

# LEARNING TO CHEW

## How Babies Learn to Chew

Chewing, like many developmental skills, depends upon a foundation of earlier experiences and abilities that babies develop. They learn to accept foods containing lumps as they increase their skill with thicker pureed foods. They learn to bite and chew when they play with toys in their mouths and become skilled with lumpy food textures.

### Early Texture Experiences

Most infants have their first experience with textures in the mouth when they feel shape, texture, size and temperature as they put their fingers, objects and toys in their mouths. Mouthing activities, which are most common at 6-9 months, give babies experience with the new sensations and movements they will need when they encounter foods that contain lumps and require more active tongue, jaw and cheek movements. This is a very safe experience for older infants because the different parts of the toy or object don't come off when the baby bites them. There is no risk of gagging and choking as there might be if their first texture experience were with pieces of food.

### First Food Textures

Babies are typically ready for lumpy solid foods when they are approximately 8 months old. They need to be sitting well by themselves before parents give them these more advanced foods. The mouth skills that they need in order to accept and handle lumps well are built upon steadiness and coordination of the body. When babies sit well, they are telling us that they have the physical ability to learn new skills with their mouths.

Babies initially learn to handle lumps and to chew through two different types of experience with food. These two approaches to increasing their eating skills occur during the same age and developmental period for most babies.

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- They learn to accept more sensory input from thick puree-consistency foods that are still relatively smooth. Gradually they become comfortable when pronounced lumps and texture are added to the thicker smooth food. These lumps increase the baby's awareness of texture and invite greater tongue and cheek movement; however they do not require any real chewing.
- They pick up pieces of soft, meltable solids (i.e. Fruit and Veggie Puffs, soft crackers, graham crackers). This enables them to feel the more solid food in the mouth and gum and mash it with the tongue and gums. But it melts so rapidly that they don't have to deal with pieces that need chewing or that could escape into the back of the mouth when it might trigger gagging. They gradually develop the ability handle soft pieces of cooked fruits, vegetables and cheese that don't actually melt, but can be mashed with the tongue and don't require actual chewing.

As babies become comfortable with the feeling of different textures in the mouth, they learn the skill of organizing and swallowing food that has already been chewed. In addition to having greater awareness of the location and size of the pieces, they have a wider variety of tongue movements. This helps them to move the food from the side of the mouth to the center of the mouth where the pieces are pulled together for swallowing.

We can see older babies and toddlers make chewing movements to break apart larger pieces of food. We often think that this is all that they need to do to chew food. We may be unaware of the essential stages that follow this. Children need to move all of the scattered pieces together and transport them to the back of the mouth for swallowing. Without this ability, they wouldn't know what to do with food after they had chewed it up.

## **Moving from Textures to Chewing**

As babies move into the toddler period when they are approximately a year old, their coordination for chewing develops. They are able to move food from the center of the tongue to the side, chew it and move it back to the center again. If their senses tell them that the food does not need more chewing, they will organize the pieces and move them to the back of the mouth for swallowing. If the food pieces are still too large, they will move them back to the side of the mouth for more chewing. By the time they are 2 or 3 years old they can move food from one side of the mouth to the other in an easy, smooth chewing pattern. This movement of tongue lateralization is what most of us call "chewing".

Children improve their biting and chewing skills over a period of 1-2 years. They begin with these early stages between 8 and 12 months. Gradually they develop better coordination and strength that enables them to eat increasingly more complex foods. Between 2 and 4 1/2 years they learn to handle more complex meats, raw fruits and vegetables, and combination-foods that require different mouth movements at the same time. For example, a chunky vegetable soup, firm cereal pieces with milk, or an unpeeled apple require the child to continue to chew the solid pieces of food while simultaneously swallowing the liquid portion. Before developing this skill, children will eat the pieces out of the soup and then drink the liquid.

It is important to introduce new sensorimotor experiences with food very slowly. Often parents will introduce mashed or chopped table foods or many of the commercial 3<sup>rd</sup> foods as their baby's first experience with solid foods and expect that their little beginner will automatically begin to chew. Most babies will gag or experience food scattering all over the tongue when food is introduced in this way. If the food is introduced at an age when the baby has the neurological maturity

to handle solids (i.e. by 8-9 months) most will keep trying until they figure it out.

However many babies become very uncomfortable when their first experience with textures triggers a great deal of fear and gagging. They often refuse to take anything but pureed food when offered future foods that contain textures. These are the children who may develop many problems with learning to take lumpy foods and reject solid, chewable foods.

