

Supplementary online content

Docosahexaenoic acid-rich algae oil supplementation on breast milk fatty acid profile of mothers who delivered prematurely: A Randomized Clinical Trial

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Supplementary Table S1. Studies, from the literature, reporting breast milk fatty acids composition in response to a supplementation in DHA (alone or in association with other long-chain polyunsaturated fatty acids).

Supplementary Table S1. Studies, from the literature, reporting breast milk fatty acids composition in response to a supplementation in DHA (alone or in association with other long-chain polyunsaturated fatty acids).

| Reference | Country | Mothers of preterm | Sample (n) | Nature of oral lipid supplement/amount per day | Placebo | Beginning of treatment | Duration of treatment | Period in which the milk was evaluated | Fatty acids in milk samples of treated | Fatty acids in milk samples of placebo | Response (%) ^a |
|---------------------------------------|-----------|--------------------|----------------------|------------------------------------------------|-----------------------------------|----------------------------|---------------------------------|-----------------------------------------------------|----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| Valentine et al. (2019) ¹¹ | USA | Yes | 10 lactating mothers | Algae (1000mg DHA) | NS (before start supplementation) | The day of birth | 4 weeks | Week 4 after delivery | DHA: 230mg/L | DHA: 90mg/L | DHA: +156 |
| Smithers et al. (2010) ²¹ | Australia | Yes | 98 pregnant women | Tuna oil (900mg DHA + 195mg EPA + 54mg AA) | Soy oil | Before delivery | Until expected date of delivery | During the intervention period at 2 weeks intervals | DHA: 1% EPA: 0.1% DPA: 0.2% AA: 0.5% | DHA: 0.3% EPA: 0.08% DPA: 0.2% AA: 0.5% | DHA: +233 EPA: +25 DPA: = AA: = |
| Boris et al. (2004) ²³ | Denmark | No | 21 pregnant women | Fish oil (900mg DHA + 1300mg EPA) | NS | Week 30 of gestation | Until day 30 after delivery | Day 30 after delivery | DHA: 1.4% EPA: 0.7% DPA: 0.6% | DHA: 0.5% EPA: 0.1% DPA: 0.2% | DHA: +180 EPA: +600 DPA: +200 |
| Jensen et al. (2000) ²⁷ | USA | No | 11 lactating women | Eggs (170mg DHA) | NS | Week 2 after delivery | 6 weeks | Week 8 after delivery | DHA: 0.29% EPA: 0.06% n-6 DPA: 0.05% AA: 0.46% | DHA: 0.22% EPA: 0.07% n-6 DPA: 0.09% AA: 0.61% | DHA: +32 EPA: (-14) n-6 DPA: -44 AA: (-25) |
| Jensen et al. (2000) ²⁷ | USA | No | 11 lactating women | Fish oil (260mg DHA) | NS | Week 2 after delivery | 6 weeks | Week 8 after delivery | DHA: 0.39% EPA: 0.09% n-6 DPA: 0.12% AA: 0.55% | DHA: 0.27% EPA: 0.08% n-6 DPA: 0.08% AA: 0.60% | DHA: +44 EPA: (+13) n-6 DPA: +50 AA: (-8) |
| Much et al. (2013) ²⁸ | Germany | No | 152 pregnant women | 1020mg DHA + 180mg EPA | NS | Week 15 of gestation | Until month 4 after delivery | Week 6 after delivery Week 16 after delivery | DHA: 1.34% EPA: 0.18% DPA: 0.23% AA: 0.43% DHA: 1.12% EPA: 0.15% DPA: 0.21% AA: 0.40% | DHA: 0.28% EPA: 0.08% DPA: 0.17% AA: 0.43% DHA: 0.24% EPA: 0.07% DPA: 0.16% AA: 0.40% | DHA: +379 EPA: +125 DPA: +35 AA: = DHA: +367 EPA: +114% DPA: +31 AA: = |
| Helland et al. (1998) ²⁴ | Norway | No | 5 lactating women | 2.5mL cod liver oil (255mg DHA) | NS | Week 3 to-8 after delivery | 14 days | Day 14 | DHA: 0.49% EPA: 0.28% DPA: 0.14% AA: 0.31% | DHA: 0.36% EPA: 0.14% DPA: 0.11% AA: 0.34% | DHA: +36 EPA: (+100) DPA: (+27) AA: (-9) |
| Helland et al. (1998) ²⁴ | Norway | No | 5 lactating women | 5mL cod liver oil (511mg DHA) | NS | Week 3 to 8 after delivery | 14 days | Day 14 | DHA: 0.59% EPA: 0.28% DPA: 0.18% AA: 0.32% | DHA: 0.33% EPA: 0.11% DPA: 0.10% AA: 0.28% | DHA: +79 EPA: +155 DPA: (+800) AA: (+14) |
| Helland et al. (1998) ²⁴ | Norway | No | 6 lactating women | 10mL cod liver oil (1021mg DHA) | NS | Week 3 to 8 after delivery | 14 days | Day 14 | DHA: 1.11% EPA: 0.43% DPA: 0.22% AA: 0.36% | DHA: 0.37% EPA: 0.16% DPA: 0.12% AA: 0.32% | DHA: +200 EPA: +169 DPA: +83 AA: (+13) |
| Cimatti et al. (2018) ³⁷ | Italy | No | 16 lactating mothers | Krill oil (250mg DHA + 70mg EPA) | NS | Week 4 to 6 after delivery | 30 days | Day 30 | DHA: 0.42% EPA: 0.11% AA: 0.43% | DHA: 0.28% EPA: 0.10% AA: 0.60% | DHA: +50 EPA: +10 AA: -28 ^b |
| Bergmann et al. (2008) ⁵⁰ | Germany | No | 53 lactating mothers | Low EPA fish oil (200mg DHA) | Vitamin and mineral supplement | Week 2 after delivery | 45 days | Month 3 after delivery | DHA: 0.50% EPA: 0.13% AA: 0.48% | DHA: 0.25% EPA: 0.09% AA: 0.47% | DHA: +100 EPA: +44 AA: (+2) |
| Dunstan et al. (2007) ⁵¹ | Australia | No | 73 pregnant women | Fish oil (1000mg) | Olive oil | Week 20 of gestation | Until delivery | Day 3 after delivery | DHA: 1.15% EPA: 0.16% DPA: 0.56% AA: 0.55% | DHA: 0.5% EPA: 0.06% DPA: 0.28% AA: 0.61% | DHA: +130 EPA: +167 DPA: +100 AA: (-10) |

