

# Maternal nutrition – Reducing risk of preterm births with DHA



Avril Soh  
APAC Scientific Affairs  
**dsm-firmenich** 



# More than a century of successful transformation

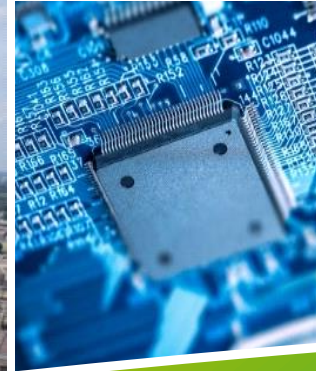
Coal mining



(Petro)chemicals



Nutrition, Health  
& Sustainable Living



Health, Nutrition,  
& Bioscience



2022

1902



DSM



Unlimited. DSM





Joining forces: DSM and Firmenich

Our roots may go back well over a century,  
but we're always looking forward too

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Experts in  
fragrance, taste,  
texture, and  
nutrition

Bringing together the best  
of both market leading  
companies

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Accelerating  
innovation

Groundbreaking products  
and solutions that reshape  
markets

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A history  
of discovery

150 years of research, and  
scientific brilliance with  
16,000 patents

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A partner in progress,  
from concept to  
commercialization

Bringing customer's ideas to  
life and delighting end  
consumers

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A global group with  
European roots

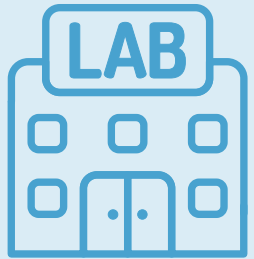
A Swiss-Dutch global group,  
proudly listed on Euronext  
Amsterdam



# Proven science that improves lives

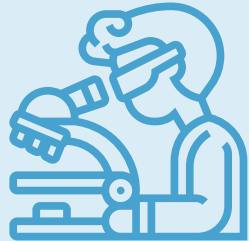
Today's challenges demand visionary solutions

With over a century of world-class scientific leadership, we apply creativity and proven science to tackle complexity using the broadest portfolio of ingredients in our industry



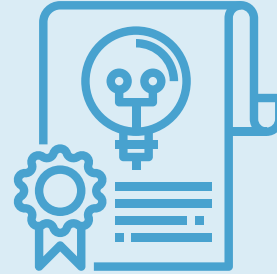
15

R&D facilities  
developing  
solutions for key  
global markets



2,000+

of the best and  
brightest  
scientists and  
engineers



16,000+

patents across  
approximately  
2,600 patent families



€700m+<sub>in</sub>

annual  
R&D investment



# BROADEST NUTRITIONAL LIPIDS PORTFOLIO

**300+**  
PRODUCTS

**MASS**  
CUSTOMIZATION

Unique Vegetarian  
Sources



Trusted Fish Oil  
Source



## NUMEROUS FORMS AVAILABLE



Bulk capsules



Powder



Oils, emulsion,  
Concentrates, food  
grade oils etc.

## POTENT & HEALTHY

- all vitamins
- premixes
- HMO's
- carotenoids
- nutraceuticals portfolio

DSM IS TRULY A "ONE STOP SHOP"



# Doing good, better than ever

## Global recognition



ecovadis

MSCI  
ESG RATINGS



Moody's ESG  
Top ranking



## World-leading partnerships



BILL & MELINDA  
GATES foundation



Please note that some of the achievements mentioned in this context were attributed to DSM and some to Firmenich – and some to both – prior to the merger.

# THE POWER OF THE FIRST 1,000 DAYS



## PREGNANCY

Pregnancy - Birth

Babies developing in the womb draw all of their nutrients from their mother. Access to healthcare, nutritious foods and a stable environment are critical for a child's health and development.



## INFANCY

Birth - 6 Months

Breastmilk is superfood for babies and serves as the first immunization against illness and disease. Both mom's and baby's health and well-being are also essential during this period.



## TODDLERHOOD

6 Months - 2 years

This sensitive period or "window of opportunity" to eat healthy, nutritious diets protects against risk of childhood obesity and other chronic conditions.

Children who get the right nutrition in the first 1,000 Days:



ARE MORE LIKELY TO BE BORN AT A HEALTHY BIRTHWEIGHT.



HAVE A LOWER RISK OF MANY ILLNESSES AND DISEASES, INCLUDING OBESITY AND TYPE 2 DIABETES.



GO ON TO BE BETTER LEARNERS WITH FEWER BEHAVIOR PROBLEMS IN KINDERGARTEN.



ENJOY IMPROVED HEALTH AND ECONOMIC SECURITY AS ADULTS.

