



Physiology and Targeted Nutrition in Infants

Alshweki A, Muñuzuri AP, Baña AM, et al. Effects of different arachidonic acid supplementation on psychomotor development in very preterm infants; a randomized controlled trial. *Nutr J*. 2015;14:101.

Barker DJ. Fetal origins of coronary heart disease. *BMJ*. 1995;311(6998):171-174.

Barua S, Kuizon S, Chadman KK, Flory MJ, Brown WT, Junaid MA. Single-base resolution of mouse offspring brain methylome reveals epigenome modifications caused by gestational folic acid. *Epigenetics Chromatin*. 2014;7(1):3. doi:10.1186/1756-8935-7-3

Blegen MB, Kennedy BC, Thibert KA, Tran PV, Georgieff MK. Multigenerational effects of fetal-neonatal iron deficiency on hippocampal BDNF signaling. *Physiol Rep*. 2013;1(5):e00096. doi:10.1002/phy2.96

Bode L. Human milk oligosaccharides: every baby needs a sugar mama. *Glycobiology*. 2012;22(9):1147-1162. doi:10.1093/glycob/cws074

Calder PC. Immunonutrition: May have beneficial effects in surgical patients. *BMJ*. 2003; 327(7407):117-118. doi:10.1136/bmj.327.7407.117

Callahan LS, Thibert KA, Wobken JD, Georgieff MK. Early-life iron deficiency anemia alters the development and long-term expression of parvalbumin and perineuronal nets in the rat hippocampus. *Dev Neurosci*. 2013;35(5):427-36. doi:10.1159/000354178

Carlo WA, McDonald SA, Tyson JE, et al. Cytokines and neurodevelopmental outcomes in extremely low birth weight infants. *J Pediatr*. 2011;159(6):919-25.e3. doi:10.1016/j.jpeds.2011.05.042

Carlson SE. Early determinants of development: a lipid perspective. *Am J Clin Nutr*. 2009; 89(5): 1523S-1529S.

Casey PH, Whiteside-Mansell L, Barrett K, Bradley RH, Gargus R. Impact of prenatal and/or postnatal growth problems in low birth weight preterm infants on school-age outcomes: an 8-year longitudinal evaluation. *Pediatrics*. 2006;118(3):1078-86.

Cho CE, Sánchez-Hernández D, Reza-López SA, Huot PS, Kim YI, Anderson GH. High folate gestational and post-weaning diets alter hypothalamic feeding pathways by DNA methylation in Wistar rat offspring. *Epigenetics*. 2013;8(7):710-9. doi:10.4161/epi.24948

Collins CT, Makrides M, McPhee AJ, et al. Docosahexaenoic acid and bronchopulmonary dysplasia in preterm infants. *N Engl J Med*. 2017;376(13):1245-1255. doi:10.1056/NEJMoa1611942

Curhan GC, Willett WC, Rimm EB, Spiegelman D, Ascherio AL, Stampfer MJ. Birth weight and adult hypertension, diabetes mellitus, and obesity in US men. *Circulation*. 1996;94(12):3246-3250.

Cusick SE, Georgieff MK. The Role of Nutrition in Brain Development: The Golden Opportunity of the "First 1000 Days". *J Pediatr*. 2016; 175:16-21. doi:10.1016/j.jpeds.2016.05.013



