further call attempts would be made at different times.

For parents inclined to participate, the staff presented the pre-selected interview time slots at respective MCHC to the parents for them to choose. There were occasions when the pre-selected slots did not fit in the parents' schedule. These cases were considered as declined to participate even as the parents had shown willingness to take part. Once the parent selected a slot and gave verbal consent to participate, the staff would inform the parent that a confirmation letter stating the location, date and time of interview would be sent to him/her two weeks prior to the scheduled interview.

A consent form and a dietary record form were attached to the confirmation letter. The staff also informed the parents that either, if not both parents, should be present at the interview. Since the parents may not be the usual caregiver who feeds the child, they were

requested to invite such caregiver to come along. She/he was also requested to write down all foods and beverages their child had taken the day before interview on the dietary record form. Instructions on completing the dietary record were included. The parent was also told to sign the consent form, complete the child's dietary record a day prior to the interview, and bring the letter to MCHC at the interview day.

A reminder call was made to the participants at least two days before the interview. The participants were reminded of the interview date and MCHC location. They were also told to bring the confirmation letter, together with signed informed consent and the 1<sup>st</sup> day dietary record, during the visit at MCHC.

## **2.4 Survey instruments**

To achieve a reliable estimate of dietary intake of a child, a collection of 3-day dietary record (included 2 weekdays and 1 weekend day) was targeted as to take into account the day-to-day variation (Lanigan et al 2004). Food and beverage intake was recorded by a dietary record form. The dietary record form and instruction sheets used in a study of dietary intake in preschool children were adopted and modified. The instruction sheet was tailored made for each of the six age groups. The dietary record form was used by research staff to assess food and beverage intake at interview. It was also used by caregivers or parents to record the dietary intake of the other two days.

In order to standardise the reporting and recording of quantity of food consumed by the child, standardised food pictures, food models and feeding utensils were used for the dietary survey. All tools were prior tested at training sessions (see section 2.5) at MCHCs. They

included:

- (1) Standard feeding utensils – bowls, spoons, drinking bottle and cup;
- (2) Rubber food model;
- (3) A ‘food portion size and utensils guide’ - which included coloured pictures in actual size of standard feeding bowls, cups, spoons, and different portion size of commonly consumed foods;
- (4) Grid and circles of various sizes – which were provided in the record sheet to facilitate the caregivers to complete the dietary record.

Letters addressed to children’s respective school were given additionally to parents whose children attending nursery and kindergarten such that the foods and beverages taken there could also be recorded. It was sent to the parents with the confirmation letter for the interview at MCHCs as well after interview at MCHCs.

## **2.5 Training of research assistants (RA)**

A training manual with verbatim for probing and clarifying questions was produced. Briefing sessions on dietary interview, together with live demonstration, delivered by an experienced researcher in this field were held. Interview scenarios aimed to cover all probable circumstances, including children who were (1) fully breastfed (+/- expressed breast milk), (2) only formula fed, (3) both breastfed and formula fed, (4) milk and on some puree food, (5) normal 9-10 months, (6) 12 months, (7) 18 months, (8) 24 months, and (9) 48 months.

Direct one-on-one coaching of RA was carried out by the study investigator, dietitian and nutritionist from October 2009 to February 2010. These coaching sessions were conducted in a



convenience sample of MCHC attendees of all targeted age groups. The aim was to provide experience for the RA in conducting semi-structured dietary interview, with immediate support and supervision from the nutritionist and dietitian. In addition, the nutritionist and dietitian had been providing supervision and quality assurance on daily basis by checking each dietary record finished by the RA.

## **2.6 Data collection**

### **2.6.1 Demographic information**

The standardised questionnaire was administered by the research staff to collect the demographic information of the index child and the parents. It included the child's sex, age, and number of siblings. Parents' age, education attainment, status of employment, whether they were born in Hong Kong, duration of residency in Hong Kong, marital status and monthly family income were also collected.

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### **2.6.2 Anthropometric information**

Body weight of the child was measured with minimal clothing by nurses in weighing station at MCHC. Children under 18 months were measured by Tanita BD-585 to the nearest 0.01 kg. Seca electronic scale was used to measure children aged 18 months or above to the nearest 0.1 kg. Standard techniques were applied in measuring height and length. Supine length was measured for children below 24 months of age using measuring mat of graduation 0.5 cm. Standing height was measured to the nearest 0.1 cm for children aged 24 months or above by Seca 242 measuring rod.

### **2.6.3 Dietary record**

A face-to-face interview was carried at the pre-arranged time at the MCHC where the child was registered at for well baby visits and vaccination. The interviewer checked the dietary record completed for the previous day with the participating parent or the caregiver who were familiar for the child's food intake. The specific time, place of consumption, types of food and drink, and the amount taken by the child were checked. Food models, 'food portion size and utensils guide' and feeding utensils were used to facilitate the dietary interview. Caregivers were asked specifically if any food or milk/ drink consumed between main meals to avoid missing information. Research staff also clarified with the interviewee on the brand if food was commercially made, request for a food package and the amount taken.

After the 1<sup>st</sup> day dietary record was conducted, blank dietary record forms were given to participating parent and/or the caretaker in order to record the child's diet in two additional assigned days. The research staff gave explanation on completing the dietary record forms with reference to the 'food portion size and utensil guide', instruction sheet and the dietary record just completed. The 'food portion size and utensils guide' was then distributed to the participating parent and/or the caretaker as an aid for future dietary record.

A follow-up phone interview would then be arranged at times of mutual convenience, usually within 14 days of the first dietary interview to collect dietary records of the two additional days. Parents or the caregivers may choose to fax or email the completed record to the research team, in which follow-up phone interview would be made after the record was received. Parents or the caregivers were contacted at the pre-arranged time. The dietary records were clarified by the research staff over the telephone. He/She would make

clarification with regard to any missing or unclear food items, and the portion size with reference to the pictures on the ‘food portion size and utensils guide’. Similar interview was carried out for those who returned the written dietary record by alternative means. At least five attempts of follow-up calls were made before giving up the case.

If the participating child attending kindergarten/nursery, assistance from his/her school teachers were solicited to provide food and beverage intake information. To collect the foods and beverages taken in kindergarten/nursery, an invitation letter to school teacher and dietary record forms were given to parents. Parents were requested to bring the letter to the teacher, and teachers were requested to record the food and beverage intake of the child and leave their name and contact number to facilitate further clarification. Parents were also asked to bring the menu of the school meal as supplement information if possible. When food and beverage taken in school were unknown or incomplete, the research staff would contact the school teacher for information with parents’ verbal consent.

During data collection, the RAs were encouraged to check over the dietary records for errors and omissions soon after the interviews, and parents or the caregivers were re-contacted if necessary to complete missing data. All completed dietary records were checked by the field supervisor on daily basis for missing foods, unrealistic quantities reported, breastfeeding status, and supplement use. The RAs re-contacted the parents/the caregivers/the school teachers regarding any problems found. In the DNS, dietary supplements were defined for participants as products intended to provide additional nutrients or give health benefits and taken liquid, powder, tablet or capsule form (Department of Health 2009b).

## **2.7 Data coding, data entry and data cleaning of dietary records**

In the DNS, three trained coders were employed to keep coding errors from unfamiliarity with the task. They were responsible to assign food codes to food and beverage items in the completed dietary records. Each coded dietary record was checked by a senior coder before data entry could be performed. All dietary records were double-entered and verified as to identify and correct any incorrectly entered data.

Nutrient intakes from the dietary records were analyzed using nutritional analysis software CompEat Pro Version 5.8.0 (UK). As the food composition database of the software were UK-based, food composition of Chinese foods and local foods were added to the software based on food composition tables from China (Yang et al 2002, Yang et al 2004) and the Centre for Food Safety, Hong Kong (Centre for Food Safety 2006). Many brand-name formulae and baby foods, especially those of Japanese brand-names were not in the nutrient database. Therefore, a list of the missing formulae and baby foods was constructed and nutrient information was obtained when possible. If an analytic value was not available for a nutrient in a food, the value was calculated based on other nutrients in the same food, on a product ingredient list, or on the nutrient content of similar foods (Sievert et al 1989). In addition, chemical analyses of nutrient contents were performed for selected formulae and baby foods commonly consumed by the subjects. A standardised estimation was used to estimate the amount of salt and cooking oil added to a meal when parents reported using salt and cooking oil in the child's diet. In this survey, most parents reported that they used one to two drops (i.e. 0.1 to 0.2 teaspoon) of cooking oil for a meal in a child's diet, thus 1 g of cooking oil was standardised per meal whenever parents reported oil used for a meal. For salt estimation, most

parents claimed that they used only trace amount of salt in the child's diet, thus 0.1 g of salt was standardised per dish whenever parents reported salt added in a child's diet.

Volume of breast milk consumption was estimated based on the rules applied in the Feeding Infants and Toddlers Study (FITS) (Devaney et al 2004). For exclusively breastfed infants under 7 months of age, an intake of 780 ml of breast milk per day was assumed, and for infants who consumed both breast milk and formula, the volume of formula was subtracted from 780 ml to obtain an estimate of the quantity of breast milk consumed. For infants 7 months of age and older, 600 ml per day was used as the quantity of breast milk for those being fed only breast milk as their milk intake. For infants 7 months of age and older who consumed both breast milk and formula, the volume of formula was subtracted from 600 ml to estimate the quantity of breast milk consumed (Institute of Medicine, Food and Nutrition Board 1997, Heinig et al 1993).

## **2.8 Confidentiality**

All completed dietary records were regarded as confidential documents. Due care in handling the records was exercised to avoid possible loss and leakage of information. No individual names or personal identifiers would appear in publications and reports and only aggregate data would be presented.

## **2.9 Ethical Approval**

The survey was approved by the Ethics Committee of the Department of Health.

## **2.10 Analysis plan**

### **2.10.1 Statistical analysis**

All statistical analyses were performed using SPSS version 16.0 (SPSS Inc., Illinois, US). Data was checked for outliers and normality. Data transformation was applied whenever appropriate. Demographic characteristics of the sample were compared to those of the Hong Kong 2006 Population By-census results (Census and Statistics Department 2007). Chi square tests and independent *t* tests were used to examine demographic differences between those included and those excluded for analysis, and between those participated and those refused to join the survey. Multiple regression analyses were also conducted to examine association and trend, where appropriate. Z-score method based on the Hong Kong reference (Leung et al 1996a, Leung et al 1996b) and relative to the 2006 WHO child growth standard (World Health Organization 2006) was used to calculate standard deviation score (SDS) of mean weight, length/height and BMI of the studied children.

### **2.10.2 Food group categorization and food sources of nutrients**

The total amount of each food and beverage consumed over the three-day period was summed and the average amount of each food and beverage per day was calculated. Each food or beverage was assigned major and sub food groups. A total of 20 major food groups and 87 sub food groups were created based on the food group classifications used in the Centre for Food Safety, Hong Kong (Centre for Food Safety 2006). Some adjustments were made, however, to permit a more detailed assessment of the consumption of specific types of foods and beverages and/or to reflect more accurately the relative roles of these items in the diets of infants and

toddlers. Further information on food group categorization is given in Chapter 3.3. The means, standard deviations (SDs), medians, minimums and maximums amounts consumed are reported in g or ml by all subjects and by consumers only for each major food group and sub food group. The percentage of food sources of each nutrient was calculated for each subject using the following formula.

$$\frac{(\text{Amount of that nutrient contributed by the food group})}{(\text{Total amount of nutrients consumed})} \times 100\%$$

In this survey, nutrient intakes contributed by health supplements and most Chinese herbal remedies were not estimated. Descriptive percentages of subjects consuming different categories of health supplements and Chinese herbal remedies by age groups are presented. In contrast, data on the means, SDs, medians, 5<sup>th</sup>, 25<sup>th</sup>, 75<sup>th</sup>, and 95<sup>th</sup> percentiles of 14 nutrients from food sources are presented in this report. These nutrients included energy, protein, carbohydrate, total fat, cholesterol, dietary fibre, calcium, iron, magnesium, phosphorus, potassium, sodium, zinc and vitamin C.

### **2.10.3 Comparison of nutrient intakes to dietary references**

As there is no local dietary reference, daily nutrient intakes of the studied children were compared to the World Health Organization/Food and Agricultural Organization (WHO/FAO) dietary references (World Health Organization, Food and Agricultural Organization of the United Nations 2004a, 2004b, 2006, 2007) and other overseas recommendations (de Benoist et al 2007, The International Zinc Nutrition Consultative Group 2007, U.S. Department of Agriculture and U.S. Department of Health and Human Services 2010, Williams et al 1995, Scientific Advisory

Committee on Nutrition 2003) in this survey.

The WHO/FAO dietary references include three main definitions of terms, namely Estimated Average Requirement (EAR), Recommended Nutrient Intake (RNI), and Tolerable Upper Intake Level (UL) (World Health Organization, Food and Agricultural Organization of the United Nations 2004b). The EAR is defined as “the average daily nutrient intake level that meets the needs of 50% of the healthy individuals in a particular age and gender group”. The RNI is defined as “the daily intake, set at the EAR plus 2 SDs, which meets the nutrient requirements of almost all (97.5%) apparently healthy individuals in an age- and sex-specific population group”. The ULs of nutrient intake have been set for some micronutrients and are defined as “the maximum intake from food, water and supplements that is unlikely to pose risk of adverse health effects from excess in almost all (97.5%) apparently healthy individuals in an age- and sex-specific population group”. As the usual intake increases above the UL, the potential risk of adverse effect may increase. Other similar terms have also been developed by the WHO/FAO whenever the above mentioned terms cannot be applied. For example, average requirements and safe intake levels of protein have been used for infants and children aged 6 months to 18 years (World Health Organization, Food and Agricultural Organization of the United Nations 2007). The average requirements, where “average” is used synonymously with median or mean, for protein for infants and children aged 6 months to 18 years are estimated as the average protein requirement needed for maintenance of growth, the deposition needs and an efficacy of utilization for growth. The safe level (exceeding the requirement of 97.5% of the population) is defined as the average protein requirement of the individuals in the population, plus twice the SD.



In this survey, energy, calcium, zinc and vitamin C intakes were compared to the age- and sex-specific WHO/FAO EARs for these nutrients. As the WHO/FAO did not define the EAR for protein and iron, only the age- and sex-specific average or median daily requirements of these nutrients proposed by the WHO/FAO were used to assess the adequacy of these nutrients of the studied children.

For energy intake, the adequacy of energy intake of the studied children was assessed by comparing it to the WHO/FAO EAR (World Health Organization, Food and Agricultural Organization of the United Nations 2004a). If mean intake was equal to the EAR, energy intake could be assumed adequate, while mean intakes below or above the EAR would be assessed as inadequate or excessive respectively (Barr 2006).

Protein intakes of the studied children were compared to the age- and sex-specific WHO average requirements (World Health Organization, Food and Agricultural Organization of the United Nations 2007). The proportion of the studied children with usual intakes less than the age- and sex-specific WHO average requirement for protein is an estimate of the proportion of the children with inadequate intakes—intakes that do not meet protein requirements. The proportion of children with intake below the age- and sex-specific safe intake level, and the proportion of children with intake above the age- and sex-specific UL of protein were also presented for readers' reference.

For calcium, no EAR is available for infants aged below 12 months of age. Instead, an average daily requirement of 240 mg and 300 mg is proposed by the WHO for breastfed infants and formula fed infants aged 6 months or below respectively. The average requirement is 300 mg/d for infants of 7 to 12 months of age. The EAR for calcium is 417 mg/d and 500 mg/d for

children aged 1 to 3 years old and children aged 4 to 6 years old respectively. The age-specific average daily requirement or EAR was used to derive the age-specific RNI, and the average daily requirement or EAR was used as the cut-off to assess the adequacy of calcium intake of the studied children (World Health Organization, Food and Agricultural Organization of the United Nations 2004b, 2006).

The age-specific EAR for zinc for infants aged below 12 months of age is available from the International Zinc Nutrition Consultative Group while that for children aged above one year of age is available from the WHO/FAO (World Health Organization, Food and Agricultural Organization of the United Nations 2006). These values were used to assess the dietary zinc intake of the studied children using the EAR cut-point method (The International Zinc Nutrition Consultative Group 2007). With this method, the proportion of the studied children with zinc intakes less than the age-specific EAR for zinc is an estimate of the proportion of the children with inadequate zinc intakes. An elevated risk of zinc deficiency in the population is said to exist when 25% or more of the population have zinc intakes less than the EAR, (de Benoist et al 2007).

For iron, EAR values were not available from the WHO/FAO recommendation. The cut-off value of “adequate iron intake” for each age group was back calculated by dividing the age-specific median total absolute iron requirement by the iron bioavailability using data from the WHO/FAO (World Health Organization, Food and Agricultural Organization of the United Nations 2004b). A bioavailability of 12 or 15% has been suggested for developed countries with more consumption of meat (World Health Organization, Food and Agricultural Organization of the United Nations 2004b). The calculated value is thus the level of dietary iron intake required

to provide the absorbable iron meeting the median total absolute iron requirements. This approach of back calculation was based on the approach that the Institute of Medicine (IOM) had used to derive the EAR for iron (Institute of Medicine 2001). The IOM derived the age-specific EAR for iron by using the following formula.

EAR for iron = median absolute iron needed / assumed iron bioavailability (Table 2.2)

Using the same approach, the age-specific cut-off value of adequate iron intake of the studied children was back calculated using the following formula based on data from the WHO/FAO. The calculated cut-off values were used to assess the adequacy of dietary iron intake of the studied children (Table 2.2).

Calculated cut-off of adequate iron intake = median total absolute iron requirement / proposed iron bioavailability assumed for developed countries

For vitamin C, no EAR is available for infants aged below 12 months of age. However, the EAR for vitamin C has been set for children aged above one year of age. The EAR for vitamin C is 25 mg/d for children aged 1 to 6 years old. The age-specific EAR was used the cut-off to assess the adequacy of vitamin C intake of the studied children (World Health Organization, Food and Agricultural Organization of the United Nations 2004b, 2006).

**Table 2.2: Iron requirements proposed by the IOM and the age-specific back calculated cut-off values for adequate dietary iron intake of the studied children applied in the DNS<sup>1</sup>**

Age group	IOM		WHO / FAO			Calculated cut-off for adequate intake of dietary iron applied in the DNS <sup>1</sup>	
	Median absolute iron needed mg/day	EAR mg/day	Median total absolute iron needed mg/day	RNI Based on 15% bioavailability mg/day	RNI Based on 12% bioavailability mg/day	Median total absolute iron needed (WHO/FAO) ÷ Iron bioavailability mg/day	Assumption of iron bioavailability
0.5 – 1 year	0.69	6.9 <sup>2</sup>	0.72	6.2	7.7	6.0 mg ( 6-, 9-, and 12- month groups)	12%
1-3 years	0.62 (1.5 years) 0.54 (2.5 years)	3.4 <sup>2</sup> (1.5 years) 3.0 <sup>2</sup> (2.5 years)	0.46	3.9	4.8	3.1 mg (18- and 24-month groups)	15%
4-6 years	0.63 (4.5 years)	3.5 <sup>2</sup> (4.5 years)	0.50	4.2	5.3	3.3 mg (48-month group)	15%

<sup>1</sup>Calculated cut-off of adequate iron intake was calculated as (median total absolute iron requirement ÷ iron bioavailability assumed for developed countries), based on the WHO/FAO data (World Health Organization, Food and Agricultural Organization of the United Nations 2004b)

<sup>2</sup>Iron bioavailability of 10% was assumed for 7 to 12 months, 18% was assumed for above 1 year of age) (Institute of Medicine 2001)

The sodium intake of the studied children was compared to the level recommended by the UK Scientific Advisory Committee on Nutrition (Scientific Advisory Committee on Nutrition 2003). A daily intake of <393 mg, <786 mg and <1179 mg sodium is set for children aged below one year, 1 to 3 years, and 4 to 6 years respectively. These levels are equivalent to a daily intake of <1 g, < 2 g, and <3 g of salt respectively. The cholesterol intake of the studied children was compared to the recommendations in the Dietary Guidelines for Americans 2010 (U.S. Department of Agriculture and U.S. Department of Health and Human Services 2010). A daily intake of <300 mg cholesterol is recommended for children aged at and above one year old. No recommendation of cholesterol intake is set for children aged below one year old. A recommendation of age plus 5 g per day as proposed by Williams et al was used for comparison in children aged 2 years and above in this survey (Williams et al 1995). No recommendation of fibre intake is set for children aged below two years old. The percentage of subjects with intake below these recommendations was calculated.

## **Chapter 3: Results**

This chapter describes results of the DNS which include (1) sample characteristics; (2) types of milk consumed; (3) daily food group consumption; (4) daily fluid intake; (5) food group consumption compared to local recommended intakes; (6) association between milk intake and consumption of other food groups; (7) daily nutrient intakes and food sources of nutrients; and (8) use of health supplements and Chinese herbal remedies.

### **3.1 Sample characteristics**

#### **3.1.1 General characteristics**

A total of 1,581 parent-child pairs were approached to participate in the DNS. There were 1,337 dietary records returned. Among them, 1,272 dietary records were included in the analysis and 65 records were excluded. Reasons for exclusion included reported illness over the record days that led to change in appetite and food intake ( $n=8$ ), and incomplete anthropometric data ( $n=57$ ).

For the interviewees, majority (90.6%) of them was mothers and the remaining were fathers or other relatives. Demographic characteristics of the parents of these target children are shown in Table 3.1. To assess the representativeness of the present sample, Chi square test was used to examine differences between the present sample and Chinese parents in households with children aged 0 to 5 years in the 2006 bi-census. Due to the large sample size, only  $p$  levels  $<0.001$  were considered statistically significant. Non-local born parents, parents with low educational attainment and low income, as well as older fathers were under-represented in the present sample. Local-born parents and parents with tertiary education

were over-represented. Income level of our sample tended to crowd towards the middle range (i.e., between HK\$20,000 and 39,999).

**Table 3.1: Demographic characteristics of parents of DNS**

Characteristics	DNS sample (n=1,272)		2006 bi-census (n=186,414)		P value
	n	%	n	%	
<b>Mother's age (years)</b>					
Less than 25	38	3.0	5,066	2.7	$\chi^2(3)=7.21$ , p=0.065
25-34	594	46.7	86,522	46.4	
35-44	624	49.1	90,377	48.5	
45 or above	16	1.3	4,449	2.4	
<b>Mother's place of birth</b>					
Hong Kong	860	70.8	107,931	57.9	$\chi^2(1)=81.92$ , p<0.001
Not born in Hong Kong	354	29.2	78,483	42.1	
<b>Mother's education level</b>					
Secondary 3 or lower	200	15.7	54,459	29.2	$\chi^2(2)=146.84$ , p<0.001
Secondary 4 to 7	565	44.5	80,450	43.2	
Tertiary or above	506	39.8	51,505	27.6	
<b>Father's age (years)</b>					
Less than 25	14	1.1	1,850	1.0	$\chi^2(3)=53.07$ , p<0.001
25-34	401	31.6	46,417	25.4	
35-44	720	56.7	102,684	56.1	
45 or above	135	10.6	31,948	17.5	
<b>Father's place of birth</b>					
Hong Kong	983	81.0	130,555	71.4	$\chi^2(1)=54.38$ , p<0.001
Not born in Hong Kong	231	19.0	52,344	28.7	
<b>Father's education level</b>					
Secondary 3 or lower	240	18.9	59,769	32.7	$\chi^2(2)=109.95$ , p<0.001
Secondary 4 to 7	514	40.4	62,734	34.3	
Tertiary or above	517	40.7	60,396	33.0	
<b>Marital status</b>					
Parents are married	1221	97.8	361,898	98.0	$\chi^2(1)=0.17$ , p=0.680
<b>Monthly family income</b>					
Less than HK\$20,000	368	29.8	77,316	41.1	$\chi^2(2)=78.01$ , p<0.001
HK\$20,000 to 39,999	497	40.3	57,209	30.4	
HK\$40,000 or above	369	29.9	53,601	28.5	

In terms of the target children, there were 646 (50.8%) boys and 626 (49.2%) girls. The sex distribution of the target children in different age groups is shown in Table 3.2. There was 54.5% and 34.0% of the target children being the first order child and the second order child respectively.

**Table 3.2: Number of children by age group and sex**

Age group (months)	Total	Male		Female	
	n	n	%	n	%
6	177	92	52.0	85	48.0
9	164	88	53.7	76	46.3
12	171	87	50.9	84	49.1
18	233	89	38.2	144	61.8
24	314	178	56.7	136	43.3
48	213	112	52.6	101	47.4
All ages	1,272	646	50.8	626	49.2

Table 3.3 summarizes the mean and 95% CI for age, weight, length/height and BMI of the target children. Means and 95% CIs for z-score of weight, length/height and BMI by age and sex with reference to the WHO child growth standard and the Hong Kong growth reference are shown in Table 3.4. The children's weight status was further compared with the Hong Kong growth reference and the WHO child growth standard. By using the Hong Kong growth reference, a total of 3.9% of children was classified as obesity (defined as body weight exceeding 120% of the median weight-for-height) (Table 3.5). By using the WHO child growth standard, 1.3% of the children were classified as underweight, 2.8% were classified as stunting, 1.6% were classified as wasting, 12.7% were classified as having possible risk of overweight, and 2.7% were classified as overweight or obese (Tables 3.6, 3.7). The percentage of children who were classified as overweight or obese increased from 1.2% at 12 months to 3.8% at 24 and 48 months (Table 3.6).



**Table 3.3: Mean (95% CI) age, weight, length/height and BMI by age group and sex**

Parameter	Age group (months)	Male			Female			P value <sup>1</sup>
		n	Mean	95% CI	n	mean	95% CI	
Age (months)	6	92	6.3	6.3-6.4	85	6.3	6.3-6.4	0.277
	9	88	9.3	9.3-9.4	76	9.3	9.3-9.4	0.703
	12	87	12.3	12.3-12.3	84	12.3	12.3-12.3	0.969
	18	89	18.5	18.4-18.6	144	18.4	18.4-18.5	0.026
	24	178	24.6	24.5-24.6	136	24.6	24.5-24.7	0.331
	48	112	49.4	49.2-49.5	101	49.3	49.2-49.5	0.856
Weight (kg)	6	92	8.1	7.9-8.3	85	7.5	7.4-7.7	<0.001
	9	88	8.9	8.7-9.1	76	8.4	8.2-8.6	<0.001
	12	87	9.6	9.4-9.8	84	9.0	8.8-9.2	<0.001
	18	89	11.0	10.7-11.2	144	10.3	10.1-10.5	<0.001
	24	178	12.0	11.8-12.2	136	11.6	11.4-11.8	0.001
	48	112	16.6	16.2-17.0	101	15.9	15.4-16.3	0.015
Length / Height (cm)	6	92	68.2	67.8-68.6	85	66.6	66.2-67.1	<0.001
	9	88	72.3	71.7-72.8	76	70.8	70.2-71.3	<0.001
	12	87	75.4	74.8-76.0	84	74.7	74.2-75.3	0.136
	18	89	81.8	81.3-82.4	144	80.1	79.6-80.5	<0.001
	24	178	86.3	85.9-86.7	136	85.3	84.8-85.8	0.002
	48	112	102.6	101.8-103.4	101	100.9	100.1-101.6	0.002
BMI (kg/m <sup>2</sup> )	6	92	17.5	17.1-17.8	85	16.9	16.7-17.2	0.016
	9	88	17.1	16.8-17.4	76	16.7	16.4-17.1	0.150
	12	87	16.9	16.6-17.2	84	16.1	15.8-16.4	<0.001
	18	89	16.3	16.1-16.6	144	16.1	15.9-16.3	0.127
	24	178	16.2	16.0-16.3	136	15.9	15.7-16.2	0.129
	48	112	15.7	15.4-15.9	101	15.5	15.3-15.8	0.404

<sup>1</sup>Sex difference by independent *t* test

**Table 3.4: Mean (95% CI) for z-score of weight, length/height and BMI by age group and sex, with reference to the WHO child growth standard (World Health Organization 2006) and the Hong Kong growth reference (Leung et al 1996a)**

Parameter	Age group (months)	Male					Female				
		n	WHO		HK		n	WHO		HK	
			mean	95% CI	mean	95% CI		mean	95% CI	mean	95% CI
Weight	6	92	0.03	-0.19-0.25	0.15	-0.07-0.37	85	0.08	-0.08-0.25	0.25	0.06-0.43
	9	88	-0.11	-0.31-0.08	-0.01	-0.21-0.19	76	0.02	-0.19-0.23	0.05	-0.19-0.28
	12	87	-0.17	-0.37-0.03	-0.08	-0.29-0.12	84	-0.07	-0.25-0.12	-0.11	-0.32-0.10
	18	89	-0.12	-0.33-0.09	0.03	-0.18-0.25	144	-0.06	-0.19-0.07	-0.06	-0.21-0.09
	24	178	-0.22	-0.35-(-0.09)	0.03	-0.11-0.16	136	-0.07	-0.20-0.07	0.07	-0.09-0.22
	48	112	-0.08	-0.26-0.11	0.21	0.02-0.39	101	-0.28	-0.46-(-0.10)	0.11	-0.09-0.31
Length/ Height	6	92	0.01	-0.19-0.21	0.04	-0.15-0.22	85	0.17	-0.02-0.35	0.13	-0.06-0.31
	9	88	-0.06	-0.28-0.17	-0.09	-0.30-0.11	76	0.07	-0.16-0.30	-0.08	-0.31-0.14
	12	87	-0.31	-0.56- (-0.07)	-0.25	-0.48-(-0.03)	84	0.14	-0.08-0.36	0.04	-0.17-0.25
	18	89	-0.34	-0.56-(-0.13)	-0.05	-0.25-0.15	144	-0.37	-0.52-(-0.21)	-0.19	-0.34-(-0.03)
	24	178	-0.44	-0.56-(-0.31)	-0.14	-0.27-(-0.02)	136	-0.30	-0.44-(-0.16)	-0.09	-0.24-0.06
	48	112	-0.35	-0.53-(-0.16)	0.12	-0.07-0.31	101	-0.61	-0.78-(-0.43)	-0.09	-0.29-0.11
BMI	6	92	0.03	-0.20-0.26	0.23	-0.02-0.48	85	-0.02	-0.20-0.17	0.30	0.09-0.51
	9	88	-0.10	-0.31-0.11	0.16	-0.07-0.39	76	-0.03	-0.25-0.20	0.21	-0.04-0.46
	12	87	0.02	-0.21-0.25	0.22	-0.03-0.47	84	-0.20	-0.40-(-0.01)	-0.12	-0.33-0.10
	18	89	0.13	-0.09-0.34	0.13	-0.10-0.36	144	0.22	0.08-0.37	0.15	-0.02-0.31
	24	178	0.06	-0.09-0.20	0.13	-0.03-0.28	136	0.12	-0.04-0.29	0.17	-0.03-0.36
	48	112	0.23	0.04-0.41	0.20	0.02-0.37	101	0.14	-0.03-0.31	0.27	0.08-0.45

**Table 3.5: Number and percentage of obese children with reference to Hong Kong growth reference<sup>1</sup> (n=1,272)**

Age group (months)	Male n (%)	Female n (%)	Overall n (%)
6	6 (6.5)	8 (9.4)	14 (7.9)
9	2 (2.3)	3 (3.9)	5 (3.0)
12	2 (2.3)	1 (1.2)	3 (1.8)
18	2 (2.2)	2 (1.4)	4 (1.7)
24	6 (3.4)	3 (2.2)	9 (2.9)
48	7 (6.3)	7 (6.9)	14 (6.6)
All ages	25 (3.9)	24 (3.8)	49 (3.9)

<sup>1</sup>Obesity is defined as body weight exceeding 120% of the median weight-for-height

**Table 3.6: Weight status of children with reference to WHO BMI for age z-score<sup>1</sup> (n= 1,272)**

Age group (months)	Male			Female			Overall		
	Normal	Possible risk of overweight	Overweight or obese	Normal	Possible risk of overweight	Overweight or obese	Normal	Possible risk of overweight	Overweight or obese
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
6	71 (77.2)	14 (15.2)	4 (4.3)	72 (84.7)	11 (12.9)	0 (0.0)	143 (80.8)	25 (14.1)	4 (2.3)
9	75 (85.2)	11 (12.5)	1 (1.1)	62 (81.6)	9 (11.8)	3 (3.9)	137 (83.5)	20 (12.2)	4 (2.4)
12	68 (78.2)	15 (17.2)	2 (2.3)	76 (90.5)	7 (8.3)	0 (0.0)	144 (84.2)	22 (12.9)	2 (1.2)
18	67 (75.3)	19 (21.3)	1 (1.1)	123 (85.4)	18 (12.5)	3 (2.1)	190 (81.5)	37 (15.9)	4 (1.7)
24	148 (83.1)	18 (10.1)	8 (4.5)	113 (83.1)	17 (12.5)	4 (2.9)	261 (83.1)	35 (11.1)	12 (3.8)
48	93 (83.0)	13 (11.6)	5 (4.5)	88 (87.1)	10 (9.9)	3 (3.0)	181 (85.0)	23 (10.8)	8 (3.8)
All ages	522 (80.8)	90 (13.9)	21 (3.3)	534 (85.3)	72 (11.5)	13 (2.1)	1,056(83.0)	162 (12.7)	34 (2.7)

<sup>1</sup>Normal: BMI for age z-score  $\geq -2$  and  $\leq 1$ ; Possible risk of overweight: BMI for age z-score  $> 1$  and  $\leq 2$ ; Overweight or obese: BMI for age z-score  $> 2$

**Table 3.7: Proportion of children with underweight, stunting and wasting with reference to WHO Child Growth Standard<sup>1</sup> (n= 1,272)**

Age group (months)	Male			Female			Overall		
	Underweight	Stunting	Wasting	Underweight	Stunting	Wasting	Underweight	Stunting	Wasting
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
6	2 (2.2)	2 (2.2)	3 (3.3)	0 (0.0)	0 (0.0)	2 (2.4)	2(1.1)	2 (1.1)	5 (2.8)
9	1 (1.2)	3 (3.5)	1 (1.1)	0 (0.0)	2 (2.5)	2 (2.6)	1 (0.6)	5 (3.0)	3 (1.8)
12	4 (4.9)	5 (6.1)	2 (2.3)	1 (1.1)	1 (1.1)	1 (1.2)	4 (2.9)	6 (3.5)	3 (1.8)
18	4 (4.8)	5 (6.0)	2 (2.2)	0 (0.0)	4 (2.7)	0 (0.0)	5 (1.7)	9 (3.9)	2 (0.9)
24	1 (0.6)	4 (2.3)	4 (2.2)	1 (0.7)	2 (1.4)	2 (1.5)	2 (0.6)	6 (1.9)	6 (1.9)
48	3 (2.8)	5 (4.7)	1 (0.9)	0 (0.0)	2 (1.9)	0 (0.0)	3 (1.4)	7 (3.3)	1 (0.5)
All ages	15(2.4)	24 (3.9)	13(2.0)	2 (0.3)	11 (1.7)	7 (1.1)	17 (1.3)	35 (2.8)	20 (1.6)

<sup>1</sup>Underweight: Weight for age z-score  $< -2$ ; Stunting: Height or Length for age z-score  $< -2$ ; Wasting: BMI for age z-score  $< -2$

### **3.1.2 Comparison between those included and those excluded for analysis**

A series of chi square tests and independent  $t$  tests were used to examine demographic differences between those included ( $n=1,272$ ) and those excluded ( $n=65$ ) for analysis. There were no significant differences in most demographic characteristics, except for monthly family income and marital status. Among those excluded for analysis, there were more families from the lowest monthly income category ( $<HK\$20,000$ ) and the highest monthly income category ( $\geq HK\$40,000$ ), and parents who were not married.

### **3.1.3 Comparison between participants and the refusal cases**

A series of chi square tests and independent  $t$  tests were used to examine demographic differences between participants ( $n=1,337$ ) and the refusal cases ( $n=244$ ). There were no significant differences in most demographic characteristics, except for mother's age, education, and parents' marital status. Among the refusal cases, there were more mothers aged 34 and below, and with education level of secondary four to seven. There were also more families with parents who were not married.

### 3.2 Types of milk consumed

Table 3.8 summarizes the types of milk consumed by the studied children at different age groups. At 6 months, 6.8% of the studied children consumed breast milk solely and 13% of the studied children consumed both breast milk and formula milk. Formula use dominated at all age groups. At 6 months, 80.2% of the studied children used formula and over 90% of the studied children kept drinking formula from 12 to 24 months. At 48 months, there was still 77% of the children used formula.

**Table 3.8: Types of milk consumed by age**

Age group (months)	Total n	Breast milk only		Formula only <sup>1</sup>		Mixed (Breast milk + formula)		Others <sup>2</sup>	
		n	%	n	%	n	%	n	%
6	177	12	6.8	142	80.2	23	13.0	0	0.0
9	164	8	4.9	137	83.5	19	11.6	0	0.0
12	171	9	5.3	154	90.1	7	4.1	1	0.6
18	233	3	1.3	226	97.0	3	1.3	1	0.4
24	314	4	1.3	309	98.4	1	0.3	0	0.0
48	213	0	0.0	164	77.0	0	0.0	49	23.0

<sup>1</sup>Included cow based, goat based and soy based formula and special formula.