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| | | | | | | | | Week 6 after delivery | DHA: 0.42% EPA: 0.09% DPA: 0.20% AA: 0.35% | DHA: 0.25% EPA: 0.07% DPA: 0.17% AA: 0.38% | DHA: +68 EPA: +29 DPA: (+18) AA: (-8) |
| | | | | | | | | Month 6 after delivery | DHA: 0.38% EPA: 0.10% DPA: 0.21% AA: 0.36% | DHA: 0.34% EPA: 0.10% DPA: 0.22% AA: 0.37% | DHA: (+12) EPA: = DPA: (+5) AA: (-3) |
| Fidler et al. (2000) ⁵² | Germany | No | 10 lactating women | 200mg DHA | NS | Week 4 after delivery | 2 weeks | Day 14 | DHA: 0.37% EPA: 0.05% DPA: 0.15% AA: 0.41% | DHA: 0.21% EPA: 0.05% DPA: 0.15% AA: 0.43% | DHA: +76 EPA: = DPA: = AA: (-5) |
| Hurtado et al. (2015) ⁵³ | Spain | No | 76 pregnant women | Fish oil drink (320mg DHA + 72mg EPA) | NS | Week 28 of gestation | Until the end of lactation | Colostrum 1 month's milk 2 month's milk 4 month's milk | DHA: 1.03% EPA: 0.22% DHA: 0.67% EPA: 0.18% DHA: 0.80% EPA: 0.18% DHA: 0.65% EPA: 0.17% | DHA: 0.67% EPA: 0.12% DHA: 0.41% EPA: 0.12% DHA: 0.37% EPA: 0.11% DHA: 0.32% EPA: 0.08% | DHA: +54 EPA: +83 DHA: +63 EPA: +50 DHA: +116 EPA: +64 DHA: +103 EPA: +113 |
| Imhoff-Kunsch et al. (2011) ⁵⁴ | Mexico | No | 174 pregnant women | 400mg DHA | NS | Week 18 to 22 of gestation | Until delivery | Month 1 after delivery | DHA: 0.20% EPA: 0.14% DPA: 0.10% AA: 0.41% | DHA: 0.17% EPA: 0.16% DPA: 0.12% AA: 0.43% | DHA: +18 EPA: (-13) DPA: (-17) AA: (-5) |
| Sherry et al. (2015) ⁵⁵ | USA | No | 56 lactating mothers | 200mg DHA | NS | Week 4 to 6 after delivery | 6 weeks | Week 6 | DHA: 88.3mg/L EPA: 19mg/L DPA: 34.3mg/L AA: 115.8mg/L | DHA: 58.7mg/L EPA: 16.1mg/L DPA: 39.9mg/L AA: 148.3mg/L | DHA: +50 EPA: (+18) DPA: (-14) AA: (-22) |
| Sherry et al. (2015) ⁵⁵ | USA | No | 53 lactating mothers | 400mg DHA | NS | Week 4 to 6 after delivery | 6 weeks | Week 6 | DHA: 130.8mg/L EPA: 20.6mg/L DPA: 35.8mg/L AA: 121.2mg/L | DHA: 58.7mg/L EPA: 16.1mg/L DPA: 39.9mg/L AA: 148.3mg/L | DHA: +123 EPA: (+28) DPA: (-10) AA: (-18) |
| Smit et al. (2000) ⁵⁶ | Holland | No | 16 lactating women | 400mg DHA + 300mg AA + 110mg EPA | NS | During breastfeeding (Month 3 to 10) | 1 week | Day 1 Day 7 | DHA: 0.25% EPA: 0.07% n-6 DPA: 0.05% AA: 0.61% DHA: 0.21% EPA: 0.06% n-6 DPA: 0.05% AA: 0.69% | DHA: 0.20% EPA: 0.05% n-6 DPA: 0.05% AA: 0.55% DHA: 0.20% EPA: 0.05% n-6 DPA: 0.05% AA: 0.55% | DHA: (+25) EPA: +40 n-6 DPA: = AA: (+11) DHA: (+5) EPA: (+20) n-6 DPA: = AA: (+26) |
| Urwin et al. (2012) ⁵⁷ | UK | No | 52 pregnant women | Salmon (480mg EPA + DHA) | Habitual diet | Week 20 of gestation | Until birth | Day 1 after delivery Day 5 after delivery Day 14 after delivery | DHA: 0.66% EPA: 0.09% DPA: 0.45% AA: 0.88% DHA: 0.65% EPA: 0.11% DPA: 0.30% AA: 0.60% DHA: 0.50% EPA: 0.10% DPA: 0.22% AA: 0.52% | DHA: 0.49% EPA: 0.06% DPA: 0.33% AA: 0.98% DHA: 0.35% EPA: 0.06% DPA: 0.23% AA: 0.62% DHA: 0.31% EPA: 0.08% DPA: 0.20% AA: 0.56% | DHA: (+35) EPA: (+50) DPA: +36 AA: (-10) DHA: +86 EPA: +83 DPA: +30 AA: (-3) DHA: +61 EPA: (+25) DPA: (+10) AA: (-7) |

