

Fischer LM, da Costa K-A, Galanko J, Sha W, Stephenson B, Vick J, Zeisel SH. Choline intake and genetic polymorphisms influence choline metabolite concentrations in human breast milk and plasma, *Am J Clin Nutr*, 2010;92:336-46.

Background: Choline is essential for infant nutrition, and breast milk is a rich source of this nutrient. Common single nucleotide polymorphisms (SNPs) change dietary requirements for choline intake.

Objective: The aim of this study was to determine whether total choline intake and/or SNPs influence concentrations of choline and its metabolites in human breast milk and plasma.

Design: We gave a total of 103 pregnant women supplemental choline or a placebo from 18 wk gestation to 45 d postpartum and genotyped the women for 370 common SNPs. At 45 d postpartum, we measured choline metabolite concentrations in breast milk and plasma and assessed the dietary intake of choline by using a 3-d food record.

Results: On average, lactating women in our study ate two-thirds of the recommended intake for choline (Adequate Intake = 550 mg choline/d). Dietary choline intake (no supplement) correlated with breast-milk phosphatidylcholine and plasma choline concentrations. A supplement further increased breast-milk choline, betaine, and phosphocholine concentrations and increased plasma choline and betaine concentrations. We identified 5 SNPs in *MTHFR* that altered the slope of the intake–metabolite concentration relations, and we identified 2 SNPs in *PEMT* that shifted these curves upward. Individuals who shared sets of common SNPs were outliers in plots of intake–metabolite concentration curves; we suggest that these SNPs should be further investigated to determine how they alter choline metabolism.

Conclusion: Total intake of choline and genotype can influence the concentrations of choline and its metabolites in the breast milk and blood of lactating women and thereby affect the amount of choline available to the developing infant. This study was registered at clinicaltrials.gov as [NCT00678925](https://clinicaltrials.gov/ct2/show/study/NCT00678925).