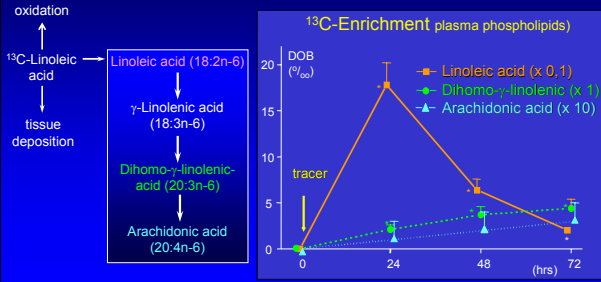
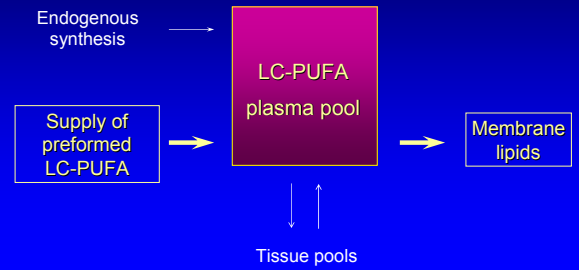


Limited ¹³C-linoleic acid conversion in newborn term infants

Low LC-PUFA enrichment in 10 breast fed neonates. *Pediatric Research* 1999;45:669-73

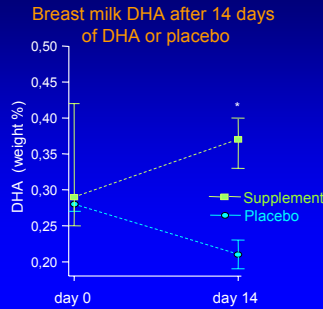


Conclusion from *in vivo* turnover studies in infants: Main contribution to LC-PUFA pool from preformed LC-PUFA supply, rather than endogenous synthesis



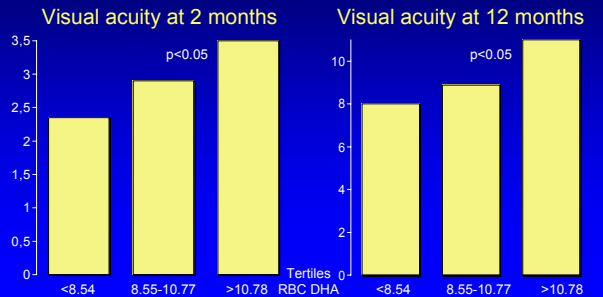
DHA supply and human milk content

Fidler et al, *J Lipid Res* 2000; ;41:1376-1383



Improved visual acuity* up to 1 year in breast fed infants with higher plasma DHA content @ 2 mon.

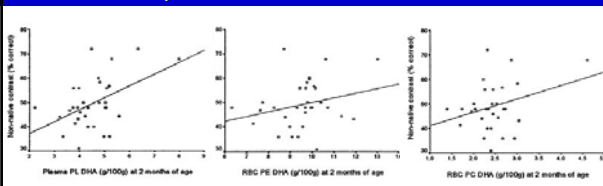
* Teller Acuity Card Procedure. *Innis et al, J Pediatrics* 2001;139:532-8



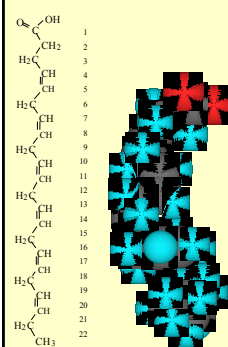
Speech perception* in breast fed infants at 9 mon. correlates with plasma DHA content at 2 months

* Conditional Head Turn Procedure. *Innis et al, J Pediatrics* 2001;139:532-8

The ability to discriminate between familiar and unfamiliar language correlates with DHA levels in plasma PL and RBC PE & PC



Docosahexaenoic Acid

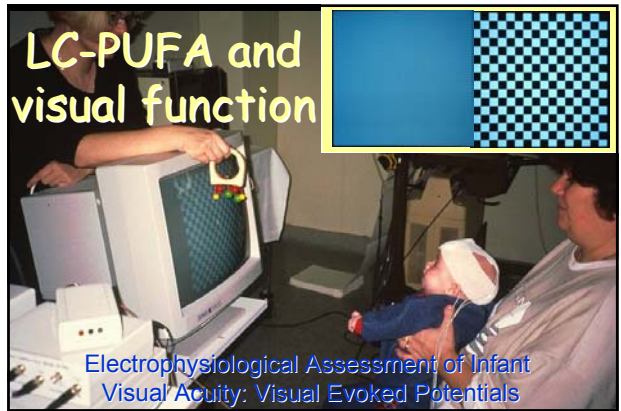
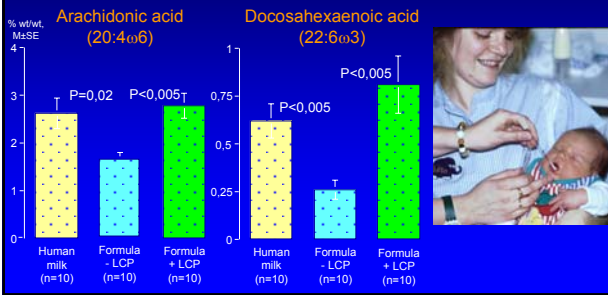