# Born too soon:

## Improving health outcomes for premature babies

- Every year, an estimated 15 million babies are born preterm (1 in 10 babies), and this number is rising.
- Preterm birth complications are the leading cause of death among children under 5 years of age
- Even among survivors there can be long-term health consequences (i.e chronic respiratory diseases, and impaired neurodevelopment)

*Investment in women's health before and during pregnancy as well as newborn care, improves outcomes for women and their babies*

Babies born before **37 weeks** are considered premature



The **World Health Organization** describes sub-categories of preterm birth, based on gestational age:



15 million babies are born prematurely every year<sup>2</sup>

This equates to more than **1 in 10** babies born too soon<sup>3</sup>



Premature babies can have an increased risk of developing significant health problems that can last a lifetime, including:



Breathing problems



Developmental issues and poor growth



Learning and behavioral difficulties



Visual and hearing impairments

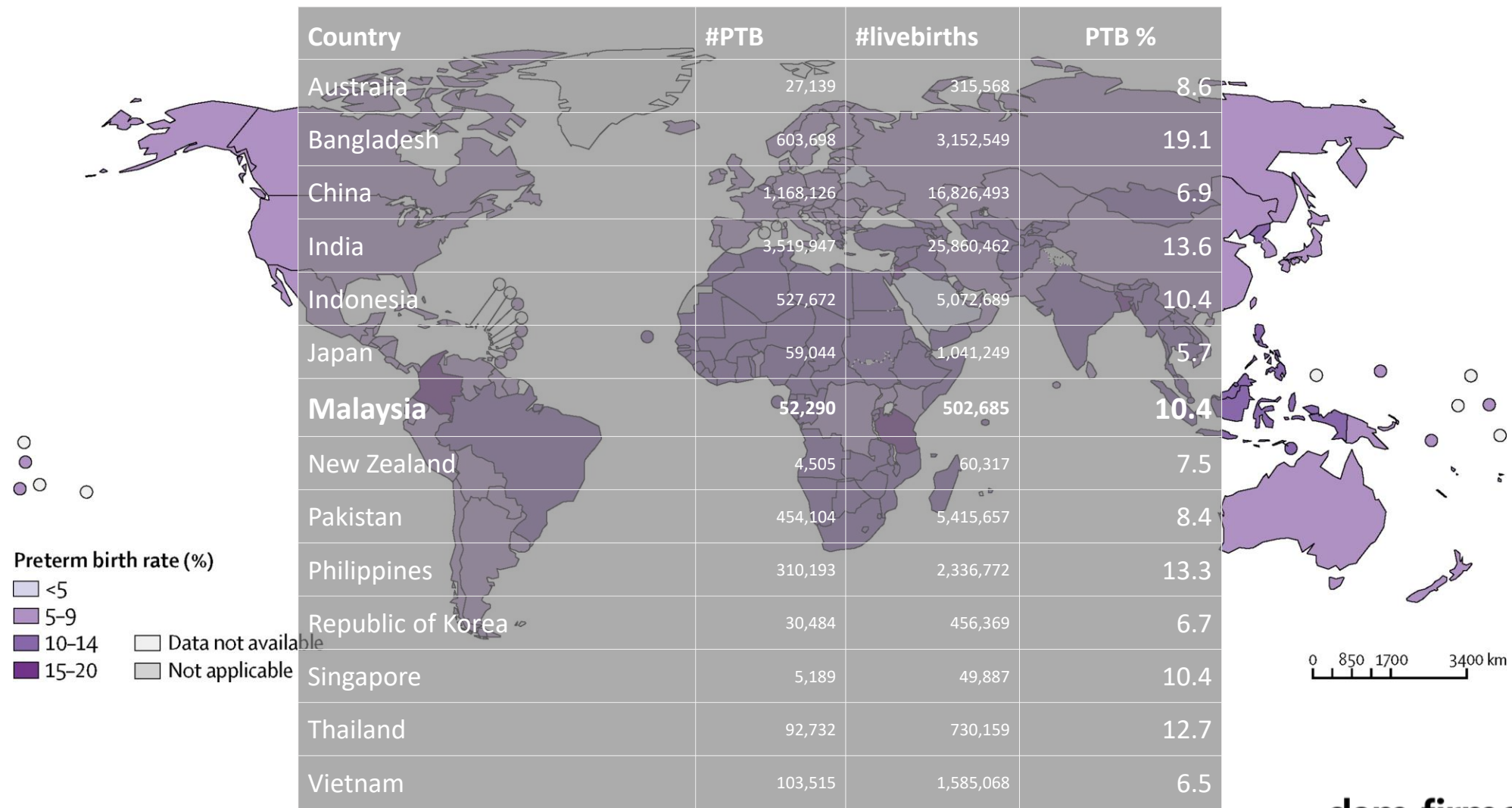


Increased risk of chronic disease later in life, such as high blood pressure and heart disease