- Ehrenkranz RA, Dusick AM, Vohr BR, Wright LL, Wrage LA, Poole WK. Growth in the neonatal intensive care unit influences neurodevelopmental and growth outcomes of extremely low birth weight infants. *Pediatrics*. 2006;117(4):1253-1261
- Eide MG, Moster D, Irgens LM, et al. Degree of fetal growth restriction associated with schizophrenia risk in a national cohort. *Psychol Med*. 2013;43(10):2057-2066. doi:10.1017/S003329171200267X
- Fretham SJ, Carlson ES, Wobken J, Tran PV, Petryk A, Georgieff MK. Temporal manipulation of transferrin-receptor-1-dependent iron uptake identifies a sensitive period in mouse hippocampal neurodevelopment. *Hippocampus*. 2012;22(8):1691-702. doi:10.1002/hipo.22004
- Garza C, Stover PJ, Ohlhorst SD, et al. Best practices in nutrition science to earn and keep the public's trust. *Am J Clin Nutr*. 2019;109(1):225-243. doi:10.1093/ajcn/nqy337
- Gluckman PD, Hanson MA. Living with the past: evolution, development, and patterns of disease. *Science*. 2004;305(5691):1733-1736.
- Grissom NM, Reyes TM. Gestational overgrowth and undergrowth affect neurodevelopment: Similarities and differences from behavior to epigenetics. *Int J Dev Neurosci*. 2013;31:406-14. doi:10.1016/j.ijdevneu.2012.11.006
- Hadley KB, Ryan AS, Forsyth S, Gautier S, Salem N Jr. The essentiality of arachidonic acid in infant development. *Nutrients*. 2016;8(4):216. doi:10.3390/nu8040216.4.
- Hair AB, Peluso AM, Hawthorne KM, et al. Beyond necrotizing enterocolitis prevention: Improving outcomes with an exclusive human milk-based diet. *Breastfeed Med*. 2016;11(2):70-74. doi:10.1089/bfm.2015.0134
- Hensch TK. Critical period regulation. *Annu Rev Neurosci*. 2004;27:549-579.
- Insel BJ, Schaefer CA, McKeague IW, Susser ES, Brown AS. Maternal iron deficiency and the risk of schizophrenia in offspring. *Arch Gen Psychiatry*. 2008;65(10):1136-1144. doi:10.1001/archpsyc.65.10.1136
- Ioannidis JPA. The challenge of reforming nutritional epidemiologic research. *JAMA*. 2018;320(10):969-970. doi:10.1001/jama.2018.11025.
- Jobe AH. Animal models, learning lessons to prevent and treat neonatal chronic lung disease. *Front Med (Lausanne)*. 2015 ;2:49. doi:10.3389/fmed.2015.00049
- Jorgenson LA, Sun M, O'Connor M, Georgieff MK. Fetal iron deficiency disrupts the maturation of synaptic function and efficacy in area CA1 of the developing rat hippocampus. *Hippocampus*. 2005;15(8):1094-1102.
- Joss-Moore LA, Hagen-Lillevik SJ, Yost C, et al. Alveolar formation is dysregulated by restricted nutrition but not excess sedation in preterm lambs managed by noninvasive support. *Pediatr Res*. 2016;80(5):719-728. doi:10.1038/pr.2016.143
- Ke X, Schober ME, McKnight RA, et al. Intrauterine growth retardation affects expression and epigenetic characteristics of the rat hippocampal glucocorticoid receptor gene. *Physiol Genomics*. 2010;42(2):177-89. doi:10.1152/physiolgenomics.00201.2009

- Ke X, Xing B, Yu B, et al. IUGR disrupts the PPAR γ -Setd8-H4K20me1 and Wnt signaling pathways in the juvenile rat hippocampus. *Int J Dev Neurosci*. 2014;38:59-67. doi:10.1016/j.ijdevneu.2014.07.008
- Konnikova Y, Zaman MM, Makda M, D'Onofrio D, Freedman SD, Martin CR. Late enteral feedings are associated with intestinal inflammation and adverse neonatal outcomes. *PLOS One*. 2015;10(7):e0132924. doi:10.1371/journal.pone.0132924
- Kroeger CM, Garza C2, Lynch CJ, et al. Scientific rigor and credibility in the nutrition research landscape. *Am J Clin Nutr*. 2018;107(3):484-494. doi:10.1093/ajcn/nqx067
- Kuzawa CW. Adipose tissue in human infancy and childhood: an evolutionary perspective. *Am J Phys Anthropol*. 1998;Suppl 27:177-209.
- Langie SA, Achterfeldt S, Gorniak JP, et al. Maternal folate depletion and high-fat feeding from weaning affects DNA methylation and DNA repair in brain of adult offspring. *FASEB J*. 2013;27(8):3323-34. Epub 2013 Apr 19. doi:10.1096/fj.12-224121
- Lavoie JC, Tremblay A. Sex-specificity of oxidative stress in newborns leading to a personalized antioxidant nutritive strategy. *Antioxidants (Basel)*. 2018;7(4). pii: E49. doi:10.3390/antiox7040049
- Leviton A, Dammann O, Engelke S, et al. The clustering of disorders in infants born before the 28th week of gestation. *Acta Paediatr*. 2010;99(12):1795-1800. doi:10.1111/j.1651-2227.2010.01973.x
- Löfqvist CA, Najm S, Hellgren G, et al. Association of retinopathy of prematurity with low levels of arachidonic acid: A secondary analysis of a randomized clinical trial. *JAMA Ophthalmol*. 2018;136(3):271-277. doi:10.1001/jamaophthalmol.2017.6658
- Lozoff B, Jimenez E, Hagen J, Mollen E, Wolf AW. Poorer behavioral and developmental outcome more than 10 years after treatment for iron deficiency in infancy. *Pediatrics*. 2000;105(4):E51.
- Lu L, Yu Y, Guo Y, Wang Y, Chang EB, Claud EC. Transcriptional modulation of intestinal innate defense/inflammation genes by preterm infant microbiota in a humanized gnotobiotic mouse model. *PLOS One*. 2015;10(4):e0124504. doi:10.1371/journal.pone.0124504
- Lukowski AF, Koss M, Burden MJ, et al. Iron deficiency in infancy and neurocognitive functioning at 19 years: evidence of long-term deficits in executive function and recognition memory. *Nutr Neurosci*. 2010;13(2):54-70. doi:10.1179/147683010X12611460763689
- Ly A, Ishiguro L, Kim D, et al. Maternal folic acid supplementation modulates DNA methylation and gene expression in the rat offspring in a gestation period-dependent and organ-specific manner. *J Nutr Biochem*. 2016;33:103-110. doi:10.1016/j.jnutbio.2016.03.018
- Martin CR, Dasilva DA, Cluette-Brown JE, et al. Decreased postnatal docosahexaenoic and arachidonic acid blood levels in premature infants are associated with neonatal morbidities. *J Pediatr*. 2011;159(5):743-749.e1-2. doi: 10.1016/j.jpeds.2011.04.039.
- Martin CR. Lipids and Fatty Acids in the Preterm Infant, Part 2: Clinical Considerations. *AAP Neoreviews*. 2015;16(3).