<sup>2</sup>Included those who did not drink formula or milk, or those who drank other types of milk (e.g. full cream milk, chocolate milk) over the three record days.

### 3.3 Daily food group consumption<sup>1</sup>

In this section, results of daily intake of major food groups and sub food groups by the studied children at different age groups are presented as for all subjects and for consumers only. The percentage of consumers for each major and sub food group is also reported to show the popularity of each food group among the studied children at different age groups.

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<sup>1</sup> Data of daily food group consumption are reported in alphabetical order.

### **3.3.1 Condiments and sauces**

At 6 months, only 9.8% boys and 12.9% girls had condiments and sauces used in their dishes. These percentages increased to over 90% from 24 months onwards (Table 3.9a). However, the average daily amount of different condiments and sauces used were low (less than 3 g per day) among the studied subjects (Table 3.9b). Among the consumers, salt was the most popular condiment used at early months, while the use of soy sauce and other condiments and sauces became more popular after 12 months (Table 3.9a). However, it should be noted that the estimated intakes of salt and other condiments were subject to large bias, and caution should be taken when interpreting these results due to the difficulties in quantifying the amount of salt and condiments used in cooking and at the table in a dietary survey.

**Table 3.9a: Daily consumption (g) of different categories of condiments and sauces by age and sex (consumers only)**

Age group (months)	Food items	Male							Female						
		n	% <sup>1</sup>	Mean	SD	Median	Min	Max	n	%	Mean	SD	Median	Min	Max
6	All condiments and sauces	9	9.8	0.1	0.2	0.1	0.0	0.5	11	12.9	0.2	0.2	0.1	0.0	0.7
	Salt	7	7.6	0.1	0.2	0.1	0.0	0.5	9	10.6	0.1	0.1	0.1	0.0	0.2
	Soy sauce	2	2.2	0.1	0.1	0.1	0.0	0.2	2	2.2	0.6	0.1	0.6	0.5	0.7
	Others <sup>2</sup>	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
9	All condiments and sauces	21	23.9	0.5	1.7	0.1	0.0	7.7	17	22.4	0.2	0.1	0.2	0.0	0.6
	Salt	21	23.9	0.1	0.1	0.1	0.0	0.3	15	19.7	0.1	0.1	0.1	0.0	0.3
	Soy sauce	2	2.3	0.6	0.6	0.6	0.2	1.0	5	6.6	0.3	0.1	0.3	0.2	0.5
	Others	1	1.1	---	---	---	6.7	6.7	1	1.3	---	---	---	0.2	0.2
12	All condiments and sauces	44	50.6	0.5	0.6	0.2	0.0	3.0	45	53.6	0.3	0.4	0.2	0.0	1.9
	Salt	40	46.0	0.3	0.3	0.2	0.0	1.6	42	50.0	0.2	0.1	0.1	0.0	0.6
	Soy sauce	16	18.4	0.5	0.5	0.2	0.0	1.7	11	13.1	0.4	0.5	0.3	0.0	1.7
	Others	2	2.3	1.4	1.8	1.4	0.2	2.7	1	1.2	---	---	---	1.3	1.3
18	All condiments and sauces	67	75.3	1.2	2.9	0.4	0.0	20.0	117	81.3	1.3	3.8	0.4	0.0	33.3
	Salt	57	64.0	0.2	0.1	0.2	0.0	0.5	107	74.3	0.2	0.2	0.2	0.0	1.2
	Soy sauce	29	32.6	0.4	0.3	0.2	0.0	1.3	62	43.1	0.5	1.3	0.2	0.0	10.0
	Others	13	14.6	4.6	5.3	1.7	0.8	20.0	13	9.0	6.8	9.4	1.7	0.5	33.3
24	All condiments and sauces	164	92.1	1.1	1.7	0.4	0.0	11.2	130	95.6	0.9	1.9	0.4	0.0	12.2
	Salt	160	89.9	0.2	0.1	0.2	0.0	0.6	121	89.0	0.2	0.1	0.2	0.0	0.8
	Soy sauce	108	60.7	0.4	0.6	0.3	0.0	5.2	76	55.9	0.4	0.8	0.2	0.0	6.7
	Others	35	19.7	2.9	2.1	2.5	0.3	10.3	20	14.7	3.0	3.6	1.5	0.3	11.7
48	All condiments and sauces	110	98.2	2.8	3.7	1.1	0.1	17.3	101	100.0	2.1	4.2	0.7	0.0	30.1
	Salt	107	95.5	0.3	0.3	0.3	0.0	3.0	97	96.0	0.3	0.2	0.3	0.0	0.8
	Soy sauce	85	75.9	0.5	0.7	0.3	0.0	3.8	67	66.3	0.5	0.8	0.3	0.0	5.8
	Others	46	41.1	4.9	3.9	3.3	1.0	16.7	31	30.7	4.8	6.6	3.3	0.0	30.0

<sup>1</sup>Percentage of consumers

<sup>2</sup>Other condiments and sauces included Chinese-style barbecue sauce, seafood sauce, rice wine, Western-style sweet and sour sauce, ketchup, and other sauces.

**Table 3.9b: Daily consumption (g) of different categories of condiments and sauces by age and sex (all subjects)**

Age group (months)	Food items	Male						Female					
		n	Mean	SD	Median	Min	Max	n	Mean	SD	Median	Min	Max
6	All condiments and sauces	92	0.0	0.1	0.0	0.0	0.5	85	0.0	0.1	0.0	0.0	0.7
	Salt		0.0	0.1	0.0	0.0	0.5		0.0	0.0	0.0	0.0	0.2
	Soy sauce		0.0	0.0	0.0	0.0	0.2		0.0	0.1	0.0	0.0	0.7
	Others <sup>1</sup>		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
9	All condiments and sauces	88	0.1	0.8	0.0	0.0	7.7	76	0.0	0.1	0.0	0.0	0.6
	Salt		0.0	0.1	0.0	0.0	0.3		0.0	0.1	0.0	0.0	0.3
	Soy sauce		0.0	0.1	0.0	0.0	1.0		0.0	0.1	0.0	0.0	0.5
	Others		0.1	0.7	0.0	0.0	6.7		0.0	0.0	0.0	0.0	0.2
12	All condiments and sauces	87	0.3	0.5	0.0	0.0	3.0	84	0.2	0.3	0.0	0.0	1.9
	Salt		0.1	0.2	0.0	0.0	1.6		0.1	0.1	0.0	0.0	0.6
	Soy sauce		0.1	0.3	0.0	0.0	1.7		0.1	0.2	0.0	0.0	1.7
	Others		0.0	0.3	0.0	0.0	2.7		0.0	0.1	0.0	0.0	1.3
18	All condiments and sauces	89	0.9	2.5	0.2	0.0	20.0	144	1.0	3.4	0.3	0.0	33.3
	Salt		0.1	0.2	0.1	0.0	0.5		0.2	0.2	0.1	0.0	1.2
	Soy sauce		0.1	0.3	0.0	0.0	1.3		0.2	0.9	0.0	0.0	10.0
	Others		0.7	2.6	0.0	0.0	20.0		0.6	3.3	0.0	0.0	33.3
24	All condiments and sauces	178	1.0	1.7	0.4	0.0	11.2	136	0.9	1.8	0.4	0.0	12.2
	Salt		0.2	0.1	0.2	0.0	0.6		0.2	0.2	0.2	0.0	0.8
	Soy sauce		0.3	0.5	0.1	0.0	5.2		0.2	0.6	0.1	0.0	6.7
	Others		0.6	1.5	0.0	0.0	10.3		0.4	1.7	0.0	0.0	11.7
48	All condiments and sauces	112	2.7	3.7	1.1	0.0	17.3	101	2.1	4.2	0.7	0.0	30.1
	Salt		0.3	0.3	0.3	0.0	3.0		0.3	0.2	0.3	0.0	0.8
	Soy sauce		0.4	0.6	0.2	0.0	3.8		0.3	0.7	0.2	0.0	5.8
	Others		2.0	3.5	0.0	0.0	16.7		1.5	4.3	0.0	0.0	30.0

<sup>1</sup>Other condiments and sauces included Chinese-style barbecue sauce, seafood sauce, rice wine, Western-style sweet and sour sauce, ketchup, and other sauces.



### **3.3.2 Desserts, snacks and sweets**

Over 50% of boys and girls consumed some desserts, snacks and sweets from 18 months onwards (Table 3.10a). The average daily consumption of all desserts, snacks and sweets consumption increased from 4.7 g in boys and 4.9 g in girls at 18 months to 20.8 g and 16.3 g respectively at 48 months (Table 3.10b). Crackers and cookies were the most common types of desserts, snacks and sweets among the studied children (Tables 3.10a, 3.10b).

**Table 3.10a: Daily consumption (g) of different categories of desserts, snacks and sweets by age and sex (consumers only)**

Age group (months)	Food items	Male							Female						
		n	% <sup>1</sup>	Mean	SD	Median	Min	Max	n	%	Mean	SD	Median	Min	Max
6	All desserts, snacks, sweets	4	4.3	2.0	1.9	2.0	0.1	4.0	3	3.5	2.7	1.2	2.5	1.7	4.0
	Candy/chocolate/gum	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Chips and popcorn	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Crackers/cookies	1	1.1	---	---	---	0.7	0.7	3	3.5	2.7	1.2	2.5	1.7	4.0
	Desserts	1	1.1	---	---	---	3.3	3.3	0	0.0	0.0	0.0	0.0	0.0	0.0
	Frozen confections	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Sugars/honey/syrup	2	2.2	2.0	2.8	2.0	0.1	4.0	0	0.0	0.0	0.0	0.0	0.0	0.0
9	All desserts, snacks, sweets	16	18.2	6.9	9.0	4.3	0.7	36.3	11	14.5	5.3	7.5	2.2	0.2	26.7
	Candy/chocolate/gum	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Chips and popcorn	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Crackers/cookies	15	17.0	5.6	7.8	3.5	0.7	32.3	8	10.5	3.1	2.6	2.1	1.7	9.3
	Desserts	0	0.0	0.0	0.0	0.0	0.0	0.0	2	2.6	16.7	14.1	16.7	6.7	26.7
	Frozen confections	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Sugars/honey/syrup	5	5.7	5.4	6.4	4.0	0.8	16.7	1	1.3	---	---	---	0.2	0.2
12	All desserts, snacks, sweets	23	26.4	6.4	8.2	2.5	0.7	38.0	29	34.5	8.5	10.9	5.3	0.2	54.1
	Candy/chocolate/gum	2	2.3	1.8	1.6	1.8	0.7	2.9	1	1.2	---	---	---	6.3	6.3
	Chips and popcorn	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Crackers/cookies	22	25.3	5.2	4.5	3.1	0.7	14.0	27	32.1	6.6	6.4	5.3	0.2	23.1
	Desserts	1	1.1	---	---	---	26.7	26.7	3	3.6	20.3	27.9	5.0	3.3	52.5
	Frozen confections	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Sugars/honey/syrup	4	4.6	0.4	0.3	0.4	0.2	0.7	2	2.4	0.8	0.8	0.8	0.2	1.3
18	All desserts, snacks, sweets	51	57.3	8.2	7.4	5.6	0.2	34.9	92	63.9	7.7	10.7	4.4	0.2	78.5
	Candy/chocolate/gum	7	7.9	5.0	3.0	5.0	1.0	9.3	11	7.6	3.9	4.0	2.7	0.3	14.7
	Chips and popcorn	1	1.1	---	---	---	1.3	1.3	11	7.6	3.8	3.3	2.5	1.2	10.0
	Crackers/cookies	44	49.4	5.8	4.8	4.1	0.4	21.9	78	54.2	5.6	4.6	4.0	0.4	18.7
	Desserts	6	6.7	9.5	5.9	7.8	4.7	20.0	5	3.5	28.1	27.3	10.8	6.7	65.0
	Frozen confections	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Sugars/honey/syrup	15	16.9	4.7	6.1	1.3	0.2	18.8	31	21.5	1.3	1.5	0.7	0.2	6.3

<sup>1</sup>Percentage of consumers

**Table 3.10a (cont): Daily consumption (g) of different categories of desserts, snacks and sweets by age and sex (consumers only)**

Age group (months)	Food items	Male							Female						
		n	% <sup>1</sup>	Mean	SD	Median	Min	Max	n	%	Mean	SD	Median	Min	Max
24	All desserts, snacks, sweets	130	73.0	10.8	12.2	6.8	0.2	66.7	113	83.1	12.8	18.3	7.2	0.2	111.1
	Candy/chocolate/gum	36	20.2	5.2	3.4	4.1	0.7	13.3	36	26.5	4.7	4.4	3.6	0.3	19.2
	Chips and popcorn	7	3.9	5.0	6.7	2.8	1.0	20.0	11	8.1	3.5	2.9	3.0	1.0	10.8
	Crackers/cookies	97	54.5	8.3	7.2	5.8	0.6	31.3	83	61.0	7.5	6.5	6.0	1.0	45.7
	Desserts	9	5.1	29.2	14.3	33.3	7.0	50.0	15	11.0	35.4	31.4	21.5	5.0	107.8
	Frozen confections	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Sugars/honey/syrup	59	33.1	2.1	3.6	0.7	0.0	18.7	44	32.4	1.9	3.0	0.7	0.2	15.0
48	All desserts, snacks, sweets	101	90.2	23.0	25.7	12.7	0.2	141.8	91	90.1	18.1	16.1	13.0	1.3	72.2
	Candy/chocolate/gum	38	33.9	7.0	6.7	4.3	1.0	25.7	39	38.6	4.9	3.6	3.7	0.7	14.7
	Chips and popcorn	11	9.8	5.3	4.2	3.0	1.7	13.3	10	9.9	2.1	2.0	1.6	0.3	7.2
	Crackers/cookies	77	68.8	11.5	9.8	9.5	1.0	49.3	70	69.3	12.3	8.4	9.8	0.7	36.5
	Desserts	19	17.0	43.8	32.7	38.3	0.7	140.0	14	13.9	29.3	14.3	26.7	6.7	49.8
	Frozen confections	1	0.9	---	---	---	6.7	6.7	2	2.0	16.8	2.1	16.8	15.3	18.3
	Sugars/honey/syrup	58	51.8	4.8	7.7	2.0	0.2	43.3	45	44.6	2.8	2.7	2.0	0.2	13.3

<sup>1</sup>Percentage of consumers

**Table 3.10b: Daily consumption (g) of different categories of desserts, snacks and sweets by age and sex (all subjects)**

Age group (months)	Food items	Male						Female					
		n	Mean	SD	Median	Min	Max	n	Mean	SD	Median	Min	Max
6	All desserts, snacks, sweets	92	0.1	0.5	0.0	0.0	4.0	85	0.1	0.5	0.0	0.0	4.0
	Candy/chocolate/gum		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Chips and popcorn		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Crackers/cookies		0.0	0.1	0.0	0.0	0.7		0.1	0.5	0.0	0.0	4.0
	Desserts		0.0	0.3	0.0	0.0	3.3		0.0	0.0	0.0	0.0	0.0
	Frozen confections		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Sugars/honey/syrup		0.0	0.4	0.0	0.0	4.0		0.0	0.0	0.0	0.0	0.0
9	All desserts, snacks, sweets	88	1.3	4.6	0.0	0.0	36.3	76	0.8	3.3	0.0	0.0	26.7
	Candy/chocolate/gum		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Chips and popcorn		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Crackers/cookies		1.0	3.8	0.0	0.0	32.3		0.3	1.2	0.0	0.0	9.3
	Desserts		0.0	0.0	0.0	0.0	0.0		0.4	3.1	0.0	0.0	26.7
	Frozen confections		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Sugars/honey/syrup		0.3	1.9	0.0	0.0	16.7		0.0	0.0	0.0	0.0	0.2
12	All desserts, snacks, sweets	87	1.7	5.0	0.0	0.0	38.0	84	2.9	7.5	0.0	0.0	54.1
	Candy/chocolate/gum		0.0	0.3	0.0	0.0	2.9		0.1	0.7	0.0	0.0	6.3
	Chips and popcorn		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Crackers/cookies		1.3	3.2	0.0	0.0	14.0		2.1	4.8	0.0	0.0	23.1
	Desserts		0.3	2.9	0.0	0.0	26.7		0.7	5.8	0.0	0.0	52.5
	Frozen confections		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Sugars/honey/syrup		0.0	0.1	0.0	0.0	0.7		0.0	0.1	0.0	0.0	1.3
18	All desserts, snacks, sweets	89	4.7	6.9	2.0	0.0	34.9	144	4.9	9.3	1.7	0.0	78.5
	Candy/chocolate/gum		0.4	1.6	0.0	0.0	9.3		0.3	1.5	0.0	0.0	14.7
	Chips and popcorn		0.0	0.1	0.0	0.0	1.3		0.3	1.3	0.0	0.0	10.0
	Crackers/cookies		2.9	4.5	0.0	0.0	21.9		3.1	4.4	1.3	0.0	18.7
	Desserts		0.6	2.8	0.0	0.0	20.0		1.0	6.9	0.0	0.0	65.0
	Frozen confections		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Sugars/honey/syrup		0.8	3.0	0.0	0.0	18.8		0.3	0.9	0.0	0.0	6.3

**Table 3.10b (cont): Daily consumption (g) of different categories of desserts, snacks and sweets by age and sex (all subjects)**

Age group (months)	Food items	Male						Female					
		n	Mean	SD	Median	Min	Max	n	Mean	SD	Median	Min	Max
24	All desserts, snacks, sweets	178	7.9	11.4	2.9	0.0	66.7	136	10.6	17.4	5.1	0.0	111.1
	Candy/chocolate/gum		1.0	2.6	0.0	0.0	13.3		1.2	3.0	0.0	0.0	19.2
	Chips and popcorn		0.2	1.6	0.0	0.0	20.0		0.3	1.2	0.0	0.0	10.8
	Crackers/cookies		4.5	6.7	1.3	0.0	31.3		4.6	6.3	3.1	0.0	45.7
	Desserts		1.5	7.1	0.0	0.0	50.0		3.9	15.1	0.0	0.0	107.8
	Frozen confections		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Sugars/honey/syrup		0.7	2.3	0.0	0.0	18.7		0.6	1.9	0.0	0.0	15.0
48	All desserts, snacks, sweets	112	20.8	25.3	11.6	0.0	141.8	101	16.3	16.2	10.7	0.0	72.2
	Candy/chocolate/gum		2.4	5.1	0.0	0.0	25.7		1.9	3.3	0.0	0.0	14.7
	Chips and popcorn		0.5	2.0	0.0	0.0	13.3		0.2	0.9	0.0	0.0	7.2
	Crackers/cookies		7.9	9.7	5.3	0.0	49.3		8.6	9.0	6.5	0.0	36.5
	Desserts		7.4	21.1	0.0	0.0	140.0		4.1	11.4	0.0	0.0	49.8
	Frozen confections		0.1	0.6	0.0	0.0	6.7		0.3	2.4	0.0	0.0	18.3
	Sugars/honey/syrup		2.5	6.0	0.2	0.0	43.3		1.3	2.3	0.0	0.0	13.3

### **3.3.3 Dim sum**

No studied children consumed dim sum at 6 months. The percentage of children consuming dim sum increased from less than 10% at 12 months to over 30% at 48 months (Table 3.11a). There was a great variation in the amount of all dim sum consumed within- and between-age groups (Table 3.11b).

**Table 3.11a: Daily consumption (g) of different categories of dim sum by age and sex (consumers only)**

Age group (months)	Food items	Male					Female								
		n	% <sup>1</sup>	Mean	SD	Median	Min	Max	n	%	Mean	SD	Median	Min	Max
6	All dim sum	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Bun and cake - savory	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Bun and cake - sweet	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Dumplings	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Other dim sum <sup>2</sup>	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
9	All dim sum	4	4.5	21.0	36.0	4.2	0.8	75.0	3	3.9	16.7	3.3	16.7	13.3	20.0
	Bun and cake - savory	1	1.1	---	---	---	3.3	3.3	0	0.0	0.0	0.0	0.0	0.0	0.0
	Bun and cake - sweet	1	1.1	---	---	---	0.8	0.8	1	1.3	---	---	---	13.3	13.3
	Dumplings	2	2.3	40.0	49.5	40.0	5.0	75.0	2	2.6	18.3	2.4	18.3	16.7	20.0
	Other dim sum	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
12	All dim sum	4	4.6	17.0	22.0	7.5	3.3	49.7	7	8.3	16.0	6.7	17.8	6.7	26.7
	Bun and cake - savory	2	2.3	21.2	20.5	21.2	6.7	35.7	3	3.6	12.2	5.7	12.5	6.4	17.8
	Bun and cake - sweet	2	2.3	4.2	1.2	4.2	3.3	5.0	2	2.4	22.2	6.3	22.2	17.8	26.7
	Dumplings	2	2.3	8.7	7.5	8.7	3.3	14.0	3	3.6	10.2	8.6	6.7	4.0	20.0
	Other dim sum	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
18	All dim sum	14	15.7	14.0	10.4	11.5	5.0	44.0	30	20.8	17.1	12.6	13.3	1.3	55.7
	Bun and cake - savory	5	5.6	12.8	4.3	12.5	8.3	17.8	13	9.0	17.7	14.1	12.5	3.3	55.7
	Bun and cake - sweet	4	4.5	10.6	3.8	12.1	5.0	13.3	13	9.0	16.1	10.9	13.3	3.3	33.3
	Dumplings	8	9.0	9.7	5.2	6.7	5.0	20.0	6	4.2	8.8	5.4	10.0	2.5	14.0
	Other dim sum	1	1.1	---	---	---	11.3	11.3	3	2.1	7.1	6.0	6.8	1.3	13.3
24	All dim sum	45	25.3	28.4	30.9	20.0	2.7	189.0	38	27.9	20.1	15.8	13.3	1.7	72.2
	Bun and cake - savory	16	9.0	28.1	15.6	25.0	3.3	71.3	14	10.3	17.0	10.6	15.0	1.7	37.5
	Bun and cake - sweet	12	6.7	14.6	7.5	15.0	3.3	28.9	11	8.1	11.3	5.1	10.0	5.8	20.0
	Dumplings	27	15.2	21.7	28.6	16.7	0.6	153.3	21	15.4	19.1	14.6	13.3	3.3	61.3
	Other dim sum	4	2.2	16.9	13.4	15.8	2.7	33.3	0	0.0	0.0	0.0	0.0	0.0	0.0
48	All dim sum	47	42.0	25.7	17.5	20.0	1.7	86.7	33	32.7	28.7	17.7	25.0	3.3	70.0
	Bun and cake - savory	12	10.7	25.7	13.9	25.0	6.7	60.2	17	16.8	21.6	13.1	22.0	1.7	50.0
	Bun and cake - sweet	17	15.2	16.0	8.3	13.3	1.7	40.0	12	11.9	12.5	5.4	13.3	3.3	20.0
	Dumplings	19	17.0	27.1	22.2	20.0	6.7	86.7	18	17.8	21.0	17.5	13.5	3.3	66.7
	Other dim sum	6	5.4	18.4	12.7	16.5	2.7	33.3	3	3.0	16.9	5.3	20.0	10.8	20.0

<sup>1</sup>Percentage of consumers

<sup>2</sup>Other dim sum included rice dumpling of savory or sweet taste, and steamed chicken paws.

**Table 3.11b: Daily consumption (g) of different categories of dim sum by age and sex (all subjects)**

Age group (months)	Food items	Male						Female					
		n	Mean	SD	Median	Min	Max	n	Mean	SD	Median	Min	Max
6	All dim sum	92	0.0	0.0	0.0	0.0	0.0	85	0.0	0.0	0.0	0.0	0.0
	Bun and cake - savory		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Bun and cake - sweet		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Dumplings		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Other dim sum <sup>1</sup>		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
9	All dim sum	88	1.0	8.0	0.0	0.0	75.0	76	0.7	3.3	0.0	0.0	20.0
	Bun and cake - savory		0.0	0.4	0.0	0.0	3.3		0.0	0.0	0.0	0.0	0.0
	Bun and cake - sweet		0.0	0.1	0.0	0.0	0.8		0.2	1.5	0.0	0.0	13.3
	Dumplings		0.9	8.0	0.0	0.0	75.0		0.5	3.0	0.0	0.0	20.0
	Other dim sum		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
12	All dim sum	87	0.8	5.4	0.0	0.0	49.7	84	1.3	4.8	0.0	0.0	26.7
	Bun and cake - savory		0.5	3.9	0.0	0.0	35.7		0.4	2.5	0.0	0.0	17.8
	Bun and cake - sweet		0.1	0.6	0.0	0.0	5.0		0.5	3.5	0.0	0.0	26.7
	Dumplings		0.2	1.5	0.0	0.0	14.0		0.4	2.3	0.0	0.0	20.0
	Other dim sum		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
18	All dim sum	89	2.2	6.5	0.0	0.0	44.0	144	3.6	9.0	0.0	0.0	55.7
	Bun and cake - savory		0.7	3.1	0.0	0.0	17.8		1.6	6.5	0.0	0.0	55.7
	Bun and cake - sweet		0.5	2.3	0.0	0.0	13.3		1.5	5.6	0.0	0.0	33.3
	Dumplings		0.9	3.1	0.0	0.0	20.0		0.4	2.0	0.0	0.0	14.0
	Other dim sum		0.1	1.2	0.0	0.0	11.3		0.1	1.2	0.0	0.0	13.3
24	All dim sum	178	7.2	19.8	0.0	0.0	189.0	136	5.6	12.3	0.0	0.0	72.2
	Bun and cake - savory		2.5	9.3	0.0	0.0	71.3		1.7	6.1	0.0	0.0	37.5
	Bun and cake - sweet		1.0	4.1	0.0	0.0	28.9		0.9	3.4	0.0	0.0	20.0
	Dumplings		3.3	13.4	0.0	0.0	153.3		2.9	8.9	0.0	0.0	61.3
	Other dim sum		0.4	3.1	0.0	0.0	33.3		0.0	0.0	0.0	0.0	0.0
48	All dim sum	112	10.8	17.0	0.0	0.0	86.7	101	9.4	16.8	0.0	0.0	70.0
	Bun and cake - savory		2.8	9.1	0.0	0.0	60.2		3.6	9.7	0.0	0.0	50.0
	Bun and cake - sweet		2.4	6.6	0.0	0.0	40.0		1.5	4.5	0.0	0.0	20.0
	Dumplings		4.6	13.6	0.0	0.0	86.7		3.7	10.8	0.0	0.0	66.7
	Other dim sum		1.0	5.0	0.0	0.0	33.3		0.5	3.0	0.0	0.0	20.0

<sup>1</sup>Other dim sum included rice dumpling of savory or sweet taste, and steamed chicken paws.



#### **3.3.4 Eggs**

From 6 months to 48 months, there was increasing number of children consumed eggs. At 6 months, 9.8% boys and 14.1% girls consumed eggs, while the corresponding figures increased to more than 50% in both sexes from 18 months onwards (Table 3.12a). The average daily consumption of eggs in boys was 0.4 g at 6 months, 11.4 g at 18 months and 19.2 g at 48 months whereas it was 1.2g, 9.3g and 14.3 g in girls respectively (Table 3.12b). Chicken egg was the major type of egg consumed.

**Table 3.12a: Daily consumption (g) of different categories of egg by age and sex (consumers only)**

Age group (months)	Food items	Male							Female						
		n	% <sup>1</sup>	Mean	SD	Median	Min	Max	n	%	Mean	SD	Median	Min	Max
6	All eggs	9	9.8	4.0	3.6	3.0	0.7	12.0	12	14.1	8.4	5.3	8.7	0.6	17.0
	Baby food - eggs	0	0.0	0.0	0.0	0.0	0.0	0.0	1	1.2	---	---	---	10.0	10.0
	Other eggs <sup>2</sup>	9	9.8	4.0	3.6	3.0	0.7	12.0	11	12.9	8.2	5.6	8.3	0.6	17.5
9	All eggs	29	33.0	8.1	5.7	6.0	1.0	23.0	30	39.5	8.6	9.5	5.7	0.6	42.7
	Baby food - eggs	0	0.0	0.0	0.0	0.0	0.0	0.0	1	1.3	---	---	---	36.7	36.7
	Other eggs	29	33.0	8.1	5.7	6.0	1.0	23.0	30	39.5	7.4	7.1	5.7	0.6	33.3
12	All eggs	41	47.1	13.8	10.8	11.3	3.0	50.0	38	45.2	15.9	16.0	8.3	1.8	76.7
	Baby food - eggs	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Other eggs	41	47.1	13.8	10.8	11.3	3.0	50.0	38	45.2	15.9	16.0	8.3	1.8	76.7
18	All eggs	45	50.6	22.6	20.4	16.7	1.0	100.0	77	53.5	17.3	13.3	16.7	0.5	54.4
	Baby food - eggs	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Other eggs	45	50.6	22.6	20.4	16.7	1.0	100.0	77	53.5	17.3	13.3	16.7	0.5	54.4
24	All eggs	110	61.8	21.7	16.2	16.7	1.0	83.3	79	58.1	20.2	14.8	16.7	1.0	66.7
	Baby food - eggs	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Other eggs	110	61.8	21.7	16.2	16.7	1.0	83.3	79	58.1	20.2	14.8	16.7	1.0	66.7
48	All eggs	87	77.7	24.7	18.4	19.3	0.3	83.3	73	72.3	19.8	14.8	16.7	0.7	66.7
	Baby food - eggs	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Other eggs	87	77.7	24.7	18.4	19.3	0.3	83.3	73	72.3	19.8	14.8	16.7	0.7	66.7

<sup>1</sup>Percentage of consumers<sup>2</sup>Other eggs included chicken egg, duck egg and quail egg.

**Table 3.12b: Daily consumption (g) of different categories of eggs by age and sex (all subjects)**

Age group (months)	Food items	Male						Female					
		n	Mean	SD	Median	Min	Max	n	Mean	SD	Median	Min	Max
6	All eggs	92	0.4	1.6	0.0	0.0	12.0	85	1.2	3.5	0.0	0.0	17.5
	Baby food - eggs		0.0	0.0	0.0	0.0	0.0		0.1	1.1	0.0	0.0	10.0
	Other eggs <sup>1</sup>		0.4	1.6	0.0	0.0	12.0		1.1	3.4	0.0	0.0	17.5
9	All eggs	88	2.7	5.0	0.0	0.0	23.0	76	3.4	7.3	0.0	0.0	42.7
	Baby food – eggs		0.0	0.0	0.0	0.0	0.0		0.5	4.2	0.0	0.0	36.7
	Other eggs		2.7	5.0	0.0	0.0	23.0		2.9	5.7	0.0	0.0	33.3
12	All eggs	87	6.5	10.1	0.0	0.0	50.0	84	7.2	13.3	0.0	0.0	76.7
	Baby food – eggs		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Other eggs		6.5	10.1	0.0	0.0	50.0		7.2	13.3	0.0	0.0	76.7
18	All eggs	89	11.4	18.4	1.0	0.0	100.0	144	9.3	13.0	1.8	0.0	54.4
	Baby food – eggs		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Other eggs		11.4	18.4	1.0	0.0	100.0		9.3	13.0	1.8	0.0	54.4
24	All eggs	178	13.4	16.5	6.7	0.0	83.3	136	11.7	15.0	3.7	0.0	66.7
	Baby food – eggs		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Other eggs		13.4	16.5	6.7	0.0	83.3		11.7	15.0	3.7	0.0	66.7
48	All eggs	112	19.2	19.2	16.7	0.0	83.3	101	14.3	15.4	9.9	0.0	66.7
	Baby food – eggs		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Other eggs		19.2	19.2	16.7	0.0	83.3		14.3	15.4	9.9	0.0	66.7

<sup>1</sup>Other eggs included chicken egg, duck egg and quail egg.

### **3.3.5 Fats and oils**

Fats and oils were seldom used by infants aged 9 months or below. From 18 months onwards, over two-thirds of the children consumed fats and oils (Table 3.13a). The average amount of fats and oils consumed per day was low, less than 3 g per day for all age groups, and various types of fats and oils were consumed by the studied children (Table 3.13b). However, it should be noted that the estimated intakes of fats and oils were subject to large bias and caution should be taken when interpreting these results due to the difficulties in quantifying the amount of fats and oils used in cooking and at the table in a dietary survey.

**Table 3.13a: Daily consumption (g) of different categories of fats and oils by age and sex (consumers only)**

Age group (months)	Food items	Male							Female						
		n	% <sup>1</sup>	Mean	SD	Median	Min	Max	n	%	Mean	SD	Median	Min	Max
6	All fats and oils	2	2.2	0.9	1.3	0.9	0.0	1.8	3	3.5	0.5	0.4	0.6	0.0	0.8
	Butter/Lard	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Canola oil	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Corn oil	0	0.0	0.0	0.0	0.0	0.0	0.0	1	1.2	---	---	---	0.0	0.0
	Grape seed oil	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Olive oil	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Peanut oil	0	0.0	0.0	0.0	0.0	0.0	0.0	2	2.4	0.7	0.1	0.7	0.6	0.8
	Other oils <sup>2</sup>	2	2.2	0.9	1.3	0.9	0.0	1.8	0	0.0	0.0	0.0	0.0	0.0	0.0
9	All fats and oils	11	12.5	0.8	0.5	0.7	0.2	1.4	8	10.5	0.3	0.3	0.3	0.1	1.0
	Butter/Lard	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Canola oil	3	3.4	0.4	0.4	0.2	0.2	0.9	0	0.0	0.0	0.0	0.0	0.0	0.0
	Corn oil	4	4.5	0.6	0.5	0.4	0.2	1.3	2	2.6	0.2	0.2	0.2	0.1	0.3
	Grape seed oil	0	0.0	0.0	0.0	0.0	0.0	0.0	1	1.3	---	---	---	0.2	0.2
	Olive oil	2	2.3	0.7	0.0	0.7	0.7	0.7	0	0.0	0.0	0.0	0.0	0.0	0.0
	Peanut oil	3	3.4	0.9	0.5	1.1	0.3	1.2	5	6.6	0.4	0.4	0.2	0.2	1.0
	Other oils	1	1.1	---	---	---	0.5	0.5	2	2.6	0.1	0.1	0.1	0.1	0.2
12	All fats and oils	37	42.5	1.0	0.9	0.8	0.0	3.3	32	38.1	1.1	0.8	0.8	0.1	4.0
	Butter/Lard	3	3.4	2.4	1.5	3.3	0.7	3.3	0	0.0	0.0	0.0	0.0	0.0	0.0
	Canola oil	14	16.1	0.8	0.7	0.6	0.0	2.2	9	10.7	1.1	0.8	0.8	0.3	2.7
	Corn oil	6	6.9	0.6	0.7	0.3	0.1	2.0	9	10.7	1.3	0.8	1.3	0.3	2.5
	Grape seed oil	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Olive oil	7	8.0	0.7	0.4	0.7	0.2	1.5	4	4.8	0.8	0.2	0.7	0.7	1.0
	Peanut oil	9	10.3	0.7	0.6	0.3	0.2	1.8	10	11.9	0.6	0.3	0.7	0.2	1.2
	Other oils	6	6.9	0.7	0.5	0.6	0.1	1.5	9	10.7	0.4	0.3	0.3	0.1	1.0

<sup>1</sup>Percentage of consumers<sup>2</sup>Other oils included rice bran oil, sesame oil, vegetable oil, mayonnaise and salad cream.

