15.6.3. Frequency and Duration of Feeding

Hofvander et al. (1982) reported on the frequency of feeding among 25 bottle-fed and 25 breast-fed infants at ages 1, 2, and 3 months. The mean number of meals for these age groups was approximately five meals a day (see Table 15-35). Neville et al. (1988) reported slightly higher mean feeding frequencies. The mean number of meals per day for exclusively breast-fed infants was 7.3 at ages 2–5 months and 8.2 at ages 2 weeks to 1 month. Neville et al. (1988) reported that, for infants between the ages of 1 week and 5 months, the average duration of a breast-feeding session is 16–18 minutes.

Buckley (2001) studied the breast-feeding patterns, dietary intake, and growth measurement of children who continued to breast-feed beyond 1 year of age. The sample was 38 mother-child pairs living in the Washington, DC, area. The criteria for inclusion in the study were that infants or their mothers had no hospitalization of either subject 3 months prior to the study and that the mother was currently breast-feeding a 1-year-old or older child (Buckley, 2001). The participants were recruited through local medical consultants and the La Leche League members. The children selected as the final study subjects consisted of 22 boys and 16 girls with ages ranging from 12 to 43 months old. The data were collected using a 7-day breast-feeding diary. The frequency and length of breast-feeding varied with the age of the child (Buckley, 2001). The author noted a statistically significant difference in the mean number of breast-feeding episodes each day and the average total minutes of breast-feeding between the 1-, 2-, and 3-year-old groups. Table 15-36 provides the comparison of breast-feeding patterns between age groups. An advantage of this study is that the frequency and duration data are based primarily on a 7-day diary and some dietary recall. Limitations of the study are the small sample size and that it is limited to one geographical area.

15.7. REFERENCES FOR CHAPTER 15

- Abbott Labs (Abbott Laboratories). (2003).

 Breastfeeding trends 2003. In Ross mothers survey. Columbus, OH: Ross Products Division of Abbott Laboratories. http://abbottnutrition.com/Downloads/News
 AndMedia/Media/Center/BF_Trends_2003.p
- Albernaz, E; Victora, CG; Haisma, H; Wright, A;

 Coward, WA. (2003). Lactation counseling increases breast-feeding duration but not breast milk intake as measured by isotopic

- methods. J Nutr 133: 205-210.
- Arcus-Arth, A; Krowech, G; Zeise, L. (2005). Breast milk and lipid intake distributions for assessing cumulative exposure and risk. J Expo Anal Environ Epidemiol 15: 357-365. http://dx.doi.org/10.1038/sj.jea.7500412.
- Bonuck, KA; Trombley, M; Freeman, K; Mckee, D. (2005). Randomized, controlled trial of a prenatal and postnatal lactation consultant intervention on duration and intensity of breastfeeding up to 12 months. Pediatrics 116: 1413-1426. http://dx.doi.org/10.1542/peds.2005-0435.
- Brown, KH; Akhtar, NA; Robertson, AD; Ahmed, MG. (1986a). Lactational capacity of marginally nourished mothers: Relationships between maternal nutritional status and quantity and proximate composition of milk. Pediatrics 78: 909-919.
- Brown, KH; Robertson, AD; Akhtar, NA. (1986b).

 Lactational capacity of marginally nourished mothers: Infants' milk nutrient consumption and patterns of growth. Pediatrics 78: 920-927.
- Buckley, KM. (2001). Long-term breastfeeding: Nourishment or nurturance? J Hum Lact 17: 304-312.
- Butte, NF; Garza, C; Smith, EO; Nichols, BL. (1984). Human milk intake and growth in exclusively breast-fed infants. J Pediatr 104: 187-195.
- Butte, NF; Wong, WW; Hopkinson, JM; Smith, EO; Ellis, KJ. (2000). Infant feeding mode affects early growth and body composition. Pediatrics 106: 1355-1366.
- CDC (Centers for Disease Control and Prevention). (2009). Breastfeeding report card 2009: Breastfeeding practices results from the National Immunization Survey. Atlanta, GA. http://www.cdc.gov/breastfeeding/pdf/2009 BreastfeedingReportCard.pdf.
- <u>Chen, A; Rogan, WJ.</u> (2004). Breastfeeding and the risk of postneonatal death in the United States. Pediatrics 113: e435-e439.
- Dewey, KG; Heinig, MJ; Nommsen, LA; Lonnerdal, B. (1991a). Maternal versus infant factors related to breast milk intake and residual milk volume: the DARLING study. Pediatrics 87: 829-837.
- Dewey, KG; Heinig, MJ; Nommsen, LA; Lönnerdal, B. (1991b). Adequacy of energy intake among breast-fed infants in the DARLING study: relationships to growth velocity, morbidity, and activity levels. Davis Area Research on Lactation, Infant Nutrition and

