

# Is Breast Still Best From a Bottle?

Alison Volpe Holmes, MD, MPH

“What is the healthiest way to feed our baby?” Many new parents ask their pediatricians this question. Although “breastfeeding” has been the clear answer for decades, the importance of exclusive breastfeeding as the primary driver of health benefits for infants has emerged more recently.<sup>1,2</sup> The strongest evidence for exclusive breastfeeding is in the prevention of common infectious diseases and sudden infant death syndrome.<sup>1-3</sup> That exclusive breastfeeding is associated with healthier early weight gain trajectories has been more difficult to demonstrate, but authors of recent studies have begun to build some early evidence in this area.<sup>2,4</sup>

Because exclusive breastfeeding was found to be the key ingredient for positive child health impacts, new questions arose. If a newborn is transiently given supplemental formula for a few days in early life but then reverts to exclusive breastfeeding, does the same degree of health benefits hold? Is there a difference in health outcomes if human milk is fed directly from the breast or if it is expressed and fed via a bottle? When bottled human milk is used, does it matter if it is used as fresh milk or reheated after refrigeration or freezing? Does the length of storage time or the temperature of storage deleteriously affect the beneficial bioactive components of human milk? When an infant is no longer exclusively breastfed at 5 or 6 months of age, are there differential health benefits depending on whether additional nutrition includes formula as opposed to solely complementary foods?

In the current issue of *Pediatrics*, Azad et al<sup>5</sup> attempt to answer some

of these more nuanced questions as they relate to infant weight gain and obesity. Their Canadian Healthy Infant Longitudinal Development (CHILD) birth cohort study is sufficiently large and has robust subgroups that allow them to explore some of these issues in detail. The research team gathered detailed data not only on diet composition but also specified whether human milk was fed directly from the breast or via a bottle. They made clear distinctions between subgroups that ended a period of exclusive breastfeeding solely because of the addition of complementary (solid) foods versus those that also had formula added to the diet. Half of the exclusively breastfed infants drank some expressed milk, whereas the other half fed only directly from the breast. Slightly more than half of the cohort began eating complementary foods in the 4- to 6-month window. For those eating complementary foods at 6 months of age, half also took formula, whereas the other half did not.

Intake directly from the breast has been postulated to mitigate obesity risk because suckling is infant-led, but authors of previous studies have not sufficiently separated out human milk delivery methods.<sup>4</sup> Indeed, the CHILD study investigators clearly demonstrate that obesity risk is most attenuated if human milk intake is all directly from the breast. The protective effects of breastfeeding are lessened when bottles of expressed human milk are added to direct breastfeeding. Added bottles of formula are even more obesogenic. With expressed human milk conferring intermediate protection, the observed effect might be from feeding route, or from the loss of protective bioactive factors during

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storage. The group of infants who had complementary foods added to their diets without the addition of formula in the 5- to 6-month window had the leanest outcomes at 12 months of age. The earlier addition of complementary foods or the concomitant use of formula was associated with more rapid weight gain. Those concerned about the increased risk of food allergy by waiting too long to introduce solids can be reassured that complementary food introduction at 5 months instead of 6 months of age had no detrimental effects on obesity risk. Food introduction before 5 months of age did lead to more rapid weight gain. In light of a recent British study showing better infant sleep with complementary food introduction at 3 months of age, parents may need to decide if sleep is more important than protection from early rapid weight gain or infectious disease.<sup>1,5,6</sup> The authors also demonstrated that brief in-hospital formula supplementation (received by 27% of the cohort) did not have any untoward effects on the measured outcomes.<sup>7</sup> As long as the supplemented subgroup quickly reverted to exclusive breastfeeding, outcomes were identical to those fed only human milk from day 1.

The high breastfeeding rates reported are noteworthy: 97.5% infants initiated, with a median of 4 months of exclusive and 11 months of any breastfeeding, and

26% infants fed only from the breast for 3 months. This reflects Canada's maternity leave of 17 to 52 weeks with job preservation and a minimum of 15 weeks of paid leave.<sup>7</sup> The United States is a member of an exclusive group of 3 nations that offer no paid maternity leave. This, coupled with US opposition to measures supporting breastfeeding at the 2018 World Health Assembly,<sup>8</sup> does not bode well for US mothers and infants trying to derive the full health benefits of exclusive breastfeeding.

Given the excellence in both data collection and study methodology, the CHILd study investigators should manage the obesity outcomes of their cohort into childhood and investigate other breastfeeding-related health outcomes. The fact that the investigators separated out the timing and types of exclusive breastfeeding and food introduction will be useful in investigating other breastfeeding benefits, like infectious disease prevention. With this report, and more to come, pediatricians have new and better evidence to advocate for family leave and workplace support policies that protect breastfeeding mothers and infants, and improve public health.

#### ABBREVIATION

CHILd: Canadian Healthy Infant Longitudinal Development

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