**Table 3.13a (cont): Daily consumption (g) of different categories of fats and oils by age and sex (consumers only)**

Age group (months)	Food items	Male							Female						
		n	% <sup>1</sup>	Mean	SD	Median	Min	Max	n	%	Mean	SD	Median	Min	Max
18	All fats and oils	58	65.2	1.1	0.9	0.9	0.1	5.5	105	72.9	1.2	0.8	1.0	0.1	3.5
	Butter/Lard	3	3.4	1.2	0.4	1.2	0.8	1.7	8	5.6	1.1	0.4	0.8	0.8	1.7
	Canola oil	24	27.0	1.0	0.5	1.0	0.3	2.0	38	26.4	1.1	0.7	1.0	0.1	3.5
	Corn oil	12	13.5	1.0	0.9	0.8	0.2	3.5	22	15.3	0.9	0.6	1.0	0.1	2.0
	Grape seed oil	1	1.1	---	---	---	1.7	1.7	2	1.4	2.6	1.3	2.6	1.7	3.5
	Olive oil	8	9.0	0.5	0.4	0.3	0.1	1.3	14	9.7	0.6	0.5	0.5	0.2	2.0
	Peanut oil	15	16.9	0.7	0.4	0.6	0.3	1.7	31	21.5	0.8	0.5	0.7	0.2	2.2
	Other oils <sup>2</sup>	15	16.9	0.5	0.5	0.3	0.1	2.2	36	25.0	0.4	0.2	0.4	0.2	0.8
24	All fats and oils	152	85.4	1.4	1.1	1.3	0.1	8.2	120	88.2	1.4	0.9	1.2	0.1	6.5
	Butter/Lard	11	6.2	2.5	1.5	3.1	0.0	5.0	7	5.1	2.1	1.1	2.4	0.2	3.3
	Canola oil	68	38.2	1.0	0.5	1.0	0.1	2.3	49	36.0	1.1	1.0	1.0	0.1	6.5
	Corn oil	21	11.8	0.9	0.6	0.8	0.2	2.0	27	19.9	1.1	0.7	0.9	0.2	3.2
	Grape seed oil	4	2.2	0.5	0.2	0.5	0.3	0.8	2	1.5	1.4	1.3	1.4	0.5	2.3
	Olive oil	22	12.4	1.0	0.7	0.9	0.1	3.2	15	11.0	0.8	0.6	0.7	0.2	1.7
	Peanut oil	44	24.7	1.0	0.7	0.8	0.2	3.0	33	24.3	1.0	0.6	0.8	0.2	2.5
	Other oils	66	37.1	0.5	0.3	0.3	0.2	1.3	55	40.4	0.5	0.3	0.3	0.1	1.3
48	All fats and oils	111	99.1	2.1	1.2	1.8	0.2	6.3	99	98.0	2.2	1.6	1.7	0.5	10.3
	Butter/Lard	13	11.6	2.1	0.9	1.7	0.5	3.3	13	12.9	2.8	2.0	2.3	0.8	8.3
	Canola oil	55	49.1	1.3	0.8	1.3	0.2	4.5	49	48.5	1.4	1.1	1.2	0.2	5.7
	Corn oil	31	27.7	0.9	0.6	0.7	0.1	2.3	26	25.7	1.0	1.0	0.9	0.2	5.3
	Grape seed oil	5	4.5	1.2	0.6	1.5	0.3	1.7	3	3.0	1.1	0.5	1.0	0.7	1.7
	Olive oil	18	16.1	0.8	0.9	0.7	0.2	4.0	17	16.8	1.0	0.4	1.0	0.2	1.7
	Peanut oil	34	30.4	1.1	0.9	1.0	0.3	5.0	33	32.7	1.1	0.6	1.0	0.2	2.5
	Other oils	55	49.1	0.8	0.7	0.7	0.1	3.3	53	52.5	0.7	0.9	0.3	0.2	5.0

<sup>1</sup>Percentage of consumers<sup>2</sup>Other oils included rice bran oil, sesame oil, vegetable oil, mayonnaise and salad cream.

**Table 3.13b: Daily consumption (g) of different categories of fats and oils by age and sex (all subjects)**

Age group (months)	Food items	Male						Female					
		n	Mean	SD	Median	Min	Max	N	Mean	SD	Median	Min	Max
6	All fats and oils	92	0.0	0.2	0.0	0.0	1.8	85	0.0	0.1	0.0	0.0	0.8
	Butter/Lard		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Canola oil		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Corn oil		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Grape seed oil		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Olive oil		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Peanut oil		0.0	0.0	0.0	0.0	0.0		0.0	0.1	0.0	0.0	0.8
	Other oils <sup>1</sup>		0.0	0.2	0.0	0.0	1.8		0.0	0.0	0.0	0.0	0.0
9	All fats and oils	88	0.1	0.3	0.0	0.0	1.4	76	0.0	0.1	0.0	0.0	1.0
	Butter/Lard		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Canola oil		0.0	0.1	0.0	0.0	0.9		0.0	0.0	0.0	0.0	0.0
	Corn oil		0.0	0.2	0.0	0.0	1.3		0.0	0.0	0.0	0.0	0.3
	Grape seed oil		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.2
	Olive oil		0.0	0.1	0.0	0.0	0.7		0.0	0.0	0.0	0.0	0.0
	Peanut oil		0.0	0.2	0.0	0.0	1.2		0.0	0.1	0.0	0.0	1.0
	Other oils		0.0	0.1	0.0	0.0	0.5		0.0	0.0	0.0	0.0	0.2
12	All fats and oils	87	0.4	0.8	0.0	0.0	3.3	84	0.4	0.7	0.0	0.0	4.0
	Butter/Lard		0.1	0.5	0.0	0.0	3.3		0.0	0.0	0.0	0.0	0.0
	Canola oil		0.1	0.4	0.0	0.0	2.2		0.1	0.4	0.0	0.0	2.7
	Corn oil		0.0	0.2	0.0	0.0	2.0		0.1	0.5	0.0	0.0	2.5
	Grape seed oil		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Olive oil		0.1	0.2	0.0	0.0	1.5		0.0	0.2	0.0	0.0	1.0
	Peanut oil		0.1	0.3	0.0	0.0	1.8		0.1	0.2	0.0	0.0	1.2
	Other oils		0.0	0.2	0.0	0.0	1.5		0.0	0.1	0.0	0.0	1.0

<sup>1</sup>Other oils included rice bran oil, sesame oil, vegetable oil, mayonnaise and salad cream.

**Table 3.13b (cont): Daily consumption (g) of different categories of fats and oils by age and sex (all subjects)**

Age group (months)	Food items	Male						Female					
		n	Mean	SD	Median	Min	Max	n	Mean	SD	Median	Min	Max
18	All fats and oils	89	0.7	0.9	0.7	0.0	5.5	144	0.9	0.8	0.7	0.0	3.5
	Butter/Lard		0.0	0.2	0.0	0.0	1.7		0.1	0.3	0.0	0.0	1.7
	Canola oil		0.3	0.5	0.0	0.0	2.0		0.3	0.6	0.0	0.0	3.5
	Corn oil		0.1	0.5	0.0	0.0	3.5		0.1	0.4	0.0	0.0	2.0
	Grape seed oil		0.0	0.2	0.0	0.0	1.7		0.0	0.3	0.0	0.0	3.5
	Olive oil		0.0	0.2	0.0	0.0	1.3		0.1	0.2	0.0	0.0	2.0
	Peanut oil		0.1	0.3	0.0	0.0	1.7		0.2	0.4	0.0	0.0	2.2
	Other oils <sup>1</sup>		0.1	0.3	0.0	0.0	2.2		0.1	0.2	0.0	0.0	0.8
24	All fats and oils	178	1.2	1.1	1.2	0.0	8.2	136	1.3	1.0	1.0	0.0	6.5
	Butter/Lard		0.2	0.7	0.0	0.0	5.0		0.1	0.5	0.0	0.0	3.3
	Canola oil		0.4	0.6	0.0	0.0	2.3		0.4	0.8	0.0	0.0	6.5
	Corn oil		0.1	0.3	0.0	0.0	2.0		0.2	0.5	0.0	0.0	3.2
	Grape seed oil		0.0	0.1	0.0	0.0	0.8		0.0	0.2	0.0	0.0	2.3
	Olive oil		0.1	0.4	0.0	0.0	3.2		0.1	0.3	0.0	0.0	1.7
	Peanut oil		0.3	0.6	0.0	0.0	3.0		0.2	0.5	0.0	0.0	2.5
	Other oils		0.2	0.3	0.0	0.0	1.3		0.2	0.3	0.0	0.0	1.3
48	All fats and oils	112	2.1	1.2	1.8	0.0	6.3	101	2.2	1.6	1.7	0.0	10.3
	Butter/Lard		0.2	0.7	0.0	0.0	3.3		0.4	1.2	0.0	0.0	8.3
	Canola oil		0.6	0.8	0.0	0.0	4.5		0.7	1.0	0.0	0.0	5.7
	Corn oil		0.3	0.5	0.0	0.0	2.3		0.3	0.7	0.0	0.0	5.3
	Grape seed oil		0.1	0.3	0.0	0.0	1.7		0.0	0.2	0.0	0.0	1.7
	Olive oil		0.1	0.5	0.0	0.0	4.0		0.2	0.4	0.0	0.0	1.7
	Peanut oil		0.3	0.7	0.0	0.0	5.0		0.3	0.6	0.0	0.0	2.5
	Other oils		0.4	0.6	0.0	0.0	3.3		0.3	0.7	0.2	0.0	5.0

<sup>1</sup>Other oils included rice bran oil, sesame oil, vegetable oil, mayonnaise and salad cream.



### **3.3.6 Fish, fish products and shellfish**

Fish and fish products were commonly consumed by children from 9 months onwards. At 6 months, only about 10% infants consumed fish and fish products, whereas more than half of children consumed fish and fish products from 9 months onwards (Table 3.14a). There was a great variation in the daily average consumption of fish and fish products among individuals of same age (Table 3.14b). Regarding shellfish consumption, less than 10% of infants consumed shellfish at 9 months or below whereas the percentage of children consuming shellfish was increased with age (Table 3.14a). There was also a great variation in the daily average consumption of shellfish among individuals of same age (Table 3.14b).

**Table 3.14a: Daily consumption (g) of fish, fish products and shellfish by age and sex (consumers only)**

Age group (months)	Food items	Male							Female						
		n	% <sup>1</sup>	Mean	SD	Median	Min	Max	n	%	Mean	SD	Median	Min	Max
6	Fish and fish products	12	13.0	11.0	12.3	6.4	0.3	40.0	12	14.1	8.6	8.4	7.0	1.0	30.0
	Shellfish	1	1.1	---	---	---	1.0	1.0	2	2.4	2.2	2.6	2.2	0.3	4.0
9	Fish and fish products	47	53.4	15.5	22.1	8.3	0.5	130.0	41	53.9	14.8	24.6	11.0	1.0	160.0
	Shellfish	3	3.4	5.4	4.2	6.7	0.7	8.8	1	1.3	---	---	---	0.5	0.5
12	Fish and fish products	60	69.0	28.4	33.0	19.2	1.0	188.3	58	69.0	20.6	22.0	16.3	0.3	133.3
	Shellfish	7	8.0	10.5	9.6	5.6	1.7	26.7	10	11.9	6.3	5.6	5.2	0.0	16.7
18	Fish and fish products	65	73.0	22.2	21.5	16.0	0.6	133.3	111	77.1	21.7	22.2	17.3	0.3	171.2
	Shellfish	11	12.4	10.3	7.4	7.3	1.3	26.7	16	11.1	5.7	7.0	3.9	0.5	29.3
24	Fish and fish products	147	82.6	25.4	20.1	20.0	0.3	121.7	109	80.1	20.2	19.4	15.2	0.5	133.3
	Shellfish	30	16.9	10.3	10.3	7.0	0.3	40.7	37	27.2	8.1	10.5	6.7	0.1	50.0
48	Fish and fish products	94	83.9	28.8	25.3	22.0	0.5	135.0	84	83.2	28.7	21.3	23.8	2.0	106.0
	Shellfish	46	41.1	9.3	12.6	6.7	0.3	66.7	29	28.7	6.9	8.2	3.3	0.3	30.6

<sup>1</sup>Percentage of consumers**Table 3.14b: Daily consumption (g) of fish, fish products and shellfish by age and sex (all subjects)**

Age group (months)	Food items	Male						Female					
		n	Mean	SD	Median	Min	Max	n	Mean	SD	Median	Min	Max
6	Fish and fish products	92	1.4	5.7	0.0	0.0	40.0	85	1.2	4.3	0.0	0.0	30.0
	Shellfish	92	0.0	0.1	0.0	0.0	1.0	85	0.1	0.4	0.0	0.0	4.0
9	Fish and fish products	88	8.3	17.9	1.8	0.0	130.0	76	8.0	19.4	2.0	0.0	160.0
	Shellfish	88	0.2	1.2	0.0	0.0	8.8	76	0.0	0.1	0.0	0.0	0.5
12	Fish and fish products	87	19.6	30.4	12.0	0.0	188.3	84	14.2	20.6	6.7	0.0	133.3
	Shellfish	87	0.8	3.8	0.0	0.0	26.7	84	0.7	2.8	0.0	0.0	16.7
18	Fish and fish products	89	16.2	20.8	11.0	0.0	133.3	144	16.7	21.5	13.3	0.0	171.2
	Shellfish	89	1.3	4.2	0.0	0.0	26.7	144	0.6	2.9	0.0	0.0	29.3
24	Fish and fish products	178	21.0	20.7	16.1	0.0	121.7	136	16.2	19.2	10.8	0.0	133.3
	Shellfish	178	1.7	5.7	0.0	0.0	40.7	136	2.2	6.5	0.0	0.0	50.0
48	Fish and fish products	112	24.2	25.5	16.7	0.0	135.0	101	23.9	22.2	18.7	0.0	106.0
	Shellfish	112	3.8	9.3	0.0	0.0	66.7	101	2.0	5.4	0.0	0.0	30.6

### **3.3.7 Fruits**

Fruits, especially fresh fruits were commonly consumed by the studied children. At 6 months, approximately 40% of boys and girls consumed fruits (Table 3.15a), but the average daily consumption was only 7.6 g in boys and 8.2 g in girls (Table 3.15b). At 9 months, nearly 70% of boys and girls consumed fruits (Table 3.15a) and the average daily consumption was increased to 31.7 g in boys and 25.5 g in girls (Table 3.15b). From 12 months onwards, over 90% of boys and girls consumed fruits (Table 3.15a), and the average daily consumption was increased from about 50 g in children aged 12 months to around 90 g in children aged 48 months (Table 3.15b).

**Table 3.15a: Daily consumption (g) of different categories of fruits by age and sex (consumers only)**

Age group (months)	Food items	Male							Female						
		n	% <sup>1</sup>	Mean	SD	Median	Min	Max	n	%	Mean	SD	Median	Min	Max
6	All fruits	34	37.0	20.6	19.1	17.2	0.3	90.7	34	40.0	20.4	19.1	10.7	1.7	75.7
	Baby food - fruits	4	4.3	15.8	12.8	13.3	4.3	32.0	3	3.5	30.6	23.7	41.7	3.3	46.7
	Canned fruits	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Dried fruits	1	1.1	---	---	---	1.0	1.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Fresh fruits	30	32.6	21.2	19.9	17.2	0.3	90.7	31	36.5	19.4	18.7	10.0	1.7	75.7
9	All fruits	61	69.3	45.7	41.9	33.3	1.3	180.7	56	73.7	34.6	31.2	25.0	1.7	139.4
	Baby food - fruits	2	2.3	72.9	85.5	72.9	12.4	133.3	1	1.3	---	---	---	53.3	53.3
	Canned fruits	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Dried fruits	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Fresh fruits	59	67.0	44.8	40.7	33.3	1.3	180.7	56	73.7	33.6	31.0	23.6	1.7	139.4
12	All fruits	77	88.5	58.9	39.7	50.0	0.7	187.7	74	88.1	50.9	41.6	39.2	0.2	181.2
	Baby food - fruits	5	5.7	25.2	16.0	33.3	5.8	40.0	3	3.6	12.7	21.6	0.3	0.2	37.7
	Canned fruits	0	0.0	0.0	0.0	0.0	0.0	0.0	3	3.6	2.9	1.4	3.3	1.3	4.0
	Dried fruits	1	1.1	---	---	---	2.2	2.2	0	0.0	0.0	0.0	0.0	0.0	0.0
	Fresh fruits	77	88.5	57.2	39.7	49.0	0.7	187.7	72	85.7	51.7	40.8	40.6	0.7	181.2
18	All fruits	80	89.9	61.3	43.5	56.2	2.0	202.7	134	93.1	67.9	49.7	58.7	1.7	326.0
	Baby food - fruits	1	1.1	---	---	---	33.3	33.3	1	0.7	---	---	---	0.3	0.3
	Canned fruits	0	0.0	0.0	0.0	0.0	0.0	0.0	1	0.7	---	---	---	3.3	3.3
	Dried fruits	3	3.4	4.7	2.2	5.0	2.3	6.7	6	4.2	6.2	4.6	4.5	1.7	14.6
	Fresh fruits	80	89.9	60.7	43.8	55.7	2.0	202.7	134	93.1	67.6	49.6	58.7	1.0	325.9
24	All fruits	163	91.6	71.7	48.8	65.0	1.7	240.0	124	91.2	73.6	51.6	62.8	4.0	253.3
	Baby food - fruits	2	1.1	35.0	2.4	35.0	33.3	36.7	0	0.0	0.0	0.0	0.0	0.0	0.0
	Canned fruits	1	0.6	---	---	---	1.7	1.7	3	2.2	2.7	1.2	3.3	1.3	3.3
	Dried fruits	10	5.6	7.5	7.7	4.4	1.3	26.7	6	4.4	3.1	2.0	3.8	0.3	5.0
	Fresh fruits	163	91.6	70.8	48.0	65.0	1.7	240.0	124	91.2	73.4	51.6	62.0	4.0	253.3
48	All fruits	105	93.8	96.5	62.7	83.4	1.7	348.7	96	95.0	90.6	55.7	78.0	7.5	274.2
	Baby food - fruits	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Canned fruits	5	4.5	5.3	3.6	3.3	1.7	10.0	2	2.0	7.5	1.2	7.5	6.7	8.3
	Dried fruits	4	3.6	16.7	20.1	10.8	0.7	44.4	9	8.9	4.9	3.2	4.2	1.0	9.3
	Fresh fruits	104	92.9	96.6	62.5	82.9	5.0	348.7	96	95.0	90.0	55.7	78.0	7.5	274.2

<sup>1</sup>Percentage of consumers

**Table 3.15b: Daily consumption (g) of different categories of fruits by age and sex (all subjects)**

Age group (months)	Food items	Male						Female					
		n	Mean	SD	Median	Min	Max	n	Mean	SD	Median	Min	Max
6	All fruits	92	7.6	15.3	0.0	0.0	90.7	85	8.2	15.6	0.0	0.0	75.7
	Baby food - fruits		0.7	4.0	0.0	0.0	32.0		1.1	6.7	0.0	0.0	46.7
	Canned fruits		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Dried fruits		0.0	0.1	0.0	0.0	1.0		0.0	0.0	0.0	0.0	0.0
	Fresh fruits		6.9	15.0	0.0	0.0	90.7		7.1	14.6	0.0	0.0	75.7
9	All fruits	88	31.7	40.7	15.3	0.0	180.7	76	25.5	30.8	13.6	0.0	139.4
	Baby food - fruits		1.7	14.3	0.0	0.0	133.3		0.7	6.1	0.0	0.0	53.3
	Canned fruits		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Dried fruits		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Fresh fruits		30.0	39.4	13.6	0.0	180.7		24.8	30.5	13.3	0.0	139.4
12	All fruits	87	52.1	41.9	46.0	0.0	187.7	84	44.9	42.4	35.3	0.0	181.2
	Baby food - fruits		1.4	6.8	0.0	0.0	40.0		0.5	4.1	0.0	0.0	37.7
	Canned fruits		0.0	0.0	0.0	0.0	0.0		0.1	0.6	0.0	0.0	4.0
	Dried fruits		0.0	0.2	0.0	0.0	2.2		0.0	0.0	0.0	0.0	0.0
	Fresh fruits		50.6	41.6	45.3	0.0	187.7		44.3	41.9	35.3	0.0	181.2
18	All fruits	89	55.1	45.3	50.6	0.0	202.7	144	63.2	51.0	53.3	0.0	325.9
	Baby food - fruits		0.4	3.5	0.0	0.0	33.3		0.0	0.0	0.0	0.0	0.3
	Canned fruits		0.0	0.0	0.0	0.0	0.0		0.0	0.3	0.0	0.0	3.3
	Dried fruits		0.2	0.9	0.0	0.0	6.7		0.3	1.5	0.0	0.0	14.6
	Fresh fruits		54.6	45.4	48.8	0.0	202.7		62.9	50.8	53.3	0.0	325.9
24	All fruits	178	65.7	50.8	57.0	0.0	240.0	136	67.1	53.5	55.8	0.0	253.3
	Baby food - fruits		0.4	3.7	0.0	0.0	36.7		0.0	0.0	0.0	0.0	0.0
	Canned fruits		0.0	0.1	0.0	0.0	1.7		0.1	0.4	0.0	0.0	3.3
	Dried fruits		0.4	2.4	0.0	0.0	26.7		0.1	0.7	0.0	0.0	5.0
	Fresh fruits		64.8	50.0	57.0	0.0	240.0		66.9	53.5	55.8	0.0	253.3
48	All fruits	112	90.5	65.1	80.3	0.0	348.7	101	86.1	57.8	75.7	0.0	274.2
	Baby food - fruits		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Canned fruits		0.2	1.3	0.0	0.0	10.0		0.1	1.1	0.0	0.0	8.3
	Dried fruits		0.6	4.5	0.0	0.0	44.4		0.4	1.7	0.0	0.0	9.3
	Fresh fruits		89.7	65.2	76.3	0.0	348.7		85.5	57.7	75.7	0.0	274.2

### **3.3.8 Grains and grain products**

Grains and grain products were commonly consumed by the studied children of all age groups (Table 3.16a, Table 3.16b). The variety and texture of grains and grain products varied with age. At 6 months, “baby food – infant cereals of all types”, thin congee and thick/very thick congee were the major grains and grain products consumed. The average daily consumption of all grains and grain products was about 60 g at 6 months. At 9 months, thick/very thick congee dominated, and the average daily consumption of all grains and grain products was approximately 250 g. From 12 months onwards, the major grains and grain products consumed were rice, plain noodles and pasta, and plain breads and rolls, and the average daily consumption was around 300 g.

**Table 3.16a: Daily consumption (g) of different categories of grains and grain products by age and sex (consumers only)**

Age group (months)	Food items	Male							Female						
		n	% <sup>1</sup>	Mean	SD	Median	Min	Max	n	%	Mean	SD	Median	Min	Max
6	All grains and grain products	86	93.5	66.8	86.7	34.8	1.7	425.8	78	91.8	73.8	109.9	32.2	1.7	743.5
	Baby food - crackers/ biscuits of all types	12	13.0	1.8	1.5	1.4	0.5	5.3	11	12.9	1.1	0.8	1.0	0.0	2.7
	Baby food - infant cereals of all types <sup>2</sup>	64	69.6	19.0	14.1	16.7	1.3	68.0	58	68.2	17.6	12.3	15.0	1.7	51.7
	Baby food – plain pasta and noodles	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Breads and rolls (plain)	6	6.5	2.6	1.5	2.5	0.7	5.0	5	5.9	4.3	3.1	3.0	0.5	8.3
	Breakfast cereals	0	0.0	0.0	0.0	0.0	0.0	0.0	1	1.2	---	---	---	5.0	5.0
	Noodles and pasta plain	3	3.3	16.4	11.1	10.0	10.0	29.2	3	3.5	12.6	11.8	6.7	5.0	26.3
	Rice	7	7.6	108.2	125.6	85.3	17.3	384.0	5	5.9	42.6	70.6	14.0	0.8	167.3
	Thick/ very thick congee	32	34.8	91.6	99.9	46.7	1.3	358.5	24	28.2	124.8	161.1	72.2	1.7	743.5
	Thin congee	14	15.2	53.8	36.1	41.8	5.0	146.7	18	21.2	80.5	65.0	67.2	11.4	277.3
	Other grains <sup>3</sup>	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
9	All grains and grain products	87	98.9	260.4	144.0	245.0	5.0	689.9	76	100.0	245.8	136.7	229.4	20.3	579.1
	Baby food - crackers/ biscuits of all types	31	35.2	3.2	2.8	2.7	0.3	15.0	30	39.5	2.0	1.8	1.5	0.1	5.8
	Baby food - infant cereals of all types	29	33.0	19.4	13.6	15.0	1.7	58.3	17	22.4	19.0	17.6	14.0	2.5	63.3
	Baby food – plain pasta and noodles	1	1.1	---	---	---	3.3	3.3	0	0.0	0.0	0.0	0.0	0.0	0.0
	Breads and rolls (plain)	20	22.7	11.3	14.1	8.3	0.3	58.3	16	21.1	9.8	9.0	6.7	1.7	33.3
	Breakfast cereals	2	2.3	19.2	22.4	19.2	3.3	35.0	4	5.3	12.9	10.9	10.8	3.3	26.7
	Noodles and pasta plain	9	10.2	56.4	44.8	39.2	15.0	136.1	9	11.8	45.9	37.1	33.3	0.7	124.4
	Rice	26	29.5	107.9	112.1	84.3	1.7	410.7	25	32.9	124.5	115.7	85.3	1.7	480.0
	Thick/ very thick congee	71	80.7	225.4	143.5	179.2	19.9	673.2	61	80.3	224.7	145.1	184.2	13.3	579.1
	Thin congee	20	22.7	119.6	95.2	80.5	3.3	378.5	8	10.5	106.6	73.2	94.6	38.3	229.9
	Other grains	2	2.3	8.3	2.4	8.3	6.7	10.0	0	0.0	0.0	0.0	0.0	0.0	0.0

<sup>1</sup>Percentage of consumers<sup>2</sup>As raw powder in gram for data entry<sup>3</sup>Other grains included millet, barley, and other flour used in seasoning (e.g. corn flour, potato flour, and wheat flour)

**Table 3.16a (cont): Daily consumption (g) of different categories of grains and grain products by age and sex (consumers only)**

Age group (months)	Food items	Male							Female						
		n	% <sup>1</sup>	Mean	SD	Median	Min	Max	n	%	Mean	SD	Median	Min	Max
12	All grains and grain products	87	100.0	366.7	173.6	325.7	90.3	922.4	84	100.0	310.5	167.1	293.1	17.5	839.1
	Baby food - crackers/ biscuits of all types	30	34.5	2.7	2.9	1.6	0.1	11.5	35	41.7	2.7	3.4	1.7	0.2	16.7
	Baby food - infant cereals of all types <sup>2</sup>	13	14.9	30.2	25.1	20.0	6.3	87.5	6	7.1	20.3	16.2	16.1	4.5	45.0
	Baby food – plain pasta and noodles	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Breads and rolls (plain)	43	49.4	18.4	16.6	13.8	0.7	93.3	44	52.4	14.3	11.7	10.4	0.3	58.3
	Breakfast cereals	9	10.3	15.9	15.0	8.3	2.8	45.0	8	9.5	7.2	5.8	3.9	2.2	15.4
	Noodles and pasta plain	31	35.6	62.0	53.1	56.7	5.0	266.7	38	45.2	56.1	71.0	29.2	0.3	373.4
	Rice	59	67.8	206.9	155.2	192.0	2.7	600.0	60	71.4	156.9	132.5	103.1	1.4	520.0
	Thick/ very thick congee	47	54.0	300.5	183.1	294.7	19.6	775.3	47	56.0	279.2	195.9	269.3	27.0	785.8
	Thin congee	13	14.9	171.9	185.9	137.1	19.2	646.8	4	4.8	128.5	126.2	95.7	25.6	297.1
	Other grains <sup>3</sup>	1	1.1	---	---	---	0.1	0.1	1	1.2	---	---	---	1.7	1.7
18	All grains and grain products	89	100.0	326.6	151.1	299.7	88.9	922.7	144	100.0	307.0	157.7	282.1	80.3	967.6
	Baby food - crackers/ biscuits of all types	20	22.5	2.5	3.8	0.7	0.1	14.5	29	20.1	3.7	4.0	2.5	0.3	17.5
	Baby food - infant cereals of all types	4	4.5	7.5	1.7	8.3	5.0	8.3	12	8.3	16.3	8.7	15.3	1.1	27.0
	Baby food – plain pasta and noodles	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Breads and rolls (plain)	57	64.0	20.1	20.8	15.0	0.8	133.3	103	71.5	21.3	17.2	16.7	0.5	100.0
	Breakfast cereals	14	15.7	12.1	9.7	9.5	1.0	35.6	20	13.9	8.9	9.9	5.1	1.0	38.4
	Noodles and pasta plain	60	67.4	73.5	68.8	62.1	3.3	398.6	112	77.8	72.0	63.0	59.8	0.6	274.2
	Rice	79	88.8	201.7	144.4	157.3	23.1	720.0	131	91.0	155.6	127.4	112.5	3.3	497.5
	Thick/ very thick congee	28	31.5	226.2	189.0	207.3	26.2	864.3	51	35.4	239.8	218.4	160.0	19.6	923.3
	Thin congee	10	11.2	99.5	56.9	76.7	35.9	215.6	14	9.7	61.0	54.7	47.9	2.4	191.7
	Other grains	4	4.5	0.2	0.2	0.1	0.1	0.6	13	9.0	0.3	0.3	0.2	0.1	1.2

<sup>1</sup>Percentage of consumers<sup>2</sup>As raw powder in gram for data entry<sup>3</sup>Other grains included millet, barley, and other flour used in seasoning (e.g. corn flour, potato flour, and wheat flour)



**Table 3.16a (cont): Daily consumption (g) of different categories of grains and grain products by age and sex (consumers only)**

Age group (months)	Food items	Male							Female						
		n	% <sup>1</sup>	Mean	SD	Median	Min	Max	n	%	Mean	SD	Median	Min	Max
24	All grains and grain products	178	100.0	294.6	132.8	267.3	63.7	730.3	136	100.0	281.1	138.7	245.7	45.8	700.2
	Baby food - crackers/ biscuits of all types	29	16.3	4.6	5.8	2.3	0.5	26.3	10	7.4	1.6	1.3	1.4	0.1	4.0
	Baby food - infant cereals of all types <sup>2</sup>	6	3.4	11.2	11.2	7.8	1.7	33.3	5	3.7	45.7	48.7	15.0	8.4	113.3
	Baby food – plain pasta and noodles	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Breads and rolls (plain)	103	57.9	23.2	17.6	20.0	1.3	91.7	82	60.3	22.4	18.8	15.6	3.3	91.7
	Breakfast cereals	35	19.7	14.6	14.3	9.6	0.2	63.4	29	21.3	9.6	7.3	6.7	1.1	29.9
	Noodles and pasta plain	142	79.8	84.3	57.7	68.1	1.1	291.7	114	83.8	86.9	69.4	70.4	8.9	311.1
	Rice	170	95.5	166.4	111.1	139.8	4.3	512.0	130	95.6	144.9	104.8	121.9	5.4	600.0
	Thick/ very thick congee	47	26.4	159.5	156.2	85.9	13.1	589.3	43	31.6	153.6	164.5	78.6	26.2	663.0
	Thin congee	16	9.0	98.3	118.5	64.1	13.1	499.7	8	5.9	55.0	43.8	46.7	19.2	140.9
	Other grains <sup>3</sup>	30	16.9	0.5	1.5	0.2	0.1	8.6	20	14.7	3.8	14.8	0.3	0.0	66.7
48	All grains and grain products	112	100.0	315.1	112.0	308.3	84.2	675.1	101	100.0	290.5	95.3	275.6	125.8	609.0
	Baby food - crackers/ biscuits of all types	2	1.8	7.7	1.4	7.7	6.7	8.7	5	5.0	3.1	5.0	1.1	0.1	12.0
	Baby food - infant cereals of all types	0	0.0	0.0	0.0	0.0	0.0	0.0	1	1.0	---	---	---	13.0	13.0
	Baby food – plain pasta and noodles	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Breads and rolls (plain)	85	75.9	33.0	21.5	31.7	4.2	99.7	76	75.2	31.5	22.8	26.7	5.0	101.7
	Breakfast cereals	32	28.6	13.1	9.6	9.8	0.8	37.4	32	31.7	14.9	17.3	9.0	0.5	90.6
	Noodles and pasta plain	102	91.1	96.7	70.0	82.0	5.6	345.6	90	89.1	91.3	58.8	76.6	6.7	290.0
	Rice	112	100.0	180.3	83.0	165.2	48.8	455.8	101	100.0	154.5	78.6	138.7	23.1	434.7
	Thick/ very thick congee	16	14.3	58.0	40.4	50.8	7.7	147.3	21	20.8	78.7	54.8	58.9	6.1	221.0
	Thin congee	17	15.2	61.6	44.8	57.5	3.6	215.6	15	14.9	64.5	43.1	55.3	5.4	143.7
	Other grains	21	18.8	1.3	3.0	0.3	0.1	13.3	7	6.9	0.5	0.6	0.2	0.1	1.7

<sup>1</sup>Percentage of consumers<sup>2</sup>As raw powder in gram for data entry<sup>3</sup>Other grains included millet, barley, and other flour used in seasoning (e.g. corn flour, potato flour, and wheat flour)

**Table 3.16b: Daily consumption (g) of different categories of grains and grain products by age and sex (all subjects)**

Age group (months)	Food items	Male						Female					
		n	Mean	SD	Median	Min	Max	n	Mean	SD	Median	Min	Max
6	All grains and grain products	92	62.4	85.4	33.3	0.0	425.8	85	67.7	107.1	26.7	0.0	743.5
	Baby food - crackers/ biscuits of all types		0.2	0.8	0.0	0.0	5.3		0.1	0.5	0.0	0.0	2.7
	Baby food - infant cereals of all types <sup>1</sup>		13.2	14.7	8.2	0.0	68.0		12.0	13.1	8.3	0.0	51.7
	Baby food – plain pasta and noodles		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Breads and rolls (plain)		0.2	0.7	0.0	0.0	5.0		0.3	1.2	0.0	0.0	8.3
	Breakfast cereals		0.0	0.0	0.0	0.0	0.0		0.0	0.5	0.0	0.0	5.0
	Noodles and pasta plain		0.5	3.4	0.0	0.0	29.2		0.4	3.0	0.0	0.0	26.3
	Rice		8.2	43.3	0.0	0.0	384.0		2.5	18.4	0.0	0.0	167.3
	Thick/ very thick congee		31.9	73.0	0.0	0.0	358.5		35.2	101.5	0.0	0.0	743.5
	Thin congee		8.2	23.7	0.0	0.0	146.7		17.1	44.2	0.0	0.0	277.3
	Other grains <sup>2</sup>		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
9	All grains and grain products	88	257.5	145.8	243.5	0.0	689.9	76	245.8	136.7	229.4	20.3	579.1
	Baby food - crackers/ biscuits of all types		1.1	2.3	0.0	0.0	15.0		0.8	1.5	0.0	0.0	5.8
	Baby food - infant cereals of all types		6.4	12.0	0.0	0.0	58.3		4.2	11.4	0.0	0.0	63.3
	Baby food – plain pasta and noodles		0.0	0.4	0.0	0.0	3.3		0.0	0.0	0.0	0.0	0.0
	Breads and rolls (plain)		2.6	8.1	0.0	0.0	58.3		2.1	5.7	0.0	0.0	33.3
	Breakfast cereals		0.4	3.7	0.0	0.0	35.0		0.7	3.6	0.0	0.0	26.7
	Noodles and pasta plain		5.8	21.9	0.0	0.0	136.1		5.4	19.2	0.0	0.0	124.4
	Rice		31.9	77.9	0.0	0.0	410.7		41.0	88.0	0.0	0.0	480.0
	Thick/ very thick congee		181.9	156.8	147.3	0.0	673.2		180.4	158.0	147.3	0.0	579.1
	Thin congee		27.2	67.2	0.0	0.0	378.5		11.2	39.8	0.0	0.0	229.9
	Other grains		0.2	1.3	0.0	0.0	10.0		0.0	0.0	0.0	0.0	0.0
12	All grains and grain products	87	366.7	173.6	325.7	90.3	922.4	84	310.5	167.1	293.1	17.5	839.1
	Baby food - crackers/ biscuits of all types		0.9	2.1	0.0	0.0	11.5		1.1	2.5	0.0	0.0	16.7
	Baby food - infant cereals of all types		4.5	14.3	0.0	0.0	87.5		1.4	6.6	0.0	0.0	45.0
	Baby food – plain pasta and noodles		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Breads and rolls (plain)		9.1	14.9	0.0	0.0	93.3		7.5	11.1	1.8	0.0	58.3
	Breakfast cereals		1.6	6.7	0.0	0.0	45.0		0.7	2.7	0.0	0.0	15.4
	Noodles and pasta plain		22.1	43.3	0.0	0.0	266.7		25.4	55.1	0.0	0.0	373.4
	Rice		140.3	160.3	85.3	0.0	600.0		112.1	132.5	69.4	0.0	520.0
	Thick/ very thick congee		162.4	201.6	55.1	0.0	775.3		156.2	201.8	63.4	0.0	785.8
	Thin congee		25.7	92.9	0.0	0.0	646.8		6.1	36.5	0.0	0.0	297.1
	Other grains		0.0	0.0	0.0	0.0	0.1		0.0	0.2	0.0	0.0	1.7

Age group (months)	Food items	Male						Female					
		n	Mean	SD	Median	Min	Max	n	Mean	SD	Median	Min	Max
18	All grains and grain products	89	326.6	151.1	299.7	88.9	922.7	144	307.0	157.7	282.1	80.3	967.6
	Baby food - crackers/ biscuits of all types		0.6	2.1	0.0	0.0	14.5		0.7	2.3	0.0	0.0	17.5
	Baby food - infant cereals of all types <sup>1</sup>		0.3	1.6	0.0	0.0	8.3		1.4	5.1	0.0	0.0	27.0
	Baby food – plain pasta and noodles		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Breads and rolls (plain)		12.9	19.2	5.8	0.0	133.3		15.2	17.5	10.0	0.0	100.0
	Breakfast cereals		1.9	5.8	0.0	0.0	35.6		1.2	4.8	0.0	0.0	38.4
	Noodles and pasta plain		49.5	66.1	23.0	0.0	398.6		56.0	63.1	34.3	0.0	274.2
	Rice		179.0	150.3	148.5	0.0	720.0		141.5	129.5	94.0	0.0	497.5
	Thick/ very thick congee		71.2	148.7	0.0	0.0	864.3		84.9	173.0	0.0	0.0	923.3
	Thin congee		11.2	36.4	0.0	0.0	215.6		5.9	24.5	0.0	0.0	191.7
	Other grains <sup>2</sup>		0.0	0.1	0.0	0.0	0.6		0.0	0.1	0.0	0.0	1.2
24	All grains and grain products	178	294.6	132.8	267.3	63.7	730.3	136	281.1	138.7	245.7	45.8	700.2
	Baby food - crackers/ biscuits of all types		0.8	2.9	0.0	0.0	26.3		0.1	0.5	0.0	0.0	4.0
	Baby food - infant cereals of all types		0.4	2.8	0.0	0.0	33.3		1.7	12.0	0.0	0.0	113.3
	Baby food – plain pasta and noodles		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Breads and rolls (plain)		13.4	17.6	6.7	0.0	91.7		13.5	18.2	8.3	0.0	91.7
	Breakfast cereals		2.9	8.5	0.0	0.0	63.4		2.0	5.2	0.0	0.0	29.9
	Noodles and pasta plain		67.3	61.7	58.3	0.0	291.7		72.8	71.1	58.3	0.0	311.1
	Rice		158.9	113.9	132.2	0.0	512.0		138.5	106.7	117.2	0.0	600.0
	Thick/ very thick congee		42.1	106.4	0.0	0.0	589.3		48.6	116.4	0.0	0.0	663.0
	Thin congee		8.8	44.5	0.0	0.0	499.7		3.2	16.4	0.0	0.0	140.9
	Other grains		0.1	0.6	0.0	0.0	8.6		0.6	5.7	0.0	0.0	66.7
48	All grains and grain products	112	315.1	112.0	308.3	84.2	675.1	101	290.5	95.3	275.6	125.8	609.0
	Baby food - crackers/ biscuits of all types		0.1	1.0	0.0	0.0	8.7		0.2	1.2	0.0	0.0	12.0
	Baby food - infant cereals of all types		0.0	0.0	0.0	0.0	0.0		0.1	1.3	0.0	0.0	13.0
	Baby food – plain pasta and noodles		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Breads and rolls (plain)		25.0	23.5	19.6	0.0	99.7		23.7	24.0	16.7	0.0	101.7
	Breakfast cereals		3.7	7.8	0.0	0.0	37.4		4.7	11.9	0.0	0.0	90.6
	Noodles and pasta plain		88.1	72.3	75.2	0.0	345.6		81.4	62.4	68.7	0.0	290.0
	Rice		180.3	83.0	165.2	48.8	455.8		154.5	78.6	138.7	23.1	434.7
	Thick/ very thick congee		8.3	25.2	0.0	0.0	147.3		16.4	40.4	0.0	0.0	221.0
	Thin congee		9.4	28.0	0.0	0.0	215.6		9.6	28.1	0.0	0.0	143.7
	Other grains		0.2	1.4	0.0	0.0	13.3		0.0	0.2	0.0	0.0	1.7

<sup>1</sup>As raw powder in gram for data entry

<sup>2</sup>Other grains included millet, barley, and other flour used in seasoning (e.g. corn flour, potato flour, and wheat flour).