- Martinez M. Abnormal profiles of polyunsaturated fatty acids in the brain, liver, kidney and retina of patients with peroxisomal disorders. *Brain Res.* 1992;583(1-2):171-82.
- Martinowich K, Hattori D, Wu H, et al. DNA methylation-related chromatin remodeling in activity-dependent BDNF gene regulation. *Science.* 2003;302(5646):890-893.
- Pisansky MT, Wickham RJ, Su J, et al. Iron deficiency with or without anemia impairs prepulse inhibition of the startle reflex. *Hippocampus.* 2013;23(10):952-62. doi:10.1002/hipo.22151
- Pollitt E, Gorman KS, Engle PL, Rivera JA, Martorell R. Nutrition in early life and the fulfillment of intellectual potential. *J Nutr.* 1995;125(4 Suppl):1111S-1118S. doi:10.1093/jn/125.suppl_4.1111S
- Pylipow M, Spector LG, Puumala SE, Boys C, Cohen J, Georgieff MK. Early postnatal weight gain, intellectual performance, and body mass index at 7 years of age in term infants with intrauterine growth restriction. *J Pediatr.* 2009;154(2):201-206. doi:10.1016/j.jpeds.2008.08.015
- Schmidt RJ, Tancredi DJ, Krakowiak P, Hansen RL, Ozonoff S. Maternal intake of supplemental iron and risk of autism spectrum disorder. *Am J Epidemiol.* 2014;180(9):890-900. doi:10.1093/aje/kwu208
- Singhal A, Lucas A. Early origins of cardiovascular disease: is there a unifying hypothesis? *Lancet.* 2004;363(9421):1642-1645.
- Spiegler J, Preuß M, Gebauer C, et al. Does Breastmilk Influence the Development of Bronchopulmonary Dysplasia? *J Pediatr.* 2016;169:76-80.e4. doi:10.1016/j.jpeds.2015.10.080
- Strauss RS, Dietz WH. Growth and development of term children born with low birth weight: effects of genetic and environmental factors. *J Pediatr.* 1998;133(1):67-72.
- Taylor SN, Basile LA, Ebeling M, Wagner CL. Intestinal permeability in preterm infants by feeding type: mother's milk versus formula. *Breastfeed Med.* 2009;4(1):11-15. doi:10.1089/bfm.2008.0114
- Thompson RA, Nelson CA. Developmental science and the media. Early brain development. *Am Psychol.* 2001;56(1):5-15.
- Tran PV, Kennedy BC, Lien YC, Simmons RA, Georgieff MK. Fetal iron deficiency induces chromatin remodeling at the Bdnf locus in adult rat hippocampus. *Am J Physiol Regul Integr Comp Physiol.* 2015;308(4):R276-82. doi:10.1152/ajpregu.00429.2014
- Tyagi E, Zhuang Y, Agrawal R, Ying Z, Gomez-Pinilla F. Interactive actions of Bdnf methylation and cell metabolism for building neural resilience under the influence of diet. *Neurobiol Dis.* 2015;73:307-318. doi:10.1016/j.nbd.2014.09.014
- Vojdani A. For the assessment of intestinal permeability, size matters. *Altern Ther Health Med.* 2013;19(1):12-24.
- Wedgwood S, Warford C, Agvateesiri SC, et al. Postnatal growth restriction augments oxygen-induced pulmonary hypertension in a neonatal rat model of bronchopulmonary dysplasia. *Pediatr Res.* 2016;80(6):894-902. doi:10.1038/pr.2016.164



Wood AC, Wren JD, Allison DB. The need for greater rigor in childhood nutrition and obesity research. *JAMA Pediatr.* 2019. doi:10.1001/jamapediatrics.2019.0015

Zeisel SH, Caudill MA. Choline. *Adv Nutr.* 2010;1(1):46–48. doi.org/10.3945/an.110.1010

Zeisel S. Choline, other methyl-donors and epigenetics. *Nutrients.* 2017;9.pii: E445. doi:10.3390/nu9050445

Zivkovic AM, German JB, Lebrilla CB, Mills DA. Human milk glycobioime and its impact on the infant gastrointestinal microbiota. *Proc Natl Acad Sci USA.* 2011;108 Suppl 1:4653-4658. doi:10.1073/pnas.1000083107