

For Healthcare Professionals Only



# Nutrition For A Healthy Pregnancy:

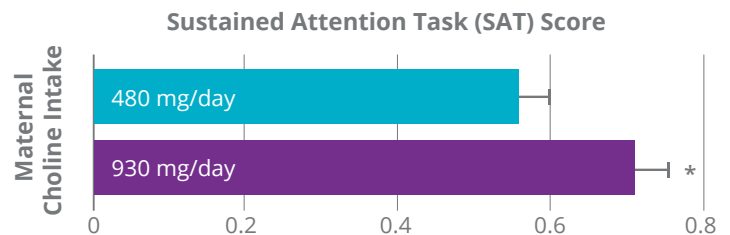
## How Choline & DHA Work Together

Two nutrients with well established roles in fetal growth and development are the essential nutrient choline and the omega-3 fatty acid, docosahexaenoic acid (DHA). Each nutrient individually helps support a healthy pregnancy but new data suggests beneficial synergies as well.

### Choline

Choline is an essential nutrient that supports the growth and development of the child's brain and spinal cord.<sup>(2,3)</sup> Recent research highlights some of the benefits that adequate or supplemental choline can provide both mom and baby:

- **Supports Cognitive Development:** Choline aids in the development of multiple aspects of cognitive function, including learning, memory, and attention.<sup>(4)</sup>
- **Enhances Baby's Neurocognitive Ability:** Children born to mothers who consume supplemental choline (930 mg/day) during the 3rd trimester of pregnancy have been shown to have improvements in information processing speed as early as 4-13 months of age.<sup>(5)</sup>
- **Cognitive Benefits That Last:** A follow up study of those same children at age 7 showed that choline supplementation during pregnancy improved children's sustained attention & cognitive function – 7 years later!<sup>(6)</sup>
- **Associated With Lower Incidence of Neural Tube Defects (NTDs):** Choline and folate share an important metabolic relationship. A recent systematic review & meta-analysis found that low maternal choline intake/circulating concentrations were associated with a higher odds of NTDs among mothers of newborns.<sup>(4)</sup>



Children born to high choline consuming mothers showed greater sustained attention when followed up at age 7y. Mean ± SEM; \*Significant main effect of choline treatment, p<0.05; Adapted From<sup>(6)</sup>



# Docosahexaenoic Acid (DHA)

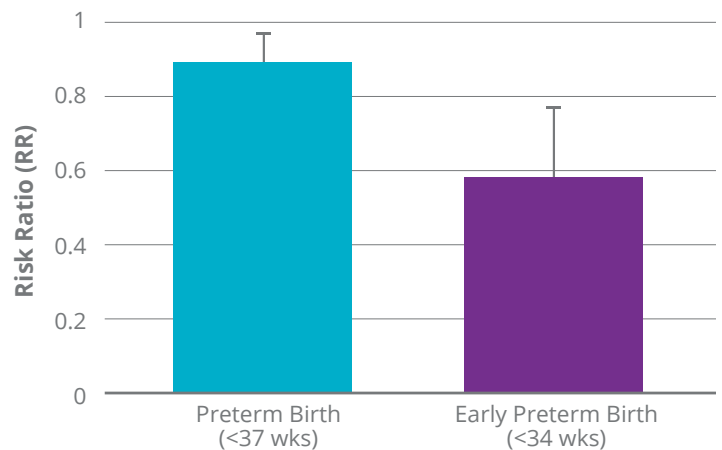
**Docosahexaenoic Acid (DHA) is one of three major omega-3 fatty acids of importance in human nutrition. DHA is primarily accumulated in the brain and retina,<sup>(7)</sup> where it plays important roles:**

**Critical for Brain Development:** An adequate supply of DHA is critical for brain development of infants and children.<sup>(1)</sup>

**Supporting Brain Function:** DHA has been shown to impact multiple aspects of brain development and function, such as modulating neurogenesis, influencing neurotransmission, and promoting synaptic activity.<sup>(8)</sup>

**Reducing Preterm Birth:** High intakes of foods containing omega-3 fatty acids such as DHA have been linked to longer gestations and improved perinatal outcomes. A recent systematic review and meta-analysis from the Cochrane Library concluded that increasing omega-3 fatty acid intake (including DHA) may reduce the incidence of preterm birth (<37 wks) and early preterm birth (<34 wks).<sup>(9)</sup>

Experts generally recommend that expecting moms consume at least 200 mg/day of DHA to support a healthy pregnancy, but more than 95% of pregnant women do not get enough DHA in their diets.<sup>(10)</sup>