### **3.3.9 Grains in mixed dishes**

The number of children consuming grains in mixed dishes and the average daily consumption of grains in mixed dishes increased with age. Less than 5% of boys and girls consumed grains in mixed dishes at 6 months, whereas the percentage rose to about 80% at 48 months (Table 3.17a). The average daily consumption of grains in mixed dishes increased from less than 1 g at 6 months to over 30 g at 48 months. Cakes, pies, pastries and muffins of sweet taste were the most popular grains in mixed dishes consumed by the studied children (Table 3.17b).

**Table 3.17a: Daily consumption (g) of different categories of grains in mixed dishes by age and sex (consumers only)**

Age group (months)	Food items	Male							Female						
		n	% <sup>1</sup>	Mean	SD	Median	Min	Max	n	%	Mean	SD	Median	Min	Max
6	Grains in mixed dishes (All)	2	2.2	7.5	8.2	7.5	1.7	13.3	3	3.5	13.9	6.7	10.0	10.0	21.7
	Baby food - pasta in mixed dishes	0	0.0	0.0	0.0	0.0	0.0	0.0	1	1.2	---	---	---	10.0	10.0
	Cakes/ pies/ pastries/ muffins - savory	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Cakes/ pies/ pastries/ muffins - sweet	2	2.2	7.5	8.2	7.5	1.7	13.3	2	2.4	15.8	8.2	15.8	10.0	21.7
	Noodles and pasta mixed	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Sandwiches/ burgers/ bread/ buns - savory	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Sandwiches/ burgers/ bread/ buns - sweet	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
9	Grains in mixed dishes (All)	8	9.1	42.5	33.0	46.3	6.7	105.0	8	10.5	21.0	17.8	19.2	1.7	53.3
	Baby food - pasta in mixed dishes	4	4.5	65.2	27.4	56.7	42.5	105.0	3	3.9	29.6	22.4	26.7	8.9	53.3
	Cakes/ pies/ pastries/ muffins - savory	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Cakes/ pies/ pastries/ muffins - sweet	4	4.5	19.8	20.4	11.2	6.7	50.0	4	5.3	11.8	13.7	7.0	1.7	31.7
	Noodles and pasta mixed	0	0.0	0.0	0.0	0.0	0.0	0.0	1	1.3	---	---	---	30.0	30.0
	Sandwiches/ burgers/ bread/ buns - savory	0	0.0	0.0	0.0	0.0	0.0	0.0	1	1.3	---	---	---	1.7	1.7
	Sandwiches/ burgers/ bread/ buns - sweet	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
12	Grains in mixed dishes (All)	23	26.4	18.7	27.5	10.0	2.5	135.7	27	32.1	13.9	12.5	10.0	1.3	52.0
	Baby food - pasta in mixed dishes	2	2.3	77.3	59.0	77.3	35.6	119.0	1	1.2	---	---	---	10.0	10.0
	Cakes/ pies/ pastries/ muffins - savory	1	1.1	---	---	---	1.0	1.0	1	1.2	---	---	---	3.3	3.3
	Cakes/ pies/ pastries/ muffins - sweet	19	21.8	11.7	8.9	8.7	2.5	30.8	25	29.8	10.5	10.6	6.7	1.3	46.7
	Noodles and pasta mixed	0	0.0	0.0	0.0	0.0	0.0	0.0	2	2.4	31.0	29.7	31.0	10.0	52.0
	Sandwiches/ burgers/ bread/ buns - savory	2	2.3	7.0	2.8	7.0	5.0	9.0	3	3.6	13.1	5.4	11.0	9.0	19.2
	Sandwiches/ burgers/ bread/ buns - sweet	3	3.4	13.1	6.7	15.5	5.5	18.3	0	0.0	0.0	0.0	0.0	0.0	0.0

<sup>1</sup>Percentage of consumers

**Table 3.17a (cont): Daily consumption (g) of different categories of grains in mixed dishes by age and sex (consumers only)**

Age group (months)	Food items	Male							Female						
		n	% <sup>1</sup>	Mean	SD	Median	Min	Max	n	%	Mean	SD	Median	Min	Max
18	Grains in mixed dishes (All)	40	44.9	20.7	17.0	13.4	1.2	65.8	58	40.3	19.7	15.1	17.3	1.0	70.0
	Baby food - pasta in mixed dishes	3	3.4	45.0	14.8	50.0	28.3	56.7	0	0.0	0.0	0.0	0.0	0.0	0.0
	Cakes/ pies/ pastries/ muffins - savory	0	0.0	0.0	0.0	0.0	0.0	0.0	2	1.4	10.3	9.0	10.3	4.0	16.7
	Cakes/ pies/ pastries/ muffins - sweet	34	38.2	15.9	14.9	12.5	1.2	64.8	51	35.4	18.3	13.9	16.7	1.0	70.0
	Noodles and pasta mixed	4	4.5	20.0	9.9	16.5	13.0	34.0	2	1.4	25.0	21.2	25.0	10.0	40.0
	Sandwiches/ burgers/ bread/ buns - savory	6	6.7	10.2	5.5	9.3	4.2	16.7	6	4.2	10.9	7.8	9.0	3.3	26.0
	Sandwiches/ burgers/ bread/ buns - sweet	2	2.2	5.6	1.6	5.6	4.4	6.7	6	4.2	12.0	4.0	11.0	9.0	20.0
24	Grains in mixed dishes (All)	108	60.7	28.5	24.3	20.1	2.7	170.0	81	59.6	20.6	14.7	18.0	1.7	60.0
	Baby food - pasta in mixed dishes	1	0.6	---	---	---	170.0	170.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Cakes/ pies/ pastries/ muffins - savory	6	3.4	18.9	22.5	7.5	1.7	58.3	4	2.9	7.8	2.6	8.6	4.0	10.0
	Cakes/ pies/ pastries/ muffins - sweet	75	42.1	20.6	13.8	18.3	2.0	60.0	62	45.6	18.5	13.3	14.9	1.7	60.0
	Noodles and pasta mixed	17	9.6	26.3	15.9	26.0	8.7	62.2	10	7.4	17.2	8.3	16.4	7.3	31.1
	Sandwiches/ burgers/ bread/ buns - savory	26	14.6	17.7	15.8	13.0	3.3	82.1	15	11.0	15.2	8.9	11.7	3.7	33.3
	Sandwiches/ burgers/ bread/ buns - sweet	18	10.1	18.9	17.9	14.9	2.0	80.0	10	7.4	9.0	7.1	5.5	2.2	23.3
48	Grains in mixed dishes (All)	92	82.1	47.4	38.1	39.8	2.9	288.3	79	78.2	41.6	28.3	33.0	6.7	129.8
	Baby food - pasta in mixed dishes	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Cakes/ pies/ pastries/ muffins - savory	6	5.4	21.9	9.6	20.4	10.8	33.3	4	4.0	18.7	11.5	16.5	8.3	33.3
	Cakes/ pies/ pastries/ muffins - sweet	70	62.5	34.6	28.6	25.8	2.9	205.0	62	61.4	30.1	22.6	25.0	6.7	129.8
	Noodles and pasta mixed	7	6.2	22.4	4.4	20.0	20.0	31.1	9	8.9	37.7	29.4	26.0	5.0	87.5
	Sandwiches/ burgers/ bread/ buns - savory	36	32.1	30.7	25.3	18.6	7.1	98.7	29	28.7	24.5	16.5	18.0	6.7	66.7
	Sandwiches/ burgers/ bread/ buns - sweet	25	22.3	21.8	12.4	22.0	8.3	50.0	15	14.9	19.8	9.1	21.0	5.8	40.0

<sup>1</sup>Percentage of consumers

**Table 3.17b: Daily consumption (g) of different categories of grains in mixed dishes by age and sex (all subjects)**

Age group (months)	Food items	Male						Female					
		n	Mean	SD	Median	Min	Max	n	Mean	SD	Median	Min	Max
6	Grains in mixed dishes (All)	92	0.2	1.4	0.0	0.0	13.3	85	0.5	2.8	0.0	0.0	21.7
	Baby food - pasta in mixed dishes		0.0	0.0	0.0	0.0	0.0		0.1	1.1	0.0	0.0	10.0
	Cakes/ pies/ pastries/ muffins - savory		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Cakes/ pies/ pastries/ muffins - sweet		0.2	1.4	0.0	0.0	13.3		0.4	2.6	0.0	0.0	21.7
	Noodles and pasta mixed		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Sandwiches/ burgers/ bread/ buns - savory		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Sandwiches/ burgers/ bread/ buns - sweet		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
9	Grains in mixed dishes (All)	88	3.9	15.4	0.0	0.0	105.0	76	2.2	8.5	0.0	0.0	53.3
	Baby food - pasta in mixed dishes		3.0	14.6	0.0	0.0	105.0		1.2	6.9	0.0	0.0	53.3
	Cakes/ pies/ pastries/ muffins - savory		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Cakes/ pies/ pastries/ muffins - sweet		0.9	5.6	0.0	0.0	50.0		0.6	3.8	0.0	0.0	31.7
	Noodles and pasta mixed		0.0	0.0	0.0	0.0	0.0		0.4	3.4	0.0	0.0	30.0
	Sandwiches/ burgers/ bread/ buns - savory		0.0	0.0	0.0	0.0	0.0		0.0	0.2	0.0	0.0	1.7
	Sandwiches/ burgers/ bread/ buns - sweet		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
12	Grains in mixed dishes (All)	87	5.0	16.2	0.0	0.0	135.7	84	4.5	9.6	0.0	0.0	52.0
	Baby food - pasta in mixed dishes		1.8	13.3	0.0	0.0	119.0		0.1	1.1	0.0	0.0	10.0
	Cakes/ pies/ pastries/ muffins - savory		0.0	0.1	0.0	0.0	1.0		0.0	0.4	0.0	0.0	3.3
	Cakes/ pies/ pastries/ muffins - sweet		2.6	6.3	0.0	0.0	30.8		3.1	7.5	0.0	0.0	46.7
	Noodles and pasta mixed		0.0	0.0	0.0	0.0	0.0		0.7	5.8	0.0	0.0	52.0
	Sandwiches/ burgers/ bread/ buns - savory		0.2	1.1	0.0	0.0	9.0		0.5	2.6	0.0	0.0	19.2
	Sandwiches/ burgers/ bread/ buns - sweet		0.5	2.6	0.0	0.0	18.3		0.0	0.0	0.0	0.0	0.0

**Table 3.17b (cont): Daily consumption (g) of different categories of grains in mixed dishes by age and sex (all subjects)**

Age group (months)	Food items	Male						Female					
		n	Mean	SD	Median	Min	Max	n	Mean	SD	Median	Min	Max
18	Grains in mixed dishes (All)	89	9.3	15.4	0.0	0.0	65.8	144	7.9	13.6	0.0	0.0	70.0
	Baby food - pasta in mixed dishes		1.5	8.5	0.0	0.0	56.7		0.0	0.0	0.0	0.0	0.0
	Cakes/ pies/ pastries/ muffins - savory		0.0	0.0	0.0	0.0	0.0		0.1	1.4	0.0	0.0	16.7
	Cakes/ pies/ pastries/ muffins - sweet		6.1	12.0	0.0	0.0	64.8		6.5	12.0	0.0	0.0	70.0
	Noodles and pasta mixed		0.9	4.6	0.0	0.0	34.0		0.3	3.4	0.0	0.0	40.0
	Sandwiches/ burgers/ bread/ buns - savory		0.7	2.9	0.0	0.0	16.7		0.5	2.6	0.0	0.0	26.0
	Sandwiches/ burgers/ bread/ buns - sweet		0.1	0.8	0.0	0.0	6.7		0.5	2.5	0.0	0.0	20.0
24	Grains in mixed dishes (All)	178	17.3	23.5	10.0	0.0	170.0	136	12.3	15.2	7.0	0.0	60.0
	Baby food - pasta in mixed dishes		1.0	12.7	0.0	0.0	170.0		0.0	0.0	0.0	0.0	0.0
	Cakes/ pies/ pastries/ muffins - savory		0.6	5.1	0.0	0.0	58.3		0.2	1.4	0.0	0.0	10.0
	Cakes/ pies/ pastries/ muffins - sweet		8.7	13.6	0.0	0.0	60.0		8.4	12.9	0.0	0.0	60.0
	Noodles and pasta mixed		2.5	9.1	0.0	0.0	62.2		1.3	5.0	0.0	0.0	31.1
	Sandwiches/ burgers/ bread/ buns - savory		2.6	8.7	0.0	0.0	82.1		1.7	5.6	0.0	0.0	33.3
	Sandwiches/ burgers/ bread/ buns - sweet		1.9	8.0	0.0	0.0	80.0		0.7	3.0	0.0	0.0	23.3
48	Grains in mixed dishes (All)	112	38.9	39.0	32.8	0.0	288.3	101	32.5	30.4	26.7	0.0	129.8
	Baby food - pasta in mixed dishes		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Cakes/ pies/ pastries/ muffins - savory		1.2	5.4	0.0	0.0	33.3		0.7	4.2	0.0	0.0	33.3
	Cakes/ pies/ pastries/ muffins - sweet		21.6	28.1	18.3	0.0	205.0		18.5	23.0	11.0	0.0	129.8
	Noodles and pasta mixed		1.4	5.6	0.0	0.0	31.1		3.4	13.6	0.0	0.0	87.5
	Sandwiches/ burgers/ bread/ buns - savory		9.9	20.2	0.0	0.0	98.7		7.0	14.1	0.0	0.0	66.7
	Sandwiches/ burgers/ bread/ buns - sweet		4.9	10.8	0.0	0.0	50.0		2.9	7.8	0.0	0.0	40.0



### **3.3.10 Legumes**

Legumes were seldom consumed by the studied children, especially at 12 months or younger. At 48 months, only about one-thirds of the studied children included legumes in their diet (Table 3.18a). There was a great variation in the average daily amount of legumes consumed within the same age group, and the average daily consumption of legumes was low for all age groups (Table 3.18b).

**Table 3.18a: Daily consumption (g) of different categories of legumes by age and sex (consumers only)**

Age group (months)	Food items	Male							Female						
		n	% <sup>1</sup>	Mean	SD	Median	Min	Max	n	%	Mean	SD	Median	Min	Max
6	Legumes (Total)	1	1.1	---	---	---	24.4	24.4	1	1.2	---	---	---	25.8	25.8
	Baby food - legumes	0	0.0	0.0	0.0	0.0	0.0	0.0	1	1.2	---	---	---	25.8	25.8
	Legumes	1	1.1	---	---	---	24.4	24.4	0	0.0	0.0	0.0	0.0	0.0	0.0
9	Legumes (Total)	6	6.8	9.2	5.6	10.0	3.3	18.3	0	0.0	0.0	0.0	0.0	0.0	0.0
	Baby food - legumes	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Legumes	6	6.8	9.2	5.6	10.0	3.3	18.3	0	0.0	0.0	0.0	0.0	0.0	0.0
12	Legumes (Total)	4	4.6	6.1	4.7	6.9	0.7	10.0	5	6.0	7.9	6.3	7.1	0.3	16.4
	Baby food - legumes	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Legumes	4	4.6	6.1	4.7	6.9	0.7	10.0	5	6.0	7.9	6.3	7.1	0.3	16.4
18	Legumes (Total)	11	12.4	8.0	9.0	3.9	0.7	27.6	26	18.1	6.5	10.2	3.3	0.7	53.3
	Baby food - legumes	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Legumes	11	12.4	8.0	9.0	3.9	0.7	27.6	26	18.1	6.5	10.2	3.3	0.7	53.3
24	Legumes (Total)	36	20.2	7.4	6.0	6.7	0.6	26.7	36	26.5	11.8	16.9	4.5	0.7	70.0
	Baby food - legumes	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Legumes	36	20.2	7.4	6.0	6.7	0.6	26.7	36	26.5	11.8	16.9	4.5	0.7	70.0
48	Legumes (Total)	41	36.6	7.7	7.6	4.2	0.3	29.0	34	33.7	10.7	10.8	9.5	0.7	56.7
	Baby food - legumes	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Legumes	41	36.6	7.7	7.6	4.2	0.3	29.0	34	33.7	10.7	10.8	9.5	0.7	56.7

<sup>1</sup>Percentage of consumers

**Table 3.18b: Daily consumption (g) of different categories of legumes by age and sex (all subjects)**

Age group (months)	Food items	Male						Female					
		N	Mean	SD	Median	Min	Max	n	Mean	SD	Median	Min	Max
6	Legumes (Total)	92	0.3	2.5	0.0	0.0	24.4	85	0.3	2.8	0.0	0.0	25.8
	Baby food - legumes		0.0	0.0	0.0	0.0	0.0		0.3	2.8	0.0	0.0	25.8
	Legumes		0.3	2.5	0.0	0.0	24.4		0.0	0.0	0.0	0.0	0.0
9	Legumes (Total)	88	0.6	2.7	0.0	0.0	18.3	76	0.0	0.0	0.0	0.0	0.0
	Baby food - legumes		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Legumes		0.6	2.7	0.0	0.0	18.3		0.0	0.0	0.0	0.0	0.0
12	Legumes (Total)	87	0.3	1.6	0.0	0.0	10.0	84	0.5	2.3	0.0	0.0	16.4
	Baby food - legumes		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Legumes		0.3	1.6	0.0	0.0	10.0		0.5	2.3	0.0	0.0	16.4
18	Legumes (Total)	89	1.0	4.0	0.0	0.0	27.6	144	1.2	4.9	0.0	0.0	53.3
	Baby food - legumes		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Legumes		1.0	4.0	0.0	0.0	27.6		1.2	4.9	0.0	0.0	53.3
24	Legumes (Total)	178	1.5	4.0	0.0	0.0	26.7	136	3.1	10.1	0.0	0.0	70.0
	Baby food - legumes		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Legumes		1.5	4.0	0.0	0.0	26.7		3.1	10.1	0.0	0.0	70.0
48	Legumes (Total)	112	2.8	5.9	0.0	0.0	29.0	101	3.6	8.0	0.0	0.0	56.7
	Baby food - legumes		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Legumes		2.8	5.9	0.0	0.0	29.0		3.6	8.0	0.0	0.0	56.7

### **3.3.11 Meat**

Meat was not common among infants aged 6 months. The percentage of children consuming meat, however, increased greatly from about 60% at 9 months to nearly 100% at 48 months (Table 3.19a). The average daily consumption of all meat increased from approximately 10 g at 9 months to around 40 g at 48 months (Table 3.19b). Pork and beef were the most popular meat consumed among the studied children. With increasing age, more children included processed meat in their diet (Table 3.19a).

**Table 3.19a: Daily consumption (g) of different categories of meat by age and sex (consumers only)**

Age group (months)	Food items	Male							Female						
		n	% <sup>1</sup>	Mean	SD	Median	Min	Max	n	%	Mean	SD	Median	Min	Max
6	All meat	13	14.1	21.6	42.8	7.7	0.5	160.0	12	14.1	3.5	4.3	1.8	0.5	14.3
	Beef	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Pork	12	13.0	21.6	44.9	4.8	0.5	160.0	12	14.1	3.5	4.3	1.8	0.5	14.3
	Lamb/other meat <sup>2</sup>	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Offals	2	2.2	10.0	4.7	10.0	6.7	13.3	0	0.0	0.0	0.0	0.0	0.0	0.0
	Processed meat	1	1.1	---	---	---	2.3	2.3	0	0.0	0.0	0.0	0.0	0.0	0.0
9	All meat	58	65.9	15.8	16.2	10.3	0.6	80.0	54	71.1	14.5	16.2	11.3	1.0	88.3
	Beef	6	6.8	11.7	11.8	6.7	1.0	26.7	6	7.9	7.1	4.6	6.3	1.5	13.3
	Pork	57	64.8	14.8	14.2	10.3	0.6	80.0	51	67.1	13.4	14.5	10.0	1.0	69.3
	Lamb/other meat	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Offals	1	1.1	---	---	---	1.0	1.0	2	2.6	28.3	7.1	28.3	23.3	33.3
	Processed meat	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
12	All meat	73	83.9	18.5	16.7	14.7	0.5	85.7	70	83.3	16.6	14.7	12.0	0.2	83.3
	Beef	13	14.9	12.7	14.4	7.3	0.5	40.0	14	16.7	11.4	6.1	10.5	3.7	22.0
	Pork	64	73.6	18.3	16.4	14.7	1.0	85.7	65	77.4	14.4	13.6	10.2	0.2	83.3
	Lamb/other meat	0	0.0	0.0	0.0	0.0	0.0	0.0	1	1.2	---	---	---	13.3	13.3
	Offals	1	1.1	---	---	---	1.0	1.0	1	1.2	---	---	---	0.4	0.4
	Processed meat	3	3.4	5.2	4.0	6.7	0.7	8.3	8	9.5	6.0	3.1	4.7	2.8	10.5
18	All meat	78	87.6	28.3	23.6	24.8	1.0	120.0	132	91.7	22.9	18.5	17.7	0.9	138.7
	Beef	20	22.5	9.2	10.5	6.7	0.5	48.0	35	24.3	9.7	11.8	6.7	0.3	50.7
	Pork	76	85.4	24.7	23.8	19.2	1.0	120.0	124	86.1	19.3	17.6	14.3	0.6	138.7
	Lamb/other meat	2	2.2	9.3	5.7	9.3	5.3	13.3	2	1.4	7.3	5.2	7.3	3.7	11.0
	Offals	1	1.1	---	---	---	4.0	4.0	5	3.5	6.8	5.6	3.7	1.7	15.0
	Processed meat	17	19.1	7.4	4.7	6.6	0.9	17.4	30	20.8	8.3	7.9	6.2	0.6	31.3
24	All meat	165	92.7	23.9	16.6	20.0	0.6	86.7	126	92.6	23.2	17.3	18.9	1.0	87.5
	Beef	56	31.5	11.4	11.6	7.3	0.6	60.0	44	32.4	8.1	7.5	5.8	0.5	27.3
	Pork	151	84.8	18.5	14.3	15.4	1.0	73.3	114	83.8	18.4	16.6	14.7	0.3	80.5
	Lamb/other meat	5	2.8	5.4	5.0	4.4	1.0	13.3	1	0.7	---	---	---	13.3	13.3
	Offals	4	2.2	5.3	6.4	2.9	0.7	14.7	1	0.7	---	---	---	5.3	5.3
	Processed meat	51	28.7	9.1	9.0	5.8	0.4	47.2	43	31.6	10.4	8.8	7.3	0.5	46.7
48	All meat	111	99.1	38.8	23.9	36.3	0.5	104.0	100	99.0	34.9	23.3	29.6	1.0	105.0
	Beef	48	42.9	10.7	10.3	7.3	0.3	45.0	45	44.6	13.6	15.1	8.7	1.0	68.7
	Pork	104	92.9	29.6	21.6	24.8	0.5	84.2	96	95.0	23.1	16.1	20.3	0.5	81.7
	Lamb/other meat	0	0.0	0.0	0.0	0.0	0.0	0.0	1	1.0	---	---	---	7.3	7.3
	Offals	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Processed meat	54	48.2	13.5	13.6	8.3	0.4	75.6	48	47.5	13.6	15.0	9.9	1.8	84.0

<sup>1</sup>Percentage of consumers; <sup>2</sup>Other meat included the edible frog meat.

**Table 3.19b: Daily consumption (g) of different categories of meat by age and sex (all subjects)**

Age group (months)	Food items	Male						Female					
		n	Mean	SD	Median	Min	Max	n	Mean	SD	Median	Min	Max
6	All meat	92	3.1	17.3	0.0	0.0	160.0	85	0.5	2.0	0.0	0.0	14.3
	Beef		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Pork		2.8	17.2	0.0	0.0	160.0		0.5	2.0	0.0	0.0	14.3
	Lamb/other meat <sup>1</sup>		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Offals		0.2	1.5	0.0	0.0	13.3		0.0	0.0	0.0	0.0	0.0
	Processed meat		0.0	0.2	0.0	0.0	2.3		0.0	0.0	0.0	0.0	0.0
9	All meat	88	10.4	15.1	5.8	0.0	80.0	76	10.3	15.1	6.3	0.0	88.3
	Beef		0.8	4.1	0.0	0.0	26.7		0.6	2.3	0.0	0.0	13.3
	Pork		9.6	13.4	4.1	0.0	80.0		9.0	13.4	3.7	0.0	69.3
	Lamb/other meat		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Offals		0.0	0.1	0.0	0.0	1.0		0.7	4.6	0.0	0.0	33.3
	Processed meat		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
12	All meat	87	15.5	16.8	8.7	0.0	85.7	84	13.8	14.8	10.0	0.0	83.3
	Beef		1.9	7.0	0.0	0.0	40.0		1.9	4.9	0.0	0.0	22.0
	Pork		13.4	16.2	8.3	0.0	85.7		11.2	13.4	7.3	0.0	83.3
	Lamb/other meat		0.0	0.0	0.0	0.0	0.0		0.2	1.5	0.0	0.0	13.3
	Offals		0.0	0.1	0.0	0.0	1.0		0.0	0.0	0.0	0.0	0.4
	Processed meat		0.2	1.1	0.0	0.0	8.3		0.6	2.0	0.0	0.0	10.5
18	All meat	89	24.8	24.0	20.3	0.0	120.0	144	21.0	18.8	16.9	0.0	138.7
	Beef		2.1	6.2	0.0	0.0	48.0		2.4	7.1	0.0	0.0	50.7
	Pork		21.1	23.7	14.0	0.0	120.0		16.6	17.6	13.3	0.0	138.7
	Lamb/other meat		0.2	1.5	0.0	0.0	13.3		0.1	1.0	0.0	0.0	11.0
	Offals		0.0	0.4	0.0	0.0	4.0		0.2	1.6	0.0	0.0	15.0
	Processed meat		1.4	3.5	0.0	0.0	17.4		1.7	4.9	0.0	0.0	31.3
24	All meat	178	22.1	17.2	19.2	0.0	86.7	136	21.5	17.7	17.3	0.0	87.5
	Beef		3.6	8.4	0.0	0.0	60.0		2.6	5.7	0.0	0.0	27.3
	Pork		15.7	14.7	12.5	0.0	73.3		15.4	16.7	11.4	0.0	80.5
	Lamb/other meat		0.2	1.2	0.0	0.0	13.3		0.1	1.1	0.0	0.0	13.3
	Offals		0.1	1.1	0.0	0.0	14.7		0.0	0.5	0.0	0.0	5.3
	Processed meat		2.6	6.3	0.0	0.0	47.2		3.3	6.9	0.0	0.0	46.7
48	All meat	112	38.5	24.1	36.2	0.0	104.0	101	34.6	23.4	29.2	0.0	105.0
	Beef		4.6	8.5	0.0	0.0	45.0		6.1	12.1	0.0	0.0	68.7
	Pork		27.4	22.1	23.2	0.0	84.2		22.0	16.5	19.4	0.0	81.7
	Lamb/other meat		0.0	0.0	0.0	0.0	0.0		0.1	0.7	0.0	0.0	7.3
	Offals		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Processed meat		6.5	11.6	0.0	0.0	75.6		6.5	12.4	0.0	0.0	84.0

<sup>1</sup>Other meat included the edible frog meat.

### **3.3.12 Milk**

Milk drinking was common among the studied children, and nearly 100% of the studied children of all age groups drank milk. At 6 months, breast milk was drunk by about 20% of infants. However, cow's formula was the most common type of milk consumed by the studied children of all age groups (Table 3.20a). The average daily consumption of all milk in both sexes was approximately 800 ml at 6 months, 560 ml at 12 months, 400 ml at 24 months, and 250 ml at 48 months (Table 3.20b).

**Table 3.20a: Daily consumption (ml) of different categories of milk by age and sex (consumers only)**

Age group (months)	Food items	Male							Female						
		n	% <sup>1</sup>	Mean	SD	Median	Min	Max	n	%	Mean	SD	Median	Min	Max
6	Milk (All types)	92	100.0	835.2	169.9	810.0	370.0	1330.0	85	100.0	727.0	148.8	746.7	170.0	990.0
	Breast milk	19	20.7	528.3	299.5	730.0	60.0	861.9	18	21.2	524.4	311.8	728.9	25.0	840.0
	Cow's milk - reduced fat/nonfat	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Cow's milk - whole	1	1.1	---	---	---	8.3	8.3	0	0.0	0.0	0.0	0.0	0.0	0.0
	Formula - cow	79	85.9	772.3	261.7	800.0	10.0	1330.0	68	80.0	677.6	219.0	714.2	40.0	990.0
	Formula - goat	0	0.0	0.0	0.0	0.0	0.0	0.0	2	2.4	390.0	311.1	390.0	170.0	610.0
	Formula - special	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Formula – soy	8	8.7	721.9	238.5	792.5	165.0	920.0	10	11.8	549.5	230.2	605.0	80.0	865.0
	Oat milk	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
9	Milk (All types)	88	100.0	642.8	152.3	631.7	283.3	1060.0	76	100.0	632.1	161.0	615.0	210.0	1100.0
	Breast milk	10	11.4	416.7	260.6	435.4	90.0	866.7	17	22.4	398.0	239.3	540.0	30.0	605.1
	Cow's milk - reduced fat/nonfat	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Cow's milk - whole	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Formula – cow	83	94.3	615.9	185.1	620.0	50.0	1060.0	70	92.1	575.6	219.2	585.0	40.0	1100.0
	Formula – goat	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Formula – special	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Formula – soy	3	3.4	427.2	233.7	475.0	173.3	633.3	1	1.3	---	---	---	985.0	985.0
	Oat milk	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
12	Milk (All types)	86	98.9	568.0	146.8	583.3	180.0	890.0	84	100.0	564.2	155.6	562.2	180.0	950.0
	Breast milk	8	9.2	388.8	175.2	375.0	180.0	670.0	8	9.5	256.4	196.6	195.0	30.0	630.0
	Cow's milk - reduced fat/nonfat	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Cow's milk - whole	4	4.6	64.9	34.4	70.8	17.8	100.0	4	4.8	45.0	25.6	33.3	30.0	83.3
	Formula – cow	78	89.7	566.8	138.3	559.3	315.0	890.0	80	95.2	554.7	163.8	543.3	200.0	950.0
	Formula – goat	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Formula - special	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Formula – soy	2	2.3	633.3	122.6	633.3	546.7	720.0	3	3.6	261.1	335.8	126.7	13.3	643.3
	Oat milk	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0

<sup>1</sup>Percentage of consumers



**Table 3.20a (cont): Daily consumption (ml) of different categories of milk by age and sex (consumers only)**

Age group (months)	Food items	Male							Female						
		n	% <sup>1</sup>	Mean	SD	Median	Min	Max	n	%	Mean	SD	Median	Min	Max
18	Milk (All types)	89	100.0	495.2	164.0	483.3	160.0	873.3	142	98.6	482.5	142.1	473.3	150.0	960.0
	Breast milk	3	3.4	206.7	140.5	220.0	60.0	340.0	3	2.1	120.1	40.2	120.0	80.0	160.3
	Cow's milk - reduced fat/nonfat	0	0.0	0.0	0.0	0.0	0.0	0.0	2	1.4	85.0	96.6	85.0	16.7	153.3
	Cow's milk - whole	3	3.4	52.8	42.8	41.7	16.7	100.0	12	8.3	52.7	58.2	33.3	1.0	170.0
	Formula – cow	84	94.4	490.3	156.1	468.3	160.0	863.3	140	97.2	477.7	140.6	451.7	150.0	960.0
	Formula – goat	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Formula – special	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Formula – soy	3	3.4	703.3	233.8	800.0	436.7	873.3	1	0.7	---	---	---	480.0	480.0
	Oat milk	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
24	Milk (All types)	177	99.4	449.0	163.9	450.0	16.7	1040.0	134	98.5	423.3	167.1	421.7	150.0	913.3
	Breast milk	3	1.7	156.7	20.8	150.0	140.0	180.0	2	1.5	125.0	21.2	125.0	110.0	140.0
	Cow's milk - reduced fat/nonfat	2	1.1	112.7	65.1	112.7	66.7	158.7	1	0.7	---	---	---	50.0	50.0
	Cow's milk - whole	17	9.6	75.6	79.2	50.0	8.6	360.0	14	10.3	81.7	47.5	68.9	16.7	166.7
	Formula – cow	173	97.2	444.8	161.9	450.0	16.7	1040.0	130	95.6	261.3	148.9	240.0	33.3	800.0
	Formula – goat	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Formula - special	0	0.0	0.0	0.0	0.0	0.0	0.0	1	0.7	---	---	---	25.0	25.0
	Formula – soy	2	1.1	160.0	113.1	160.0	80.0	240.0	2	1.5	365.0	304.1	365.0	150.0	580.0
	Oat milk	2	1.1	116.7	70.7	116.7	66.7	166.7	0	0.0	0.0	0.0	0.0	0.0	0.0
48	Milk (All types)	106	94.6	279.2	180.1	240.0	4.7	723.3	90	89.1	257.7	159.1	216.7	2.3	880.0
	Breast milk	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Cow's milk - reduced fat/nonfat	5	4.5	69.5	62.0	66.7	2.0	166.7	5	5.0	68.9	59.2	76.7	11.1	156.7
	Cow's milk - whole	46	41.1	85.8	80.1	72.3	3.6	383.3	34	33.7	103.4	100.6	70.6	2.3	500.0
	Formula – cow	91	81.2	273.0	174.6	239.6	20.0	720.0	74	73.3	261.3	148.9	240.0	33.3	800.0
	Formula – goat	2	1.8	230.0	51.9	230.0	193.3	266.7	0	0.0	0.0	0.0	0.0	0.0	0.0
	Formula - special	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Formula – soy	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Oat milk	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0

<sup>1</sup>Percentage of consumers

**Table 3.20b: Daily consumption (ml) of different categories of milk by age and sex (all subjects)**

Age group (months)	Food items	Male						Female					
		n	Mean	SD	Median	Min	Max	n	Mean	SD	Median	Min	Max
6	Milk (All types)	92	835.2	169.9	810.0	370.0	1330.0	85	727.0	148.8	746.7	170.0	990.0
	Breast milk		109.1	253.0	0.0	0.0	861.9		111.0	257.1	0.0	0.0	840.0
	Cow's milk - reduced fat/nonfat		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Cow's milk – whole		0.1	0.9	0.0	0.0	8.3		0.0	0.0	0.0	0.0	0.0
	Formula – cow		663.2	363.2	780.0	0.0	1330.0		542.1	335.6	663.3	0.0	990.0
	Formula – goat		0.0	0.0	0.0	0.0	0.0		9.2	68.5	0.0	0.0	610.0
	Formula – special		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Formula – soy		62.8	215.0	0.0	0.0	920.0		64.6	193.4	0.0	0.0	865.0
	Oat milk		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
9	Milk (All types)	88	642.8	152.3	631.7	283.3	1060.0	76	632.1	161.0	615.0	210.0	1100.0
	Breast milk		47.4	157.2	0.0	0.0	866.7		89.0	200.2	0.0	0.0	605.1
	Cow's milk - reduced fat/nonfat		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Cow's milk - whole		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Formula – cow		580.9	229.9	620.0	0.0	1060.0		530.1	262.0	555.0	0.0	1100.0
	Formula – goat		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Formula – special		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Formula – soy		14.6	85.6	0.0	0.0	633.3		13.0	113.0	0.0	0.0	985.0
	Oat milk		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
12	Milk (All types)	87	561.4	158.1	583.3	0.0	890.0	84	564.2	155.6	562.2	180.0	950.0
	Breast milk		35.7	123.5	0.0	0.0	670.0		24.4	94.8	0.0	0.0	630.0
	Cow's milk - reduced fat/nonfat		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Cow's milk - whole		3.0	15.1	0.0	0.0	100.0		2.1	10.8	0.0	0.0	83.3
	Formula – cow		508.1	217.4	540.0	0.0	890.0		528.3	199.2	540.0	0.0	950.0
	Formula – goat		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Formula - special		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Formula – soy		14.6	96.4	0.0	0.0	720.0		9.3	71.4	0.0	0.0	643.3
	Oat milk		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0

**Table 3.20b (cont): Daily consumption (ml) of different categories of milk by age and sex (all subjects)**

Age group (months)	Food items	Male						Female					
		n	Mean	SD	Median	Min	Max	n	Mean	SD	Median	Min	Max
18	Milk (All types)	89	495.2	164.0	483.3	160.0	873.3	144	475.8	152.0	460.0	0.0	960.0
	Breast milk		7.0	43.1	0.0	0.0	340.0		2.5	17.9	0.0	0.0	160.3
	Cow's milk - reduced fat/nonfat		0.0	0.0	0.0	0.0	0.0		1.2	12.8	0.0	0.0	153.3
	Cow's milk - whole		1.8	11.5	0.0	0.0	100.0		4.4	21.8	0.0	0.0	170.0
	Formula – cow		462.7	189.4	450.0	0.0	863.3		464.4	159.4	446.7	0.0	960.0
	Formula – goat		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Formula – special		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Formula – soy		23.7	132.4	0.0	0.0	873.3		3.3	40.0	0.0	0.0	480.0
	Oat milk		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
24	Milk (All types)	178	446.5	166.8	450.0	0.0	1040.0	136	417.0	173.6	420.0	0.0	913.3
	Breast milk		2.6	20.3	0.0	0.0	180.0		1.8	15.2	0.0	0.0	140.0
	Cow's milk - reduced fat/nonfat		1.3	12.9	0.0	0.0	158.7		0.4	4.3	0.0	0.0	50.0
	Cow's milk - whole		7.2	32.6	0.0	0.0	360.0		8.4	29.0	0.0	0.0	166.7
	Formula – cow		432.3	175.8	450.0	0.0	1040.0		400.9	185.8	416.7	0.0	913.3
	Formula – goat		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Formula - special		0.0	0.0	0.0	0.0	0.0		0.2	2.1	0.0	0.0	25.0
	Formula – soy		1.8	18.9	0.0	0.0	240.0		5.4	51.3	0.0	0.0	580.0
	Oat milk		1.3	13.4	0.0	0.0	166.7		0.0	0.0	0.0	0.0	0.0
48	Milk (All types)	112	264.3	186.2	238.3	0.0	723.3	101	229.6	170.4	212.7	0.0	880.0
	Breast milk		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Cow's milk - reduced fat/nonfat		3.1	18.6	0.0	0.0	166.7		3.4	19.1	0.0	0.0	156.7
	Cow's milk - whole		35.2	66.3	0.0	0.0	383.3		34.8	75.8	0.0	0.0	500.0
	Formula – cow		221.8	190.2	180.0	0.0	720.0		191.4	172.3	200.0	0.0	800.0
	Formula – goat		4.1	31.0	0.0	0.0	266.7		0.0	0.0	0.0	0.0	0.0
	Formula - special		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Formula – soy		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Oat milk		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0

### **3.3.13 Milk products**

The percentage of children consuming different milk products increased with age. At 12 months, 21.8% boys and 15.5% girls consumed milk products. The percentage increased to 58.8% in boys and 71.3% in girls at 48 months (Table 3.21a). At 12 months, the average daily consumption of milk products was 3.4 g in boys and 1.9 g in girls. At 48 months, the amount increased to 18.2 g in boys and 21.2% in girls, and the most popular milk products consumed were “yogurt – whole”, ice cream and cheese (Table 3.21b).

