

Zeisel , SH. Choline: Critical role during fetal development and dietary requirements in adults. *Annu Rev Nutr* 2006;26:5.1-5.22.

Choline is an essential nutrient needed for the structural integrity and signaling functions of cell membranes; for normal cholinergic neurotransmission; for normal muscle function; for lipid transport from liver; and it is the major source of methyl groups in the diet. Choline is critical during fetal development, when it influences stem cell proliferation and apoptosis, thereby altering brain and spinal cord structure and function and influencing risk for neural tube defects and lifelong memory function. Choline is derived not only from the diet, but from de novo synthesis as well. Though many foods contain choline, there is at least a twofold variation in dietary intake in humans. When deprived of dietary choline, most men and postmenopausal women developed signs of organ dysfunction (fatty liver or muscle damage), while less than half of premenopausal women developed such signs. Aside from gender differences, there is significant variation in the dietary requirement for choline that can be explained by very common genetic polymorphisms.