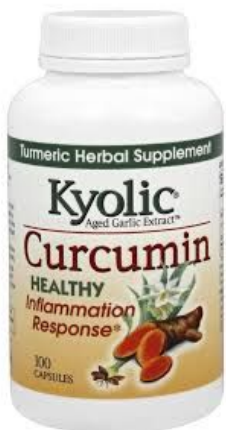


To Do:

- Remove & Consider
 - Sugary Processed foods that tend to be rich in vegetable oils;
 - Limit/ avoid alcohol - alcohol increases your need for Choline
 - Limit / avoid and large amounts of vegetable oils (corn oil etc).
 - Basically, the liver turns sugars into fat if we do not get enough choline
 - Lower estrogen concentrations in postmenopausal women increases their risk of organ dysfunction in response to a low-choline diet, so their requirements are higher than those of premenopausal women
- Eat more:
 - Whole Eggs (eat the yolk!!!) contain a lot choline.
 - Cold Water Fish (wild caught Alaskan salmon , Krill oil tabs)
 - Shiitaki Mushrooms
 - Cruciferous vegetables (Asparagus, Broccoli, Cauliflower, Kale, Brussel's Sprouts, Collard Greens, Cabbage).
- Take the Following Supplements: That have Choline (in the **Kyolic Curcumin**) and **Milk Thistle** (Supports the Liver in general). **Garden of Life's Primal Defense Ultra Probiotic** is key. Optional: You can add **Herbs Etc's Liver Tonic Tincture** for additional liver toning supports.



#1



#2



#3



#4

Additional Information



Choline is an essential nutrient and the liver is a central organ responsible for choline metabolism. Hepatosteatosis and liver cell death occur when humans are deprived of choline. Humans eating low choline diets develop fatty liver and liver damage,. Furthermore, the hepatic steatosis phenotype and can be characterized more fully via metabolomic signatures and is influenced by the gut microbiome. Choline influences liver function, and the dietary requirement for this nutrient varies depending on an individual's

genotype and estrogen status. Understanding these individual differences is important for gastroenterologists seeking to understand why some individuals develop NAFLD and others do not (Corbin, et al. 2012).

Choline is necessary to produce a phospholipid called phosphatidylcholine (PC) ... a critical component of the very low density lipoprotein (VLDL) particle, which we need to make in order to export fats from our livers. The amino acid methionine can act as a precursor to choline and can also be used to convert a different phospholipid called phosphatidylethanolamine directly into PC. Thus, the combined deficiency of choline and methionine will severely impair our abilities to package up the fats in our livers and to send them out into the bloodstream." (Mercola, 2019)

- Choline is a vitamin-like essential nutrient and a methyl donor involved in many physiological processes, including normal metabolism and transport of lipids, methylation reactions, and neurotransmitter synthesis.
- Choline deficiency causes muscle damage and abnormal deposition of fat in the liver, which results in a condition called nonalcoholic fatty liver disease. Genetic predispositions and gender can influence individual variation in choline requirements and thus the susceptibility to choline deficiency-induced fatty liver disease.

- The recommended adequate intake (AI) of choline is set at 425 milligrams (mg)/day for women and 550 mg/day for men.
- Choline is involved in the regulation of homocysteine concentration in the blood through its metabolite betaine. There is currently no convincing evidence that high choline intakes could benefit cardiovascular health through lowering blood homocysteine. Besides, elevated blood concentrations of trimethylamine N-oxide (TMAO), generated from choline, may increase the risk of cardiovascular events (Zeisel, 2015)

CHECK THIS OUT !

Check out this Website / Blog: [Fatty Liver Diary](#) for additional information and meal planning to resolve fatty liver. Below is a plate of food used in the program.

<https://www.fattyliverdiary.com/fatty-liver-meal-plan-for-a-week/>



References:

Corbin, Karen; Zeisel, Steven. (2012). Choline Metabolism Provides Novel Insights into Non-alcoholic Fatty Liver Disease and its Progression. Current Opinions in Gastroenterology. Retrieved: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3601486/>

Mercola, Joseph. (2019). Choline is Crucial for Liver Health. Retrieved from: <https://articles.mercola.com/sites/articles/archive/2018/11/19/choline-fatty-liver.aspx>

Zeisel, Steven H. M.D., Ph.D [edited]. (2015). Choline. The School of Public Health Oregon State University Linus Pauling Micronutrient Information Center. Retrieved from <https://lpi.oregonstate.edu/mic/other-nutrients/choline>



ABOUT THE AUTHOR



Njeri Kai Jarvis MS/RD/LDN owns **Bear Nutrition and Herbs**, an integrative nutrition and wellness practice located in Washington, DC. Her nutrition practice covers a wide range of health issues from body composition, cardiac, endocrine and kidney imbalances to cancer and autoimmunity. She also specializes in food-sensitivity issues as they relate to ADHD, autism, mood regulation, and chronic health conditions.

Ms. Jarvis uses a variety of functional testing methods to look for wellness potential as well as underlying imbalances upon which to target diet and nutritional programs. She uses this testing along with an extensive health assessment to develop individualized nutrition and lifestyle programs. Her desire is that her clients realize their health potential as they create lives devoted to healthy eating and healthy living.

Njeri has Masters in Herbal Medicine and is a board-certified, licensed dietician with over 19 years clinical practice experience with additional study and specialization for ADHD / Autism Spectrum Disorders and Functional Nutrition. She utilizes best practices for digestion, absorption, food sensitivities, inflammation and immunity support. Njeri also works to improve outcomes in this area by working with people on improving sleep hygiene through lifestyle and nutritional support. Contact her to find out how she can support you in your journey to better health !