In fact, premature birth is responsible for **85%** of all complications in early life<sup>4</sup>



# Preterm Birth Rate in Asia Pacific



## Risk Factors for Preterm birth

- Previous preterm delivery
- Multiple gestations
- Clinical depression during pregnancy
- Intrauterine infection
- Nutritional status
  - Maternal overweight/obesity and underweight
  - Excessive or inadequate weight gain during pregnancy
  - Low intake of nutrient e.g. iron, folate, omega-3 LCPUFA



# Role of marine n-3 in preterm birth prevention first proposed over 35 years ago

It was observed that women in the Faroe Islands, where they eat a lot of fish, had longer gestations than women in many other countries



THE LANCET, AUGUST 16, 1986

## Hypothesis

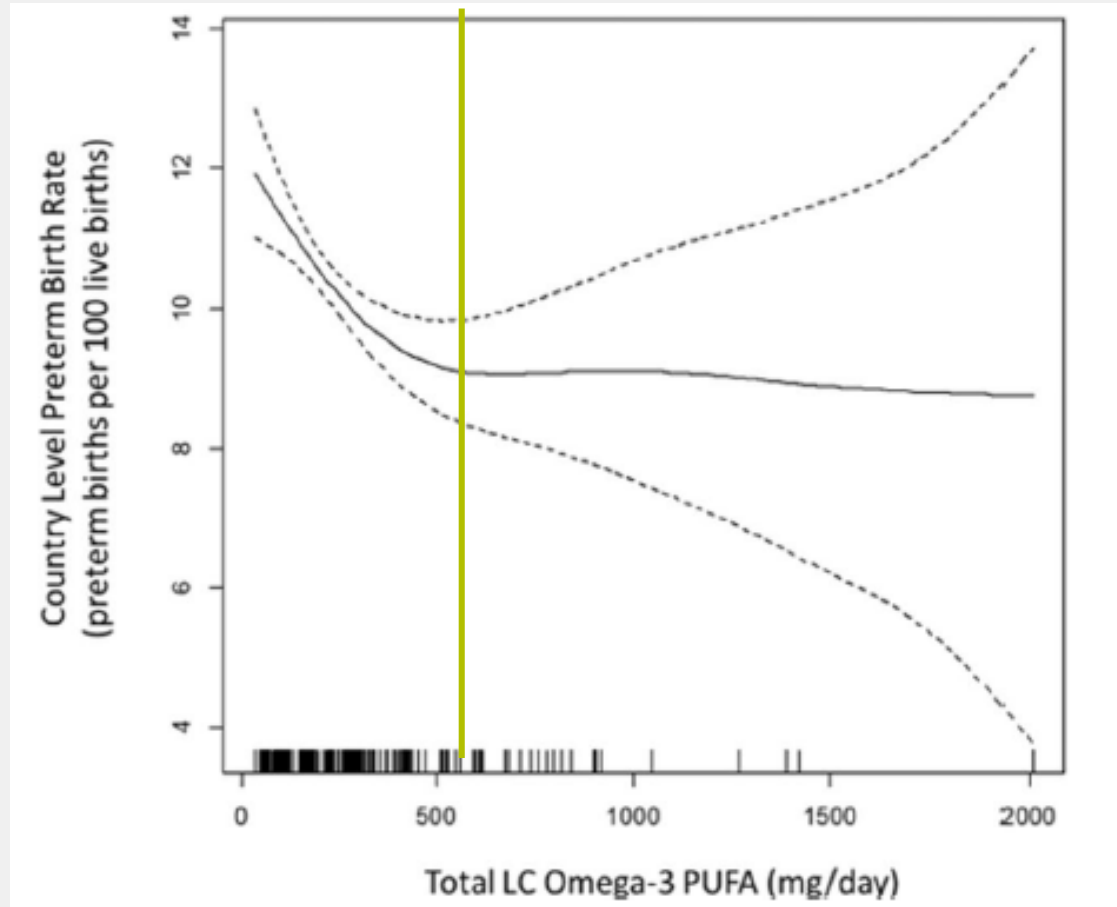
**INTAKE OF MARINE FAT, RICH IN  
(n-3)-POLYUNSATURATED FATTY ACIDS,  
MAY INCREASE BIRTHWEIGHT BY  
PROLONGING GESTATION**

SJURÐUR F. OLSEN<sup>1</sup> HARALD S. HANSEN<sup>2</sup>  
THORKILD I. A. SØRENSEN<sup>3</sup> BENNY JENSEN<sup>2</sup>  
NIELS J. SECHER<sup>4</sup> STEFFEN SOMMER<sup>4</sup>  
LISBETH B. KNUDSEN<sup>5</sup>

