

The First Years Eases Baby's Breast-to-Bottle Transition Foster-Miller Leverages Biomimetic Technology to Develop Unique New Product

As more women return to work and new fathers take a greater role in caring for their babies, the trend of mixing breast and bottle-feeding continues to grow. While this combination solution may be ideal for caregivers, babies moving from one process to another often become frustrated because bottle-feeding requires a different oral technique than breastfeeding. The First Years (Stoughton, MA), one of the world's top providers of feeding, care and play products for children from birth to age three, has removed this challenge by creating the Breastflow Bottle™ Feeding System specifically designed to ease a baby's transition between feeding practices.

The company accomplished this feat by taking their concept to Foster-Miller (Waltham, MA), a leading technology and innovation company, that coupled engineering expertise with physiology to design a bottle system that emulated the interaction of a baby's mouth with a mother's breast in the feeding process.

“Our goal was to create a simple, cost effective system that would help breastfeeding moms ease the transition from breast to bottle,” says Sherry Thomas, Managing Director for The First Years. “Foster-Miller helped us meet our goal by developing a feeding system that is designed to work more like a mother's breast.”

The development and testing phases gave way to the creation of a patented biomimetic valve and nipple assembly system designed to deliver milk while mimicking the functions of breastfeeding, meeting The First Year's goal to provide babies a bottle-feeding experience more like breast feeding.

Almost Like Mom

The first thing Foster-Miller had to discover was why babies were not willing to revert back to breastfeeding after using a bottle. In order to better understand the ergonomics of a mother's breast, a pump was created to imitate as closely as possible the breastfeeding process. The company went “back to the basics” and reviewed the functionality of the human breast. Breastfeeding babies perform a pumping and suckling motion in order to extract liquid from the 16 to 20 milk ducts in the mother's breast. During this process, babies actually have to pump the breast milk out by compressing the milk ducts and expelling the milk.

This interaction greatly contrasts with the much easier suckling motion required for bottle-feeding babies. Using a conventional nipple, the baby needs only to gently suck in order to promote liquid flow. Little ones often have less difficulty using a bottle, and when reintroduced to the breast may not easily resume the breast latching technique needed to properly release the mother's milk.

To bridge the different techniques, a two-piece nipple was designed to effectively duplicate the fluid delivery functions of the human breast, incorporating a process similar to that of a basketball pump. The nipple's elastomer material is composed of the same type of silicone used in

traditional bottle nipples but with a durable exterior that makes consistent use possible and sanitizing easier.

The two relatively simple components of the Breastflow Bottle Feeding System perform the functions of inlet and outlet valves as well as four milk ducts. When the baby squeezes the nipple, the inlet valve closes while the outlet valve opens, allowing the milk to flow. When the child ceases suckling, the nipple expands, the outlet valve closes, the inlet valve opens, and the milk again enters the nipple, successfully mimicking the functions of breast-feeding.

“No other product on the market offers the benefits of breast and bottle feeding quite like the Breastflow Bottle,” says Thomas. “We had a very cooperative relationship with Foster-Miller who lent their innovation and expertise to develop a next generation baby bottle that is a simple, compatible solution for breastfeeding moms.”

Designing for Baby

Foster-Miller closely collaborated with The First Years in the development of the Breastflow Bottle Feeding System. The cross-company team involved engineers with mechanical design, fluid dynamics and materials experience to ensure the product met all applicable quality standards and goals. The Breastflow Bottle was also tested to ensure viability and prevent against potential choking hazards. It passed with flying colors.

What differentiates the Breastflow Bottle Feeding System from other products on the market is its functionality and ability to imitate the shape and pumping motion of a mother’s breast. Breastfeeding moms can now use The First Years Breastflow Bottle Feeding System to ease babies’ transition from their mother’s breast to a bottle and back to breast as well as during the weaning period. Unlike a conventional bottle, The First Years’ product requires babies to perform the same pumping motion they use when breastfed, and is constructed to be both microwave and dishwasher safe. “Now parents have the freedom to go back and forth from the breast to bottle without interrupting baby’s nourishment,” says Thomas.

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