

Risks of Artificial Feeding (Studies done *mostly* in affluent societies)

Risks to Infant and Child: [Review](#) | [Cognitive Development](#) | [Neurologic Outcome](#) | [SIDS](#) | [Insulin Dependent Diabetes](#) | [Cow Milk Allergy and Intolerance](#) | [Respiratory Illness](#) | [Otitis Media](#) | [Risks for the Premature Baby](#) | [Childhood Cancer](#) | [Gastrointestinal Disease and Infections](#) | [Urinary Tract Infection](#) | [Malocclusion](#) | [Formula as a Heavy Metal Cocktail](#) | [Other Contamination Due to Bottle Feeding](#) | [Allergy](#) | [Cardiovascular Risks Miscellaneous](#) | [Breastmilk as "Antimicrobial"](#)

Risks to Mother: [Ovarian Cancer](#) | [Osteoporosis](#) | [Endometrial Carcinoma](#) | [Breast Cancer](#) | [Weight Loss](#) | [Risks to Society](#)

Risks to Infant and Child

Review

1. Walker M. A fresh look at the risks of artificial feeding. *J Hum Lact* 1993;9:97-107
2. Cunningham AS, Jelliffe DB, Jelliffe EFP. Breastfeeding and health in the 1980's: a global epidemiologic review. *J Pediatr* 1991;118:659-66
3. Oddy WH. Breastfeeding protects against illness and infection in infants and children: a review of the evidence. *Breastfeeding Review* 2001;9(2):11-18
4. Van Estrick P. Risks, rights and regulation. *Communicating about risks and infant feeding*. Revised June 2001.

Cognitive Development

- CD (review): Andraca I, Uauy R. Breastfeeding for optimal mental development. Simopoulos AP, Dutra de Oliveira JE, Desai ID (eds): *Behavioral and Metabolic Aspects of Breastfeeding*. World Rev Nutr Diet. Basel, Karger, 1995;78:1-27
- CD (review): Gordon N. Nutrition and cognitive function. *Brain and Development* 1997;19:165-70
- CD-1: Morrow-Tlucak M, Haude RH, Ernhart CB. Breastfeeding and cognitive development in the first 2 years of life. *Soc Sci Med* 1988;26:635-9
- CD-2: Taylor B, Wadsworth J. Breastfeeding and child development at five years. *Dev Med Child Neurol* 1984;26:73-80
- CD-3: Lucas A, Morley R, Cole TJ, Lister G, Leeson-Payne C. Breastmilk and subsequent intelligence quotient in children born preterm. *Lancet* 1992;339:261-4
- CD-4: Nettleton JA. Are n-3 fatty acids essential nutrients for fetal and infant development. *J Am Diet Assoc* 1993;93:58-64
- CD-5: Rogan WJ, Gladen BC. Breastfeeding and cognitive development. *Early Hum Dev* 1993;31:181-93
- CD-6: Silver LB, Levinson RB, Laskin CR, Pilot LJ. Learning disabilities as a probable consequence of using chloride-deficient infant formula. *J Pediatr* 1989;115:97-9
- CD-7: Willoughby A, Moss HA, Hubbard VS, Bercu BB, Graubard BI, Vietze PM, et al. Developmental outcome in children exposed to chloride deficient formula. *Pediatrics* 1987;79:851-7
- CD-8: Wing CS. Defective infant formulas and expressive language problems: a case study. *Language, Speech and Hearing Services in Schools* 1990;21:22-7
- CD-9: Crawford MA. The role of essential fatty acids in neural development: implications for perinatal nutrition. *Am J Clin Nutr* 1993;57(suppl):703S-10S
- CD-10: Temboury MC, Otero A, Polanco I, Arribas E. Influence of breastfeeding on the infant's intellectual development. *J Pediatric Gastroenterol Nutr* 1994;18:32-36
- CD-11: Pollock JI. Longterm associations with infant feeding in a clinically advantaged population

of babies. *Dev Med Child Neur* 1994;36:429-40

CD-12: Makrides M, Neumann MA, Byard RW, Simmer K, Gibson RA. Fatty acid composition of brain, retina and erythrocytes in breast and formula fed infants. *Am J Clin Nutr* 1994;60:189-94

CD-14: Anderson GJ, Connor WE, Corliss JD. Docosahexaenoic acid is the preferred dietary n-3 fatty acid for the development of the brain and retina. *Pediatr Res* 1990;27:87-97

CD-15: Neuringer M, Connor WE, Lin DS, Barstad L, Luck S. Biochemical and functional effects of prenatal and postnatal fatty acid deficiency on retina and brain in rhesus monkeys. *Proc Natl Acad Sci USA* 1986;83:4021-5

CD-16: Florey C Du V, Leech AM, Blackhall A. Infant feeding and mental and motor development at 18 months of age in first born singletons. *Int J Epidemiol* 1995;24 (Suppl 1):S21-6

CD-17: Wang YS, Wu SY. The effect of exclusive breastfeeding on development and incidence of infection in infants. *JHL* 1996;12:27-30

CD-18: Greene LC, Lucas A, Livingstone BE, Harland PSEG, Baker BA. Relationship between early diet and subsequent cognitive performance during adolescence. *Biochem Soc Trans* 1995;23:376S

CD-19: Riva E, Agostoni C, Biasucci G, Trojan S, Luotti D, Fiori L, et al. Early breastfeeding is linked to higher intelligence quotient scores in dietary treated phenylketonuric children. *Acta Paediatr* 1996;85:56-8

CD-20: Niemelä A, Järvenpää A-L. Is breastfeeding beneficial and maternal smoking harmful to the cognitive development of children? *Acta Paediatr* 1996;85:1202-6

CD-21: Rodgers B. Feeding in infancy and later ability and attainment: a longitudinal study. *Devel Med Child Neurol* 1978;20:421-6

