

Non-Communicable Diseases Watch

January 2016



衛生防護中心
Centre for Health Protection



衛生署
Department of Health

Milk Watch and Raising Healthy Eaters

Key Points

- ※ Adequate nutrition during early childhood is fundamental to the physical growth, cognitive development and well-being of every child.
- ※ Suboptimal feeding practices among babies and young children are common. They may include: early cessation of breastfeeding; excessive consumption of formula milk; prolonged use of milk bottles; and introducing complementary or solid foods too early or too late, lacking dietary variety.
- ※ In Hong Kong, a survey showed that over 90% of children aged between 12 and 48 months had consumed formula milk in the 7 days prior to enumeration; and less than one-third (30.3%) of them had milk intake within the recommended range of 360 to 480 ml per day. Among the children who consumed milk, 95.2%, 89.4% and 55.2% of children aged 18, 24 and 48 months were still using bottle for milk drinking in the 7 days prior to enumeration respectively.

Recommendations on Milk Feeding for Young Children

Babies under 1 year

- ※ Babies should be breastfed exclusively in the first 6 months, and continue to be breastfed after they start eating complementary or solid foods.
- ※ For 6- to 12-month-old babies, breastmilk or infant formula still is the main source of nutrition. A variety of nutritious foods (such as animal-source foods, fruit and vegetables) should also be introduced in age-appropriate textures, frequencies and amounts to fill the energy and nutrient gaps.
- ※ There is inadequate scientific evidence to support switching to follow-up formulae after 6-month of age.

Children aged 1 year or above

- ※ Milk is a part of their balanced diet. Mothers can breastfeed their child up to 2 years of age and beyond. For most Chinese children aged 1 year or above in Hong Kong, a daily milk intake of 360 to 480 ml would be sufficient.
- ※ For the choice of milk, children aged 1 year or above can consume full fat cow's milk or full fat cow's milk powder when they consume adequate amounts of a variety of nutritious foods. Children aged between 2 and 5 years can take low-fat cow's milk and children above 5 years can take skimmed milk.
- ※ For children aged 2 years or above, they can eat a balanced diet in accordance with the Healthy Eating Food Pyramid for sufficient energy and optimal nutrients.

This publication is produced by the Surveillance and Epidemiology Branch, Centre for Health Protection of the Department of Health

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Milk Watch and Raising Healthy Eaters

Adequate nutrition during early childhood is fundamental to the physical growth, cognitive development, and optimal wellbeing of every child. The World Health Organization (WHO) recommends that infants are to be breastfed exclusively in the first 6 months of life. It means that babies should receive only breastmilk from mothers excluding solids or any other fluids (including infant formulae and water) with the exception of prescribed medications, vitamins and mineral supplements. At about 6 months old, complementary or solid foods

should be introduced while breastfeeding continues till 2 years of age or beyond.¹ There is inadequate scientific evidence to support switching to follow-up formulae after 6-month of age. However, sub-optimal feeding practices among babies and young children are common. They may include: early cessation of breastfeeding; excessive consumption of formula milk; prolonged use of bottles; and introduction of complementary or solid foods too early or too late, lacking in variety.

Changing Nutritional Needs and Feeding Habits

From 6 months to 2 years of age, children gradually change from consuming a milk-only diet (breastmilk and/or infant formula) to eating a balanced diet which contains a variety of foods. During this time, milk still makes a substantial contribution to the energy and nutrition intake of infants and toddlers, particularly for essential fatty acids, proteins, calcium and many of the vitamins and minerals. However, milk alone is no longer sufficient to meet their nutritional requirements, in particular the need for iron. Equally important, children are also in the stage of development of food acceptance and oro-motor skills. Thus, other nutritious foods should be introduced in age-appropriate textures (such as pureed, semi-solids or solids), frequencies and amounts. For animal-source foods (such as meat, poultry, fish and eggs), they are rich in many key nutrients including proteins, iron and zinc.