Chapter 15—Human Milk Intake

- Growth. J Pediatr 119: 538-547.
- <u>Dewey, KG; Lönnerdal, B.</u> (1983). Milk and nutrient intake of breast-fed infants from 1 to 6 months: relation to growth and fatness. J Pediatr Gastroenterol Nutr 2: 497-506.
- Dewey, KG; Peerson, JM; Heinig, MJ; Nommsen, LA; Lönnerdal, B; Lopez de Romaña, G; de Kanashiro, HC; Black, RE; Brown, KH. (1992). Growth patterns of breast-fed infants in affluent (United States) and poor (Peru) communities: implications for timing of complementary feeding. Am J Clin Nutr 56: 1012-1018.
- Drewett, R; Amatayakul, K; Wongsawasdii, L; Mangklabruks, A; Ruckpaopunt, S; Ruangyuttikarn, C; Baum, D; Imong, S; Jackson, D; Woolridge, M. (1993). Nursing frequency and the energy intake from breast milk and supplementary food in a rural Thai population: a longitudinal study. Eur J Clin Nutr 47: 880-891.
- Ferris, AM; Neubauer, SH; Bendel, RB; Green, KW; Ingardia, CJ; Reece, EA. (1993). Perinatal lactation protocol and outcome in mothers with and without insulin-dependent diabetes mellitus. Am J Clin Nutr 58: 43-48.
- Gartner, LM; Morton, J; Lawrence, RA; Naylor, AJ;
 O'Hare, D; Schanler, RJ; Eidelman, AI;
 Breastfeeding, AAO, PSO. (2005).
 Breastfeeding and the use of the human milk. Pediatrics 115: 496-506.
 http://dx.doi.org/10.1542/peds.2004-2491.
- González-Cossío, T; Habicht, JP; Rasmussen, KM; Delgado, HL. (1998). Impact of food supplementation during lactation on infant breast-milk intake and on the proportion of infants exclusively breast-fed. J Nutr 128: 1692-1702.
- Hofvander, Y; Hagman, U; Hillervik, C; Sjölin, S. (1982). The amount of milk consumed by 1-3 months old breast- or bottle-fed infants. Acta Paediatr Scand 71: 953-958.
- Kent, JC; Mitoulas, LR; Cregan, MD; Ramsay, DT; Doherty, DA; Hartmann, PE. (2006).

 Volume and frequency of breastfeedings and fat content of breast milk throughout the day. Pediatrics 117: e387-e395. http://dx.doi.org/10.1542/peds.2005-1417.
- Li, R; Grummer-Strawn, L. (2002). Racial and ethnic disparities in breastfeeding among United States infants: Third National Health and Nutrition Examination Survey, 1988-1994. Birth 29: 251-257.
- Lönnerdal, B; Forsum, E; Gebre-Medhin, M; <u>Hambraeus, L.</u> (1976). Breast milk

- composition in Ethiopian and Swedish mothers. II. Lactose, nitrogen, and protein contents. Am J Clin Nutr 29: 1134-1141.
- Marriott, BM; Campbell, L; Hirsch, E; Wilson, D. (2007). Preliminary data from demographic and health surveys on infant feeding in 20 developing countries. J Nutr 137: 518S-523S.
- Maxwell, NI; Burmaster, DE. (1993). A simulation model to estimate a distribution of lipid intake from breast milk during the first year of life. J Expo Anal Environ Epidemiol 3: 383-406.
- McDowell, MM; Wang, CY; Kennedy-Stephenson, J. (2008). Breastfeeding in the United States: Findings from the National Health and Nutrition Examination Surveys, 1999-2006. NCHS1-8.
- Mitoulas, LR; Gurrin, LC; Doherty, DA; Sherriff, JL; Hartmann, PE. (2003). Infant intake of fatty acids from human milk over the first year of lactation. Br J Nutr 90: 979-986. http://dx.doi.org/10.1079/BJN2003979.
- Mitoulas, LR; Kent, JC; Cox, DB; Owens, RA; Sherriff, JL; Hartmann, PE. (2002). Variation in fat, lactose and protein in human milk over 24 h and throughout the first year of lactation. Br J Nutr 88: 29-37. http://dx.doi.org/10.1079/BJNBJN2002579.
- NAS (National Academy of Sciences). (1991).

 Nutrition during lactation. Washington, DC:

 The National Academies Press.

 http://www.nap.edu/catalog.php?record_id=
 1577.
- Neubauer, SH; Ferris, AM; Chase, CG; Fanelli, J; Thompson, CA; Lammi-Keefe, CJ; Clark, RM; Jensen, RG; Bendel, RB; Green, KW. (1993). Delayed lactogenesis in women with insulin-dependent diabetes mellitus. Am J Clin Nutr 58: 54-60.
- Neville, MC; Keller, R; Seacat, J; Lutes, V; Neifert, M; Casey, C; Allen, J; Archer, P. (1988). Studies in human lactation: milk volumes in lactating women during the onset of lactation and full lactation. Am J Clin Nutr 48: 1375-1386.
- Pao, EM; Himes, JM; Roche, AF. (1980). Milk intakes and feeding patterns of breast-fed infants. J Am Diet Assoc 77: 540-545.
- Ryan, AS. (1997). The resurgence of breastfeeding in the United States. Pediatrics 99: E12.
- Ryan, AS; Rush, D; Krieger, FW; Lewandowski, GE. (1991). Recent declines in breast-feeding in the United States, 1984 through 1989. Pediatrics 88: 719-727.

- Salmenperä, L; Perheentupa, J; Siimes, MA. (1985). Exclusively breast-fed healthy infants grow slower than reference infants. Pediatr Res 19: 307-312.
- Scanlon, K; Grummer-Strawn, L; Shealy, K; Jefferds, M; Chen, J; Singleton, J; Philip, C. (2007). Breastfeeding trends and updated national health objectives for exclusive breastfeeding—United States, birth years 2000-2004. 56: 760-763.
- Stuff, JE; Nichols, BL. (1989). Nutrient intake and growth performance of older infants fed human milk. J Pediatr 115: 959-968.
- Wright, CM; Parkinson, K; Scott, J. (2006). Breast-feeding in a UK urban context: who breast-feeds, for how long and does it matter? Public Health Nutr 9: 686-691.