*Academia Faeroensis, Faroe Islands;<sup>1</sup> Royal Danish School of  
Pharmacy, Copenhagen;<sup>2</sup> Hvidovre University Hospital,  
Copenhagen;<sup>3</sup> Municipal Hospital, Århus;<sup>4</sup> and National Board of  
Health, Copenhagen;<sup>5</sup> Denmark*



At a population level, high n-3 PUFA intakes are associated with lower preterm birth rates up to a threshold of 550-600mg/day



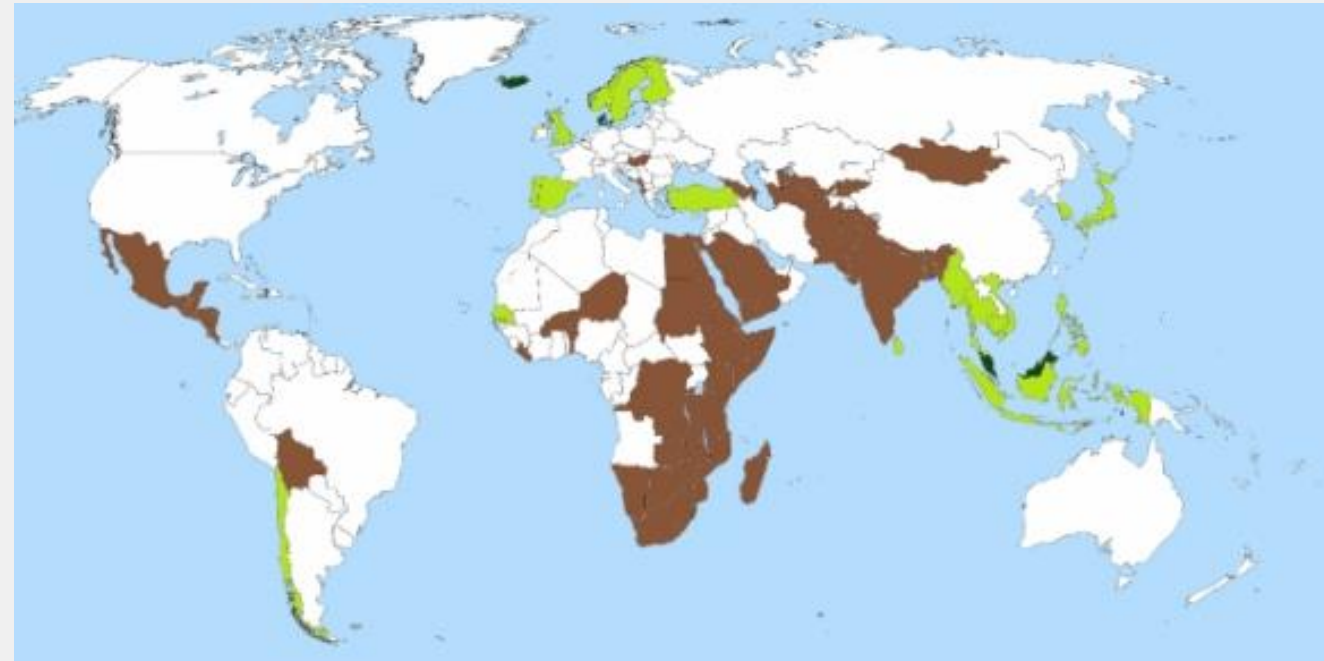
Country wide data from 2010 and 184 countries used to explore associations between n-3 PUFA intakes and PTB rates.

**Dark Green = >1000mg/day**

**Light Green = >550mg/day**

**White = <550mg/day**

**Brown = <170mg/day**



# High quality evidence shows omega-3 LCPUFA supplementation during pregnancy reduces preterm & early preterm birth

## Cochrane Review (2018)

- 26 RCTs and >10,000 subjects
- Test dose range 200 - 2,700 mg/day of n-3 LCPUFA

### Variable Effect size

Preterm Birth <37 weeks*	<b>11% reduction</b> 26 trials with 10,304 women
Low birthweight infants*	<b>10% reduction</b> 15 trials with 8,449 women

- These findings were largely driven by studies that provided **500 – 1000 mg/d DHA** (few studies below this level)