Fruit and vegetables contain various amounts of minerals (such as potassium, selenium and magnesium), vitamins (such as folate, vitamins A, C and E, carotenoids), antioxidants (such as flavonoids and other phytochemicals) as well as soluble and insoluble fibres which help to keep digestive system healthy. The WHO's guiding principles for transitional feeding of healthy breastfed and non-breastfed children aged 6 months to 2 years recommend that their daily diet should include fruit and vegetables. Meat, poultry, fish or egg should be eaten daily, or as often as possible.^{2, 3} For children aged 2 years or above, they can start eating a balanced diet in accordance with the Healthy Eating Food Pyramid for obtaining sufficient energy and optimal nutrients from each of the basic food groups (including grains; fruit; vegetables; meat along with fish, eggs and legumes; milk and milk products).⁴

Recommended Levels of Milk Intake for Young Children above 1 Year of Age

Milk is an important source of energy and nutrition for infants and young children and a convenient source of calcium. For young children, however, it constitutes only part of a diversified and balanced diet. If adequate amounts of animal-source foods like meat, poultry, fish and eggs are consumed regularly, WHO reckons that a milk intake of 200

to 400 ml per day is considered adequate for healthy non-breastfed children aged 6 months to 2 years; otherwise, the amount of milk needed is about 300 to 500 ml per day.³ When taking calcium requirement as a major consideration, health authorities of various countries recommend different levels of milk intake for their children.

For Chinese children aged 1 to 5 years in Hong Kong, daily intake of 360 to 480 ml of milk would largely satisfy the calcium requirement and be less likely to displace the children's appetite for main meals. Such recommendation has taken into consideration the availability of various calcium-rich foods (such as dark green leafy vegetables like spinach, bok choy and kale, tofu and dried shrimps) in traditional Chinese diet, and that Chinese children and adolescents have been shown to have higher fractional calcium absorption when compared with the Caucasians.⁵

It is noteworthy that excessive milk intake can contribute to unhealthy weight gain in children.

Health Consequences of Prolonged Milk Bottle Use

Unhealthy weight gain in early childhood is not only associated with the amount of milk consumed, but also the utensils used. Compared with non-bottle-users, bottle-users tend to consume greater volumes of milk.^{8, 9} A longitudinal cohort study of 6 750 American children born in 2001 reported that children who were still using a bottle at 2 years old were 33% more likely to be obese (BMI-for-age ≥ 95 th percentile) at 5.5 years of age than those children who were not.¹⁰

Milk bottle use is also a known risk factor for early childhood dental caries and ear infections. An Australian study of 3 375 children aged 4 to 6 years old observed that children who were bottle-fed beyond 12 months had 37% increased risk of early childhood caries (i.e. the presence of caries on at least

A study of 8 950 preschool children in the United States observed that 4-year-old children who drank 3 or more servings of milk daily had 16% increased risk of overweight and obesity (BMI-for-age ≥ 85 th percentile) than their counterparts who drank 0.5 to 2 servings (about 2 cups) of milk daily.⁶ Besides, drinking too much milk can decrease young children's appetite for eating various nutritious foods. For example, displacing fibre-rich cereal, fruit and vegetables can precipitate constipation. A community-based study of 368 preschool children aged 3-5 years in Hong Kong observed that constipated children had a marginally higher milk intake and significantly lower intake of fruit and plant foods than non-constipated children.⁷

one primary tooth in children under 6 years of age) compared with children who were not bottle-fed. Going to sleep with the bottle was associated with 55% increase in risk of early childhood caries. Similarly, children who started cup drinking beyond 2 years old were 2.14 times as likely to have early childhood caries as compared with those who started cup drinking by 1 year old or younger.¹¹ In Hong Kong, the Oral Health Education Unit of the Department of Health (DH) recommends start using a training cup when babies are around 9 months old. It is best to wean them from bottle to training cup by 14 months of age to reduce the risk of getting dental caries. After 2 years old, children must be weaned from bottle. Feed children with cups and never allow them to sleep with a bottle drink.¹²

Milk Consumption among Local Children Aged 12 to 48 months

In 2010, the Family Health Service (FHS) of DH and the Department of Medicine and Therapeutics and the Centre for Nutritional Studies of the Chinese University of Hong Kong conducted a Dietary Survey of Hong Kong Infant and Young Child, including milk consumption. The survey asked 1 063

randomly selected parents of children aged between 12 and 48 months to report their children's milk consumption patterns and behaviours in the 7 days prior to enumeration. Results showed that milk feeding practices of young children was not satisfactory.¹³