### **Successful First Steps**

Babies seem to learn most easily when parents use the following initial sequence:

#### *Pureed Background with Texture to Mashed Table Food*

1. Provide opportunities to explore toys or objects with shape and multiple textures with the mouth.
2. Offer smooth pureed food thickened with baby cereal or home-made purees that are thick but smooth.
3. Introduce thicker pureed foods with small, soft, regular lumps of the same size and texture.
4. Advance to foods with a thicker smooth background "sauce" or "gravy" that contain soft lumps that vary in size or texture.
5. Introduce finely mashed table food mixed with a gravy or sauce to bind the pieces together.
6. Include moist mashed table food without a specific sauce.

### ***Soft Solid Finger Foods***

1. Offer meltable solids that can be gummed easily and placed in the mouth by the baby. The key feature is that the baby can pick up the piece of food and place it in the mouth where it rapidly melts in the saliva. The baby may mash the food for a short time with the tongue or gums but does not have to chew it. These foods would include Veggie Stix, Fruit and Veggie Puffs, graham crackers and other crackers that don't have a shiny surface.
2. Introduce soft pieces of solid foods (fruits, vegetables, breads, meats) can be placed in a small nylon bag that is attached to a handle. The baby can place the food bag into the mouth and mash the food to gain sensory experience and taste. Since the pieces remain in the bag, there is no danger that the baby can choke on the food.
3. Provide pieces of solid foods that require very little chewing but can be mashed with the tongue and gums. These would include soft cheese cubes, vegetable and fruit dices that the baby can pick up and put in the mouth with the fingers, and mashed or finely chopped vegetable and fruit pieces.
4. Advance to foods that require more tongue and cheek manipulation for chewing but do not require the grinding movement of the teeth and movement from one side of the mouth to the other that would be required for meat, salads, raw vegetables etc.

## Guidelines for Parents

- Encourage and support your baby's ability to put fingers, safe toys and objects in the mouth and explore them with the jaw, lips, and tongue. Know that this is how most babies develop the first skills that will lead toward handling lumpy foods.
- Wait until your baby is sitting independently and is approximately 8 months old before introducing thicker purees, soft lumpy foods and meltable solid finger foods. Babies need to have the physical and neurological maturity to succeed with chewing. Not all babies are ready for this at the same age level.
- Babies do not need to have teeth to learn to chew. The first steps of chewing require only tongue, jaw and cheek movements. Teeth are used later for more complicated foods with fibers that must be broken up by the teeth.
- Introduce foods with lumps very slowly to your baby. You can use a baby food mill to create a very soft, gentle texture that can be mixed with a thicker puree.
- Introduce new foods to your baby after offering enough of a familiar food or texture when he is not extremely hungry. You can give your baby the pureed food and then offer a small spoonful of the textured food, mixed in with the familiar puree. Then offer a spoonful of the pureed food. Gradually you can offer several spoonfuls of the textured food and follow it with several spoons of pureed food. As your baby becomes accustomed to the new texture, she will be able to eat just the textured foods.
- If you are using a commercial 3<sup>rd</sup> baby food, it is very important to know that different manufacturers use different approaches to making the baby food. Some 3<sup>rd</sup> foods have relatively large lumps or even small pieces of meat that require some actual chewing. Some have a relatively thin background sauce or gravy. When the baby's saliva mixes with the food, the sauce turns to a liquid and the baby has to handle the thin consistency combined with a chunky texture. Several companies make a more appropriate 3<sup>rd</sup> food that has a thick background sauce combined with soft, regular pieces of food that is much easier for babies to handle successfully. You want to give your baby a 3<sup>rd</sup> food that is thick and contains these soft regular pieces of soft solid food. Purchase single examples of 3<sup>rd</sup> foods from different baby food companies. Check out the background sauce and the "mouth feel" of the food to decide whether it is appropriate for your baby's current abilities. If the food does not fit your baby's needs, you can puree it and offer it as a smooth pureed food. In this way none of the food you purchase will be wasted.
- You can make your own baby food with soft texture or lumps. Use a blender to create a thicker, smooth puree initially. Use a baby food grinder to create a regular texture that you can add to the thick puree. Then experiment with adding lumps by finely mashing soft cooked vegetables or fruit with a fork and mixing these into the thicker puree.
- Move slowly as you increase the texture and the challenge for your baby. Let your baby guide you. If he has difficulty with the amount of lumpiness or the size of the pieces in the food, go

back to an easier food mixture that he handled successfully. When he is doing well with the food you have served, begin to make the pieces of food bigger or include several different types of pieces in the textured-food meal.

- Safety is your highest priority in selecting foods for your child. Avoid firm foods that are the size of your child's airway until she is at least 3 years old. This includes nuts, popcorn, whole grapes and any meat that is not cut up finely. These foods are very unforgiving if the child loses control of the pieces. Food pieces can move into the airway and block the child's ability to breathe, resulting in brain injury or death from lack of oxygen.