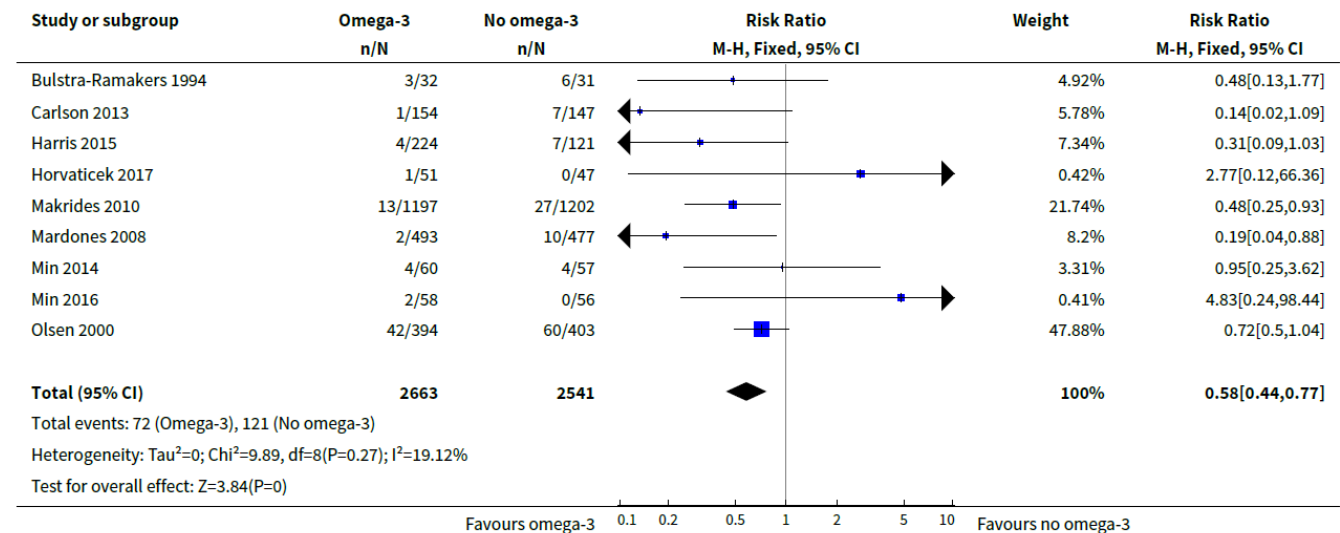
## Analysis of omega-3 supplementation and early preterm birth:



Trusted evidence.  
Informed decisions.  
Better health.

Cochrane Database of Systematic Reviews

### Analysis 1.2. Comparison 1 Overall: omega-3 versus no omega-3, Outcome 2 Early preterm birth (< 34 weeks).



- The findings were more compelling for DHA and DHA predominant blends

# Status entering pregnancy is important

Women who were replete at baseline did not benefit from a high dose

## Assessment of DHA On Reducing Early Preterm Birth (ADORE), US : n=1100

Control = 200mg DHA

Intervention = 1000mg DHA

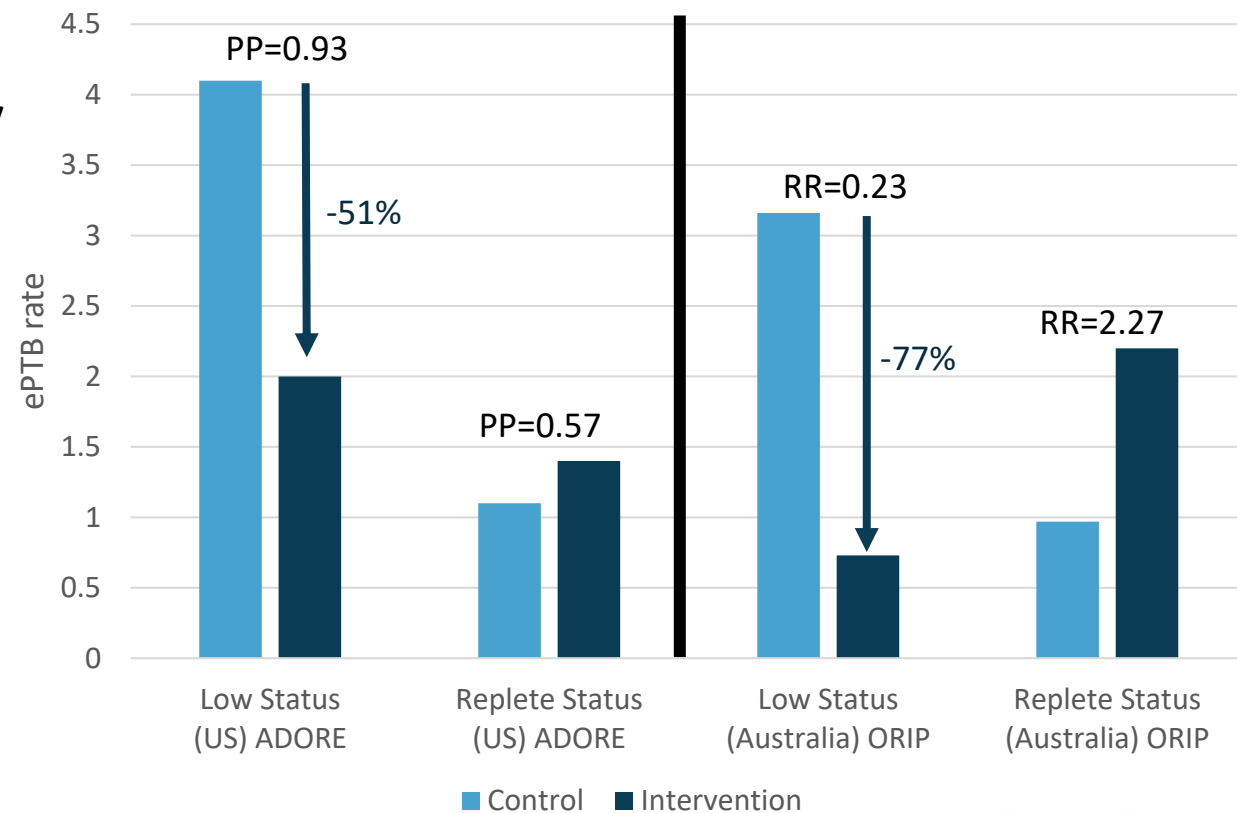
## Omega-3 to Reduce the Incidence of Prematurity (ORIP), Australia : n=5544

