Thickening formula is done for several reasons:

- You want a food that doesn't splash every time the baby moves or the stomach churns. Thickened liquids don't splash out of the stomach as easily.
- The stomach treats liquids and solids differently. Thickened liquids provoke a different kind of churning action.
- Children who have trouble gaining weight may benefit from extra calories in their food.
- Children prone to choking sometimes do better on thicker liquids. The thicker liquids seem to be less prone to going "down the wrong tube."

There is a chemical sensor at the top of the stomach that senses air bubbles and lets them out. If it senses food or acid, it is supposed to keep the top of the stomach shut. Thickened liquids may help the chemical receptor recognize the presence of a liquid and close the sphincter at the top of the stomach correctly.

Thickening doesn’t work for all children all the time:

- Watch your child carefully! There are a few children who choke more on thickened liquids! Watch how the thickening affects swallowing of "second hand" food that has been refluxed out of the stomach once. The baby may re-swallow it.
- Some children gain too much weight when the milk is thickened with cereal. Non calorie thickeners are available at pharmacies.
- Thickening does not reduce acid.
- Thickening doesn't decrease reflux in all children, it just keeps the stomach contents from coming up far enough to be seen.
- Pumping and using a bottle can disrupt breastfeeding. Please consult a breastfeeding expert to help avoid problems.
- Some children with reflux sleep better with an empty stomach. Parents discover this after accidentally missing the last evening bottle. It may be worth trying.

Ideal Thickness:

If the formula is too thin, you aren’t accomplishing anything except increasing the number of calories per ounce—it will still splash. If the formula is too thick, the baby won’t be able to get it out of the bottle and will get tired before she gets full.

Pediatricians use these descriptions for the perfect thickness: “stage 1 baby foods” or “tomato sauce.” (Not tomato paste!) Commercial thickening companies use the terms “nectar,” “honey” and “pudding.” We tested real fruit nectars and found them to be too thin. Honey was far too thick. Tomato sauce and stage 1 foods are just about right. When we tested commercial thickeners, we usually used a bit more thickener than their “nectar” recipe.

Note: Breast milk will thicken up fine, but a few minutes later it gets thin again. There is an enzyme in the breast milk (Amylase) that “digests” cereals and it will get thin after about 5 minutes. If your child chokes on thin liquids, thickening breast milk may help. But if you want the milk to stay thick, try using commercial thickener made of Xanthan gum.
Pediatricians usually recommend that you add 1 Tablespoon of cereal per every ounce of water; however, some cereals thicken much more than others.

To find a solution, PAGER Association has conducted a series of experiments to find the appropriate thickness for a few different brands of baby cereals. The purpose of putting together this booklet is to demonstrate potential ways of thickening up your baby’s cereal.

Each experiment was started using 1 Tablespoon of cereal per ounce of water, with more cereal/thickener added to mixture as needed to create the ideal thickness. Our measuring device was more accurate with large bottles, so we mixed 8 ounce bottles with each brand.

We used powdered formula in pre-measured packets for our experiments. Use liquid formula if a pediatrician instructs you to do so. Powders are not sterile and should not be given to babies that were born prematurely or babies with immunity issues. Powders contain cornstarch to prevent caking, and some babies may have a reaction to this ingredient.

Which one is the Tablespoon? The one on the left!
Three teaspoons fit into a Tablespoon