CD-22: Horwood LJ, Fergusson DM. Breastfeeding and later cognitive and academic outcomes. *Pediatrics* 1998;101:p. e9

CD-23: Paine BJ, Makrides M, Gibson RA. Duration of breastfeeding and Bayley's mental developmental Index at 1 year of age. *J Paediatr Child Health* 1999;35:82-5

CD-24: Fergusson DM, Beautrais AL, Silva PA. Breastfeeding and cognitive development in the first seven years of life. *Soc Sci Med* 1982;16:1705-8

CD-25: Vestergaard M, Obel C, Henriksen TB, Sørensen HT, Skajaa E, Østergaard J. Duration of breastfeeding and developmental milestones during the latter half of infancy. *Acta Paediatr* 1999;88:1327-32

CD-26: Rao MR, Hediger ML, Levine RJ, Naficy AB, Vik T. Effect of breastfeeding on cognitive development of infants born small for gestational age. *Acta Paediatr* 2002;91:267-74

Neurologic Outcome

N-1: Lanting CI, Fidler V, Huisman M, Touwen BCL, Boersma ER. Neurological differences between 9 year old children fed breastmilk or formula milk as babies. *Lancet* 1994;344:1319-22

N-2: Lanting CI, Patandin S, Weisglas-Kuperus N, Touwen BCL, Boersma ER. Breastfeeding and neurological outcome at 42 months. *Acta Paediatr* 1998;87:1224-9

SIDS

SIDS-1: Mitchell EA, Scragg R, Stewart AW, Becroft DMO, Taylor BJ, For RPK, et al. Results from the first year of the New Zealand cot death study. *NZ Med J* 1991;104:71-6

Insulin Dependent Diabetes

Working Group on Cow's Milk Protein and Diabetes Mellitus of the American Academy of Pediatrics. Infant feeding practices and their possible relationship to the etiology of diabetes mellitus. *Pediatrics* 1994;94:752-4

JD-1: Karjalainen J, Martin JM, Knip M, Ilonen J, Robinson BH, Savilahti E, et al. A bovine albumin peptide as a possible trigger of insulin-dependent diabetes mellitus. *N Eng J Med* 1992;327:302-7 (Editorial: 1992:327:348-9)

- JD-2: Mayer EJ, Hamman RF, Gay EC, Lezotte DC, Savitz DA, Klingensmith J. Reduced risk of IDDM among breastfed children. *Diabetes* 1988;37:1625-32
- JD-3: Virtanen SM, Räsänen L, Ylönen K, Aro A, Clayton D, Langholz B, et al. Early introduction of dairy products associated with increased risk of IDDM in Finnish children. *Diabetes* 1993;42:1786-90
- JD-4: Virtanen SM, Räsänen L, Aro A, Lindström J, Sippola H, Lounamaa R, et al. Infant feeding in Finnish children <7 yr of age with newly diagnosed IDDM. *Diabetes Care* 1991;14:415-17
- JD-5: Gerstein HC. Cow's milk exposure and type I diabetes mellitus. *Diabetes Care* 1994;17:13-9
- JD-6: Kostraba JN, Cruickshanks KJ, Lawler-Heavner J, Jobim LF, Rewers MJ, Gay EC, et al. Early exposure to cow's milk and solid foods in infancy, genetic predisposition, and risk of IDDM. *Diabetes* 1993;42:288-95
- JD-7: Pérez-Bravo F, Carrasco E, Gutierrez-López MD, Martínez MT, López G, García de los Rios M. Genetic predisposition and environmental factors leading to the development of insulin-dependent diabetes mellitus in Chilean children. *J Mol Med* 1996;74:105-9
- JD-8: Gimeno SGA, De Souza JMP. IDDM and milk consumption. *Diabetes Care* 1997;20:1256-60
- JD-9: Hammond-McKibbon D, Karges W, Gaedigk R, Dosch H-M. Immunological mechanisms that link cow milk protein and insulin dependent diabetes: a synopsis. *Can J Allergy and Clin Immunol* 1997;2:136-46
- JD-10: Shehadeh N, Gelertner L, Blazer S, Perlman R, Solovachik L, Etzioni A. Importance of insulin content in infant diet: suggestion for a new infant formula. *Acta Paediatrica* 2001;90:93-5

Cow Milk Allergy and Intolerance

- CM-1: Høst A. Importance of the first meal on the development of cow's milk allergy and intolerance. *Allergy Proc* 1991;12:227-32

Respiratory Illness

- RI-1: Pullan CR, Toms GL, Martin AJ, Gardner PS, Webb JKG, Appleton DR. Breastfeeding and respiratory syncytial virus infection. *Br Med J* 1980;281:1034-6
- RI-2: Chiba Y, Minagawa T, Mito K, Nakane A, Suga K, Honjo T, Nakao T. Effect of breastfeeding on responses of systemic interferon and virus-specific lymphocyte transformation with respiratory syncytial virus infection. *J Med Virology* 1987;21:7-14
- RI-3: Wright AL, Holberg CJ, Martinez FD, Morgan WJ, Taussig LM. Breastfeeding and lower respiratory tract illness in the first year of life. *Br Med J* 1989;299:946-9
- RI-4: Porro E, Indinnimeo L, Antognoni G, Midulla F, Criscione S. Early wheezing and breastfeeding. *J Asthma* 1993;30:23-8
- RI-5: Burr ML, Limb ES, Maguire JM, Amarah L, Eldridge BA, Layzell JCM, Merret TG. Infant feeding, wheezing, and allergy: a prospective study. *Arch Dis Child* 1993;68:724-28
- RI-6: Pisacane A, Graziano L, Zona G, Granata G, Dolezalova H, Cafiero M, et al. Breastfeeding and acute lower respiratory infection. *Acta Pædiatr* 1994;83:714-18
- RI-7: Beaudry M, Dufour R, Marcoux S. Relation between infant feeding and infections during the first six months of life. *J Pediatr* 1995;126:191-7
- RI-8: Okamoto Y, Ogra PL. Antiviral factors in human milk: implications in respiratory syncytial virus infection. *Acta Pædiatr Scand Suppl* 1989;351:137-43
- RI-9: Downham MAPS, Scott R, Sims DG, Webb JKG, Gardner PS. Breastfeeding protects against respiratory syncytial virus infections. *Br Med J* 1976;2:274-6
- RI-10: Wright AL, Holberg CJ, Taussig LM, Martinez FD. Relationship of infant feeding to recurrent wheezing at age 6 years. *Arch Pediatr Adolesc Med* 1995;149:758-63
- RI-11: Yue Chen. Synergistic effect of passive smoking and artificial feeding on hospitalization for respiratory illness in early childhood. *Chest* 1989;95:1004-07
- RI-12: Wilson AC, Forsyth JS, Greene SA, Irvine L, Hau C, Howie PW. Relation of infant diet to childhood health: seven year followup of cohort of children in Dundee infant feeding study. *Br*