**Table 3.21a: Daily consumption (g) of different categories of milk products by age and sex (consumers only)**

Age group (months)	Food items	Male							Female						
		n	% <sup>1</sup>	Mean	SD	Median	Min	Max	n	%	Mean	SD	Median	Min	Max
6	All milk products	0	0.0	0.0	0.0	0.0	0.0	0.0	2	2.4	23.3	0.0	23.3	23.3	23.3
	Baby food - cheese	0	0.0	0.0	0.0	0.0	0.0	0.0	1	1.2	---	---	---	23.3	23.3
	Cheese	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Ice cream	0	0.0	0.0	0.0	0.0	0.0	0.0	1	1.2	---	---	---	23.3	23.3
	Yogurt - reduced fat/nonfat	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Yogurt - whole	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Other milk products <sup>2</sup>	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
9	All milk products	4	4.5	2.0	0.9	1.7	1.3	3.3	1	1.3	---	---	---	1.7	1.7
	Baby food - cheese	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Cheese	3	3.4	2.1	1.1	1.7	1.3	3.3	1	1.3	---	---	---	1.7	1.7
	Ice cream	1	1.1	---	---	---	1.7	1.7	0	0.0	0.0	0.0	0.0	0.0	0.0
	Yogurt - reduced fat/nonfat	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Yogurt - whole	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Other milk products	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
12	All milk products	19	21.8	15.5	24.6	6.7	0.8	103.3	13	15.5	12.2	15.2	8.7	0.4	56.7
	Baby food - cheese	0	0.0	0.0	0.0	0.0	0.0	0.0	1	1.2	---	---	---	0.7	0.7
	Cheese	17	19.5	5.6	4.7	4.0	0.8	20.0	8	9.5	6.1	5.6	5.0	0.4	16.7
	Ice cream	1	1.1	---	---	---	4.3	4.3	0	0.0	0.0	0.0	0.0	0.0	0.0
	Yogurt - reduced fat/nonfat	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Yogurt - whole	5	5.7	39.3	34.4	23.3	20.0	100.0	4	4.8	25.8	16.4	20.0	13.3	50.0
	Other milk products	0	0.0	0.0	0.0	0.0	0.0	0.0	2	2.4	2.7	0.9	2.7	2.1	3.3
18	All milk products	25	28.1	18.9	21.5	15.1	1.3	105.0	47	32.6	17.9	21.8	8.3	0.3	83.3
	Baby food - cheese	2	2.2	5.8	5.9	5.8	1.7	10.0	3	2.1	8.9	6.9	6.7	3.3	16.7
	Cheese	11	12.4	8.4	12.5	5.1	1.3	45.0	25	17.4	7.2	7.4	4.7	0.3	33.3
	Ice cream	4	4.5	9.5	7.6	8.8	0.9	19.4	12	8.3	8.3	12.9	4.6	1.7	48.1
	Yogurt - reduced fat/nonfat	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Yogurt - whole	12	13.5	27.3	14.4	23.3	10.0	60.0	13	9.0	41.0	23.4	33.3	15.0	83.3
	Other milk products	2	2.2	1.4	1.0	1.4	0.7	2.1	3	2.1	0.6	0.3	0.7	0.3	0.8

<sup>1</sup>Percentage of consumers

<sup>2</sup>Other milk products included fresh whipping cream, evaporated milk and condensed milk

**Table 3.21a (cont): Daily consumption (g) of different categories of milk products by age and sex (consumers only)**

Age group (months)	Food items	Male							Female						
		n	% <sup>1</sup>	Mean	SD	Median	Min	Max	n	%	Mean	SD	Median	Min	Max
24	All milk products	69	38.8	33.8	30.9	31.7	1.1	152.1	63	46.3	35.5	35.0	25.0	1.7	153.3
	Baby food - cheese	1	0.6	---	---	---	10.0	10.0	1	0.7	---	---	---	3.5	3.5
	Cheese	28	15.7	6.5	6.3	5.3	1.7	30.0	23	16.9	6.8	4.6	6.7	1.0	18.0
	Ice cream	19	10.7	15.2	9.4	15.4	0.4	29.3	22	16.2	19.6	14.5	17.3	1.3	58.2
	Yogurt - reduced fat/nonfat	2	1.1	33.3	0.0	---	33.3	33.3	3	2.2	31.1	3.8	33.3	26.7	33.3
	Yogurt - whole	32	18.0	55.1	27.1	50.0	30.0	133.3	29	21.3	52.6	34.0	33.3	16.7	133.3
	Other milk products <sup>2</sup>	8	4.5	2.9	1.7	2.6	1.1	5.0	4	2.9	7.2	5.7	7.1	2.1	12.6
48	All milk products	65	58.0	31.4	25.4	30.0	0.8	101.9	72	71.3	29.7	31.3	20.0	0.7	159.1
	Baby food - cheese	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Cheese	23	20.5	6.7	4.3	6.7	1.7	16.7	25	24.8	6.3	3.5	6.7	1.7	16.0
	Ice cream	25	22.3	23.0	14.2	23.0	3.8	56.7	25	24.8	25.4	17.4	22.1	6.7	66.2
	Yogurt - reduced fat/nonfat	1	0.9	---	---	---	80.0	80.0	1	1.1	---	---	---	33.3	33.3
	Yogurt - whole	27	24.1	43.1	18.5	33.3	20.0	100.0	22	21.8	54.8	33.6	41.7	13.3	150.0
	Other milk products	11	9.8	6.4	7.5	5.3	0.8	27.7	22	21.8	4.8	6.2	2.2	0.7	25.0

<sup>1</sup>Percentage of consumers<sup>2</sup>Other milk products included fresh whipping cream, evaporated milk and condensed milk

**Table 3.21b: Daily consumption (g) of different categories of milk products by age and sex (all subjects)**

Age group (months)	Food items	Male						Female					
		n	Mean	SD	Median	Min	Max	n	Mean	SD	Median	Min	Max
6	All milk products	92	0.0	0.0	0.0	0.0	0.0	85	0.5	3.6	0.0	0.0	23.3
	Baby food - cheese		0.0	0.0	0.0	0.0	0.0		0.3	2.5	0.0	0.0	23.3
	Cheese		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Ice cream		0.0	0.0	0.0	0.0	0.0		0.3	2.5	0.0	0.0	23.3
	Yogurt - reduced fat/nonfat		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Yogurt - whole		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Other milk products <sup>1</sup>		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
9	All milk products	88	0.1	0.5	0.0	0.0	3.3	76	0.0	0.2	0.0	0.0	1.7
	Baby food - cheese		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Cheese		0.1	0.4	0.0	0.0	3.3		0.0	0.2	0.0	0.0	1.7
	Ice cream		0.0	0.2	0.0	0.0	1.7		0.0	0.0	0.0	0.0	0.0
	Yogurt - reduced fat/nonfat		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Yogurt - whole		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Other milk products		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
12	All milk products	87	3.4	13.0	0.0	0.0	103.3	84	1.9	7.3	0.0	0.0	56.7
	Baby food - cheese		0.0	0.0	0.0	0.0	0.0		0.0	0.1	0.0	0.0	0.7
	Cheese		1.1	3.0	0.0	0.0	20.0		0.6	2.4	0.0	0.0	16.7
	Ice cream		0.0	0.5	0.0	0.0	4.3		0.0	0.0	0.0	0.0	0.0
	Yogurt - reduced fat/nonfat		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Yogurt - whole		2.3	11.8	0.0	0.0	100.0		1.2	6.4	0.0	0.0	50.0
	Other milk products		0.0	0.0	0.0	0.0	0.0		0.1	0.4	0.0	0.0	3.3
18	All milk products	89	5.3	14.1	0.0	0.0	105.0	144	5.8	15.0	0.0	0.0	83.3
	Baby food - cheese		0.1	1.1	0.0	0.0	10.0		0.2	1.5	0.0	0.0	16.7
	Cheese		1.0	5.0	0.0	0.0	45.0		1.3	4.1	0.0	0.0	33.3
	Ice cream		0.4	2.4	0.0	0.0	19.4		0.7	4.3	0.0	0.0	48.1
	Yogurt - reduced fat/nonfat		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Yogurt - whole		3.7	10.7	0.0	0.0	60.0		3.7	13.6	0.0	0.0	83.3
	Other milk products		0.0	0.2	0.0	0.0	2.1		0.0	0.1	0.0	0.0	0.8

<sup>1</sup>Other milk products included fresh whipping cream, evaporated milk and condensed milk.

**Table 3.21b (cont): Daily consumption (g) of different categories of milk products by age and sex (all subjects)**

Age group (months)	Food items	Male						Female					
		n	Mean	SD	Median	Min	Max	n	Mean	SD	Median	Min	Max
24	All milk products	178	13.1	25.3	0.0	0.0	152.1	136	16.5	29.7	0.0	0.0	153.3
	Baby food - cheese		0.1	0.7	0.0	0.0	10.0		0.0	0.3	0.0	0.0	3.5
	Cheese		1.0	3.4	0.0	0.0	30.0		1.2	3.2	0.0	0.0	18.0
	Ice cream		1.6	5.6	0.0	0.0	29.3		3.2	9.2	0.0	0.0	58.2
	Yogurt - reduced fat/nonfat		0.4	3.5	0.0	0.0	33.3		0.7	4.6	0.0	0.0	33.3
	Yogurt - whole		9.9	24.1	0.0	0.0	133.3		11.2	26.6	0.0	0.0	133.3
	Other milk products <sup>1</sup>		0.1	0.7	0.0	0.0	5.0		0.2	1.5	0.0	0.0	12.6
48	All milk products	112	18.2	24.8	5.1	0.0	101.9	101	21.2	29.6	6.7	0.0	159.1
	Baby food – cheese		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Cheese		1.4	3.3	0.0	0.0	16.7		1.6	3.2	0.0	0.0	16.0
	Ice cream		5.1	11.7	0.0	0.0	56.7		6.3	13.9	0.0	0.0	66.2
	Yogurt - reduced fat/nonfat		0.7	7.6	0.0	0.0	80.0		0.3	3.3	0.0	0.0	33.3
	Yogurt – whole		10.4	20.6	0.0	0.0	100.0		11.9	27.5	0.0	0.0	150.0
	Other milk products		0.6	3.0	0.0	0.0	27.7		1.0	3.5	0.0	0.0	25.0

<sup>1</sup>Other milk products included fresh whipping cream, evaporated milk and condensed milk.



#### **3.3.14 Mushroom, seaweed, nuts and seeds**

Mushroom, seaweed, nuts and seeds were seldom consumed by the studied children before 24 months of age. At 48 months, 42% boys and 33.7% girls consumed mushroom and seaweed, whereas approximately 20% of the children aged 48 months included nuts and seeds in their diet (Table 3.22a). However, the average daily consumption of these two food groups was low and varied greatly among individuals of same age group (Table 3.22b).

**Table 3.22a: Daily consumption (g) of mushroom, seaweed, nuts and seeds by age and sex (consumers only)**

Age group (months)	Food items	Male							Female						
		n	% <sup>1</sup>	Mean	SD	Median	Min	Max	n	%	Mean	SD	Median	Min	Max
6	Mushroom and seaweed	0	0.0	0.0	0.0	0.0	0.0	0.0	1	1.2	---	---	---	0.1	0.1
	Nuts and seeds	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
9	Mushroom and seaweed	1	1.1	---	---	---	10.0	10.0	1	1.3	---	---	---	8.0	8.0
	Nuts and seeds	1	1.1	---	---	---	6.7	6.7	0	0.0	0.0	0.0	0.0	0.0	0.0
12	Mushroom and seaweed	2	2.3	1.4	1.8	1.4	0.1	2.7	1	1.2	---	---	---	0.2	0.2
	Nuts and seeds	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
18	Mushroom and seaweed	5	5.6	7.1	8.9	3.3	0.4	22.0	9	6.3	2.9	2.6	1.3	0.1	7.1
	Nuts and seeds	3	3.4	3.1	2.8	2.0	1.0	6.3	9	6.3	5.8	8.2	2.7	0.5	24.5
24	Mushroom and seaweed	24	13.5	5.2	7.9	2.1	0.2	36.9	27	19.9	2.7	3.4	1.3	0.2	13.3
	Nuts and seeds	12	6.7	3.9	5.0	1.7	0.7	17.7	17	12.5	7.8	10.0	3.3	0.7	36.1
48	Mushroom and seaweed	47	42.0	4.3	5.2	2.7	0.1	27.3	34	33.7	4.2	6.1	1.4	0.1	32.0
	Nuts and seeds	21	18.8	4.6	4.0	4.0	0.3	16.3	24	23.8	4.8	4.2	2.9	0.3	16.7

<sup>1</sup>Percentage of consumers**Table 3.22b: Daily consumption (g) of mushroom, seaweed, nuts and seeds by age and sex (all subjects)**

Age group (months)	Food items	Male						Female					
		n	Mean	SD	Median	Min	Max	n	Mean	SD	Median	Min	Max
6	Mushroom and seaweed	92	0.0	0.0	0.0	0.0	0.0	85	0.0	0.0	0.0	0.0	0.1
	Nuts and seeds	92	0.0	0.0	0.0	0.0	0.0	85	0.0	0.0	0.0	0.0	0.0
9	Mushroom and seaweed	88	0.1	1.1	0.0	0.0	10.0	76	0.1	0.9	0.0	0.0	8.0
	Nuts and seeds	88	0.1	0.7	0.0	0.0	6.7	76	0.0	0.0	0.0	0.0	0.0
12	Mushroom and seaweed	87	0.0	0.3	0.0	0.0	2.7	84	0.0	0.0	0.0	0.0	0.2
	Nuts and seeds	87	0.0	0.0	0.0	0.0	0.0	84	0.0	0.0	0.0	0.0	0.0
18	Mushroom and seaweed	89	0.4	2.5	0.0	0.0	22.0	144	0.2	0.9	0.0	0.0	7.1
	Nuts and seeds	89	0.1	0.7	0.0	0.0	6.3	144	0.4	2.4	0.0	0.0	24.5
24	Mushroom and seaweed	178	0.7	3.3	0.0	0.0	36.9	136	0.5	1.8	0.0	0.0	13.3
	Nuts and seeds	178	0.3	1.6	0.0	0.0	17.7	136	1.0	4.3	0.0	0.0	36.1
48	Mushroom and seaweed	112	1.8	4.0	0.0	0.0	27.3	101	1.4	4.0	0.0	0.0	32.0
	Nuts and seeds	112	0.9	2.5	0.0	0.0	16.3	101	1.1	2.9	0.0	0.0	16.7

### **3.3.15 Poultry**

The percentage of children consuming poultry increased greatly from 9 months onwards. Nearly 20% of the studied children included poultry in their diet at 9 months whereas this percentage increased to more than 70% at 48 months. Chicken was the most popular poultry consumed (Table 3.23a). The average daily consumption of poultry was 1.9 g in boys and 4.9 g in girls at 9 months, and 19.3 g in boys and 17 g in girls at 48 months (Table 3.23b).

**Table 3.23a: Daily consumption (g) of different categories of poultry by age and sex (consumers only)**

Age group (months)	Food items	Male							Female						
		n	% <sup>1</sup>	Mean	SD	Median	Min	Max	n	%	Mean	SD	Median	Min	Max
6	All poultry	2	2.2	6.8	4.5	6.8	3.7	10.0	4	4.7	4.3	3.8	3.8	1.0	8.3
	Baby food - poultry	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Chicken	2	2.2	6.8	4.5	6.8	3.7	10.0	4	4.7	4.3	3.8	3.8	1.0	8.3
	Duck, goose, other poultry <sup>2</sup>	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
9	All poultry	19	21.6	8.7	6.4	6.7	1.0	24.0	17	22.4	22.1	23.7	16.7	0.6	85.3
	Baby food - poultry	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Chicken	19	21.6	8.7	6.4	6.7	1.0	24.0	17	22.4	22.1	23.7	16.7	0.6	85.3
	Duck, goose, other poultry	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
12	All poultry	29	33.3	19.9	17.9	13.3	2.0	80.0	28	33.3	13.6	14.8	7.0	0.3	55.8
	Baby food - poultry	1	1.1	---	---	---	23.7	23.7	0	0.0	0.0	0.0	0.0	0.0	0.0
	Chicken	28	32.2	19.8	18.2	13.3	2.0	80.0	28	33.3	13.6	14.8	7.0	0.3	55.8
	Duck, goose, other poultry	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
18	All poultry	40	44.9	13.9	13.4	10.3	0.3	56.7	64	44.4	18.3	23.5	11.6	1.0	129.8
	Baby food - poultry	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Chicken	38	42.7	14.5	13.4	10.6	0.3	56.7	64	44.4	18.2	23.3	11.6	1.0	129.8
	Duck, goose, other poultry	2	2.2	1.6	0.4	1.6	1.3	1.8	1	0.7	---	---	---	7.3	7.3
24	All poultry	85	47.8	17.0	16.0	11.0	0.6	66.7	88	64.7	17.3	19.7	10.0	0.5	133.3
	Baby food - poultry	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Chicken	83	46.6	16.6	15.9	11.0	0.6	66.7	84	61.8	17.2	19.9	10.0	0.5	133.3
	Duck, goose, other poultry	5	2.8	12.3	5.8	9.6	6.7	20.0	8	5.9	9.5	12.5	5.1	3.7	40.0
48	All poultry	84	75.0	25.8	25.6	20.0	1.0	170.0	74	73.3	23.3	19.2	19.2	1.0	82.3
	Baby food - poultry	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Chicken	82	73.2	25.0	24.6	20.0	1.0	170.0	73	72.3	21.8	17.4	19.1	1.0	82.3
	Duck, goose, other poultry	7	6.2	16.0	11.6	11.0	6.7	40.0	7	6.9	18.4	15.6	10.0	3.7	40.0

<sup>1</sup>Percentage of consumers

<sup>2</sup>Other poultry included pigeon and turkey.

**Table 3.23b: Daily consumption (g) of different categories of poultry by age and sex (all subjects)**

Age group (months)	Food items	Male						Female					
		n	Mean	SD	Median	Min	Max	n	Mean	SD	Median	Min	Max
6	All poultry	92	0.1	1.1	0.0	0.0	10.0	85	0.2	1.2	0.0	0.0	8.3
	Baby food - poultry		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Chicken		0.1	1.1	0.0	0.0	10.0		0.2	1.2	0.0	0.0	8.3
	Duck, goose, other poultry <sup>1</sup>		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
9	All poultry	88	1.9	4.6	0.0	0.0	24.0	76	4.9	14.4	0.0	0.0	85.3
	Baby food - poultry		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Chicken		1.9	4.6	0.0	0.0	24.0		4.9	14.4	0.0	0.0	85.3
	Duck, goose, other poultry		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
12	All poultry	87	6.6	13.9	0.0	0.0	80.0	84	4.5	10.6	0.0	0.0	55.8
	Baby food - poultry		0.3	2.5	0.0	0.0	23.7		0.0	0.0	0.0	0.0	0.0
	Chicken		6.4	13.8	0.0	0.0	80.0		4.5	10.6	0.0	0.0	55.8
	Duck, goose, other poultry		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
18	All poultry	89	6.2	11.3	0.0	0.0	56.7	144	8.1	18.0	0.0	0.0	129.8
	Baby food - poultry		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Chicken		6.2	11.3	0.0	0.0	56.7		8.1	17.9	0.0	0.0	129.8
	Duck, goose, other poultry		0.0	0.2	0.0	0.0	1.8		0.1	0.6	0.0	0.0	7.3
24	All poultry	178	8.1	13.9	0.0	0.0	66.7	136	11.2	17.9	3.7	0.0	133.3
	Baby food - poultry		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Chicken		7.8	13.6	0.0	0.0	66.7		10.6	17.7	3.7	0.0	133.3
	Duck, goose, other poultry		0.3	2.2	0.0	0.0	20.0		0.6	3.6	0.0	0.0	40.0
48	All poultry	112	19.3	24.8	14.0	0.0	170.0	101	17.0	19.4	10.0	0.0	82.3
	Baby food - poultry		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Chicken		18.3	23.8	13.3	0.0	170.0		15.8	17.8	10.0	0.0	82.3
	Duck, goose, other poultry		1.0	4.7	0.0	0.0	40.0		1.3	6.1	0.0	0.0	40.0

<sup>1</sup>Other poultry included pigeon and turkey.

### **3.3.16 Soy and soy products**

Soy and soy products were not common for children at or before 12 months of age. From 18 months onwards, over one-fifths of boys and girls consumed soy and soy products. At 48 months, over 40% of the children included soy and soy products in their diet (Table 3.24a). There was a great variation in the average daily consumption of soy and soy products among individuals of same age, and soy milk was the major type of soy and soy products consumed by the studied children (Table 3.24b).

**Table 3.24a: Daily consumption (g or ml) of different categories of soy and soy products by age and sex (consumers only)**

Age group (months)	Food items	Male							Female						
		n	% <sup>1</sup>	Mean	SD	Median	Min	Max	n	%	Mean	SD	Median	Min	Max
6	All soy and soy products	0	0.0	0.0	0.0	0.0	0.0	0.0	3	3.5	2.8	1.0	3.3	1.7	3.3
	Soy milk (ml)	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Soybean and other products <sup>2</sup> (g)	0	0.0	0.0	0.0	0.0	0.0	0.0	3	3.5	2.8	1.0	3.3	1.7	3.3
9	All soy and soy products	3	3.4	12.2	12.6	6.7	3.3	26.7	4	5.3	11.2	5.9	12.3	3.3	16.7
	Soy milk	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Soybean and other products	3	3.4	12.2	12.6	6.7	3.3	26.7	4	5.3	11.2	5.9	12.3	3.3	16.7
12	All soy and soy products	6	6.9	20.0	32.9	8.0	3.3	87.0	13	15.5	22.8	39.8	8.3	0.3	150.0
	Soy milk	1	1.1	---	---	---	85	85.0	2	2.4	79.2	100.2	79.2	8.3	150.0
	Soybean and other products	6	6.9	5.8	3.3	5.2	2.0	10.0	11	13.1	12.5	11.9	7.0	0.3	38.0
18	All soy and soy products	23	25.8	34.0	45.9	20.0	0.7	210.0	35	24.3	46.5	82.9	20.0	0.7	460.0
	Soy milk	10	11.2	64.3	56.3	41.7	10.0	210.0	16	11.1	86.5	107.6	50.0	13.3	460.0
	Soybean and other products	14	15.7	10.0	9.4	6.7	0.7	30.0	21	14.6	11.7	13.6	6.7	0.7	50.0
24	All soy and soy products	66	37.1	44.9	52.4	25.3	0.2	229.7	57	41.9	52.5	65.4	33.3	0.7	362.4
	Soy milk	35	19.7	71.0	54.7	43.7	11.7	210	31	22.8	81.0	59.7	66.7	20.0	255.0
	Soybean and other products	43	24.2	11.1	9.3	7.3	0.2	39	35	25.7	13.7	20.2	7.0	0.3	112.4
48	All soy and soy products	49	43.8	51.1	50.8	41.7	0.8	208.3	46	45.5	54.6	60.4	37.5	0.8	308.3
	Soy milk	28	25.0	79.2	47.5	75.8	8.3	208.3	23	22.8	79.3	59.9	58.3	20.0	308.3
	Soybean and other products	28	25.0	10.3	12.8	5.0	0.8	54.7	30	29.7	22.9	28.0	13.3	0.8	112.8

<sup>1</sup>Percentage of consumers<sup>2</sup>Other products included tofu, dried soybean curd, fried tofu, tofu sheet, soybean curd dessert, baked soybeans in tomato sauce.

**Table 3.24b: Daily consumption (g or ml) of different categories of soy and soy products by age and sex (all subjects)**

Age	Food items	Male						Female					
		n	Mean	SD	Median	Min	Max	n	Mean	SD	Median	Min	Max
6	All soy and soy products	92	0.0	0.0	0.0	0.0	0.0	85	0.1	0.5	0.0	0.0	3.3
	Soy milk (ml)		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Soybean and other products <sup>1</sup> (g)		0.0	0.0	0.0	0.0	0.0		0.1	0.5	0.0	0.0	3.3
9	All soy and soy products	88	0.4	2.9	0.0	0.0	26.7	76	0.6	2.8	0.0	0.0	16.7
	Soy milk		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Soybean and other products		0.4	2.9	0.0	0.0	26.7		0.6	2.8	0.0	0.0	16.7
12	All soy and soy products	87	1.4	9.4	0.0	0.0	87.0	84	3.5	17.2	0.0	0.0	150.0
	Soy milk		1.0	9.1	0.0	0.0	85.0		1.9	16.4	0.0	0.0	150.0
	Soybean and other products		0.4	1.7	0.0	0.0	10.0		1.6	5.9	0.0	0.0	38.0
18	All soy and soy products	89	8.8	27.4	0.0	0.0	210.0	144	11.3	45.1	0.0	0.0	460.0
	Soy milk		7.2	27.2	0.0	0.0	210.0		9.6	44.3	0.0	0.0	460.0
	Soybean and other products		1.6	5.1	0.0	0.0	30.0		1.7	6.6	0.0	0.0	50.0
24	All soy and soy products	178	16.7	38.5	0.0	0.0	229.7	136	22.0	49.5	0.0	0.0	362.4
	Soy milk		14	37.1	0.0	0.0	210.0		18.5	44.2	0.0	0.0	255.0
	Soybean and other products		2.7	6.6	0.0	0.0	39.0		3.5	11.8	0.0	0.0	112.4
48	All soy and soy products	112	22.4	42	0.0	0.0	208.3	101	24.9	48.9	0.0	0.0	308.3
	Soy milk		19.8	41.7	0.0	0.0	208.3		18.1	43.7	0.0	0.0	308.3
	Soybean and other products		2.6	7.8	0.0	0.0	54.7		6.8	18.4	0.0	0.0	112.8

<sup>1</sup>Other products included tofu, dried soybean curd, fried tofu, tofu sheet, soybean curd dessert, baked soybeans in tomato sauce.



### **3.3.17 Vegetables**

The number of children consuming vegetables greatly increased from 9 months onwards (Table 3.25a). At 6 months, less than 40% children aged 6 months included vegetables in their diet. From 9 months onwards, over 90% of boys and girls included vegetables in their diet. “Baby food – vegetables” were not common among the studied children. Yellow orange vegetables were the major type of vegetables consumed by children aged 18 months or younger whereas dark green vegetables dominated from 24 months onwards. At 9 months, the average daily consumption of all vegetables was 40.4 g in boys and 45.9 g in girls. The amount increased to 70.9 g, 65.8 g and 83.3 g in boys and 56.1 g, 72.9 g and 89 g in girls at 12, 24 and 48 months respectively (Table 3.25b).

**Table 3.25a: Daily consumption (g) of different categories of vegetables by age and sex (consumers only)**

Age group (months)	Food items	Male							Female						
		n	% <sup>1</sup>	Mean	SD	Median	Min	Max	n	%	Mean	SD	Median	Min	Max
6	All vegetables	28	30.4	29.4	37.9	11.9	2.0	128.0	33	38.8	31.7	32.2	20.0	1.0	114.7
	Baby food - vegetables	0	0.0	0.0	0.0	0.0	0.0	0.0	4	4.7	40.7	49.6	23.3	4.0	112.0
	Cruciferous vegetables	2	2.2	5.8	1.2	5.8	5.0	6.7	2	2.4	15.7	17.9	15.7	3.0	28.3
	Dark green vegetables	9	9.8	18.5	38.2	5.3	0.3	120.0	8	9.4	11.0	8.8	8.3	3.3	28.3
	Yellow orange vegetables	24	26.1	20.5	28.6	8.3	1.7	128.0	25	29.4	20.3	18.2	13.3	1.0	64.7
	Potatoes	3	3.3	27.2	27.1	21.7	3.3	56.7	2	2.4	34.7	44.3	34.7	3.3	66.0
	Other vegetables <sup>2</sup>	2	2.2	35.8	43.6	35.8	5.0	66.7	10	11.8	18.7	14.4	16.5	1.0	50.0
9	All vegetables	80	90.9	44.4	40.9	33.8	1.5	240.0	73	96.1	47.8	43.2	36.7	0.7	210.7
	Baby food – vegetables	2	2.3	21.1	23.5	21.1	4.4	37.7	1	1.3	---	---	---	5.0	5.0
	Cruciferous vegetables	20	22.7	13.3	13.2	10.0	3.0	60.0	17	22.4	18.3	17.2	11.3	1.3	53.3
	Dark green vegetables	40	45.5	20.0	34.0	10.0	1.2	200.0	36	47.4	19.0	12.2	17.1	0.3	55.8
	Yellow orange vegetables	59	67.0	22.6	19.4	16.7	1.5	80.0	56	73.7	29.1	28.4	20.8	0.7	133.3
	Potatoes	16	18.2	17.4	13.8	21.7	3.3	53.0	15	19.7	20.4	19.6	34.7	1.3	65.0
	Other vegetables	35	39.8	23.8	29.7	10.0	2.2	132.0	25	32.9	22.3	18.2	18.3	0.3	66.7
12	All vegetables	85	97.7	72.6	54.9	57.5	0.3	238.3	83	98.8	56.8	45.3	44.0	0.8	301.3
	Baby food – vegetables	2	2.3	37.2	0.7	37.2	36.7	37.7	3	3.6	30.0	5.8	26.7	26.7	36.7
	Cruciferous vegetables	21	24.1	13.7	13.7	10.0	0.8	51.0	18	21.4	14.1	18.1	4.5	1.0	68.0
	Dark green vegetables	63	72.4	22.7	22.9	16.7	1.1	141.7	64	76.2	18.7	12.4	15.8	0.3	60.0
	Yellow orange vegetables	71	81.6	41.0	38.5	30.0	0.3	180.0	66	78.6	30.3	36.5	20.0	1.0	233.3
	Potatoes	24	27.6	18.7	18.7	9.2	2.0	58.3	17	20.2	15.9	11.7	20.0	1.7	33.3
	Other vegetables	43	49.4	23.7	20.2	17.5	1.3	86.7	49	58.3	18.5	18.2	12.5	0.4	70.6

<sup>1</sup>Percentage of consumers<sup>2</sup>Details of other vegetables are shown in Appendix 1.

**Table 3.25a (cont): Daily consumption (g) of different categories of vegetables by age and sex (consumers only)**

Age group (months)	Food items	Male							Female						
		n	% <sup>1</sup>	Mean	SD	Median	Min	Max	n	%	Mean	SD	Median	Min	Max
18	All vegetables	89	100.0	75.5	53.1	69.4	3.3	235.2	141	97.9	67.0	50.3	57.3	0.9	243.7
	Baby food - vegetables	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Cruciferous vegetables	32	36.0	14.9	10.9	13.8	0.7	53.2	58	40.3	11.4	8.9	6.9	0.7	40.0
	Dark green vegetables	69	77.5	32.3	26.1	25.0	1.3	105.0	108	75.0	30.1	31.0	20.0	0.7	200.0
	Yellow orange vegetables	61	68.5	34.5	29.8	24.0	1.3	130.0	87	60.4	31.9	27.7	25.0	0.9	143.3
	Potatoes	20	22.5	31.7	36.6	24.6	1.3	155.6	26	18.1	17.6	22.7	6.3	1.0	87.5
	Other vegetables <sup>2</sup>	57	64.0	22.3	18.9	17.3	0.7	79.0	92	63.9	25.0	30.0	15.2	1.7	160.0
24	All vegetables	172	96.6	68.1	49.5	58.2	1.7	232.9	133	97.8	74.6	54.4	60.5	1.0	290.4
	Baby food - vegetables	1	0.6	---	---	---	26.7	26.7	0	0.0	0.0	0.0	0.0	0.0	0.0
	Cruciferous vegetables	73	41.0	13.2	12.9	10.0	0.3	85.0	52	38.2	16.4	17.5	11.3	0.2	100.7
	Dark green vegetables	142	79.8	33.7	31.1	22.1	0.3	157.1	109	80.1	32.9	28.6	25.0	1.0	138.3
	Yellow orange vegetables	106	59.6	26.8	29.8	16.1	0.7	133.3	82	60.3	31.3	35.3	19.2	0.7	202.4
	Potatoes	41	23.0	11.8	12.3	7.3	0.7	58.3	39	28.7	21.5	26.9	8.3	1.3	116.7
	Other vegetables	117	65.7	22.4	22.8	16.3	0.7	166.0	91	66.9	22.8	23.4	14.4	0.7	108.7
48	All vegetables	112	100.0	83.3	56.0	70.5	1.0	312.5	101	100.0	89.0	51.8	72.1	3.3	266.1
	Baby food - vegetables	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Cruciferous vegetables	67	59.8	20.3	20.4	16.7	0.3	98.0	53	52.5	15.4	12.5	11.3	0.3	56.7
	Dark green vegetables	93	83.0	45.5	49.5	31.3	3.3	312.5	87	86.1	38.3	29.8	33.3	1.0	154.2
	Yellow orange vegetables	58	51.8	17.7	18.2	11.5	0.3	83.3	70	69.3	27.3	30.9	18.8	0.7	178.3
	Potatoes	39	34.8	13.3	9.6	12.5	0.7	45.3	39	38.6	15.6	13.5	11.3	1.3	58.3
	Other vegetables	86	76.8	25.5	23.0	20.0	0.3	120.8	86	85.1	27.0	20.4	21.2	0.3	113.4

<sup>1</sup>Percentage of consumers

<sup>2</sup>Details of other vegetables are shown in Appendix 1.

