

# Determine Preterm Infants Feeding By Testing Weight; Systematic Review

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**Abstract:** Breastfeeding and human milk are widely acknowledged as the gold standard for infant feeding and advised by peak bodies such as the American Academy of Pediatrics and the World Health Organization (WHO). Human milk is especially important for preterm infants (infants born <37 weeks' gestational age) as these are the tiniest, most susceptible infants. Therefore, the aim of this systematic review was to evaluate studies that using testing Wight to measure the preterm infant breastfeeding, we also aimed to discuss the benefits of breastfeeding for preterm infants through wide variety of evidence worldwide. We searched PubMed/MEDLINE, EMBASE and Dialog databases between 1980-2016 with English language restriction but limited to "human" (Search strategy terms: "preterm infants" OR "premature infants" OR "low birth-weight" OR "low birthweight" OR LBW OR "very low birthweight" OR "very low birthweight" OR VLBW OR (extremely low birth weight) OR ELBW OR infant OR newborn OR neonat\*) AND (nutrition OR formula\* OR "infant formula" OR milk OR "preterm formula" OR growth OR "infant nutrition"). This weighing efficiency is insufficient for dependable measurement of small increments in weight, as is needed for test weighing. Although more sensitive scales need to show smaller standard deviations with repeated measurements, the fragile handling required to operate them makes their usage impractical for test weighing purposes. screening weighing seems dependable, simple, medically useful method for examining milk intake in breast fed preterm infants. a number of research studies suggest that test weighing of a single feed is too inaccurate to be of clinical use and ought to be discouraged.

**Keywords:** American Academy of Pediatrics, Determine preterm infants feeding.

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## 1. INTRODUCTION

Breastfeeding and human milk are widely acknowledged as the gold standard for infant feeding and advised by peak bodies such as the American Academy of Pediatrics <sup>(1)</sup> and the World Health Organization (WHO) <sup>(2)</sup>. Human milk is especially important for preterm infants (infants born <37 weeks' gestational age) as these are the tiniest, most susceptible infants. Preterm really low birth weight (VLBW, <1,500 g) infants are at high risk for growth failure and co-morbidities that lead to delayed neurodevelopment and scholastic accomplishment <sup>(3,4,5)</sup>. Early nutrition assistance is acknowledged as critical to growth and development and unique breastfeeding is widely advised as beneficial to the health and well-being for all infants <sup>(1,7,8)</sup>. Human milk also gives significant neuro developmental advantage to preterm infants <sup>(9,10)</sup>. Test weighing (test feeding) is utilized to determine an infant's breast milk intake by weighing the infant prior to and after feeding without changing the napkin or otherwise modifying the infant's clothes <sup>(10)</sup>.

The most typically utilized method for estimating breastfeed volume in research study reporting dietary consumption of preterm infants is estimation of the prescribed feed volume minus the charted consumption, with the rest presumed to be the breastfeed volume <sup>(11)</sup>. Other approaches taken include ignoring the contribution from breastfeeds <sup>(12,13)</sup>, using intricate analytical approaches to impute the volume <sup>(14)</sup> or using the test weighing technique <sup>(15)</sup>. Test weighing includes weighing infants before and after a breastfeed, with the change in weight reflecting the milk volume taken by the infant. Test weighing is considered the gold standard for measuring volume taken throughout a breastfeed in a scientific setting <sup>(16)</sup>.

Test weighing, the practice of weighing a child before and after feeding to approximate feeding volume, is a clinically accessible and noninvasive technique for quantifying milk intake in breastfed infants. As a result of its favorable correlation with effective breastfeeding<sup>(17,18,19)</sup>, test weighing is utilized by many medical service providers<sup>(18,20)</sup> and is endorsed by the World Health Organization for term newborns<sup>(21)</sup>. There are variations in breastfeeding rates for preterm infants compared to term infants. Test weighing has the possible to increase direct breastfeeding in the neonatal intensive care unit (NICU)<sup>(18)</sup> and to assist maintain a mom's milk supply<sup>(20,21,22)</sup>. A couple of small studies support making use of test weighing in the NICU<sup>(13,14,18)</sup>; however, adoption of this method have actually been limited by issues about accuracy in preterm infants<sup>(23)</sup>.