Use of Formula Milk Was Prevalent

As shown in Table 1, continued breastfeeding was uncommon among children aged beyond 12 months. While 23.7% of 12-month-old children reported consuming infant formula, 94.4% of 24-

month-old children reported consuming follow-up formula. Overall, more than 90% of children aged between 12 and 48 months had consumed formula milk in the 7 days prior to enumeration.¹³

Table 1: Type of milk consumed by children aged 12 to 48 months in the 7 days prior to enumeration

Type of milk*	12-month	18-month	24-month	48-month	Overall
Breastmilk	9.8%	5.4%	2.9%	0.9%	4.5%
Infant formula	23.7%	11.2%	1.6%	0.5%	7.9%
Follow-up formula	71.6%	84.8%	94.4%	79.6%	84.8%
Other types of formula	0.5%	0.7%	0.3%	0.0%	0.4%
Cow milk / milk products	3.1%	14.5%	21.0%	38.0%	19.5%
No milk taken	1.0%	1.4%	1.9%	11.1%	3.5%

Note: *Some children consumed 2 or more types of milk or milk products.

Source: Family Health Service, Department of Health.

Many Young Children Consumed Too Much or Too Little Milk

Majorities (71.7%) of 12-month-old children consumed more than 480 ml of milk per day; about three-fifths (60.3%) of 48-month-old children consumed less than 360 ml (including none) per day.

Overall, 30.3% children aged between 12 and 48 months whose milk intake was within the recommended range of 360 to 480 ml per day (Table 2).¹³

Table 2: Quantity of milk consumed by children aged 12 to 48 months in the 7 days prior to enumeration

Quantity of milk consumed per day	12-month	18-month	24-month	48-month	Overall
More than 480 ml	71.7%	47.8%	40.5%	15.4%	42.9%
360 ml to 480 ml	18.5%	33.3%	37.5%	24.3%	30.3%
Less than 360 ml	5.4%	16.7%	19.5%	49.1%	22.4%
No milk taken	4.3%	1.8%	2.5%	11.2%	4.4%

Note: Excluding children with missing data.

Source: Family Health Service, Department of Health.

Prolonged Milk Bottle Use Was Common

Among the children who consumed milk, 95.2%, 89.4% and 55.2% of children aged 18, 24 and 48 months respectively were still using bottle for

milk drinking in the 7 days prior to enumeration. (Table 3).¹³

Table 3: Type of utensil used for milk drinking by children aged 12 to 48 months* in the 7 days prior to enumeration

Type of utensil**	12-month	18-month	24-month	48-month	Overall
Milk bottle	99.5%	95.2%	89.4%	55.2%	86.3%
Cup with a straw	3.8%	9.2%	16.3%	14.6%	11.8%
Trainer cup	0.5%	4.1%	6.3%	3.6%	4.1%
Regular cup	0.5%	3.0%	12.0%	53.1%	15.2%

Notes: *Excluding 46 children who did not drink milk or received only breastmilk. ** Multiple responses were allowed.

Source: Family Health Service, Department of Health.

Healthy Feeding of Young Children Aged 1 to 5 Years

For children aged 1 year or above, milk should become a part of their balanced diet. To support their growth and development, consuming a variety of foods is crucial for them obtaining different types of nutrients. They should be fed adequately, appropriately and with various nutritious foods, in particular iron-rich meat, fish, eggs, and green leafy vegetables. As young children eat more, in terms of variety and amount of complementary or solid foods, they need less milk. For most Chinese children of age 1 to 5 years in Hong Kong, a daily milk intake of 360 to 480 ml would largely satisfy the calcium requirement. Besides, there is inadequate scientific evidence that formula products with additional “nutritive” substances would provide extra benefits to infants and children. Children under 2 years can consume full fat cow’s milk or full fat cow’s milk powder. Children aged between 2 and 5 years can take low-fat cow’s milk and children above

5 years old can take skimmed milk.⁵ Apart from cow’s milk, children above 2 years old can choose calcium-added low-sugar soy milk.