Breast milk DHA

- depends on maternal DHA supply
- affects development of visual acuity, speech perception and psychomotor abilities
- breastfeeding women need DHA supply

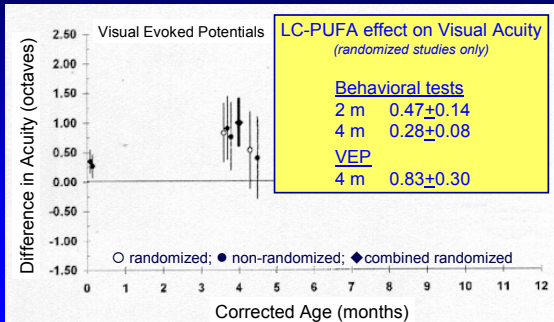
Early formula with LC-PUFA normalizes later oral mucosa cell phospholipid levels in preterm infants (at 12 weeks corr. age)

Koletzko et al, *JPGN* 1999;29:467-74



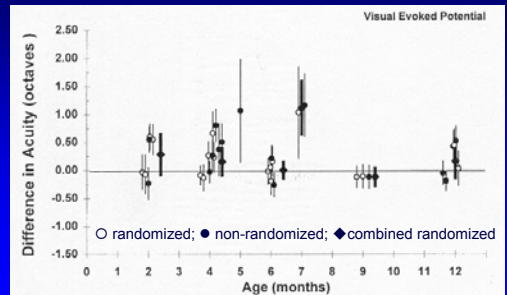
Meta-analysis: LC-PUFA and visual acuity in preterm infants

SanGiovanni et al, *Pediatrics* 2000;105:1292-1298



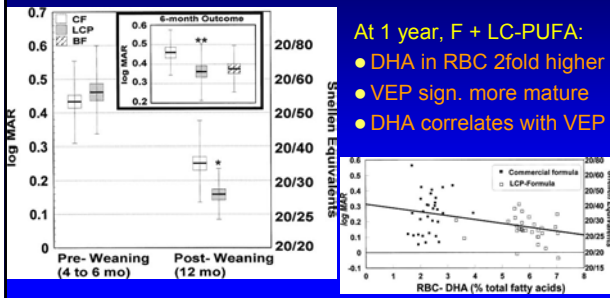
Dietary LC-PUFA and visual acuity in healthy fullterm infants: a systematic review

(SanGiovanni et al, *Early Hum Dev* 2000;57:165-188)



Visual function in breast fed infants weaned at 4-6 months to formula with or without LC-PUFA

Hoffman et al, *J Pediatr* 2003;142:669-677



Stereo-acuity at age 3.5 y in 435 children born full-term: effect of pre- and postnatal n-3 LC-PUFA supply

ALSPAC study: Williams et al, *Am J Clin Nutr* 2001;73:316-322

Predictors of stereoacuity (adjusted logistic regression)

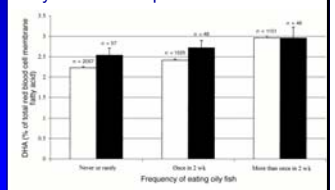
Breast feeding

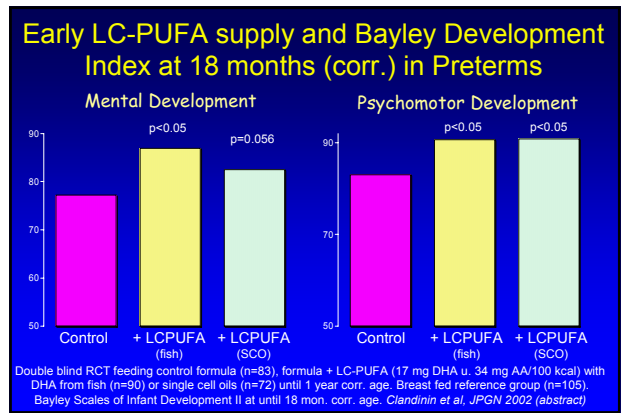
Never	1.00
≥4 months	2.77 (1.54-4.97)