Med J 1998;316:21-5 (also shows higher blood pressure in formula fed children)
RI-13: Oddy WH, Holt PG, Sly PD, Read AW, Landau LI, Stanley FJ, Kendall GE, Burton PR. Association between breastfeeding and asthma in 6 year old children: findings of a prospective birth cohort study. Br Med J 1999;319:815-9
RI-14: César JA, Victora CG, Barros FC, Santos IS, Flores JA. Impact of breastfeeding on admission for pneumonia during postneonatal period in Brazil: nested case-control study. Br Med J 1999;318:1316-20
RI-15: Pisacane A, Impagliazzo N, De Caprio C, Criscuolo L, Inglese A, da Silva MCMP. Breastfeeding and tonsillectomy. Br Med J 1996;??
RI-16: López-Alarcón M, Villalpando S, Fajardo A. Breastfeeding lowers the frequency and duration of acute respiratory infection and diarrhea in infants under 6 months of age. J Nutr 1997;127:436-43
RI-17: Gdlavevich M, Minouni D, Minouni M. Breastfeeding and the risk of bronchial asthma in childhood: a systematic review with meta-analysis of prospective studies. J Pediatr 2001;139:261-6

Otitis Media

OM-1: Saarinen UM. Prolonged breastfeeding as prophylaxis for recurrent otitis media. Acta Paediatr Scand 1982;71:567-71
OM-2: Teele DW, Klein JO, Rosner B. Epidemiology of otitis media during the first seven years of life in children in greater Boston: a prospective cohort study. J Infect Dis 1989;160:83-94
OM-3: Duncan B, Ey J, Holberg CJ, Wright AL, Martinez FD, Taussig LJ. Exclusive breastfeeding for at least 4 months protects against otitis media. Pediatrics 1993;91:867-72
OM-4: Owen MJ, Baldwin CD, Swank PR, Pannu AK, Johnson DL, Howie VM. Relation of infant feeding practices, cigarette smoke exposure and group child care to the onset and duration of otitis media with effusion in the first two years of life. J Pediatr 1993;123:702-11
OM-5: Harabuchi Y, Faden H, Yamanaka N, Duffy L, Wolf J, Krystofik D. Human milk secretory IgA antibody to nontypeable *Haemophilus influenzae*: Possible protective effects against nasopharyngeal colonization. J Pediatr 1994;124:193-8
OM-6: Aniansson G, Alm B, Andersson B, Håkansson A, Larsson P, Nylén O, et al. A prospective cohort study on breastfeeding and otitis media in Swedish infants. Paediatr Infect Dis J 1994;13:183-8
OM-7: Paradise JL, Elster BA, Tan L. Evidence in infants with cleft palate that breast milk protects against otitis media. Pediatrics 1994;94:853-60
OM-8: Sassen ML, Brand R, Grote JJ. Breastfeeding and acute otitis media. Am J Otolaryng 1994;15:351-7
OM-9: Dewey KG, Heinig J, Nommsen-Rivers LA. Differences in morbidity between breastfed and formula fed infants. J Pediatr 1995;126:696-702 (risk also increased in FF infant for diarrhea)
OM-10: Scariati PD, Grummer-Strawn LM, Fein SB. A longitudinal analysis of infant morbidity and the extent of breastfeeding in the United States. Pediatrics 1997;99:e5

Risks for the Premature Baby

P-1: Lucas A, Cole TJ. Breastmilk and neonatal necrotizing enterocolitis. Lancet 1990;336:1519-23
P-2: El-Mohandes AE, Picard MB, Simmens SJ, Keiser JF. Use of human milk in the intensive care nursery decreases the incidence of nosocomial sepsis. J Perinatol 1997;17:130-4
P-3: Daniels L, Gibson R, Simmer K. Selenium status of preterm infants: the effect of postnatal age and method of feeding. Acta Paediatr 1997;86:281-8 (M:23)
P-4: Uauy RD, Birch DG, Birch EE, Tyson JE, Hoffman DR. Effect of dietary omega-3 fatty acids on retinal function of very low birth weight neonates. Pediatr Res 1990;28:485-92 (M:18)
P-5: Lucas A, Morley R, Cole TJ, Lister G, Leeson-Payne C. Breastmilk and subsequent intelligence quotient in children born preterm. Lancet 1992;339:261-4 (CD: 3)
P-6: Bishop NJ, Dahlenburg SL, Fewtrell MS, Morley R, Lucas A. Early diet of preterm infants and

bone mineralization at age five years. *Acta Paediatr* 1996;85:230-6

P-7: Carlson SE, Rhodes PG, Ferguson MG. Docosahexaenoic acid status of preterm infants at birth and following feeding with human milk or formula. *Am J Clin Nutr* 1986;44:798-804