Control = placebo

Intervention = 800mg DHA + 100mg EPA

Note: in ADORE, high dose DHA supplementation improved early preterm birth rates for women with low status, but not down to the level of women with replete status at baseline

ePTB Rates According to Baseline  
n-3 Status and Intervention





## Current n-3 Recommendations Specific to Preterm Birth

### Australian National Health and Medical Research Council

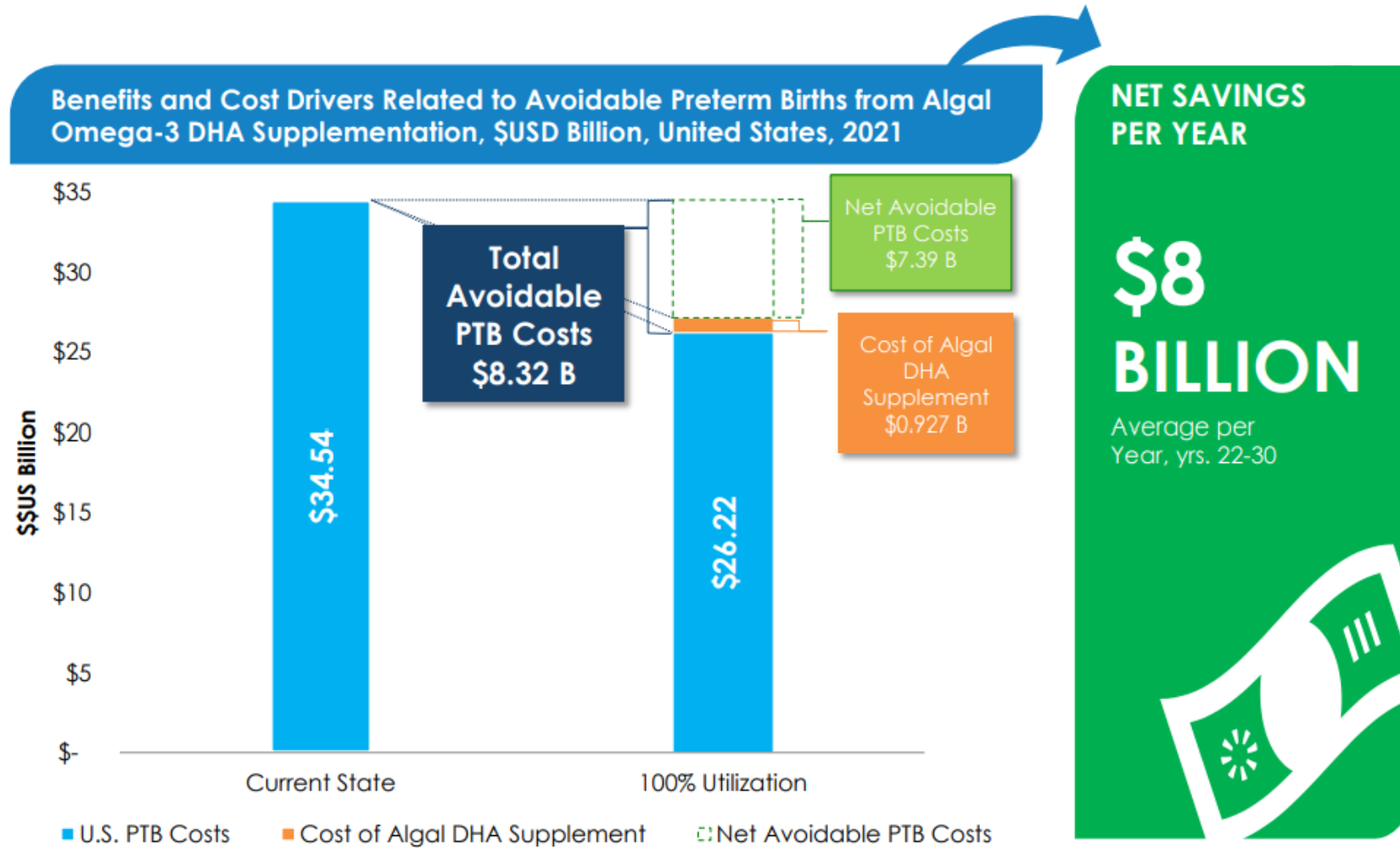
- Supplementation with omega-3 long-chain polyunsaturated fatty acids (**800mg DHA and 100mg EPA per day**) may reduce the risk of preterm birth among women who are **low in omega-3**