**Table 3.25b: Daily consumption (g) of different categories of vegetables by age and sex (all subjects)**

Age group (months)	Food items	Male						Female					
		n	Mean	SD	Median	Min	Max	n	Mean	SD	Median	Min	Max
6	All vegetables	92	9.0	24.7	0.0	0.0	128.0	85	12.3	25.3	0.0	0.0	114.7
	Baby food - vegetables		0.0	0.0	0.0	0.0	0.0	85	1.9	12.8	0.0	0.0	112.0
	Cruciferous vegetables		0.1	0.9	0.0	0.0	6.7	85	0.4	3.1	0.0	0.0	28.3
	Dark green vegetables		1.8	12.6	0.0	0.0	120.0	85	1.0	4.1	0.0	0.0	28.3
	Yellow orange vegetables		5.4	17.0	0.0	0.0	128.0	85	6.0	13.5	0.0	0.0	64.7
	Potatoes		0.9	6.3	0.0	0.0	56.7	85	0.8	7.2	0.0	0.0	66.0
	Other vegetables <sup>1</sup>		0.8	7.0	0.0	0.0	66.7	85	2.2	7.7	0.0	0.0	50.0
9	All vegetables	88	40.4	41.0	29.2	0.0	240.0	76	45.9	43.4	34.7	0.0	210.7
	Baby food - vegetables		0.5	4.0	0.0	0.0	37.7	76	0.1	0.6	0.0	0.0	5.0
	Cruciferous vegetables		3.0	8.3	0.0	0.0	60.0	76	4.1	11.1	0.0	0.0	53.3
	Dark green vegetables		9.1	24.9	0.0	0.0	200.0	76	9.0	12.7	0.0	0.0	55.8
	Yellow orange vegetables		15.2	19.1	6.9	0.0	80.0	76	21.4	27.5	11.0	0.0	133.3
	Potatoes		3.2	8.9	0.0	0.0	53.0	76	4.0	11.8	0.0	0.0	65.0
	Other vegetables		9.5	21.9	0.0	0.0	132.0	76	7.3	14.7	0.0	0.0	66.7
12	All vegetables	87	70.9	55.3	57.3	0.0	238.3	84	56.1	45.5	43.8	0.0	301.3
	Baby food - vegetables		0.9	5.6	0.0	0.0	37.7	84	1.1	5.7	0.0	0.0	36.7
	Cruciferous vegetables		3.3	8.9	0.0	0.0	51.0	84	3.0	10.0	0.0	0.0	68.0
	Dark green vegetables		16.4	22.0	8.3	0.0	141.7	84	14.2	13.5	13.3	0.0	60.0
	Yellow orange vegetables		33.5	38.2	23.3	0.0	180.0	84	23.8	34.6	13.3	0.0	233.3
	Potatoes		5.1	12.8	0.0	0.0	58.3	84	3.2	8.2	0.0	0.0	33.3
	Other vegetables		11.7	18.5	0.0	0.0	86.7	84	10.8	16.6	2.7	0.0	70.6
18	All vegetables	89	75.5	53.1	69.4	3.3	235.2	144	65.6	50.7	54.6	0.0	243.7
	Baby food - vegetables		0.0	0.0	0.0	0.0	0.0	144	0.0	0.0	0.0	0.0	0.0
	Cruciferous vegetables		5.4	9.7	0.0	0.0	53.2	144	4.6	7.9	0.0	0.0	40.0
	Dark green vegetables		25.0	26.6	15.0	0.0	105.0	144	22.6	29.9	12.5	0.0	200.0
	Yellow orange vegetables		23.7	29.5	13.3	0.0	130.0	144	19.3	26.6	6.7	0.0	143.3
	Potatoes		7.1	21.6	0.0	0.0	155.6	144	3.2	11.7	0.0	0.0	87.5
	Other vegetables		14.3	18.5	5.0	0.0	79.0	144	16.0	26.8	6.7	0.0	160.0

<sup>1</sup>Details of other vegetables are shown in Appendix 1.

**Table 3.25b (cont): Daily consumption (g) of different categories of vegetables by age and sex (all subjects)**

Age group (months)	Food items	Male						Female					
		n	Mean	SD	Median	Min	Max	n	Mean	SD	Median	Min	Max
24	All vegetables	178	65.8	50.2	57.5	0.0	232.9	136	72.9	54.9	58.5	0.0	290.4
	Baby food - vegetables		0.1	2.0	0.0	0.0	26.7	136	0.0	0.0	0.0	0.0	0.0
	Cruciferous vegetables		5.4	10.5	0.0	0.0	85.0	136	6.3	13.4	0.0	0.0	100.7
	Dark green vegetables		26.9	30.9	15.3	0.0	157.1	136	26.4	28.7	16.7	0.0	138.3
	Yellow orange vegetables		15.9	26.4	3.3	0.0	133.3	136	18.9	31.4	3.7	0.0	202.4
	Potatoes		2.7	7.7	0.0	0.0	58.3	136	6.2	17.3	0.0	0.0	116.7
	Other vegetables <sup>1</sup>		14.7	21.3	6.9	0.0	166.0	136	15.2	22.0	5.6	0.0	108.7
48	All vegetables	112	83.3	56.0	70.5	1.0	312.5	101	89.0	51.8	72.1	3.3	266.1
	Baby food - vegetables		0.0	0.0	0.0	0.0	0.0	101	0.0	0.0	0.0	0.0	0.0
	Cruciferous vegetables		12.1	18.6	2.8	0.0	98.0	101	8.1	11.9	3.3	0.0	56.7
	Dark green vegetables		37.8	48.2	22.2	0.0	312.5	101	33.0	30.7	26.7	0.0	154.2
	Yellow orange vegetables		9.2	15.8	1.5	0.0	83.3	101	19.0	28.7	10.0	0.0	178.3
	Potatoes		4.6	8.5	0.0	0.0	45.3	101	6.0	11.3	0.0	0.0	58.3
	Other vegetables		19.6	22.9	13.6	0.0	120.8	101	23.0	21.1	20.0	0.0	113.4

<sup>1</sup>Details of other vegetables are shown in Appendix 1.

### **3.4 Daily fluid intake**

This section summarizes daily fluid intake of the studied children. The fluid intake included intake of total milks, different types of beverages, soup, water and water for diluting other beverages (e.g. honey).

The average daily intake of all fluids decreased gradually from 6 months to 12 months but increased afterwards (Table 3.26b). Milk, water and soup were the three major types of fluids consumed. Regarding beverages, there was increasing number of children consumed beverages from 6 months to 48 months, and the types of beverages consumed varied with age. At earlier ages, 100% fruit juice and “baby food – fruit juice” were the most popular beverages among infants. At 48 months, fruit drink became the most popular beverage among children (Table 3.26a). There was also a great variation in the amount of beverages consumed within- and between-age groups (Table 3.26b).

**Table 3.26a: Daily consumption (ml) of different categories of fluids by age and sex (consumers only)**

Age group (months)	Food items	Male							Female						
		n	% <sup>1</sup>	Mean	SD	Median	Min	Max	n	%	Mean	SD	Median	Min	Max
6	All fluids	92	100	918.6	176.4	879.2	590.0	1424.0	85	100	804.5	150.2	825	343.3	1090
	Total milks <sup>2</sup>	92	100	837.4	173.3	810.0	370.0	1330.0	85	100	728.4	149.3	753.3	170.0	990.0
	100% fruit juice	7	7.6	25.4	15.4	20.0	11.7	53.3	8	9.4	22.0	29.1	9.6	1.7	90.0
	Carbonated drinks	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Coffee and tea	1	1.1	---	---	---	16.7	16.7	0	0.0	0.0	0.0	0.0	0.0	0.0
	Baby food - fruit juice	6	6.5	13.1	6.4	11.7	6.7	25.0	5	5.9	13.0	4.8	13.3	6.7	20.0
	Fruit drinks <sup>3</sup>	1	1.1	---	---	---	23.3	23.3	1	1.2	---	---	---	33.3	33.3
	Other beverages <sup>4</sup>	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Water (plain)	82	89.1	74.0	63.8	60.0	1.7	293.3	79	92.9	63.7	55.4	43.3	3.3	283.3
	Soup <sup>5</sup>	12	13	92.7	101.4	56.7	10.0	353.3	15	17.6	77.3	67.9	66.7	5.0	260.0
9	Water (honey) <sup>6</sup>	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	All fluids	88	100	758.5	159.6	731.7	406.7	1291.0	76	100	751.8	189.0	703.3	285.0	1300.0
	Total milks	88	100	643.7	152.6	631.7	283.3	1060.0	76	100	632.1	161.0	615.0	210.0	1100.0
	100% fruit juice	8	9.1	23.3	21.8	19.2	1.7	60.0	8	10.5	22.3	17.5	17.5	5.0	60.0
	Carbonated drinks	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Coffee and tea	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Baby food - fruit juice	4	4.5	34.0	22.9	31.3	10.0	63.3	7	9.2	40.5	21.7	36.7	13.3	66.7
	Fruit drinks	2	2.3	13.8	18.3	13.8	0.8	26.7	3	3.9	26.3	36.4	10.0	1.0	68.0
	Other beverages	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Water (plain)	84	95.5	95.5	72.3	80.0	6.7	420.0	75	98.7	100.0	88.3	80.0	5.0	425.0
12	Soup	27	30.7	64.0	47.8	53.3	0.8	193.3	13	17.1	81.0	118.0	33.3	17.8	453.3
	Water (honey)	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	All fluids	87	100	782.7	200.9	813.4	80.0	1255.0	84	100	767.8	213.1	743.9	340.0	1480.0
	Total milks	86	98.9	573.2	149.1	590.0	180.0	890.0	84	100	566.9	158.3	562.2	180.0	950.0
	100% fruit juice	11	12.6	48.8	34.0	41.7	4.6	110.0	10	11.9	31.4	18.5	23.3	18.3	70.0
	Carbonated drinks	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Coffee and tea	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Baby food - fruit juice	3	3.4	23.3	8.8	20.0	16.7	33.3	3	3.6	20.6	12.5	20.0	8.3	33.3
	Fruit drinks	3	3.4	74.8	37.9	66.7	41.7	116.1	6	7.1	33.1	14.1	33.3	16.7	55.5
	Other beverages	0	0.0	0.0	0.0	0.0	0.0	0.0	1	1.2	---	---	---	88.9	88.9
	Water (plain)	86	98.9	179.5	118.2	150.0	25.0	733.3	83	98.8	163.1	136.4	120.0	6.7	690.0
	Soup	35	40.2	72.4	67.6	50.0	6.7	276.7	40	47.6	66.8	60.7	50.0	0.0	246.7
	Water (honey)	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0

<sup>1</sup>Percentage of consumers<sup>2</sup>Total milks included breast milk, all kinds of formula (cow, goat, soy and special), cow's milk with varying fat content, soy milk, goat milk and oat milk<sup>3</sup>Fruit drinks included beverages with less than 100% juice and with added sugars.<sup>4</sup>Other beverages included cocoa and other instant powdered drinks, and sports drink.<sup>5</sup>Included all soup and selected Chinese herbal remedies, namely 七星茶 and 開奶茶<sup>6</sup>Water for diluting honey

**Table 3.26a (cont): Daily consumption (ml) of different categories of fluids by age and sex (consumers only)**

Age group (months)	Food items	Male							Female						
		n	% <sup>1</sup>	Mean	SD	Median	Min	Max	n	%	Mean	SD	Median	Min	Max
18	All fluids	89	100	861.3	252.5	866.7	336.7	1593.3	144	100	829.5	228.0	809.2	385.8	1599.7
	Total milks <sup>2</sup>	89	100	503.2	163.8	500.0	190.0	873.3	144	100	487.7	141.7	480.0	150.0	960.0
	100% fruit juice	8	9.0	35.0	29.1	28.1	0.8	98.3	24	16.7	45.9	40.6	31.7	3.3	141.7
	Carbonated drinks	0	0.0	0.0	0.0	0.0	0.0	0.0	3	2.1	43.9	40.2	33.3	10.0	88.3
	Coffee and tea	0	0.0	0.0	0.0	0.0	0.0	0.0	1	0.7	---	---	---	33.3	33.3
	Baby food - fruit juice	8	9.0	48.0	34.6	37.5	6.0	110.0	9	6.2	52.1	27.7	41.7	10.0	107.9
	Fruit drinks <sup>3</sup>	13	14.6	67.1	65.8	41.7	10.0	250.0	22	15.3	47.4	40.5	36.7	1.7	166.7
	Other beverages <sup>4</sup>	2	2.2	23.3	9.4	23.3	16.7	30.0	1	0.7	---	---	---	16.7	16.7
	Water (plain)	86	96.6	287.6	194.0	240.0	36.7	966.7	144	100	265.3	150.0	237.5	10.8	750.0
	Soup <sup>5</sup>	53	59.6	101.2	93.8	80.0	0.0	398.3	90	62.5	90.6	80.4	66.7	0.0	383.3
	Water (honey) <sup>6</sup>	2	2.2	93.3	94.3	93.3	26.7	160.0	1	0.7	---	---	---	58.3	58.3
24	All fluids	178	100	974.4	309.8	947.9	361.7	2090.0	136	100	946.8	346.0	915.5	315.0	2526.7
	Total milks	177	99.4	465.9	168.7	470.0	16.7	1123.3	135	99.3	445.3	163.9	440.0	150.0	913.3
	100% fruit juice	28	15.7	53.4	35.0	50.0	8.3	153.3	24	17.6	48.0	46.7	36.7	0.7	206.7
	Carbonated drinks	12	6.7	24.1	18.6	26.3	2.5	60.0	5	3.7	38.3	15.1	36.7	16.7	55.0
	Coffee and tea	4	2.2	17.7	12.0	16.7	4.2	33.3	7	5.1	101.4	116.3	41.7	8.3	320.0
	Baby food - fruit juice	10	5.6	72.2	51.3	69.4	8.3	170.0	9	6.6	55.9	43.4	41.7	10.0	133.3
	Fruit drinks	39	21.9	88.7	94.6	66.7	10.0	525.0	33	24.3	85.2	82.5	58.3	10.0	385.0
	Other beverages	6	3.4	38.0	21.3	33.3	8.3	66.7	9	6.6	60.2	29.4	58.3	16.7	100.0
	Water (plain)	178	100	398.7	257.2	330.0	61.7	1296.7	136	100	362.3	263.8	313.3	6.7	2160.0
	Soup	127	71.3	103.5	87.0	73.3	0.1	500.0	101	74.3	129.1	122.5	100.0	0.0	673.3
	Water (honey)	5	2.8	120.7	84.3	133.3	20.0	216.7	5	3.7	86.0	30.3	90.0	36.7	120.0
48	All fluids	112	100	1139.7	365.8	1096.9	478.9	2415.0	101	100	1018.2	372.9	993.4	225.0	2103.3
	Total milks	109	97.3	306.7	184.9	276.7	4.7	843.3	95	94.1	277.7	164.2	235.0	2.3	880.0
	100% fruit juice	12	10.7	48.8	43.7	33.3	0.8	140.0	6	5.9	80.0	60.3	62.5	15.0	166.7
	Carbonated drinks	24	21.4	77.9	60.7	66.7	1.7	220.0	14	13.9	58.1	56.9	33.3	16.7	200.0
	Coffee and tea	10	8.9	72.5	51.2	57.5	16.7	185.0	10	9.9	51.6	51.6	37.5	6.7	150.0
	Baby food - fruit juice	1	0.9	---	---	---	39.3	39.3	2	2.0	54.2	17.7	54.2	41.7	66.7
	Fruit drinks	48	42.9	113.7	116.6	76.1	8.3	561.7	46	45.5	79.4	44.6	66.7	16.7	211.7
	Other beverages	19	17.0	62.0	30.4	56.7	10.0	156.7	30	29.7	59.4	58.2	50.8	0.5	308.3
	Water (plain)	112	100	602.7	310.7	537.5	46.7	1750.0	101	100	549.4	309.0	496.7	96.7	1676.7
	Soup	90	80.4	182.0	132.1	153.3	13.3	573.3	84	83.2	158.7	112.5	136.1	0.1	500.0
	Water (honey)	5	4.5	96.0	64.7	63.3	40.0	200.0	4	4.0	70.8	38.6	61.7	40.0	120.0

<sup>1</sup>Percentage of consumers<sup>2</sup>Total milks included breast milk, all kinds of formula (cow, goat, soy and special), cow's milk with varying fat content, soy milk, goat milk and oat milk<sup>3</sup>Fruit drinks included beverages with less than 100% juice and with added sugars.<sup>4</sup>Other beverages included cocoa and other instant powdered drinks, and sports drink.<sup>5</sup>Included all soup and selected Chinese herbal remedies, namely 七星茶 and 開奶茶<sup>6</sup>Water for diluting honey



**Table 3.26b: Daily consumption (ml) of different categories of fluids by age and sex (all subjects)**

Age group	Food items	Male						Female					
(months)		n	Mean	SD	Median	Min	Max	n	Mean	SD	Median	Min	Max
6	All fluids	92	918.6	176.4	879.2	590.0	1424.0	85	804.5	150.3	825.0	343.3	1090.0
	Total milks <sup>1</sup>		837.4	173.3	810.0	370.0	1330.0		728.4	149.3	753.3	170.0	990.0
	100% fruit juice		1.9	7.8	0.0	0.0	53.3		2.1	10.6	0.0	0.0	90.0
	Carbonated drinks		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Coffee and tea		0.2	1.7	0.0	0.0	16.7		0.0	0.0	0.0	0.0	0.0
	Baby food - fruit juice		0.9	3.6	0.0	0.0	25.0		0.8	3.2	0.0	0.0	20.0
	Fruit drinks <sup>2</sup>		0.3	2.4	0.0	0.0	23.3		0.4	3.6	0.0	0.0	33.3
	Other beverages <sup>3</sup>		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Water (plain)		66.0	64.5	51.7	0.0	293.3		59.2	55.9	40.0	0.0	283.3
	Soup <sup>4</sup>		12.1	47.2	0.0	0.0	353.3		13.6	40.6	0.0	0.0	260.0
9	Water (honey) <sup>5</sup>	88	0.0	0.0	0.0	0.0	0.0	76	0.0	0.0	0.0	0.0	0.0
	All fluids		758.5	159.6	670.0	406.7	1291.0		751.8	189.0	703.3	285.0	1300.0
	Total milks		643.7	152.6	573.8	283.3	1060.0		632.1	161.0	615.0	210.0	1100.0
	100% fruit juice		2.1	9.2	0.0	0.0	60.0		2.3	8.7	0.0	0.0	60.0
	Carbonated drinks		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Coffee and tea		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Baby food - fruit juice		1.5	8.3	0.0	0.0	63.3		3.7	13.3	0.0	0.0	66.7
	Fruit drinks		0.3	2.8	0.0	0.0	26.7		1.0	7.9	0.0	0.0	68.0
	Other beverages		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Water (plain)		91.1	73.4	40.0	0.0	420.0		98.7	88.4	78.3	0.0	425.0
12	Soup	87	19.6	39.6	0.0	0.0	193.3	84	13.9	56.3	0.0	0.0	453.3
	Water (honey)		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	All fluids		782.7	200.9	653.7	80.0	1255.0		767.8	213.1	743.9	340.0	1480.0
	Total milks		566.6	160.5	450.0	0.0	890.0		566.9	158.3	562.2	180.0	950.0
	100% fruit juice		6.2	20.0	0.0	0.0	110.0		3.7	11.9	0.0	0.0	70.0
	Carbonated drinks		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Coffee and tea		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	Baby food - fruit juice		0.8	4.5	0.0	0.0	33.3		0.7	4.3	0.0	0.0	33.3
	Fruit drinks		2.6	14.9	0.0	0.0	116.1		2.4	9.3	0.0	0.0	55.5
	Other beverages		0.0	0.0	0.0	0.0	0.0		1.1	9.7	0.0	0.0	88.9
	Water (plain)		177.4	119.0	91.7	0.0	733.3		161.1	136.7	118.3	0.0	690.0
	Soup		29.1	55.5	0.0	0.0	276.7		31.8	53.4	0.0	0.0	246.7
	Water (honey)		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0

<sup>1</sup>Total milks included breast milk, all kinds of formula (cow, goat, soy and special), cow's milk with varying fat content, soy milk, goat milk and oat milk

<sup>2</sup>Fruit drinks included beverages with less than 100% juice and with added sugars.

<sup>3</sup>Other beverages included cocoa and other instant powdered drinks, and sports drink.

<sup>4</sup>Included all soup and selected Chinese herbal remedies, namely 七星茶 and 開奶茶

<sup>5</sup>Water for diluting honey

**Table 3.26b (cont): Daily consumption (ml) of different categories of fluids by age and sex (all subjects)**

Age group	Food items	Male						Female					
(months)		n	Mean	SD	Median	Min	Max	n	Mean	SD	Median	Min	Max
18	All fluids	89	861.3	252.5	681.4	336.7	1593.3	144	829.5	228.0	809.2	385.8	1599.7
	Total milks <sup>1</sup>		503.2	163.8	373.3	190.0	873.3		487.7	141.7	480.0	150.0	960.0
	100% fruit juice		3.1	13.0	0.0	0.0	98.3		7.7	23.7	0.0	0.0	141.7
	Carbonated drinks		0.0	0.0	0.0	0.0	0.0		0.9	7.9	0.0	0.0	88.3
	Coffee and tea		0.0	0.0	0.0	0.0	0.0		0.2	2.8	0.0	0.0	33.3
	Baby food - fruit juice		4.3	16.9	0.0	0.0	110.0		3.3	14.3	0.0	0.0	107.9
	Fruit drinks <sup>2</sup>		9.8	34.0	0.0	0.0	250.0		7.2	23.1	0.0	0.0	166.7
	Other beverages <sup>3</sup>		0.5	3.6	0.0	0.0	30.0		0.1	1.4	0.0	0.0	16.7
	Water (plain)		277.9	197.7	140.0	0.0	966.7		265.3	150.0	237.5	10.8	750.0
	Soup <sup>4</sup>		60.3	87.7	0.0	0.0	398.3		56.6	77.2	33.4	0.0	383.3
	Water (honey) <sup>5</sup>		2.1	17.2	0.0	0.0	160.0		0.4	4.9	0.0	0.0	58.3
24	All fluids	178	974.4	309.8	723.3	361.7	2090.0	136	946.8	346.0	915.5	315.0	2526.7
	Total milks		463.3	171.8	360.0	0.0	1123.3		442.0	167.7	436.7	0.0	913.3
	100% fruit juice		8.4	23.8	0.0	0.0	153.3		8.5	26.6	0.0	0.0	206.7
	Carbonated drinks		1.6	7.6	0.0	0.0	60.0		1.4	7.7	0.0	0.0	55.0
	Coffee and tea		0.4	3.1	0.0	0.0	33.3		5.2	33.3	0.0	0.0	320.0
	Baby food - fruit juice		4.1	20.3	0.0	0.0	170.0		3.7	17.5	0.0	0.0	133.3
	Fruit drinks		19.4	57.2	0.0	0.0	525.0		20.7	54.4	0.0	0.0	385.0
	Other beverages		1.3	7.7	0.0	0.0	66.7		4.0	16.6	0.0	0.0	100.0
	Water (plain)		398.7	257.2	200.0	61.7	1296.7		362.3	263.8	313.3	6.7	2160.0
	Soup		73.8	87.1	0.0	0.0	500.0		95.9	119.7	55.8	0.0	673.3
	Water (honey)		3.4	23.7	0.0	0.0	216.7		3.2	17.1	0.0	0.0	120.0
48	All fluids	112	1139.7	365.8	883.4	478.9	2415.0	101	1018.2	372.9	993.4	225.0	2103.3
	Total milks		298.4	189.0	148.2	0.0	843.3		261.2	172.3	220.0	0.0	880.0
	100% fruit juice		5.2	20.5	0.0	0.0	140.0		4.8	23.3	0.0	0.0	166.7
	Carbonated drinks		16.7	42.4	0.0	0.0	220.0		8.1	28.8	0.0	0.0	200.0
	Coffee and tea		6.5	25.4	0.0	0.0	185.0		5.1	21.9	0.0	0.0	150.0
	Baby food - fruit juice		0.4	3.7	0.0	0.0	39.3		1.1	7.8	0.0	0.0	66.7
	Fruit drinks		48.7	94.6	0.0	0.0	561.7		36.2	49.7	0.0	0.0	211.7
	Other beverages		10.5	26.4	0.0	0.0	156.7		17.6	41.6	0.0	0.0	308.3
	Water (plain)		602.7	310.7	397.1	46.7	1750.0		549.4	309.0	496.7	96.7	1676.7
	Soup		146.3	138.8	28.9	0.0	573.3		132.0	118.6	106.7	0.0	500.0
	Water (honey)		4.3	23.4	0.0	0.0	200.0		2.8	15.4	0.0	0.0	120.0

<sup>1</sup>Total milks included breast milk, all kinds of formula (cow, goat, soy and special), cow's milk with varying fat content, soy milk, goat milk and oat milk

<sup>2</sup>Fruit drinks included beverages with less than 100% juice and with added sugars.

<sup>3</sup>Other beverages included cocoa and other instant powdered drinks, and sports drink.

<sup>4</sup>Included all soup and selected Chinese herbal remedies, namely 七星茶 and 開奶茶

<sup>5</sup>Water for diluting honey

### **3.5 Food group consumption of the studied children compared to local recommended intakes**

In this survey, daily intakes of main food groups for children aged one and above were compared to the recommended intakes of local food pyramids (Central Health Education Unit, Department of Health 2008a, 2008b, 2008c). Intakes of vegetables and fruits were low whereas consumption of protein-rich foods was high compared to the recommendations (Tables 3.27 and 3.28). Over 60% of children aged 12 months and above had vegetables consumption and over 30% had fruits consumption below the recommendations. In contrast, the proportion of children with meat/fish/egg/legume intakes higher than the recommendation level increased with age, from 12.9% in 12-month group, to 34.3% in 48-month group. High consumption of milk was observed among the studied children, with 69.6% in 12-month group, 47.6% in 18-month group, 35.7% in 24-month group and 9.9% in 48-month group consuming more than the recommended amount of 2 cups (480 ml) per day.

**Table 3.27: Number and percentage of children with vegetables and fruits intakes below the recommendations**

Food group	Age group (months)	Recommendations	Number and percentage of children with intakes below recommendation		
			Male	Female	Total
Vegetables <sup>1</sup>	12	at least 2 tael <sup>2</sup>	56 (64.4%)	65 (77.4%)	112 (70.8%)
	18		54 (60.7%)	95 (66.0%)	149 (63.9%)
	24		117 (65.7%)	87 (64.0%)	204 (65.0%)
	48	at least 4 tael <sup>2</sup>	104 (92.9%)	90 (89.1%)	194 (91.1%)
Fruits <sup>3</sup>	12	0.5 to 1 portion (40 to 80 g)	31 (35.6%)	47 (56.0%)	78 (45.6%)
	18		38 (42.7%)	51 (35.4%)	89 (38.2%)
	24		57 (32.0%)	45 (33.1%)	102 (32.5%)
	48	1 portion (80 g)	55 (49.1%)	52 (51.5%)	107 (50.2%)

<sup>1</sup>Included all kinds of vegetables, mushroom and seaweeds

<sup>2</sup>One tale approximates 40g

<sup>3</sup>Included fresh and canned fruits, dried fruits and 100% purely natural / freshly made fruit juices

**Table 3.28: Number and percentage of children with meat, poultry, fish, eggs, legumes and milk intakes over the recommendations**

Food group	Age group (months)	Recommendations	Number and percentage of children with intakes over recommendation		
			Male	Female	Total
Meat, poultry, fish, eggs and legumes	12	1 to 2 tael <sup>1</sup>	13 (14.9%)	9 (10.7%)	22 (12.9%)
	18		24 (27.0%)	32 (22.2%)	56 (24.0%)
	24		58 (32.6%)	51 (37.5%)	109 (34.7%)
	48	2 to 3 tael <sup>2</sup>	44 (39.3%)	29 (28.7%)	73 (34.3%)
Milk <sup>2</sup> (excluding other dairy)	12	Approximately 2 cups (480ml)	61 (70.1%)	58 (69.0%)	119 (69.6%)
	18		45 (50.6%)	66 (45.8%)	111 (47.6%)
	24		66 (37.1%)	46 (33.8%)	112 (35.7%)
	48		16 (14.3%)	5 (5.0%)	21 (9.9%)

<sup>1</sup>One tale approximates 40g

<sup>2</sup>Included cow's milk, goat's milk, soy formula / milk powder, and special formula / milk powder

### **3.6 Association between milk intake and consumption of other food groups**

Excessive milk drinking may be a cause of low appetite at meal times and could possibly reduce food variety (Wright et al 2007). Since a substantial proportion of the studied children with milk intake above the recommendation level, analysis of covariance (ANCOVA) was performed to examine the association between milk intake and consumption of other food groups in children aged 12 months and above with adjustment for daily energy intake. Children who drank more milk than the recommended volume generally consumed a smaller amount of other food group (Table 3.29).

**Table 3.29: Mean and 95% CI energy adjusted food group intakes by three categories of milk intake in children aged 12 months and above**

Food group	Age group (months)	Milk intake (< 360 ml)			Milk intake (360-480 ml)			Milk intake (> 480 ml)			P trend <sup>1</sup>
		n	Adjusted mean <sup>2</sup>	95% CI	n	Adjusted mean	95% CI	n	Adjusted mean	95% CI	
Grains and cereals	12	15	464.2	389.7-538.6	37	425.9	378.8-473.0	119	303.1	276.8-329.4	<0.001
	18	40	417.7	376.7-458.6	82	332.1	304.3-359.9	111	282.0	257.7-306.2	<0.001
	24	100	345.4	323.5-367.3	102	292.6	270.9-314.2	112	277.1	256.5-297.8	<0.001
	48	153	345.5	333.0-358.0	36	322.1	296.2-348.0	21	323.4	288.3-358.5	0.220
Vegetables	12	15	65.9	39.8-92.0	37	73.5	57.0-90.0	119	60.3	51.1-69.5	0.839
	18	40	74.7	59.2-90.3	82	71.4	60.8-82.0	111	66.6	57.4-75.8	0.836
	24	100	80.7	71.1-90.3	102	68.2	58.7-77.6	112	60.8	51.7-69.8	0.001
	48	153	90.1	81.5-98.6	36	81.1	63.4-98.8	21	80.5	56.5-104.5	0.042
Fruits	12	15	56.6	35.3-78.0	37	59.5	46.0-73.0	119	44.1	36.6-51.7	0.866
	18	40	61.0	45.8-76.2	82	70.8	60.5-81.1	111	51.9	42.9-60.9	0.481
	24	100	76.9	66.9-86.9	102	69.2	59.3-79.0	112	54.2	44.7-63.6	0.008
	48	153	95.1	85.6-104.7	36	76.1	56.4-95.8	21	59.4	32.7-86.1	0.002
Meat, poultry, fish, eggs and legumes	12	15	54.4	38.0-70.9	37	57.2	46.8-67.6	119	41.8	36.0-47.6	0.381
	18	40	75.0	63.8-86.2	82	60.8	53.2-68.4	111	54.3	47.7-61.0	0.005
	24	100	77.7	70.3-85.0	102	69.6	62.4-76.9	112	63.7	56.8-70.6	0.011
	48	153	113.6	106.6-120.7	36	97.3	82.8-111.8	21	69.3	49.7-89.0	<0.001

<sup>1</sup>P for trend by ANCOVA

<sup>2</sup>ANCOVA model adjusted for daily energy intake

### **3.7 Daily nutrient intake and food sources of nutrients**

#### **3.7.1 Energy intake**

The mean (SD) and percentile energy intakes for boys and girls of different age groups are shown in Tables 3.30. In boys, the mean energy intake was at or above the WHO EAR for all age groups. In girls, the mean energy intake exceeded the WHO EAR for most age groups. The top five food sources of energy are shown in Table 3.31. Milk was the main source of energy for children aged one year old and below, contributing 84.4% energy intake for infants aged 6 months, 62.3% for infants aged 9 months and 45.7% for children aged 12 months. At 18 and 24 months of age, both grains and milk were the two major sources of energy, contributing about 70% energy intake. At 48 months, grains (37.7%) remained as the main source of energy, followed by milk (16.1%) and “grains in mixed dishes” (8.9%).

**Table 3.30: Energy intake per kilogram of body weight per day (kcal/kg/d) by age and sex compared to the WHO EAR**

Sex	Age group (months)	n	Mean	SD	Percentile					WHO EAR <sup>1</sup>
					5	25	50	75	95	
Male	6	92	83.7	15.4	61.1	73.1	84.3	92.8	113.0	81
	9	88	81.1	15.9	57.3	70.1	79.7	91.6	111.4	79
	12	87	96.1	25.3	66.2	79.1	93.0	108.5	143.9	82.4
	18	89	90.2	22.7	53.9	72.2	87.6	106.6	131.3	82.4
	24	178	85.7	17.8	60.0	75.1	84.0	95.1	118.7	83.6
	48	112	78.6	17.4	48.7	67.6	77.5	90.3	108.7	76.8
Female	6	85	79.1	14.5	54.9	70.1	77.3	87.1	105.0	81
	9	76	84.2	18.3	56.4	70.9	83.2	95.1	113.6	78
	12	84	93.0	23.5	62.0	76.4	89.2	105.5	144.5	80.1
	18	144	91.0	21.4	57.9	73.9	91.3	105.3	132.6	80.1
	24	136	86.2	20.5	56.2	72.4	85.1	96.8	118.7	80.6
	48	101	72.1	14.4	52.0	63.1	70.7	81.3	99.7	73.9

<sup>1</sup>: Estimated average requirement (EAR) (World Health Organization, Food and Agricultural Organization of the United Nations 2004a)

**Table 3.31: Top five food sources of energy by age (male and female combined)**

Rank	Age group (months)											
	6		9		12		18		24		48	
	Food group	%	Food group	%	Food group	%	Food group	%	Food group	%	Food group	%
1	Milk	84.4	Milk	62.3	Milk	45.7	Grains and grain products	38.5	Grains and grain products	37.0	Grains and grain products	37.7
2	Grains and grain products	12.5	Grains and grain products	25.7	Grains and grain products	36.5	Milk	37.1	Milk	31.8	Milk	16.1
3	Fruits	0.6	Meat	2.5	Meat	3.1	Meat	4.3	Grains in mixed dishes	4.4	Grains in mixed dishes	8.9
4	Vegetables	0.5	Fruits	2.1	Fruits	2.9	Fruits	3.3	Meat	4.2	Meat	6.1
5	Soup / Meat <sup>1</sup>	0.4	Vegetables	2.0	Vegetables	2.2	Grains in mixed dishes	2.7	Fruits	3.4	Desserts, snacks, sweets	4.9

<sup>1</sup> Soup group and meat group each contributed 0.4% of total energy intake



### **3.7.2 Macronutrients, cholesterol and fibre intakes**

The mean (SD) and percentile intakes of carbohydrate, protein, total fat, cholesterol and fibre for boys and girls of different age groups are shown in Tables 3.32 and 3.33.

The total carbohydrate intake provided approximately 50%, 56% and 60% of total energy intake for the studied children at 6 months, 9 months, and 12 months and above respectively (Table 3.34). Milk was the main source of carbohydrate intake at 6 month and 9 months, contributing 76.8% and 53% of total carbohydrate intake respectively. From 12 months onwards, grains and grain products dominated as the main source of carbohydrate intake and contributed approximately 50% of the total carbohydrate intake (Table 3.35).