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| | | | | | | | | Day 28 after delivery | DHA: 0.43% EPA: 0.09% DPA: 0.27% AA: 0.49% | DHA: 0.32% EPA: 0.07% DPA: 0.23% AA: 0.53% | DHA: +34 EPA: (+29) DPA: +17% AA: (-8) |
| Van Goor et al. (2009) ⁵⁸ | Holland | No | 48 pregnant women | DHA (220mg) | Soy bean oil | Week 14 to 20 of gestation | Until week 12 after delivery | Week 2 after delivery Week 12 after delivery | DHA: 0.60% AA: 0.57% DHA: 0.39% AA: 0.39% | DHA: 0.40% AA: 0.58% DHA: 0.25% AA: 0.39% | DHA: +50 AA: (-2) DHA: +56 AA: = |
| Van Goor et al. (2009) ⁵⁸ | Holland | No | 37 pregnant women | DHA + AA (220mg + 220mg) | Soy bean oil | Week 14 to 20 of gestation | Until week 12 after delivery | Week 2 after delivery Week 12 after delivery | DHA: 0.51% AA: 0.66% DHA: 0.38% AA: 0.49% | DHA: 0.40% AA: 0.58% DHA: 0.25% AA: 0.39% | DHA: +28 AA: +14 DHA: +52 AA: (+26) |
| Weseler et al. (2008) ⁵⁹ | Holland | No | 16 lactating women | 320mg DHA + 80mg EPA | NS | Week 3 after delivery | 2 weeks 8 weeks | Week 5 after delivery Week 11 after delivery | DHA: 0.55% AA: 0.43% DHA: 0.53% AA: 0.40% | DHA: 0.25% AA: 0.45% DHA: 0.24% AA: 0.41% | DHA: +120 AA: (-4) DHA: +121 AA: (-2) |

^a Responses reported when treatment effects were significant (P<0.05) and calculated as $(((\text{Treatment} - \text{Control})/\text{Control}) \times 100)$. Values in parentheses are not significant (P > 0.05).

^b Values where P-values were not specified.

AA: arachidonic acid, DHA: docosahexaenoic acid, DPA: docosapentaenoic acid, EPA: eicosapentaenoic acid, NS: Not supplemented.