### International Society for the Study of Fatty Acids and Lipids

- Adequate intakes of omega-3 LCPUFA should be encouraged for all **women of childbearing age**
- Women with **low omega-3 blood status** early in pregnancy will benefit from supplemental dose of about **1,000 mg DHA + EPA** beginning prior to 20 weeks' gestation

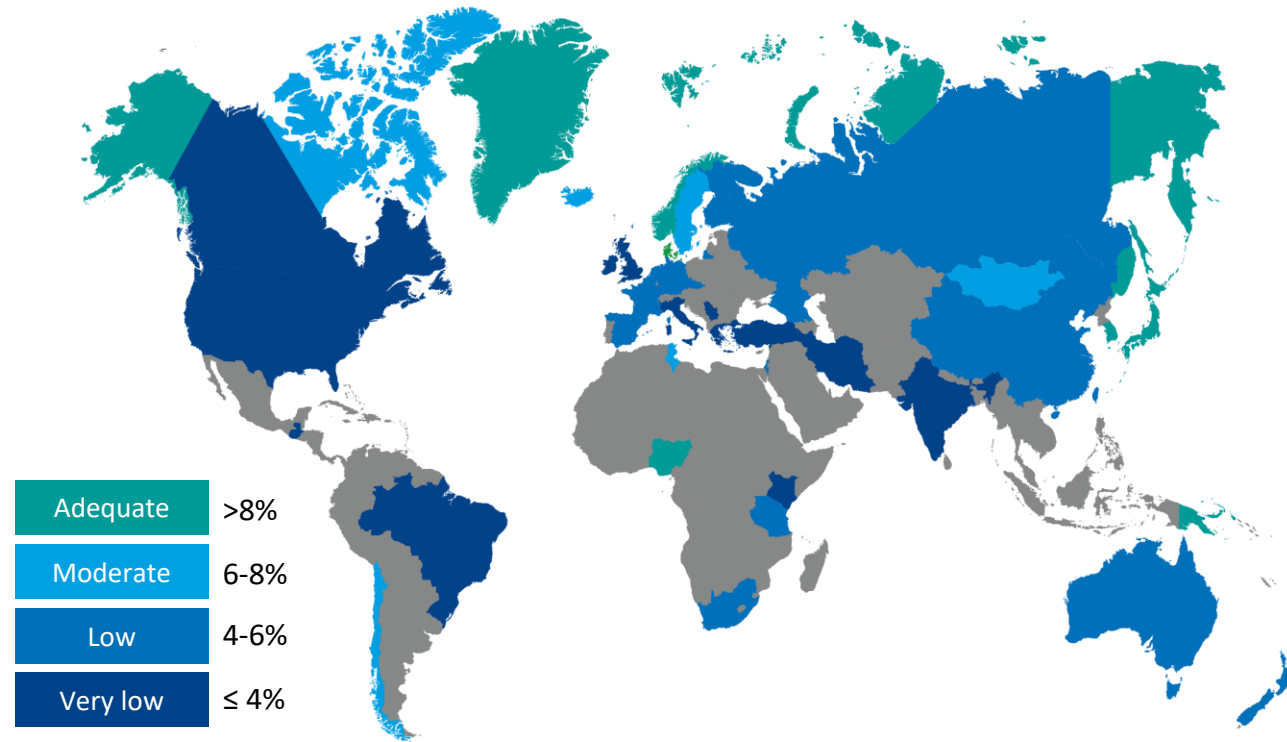


# Cost-effectiveness of DHA supplementation and preterm birth



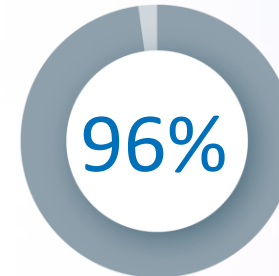
# Global Omega-3 status map shows low levels for most of the world

Low omega-3 levels are widespread



**Most of the global population does not consume enough of the recommended levels of omega-3 EPA and DHA.**

Even with adequate knowledge of the health benefits and food sources of omega-3s...