Preterm birth (<37 wks) and early preterm birth (<34 wks) were reduced in women receiving omega-3 fatty acids compared with no omega-3. Figure adapted from<sup>(9)</sup>

| Expert Group   | Intake Recommendation |
|--|-----------------------|
| American Academy of Pediatrics (AAP) <sup>(11)</sup>   | 200-300 mg/day DHA    |
| European Food Safety Authority (EFSA) <sup>(12)</sup>  | 100-200 mg/day DHA    |
| Food & Agriculture Organization of the United Nations (FAO)<br>World Health Organization (WHO) Joint Expert Consultation <sup>(13)</sup> | 200 mg/day DHA        |
| Global Organization for EPA and DHA Omega-3 (GOED) <sup>(14)</sup>   | 300 mg/day DHA        |

# Choline + Docosahexaenoic Acid (DHA)

**Choline and DHA share an important metabolic relationship highlighted by new clinical data in expecting mothers. Phosphatidylcholine, a choline derivative, helps transport various lipids around the body, including DHA<sup>(8)</sup> and higher maternal choline intake helps improve DHA uptake:**

**Choline Improves Markers of DHA Status:** Pregnant women given supplemental choline + DHA during the 2nd and 3rd trimesters of pregnancy increased their DHA status more than women given DHA alone.<sup>(15)</sup>

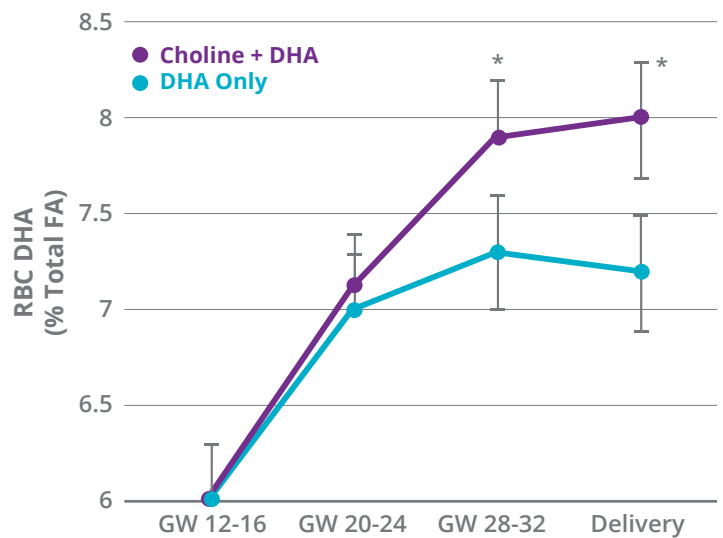
Adequate maternal DHA status during pregnancy is critical to ensure proper supply of nutrients to baby.

The Institute of Medicine recommends that women consume 450 mg/day of choline and during pregnancy 550 mg/day during lactation,<sup>(2)</sup>