However, many parents falsely believe that follow-up formulae (No. 3 and 4 Formula) are added with nutrients which cannot be provided by other foods or they are more suitable for 1- to 4-year-old children than cow’s milk.¹³ In fact, the nutrient additives in the formulae are actually widely available in many natural foods (Table 4). When young children eat a balanced diet including foods from the 5 basic food groups (i.e. grains; fruit; vegetables; meat along with fish, eggs and legumes; milk and milk products), formula milk is not necessary. Besides, over-reliance on formula milk may displace young children’s appetite for eating various foods, making it difficult for them to establish a healthy eating habit.⁵

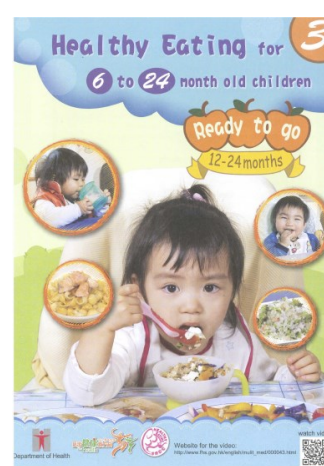
Table 4: Natural food sources of the nutrients commonly added to follow-up formulae^{13, 14}

Nutrients / additives	Examples of natural food sources
Docosahexaenoic acid (DHA) or Arachidonic acid (AA or ARA)	<ul style="list-style-type: none"> fish, such as salmon, sardines, halibut and jade perch (but avoid eating large predatory fish and the types of fish which may contain high levels of mercury, such as shark, swordfish, marlin, alfonso and tuna)
Taurine	<ul style="list-style-type: none"> fish, animal protein
Lutein	<ul style="list-style-type: none"> fruits and dark green leafy vegetables (such as spinach, bok choy, kale and broccoli)
Beta-carotene	<ul style="list-style-type: none"> yellow and orange fruits (such as papaya and mango), dark green leafy vegetables and carrots
Choline	<ul style="list-style-type: none"> animal liver, milk, egg, beef, broccoli and brussel sprouts
Iron	<ul style="list-style-type: none"> meat (especially red meat), fish, egg yolk, soy and soy products, green leafy vegetables, nuts
Calcium	<ul style="list-style-type: none"> milk and dairy products (such as cheese, yoghurt), calcium added tofu or soy milk, dark green leafy vegetables, dried shrimps
Zinc	<ul style="list-style-type: none"> milk, meat, egg, soy and soy products
Prebiotics or Fructo-oligosaccharides (FOS)	<ul style="list-style-type: none"> fruit, soy and soy products, whole grains

It is also noteworthy that early childhood is a critical time period for acquiring self-feeding skills, developing food preferences and establishing healthy eating habits that may last a lifetime. Parents and carers should help their young children learn to self-feed and wean from bottle to cup by 24 months old, select and provide a variety of foods in appropriate portions (such as in accordance with the Healthy Eating Food Pyramid for children aged 2 to 5 years), schedule proper mealtimes (such as offering 3 meals and 2 or 3 snacks at regular time daily), provide a pleasant eating environment and minimise distractions (such as turning off the TV, putting away

toys and electronic screen products), teach proper mealtime behaviours and manage misbehaviours in a positive way. Besides, young children are highly aware when they are hungry or full. Let their appetite guide how much they eat. Do not force or nag them to eat, or insist that they should eat a certain quantity. For more information about early childhood nutrition, feeding tips and healthy eating for infants, toddlers and preschool children (Box 1), please visit the website of FHS at <http://www.fhs.gov.hk> and 'StartSmart@school.hk' Campaign at <http://www.startsmart.gov.hk> to browse or download the relevant resources.

Box 1: Information about healthy eating and feeding tips for young children



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The longer children are breastfed, the more health benefits mothers and their children will have. Family, healthcare professionals and the community play a significant role in supporting mothers to continue breastfeeding.

In view of this, FHS of DH has produced a series of TV APIs on promoting breastfeeding to create a Breastfeeding Friendly environment. They include “*Let’s give our children the best. Support sustained breastfeeding*”, “*Breastfeeding Friendly Community. Let’s give our children the best*”, and “*Breastfeeding Friendly Workplace. Let’s give our children the best*”.

For more information or audio-visual resources about breastfeeding, please visit the website of FHS at <http://www.fhs.gov.hk>.

Non-Communicable Diseases (NCD) WATCH is dedicated to promote public’s awareness of and disseminate health information about non-communicable diseases and related issues, and the importance of their prevention and control. It is also an indication of our commitments in responsive risk communication and to address the growing non-communicable disease threats to the health of our community. The Editorial Board welcomes your views and comments. Please send all comments and/or questions to so_dp3@dh.gov.hk.

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