Thickened formula will not come out of a regular nipple. Most bottle manufacturers have cross cut nipples and variable flow nipples. Ask your pharmacist or grocery manager to order them. (See the section on choosing nipples, beginning on page 13??)
<table>
<thead>
<tr>
<th>Brand</th>
<th>Amount needed to thicken a 4 ounce bottle</th>
<th># of calories in the thickener for the 4 ounce bottle. (Add this to the calories from the milk.)</th>
<th>Amount needed to thicken an 8 ounce bottle</th>
<th># of calories in the thickener for the 8 ounce bottle. (Add this to the calories from the milk.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gerber DHA &amp; Probiotic Rice</td>
<td>3.5 Tablespoons</td>
<td>52</td>
<td>7 Tablespoons</td>
<td>105</td>
</tr>
<tr>
<td>Gerber Rice</td>
<td>5 Tablespoons</td>
<td>75</td>
<td>10 Tablespoons</td>
<td>150</td>
</tr>
<tr>
<td>Gerber Oatmeal</td>
<td>5 Tablespoons</td>
<td>75</td>
<td>10 Tablespoons</td>
<td>150</td>
</tr>
<tr>
<td>Beechnut Rice</td>
<td>4 Tablespoons</td>
<td>60</td>
<td>8 Tablespoons</td>
<td>120</td>
</tr>
<tr>
<td>Beechnut Oatmeal</td>
<td>4 Tablespoons</td>
<td>60</td>
<td>8 Tablespoons</td>
<td>120</td>
</tr>
<tr>
<td>Earth’s Best Whole Grain Oatmeal</td>
<td>3 Tablespoons &amp; 1/2 teaspoon</td>
<td>42</td>
<td>6 Tablespoons &amp; 1 teaspoon</td>
<td>85</td>
</tr>
<tr>
<td>Earth’s Best Whole Grain Rice</td>
<td>2 Tablespoons &amp; 1/2 teaspoon</td>
<td>31</td>
<td>4 Tablespoons &amp; 1 teaspoon</td>
<td>63</td>
</tr>
<tr>
<td>Happy Bellies Organic Multi-grain</td>
<td>4 Tablespoons &amp; 1 teaspoon</td>
<td>80</td>
<td>9 Tablespoons &amp; 2 teaspoons</td>
<td>190</td>
</tr>
<tr>
<td>Happy Bellies Organic Brown Rice</td>
<td>3.5 Tablespoons</td>
<td>70</td>
<td>7 Tablespoons</td>
<td>140</td>
</tr>
<tr>
<td>Happy Bellies Organic Oatmeal</td>
<td>4 Tablespoons &amp; 2 teaspoons</td>
<td>92</td>
<td>9 Tablespoons &amp; 1 teaspoon</td>
<td>185</td>
</tr>
<tr>
<td>Thick-It</td>
<td>2 Tablespoons &amp; 1/2 teaspoon</td>
<td>32</td>
<td>4 Tablespoons &amp; 1 teaspoon</td>
<td>65</td>
</tr>
<tr>
<td>Thick &amp; Easy</td>
<td>1.5 Tablespoons</td>
<td>22</td>
<td>3 Tablespoons</td>
<td>45</td>
</tr>
<tr>
<td>NutraThik (powder) [Also available in packets called Thik and Clear]</td>
<td>1 Tablespoon</td>
<td>20</td>
<td>2 Tablespoons</td>
<td>40</td>
</tr>
<tr>
<td>Hydra-Aid (gel) Nectar</td>
<td>1 &amp; 1/8 packets</td>
<td>0</td>
<td>2 ¼ packets</td>
<td>0</td>
</tr>
<tr>
<td>Simply Thick (gel) Nectar</td>
<td>2 packets</td>
<td>0</td>
<td>4 packets</td>
<td>0</td>
</tr>
<tr>
<td>Simply Thick (gel) Honey</td>
<td>1 &amp; 1/8 packets</td>
<td>0</td>
<td>2 ¼ packets</td>
<td>0</td>
</tr>
<tr>
<td>Missing brand??</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Missing brand??</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
These are all the brands of bottles that we used when conducting our experiment for the nipple with the best flow.

The nipples were rated on a point scale of 0 to 5, with 0 being too slow and 5 being quite fast.

Thickened formula required a larger nipple. We tested various baby bottles and nipples to determine which brand would allow the best flow. Before running our tests, we visited 4 stores and purchased every “cereal,” “thick liquid,” “x-cut” nipple and “y-cut” nipple possible. It made sense to buy 1 of every bottle system that was available. We also purchased a large packet of cheap Gerber nipples to take a more hands on approach and practice cutting our own holes to increase the opening.