P-8: Foreman-van Drongelen MMHP, van Houwelingen AC, Kester ADM, Hasaart THM, Blanco CE, Hornstra G. Long-chain polyunsaturated fatty acids in preterm infants: status at birth and its influence on postnatal levels. *J Pediatr* 1997;126:611-8

P-9: Bier JB, Ferguson AE, Morales Y, Liebling JA, Oh W, Vohr BR. Breastfeeding infants who were extremely low birth weight. *Pediatrics* 1997;100:p e3

P-10: Morley R, Cole TJ, Powell R, Lucas A. Mother's choice to provide breastmilk and developmental outcome. *Arch Dis Child* 1988;63:1382-5

P-11: Singhal A, Cole T, Lucas A. Early nutrition in preterm infants and later blood pressure: two cohorts after randomised trials. *Lancet* 2001;357:413-9

Childhood Cancer

CC-1: Schwartzbaum JA, George SL, Pratt CB, Davis B. An exploratory study of environmental and medical factors potentially related to childhood cancer. *Med pediatr Oncol* 1991;19:115-21

CC-2: Davis MK, Savitz DA, Graubard BI. Infant feeding and childhood cancer. *Lancet* 1988;2:365-8

CC-3: Freudenheim JL, Marshall JR, Graham S, Laughlin R, Vena JE, Bandera E, et al. Exposure to breastmilk in infancy and the risk of breast cancer. *Epidemiology* 1994;5:324-31

CC-4: Shu XO, Linet MS, Steinbuch M, Wen WQ, Buckley JD, Neglia JP, Potter JD et al.

Breastfeeding and the risk of childhood acute leukemia. *J Nat Cancer Institute* 1999;91:1765-72

CC-5: Davis MK. Review of the evidence for an association between Infant feeding and childhood cancer. *Int J Cancer* 1998;Supplement II:29-33

Gastrointestinal Disease and Infections

GI-1: Koletzko S, Sherman P, Corey M, Griffiths A, Smith C. Role of infant feeding practices in the development of Crohn's disease in childhood. *Br Med J* 1989;298:1617-8

GI-2: Greco L, Auricchio S, Mayer M, Grimaldi M. Case control study on nutritional risk factors in celiac disease. *J Pediatr Gastroenterol Nutr* 1988;7:395-8

GI-3: Duffy LC, Byers TE, Riepenhoff-Talty M, La Scolea L, Zielezny M, Ogra PL. The effects of infant feeding on rotavirus-induced gastroenteritis. A prospective study. *Am J Pub Health* 1986;76:259-63

GI-4: Hanson LA, Lindquist B, Hofvander Y, Zetterstrom R. Breastfeeding as a protection against gastroenteritis and other infections. *Acta Paediatr Scand* 1985;74:641-2

GI-5: Ruiz-Palacios GM, Calva JJ, Pickering LK, Lopez-Vidal Y, Volkow P, Pezzarossi H, et al. Protection of breastfed infants against *Campylobacter* diarrhea by antibodies in human milk. *J Pediatr* 1990;116:707-13

GI-6: Cruz JR, Gil L, Cano F, Caceres P, Pareja G. Breastmilk anti-*Escherichia coli* heat labile toxin IgA antibodies protect against toxin-induced infantile diarrhea. *Acta Paediatr Scand* 1988;77:658-62

GI-7: Gillin FD, Reiner DS, Wang C-S. Human milk kills parasitic intestinal protozoa. *Science* 1983;221:1290-2

GI-8: France GL, Marmer DJ, Steele RW. Breastfeeding and *Salmonella* infection. *Am J Dis Child* 1980;134:147-52

GI-9: Haffejee IE. Cow's milk-based formula, human milk and soya feeds in acute infantile diarrhea: A therapeutic trial. *J Pediatr Gastroenterol Nutr* 1990;10:193-8

GI-10: Lerman Y, Slepon R, Cohen D. Epidemiology of acute diarrheal diseases in children in a high standard of living rural settlement in Israel. *Pediatr Infect Dis J*. 1994;13:116-22

GI-11: Howie PW, Forsyth JS, Ogston SA, Clark A, Du V Florey C. Protective effect of breastfeeding against infection. *Br Med J* 1990;300:11-6

GI-12: Duffy LC, Riepenhoff-Talty M, Byers TE, La Scolea LJ, Zielezny MA, Dryja DM et al. Modulation of rotavirus enteritis during breastfeeding. *Am J Dis Child* 1986;140:1164-8

GI-13: Haddock RL, Cousens SN, Guzman CC. Infant diet and salmonellosis. *Am J Pub Health* 1991;81:997-1000

GI-14: Scariati PD, Grummer-Strawn LM, Fein SB. A longitudinal analysis of infant morbidity and the extent of breastfeeding in the United States. *Pediatrics* 1997;99, June 1997;e5 (also for otitis media)

GI-15: Heacock HJ, Jeffery HE, Baker JL, Page M. Influence of breast versus formula milk on physiological gastroesophageal reflux in healthy, newborn infants. *J Pediatr Gastroenterol Nutr* 1992;14:41-6

GI-16: Kramer MS, Chalmers B, Hodnett ED, Sevkovskaya Z, Dzikovich I, Shapiro S, et al. Promotion of breastfeeding intervention trial. *JAMA* 2001;285:413-20 (also shows less eczema) (study shows that baby friendly interventions do work)

Urinary Tract Infection

UT-1: Pisacane A, Graziano L, Mazzarella G, Scarpellino B, Zona G. Breastfeeding and urinary tract infection. *J Pediatr* 1992;120:87-9

Malocclusion

MA-1: Labbock MH, Hendershot GE. Does breastfeeding protect against malocclusion? An analysis of the 1981 child health supplement to the national health interview survey. *Am J Prev Med* 1987;3:227-32