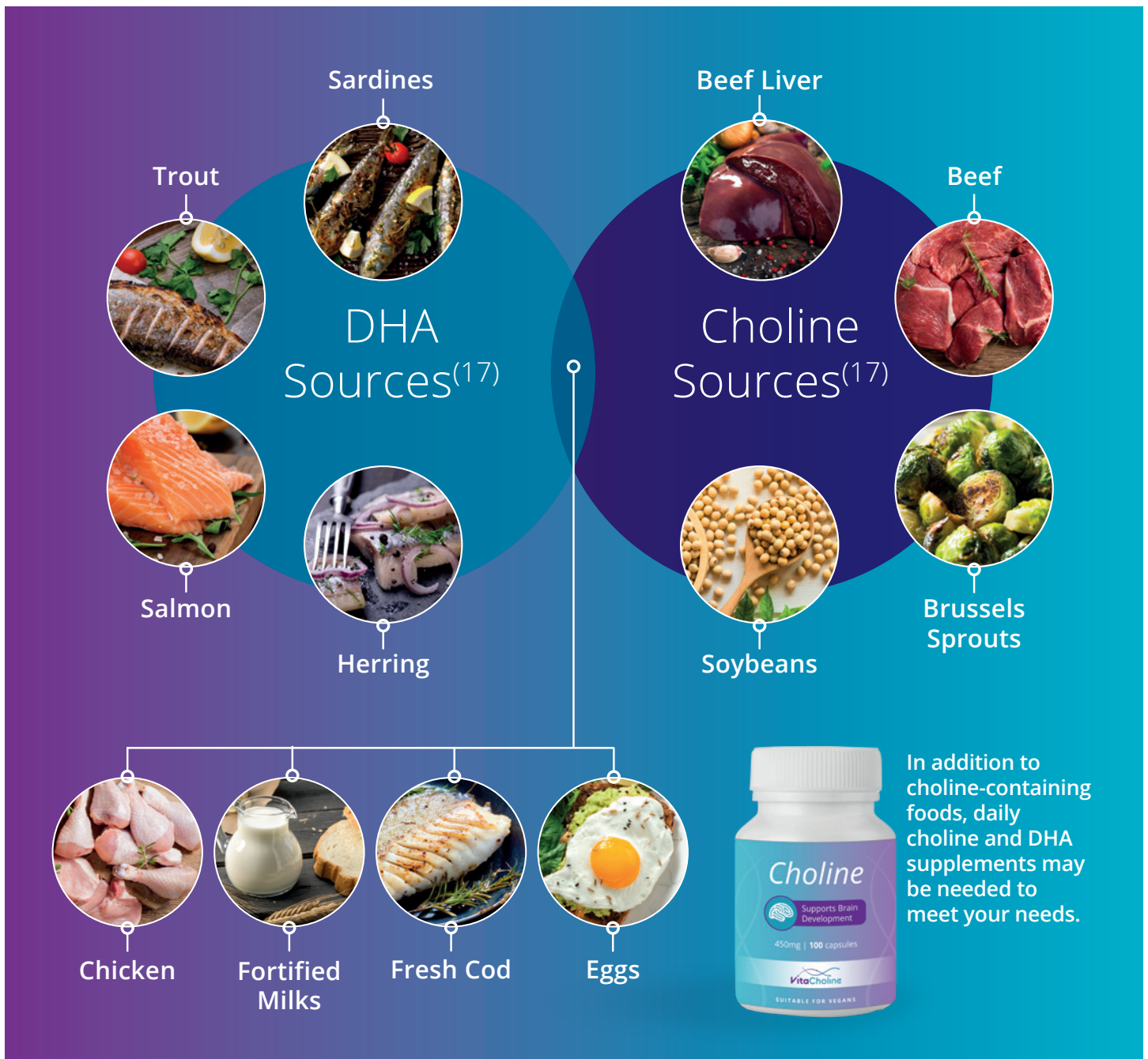
yet less than 5% of women in the United States meet those recommendations from food and beverages alone.<sup>(16)</sup>

Encourage your patients to get enough choline and DHA in their diets to help support a healthy pregnancy.



Maternal DHA Choline + DHA supplementation improves DHA status better than DHA alone. Mean  $\pm$  95% CI; \*Significant difference between groups,  $p < 0.05$ ; GW = gestational week; RBC = red blood cell; FA = fatty acid; Adapted from<sup>(15)</sup>





Balchem is the only North American producer of human grade choline, with manufacturing sites in USA and Italy.

For more research and materials on choline's role in health, visit: [www.vitacholine.com](http://www.vitacholine.com)

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**References:**

**1)** <https://www.acog.org/womens-health/faqs/nutrition-during-pregnancy>; **2)** Institute of Medicine, 1998; **3)** <https://www.dietaryguidelines.gov>; **4)** Obeid R, et al., Adv Nutr 2022; 13(6): 2445-2457; **5)** Caudill MA, et al., FASEB J 2018; 32(4): 2172-2180; **6)** Bahnfleth CL, et al., FASEB J 2022; 36(1): e22054; **7)** Arterburn L et al., Am J Clin Nutr 2006; 83(6 suppl): 1476S-1476S; **8)** Mun JG, et al., Nutrients 2019; 11(5): 1125; **9)** Middleton P, et al., Cochrane Database Syst Rev 2019; 11(11): CD003402; **10)** Zhang Z, et al., Nutrients 2018; 10(4): 416. doi: 10.3390/nu10040416; **11)** Eidelman AI, et al., Pediatrics 2012; 129(3): e827-e841; **12)** EFSA J 2010; 8(3): 1461; **13)** <https://www.fao.org/3/i1953e/i1953e00.pdf>; **14)** <https://goedomega3.com/intake-recommendations>; **15)** Klatt KC, et al., Am J Clin Nutr 2022; 116(3): 820-832; **16)** USDA, Agricultural Research Service, 2021. Usual Nutrient Intake from Food and Beverages, by Pregnancy/ Lactation Status, What We Eat in America, NHANES 2015-2018. Available at: <http://www.ars.usda.gov/nea/bhnrc/fsrgARS> data; **17)** USDA, Agricultural Research Service. FoodData Central, 2019. Available at: <https://fdc.nal.usda.gov/>



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