Initiating and sustaining breastfeeding with an infant at risk for suboptimal intake are common obstacles in neonatal units. Therefore, the aim of this systematic review was to evaluate studies that using testing Wight to measure the preterm infant breastfeeding, we also aimed to discuss the benefits of breastfeeding for preterm infants through wide variety of evidence worldwide.

## 2. METHODOLOGY

### Systematic review study was conducted:

#### Search methods:

We followed the Preferred Reporting Items For Systematic Reviews And Meta-Analyses (PRISMA) guidance, and searched PubMed/MEDLINE, EMBASE and Dialog databases between 1980-2016 with English language restriction but limited to “human” (Search strategy terms: “preterm infants” OR “premature infants” OR “low birth-weight” OR “low birthweight” OR LBW OR “very low birthweight” OR “very low birthweight” OR VLBW OR (extremely low birth weight) OR ELBW OR infant OR newborn OR neonat\*) AND (nutrition OR formula\* OR “infant formula” OR milk OR “preterm formula” OR growth OR “infant nutrition”).

We included most important, reviews, RCTs, and every type of study discussing the determine of breastfeeding in preterm infants by testing weight, we excluded from these case reports studies.

## 3. RESULTS & DISCUSSION

Test weighing (weighing previously and after feeding) is the most convenient approach to evaluate milk intake in breast fed infants<sup>(10,14,25)</sup>. This approach is typically used during the very first weeks of life, throughout the build-up stage of breast feeding and when newborn infants are ill, both in the house and in health center<sup>(25,26)</sup>. It is assumed that the increase in the infant's weight after feeding (in grams) reflects the amount of milk (in milliliters) drunk by the infant. The World Health Organization considers test weighing to be a helpful approach of assessing milk consumption in breast fed infants<sup>(27)</sup> and natural requirement for preterm infants (**Table1**) which all found in breastfeeding<sup>(27)</sup>. This is based on a number of research studies that took a look at the dependability of test weighing in bottle fed infants, comparing the distinction in weight with the quantity of milk drunk from the bottle<sup>(10,13,14,16,25,26,28,29,30)</sup>. In these research studies, conclusions were based on extremely significant connections between weight modification and milk consumption, which show association however not necessarily arrangement in between 2 techniques<sup>(30)</sup>.

**Table1.Nutritional requirements for preterm infants \*<sup>(27)</sup>**

• Energy—110-20 kcal/kg/day
• Protein—3-3.8 g/kg/day
• Fat—4.5-6.8 g/kg/day
• Calcium—120-230 mg/kg/day
• Phosphorus—60-140 mg/kg/day

\*International consensus group recommendations

In the process of establishing a test weight strategy we discovered that infant motion such as flailing legs and arms can cause unreliable outcomes; for that reason, several proof suggest tightly swaddling the infant prior to weighing <sup>(12,13)</sup>. The last factor adding to weight variation is the accessory of an infant to monitors or oxygen. This factor has been previously pointed out by Meier and associates <sup>(12,13,14)</sup>; nevertheless, no technique for managing weight variation has actually been explained. Stress or dangling of tubing, wires, or the lead connection point or holding them above the infant all common mistakes kept in mind in the medical location can cause significant weight variation. It is very important to put the cart holding the scale as near as possible to the infant's crib and in the same location for the pre- and post-weights. Taping the lead connection point and/or tubing to the crib avoids lead wires/tubing from touching the edge of the scale while preventing unwanted stress. When a post-feeding weight was figured out for the infants with leads, the scale was shut off while the scientist rearranged the infant on the scale the leads. If the scale was not switched off the post-feeding weight would be computed by the scale while the infant and leads were being resituated <sup>(16)</sup>.