MA-2: Palmer B. The influence of breastfeeding on the development of the oral cavity: A commentary. *J Hum Lact* 1998;14:93-8

Formula as a Heavy Metal Cocktail

HM-1: Koo WWK, Kaplan LA, Krug-Wispe SK. Aluminum contamination of infant formulas. *J Parenteral Enteral Nutrition* 1988;12:170-3

HM-2: Davidsson L, Cederblad Å, Lönnerdal B, Sandström B. Manganese absorption from human milk, cow's milk and infant formulas in humans. *Am J Dis Child* 1989;143:823-7

HM-3: Dabeka RW, McKenzie AD. Lead and cadmium levels in commercial infant foods and dietary intake by infants 0-1 year old. *Food Additives and Contaminants* 1988;5:333-42

Other Contamination Due to Bottle Feeding

C-1: Mytjens HL, Roelofs-Willems H, Jaspar GHJ. Quality of powdered substitutes for breastmilk with regard to members of the family Enterobacteriaceae. *J Clin Microbiol* 1988;26:743-6

C-2: Biering G, Karlsson S, Clark NC, Jonsdottir KE, Ludvigsson P, Steingrimsson O. Three cases of neonatal meningitis caused by *Enterobacter sakazakii* in powdered milk. *J Clin Microbiol* 1989;27:2054-6

C-3: Westin JB. Ingestion of carcinogenic N-nitrosamines by infants and children. *Arch Environmental Health* 1990;45:359-63

C-4: Schwarz KB, Cox JM, Sharma S, Clement L, Witter F, Abbey H, et al. Prooxidant effects of maternal smoking and formula in newborn infants. *J Pediatr Gastroenterol Nutr* 1997;24:68-74

Allergy

A-1: Lucas A, Brooke OG, Morley R, Cole TJ, Bamford MF. Early diet of preterm infants and development of allergic or atopic disease: randomized prospective study. *Br Med J* 1990;300:837-40

A-2: Kajosaari M, Saarinen UM. Prophylaxis of atopic disease by six months' total solid food elimination. *Acta Pediatr Scand* 1983;72:411-14

- A-3: Ellis MH, Short JA, Heiner DC. Anaphylaxis after ingestion of a recently introduced hydrolyzed whey protein formula. *J Pediatr* 1991;118:74-7
- A-4: Saarinen UM, Kajosaari M. Breastfeeding as prophylaxis against atopic disease: prospective follow-up study until 17 years old. *Lancet* 1995;346:1065-69
- A-5: Saylor JD, Bahna SL. Anaphylaxis to casein hydrolysate formula. *J Pediatr* 1991;118:71-4
- A-6: Marini A, Agosti M, Motta G, Mosca F. Effects of a dietary and environmental prevention programme on the incidence of allergic symptoms in high atopic risk infants: three years' followup. *Acta Pædiatr* 1996;Suppl 414 vol 85:1-19
- A-7: Wright AL, Holberg CJ, Martinez FD, Halonen M, Morgan W, Taussig LM. Epidemiology of physician diagnosed allergic rhinitis in childhood. *Pediatrics* 1994;94:895-901
- A-8: Bloch AM, Mimouni D, Minouni M, Gdalevich M. Does breastfeeding protect against allergic rhinitis during childhood? A meta-analysis of protective studies. *Acta Paediatr* 2002;91:275-9

Cardiovascular Risks

- M-3: Kramer MS. Do breastfeeding and delayed introduction of solid foods protect against subsequent obesity? *J Pediatr* 1981;98:883-7
- M-13: Osborn GR. Stages in development of coronary disease observed from 1,500 young subjects. Relationship of hypotension and infant feeding to aetiology. Watson Smith Lecture, delivered to the Royal College of Physicians of London, January 11, 1965
- M13a: Bergström E, Hernell O, Persson LÅ, Vessby B. Serum lipid values in adolescents are related to family history, infant feeding, and physical growth. *Atherosclerosis* 1995;117:1-13
- M-25: Routi T, Rönnemaa T, Lapinleimu H, Salo P, Viikari J, Leino A, et al. Effect of weaning on serum lipoprotein (a) concentration: the STRIP baby study. *Pediatric Research* 1995;38:522-27
- M-26: Bergström E, Hernell O, Persson LÅ, Vessby B. Serum lipid values in adolescents are related to family history, infant feeding and physical growth. *Atherosclerosis* 1995;117:1-13
- M-27: Von Kries R, Sauerwald T, von Mutius E, Barnert D, Grunert V, von Voss H. Breastfeeding and obesity: cross sectional study. *Br Med J* 1999;319:147-50
- M-32: Tulldahl J, Pettersson K, Andersson SW, Hulthén. Mode of Infant feeding and achieved growth in adolescence: early feeding patterns in relation to growth and body composition in adolescence. *Obesity Research* 1999;7:431-7
- M-35: Gillman MW, Rifas-Shiman SL, Camargo CA, Berkey CS, Frasier AL, Rockett HRH, et al. Risk of overweight among adolescents who were breastfed as infants. *J Am Med Assoc* 2001;285:2461-7 (Editorial by WH Dietz, 2506-7)
- P-11: Singhal A, Cole T, Lucas A. Early nutrition in preterm infants and later blood pressure: two cohorts after randomised trials. *Lancet* 2001;357:413-9