Regarding protein intake, the average protein intake of boys and girls in all age groups were well above the WHO/FAO average requirement and safe level for protein. Out of 1,272 children, only two (0.2%) children had protein intake less than the average requirement for protein. 99.0% had an intake above the safe individual intake level. Majority of the children had protein intake over these two levels (Tables 3.32 and 3.33). The protein intake provided approximately 10% to 16% of total energy intake in all age groups (Table 3.34). Milk was the main source of protein intake from 6 months to 24 months, contributing 83.6% of total protein intake at 6 months, 56.5% at 9 months, 41.4% at 12 months, 33.7% at 18 months and 29.4% at 24 months. With increasing age, grains and grain products, meat, fish and fish products were other food sources of protein intake (Table 3.36).

The average proportion of total energy derived from total fat decreased from approximately 40% at 6 months to 25% at 48 months (Table 3.34). Milk was the major source of total fat intake in all age groups (Table 3.37). However, as estimation of fats and oils used in

cooking and at the table is subject to large bias in a dietary survey, caution should be taken when interpreting these results.

The average cholesterol intake of boys and girls increased with age (Tables 3.32 and 3.33). Overall, there were 3 (1.8%), 3 (1.3%), 7 (2.2%) and 15 (7%) of children with daily cholesterol intake at or above 300 mg at 12, 18, 24 and 48 months respectively. Milk was the main source of cholesterol intake at 6 months of age. With increasing age, contribution of egg and meat to the cholesterol intake gradually increased (Table 3.38).

The average fibre intake increased with age, and was low when compared to the recommended level (Tables 3.32 and 3.33). Over 80% of children at 24 and 48 months had fibre intake level lower than the recommendation. Grains and grain products were the main source of fibre intake, followed by vegetables and fruits (Table 3.39).

**Table 3.32: Daily intakes of macronutrients, cholesterol and fibre by age in male**

Nutrient	Age group (months)	Percentile								WHO average requirement, unless specified	% children below WHO average requirement, unless specified	WHO safe level, unless specified	% children below WHO safe level, unless specified
		n	Mean	SD	5	25	50	75	95				
Carbohydrate (g)	6	92	83.2	18.1	58.2	69.3	81.2	93.2	113.7	---	---	---	---
	9	88	102.3	23.9	63.0	88.8	99.0	117.2	151.0	---	---	---	---
	12	87	140.6	38.9	93.3	108.0	133.7	161.6	224.7	---	---	---	---
	18	89	152.5	41.6	90.6	122.1	145.5	183.5	226.1	---	---	---	---
	24	178	158.0	38.2	102.1	133.3	151.2	178.0	231.1	---	---	---	---
	48	112	193.5	43.1	132.3	161.8	187.2	221.1	272.2	---	---	---	---
Protein (g/kg body weight)	6	92	2.10	0.65	1.36	1.72	1.99	2.34	3.20	1.12 <sup>1</sup>	0.0	1.31 <sup>1</sup>	4.3
	9	88	2.68	0.83	1.58	2.01	2.53	3.14	4.59	1.12	0.0	1.31	0.0
	12	87	3.49	1.08	1.92	2.84	3.29	4.10	5.55	0.95	0.0	1.14	0.0
	18	89	3.39	1.04	1.96	2.72	3.23	3.90	5.18	0.85	0.0	1.03	0.0
	24	178	3.27	0.81	2.08	2.73	3.16	3.71	4.80	0.79	0.0	0.97	0.0
	48	112	3.15	0.80	1.96	2.63	3.08	3.66	4.62	0.69	0.0	0.86	0.0
Total fat (g)	6	92	30.6	6.6	17.2	27.1	30.8	34.6	41.5	---	---	---	---
	9	88	23.7	5.0	15.8	20.1	23.9	26.9	31.7	---	---	---	---
	12	87	23.8	6.7	14.4	19.7	23.0	27.7	38.0	---	---	---	---
	18	89	24.4	6.7	13.9	19.5	23.8	28.4	37.8	---	---	---	---
	24	178	26.5	6.5	16.1	22.1	26.0	30.4	37.8	---	---	---	---
	48	112	35.3	10.3	21.3	27.9	34.3	40.7	52.7	---	---	---	---
Cholesterol (mg)	6	92	51.0	45.1	9.6	16.2	34.3	72.6	147.8	---	---	---	---
	9	88	72.2	54.1	16.3	28.4	61.4	94.1	179.9	---	---	---	---
	12	87	100.4	68.1	24.6	49.5	85.7	135.8	239.3	<300 <sup>2</sup>	1.1 <sup>3</sup>	---	---
	18	89	108.0	83.4	22.5	49.0	86.0	152.7	273.6	<300	3.4	---	---
	24	178	120.6	72.3	39.3	64.0	105.9	160.4	281.9	<300	3.4	---	---
	48	112	182.2	98.7	56.7	111.8	164.7	231.3	360.6	<300	8.9	---	---
Fibre (g)	6	92	0.6	0.7	0.0	0.1	0.3	0.8	2.2	---	---	---	---
	9	88	2.1	1.3	0.3	1.1	1.8	2.7	4.6	---	---	---	---
	12	87	3.8	1.5	1.2	2.8	3.6	4.5	6.8	---	---	---	---
	18	89	4.4	1.8	1.6	3.0	4.3	5.4	7.6	---	---	---	---
	24	178	4.8	1.9	2.1	3.4	4.7	6.0	8.2	7 <sup>4</sup>	86.0 <sup>5</sup>	---	---
	48	112	7.0	2.6	3.3	5.0	6.6	8.7	12.1	9	77.7	---	---

<sup>1</sup>: WHO average requirement and safe level (World Health Organization, Food and Agricultural Organization of the United Nations, United Nations University 2004a, 2007)

<sup>2</sup>: Daily intake of <300 mg cholesterol is recommended for children aged one year and above (U.S. Department of Agriculture and U.S. Department of Health and Human Services 2010)

<sup>3</sup>: Percentage of children with daily cholesterol intake  $\geq$  300 mg

<sup>4</sup>: Recommendation of age plus 5 g per day is recommended for children aged 2 years and above (Williams et al 1995). No recommendation of fibre intake is set for children aged below two years old.

<sup>5</sup>: Percentage of children with daily fibre intake below the recommendation

**Table 3.33: Daily intakes of macronutrients, cholesterol and fibre by age in female**

Nutrient	Age group (months)	Percentile								WHO average requirement, unless specified	% children below WHO average requirement, unless specified	WHO safe level, unless specified	% children below WHO safe level, unless specified
		n	Mean	SD	5	25	50	75	95				
Carbohydrate (g)	6	85	73.4	15.6	50.8	63.0	70.6	82.3	105.2	---	---	---	---
	9	76	98.6	23.0	67.5	78.6	100.4	110.4	135.8	---	---	---	---
	12	84	125.7	35.9	74.9	101.6	119.2	141.9	212.4	---	---	---	---
	18	144	145.1	38.7	92.3	117.0	138.1	169.2	220.7	---	---	---	---
	24	136	151.8	38.9	99.5	122.6	142.5	176.8	232.5	---	---	---	---
	48	101	169.1	34.5	118.7	147.4	166.2	188.6	241.4	---	---	---	---
Protein (g/kg body weight)	6	85	1.87	0.48	1.19	1.56	1.78	2.15	2.70	1.12 <sup>1</sup>	2.4	1.31 <sup>1</sup>	10.6
	9	76	2.70	0.92	1.53	2.06	2.58	3.14	4.14	1.12	0.0	1.31	0.0
	12	84	3.32	1.01	1.80	2.67	3.26	3.96	4.94	0.95	0.0	1.14	0.0
	18	144	3.49	1.02	1.97	2.69	3.45	4.15	5.31	0.85	0.0	1.03	0.0
	24	136	3.28	0.98	1.88	2.64	3.21	3.85	4.85	0.79	0.0	0.97	0.0
	48	101	2.92	0.67	1.91	2.42	2.97	3.32	3.96	0.69	0.0	0.86	0.0
Total fat (g)	6	85	26.9	5.9	17.6	22.3	27.4	32.1	35.1	---	---	---	---
	9	76	23.9	7.0	13.5	18.8	23.5	28.0	38.6	---	---	---	---
	12	84	23.0	7.0	12.4	18.7	22.7	27.0	35.4	---	---	---	---
	18	144	23.4	6.0	13.8	19.5	22.9	27.0	34.2	---	---	---	---
	24	136	26.4	7.0	15.5	22.6	26.5	30.0	37.4	---	---	---	---
	48	101	30.9	7.3	18.2	25.7	30.0	35.3	44.3	---	---	---	---
Cholesterol (mg)	6	85	47.4	42.4	8.9	14.1	28.5	76.9	134.4	---	---	---	---
	9	76	75.7	63.2	15.9	26.2	46.4	103.7	227.7	---	---	---	---
	12	84	88.9	69.4	21.6	42.9	68.1	110.2	245.4	<300 <sup>2</sup>	2.4 <sup>3</sup>	---	---
	18	144	98.6	63.7	24.9	48.8	81.5	128.3	251.9	<300	0.0	---	---
	24	136	116.3	66.9	36.9	64.1	106.3	148.2	260.1	<300	0.7	---	---
	48	101	154.7	68.8	61.2	106.1	148.9	189.8	304.4	<300	5.0	---	---
Fibre (g)	6	85	0.6	0.8	0.0	0.1	0.3	0.9	2.2	---	---	---	---
	9	76	2.0	1.2	0.3	1.2	1.9	2.7	4.0	---	---	---	---
	12	84	3.1	1.6	1.1	2.0	2.9	4.0	5.8	---	---	---	---
	18	144	4.4	1.9	1.8	3.0	4.2	5.4	8.1	---	---	---	---
	24	136	4.7	2.0	2.0	3.4	4.3	5.7	8.5	7 <sup>4</sup>	86.0 <sup>5</sup>	---	---
	48	101	6.4	2.1	2.9	4.8	6.3	7.9	10.7	9	89.1	---	---

<sup>1</sup>: WHO average requirement and safe level (World Health Organization, Food and Agricultural Organization of the United Nations, United Nations University 2004a, 2007)

<sup>2</sup>: Daily intake of <300 mg cholesterol is recommended for children aged one year and above (U.S. Department of Agriculture and U.S. Department of Health and Human Services 2010)

<sup>3</sup>: Percentage of children with daily cholesterol intake  $\geq$  300 mg

<sup>4</sup>: Recommendation of age plus 5 g per day is recommended for children aged 2 years and above (Williams et al 1995). No recommendation of fibre intake is set for children aged below two years old.

<sup>5</sup>: Percentage of children with daily fibre intake below the recommendation

**Table 3.34: Source of energy from macronutrients by age and sex**

Source of energy	Age group (months)	Male								Female							
		n	Mean	SD	Percentile					n	Mean	SD	Percentile				
Carbohydrate (%)	6	92	49.2	5.7	42.7	45.1	48.1	51.5	60.7	85	49.6	5.8	42.7	45.3	48.2	53.0	59.9
	9	88	56.7	5.0	47.9	53.4	56.0	60.9	64.4	76	56.4	6.9	45.7	51.0	56.3	61.5	69.4
	12	87	61.4	7.0	49.3	56.7	61.4	66.3	72.0	84	60.3	6.8	48.6	55.9	60.4	64.8	72.2
	18	89	62.0	6.6	50.6	59.5	61.6	66.3	72.7	144	62.0	5.6	52.4	58.4	62.5	65.2	71.2
	24	178	61.5	5.8	52.8	57.2	61.1	65.6	71.8	136	61.1	6.4	50.1	56.6	61.4	65.4	71.6
	48	112	60.2	5.4	51.2	56.2	60.9	64.3	68.0	101	60.0	5.3	49.9	56.7	60.5	63.7	69.4
Protein (%)	6	92	10.1	2.6	7.5	8.8	9.3	10.2	14.8	85	9.4	1.7	7.6	8.3	8.9	9.8	13.3
	9	88	13.1	2.7	9.4	11.4	12.7	14.5	18.3	76	12.8	3.1	8.2	10.8	12.7	13.9	17.7
	12	87	14.6	3.0	10.5	12.6	14.4	16.0	21.0	84	14.3	2.6	10.2	12.4	14.2	15.9	17.8
	18	89	15.1	3.0	10.8	13.1	14.6	16.5	21.1	144	15.3	2.4	11.7	13.6	14.9	16.7	19.6
	24	178	15.3	2.6	11.8	13.4	15.0	16.6	20.6	136	15.2	2.6	11.2	13.5	15.0	16.8	20.4
	48	112	16.1	2.2	12.6	14.4	16.1	17.5	19.6	101	16.3	2.6	12.7	14.4	16.0	17.5	21.8
Fat (%)	6	92	41.1	7.1	25.9	37.6	42.8	46.3	48.4	85	41.2	7.0	27.5	37.6	43.4	46.2	49.3
	9	88	30.2	5.8	20.3	25.8	30.3	34.2	40.2	76	30.9	7.4	18.4	25.5	30.4	37.3	42.7
	12	87	23.8	5.9	14.7	20.3	24.0	27.1	35.2	84	25.3	6.5	14.6	19.7	26.1	29.6	34.8
	18	89	22.8	5.3	14.7	19.4	22.7	26.0	31.6	144	23.0	4.9	14.8	19.4	23.2	26.7	30.7
	24	178	23.6	5.0	14.8	19.7	23.8	26.8	31.9	136	24.3	5.4	15.7	19.5	24.3	28.2	33.4
	48	112	24.7	4.7	17.6	21.0	23.8	28.3	33.2	101	24.8	4.5	17.7	21.6	24.4	27.7	32.5

**Table 3.35: Top five food sources of carbohydrate by age (male and female combined)**

Rank	Age group (months)											
	6		9		12		18		24		48	
	Food group	%	Food group	%	Food group	%	Food group	%	Food group	%	Food group	%
1	Milk	76.8	Milk	53.0	Grains and grain products	50.3	Grains and grain products	52.3	Grains and grain products	50.2	Grains and grain products	51.9
2	Grains and grain products	20.0	Grains and grain products	38.3	Milk	38.0	Milk	31.2	Milk	27.4	Milk	14.0
3	Fruits	1.2	Fruits	3.6	Fruits	4.6	Fruits	5.1	Fruits	5.3	Grains in mixed dishes	8.0
4	Vegetables	0.7	Vegetables	2.5	Vegetables	2.8	Grains in mixed dishes	2.5	Grains in mixed dishes	3.7	Fruits	5.5
5	Soup	0.5	Soup / Beverages / Desserts, snacks, sweets <sup>1</sup>	0.6	Grains in mixed dishes	1.3	Vegetables	2.4	Desserts, snacks, sweets	3.3	Desserts, snacks, sweets	5.5

<sup>1</sup> Soup group, beverages group, and desserts, snacks, sweets group each contributed 0.6% of total carbohydrate intake

**Table 3.36: Top five food sources of protein by age (male and female combined)**

Rank	Age group (months)											
	6		9		12		18		24		48	
	Food group	%	Food group	%	Food group	%	Food group	%	Food group	%	Food group	%
1	Milk	83.6	Milk	56.5	Milk	41.4	Milk	33.7	Milk	29.4	Grains and grain products	22.7
2	Grains and grain products	10.2	Grains and grain products	16.8	Grains and grain products	23.0	Grains and grain products	24.0	Grains and grain products	22.7	Meat	17.4
3	Meat	1.7	Meat	10.6	Meat	11.4	Meat	14.9	Meat	13.2	Milk	16.4
4	Fish and fish products	1.3	Fish and fish products	5.6	Fish and fish products	9.0	Fish and fish products	7.9	Fish and fish products	8.3	Fish and fish products	8.1
5	Soup	0.9	Vegetables	2.9	Poultry	3.7	Poultry	3.8	Poultry	4.7	Poultry	7.1

**Table 3.37: Top five food sources of total fat by age (male and female combined)**

Rank	Age group (months)											
	6		9		12		18		24		48	
	Food group	%	Food group	%	Food group	%	Food group	%	Food group	%	Food group	%
1	Milk	95.5	Milk	84.7	Milk	69.9	Milk	57.0	Milk	45.6	Milk	21.5
2	Grains and grain products	2.1	Meat	3.2	Grains and grain products	6.3	Meat	8.1	Grains and grain products	8.7	Grains in mixed dishes	13.5
3	Egg	0.6	Grains and grain products	3.1	Meat	5.7	Grains and grain products	7.9	Meat	8.3	Meat	12.1
4	Meat	0.5	Egg	3.1	Egg	4.4	Egg	4.7	Grains in mixed dishes	7.2	Grains and grain products	10.7
5	Soup / Grains in mixed dishes <sup>1</sup>	0.3	Fish and fish products	1.7	Fish and fish products	2.8	Grains in mixed dishes	4.3	Egg	5.4	Fats and oils	6.4

<sup>1</sup> Soup group and grains in mixed dishes group each contributed 0.3% of total fat intake

**Table 3.38: Top five food sources of cholesterol by age (male and female combined)**

Rank	Age group (months)											
	6		9		12		18		24		48	
	Food group	%	Food group	%	Food group	%	Food group	%	Food group	%	Food group	%
1	Milk	85.2	Milk	49.8	Milk	32.0	Egg	25.3	Egg	30.1	Egg	32.2
2	Egg	6.5	Egg	20.9	Egg	26.2	Milk	24.6	Milk	19.1	Meat	19.8
3	Grains and grain products	2.8	Meat	13.8	Meat	17.1	Meat	22.3	Meat	18.7	Grains in mixed dishes	12.1
4	Meat	2.7	Fish and fish products	8.3	Fish and fish products	12.2	Fish and fish products	9.3	Fish and fish products	8.5	Milk	9.9
5	Fish and fish products	1.5	Poultry	3.9	Poultry	4.7	Poultry	6.7	Grains in mixed dishes	8.2	Poultry	9.0

**Table 3.39: Top five food sources of fibre by age (male and female combined)**

Rank	Age group (months)											
	6		9		12		18		24		48	
	Food group	%	Food group	%	Food group	%	Food group	%	Food group	%	Food group	%
1	Grains and grain products	62.7	Grains and grain products	45.3	Grains and grain products	45.9	Grains and grain products	47.4	Grains and grain products	45.4	Grains and grain products	40.9
2	Fruits	17.0	Vegetables	32.8	Vegetables	30.7	Vegetables	25.0	Vegetables	22.8	Vegetables	22.0
3	Vegetables	16.8	Fruits	16.7	Fruits	18.1	Fruits	17.2	Fruits	16.7	Fruits	17.1
4	Beverages	1.3	Grains in mixed dishes	1.3	Grains in mixed dishes	1.4	Grains in mixed dishes	2.2	Grains in mixed dishes	4.0	Grains in mixed dishes	7.1
5	Soup	0.7	Dim sum	0.9	Soup	1.1	Milk	2.0	Dim sum	3.3	Desserts, snacks, sweets	3.4

### 3.7.3 Micronutrient intakes

Tables 3.40 to 3.41 show the mean (SD) and percentiles intakes of minerals and vitamins of boys and girls at different age groups. The median intake of calcium, magnesium, iron, zinc and vitamin C of all age group were above age-specific RNIs, except the calcium intake in the 48-month group (Tables 3.40 and 3.41).

The percentage of children with calcium intake below the WHO/FAO average requirement or EAR increased with age. 3.4%, 8.5% and 5.8% of children in 6-, 9- and 12-month groups respectively with calcium intake below the average requirement. 10.7%, 13.1% and 36.2% in the 18-, 24- and 48-month groups respectively had calcium intake below the WHO/FAO EAR (Tables 3.40 and 3.41). Milk was the main source of calcium intake for all age groups, contributing over 80% of total calcium intake at or before 12 months, approximately 70% at 18 and 24 months, and around 50% at 48 months (Table 3.42).

The median intake of dietary iron of all age groups was above the age-specific RNIs. A significant proportion of children in 6-, 9- and 12-month groups had iron intake below the RNI (Tables 3.40 and 3.41). 22.0%, 16.5% and 12.3% of the 6-, 9- and 12-month groups respectively having dietary iron intake below 6 mg/d, the intake level that meets the WHO/FAO median total absolute requirement of iron assuming dietary iron bioavailability of 12% (refer to section 2.10.3 and table 2.2 for details). Compared to the age-specific EARs of the US IOM, the percentage of children with iron intake below the EAR of 6.9 mg/d was 30.5%, 29.9% and 19.9% for 6-, 9- and 12-month groups respectively. Cautions should be taken when interpreting these findings. Although majority of children with inadequate iron intake were breastfed children or mixed fed children, it should be noted that the iron bioavailability of



breast milk (about 50%) was high compared to that of formula milk (about 10%). Therefore the iron status among these children cannot be simply reflected by the present results and data on other parameters, such as growth status and biochemical measurements should be considered to assure the prevalence of these deficiencies (Department of Health 1991, Institute of Medicine 2006, 中國營養學會 2000). Milk, grains and vegetables were the main sources of total iron intake for all age groups, but children at 48 months obtained iron from more diverse food groups (Table 3.43).

The average zinc intakes of the studied children increased with age. The median intake of dietary zinc of all groups was above the age-specific RNIs (Tables 3.40 and 3.41). Overall, 6.4% had zinc intake below the EAR. This proportion of zinc inadequacy was low compared to the Population Zinc Inadequacy Indicator of > 25% as defined by the International Zinc Nutrition Consultative Group. Inadequate dietary zinc intake was more common among in the 9-month group in which 21.3% children had the dietary zinc intake below the EAR. Milk, grains and meats were the main sources of zinc intake for all age groups (Table 3.44). Similarly, as mentioned above, there are several methodological limitations in developing dietary recommendations, thus data on other parameters, such as growth status and biochemical measurements should be considered to assure the prevalence of these deficiencies (Department of Health 1991, Institute of Medicine 2006, 中國營養學會 2000).

Overall, less than 10% of children had sodium intake higher than the recommendation at or before 18 months of age. The corresponding proportion of children with sodium intake above the recommendation was 1.7%, 4.3%, 4.1%, and 9.0% for the 6-, 9-, 12-, and 18-month groups respectively. At 24- and 48-month groups, the proportion of children with sodium intake

higher than the recommendation increased to 26.1% and 31.0% respectively (Tables 3.40 and 3.41). Milk contributed to the majority of total sodium intake at or before 12 months. From 18 months onwards, milk, condiments and sauces, grains were the main sources of sodium intake (Table 3.48). However, cautions should be taken when interpreting data on sodium intake since the estimated intakes of salt and other condiments are subject to large bias and usually an underestimation of salt and other condiments intakes is resulted in dietary surveys.

Regarding phosphorus intake, milk was the major source of phosphorus intake at all age groups, but its contribution decreased as the child grew. Meanwhile, the contribution of other food groups, including grains, meats, fish and fish products to the total phosphorus intake increased from 18 months onwards (Table 3.45). Similarly, milk and grains were the major sources of magnesium, and with increasing age, vegetables and fruits increased their contribution to the total magnesium intake (Table 3.46). For potassium intake, milk was the major source of potassium, and with increasing age, vegetables, fruits and grains increased their contribution to the total potassium intake (Table 3.47). Regarding vitamin C intake, milk, vegetables and fruits were the main sources of vitamin C intake for the studied children at most age groups (Table 3.49), and only a small proportion of children with vitamin C intake below the WHO/FAO EAR (Tables 3.40 and 3.41).

**Table 3.40: Daily intakes of selected minerals and vitamins by age in male**

Nutrient	Age group (months)	Percentile								WHO AR or EAR <sup>1</sup>	% below WHO AR or EAR	WHO RNI <sup>1</sup>	% below RNI	WHO UL <sup>1</sup>	% over WHO UL
		n	Mean	SD	5	25	50	75	95						
Calcium (mg)	6	92	536.9	176.1	304.6	424.7	487.4	621.2	915.2	240(BF) <sup>2</sup> 300(FF)	1.1	300(BF) <sup>2</sup> 400(FF)	18.5	3000	0.0
	9	88	549.0	187.8	279.3	410.3	517.9	685.3	894.6	300	6.8	400	23.9	3000	0.0
	12	87	607.5	206.9	238.7	478.1	621.4	739.8	950.1	300	8.0	400	17.2	3000	0.0
	18	89	619.8	170.3	353.8	502.9	615.2	729.1	908.6	417	10.1	500	24.7	3000	0.0
	24	178	645.0	204.9	350.8	513.6	632.2	748.4	986.3	417	11.8	500	23.0	3000	0.0
	48	112	609.5	213.3	305.4	463.4	587.2	731.4	1019.7	500	30.4	600	52.7	3000	0.0
Phosphorus (mg)	6	92	332.2	133.0	186.0	234.7	282.6	410.1	611.1	---	---	---	---	---	---
	9	88	443.5	138.1	220.6	320.3	455.5	548.3	688.4	---	---	---	---	---	---
	12	87	580.6	156.4	305.0	491.9	578.5	672.4	866.6	---	---	---	---	---	---
	18	89	615.6	156.8	418.8	500.5	576.6	707.3	857.2	---	---	---	---	---	---
	24	178	653.4	143.1	430.0	546.6	644.1	739.6	891.4	---	---	---	---	---	---
	48	112	782.3	179.8	490.0	664.0	751.7	908.3	1125.5	---	---	---	---	---	---
Magnesium (mg)	6	92	58.1	19.8	33.7	43.1	53.3	68.5	95.6	---	---	26(BF) <sup>2</sup> 36(FF)	0.0	---	---
	9	88	78.1	22.9	42.7	63.4	75.8	89.9	125.0	---	---	54	0.0	---	---
	12	87	107.9	30.8	58.9	89.3	105.0	122.7	158.8	---	---	54	1.1	---	---
	18	89	120.1	33.2	71.3	97.6	115.2	142.1	191.8	---	---	60	0.0	---	---
	24	178	127.4	30.2	79.8	106.0	125.2	147.5	176.9	---	---	60	0.0	---	---
	48	112	158.7	37.1	105.5	128.2	154.0	185.3	223.2	---	---	76	0.0	---	---
Potassium (mg)	6	92	705.9	180.5	485.8	570.2	671.7	787.2	1077.3	---	---	---	---	---	---
	9	88	878.1	217.5	512.2	707.0	886.4	1021.2	1253.9	---	---	---	---	---	---
	12	87	1167.6	309.3	661.7	983.0	1116.4	1327.9	1825.7	---	---	---	---	---	---
	18	89	1219.1	318.9	724.7	970.7	1217.5	1464.0	1807.5	---	---	---	---	---	---
	24	178	1286.7	312.3	808.3	1062.2	1288.5	1478.5	1815.0	---	---	---	---	---	---
	48	112	1470.5	347.1	907.8	1217.4	1423.8	1713.4	2116.8	---	---	---	---	---	---
Sodium (mg)	6	92	190.6	61.5	117.0	147.6	172.8	215.1	310.4	<393 <sup>3</sup>	2.2	---	---	---	---
	9	88	251.4	109.4	134.1	178.0	227.2	296.4	464.5	<393	8.0	---	---	---	---
	12	87	386.9	178.0	157.9	262.9	350.2	480.8	814.6	<786	5.7	---	---	---	---
	18	89	490.7	190.7	249.9	350.5	463.8	585.0	944.5	<786	5.6	---	---	---	---
	24	178	668.4	269.2	295.7	493.7	626.5	814.3	1159.0	<786	27.5	---	---	---	---
	48	112	1131.0	460.8	591.5	850.0	1064.6	1319.4	1906.2	<1179	34.8	---	---	---	---
Iron (mg)	6	92	8.5	3.4	2.7	7.0	8.6	10.2	14.3	6.0 <sup>4</sup>	19.6 (2.7) <sup>5</sup>	7.7	40.2 (25.7) <sup>5</sup>	---	---
	9	88	8.4	2.5	3.4	6.8	8.8	9.9	12.5	6.0	12.5 (5.2)	7.7	37.5 (29.9)	---	---
	12	87	9.0	2.8	3.6	7.4	8.9	11.2	13.8	6.0	10.3 (3.8)	7.7	28.7 (24.1)	65	0.0
	18	89	9.0	2.3	5.5	7.7	8.9	10.6	12.5	3.1	1.1 (0.0)	3.9	1.1 (0.0)	65	0.0
	24	178	9.1	2.3	5.2	7.5	9.0	10.5	13.3	3.1	0.0 (0.0)	3.9	0.6 (0.0)	65	0.0
	48	112	8.9	2.8	4.7	7.0	8.6	10.4	14.1	3.3	0.9 (0.9)	4.2	2.7 (2.7)	65	0.0

**Table 3.40 (cont): Daily intakes of selected minerals and vitamins by age in male**

Nutrient	Age group (months)	Percentile								WHO AR or EAR <sup>1</sup>	% below WHO AR or EAR	WHO RNI <sup>1</sup>	% below RNI	WHO UL <sup>1</sup>	% over WHO UL
		n	Mean	SD	5	25	50	75	95						
Zinc (mg)	6	92	4.6	1.4	2.6	3.5	4.4	5.6	7.0	3.0 <sup>6</sup>	10.9 <sup>6</sup>	4.1 <sup>6</sup>	43.5 <sup>6</sup>	23-28 <sup>7</sup>	0.0
	9	88	4.7	1.8	2.0	3.5	4.5	6.0	7.5	3.0	18.2	4.1	43.2	23-28	0.0
	12	87	5.0	2.0	2.2	3.6	5.0	6.4	8.0	2.0	2.3	4.1	33.3	23-28	0.0
	18	89	5.0	2.1	2.5	3.5	4.5	6.0	9.7	2.0	0.0	2.4	4.5	23-28	0.0
	24	178	5.3	1.8	2.7	3.9	5.1	6.4	8.8	2.0	1.1	2.4	1.7	23-28	0.0
	48	112	6.7	2.0	3.9	5.4	6.5	7.5	10.4	2.4	0.0	2.9	2.7	23-28	0.0
Vitamin C (mg)	6	92	69.6	23.4	39.6	53.3	65.0	82.7	114.2	---	---	25	0.0	1000	0.0
	9	88	71.8	25.2	36.5	52.2	66.6	89.3	122.4	---	---	30	1.1	1000	0.0
	12	87	81.4	29.0	37.7	61.3	77.4	98.4	138.0	---	---	30	2.3	1000	0.0
	18	89	78.7	31.9	37.5	56.0	71.9	97.2	145.1	25 <sup>8</sup>	1.1	30	1.1	1000	0.0
	24	178	85.1	34.8	40.2	60.7	80.4	102.4	154.4	25	1.1	30	1.7	1000	0.0
	48	112	81.1	43.4	23.6	52.5	71.2	102.3	177.8	25	6.2	30	8.9	1000	0.0

<sup>1</sup>: Based on the WHO recommendation (World Health Organization, Food and Agricultural Organization of the United Nations 2004b, 2006), unless specified

<sup>2</sup>: BF stands for breastfed children whereas FF stands for formula fed children

<sup>3</sup>: Based on the recommendation of the Scientific Advisory Committee on Nutrition (Scientific Advisory Committee on Nutrition 2003)

<sup>4</sup>: Cut-off values derived by back-calculation of the median absolute requirement of iron and assuming iron bioavailability of 12% for 6- to 12-month groups, and 15% for 18 months of age or above

<sup>5</sup>: Data in bracket refers to the percentage for children not breastfed or mixed fed. Cautions should be taken when interpreting the relatively high percentage of children of all milk feeding types with intake below the calculated cut-off level derived from the median absolute iron requirement of the WHO/FAO (see section 2.10.3 and table 2.2). Although majority of these children were breastfed children or mixed fed children, readers should take into account the issue of the high iron bioavailability of breast milk (about 50%) compared to that of formula milk (about 10%). Therefore the high percentage of inadequate iron intake among breastfed children or mixed fed children may not accurately reflect their iron status. Separate figures are therefore given for children being not breastfed or mixed fed for reference.

<sup>6</sup>: Recommended intake of zinc for 6 to 12 months was based on mixed or refined plant-based diets (de Benoist et al 2007, International Zinc Nutrition Consultative Group 2007) and that for above 1 year of age was based on high bioavailability (World Health Organization, Food and Agricultural Organization of the United Nations 2006),

<sup>7</sup>: The WHO sets a range of UL for zinc for children aged 6 months to 9 years. In this study, the lower UL limit (23mg/d) was used as UL cutoff for comparison.

<sup>8</sup>: EAR for vitamin C is only available for children aged above 1 year of age

**Table 3.41: Daily intakes of selected minerals and vitamins by age in female**

Nutrient	Age group (months)	Percentile								WHO AR or EAR <sup>1</sup>	% below WHO AR or EAR	WHO RNI <sup>1</sup>	% below RNI	WHO UL <sup>1</sup>	% over WHO UL
		n	Mean	SD	5	25	50	75	95						
Calcium (mg)	6	85	451.8	141.7	266.7	368.7	416.3	507.1	776.7	240 (BF) <sup>2</sup> 300 (FF)	5.9	300(BF) <sup>2</sup> 400(FF)	40.0	3000	0.0
	9	76	495.6	166.2	260.6	357.5	468.0	579.9	881.5	300	10.5	400	28.9	3000	0.0
	12	84	621.0	204.3	335.5	459.6	616.5	734.7	1043.2	300	3.6	400	13.1	3000	0.0
	18	144	646.0	218.8	343.2	500.7	600.8	761.4	1074.1	417	11.1	500	25.0	3000	0.0
	24	136	641.1	209.7	346.8	506.9	626.5	757.5	971.7	417	14.7	500	22.1	3000	0.0
	48	101	562.5	199.0	260.5	433.6	537.9	707.3	905.2	500	42.6	600	62.4	3000	0.0
Phosphorus (mg)	6	85	280.0	117.1	145.5	203.6	242.9	308.8	567.6	---	---	---	---	---	---
	9	76	399.2	128.9	193.8	290.7	399.9	496.9	611.1	---	---	---	---	---	---
	12	84	535.9	145.2	317.4	435.2	518.1	620.8	841.3	---	---	---	---	---	---
	18	144	614.6	166.6	368.2	482.2	594.1	732.2	940.5	---	---	---	---	---	---
	24	136	634.8	152.3	397.0	537.2	630.4	723.2	895.0	---	---	---	---	---	---
	48	101	692.1	147.1	467.4	598.4	686.2	787.2	955.4	---	---	---	---	---	---
Magnesium (mg)	6	85	50.9	18.8	28.0	38.6	46.5	58.9	86.9	---	---	26(BF) <sup>2</sup> 36(FF)	0.0	---	---
	9	76	73.5	22.0	43.4	56.2	70.1	85.4	114.0	---	---	54	0.0	---	---
	12	84	100.4	27.9	56.1	83.3	95.2	117.9	146.5	---	---	54	0.0	---	---
	18	144	117.0	30.5	69.1	94.4	117.2	135.5	169.4	---	---	60	0.0	---	---
	24	136	128.0	35.5	79.4	103.0	125.5	147.3	191.3	---	---	60	0.0	---	---
	48	101	141.9	31.7	89.6	120.6	138.8	160.6	202.8	---	---	76	0.0	---	---
Potassium (mg)	6	85	621.0	156.3	435.4	525.8	580.3	691.7	956.1	---	---	---	---	---	---
	9	76	831.3	200.4	529.2	697.1	809.4	963.5	1204.2	---	---	---	---	---	---
	12	84	1039.0	288.1	602.2	879.2	1006.1	1156.5	1596.6	---	---	---	---	---	---
	18	144	1198.1	307.4	682.8	965.9	1238.5	1401.3	1676.8	---	---	---	---	---	---
	24	136	1273.1	307.4	757.1	1069.7	1249.6	1488.7	1851.3	---	---	---	---	---	---
	48	101	1315.9	301.5	837.7	1096.6	1295.9	1507.8	1808.0	---	---	---	---	---	---
Sodium (mg)	6	85	164.2	59.9	94.6	131.3	154.6	177.5	262.6	<393 <sup>3</sup>	1.2	---	---	---	---
	9	76	217.3	64.9	122.5	165.1	211.2	265.8	342.7	<393	0.0	---	---	---	---
	12	84	361.5	174.8	182.0	248.5	319.5	433.0	698.7	<786	2.4	---	---	---	---
	18	144	524.6	195.3	243.5	370.1	513.0	621.4	942.2	<786	11.1	---	---	---	---
	24	136	650.3	289.6	313.1	465.5	613.4	779.6	1128.4	<786	24.3	---	---	---	---
	48	101	1005.4	332.9	532.9	732.1	979.7	1187.6	1596.7	<1179	26.7	---	---	---	---
Iron (mg)	6	85	7.9	4.4	1.1	6.0	7.7	8.9	16.3	6.0 <sup>4</sup>	24.7 (13.2) <sup>5</sup>	7.7	49.4 (42.6) <sup>5</sup>	---	---
	9	76	7.7	2.6	2.3	6.4	7.9	9.4	12.1	6.0	21.1 (3.3)	7.7	46.1 (33.3)	---	---
	12	84	8.5	2.3	4.5	7.1	8.6	10.1	12.1	6.0	14.3 (9.2)	7.7	33.3 (28.9)	65	0.0
	18	144	8.8	2.3	4.9	7.1	8.6	10.3	12.7	3.1	0.0 (0.0)	3.9	1.4 (1.4)	65	0.0
	24	136	8.7	2.4	4.8	7.1	8.6	10.3	12.7	3.1	0.7 (0.0)	3.9	2.2 (0.7)	65	0.0
	48	101	7.9	2.4	4.4	6.1	7.6	9.3	12.9	3.3	0.0 (0.0)	4.2	2.0 (2.0)	65	0.0

**Table 3.41 (cont): Daily intakes of selected minerals and vitamins by age in female**

Nutrient	Age group (months)	n	Mean	SD	Percentile					WHO AR or EAR <sup>1</sup>	% below WHO AR or EAR	WHO RNI <sup>1</sup>	% below RNI	WHO UL <sup>1</sup>	% over WHO UL
					5	25	50	75	95						
Zinc (mg)	6	85	4.1	1.2	2.5	3.2	3.9	4.7	6.9	3.0 <sup>6</sup>	14.1 <sup>6</sup>	4.1 <sup>6</sup>	55.3 <sup>6</sup>	23-28 <sup>7</sup>	0.0
	9	76	4.2	1.7	1.8	2.9	4.2	5.4	6.8	3.0	25.0	4.1	48.7	23-28	0.0
	12	84	4.3	1.9	1.6	2.8	4.0	5.6	7.4	2.0	13.1	4.1	51.2	23-28	0.0
	18	144	4.7	1.8	2.0	3.5	4.6	6.0	8.0	2.0	4.9	2.4	6.9	23-28	0.0
	24	136	5.0	1.7	2.3	3.8	4.9	6.1	7.9	2.0	1.5	2.4	5.1	23-28	0.0
	48	101	5.9	1.6	3.3	4.6	5.8	6.8	9.1	2.4	1.0	2.9	3.0	23-28	0.0
Vitamin C (mg)	6	85	64.6	24.0	31.7	48.5	58.5	78.6	117.7	---	---	25	0.0	1000	0.0
	9	76	69.7	25.4	34.5	50.8	64.7	88.4	120.8	---	---	30	2.6	1000	0.0
	12	84	74.2	29.6	36.3	54.1	72.2	85.3	130.3	---	---	30	2.4	1000	0.0
	18	144	84.2	34.9	35.1	59.6	79.4	103.4	148.5	25 <sup>8</sup>	0.7	30	1.4	1000	0.0
	24	136	83.3	39.8	29.6	56.9	74.9	104.6	154.2	25	2.2	30	5.1	1000	0.0
	48	101	75.9	37.5	22.0	51.6	71.1	91.2	153.2	25	6.9	30	7.9	1000	0.0

<sup>1</sup>: Based on the WHO recommendation (World Health Organization, Food and Agricultural Organization of the United Nations 2004b, 2006), unless specified

<sup>2</sup>: BF stands for breastfed children whereas FF stands for formula fed children

<sup>3</sup>: Based on the recommendation of the Scientific Advisory Committee on Nutrition (Scientific Advisory Committee on Nutrition 2003)

<sup>4</sup>: Cut-off values derived by back-calculation of the median absolute requirement of iron and assuming iron bioavailability of 12% for 6- to 12-month groups, and 15% for 18 months of age or above

<sup>5</sup>: Data in bracket refers to the percentage for children not breastfed or mixed fed. Cautions should be taken when interpreting the relatively high percentage of children of all milk feeding types with intake below the calculated cut-off level derived from the median absolute iron requirement of the WHO/FAO (see section 2.10.3 and table 2.2). Although majority of these children were breastfed children or mixed fed children, readers should take into account the issue of the high iron bioavailability of breast milk (about 50%) compared to that of formula milk (about 10%). Therefore the high percentage of inadequate iron intake among breastfed children or mixed fed children may not accurately reflect their iron status. Separate figures are therefore given for children being not breastfed or mixed fed for reference.

