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## The distribution of usual choline intake during the first 1000 days in Australia: cause for concern?

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Choline is an essential nutrient required in increased amounts during periods of rapid growth such as pregnancy and early life<sup>(1)</sup>. It is a precursor for acetylcholine synthesis, a key neurotransmitter involved in muscle coordination and memory, and betaine, a major methyl donor. Choline is also a component of phosphatidylcholine, a phospholipid that makes up to 50% of neural tissue, most of which is accrued in late pregnancy and early life. Choline can be synthesised in the liver; however, de novo synthesis is not sufficient to meet needs and exogenous choline must come from diet. Australia's National Health and Medical Research Council (NHMRC) has established Adequate Intakes (AI) for choline. During pregnancy and lactation, the AI for choline is set at 440 and 550 mg/d. For young children 0–3 years of age, the AI is set at 125–200 mg/day. We and others have shown that pregnant and lactating Australian women have low choline intakes with few exceeding their AI (1–40%). There are no data on the choline intakes of children under 2 years. In 2021, we published the first ever Australia-wide study on nutrient intakes in children under two years, and, in 2024, updated it to include choline. Using a 24-hour food record with repeats in a subsample of the population (~30%), we estimated usual choline intake distributions and its dietary sources in  $n = 761$  children 6–24 months. Average choline intakes for infants 6–12 months and toddlers 12–24 months were  $142 \pm 1.9$  and  $181 \pm 1.2$  mg/day, respectively. Only one third of infants and one quarter of toddlers exceeded their respective AIs of 125 and 200 mg/day. Breastfeeding rates were high with 78% of infants and 44% of toddlers still receiving breastmilk. In both groups, breastmilk was the leading source of choline contributing 56% and 32% among consumers<sup>(2)</sup>. Animal-source foods (meat, chicken, fish, and eggs) rich in choline and other essential nutrients were consumed by less than one third of children and in small amounts. Given choline's role in neurodevelopment, the low intakes observed in pregnant and lactating women and young children suggest dietary intakes may need improvement. Moreover, the impact of low choline intake on neurodevelopmental outcomes remains unknown and warrants further investigation.

### References

1. Wiedeman AM, Barr SI, Green TJ *et al.* (2018) *Nutrients* **10**(10), 1513–1537.
2. Li Z, Zhou SJ, Green TJ *et al.* (2024) *Nutrients* **16**(12), 1927–1937.