Miscellaneous

- M-1: McJunkin JE, Bithoney WG, McCormick MC. Errors in formula concentration in an outpatient population. *J Pediatr* 1987;111:848-50
- M-1a: Abrams CAL, Phillips LL, Berkowitz C, Blacket PR, Priebe CJ. Hazards of overconcentrated milk formula. *JAMA* 1975;232:1136-40
- M-1b: Potur AH, Kalmaz N. An investigation into feeding errors of 0-4 month old infants. *J Trop Pediatr* 1995;41:120-2
- M-1c: Green HL, Moyer VA. Improper mixing of formula due to reuse of hospital bottles. *Arch Pediatr Adolesc Med* 1995;149:97-9
- M-1d: Coodin Fj, Gabrielson IW, Addiego JE. Formula fatality. *Pediatrics* 1971;47:438-9
- M-1e: Wilcox DT, Fiorello AB, Glick PL. Hypovolemic shock and intestinal ischemia: a preventable complication of incomplete formula labeling. *J Pediatr* 1993;122:103-4
- M-2: Specker BL, Tsang RC, Ho ML, Landi TM, Gratton TL. Low serum calcium and high parathyroid hormone levels in neonates fed "humanized" cow's milk-based formula. *Am J Dis Child* 1991;145:941-5
- M2a: Jochum F, Fuchs A, Menzel H, Lombeck I. Selenium in German infants fed breastmilk or different formulas. *Acta Paediatr* 1995;84:859-62

M-3: Kramer MS. Do breastfeeding and delayed introduction of solid foods protect against subsequent obesity? *J Pediatr* 1981;98:883-7

M-4: Dick G. The etiology of multiple sclerosis. *Proc Roy Soc Med.* 1976;69:611-5

M-4b: Pisacane A, Impagliazzo N, Russo M, Valiani R, Mandarinini A, Florio C, Vivo P. Breastfeeding and multiple sclerosis. *Br Med J* 1994;308:1411-2

M-5: Birch E, Birch D, Hoffman D, Hale L, Everett M, Uauy R. Breastfeeding and optimal visual development. *J Pediatr Ophthalmol Strabismus* 1993;30:33-8

M-6: Makrides M, Simmer K, Googin M, Gibson RA. Erythrocyte docosahexaenoic acid correlates with the visual response of healthy, term infants. *Pediatr Res* 1993;34:425-7

M-7: Sullivan SA, Birch LL. Infant dietary experience and acceptance of solid foods. *Pediatrics* 1994;93:271-77

M-8: Cochi SL, Fleming DW, Hightower AW, Limpakarnjanarat K, Facklam RR, Smith JD, et al. Primary invasive *Haemophilus influenzae* type b disease: A population-based assessment of risk factors. *J Pediatr* 1986;108:887-96

M-9: Arnold C, Makintube S, Istre GR. Day Care Attendance and other risk factors for invasive *Haemophilus influenzae* type b disease. *Am J Epidemiol* 1993;138:333-40

M-9a: Takala AK, Eskola J, Palmgren J, Rönnerberg P-R, Kela E, Rekola P, Mäkelä PH. Risk factors of invasive *Haemophilus influenzae* type b disease among children of Finland. *J Pediatr* 1989;115:694-701

M-10: Michaelsen KM, Johansen JS, Samuelson G, Price PA, Christiansen C, Skakkebæk NE. Serum bone Gla protein (BGP, Osteocalcin) in infants: Values positively correlated with human milk intake. *Mechanisms Regulating Lactation and Infant Nutrient Utilization.* (Picciano MF, Lönnerdal B, editors). Volume 15 of *Contemporary Issues in Clinical Nutrition*, pages 419-23.

M-11: Jones EG, Matheny RJ. Relationship between infant feeding and exclusion rate from child care because of illness. *J Am Dietetic Assoc* 1993;93:809-11

M-12: MacFarlane PI, Miller V. Human milk in the management of protracted diarrhoea of infancy. *Arch Dis Child* 1984;59, 260-65

M-13: Osborn GR. Stages in development of coronary disease observed from 1,500 young subjects. Relationship of hypotension and infant feeding to aetiology. Watson Smith Lecture, delivered to the Royal College of Physicians of London, January 11, 1965.

M13a: Bergström E, Hernell O, Persson LÅ, Vessby B. Serum lipid values in adolescents are related to family history, infant feeding, and physical growth. *Atherosclerosis* 1995;117:1-13

M-14: Keating JP, Schears GJ, Dodge PR. Oral water intoxication in infants. *Am J Dis Child* 1991;145:985-90

M-14a: Bruce RC, Kiegman RM. Hyponatremic seizures secondary to oral water intoxication in infancy: association with commercial bottled drinking water. *Pediatrics* 1997;100; p e4

M-15: Finberg L. Water intoxication. (editorial). *Am J Dis Child* 1991;145:981-2

M-16: Shannon MW, Graef JW. Lead intoxication in infancy. *Pediatrics* 1992;89:87-90

M-17: Nako Y, Fukushima N, Tomomasa T, Nagashima K. Hypervitaminosis D after prolonged feeding with a premature formula. *Pediatrics* 1993;92:862-3

M-18: Uauy RD, Birch DG, Birch EE, Tyson JE, Hoffman DR. Effect of dietary omega-3 fatty acids on retinal function of very low birth weight neonates. *Pediatr Res* 1990;28:485-92

M-19: Hahn-Zoric M, Fulconis F, Minoli I, Moro G, Carlsson B, Böttiger M, et al. Antibody responses to parenteral and oral vaccines are impaired by conventional and low protein formulas as compared to breastfeeding. *Acta Pædiatr Scand* 1990;79:1137-42

M-20: Arnon SS, Damus K, Thompson B, Midura TF, Chin J. Protective role of human milk against sudden death from infant botulism. *J Pediatr* 1982;100:568-73

M-21: Mason T, Rabinovich E, Fredrickson DD, Amoroso K, Reed AM, Stein LD, et al. Breastfeeding and the development of juvenile rheumatoid arthritis. *J Rheumatol* 1995;22:1166-70

M-22: Hasselbalch H, Jeppesen DL, Engelman MDM, Fleischer-Michaelson K, Nielson MB. Decreased thymus size in formula-fed compared with breastfed infants. *Acta Pædiatr* 1996;85:1029-32