<sup>6</sup>: Recommended intake of zinc for 6 to 12 months was based on mixed or refined plant-based diets (de Benoist et al 2007, International Zinc Nutrition Consultative Group 2007) and that for above 1 year of age was based on high bioavailability (World Health Organization, Food and Agricultural Organization of the United Nations 2006),

<sup>7</sup>: The WHO sets a range of UL for zinc for children aged 6 months to 9 years. In this study, the lower UL limit (23mg/d) was used as UL cutoff for comparison.

<sup>8</sup>: EAR for vitamin C is only available for children aged above 1 year of age

**Table 3.42: Top five food sources of calcium by age (male and female combined)**

Rank	Age group (months)											
	6		9		12		18		24		48	
	Food group	%	Food group	%	Food group	%	Food group	%	Food group	%	Food group	%
1	Milk	84.6	Milk	84.3	Milk	80.1	Milk	75.5	Milk	69.0	Milk	46.1
2	Grains and grain products	13.8	Grains and grain products	8.2	Grains and grain products	7.5	Grains and grain products	7.9	Grains and grain products	7.9	Grains and grain products	12.1
3	Vegetables	0.8	Vegetables	3.9	Vegetables	4.7	Vegetables	5.3	Vegetables	5.8	Vegetables	8.4
4	Soup	0.2	Fish and fish products	0.8	Milk products	1.3	Milk products	1.8	Milk products	3.6	Milk products	5.6
5	Egg	0.2	Egg	0.7	Fish and fish products	1.2	Soybean and products	1.6	Soybean and products	2.9	Grains in mixed dishes	4.7

**Table 3.43: Top five food sources of iron by age (male and female combined)**

Rank	Age group (months)											
	6		9		12		18		24		48	
	Food group	%	Food group	%	Food group	%	Food group	%	Food group	%	Food group	%
1	Milk	80.0	Milk	74.2	Milk	67.4	Milk	61.0	Milk	55.2	Milk	29.8
2	Grains and grain products	16.4	Grains and grain products	11.6	Grains and grain products	13.3	Grains and grain products	14.0	Grains and grain products	14.7	Grains and grain products	20.5
3	Vegetables	1.2	Vegetables	5.5	Vegetables	7.2	Vegetables	8.7	Vegetables	9.5	Vegetables	13.8
4	Soup	0.5	Meat	2.2	Meat	2.6	Meat	3.8	Meat	3.6	Meat	6.5
5	Egg / Meat	0.5	Egg	2.1	Egg	2.4	Egg	2.5	Egg	3.0	Soup	4.8

**Table 3.44: Top five food sources of zinc by age (male and female combined)**

Rank	Age group (months)											
	6		9		12		18		24		48	
	Food group	%	Food group	%	Food group	%	Food group	%	Food group	%	Food group	%
1	Milk	82.8	Milk	63.8	Milk	43.9	Milk	33.9	Milk	33.8	Grains and grain products	24.5
2	Grains and grain products	13.8	Grains and grain products	17.4	Grains and grain products	26.3	Grains and grain products	28.0	Grains and grain products	25.7	Milk	24.3
3	Meat	1.1	Meat	8.4	Meat	12.0	Meat	16.5	Meat	14.5	Meat	18.3
4	Vegetables	0.7	Vegetables	3.5	Vegetables	5.1	Vegetables	5.8	Vegetables	5.6	Vegetables	6.1
5	Soup / Egg	0.5	Egg	2.2	Egg	3.1	Egg	3.0	Egg	3.6	Soup	4.1

**Table 3.45: Top five food sources of phosphorus by age (male and female combined)**

Rank	Age group (months)											
	6		9		12		18		24		48	
	Food group	%	Food group	%	Food group	%	Food group	%	Food group	%	Food group	%
1	Milk	80.7	Milk	65.5	Milk	54.5	Milk	48.3	Milk	43.3	Milk	27.1
2	Grains and grain products	14.8	Grains and grain products	16.5	Grains and grain products	20.9	Grains and grain products	21.8	Grains and grain products	21.0	Grains and grain products	21.8
3	Vegetables	1.0	Meat	4.5	Fish and fish products	5.1	Meat	7.1	Meat	6.6	Meat	9.8
4	Egg	0.9	Vegetables	3.5	Meat	5.0	Fish and fish products	4.6	Fish and fish products	5.0	Grains in mixed dishes	6.4
5	Meat	0.8	Fish and fish products	3.4	Vegetables	3.7	Vegetables	3.9	Egg	4.1	Fish and fish products	5.2

**Table 3.46: Top five food sources of magnesium by age (male and female combined)**

Rank	Age group (months)											
	6		9		12		18		24		48	
	Food group	%	Food group	%	Food group	%	Food group	%	Food group	%	Food group	%
1	Milk	78.2	Milk	58.3	Milk	46.6	Milk	38.6	Milk	34.1	Grains and grain products	26.3
2	Grains and grain products	14.6	Grains and grain products	18.7	Grains and grain products	24.3	Grains and grain products	26.2	Grains and grain products	25.1	Milk	19.6
3	Vegetables	2.0	Vegetables	8.1	Vegetables	8.7	Vegetables	8.5	Vegetables	7.9	Vegetables	9.6
4	Soup	1.8	Fruits	4.4	Fruits	5.7	Fruits	6.9	Fruits	6.9	Soup	7.7
5	Fruits	1.4	Meat	2.7	Fish and fish products	4.2	Soup	4.1	Soup	5.3	Fruits	7.2

**Table 3.47: Top five food sources of potassium by age (male and female combined)**

Rank	Age group (months)											
	6		9		12		18		24		48	
	Food group	%	Food group	%	Food group	%	Food group	%	Food group	%	Food group	%
1	Milk	83.8	Milk	65.2	Milk	53.4	Milk	46.9	Milk	42.2	Milk	24.6
2	Grains and grain products	8.7	Vegetables	9.7	Grains and grain products	11.5	Vegetables	11.3	Grains and grain products	10.6	Vegetables	12.6
3	Vegetables	2.4	Grains and grain products	9.2	Vegetables	11.5	Grains and grain products	11.2	Vegetables	10.6	Grains and grain products	12.0
4	Fruits	1.8	Fruits	5.8	Fruits	8.2	Fruits	9.8	Fruits	10.3	Fruits	11.4
5	Soup	1.2	Meat	3.1	Fish and fish products	4.8	Meat	5.2	Meat	4.8	Meat	7.3



**Table 3.48: Top five food sources of sodium by age (male and female combined)**

Rank	Age group (months)											
	6		9		12		18		24		48	
	Food group	%	Food group	%	Food group	%	Food group	%	Food group	%	Food group	%
1	Milk	90.5	Milk	73.8	Milk	51.3	Milk	35.8	Milk	26.2	Grains and grain products	17.7
2	Grains and grain products	3.1	Grains and grain products	6.0	Condiments and sauces	10.6	Condiments and sauces	15.0	Condiments and sauces	16.4	Condiments and sauces	16.1
3	Condiments and sauces	1.9	Vegetables	5.7	Grains and grain products	9.5	Grains and grain products	12.4	Grains and grain products	12.4	Milk	11.0
4	Vegetables	1.5	Condiments and sauces	3.5	Vegetables	6.7	Vegetables	6.0	Meat	6.5	Grains in mixed dishes	10.0
5	Soup	0.9	Meat	2.4	Soup	3.4	Meat	5.3	Vegetables / Grains in mixed dishes <sup>1</sup>	5.8	Meat	9.0

<sup>1</sup>: Vegetables group and grains in mixed dishes group each contributed 5.8% of total sodium intake

**Table 3.49: Top five food sources of vitamin C by age (male and female combined)**

Rank	Age group (months)											
	6		9		12		18		24		48	
	Food group	%	Food group	%	Food group	%	Food group	%	Food group	%	Food group	%
1	Milk	89.5	Milk	76.9	Milk	64.8	Milk	55.2	Milk	49.0	Vegetables	34.2
2	Grains and grain products	5.5	Vegetables	12.3	Vegetables	18.7	Vegetables	23.0	Vegetables	23.3	Milk	26.5
3	Vegetables	2.3	Fruits	4.8	Fruits	11.3	Fruits	14.8	Fruits	17.9	Fruits	25.7
4	Beverages	1.4	Beverages	3.0	Beverages	3.0	Beverages	5.1	Beverages	7.8	Beverages	10.7
5	Fruits	1.2	Grains and grain products	2.2	Grains and grain products	1.5	Poultry	1.0	Poultry	0.5	Poultry / Meat / Legumes <sup>1</sup>	0.5

<sup>1</sup>: Poultry group, meat group and legumes group each contributed 0.5% of total vitamin C intake

### 3.8 Use of health supplements and Chinese herbal remedies

Table 3.50 shows how common the studied children used health supplements and Chinese herbal remedies. There was an increased use of health supplements and Chinese herbal remedies with advancing age. Overall, approximately one-thirds of the studied children had used health supplements and Chinese herbal remedies over the three record days. At younger age, Chinese herbal remedies were common. With increasing age, fish liver oil was the most common type of health supplement used by the studied children, followed by pure vitamins and/or minerals.

**Table 3.50: Use of health supplements and Chinese herbal remedies by age groups**

	Age group (months)						All
	6	9	12	18	24	48	
Total no. of subjects, n	177	164	171	233	314	213	1,272
No. of subjects using health supplements and Chinese herbal remedies, n (%)	15 (8.5%)	17 (10.4%)	28 (16.4%)	77 (33.0%)	137 (43.6)	94 (44.1%)	368 (28.9) <sup>1</sup>
No. of subjects using different types of health supplements or Chinese herbal remedies <sup>2</sup> , n							
Fish liver oil <sup>3</sup>	1	1	7	38	66	51	164
Pure vitamins and/or minerals <sup>4</sup>	2	5	9	13	39	37	105
Fish oil	1	1	3	10	20	9	44
Colostrum / milk tablets	0	0	5	7	13	3	28
Calorie supplement, e.g. Polycal	1	1	0	2	1	1	6
Prebiotic powder	2	0	0	2	1	0	5
Chinese herbal remedies <sup>5</sup>	9	13	7	16	26	8	79

<sup>1</sup>: Percentage was calculated as (no. of subjects using health supplements or Chinese herbal remedies / total no. of subjects) x 100%

<sup>2</sup>: One subject may use more than one type of health supplements and Chinese herbal remedies

<sup>3</sup>: Both fish liver oil and fish liver oil containing vitamins and minerals were included

<sup>4</sup>: Vitamins and minerals from fish liver oil were excluded

<sup>5</sup>: Included Chinese herbal tonics and remedies, e.g. 七星茶, 開奶茶, 保嬰丹, 猴棗散

## **Chapter 4: Discussion and limitations**

### **4.1 Outcomes of the DNS**

As mentioned in section 1.3, most studies on food consumption and nutrient intake of infants and young children in Hong Kong were conducted in the 1980s and early 1990s. In addition, these studies had several research constraints, such as small sample size and convenient sampling. The DNS of 1,272 Hong Kong children aged 0 to 5 years aimed to elucidate the up-to-date status of diet and nutrient intake of this young population in Hong Kong.

In this report, information on types of milk consumed and food consumption by infants and young children in Hong Kong were collected and analyzed. Data on the intake of different nutrients and the food sources contributed to the major nutrients in local infants, toddlers and preschool children were also reported. Moreover, the proportions of individuals with intakes of specific nutrients above or below the dietary recommendations were documented.

### **4.2 Key findings**

#### **4.2.1 Energy and nutrient intakes**

The DNS showed that the mean energy intake of the studied children was close to or even exceeded the WHO EAR for energy. The protein intakes of the studied children were adequate compared to the WHO/FAO average requirement and safe intake level for protein, and the mean intake of all age groups was approximately two to three times higher than the average requirement and the safe intake level. Anthropometric status of the studied infants and children was generally comparable to the WHO child growth standard and the Hong Kong growth reference. The prevalence of underweight and wasting were low, 1.3% and 1.6%

respectively, and 2.8% of the studied children were stunted in height. By using BMI z-score classification of the WHO child growth standard, 12.7% of children aged between 0 and 5 years were classified as “having possible of overweight” and 2.7% as “overweight or obese”. Our data also suggested that overweight or obesity started to increase at 24 months onwards. In addition, the proportion of children with sodium intake higher than the recommended level increased greatly after the age of two. These findings therefore suggest that the nutritional status of the studied children were unlikely to be inadequate, and highlight the importance of developing healthy eating before the age of two. These findings are also consistent with findings of previous studies (Department of Health 2009a, Leung et al 2000). Leung et al in a longitudinal study of growth and nutrition reported a high level of protein intake in children aged 0 to 7 years (Leung et al 2000). Recent findings of the CHS also indicated that Hong Kong children aged 2 to 5 years consumed quite high amount of protein foods. A total of 96.9% and 94.7% of young children ate meat and fish per meal respectively and the median amount of meat and fish consumed was around 2 taels per meal per day (Department of Health 2009a).

Regarding fibre intake, the DNS showed that children aged two and four years had fibre intake lower than the recommended level. Previous studies also reported similar results (Department of Health 2009a, Lee et al 2008), and suggested that the low fibre intake as result of under-consumption of plant foods was associated with increased risk of constipation in preschool children in Hong Kong (Lee et al 2008).

Though the dietary intake of calcium, iron and zinc was adequate as a whole, higher proportion of children had a low intake of iron and zinc before 12 months and the intake of dietary calcium may need to improve in the 48-month group, where 36.2% of children of this

group had calcium intake below the WHO/FAO EAR. Consumption of meat or fish was uncommon in the 6-month group, around 13 to 14%. A significant proportion of the 9-month group did not take these iron and zinc rich foods. These may account for the inadequate iron and zinc intake in these age groups. The DNS showed that an overall of 6.4% of children aged 6 to 48 months had zinc intake below the EAR. The proportion of zinc inadequacy was low compared to the population zinc inadequacy indicator of greater than 25% as defined by the International Zinc Nutrition Consultative Group (de Benoist et al 2007). However, there was more children in the 9-month group with intake fallen below the EAR than other age groups. Deficiencies of these trace elements during infancy and early childhood can have long lasting detrimental effects on neurodevelopment, psychomotor development, and growth (Chang et al 2011, Georgieff 2007, Lukowski et al 2010, Salgueiro et al 2002, Specker 2004). However, concerning the methodological limitations of the present study, further studies are warranted to collect data on other parameters, such as growth status and biochemical measurements to confirm the prevalence of these deficiencies (Department of Health 1991, Institute of Medicine 2006, 中國營養學會 2000).

#### **4.2.2 Types of milk consumed**

Both the WHO (2001) and the American Academy of Pediatrics (AAP) (Gartner et al 2005) have recommended exclusive breastfeeding for the first six months of life, with continued breastfeeding up to 12 months of age or longer along with the introduction of solid foods. Although new mothers in Hong Kong are increasingly choosing to breastfeed their babies, rates of exclusive breastfeeding are still low and duration remains short when compared with other

developed countries (Callen and Pinelli 2004, Foo et al 2005, Leung et al 2006, Tarrant et al 2010).

The DNS showed that the use of formula milk was prevalent among the studied children at all age groups and exclusively breastfeeding rate at six months was low. At six months, 6.8% of the studied children consumed breast milk solely, 13% consumed both breast milk and formula milk, and 80.2% used formula milk solely. From 12 to 24 months, over 90% of the studied children kept drinking formula solely. At 48 months, 77% of the studied children still used formula. These percentages of formula use were high when compared to other developed countries. In US, only 21.2%, 5.1% and 1.5% toddlers used formula at 12-14 months, 15-18 months, and 19-24 months respectively. Instead, they used cow's milk after one year of age (Fox et al 2004). Parents' misconception about the nutritional benefits of formula milk might have contributed to the choice of milk among the studied children. Data from a milk consumption survey revealed that 78.4% of parents considered that "follow up milk is more suitable for the 1-4 years old than cow milk"; 53% of parents agreed that "follow up formula is added with nutrients that promote the child's brain development, which cannot be found in the other foods"; and 25.4% believed that "follow up formula can replace other food to provide nutrients" (Milk Consumption Survey, Department of Health 2012).

#### **4.2.3 Food consumption pattern**

The survey showed that young children's diet was unbalanced. The food consumption pattern of children aged 12 months and above was characterized by inadequate intake of vegetables and fruits, high intake of protein-rich foods and over dependence on formula milk. It was also

found that children who drank more milk (mainly formula milk) than the recommended volume generally consumed a smaller amount of grains, vegetables and fruits. Prolonged use of the bottle and parents' misconception about the nutritional benefits of formula milk might have contributed to the high milk intake and the choice of milk (Milk Consumption Survey, Department of Health 2012). These findings were consistent with findings of previous studies. Low intakes of vegetables and fruits have been reported in Hong Kong preschoolers (Lee et al 2008), children (Leung et al 2000) and adolescents (Lee et al 1994a). High intakes of protein foods were also observed among these populations in Hong Kong (Department of Health 2009a, Leung et al 2000), and high milk intake may account for the low dietary fibre intake in young children in Hong Kong (Lee et al 2008).

It was observed that children with milk intake above the recommended level had lower intake of vegetables, fruits and grains. However, inadequate calcium intake was more seen after 1 year of age when milk intake reduced in some children. On comparing the total dietary calcium intake across different milk intake levels in children of 18 months and above, 4.1% of those receiving milk (excluding milk products) at the recommended milk intake level of 360 to 480 ml per day had calcium intake below the EAR, and 82.3% had intake above the RNI (Table 4.1). Taking that level of milk as a part of diet is adequate for meeting the calcium requirement. Those having a lower milk intake level may have a problem of meeting the calcium requirement. Apart from milk and milk products, children can improve their calcium intakes by including more calcium rich foods in their diet (Table 4.2).

Unhealthy dietary habits are associated with increased health risks. Findings of the survey revealed that some unhealthy dietary habits emerged in children of four years old. The

number of children consuming desserts, snacks, sweets, processed meat, fruit drink and carbonated drink greatly increased at four years of age. At four years of age, approximately 90% boys and girls consumed desserts, snacks and sweets, and nearly 50% included processed meat in their diet. Over 40% of children had fruit drinks in the record days whereas a total of 17.8% of children reported to have carbonated drinks. The CHS has explored the consumption of soft drink, fast food, fried food and junk food by children. Among children aged 2 to 5, 14% consumed at least one cup of soft drink each day, 18.1% consumed fast food for at least twice per week, 12.9% consumed fried food in main meals for at least 3 times per week and 12.6% consumed junk food at least once a day (Department of Health 2009a).

**Table 4.1: Proportion of children aged 18 months and above with calcium intake below the WHO/FAO EAR and RNI at different levels of milk intake**

Dietary calcium intake	Quantity of milk intake in a day			Total
	0-<360 ml N=296	360-480 ml N=220	>480 ml N=244	
Meeting or above the RNI	85 (28.7%)	183 (83.2%)	241(98.8%)	509(67.0%)
Below the EAR	131 (44.3%)	9 (4.1%)	3 (1.2%)	143 (18.8%)

**Table 4.2: Calcium content of selected local foods**

	Equivalent portion to 100 g food	Calcium content (mg/100 g food)
Whole cream milk	100 ml	104
Whole egg	2 pieces	60
Sesame	2 tablespoon or 18 g	176
Bean curd	1/2 cube	285
Soy bean, dried	3/4 medium bowl	191
Soy Beverage, Calcium Added	100 ml	119
Mustard green (	1 medium bowl	132
Chinese cabbage, Bok Choi, petiole	1 medium bowl	113
Canned sardine in tomato sauce	2 pieces	240
Prawn, large	5 pieces	146
Dried Scallops	10 pieces	77
Wood ear, soaked	1 medium bowl	34
Shitake mushroom, dried	10 pieces, big size 20 pieces, medium size	83



#### **4.2.4 Use of health supplements**

In this survey, approximately one-thirds of the studied children had used health supplements, and Chinese herbal tonics and remedies over the record days. At younger age, Chinese herbal tonics and remedies were common. With increasing age, fish liver oil was the most common type of health supplement used by the studied children, followed by pure vitamins and/or minerals. The findings were consistent with those reported in the CHS (Department of Health 2009a). The CHS showed that 65.8% children aged two to five years did not use vitamins including fish oil, but 15.8% used one to three times per week, 6.3% used four to six times per week, and 11.3% used at least once per day. A recent cross-sectional and self-administered questionnaire survey also suggested that there was high rate of health supplement consumption among healthy kindergarten children in Hong Kong. Approximately 52% (95% CI, 47-58%) of the parents gave regular health supplements to their child, and the commonest type of supplement given was cod fish oil (69%) (Leung and Lum 2011).

#### **4.3 Study limitations**

This section highlights some of the problems encountered during the DNS and addresses the limitations that readers should consider.

##### **4.3.1 Sample representativeness**

This survey covered only clients attending MCHCs. Though over 90% of infants and young children used MCHC service, the nutrient intake and the food consumption pattern of 10% children not using the service were not reflected in this survey. In addition, there were some

demographic differences between those included and excluded for analysis, and between those consented and refused to participate in the survey. Comparison of the weight status of the present sample with previous MCHC data revealed that there was a lower prevalence of obesity in the present sample. By defining obesity as body weight exceeding 120% of the median weight-for-height based on the Hong Kong growth reference, 6.6% children aged 48 months were obese in the DNS. An earlier study on 1,033 young children aged 48 to 60 months attending MCHCs in 2007 reported an overall prevalence of 7.7%. Further figures from MCHC on 1,635 children aged 48 to 61 months (who were born in 2006 and received preschool vision screening between February and March 2011) showed a corresponding rate of 9.0% (Department of Health 2011). Such differences could be explained by the possibility that parents with underweight or relatively thinner children might concern more about their child's feeding and were more likely to participate in the DNS. It is thus possible that the dietary intake pattern and food intake may be different from those with higher body weight.

#### **4.3.2 Food composition database and nutrient analysis**

Nutrient information of some baby foods and formulae available in Hong Kong were not comprehensive. Several approaches were therefore used in the DNS for more accurate estimation of nutrient intakes. For instance, the research team tried to contact manufacturers of baby foods and formulae to request for nutrient information. If nutrient information cannot be provided by the manufacturers, values based on other nutrients in the same food, on a product ingredient list, or on the nutrient content of similar foods were used (Sievert et al 1989). Selected baby foods and formulae were also chosen for chemical analyses of nutrients of

interest, based on their popularities among the studied children. Another limitation was that the number of nutrient listed varied among different food composition tables. For example, local food composition database does not include information of most vitamins and fatty acids of foods. The intake of these nutrients therefore cannot be estimated in the DNS. Moreover, the contribution of breast milk may be over- or underestimated since intake of breast milk was calculated based on age and consumption of infant formula, rather than measured precisely. A consistent nutrient profile was also used for breast milk fed to infants and children of all age but concentrations of some nutrients in breast milk decline over time in reality (Krebs 2001). This method however has been used by other researchers (Devaney et al 2004, Heinig et al 1993). Furthermore, only descriptive data on supplement use were collected in this survey. The frequency and dosage of health supplements were not obtained. Nutrient information of these supplements was also not collected. As a result, nutrient intakes from health supplements cannot be estimated in the DNS. The present study may have underestimated the intake of calcium, zinc and iron in those who took nutrient supplements containing these minerals.

#### **4.3.3 Three-day dietary record**

All data in the DNS were self-reported. A standardised estimation was also used to calculate the amount of salt and cooking oil added in the child's diet. These limitations may have contributed to over- or underreported food intakes. In this survey, several quality assurance measures have been used to minimize the reporting bias. In the DNS, analyses of dietary intakes were based on three-day dietary record and these may not reflect the "usual" food intake. However, less day-to-day variation in dietary intake was reported among infants and young children than among

older children and adults (Lanigan et al 2004).

#### **4.3.4 Use of dietary references to assess nutrient adequacy of local population**

As no local dietary reference was available, overseas dietary references were used to assess the nutrient adequacy of the studied children in the DNS. For instance, the WHO/FAO average requirements or EARs were applied, however the EAR is not available for some nutrients. The derived cut-off for iron intake was comparable to the IOM level but slightly lower. Therefore, the proportion reported with inadequate iron intake in the present study may be an under-estimation. It has been suggested that the development of dietary references of some nutrients were based on insufficient data or small studies, and some reference intakes of young children were even derived by extrapolating data taken from the studies of adults (Department of Health 1991, Institute of Medicine 2006, 中國營養學會 2000). In addition, there are several limitations associated with the use of dietary surveys to assess the adequacy of nutrient intakes against dietary references (Department of Health 1991). For instance, the reliability of food composition tables and misreporting of food consumption may reduce confidence in the accuracy of population mean intakes and can affect the distribution of measured intakes. Therefore, data on clinical, biochemical and anthropometric aspects should also be considered when assessing the nutritional status of a group (Department of Health 1991, Institute of Medicine 2006, 中國營養學會 2000).

#### **4.3.5 Other limitations**

The DNS reported the general picture of diet and nutrient intake of children aged 0 to 5 years in

Hong Kong. However, due to the small number of breastfeeding subjects in this survey, subgroup analyses cannot be performed to examine differences in the dietary and nutrient intakes among infants with different milk feeding practices. Moreover, infants and young children from ethnic minority groups, non-Chinese speaking families and families with vegetarian diets were not included in this survey. Therefore, the nutrient intake and food consumption pattern of these groups were not reflected in this survey.

## **Chapter 5: Conclusions and Recommendations**

This survey showed that the nutritional status of infants' and children's diets in Hong Kong were unlikely to be inadequate. In spite of the limitations associated with the development of dietary references, the results of this survey showed that the studied children had low fibre intake and inadequate intakes of calcium, iron and zinc at some age groups. This survey also identified several dietary problems of infants and children in Hong Kong, including dietary imbalance, over dependence on formula use, and inadequate intake of plant-based foods. Several recommendations are made to address these problems and some areas for future research and service are also discussed.

### **5.1 Recommendations**

#### **5.1.1 Importance of parental roles in helping infants and young children develop a healthy and balanced diet**

The period from weaning to consumption of a mature diet, from 4 to 6 months to about 2 years of age, represents a radical shift in pattern of food consumption. During this transition period, infants are expected to mature from receiving all nutrition from a milk-based diet to a diet chosen from a variety of adult foods.

Our data showed that the studied children had high protein intake compared to the WHO average requirement and safe intake level, and their protein sources were mainly from milk and animal foods. A high protein intake has been proposed to increase risk of obesity. There is evidence to show that high protein intake stimulates the insulin and insulin-like growth factor 1 metabolism and consecutively leads to cell proliferation, accelerated growth, and

increased adipose tissue (Axelsson 2006). A longitudinal study of examining the association of protein intake in early childhood with obesity risk and body composition at 7 years in 203 young children of the Dortmund Nutritional and Longitudinally Designed Study suggested that a higher intake of animal protein at 12 months of age, in particular from cow milk and dairy products, might be associated with an unfavorable body composition at the age of 7 years (Günther et al 2007).

Numerous research has shown that higher intakes of fruits and vegetables have been associated with reduction of chronic diseases, such as lower risks of cardiovascular diseases (Dauchet et al 2006, He et al 2006), diabetes (Ford and Mokdad 2001), and certain cancers (World Cancer Research Fund and American Institute for Cancer Research 2007). Low fibre intake and inadequate consumption of fruits and vegetables have also been suggested as risk factors for constipation in preschoolers and school children in Hong Kong (Chan and Chan 2010, Lee et al 2008). A plant-based diet composing of whole grains and plenty of fruits and vegetables is suggested to be important in chronic diseases prevention and optimal health (Hu 2003, Sabate and Wien 2010).

Parents play a vital role in influencing child's diet, and optimizing diet during the toddler years and beyond begins at the time of weaning. A study on parental influences on 5-year-old children's fruit and vegetable intake reported that parents' own fruit and vegetable intake was positively associated with fruit and vegetable consumption and micronutrient intakes of their daughters (Fisher et al 2002). The Avon Longitudinal Study of Pregnancy and Childhood also found that the earlier infants were introduced to home cooked fruit and vegetables, the more likely they were to eat fruit and vegetables at the age of seven (Coulthard et al 2009). Therefore,

establishing healthy eating habits during early years will be critical to develop lifelong healthy eating habits and reduce the burdens of chronic diseases. Parents should help infants and children develop and foster a balanced diet with a variety of foods. Such a diet should include

- (1) plenty of fresh vegetables, fruits, some whole grain food;
- (2) appropriate amount of protein-rich foods including meat, fish, egg and legumes; and
- (3) appropriate amount of milk

#### **5.1.2 Types of milk recommended for children over one year of age**

For children over one year of age, they are recommended to continue being breastfed or change to use whole (full-fat) cow's milk along with a variety of foods until they are two years of age. Toddlers that are eating well can change to use reduced fat / semi-skimmed milk from two years of age. Skimmed milk should not be given to children under five years old (Department of Health 2009b, Gidding et al 2006). Specific advice on when to introduce low fat milk to children should also be based on the individual child's growth and needs (Anonymous 1987, Network of the Federal/Provincial/Territorial Group on Nutrition and National Institute of Nutrition 1989). In addition, milk from baby bottles should be discontinued by one year of age. Thereafter milk and other drinks should be given in beakers or cups, because continued bottle sucking can become a difficult habit to break (Department of Health 2009b) and prolong bottle use is associated with increase risk of obesity (Bonuck et al 2010, Gooze et al 2011).

#### **5.1.3 Volume of milk recommended for children over one year of age**

Excessive milk drinking may be a cause of low appetite at meal times. In a cross-sectional



analysis of data from a United Kingdom population-based birth cohort, high milk consumption was associated with lower appetite but not with poor growth (Wright et al 2007). Moreover, excessive intake of milk and milk products may decrease iron availability due to the presence of high levels of calcium and phosphorus (Bothwell et al 1989). Table 5.1 summarizes the volume of milk recommended for children over one year of age in various countries.

**Table 5.1: Recommended volume of milk for children over one year of age in various countries**

Country	Volume of milk recommended per day		References
	1-2 years	3-6 years	
China	Not less than 350 ml	300 to 600 ml	Chinese Nutrition Society <sup>1,2</sup>
Singapore	750 ml	500 ml	Health Promotion Board <sup>3</sup>
New Zealand	No more than 500 ml		Ministry of Health <sup>4</sup>
UK	360 to 480 ml		Department of Health <sup>5</sup>
US	2 cups (480 ml)		American Academy of Pediatrics <sup>6</sup>

<sup>1</sup>: Chinese Nutrition Society (中國營養學會 2008a)

<sup>2</sup>: Chinese Nutrition Society (中國營養學會 2008b)

<sup>3</sup>: Health Promotion Board (2010)

<sup>4</sup>: Ministry of Health (2008)

<sup>5</sup>: Department of Health (Department of Health 2009b)

<sup>6</sup>: American Academy of Pediatrics (Gidding et al 2006)

A recommendation of 360 to 480 ml of milk per day is proposed for children aged over one year old in Hong Kong. The recommended intake level is based on several considerations. Firstly, high milk intake was associated with reduced food variety. The DNS showed that children who drank more milk (mainly formula milk) than the recommended volume generally consumed a smaller amount of grains, vegetables and fruits. Secondly, Chinese children have relatively higher true fractional calcium absorption as compared to Caucasian children consuming a calcium diet of 925 mg/d. The true fractional calcium absorption of Chinese

children (54 to 63%) was nearly double of that of Caucasian children (25 to 34%) (Abrams et al 1995, Lee et al 1994b, Lee et al 2002). Thirdly, indigenous Asian foods, such as tofu, sea weeds, nuts and seeds dishes and green leafy vegetables, are rich in calcium and some dark green leafy vegetables have comparable or even higher calcium bioavailability than milk and milk products (Weaver et al 1999). Therefore Chinese children are likely to acquire adequate calcium from the recommended milk intake provided that they consume a variety of calcium rich foods.

## **5.2 Areas for future research and service**

Several areas for future research and service are identified in this survey. These areas include:

- Studies to collect biochemical measurements of iron, zinc, calcium and possibly vitamin D status of infants and young children in Hong Kong
- Studies to compare nutrient intakes and nutritional status among infants and young children of different milk feeding practices
- Studies to examine nutrient intakes from supplements in infants and young children in Hong Kong
- Data on social, biological and environmental determinants of nutritional status, food consumption and nutrient intake of infants and young children in Hong Kong
- Studies to examine nutritional status, food consumption and nutrient intakes of other groups, such as vegetarians, ethnic minority groups and non-Chinese speaking population
- Development and regular update of food composition tables for infant formulae, baby foods and health supplements available in Hong Kong

- Development of own dietary reference or adoption of overseas dietary reference appropriate for use in local context

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## Appendix

### Appendix 1 List of other vegetables

Angeled loofah  
Asparagus  
Beetroot  
Burdock root  
Celery  
Chinese lettuce  
Cho cho  
Coriander leaves  
Corn, sweet, yellow, canned, cream style  
Cucumber  
Daylily, flower  
Eggplant  
Garlic  
Indian lettuce  
Kudzu  
Lettuce  
Lily  
Lotus root  
Melon, bitter  
Melon, hairy  
Mixed vegetables, frozen  
Onions  
Peppers  
Squash, summer, all varieties  
Squash, summer, zucchini  
Sweetcorn, baby  
Sweetcorn, kernels  
Tapioca  
Taro  
Turnip  
Vegetarian fillets  
Water chestnuts  
Wild greens, wolfberry, Chinese, leaf  
Winter melon  
Yam