Infant & Young Child Feeding n Nutrition in Perspective 透視嬰幼兒餵哺與營養

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Acceptance of Food During Complementary Feeding II

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Developmental Readiness

At around 6 months of age, infants display developmental signs of readiness for complementary feeding which include the ability to maintain an upright posture for a short time when placed in a sitting position and diminished tongue thrust reflex. These coincide with the anatomic changes of growth of the oral cavity and lowering of laryngeal structures, that facilitate the transition from suckling to sucking and spoon feeding.



The chewing efficiency for solid food textures improves as infants develop the necessary oro-motor skills.¹ Around 4 to 6 months, food is mashed by the tongue's upward and downward motions. From 8 months onwards, munching (food crushed by raising and lowering of the lower jaw) is firmly established and chewing becomes more efficient. Carruth and Skinner¹ summarised the milestones of oral motor and fine motor skills related to feeding based on parent's report. (Table 1) Table 1: Children's Oral Motor Development and Fine Motor Development Related toFeeding Behaviour¹

Oral Motor Development	Mean Age (Months)
Opens mouth when spoon approaches or touches lips	4.46
Tongue moves food to back of mouth to swallow	4.95
Uses tongue and mouth to explore shapes and texture	6.29
Eats food with tiny lumps without gagging	8.70
Chews softer foods, keeps most in mouth	9.42
Chews and swallows firmer foods without choking	12.17
Fine motor development	Mean Age (Months)
Reaches for spoon when hungry	5.47
Eats finger foods without gagging	8.44
Brings side of spoon to mouth	14.37
Picks up, dips foods and brings to mouth	16.42
Scoops puddings and brings to mouth	17.05

Progress in Acceptance of Food Textures

Spoon feeding of thin and smooth pureed food can start once a child is developmentally ready. Then foods with different texture are gradually added. These include dissolvable solids (e.g. soft cracker), textured pureed foods (e.g. mashed banana, cottage cheese) and ground solids at 6–9 months, soft diced solids (e.g. fruits and vegetables) at 9–12 months and eventually a general toddler diet of table foods by 12–18 months.² Gradual change from smooth puree to mashed foods with soft lumps (like minced meat and vegetables in thick congee) enables infants and young children to have more control of the food bolus.

Culture or traditional feeding practices have great influence on parents in preparing foods for infants during complementary feeding. The food texture acceptance pattern differs geographically. The Start Healthy Feeding Guidelines for Infants and Toddlers issued by the American Dietetic Association provides a detailed guide for parents and caregivers of infants to gradually add foods with texture in the US context.³ In a study of mothers in France, children are mainly exposed to puree in the first year of life.

Then soft and small pieces are slowly introduced while hard or large pieces are mainly introduced after 13 months.⁴ In Japan, 50% of infants are able to accept rice gruel at 4.5 months, mashed grains and vegetables at 5 months, strained protein foods at 7 months, larger sizes (3-4 cm cubes) of boiled root vegetables after 10 months and adult foods by 12 months.^{5,6}

Besides, the timing of introducing appropriate texture is also important for texture acceptance. When foods with small lumps are introduced after 10 months of age, children are more likely to refuse solids, consume inadequate food and are choosy about foods at 15 months.⁷ At 7 year of age they consume significantly less fruit and vegetables and have more feeding problems.⁸

Sensory Sensitivity

Most infants adapt well to the typical progression from puree, through lumpy foods, to soft cooked family foods. Allowing children to experiment different food textures could help those who may refuse or have difficulty in adaption. A recent area of interest in food acceptance is sensory hypersensitivity. Oral / visual / tactile / olfactory hypersensitivity can lead to a limited range of foods being accepted within the diet, limited acceptance of textures and the fear of trying new foods.⁹ An association between tactile hypersensitivity and acceptance of new food at 4 to 6 months has been reported.¹⁰ Chatoor described the phenomenon as "sensory food aversion".¹¹ Children with sensory food aversion often become symptomatic at around 6–10 months old when they are introduced to a variety of baby foods, especially mashed food with lumps. They may react to the new taste or texture by grimacing, spitting out the food on repeated exposures. However, some infants may become very distressed if the parent offers the aversive food again, especially if the food triggers gagging or vomiting. In these children, repeated exposure would cause more refusals. In her paper, Chatoor shares her approach to helping parents manage food refusal in these children, which includes parental modelling, allowing children to self-feed and controlling the extent of exposure to new food.¹¹

Conclusion

Infants' experience with varied food textures promotes their food acceptance which in turn enhances their feeding experiences. Characteristics of infants including temperament and sensory sensitivity also contribute to their food acceptance. Taking these factors into consideration, the progression of texture introduction to infants' diet should be individualised.

Key Messages:

- Parents may introduce a variety of food textures according to the readiness of infants' oro-motor skills. Delayed introduction of appropriate food texture, for example, introducing small lumps after 10 months of age, could give rise to later refusal of solid foods.
 隨着寶寶不同的口肌發展能力,家長可以給他嘗試不同質地的食物。太遲引進合適的食物質地 (例如:10個月大後才開始吃有顆粒的泥蓉狀食物)或會令寶寶對固體食物產生抗拒。
- Enhancing infants' experience with foods and allowing them to experiment with different food textures would help their food acceptance.
 增添寶寶對食物的體驗,讓他們探索不同的食物質地,均有助寶寶接受新食物。
- For infants who have sensory food aversion, parents should engage in parental modelling, allow them to self-feed and monitor the extent of their exposure to new food.
 對於因感官敏感而對食物產生抗拒的寶寶,家長要以身作則,多容許寶寶自己餵食和調節他嚐 新食物的次數。
- 4. In introducing a progression of textures to infants' diet, parents would base their practices on culture and tradition, and should take into account individual differences like temperament and sensory sensitivity.

在引進不同食物質地時,家長會基於他們不同的文化習俗,並須考慮個別寶寶的脾性及感官敏 感度。

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