M-22a: Hasselbalch H, Engelman MDM, Ersbøll AK, Jeppesen DL, Fleischer-Michaelson K. Breastfeeding Influences thymic size In late Infancy. *Eur J Pediatr* 1999;158:964-7

M-23: Daniels L, Gibson R, Simmer K. Selenium status of preterm infants: the effect of postnatal

age and method of feeding. *Acta Pædiatr* 1997;86:281-8

M-24: Pettitt DJ, Forman MR, Hanson RL, Knowler WC, Bennett PH. Breastfeeding and incidence of non-insulin-dependent diabetes mellitus in Pima Indians. *Lancet* 1997;350:166-8

M-25: Routi T, Rönnemaa T, Lapinleimu H, Salo P, Viikari J, Leino A, et al. Effect of weaning on serum lipoprotein (a) concentration: the STRIP baby study. *Pediatric Research* 1995;38:522-27

M-26: Bergströme E, Hernell O, Persson LÅ, Vessby B. Serum lipid values in adolescents are related to family history, infant feeding and physical growth. *Atherosclerosis* 1995;117:1-13

M-27: Von Kries R, Sauerwald T, von Mutius E, Barnert D, Grunert V, von Voss H. Breastfeeding and obesity: cross sectional study. *Br Med J* 1999;319:147-50

M-28: Håkansson A, Zhivotovsky B, Orrenius S, Sabharwal H. Apoptosis induced by a human milk protein. *Proc Natl Acad Sci USA* 1995;92:8064-68

M-29: Håkansson A, Andréasson J, Zhivotovsky B, Karpman D, Orrenius S, Svanborg C. Multimeric alpha lactalbumin from human milk induces apoptosis through a direct effect on cell nuclei. *Exps Cell Research* 1999;246:451-60

M-30: Fitzpatrick M, Mitchell K, et al. Soy formulas and the effects of Isoflavones on the thyroid *NZ Med J* 2000;113: pages

M-31: Lambertina W, Freni-Titulaer MD, Cordero JF, Haddock L, Lebron G, Martinez R, Mills JL. Premature Thelarche In Puerto Rico. *Am J Dis Child* 1986;140:1263-7

M-32: Tuldahl J, Pettersson K, Andersson SW, Hulthén. Mode of Infant feeding and achieved growth In adolescence: early feeding patterns In relation to growth and body composition In adolescence. *Obesity Research* 1999;7:431-7

M-33: Erickson PR, Mazhari E. Investigation of the role of human breastmilk in caries development. *Pediatr Dent* 1999;21:86-90

M-34: Setchell KDR, Zimmer-Nechmias L, Cai J, Heubi JE. Exposure of infants to phyto-oestrogens from soy-based infant formula. *Lancet* 1997;350:23-27

M-35: Gillman MW, Rifas-Shiman SL, Camargo CA, Berkey CS, Frasier AL, Rockett HRH, et al. Risk of overweight among adolescents who were breastfed as infants. *J Am Med Assoc* 2001;285:2461-7 (Editorial by WH Dietz, 2506-7)

M-36: Type 2 diabetes in Children: prenatal and early infancy risk factors among Native Canadians. *Arch Pediatr Adolesc Med* 2002;156:651-55

Breastmilk as "Antimicrobial"

AM-1: Yoshioka H, Ken-ichi I, Fujita K. Development and differences of intestinal flora in the neonatal period in breastfed and bottle fed infants. *Pediatrics* 1983;72:317-21

AM-2: Hernell O, Ward H, Bläckberg L, Pereira MEA. Killing of *Giardia lamblia* by human milk lipases: An effect mediated by lipolysis of milk lipids. *J Infectious Diseases* 1986;153:715-20

AM-3: Andersson B, Porrás O, Hanson LA, Lagergård T, Svanborg-Edén C. Inhibition of attachment of *Streptococcus pneumoniae* and *Haemophilus influenzae* by human milk and receptor oligosaccharides. *J Infectious Diseases* 1986;153:232-7

AM-4: Bell LM, Clark HF, Offit PA, Slight PH, Arbeter AM, Plotkin SA. Rotavirus serotype-specific neutralizing activity in human milk. *Am J Dis Child* 1988;142:275-8

AM-5: Schroten H, Lethen A, Hanisch FG, Plogmann R, Hacker J, Nobis-Bosch R et al. Inhibition of adhesion of S-Fimbriated *Escherichia coli* to epithelial cells by meconium and feces of breastfed and formula fed newborns: mucins are the major inhibitory component. *J Pediatr Gastroentero Nutr* 1992;15:150-8

AM-6: Walterspiel JN, Morrow AL, Guerrero ML, Ruiz-Palacios GM, Pickering LK. Secretory anti-*Giardia lamblia* antibodies in human milk: protective effect against diarrhea. *Pediatrics* 1994;93:28-31

AM-7: Torres O, Cruz JR. Protection against *Campylobacter* diarrhea: role of milk IgA antibodies against bacterial surface antigens. *Acta Pediatr Scand* 1993;82:835-8

AM-8: Pickering LK, Morrow AL, Herrera I, O'Ryan M, Estes MK, Suilliams SE, et al. Effect of maternal rotavirus immunization on milk and serum antibody titers. *J Inf Dis* 1995;172:723-8

AM-9: Grover M, Giouzeppos O, Shnagl RD, May JT. Effect of human milk protaglandins and lactoferrin on respiratory syncytial virus and rotavirus. *Acta Pædiatr* 1997;86:315-6

AM-10: Delneri MT, Carbonare SB, Silva MLM, Palmeira P, Carneiro-Sampaio MMS. Inhibition of enteropathogenic *Escherichia coli* adhesion to EHP-2 cells by colostrum and milk from mothers delivering low birth weight neonates. *Eur J Pediatr* 1997;156:493-8

Risks to the Mother

Ovarian Cancer

MO-1: Hartge P, Schiffman MH, Hoover R, McGowan L, Leshner L, Norris HJ. A case control study of epithelial ovarian cancer. *Am J Obstet Gynecol* 1989;161:10-6