After debating for some time the best way to go about testing this experiment (since we had no babies to volunteer), we decided to take more of a “do-it-yourself” approach! The 2 testers, Beth and Sorley, used a pitcher of thickened cereal and began sampling the various bottles spread out across the kitchen table. Of course, we weren’t going to swallow the mixture, so after sucking the displeasing concoction through the nipple, we had spit buckets at the ready. The two of us took turns trying out every bottle (we each had our own, and each was sterilized) and rated them from most effective to least effective based on our own opinions. We each wrote down our own ratings before comparing them with one another.

*Stomach acid kills bacteria. If your baby is on acid reducing medicines, you will need to be extra careful about avoiding bacteria. Ask your pediatrician how long to keep boiling bottles, nipples, pacifiers, spoons, medicine droppers and teething rings. Also, high-chair surfaces should be kept clean.*
These three bottles (Gerber Nuk, Dr. Brown’s, and Avent) seemed to have the best flows out of all the bottles that were used, with Gerber Nuk being the best (5), Dr. Brown’s coming in second (4), and Avent coming in third place (3). The nipples were naturally wider than other brands we experimented with and proved to be easier to suck the thickened liquid through, therefore making it easier for a baby to receive their meal with minimal effort. It is possible that the flow can be too fast for some babies and they could gag.

**Gerber Nuk**

Ranked at 5. Gerber’s orthodontic nipples, made of silicon. Has 1 large hole placed towards roof of mouth and works great! It might be too fast for some children. The nipple is very soft and collapsible which also may not work for some children.

**Dr. Brown’s**

Ranked at 4. Has a Y-cut nipple that works well.

**Avent**

Ranked at 3. Did not flow as well as Gerber Nuk or Dr. Brown’s, but still does the job.
Born Free

Ranked at 2. You would probably have to enlarge the hole.

ThinkBaby

Ranked at 1.5. You would probably have to enlarge the hole.

Nuby Non-drip

Ranked at 1.5. These nipples are difficult or impossible to cut yourself

Playtex

Ranked at 1. You would need to enlarge the hole.
Gerber (latex nipple)

 Ranked at 0. You would have to enlarge the hole. Easy to cut.

Gerber (silicon nipple)

 Ranked at 0. Easy to cut.

Other feeding gadgets that might be useful for reflux

The Flowspoon is useful for feeding cereal separately instead of mixing it into the bottle. Baby slurps the cereal from the bottom opening. This is a more natural mouth movement for infants.

The Podee Bottle is great for feeding your child in an upright position; however, it does not allow sufficient flow for thickened meals.

The Boon Squirt and similar “spoons” hold cereal in the handle.

Zoom for Detail
It is possible to cut your own holes into the top of a nipple if you want to increase the flow.

It works much better with silicon nipples rather than other materials.

The easiest way to cut your own is with an exact-o knife or manicure scissors. Get a wooden spoon (we used a mallet) with a rounded end and push it up into the nipple. Then, using the wood as a base, carefully push the blade through the top of the nipple and make an X-shaped cut.

It is relatively easy to do this yourself, and it does not require much precision by the cutter. Just gently use the blade (without cutting yourself please!) to cut a larger X or Y cut into the center of the nipple. You do not need to enlarge it a great deal, just use tiny strokes.

The above picture (nipples on chopsticks) shows how we increased the size of the hole based on how far down the chopstick the nipple is resting.
The mallet displayed on the right would be the correct type to use because it is rounded off at the end. The other mallet has a flat bottom, which makes it harder to cut an X into the nipple.

This shows how we increased the size of one of the nipple openings. They started off the same, but after a few incisions, the adjusted nipple flowed noticeably better than it did as purchased.

Comments? Your input is welcome. We are seeking a graphic designer to improve the appearance of the booklet.