Maternal consumption of oily fish

No	1.00
Yes	1.57 (1.00-2.45)

Oily fish consumption and DHA levels

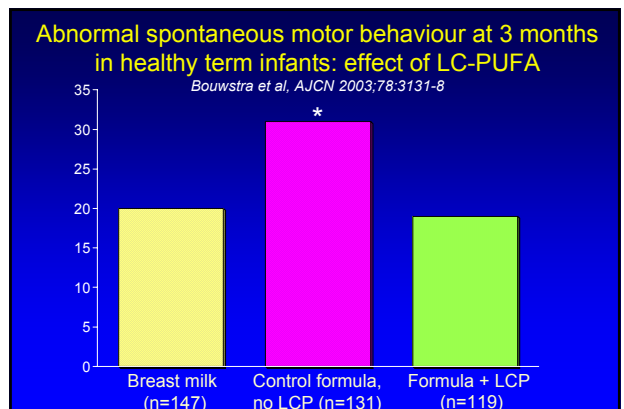
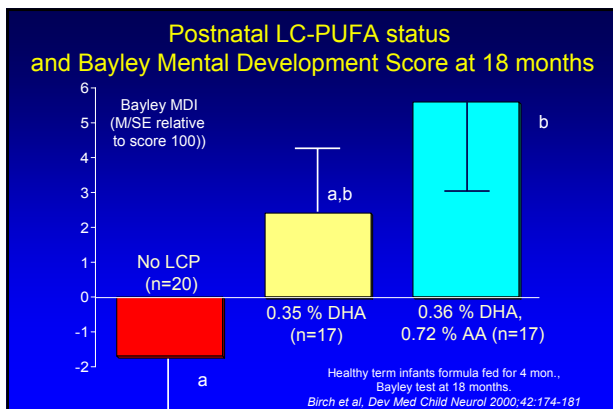




LC PUFA and developmental outcomes in preterms
O'Connor et al, Pediatrics 2001;108:359-71

- Randomized, masked 8 centre trial with 470 preterm infants (GA <33wks, M=29.7; 750-1805 g, M= 1300) fed control (n=142), fish/fungal (0.43% AA & 0.27 % DHA, n=138), egg TG/fish (0.41% AA & 0.24 % DHA, n=140), or human milk (N=43)
- No difference for Bayley MDI @ 12 mon, vocabulary comprehension @ 9 & 14 mon, vocabulary production @ 14 mon

	Control	Fish/Fungal	Egg/Fish	p
Fagan Novelty Preference (6 mon)	57.5±0.8 ^a	56.6±0.8 ^a	60.0±0.8 ^b	≤0.02
Bayley Motor Development (12 mo, <1250g, per protocol)	81.8±4.3 ^a	90.6±4.4 ^b	84.7±4.3 ^{a,b}	0.007
Vocabulary Comprehension 14 mon, English language singleton:	94.1±2.9 ^a	102.2±2.8 ^b	100.6±2.9 ^b	≤0.05



LC-PUFA supply with infant formulae and blood pressure in later childhood (6 years)

Forsyth et al, Brit Med J 2003;326:953-5

Blood pressure	Formula, no LCP n=76	Formula, with LCP n=71	Mean Δ -/+ LCP	p
Systolic	94.7	92.4	-3.6 (-6.5 - -0.6)	0.02
Diastolic	60.9	57.3	-2.3 (-5.3-0.7)	n.s.
Mean	77.8	74.8	-3.0 (-5.4-0.5)	0.018

Non randomised reference of 83 previously breast fed children:
systolic 92.5.5 \pm 9.7, diastolic 57.5 \pm 8.5
(mean Δ to control formula -3.4 [-6.8 - -0.01, p=0.02])

Postnatal supply of preformed DHA (with AA) can enhance visual and cognitive development, motor function, growth, immune phenotypes and reduce later blood pressure

➔ DHA = conditionally essential nutrient that needs to be supplied with the postnatal diet

CHILD HEALTH FOUNDATION CONSENSUS ON LC-PUFA

Recommendations for LC-PUFA supply to term infants

- Breast feeding (supplies preformed LC-PUFA) is the preferred feeding method for healthy infants and is strongly supported.
- Infant formulas should contain ≥ 0.2 % (of fatty acids) DHA and ≥ 0.35 % AA. These levels seem prudent given that they are at the lower end of the range of human milk DHA content world-wide.
- Higher DHA and AA levels might confer additional benefits and should be studied as optimal dietary intakes for term and preterm infants remain to be defined.

Koletzko et al, Acta Paediatr 2001;90:460-464