MO-2: Gwinn ML, Lee NC, Rhodes PH, Layde PM, Rubin GL. Pregnancy, breastfeeding and oral contraceptives and the risk of epithelial ovarian cancer. *J Clin Epidemiol* 1990;43:559-68

MO-3: Rosenblatt KA, Thomas DB, and the WHO collaborative study of neoplasia and steroid contraceptives. Lactation and the risk of epithelial ovarian cancer. *International J Epidemiol* 1993;22:192-7

Osteoporosis

MO-4: Aloia JF, Cohn SH, Vaswani A, Yeh JK, Yuen K, Ellis K. Risks factors for postmenopausal osteoporosis. *Am J Med* 1985;78:95-100

MO-5: Melton LJ, Bryant SC, Wahner HW, O'Fallon WM, Malkasian GD, Judd HL, Riggs BL. Influence of breastfeeding and other reproductive factors on bone mass later in life. *Osteoporosis Int* 1993;3:76-83

MO-6: Cumming RG, Klineberg RJ. Breastfeeding and other reproductive factors and the risk of hip fractures in elderly women. *International J Epidemiol* 1993;22:684-91

MO-6a: Blaauw R, Albertse EC, Beneke T, Lombard CJ, Laubscher R, Hough FS. Risk factors for the development of osteoporosis in a South African population. *S Afr Med J* 1994;84:328-32

MO-6b: Krieger N, Kelsey JL, Holford TR, O'Connor T. An epidemiologic study of hip fractures in postmenopausal women. *Am J Epidemiol* 1982;116:141-8

Endometrial Carcinoma

MO-7: Petterson B, Hans-Olov A, Berström R, Johansson EDB. Menstruation span-a time-limited risk factor for endometrial carcinoma. *Acta Obstet Gynecol Scand* 1986;65:247-55

MO-7a: Rosenblatt KA, Thomas DB, and the WHO collaborative study of neoplasia and steroid contraceptives. Prolonged Lactation and endometrial cancer. *Int J Epidemiol* 1995;24:499-503

Breast Cancer

MO-8: Layde PM, Webster LA, Baughman AL, Wingo PA, Rubin GL, Ory HW and the cancer and steroid hormone study group. The independent associations of parity, age at first full term pregnancy, and duration of breastfeeding with the risk of breast cancer. *J Clin Epidemiol* 1989;42:963-73

MO-9: Ing R, Ho JHC, Petrakis NL. Unilateral breastfeeding and breast cancer. *Lancet* July 16, 1997;124-27

MO-10: McTiernan A, Thomas DB. Evidence for a protective effect of lactation on risk of breast cancer in young women. *Am J Epidemiol* 1986;124:353-74

MO-11: Yuan J-M, Yu MC, Ross RK, Gao Y-T, Henderson BE. Risk factors for breast cancer in Chinese women in Shanghai. *Cancer Res* 1988;58:99-104

MO-12: Yoo K-Y, Tajima K, Kuroishi T, Hirose K, Yoshida M, Miura S, Murai H. Independent protective effect of lactation against breast cancer: a case-control study in Japan. *Am J Epidemiol* 1992;135:726-33

MO-13: Reuter KL, Baker SP, Krolkowski FJ. Risk factors for breast cancer in women

undergoing mammography. Am J Radiol 1992;158:273-8
MO-14: United Kingdom National Case-Control Study Group. Breastfeeding and risk of breast cancer in young women. Br Med J 1993;307:17-20
MO-15: Newcomb PA, Storer BE, Longnecker MP, Mittendorf R, Greenberg ER, Clapp RW, et al. Lactation and a reduced risk of premenopausal breast cancer. N Eng J Med 1994;330:81-7
MO-16: Tao S-C, Yu MC, Ross RK, Xiu K-W. Risk factors for breast cancer in Chinese women of Beijing. Int J Cancer 1988;42:495-98
MO-17: Siskind V, Schofield F, Rice D, Bain C. Breast cancer and breastfeeding: results from an Australian case-control study. Am J Epidemiol 1989;130:229-36
MO-18: Romieu I, Hernández-Avila M, Lazcano E, Lopez L, Romero-Jaime R. Breast cancer and lactation history in Mexican women. Am J Epidemiol 1996;143:543-52
MO-18b: Furberg H, Newman B, Moorman P, Millikan R. Lactation and breast cancer risk. Int J Epidemiol 1999;28:396-402
MO-18c: Tryggvadóttir L, Tulinius H, Eyfjord JE, Sigurvinsson T. Breastfeeding and reduced risk of breast cancer in an Icelandic cohort study. Am J Epidemiol 2001;154:37-42

Weight Loss

MO-19: Dewey KG, Heinig MJ, Nommsen LA. Maternal weight loss patterns during prolonged lactation. Am J Clin Nutr 1993;58:162-6

Risks to Society

S-1: Thapa S, Short RV, Potts M. Breastfeeding, birth spacing, and their effects on child survival. Nature 1988;335:679-82
S-2: Short . Breastfeeding (contraceptive effect). Scientific American 1984;250:35-41
S-3: Bitoun P. The economic value of breastfeeding in France. Les Dossiers de l'Obstetrique. 1994;#216 (available on request)
S-4: Radford A. The ecological impact of bottle feeding. (available on request)
S-5: Gross BA. Is the lactational amenorrhea method a part of natural family planning? Biology and policy. Am J Obstet Gynecol 1991;165:2014-9
S-6: Kennedy KI, River R, McNeilly AS. Consensus statement on the use of breastfeeding as a family planning method. Contraception 1989;39:477-96

Compiled by Dr. Jack Newman
Revised: August, 2002

<http://www.breastfeedingonline.com>



Cindy Curtis, RN, IBCLC