Resolving the argument over whether test weighing can accurately show intake for preterm infants is an essential step in enhancing assistance for direct breastfeeding in the neonate care join. Frequently, clinicians hesitate to enable preterm infants to directly breastfeed when feeding volumes are unknown, making it difficult to approximate how much milk should be supplemented after breastfeeding and tough to figure out whether suboptimal development is connected to insufficient calorie consumption <sup>(29)</sup>. Adoption of pre- and post-feeding test weights might help promote direct breastfeeding in preterm infants <sup>(26)</sup>.

We have determined one important Single-center prospective associate study <sup>(24)</sup> of infants 28-36 weeks' fixed age getting gavage feedings. That aimed to evaluate the accuracy of pre- and post-feeding weights to approximate enteral feeding volumes in preterm infants. their outcomes showed test weight measurements correlated well with volumes of gavage feeding even in little infants, no matter kind of feeding. The mean outright difference (2.95 mL) was little for the total population. The percent error was significantly higher in less fully grown infants and when protocol issues were kept in mind (**Table2**) <sup>(24)</sup>. This finding is not unexpected, because more immature infants frequently require additional medical assistance and take in smaller sized volumes, potentially making complex the test weighing treatments. Four of the 6 infants who had > 30% error were kept in mind to have procedure concerns and their results supply additional proof for clinicians to support using test weights to estimate enteral feeding volume in a preterm population, particularly infants beyond 34 weeks. and concluded that the use of a basic protocol, feeding volumes can be approximated precisely by pre- and post-feeding weights. Test weighing could be a valuable tool to support direct breastfeeding <sup>(24)</sup>.

**Table2. Test weight protocol concerns** <sup>(24)</sup>

	<b>Total n = 27</b>
Protocol concerns, n (%)	measurements
Difficulty securing oxygen tubing	10 (37)
Emesis/milk leaking from tubing	5 (19)
Delayed or incomplete feeding	4 (15)
Medication administered with feeding	3 (11)
Difficulty swaddling infant	2 (7)
Gastric residual refeed or gastric tube vented between	2 (7)
Test weights	
Diaper change	1(4)

Alternative approaches for estimating milk intake have been analyzed, consisting of computerised measurements of breast volume and deuterium tracer studies <sup>(27,31)</sup>. These techniques are too complicated, nevertheless, for practical scientific use. Indirect test weighing (measuring weight modifications in the mother rather than the child) can be assumed to struggle with the very same measurement imprecision as the method of test weighing examined in this research study <sup>(29,32,33)</sup>. Since weight modifications over 24 hours in infants are larger than weight modifications after a single feed, the imprecision of everyday weighing must be smaller sized, and the reliability greater, than the imprecision of single feed test weighing <sup>(33)</sup>. One study recommended that duplicated test weighing after every feed throughout 24 hours was more dependable in anticipating milk consumption than test weighing of a separated feed, however these findings are tough to generalise because the study included only six subjects and was never ever confirmed <sup>(29)</sup>. Medical indices such as great suckling and baby contentedness after feeding have also been revealed to be unreliable in predicting milk consumption <sup>(14)</sup>.

Lastly, we consisted of one study<sup>(34)</sup> that Test weights were carried out on a sample of hospitalized high-risk infants with and without leads who were bottle- or nasogastric-fed. This study concluded support the use of this test weighing method as a precise, unbiased assessment of the measurement of breastmilk intake after a breastfeeding session, hence permitting medical decisions relating to supplementation to be based on objective information instead of incorrect scientific indices of the quality of infant feedings at the breast<sup>(34)</sup>.

#### 4. CONCLUSION

**TEST WEIGHING** or weighing the infant prior to and after breastfeeding to examine milk consumption, in which weight gain in grams is converted equally to volume of consumption in milliliters. The most likely reason for the imprecision of test weighing is that the scales used are designed to determine infant weight reliably, however not to get small changes in infant weight after a single feed. This weighing efficiency is insufficient for dependable measurement of small increments in weight, as is needed for test weighing. Although more sensitive scales need to show smaller standard deviations with repeated measurements, the fragile handling required to operate them makes their usage impractical for test weighing purposes. screening weighing seems dependable, simple, medically useful method for examining milk intake in breast fed preterm infants. a number of research studies suggest that test weighing of a single feed is too inaccurate to be of clinical use and ought to be discouraged.

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