...of the population still fall below the optimal range.



# Omega-3 intake in Malaysia

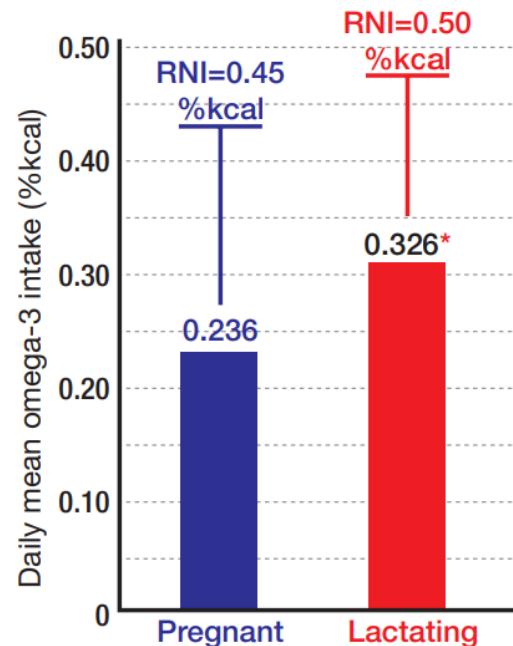
Review Article

IeJSME 2012 6(2): 4-9

## Omega-6 and omega-3 fatty acid nutrition amongst Malaysians are far from desirable

Tony Kock Wai Ng<sup>1</sup>, Sivalingam Nalliah<sup>2</sup>, Azlinda Hamid<sup>3</sup>, Siew Rong Wong<sup>1</sup>, Sim Ling Chee<sup>1</sup>, Cheryl Andrea Augustine<sup>1</sup>

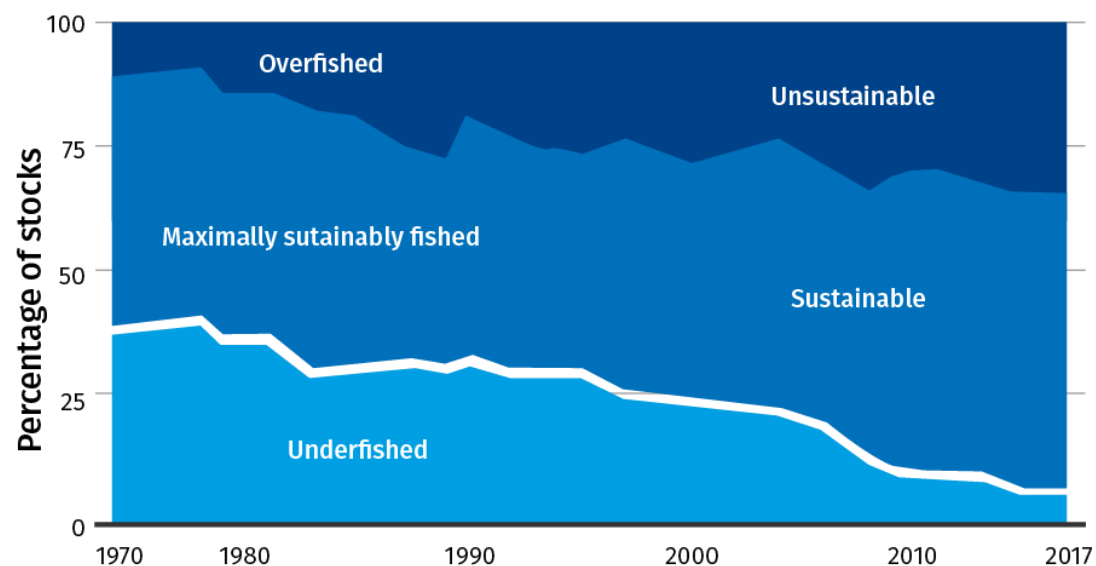
Mean intakes of  
**OMEGA-3** FA by subjects  
compared to RNI



- Dietary intake of omega-3 fatty acids (ALA + EPA + DHA) are very low
- Local foods are not good sources of EPA or DHA

# Overfishing is increasing, damaging marine ecosystems and their resilience to climate change

Global trends in the state of the world's marine fish stock (1974-2017)

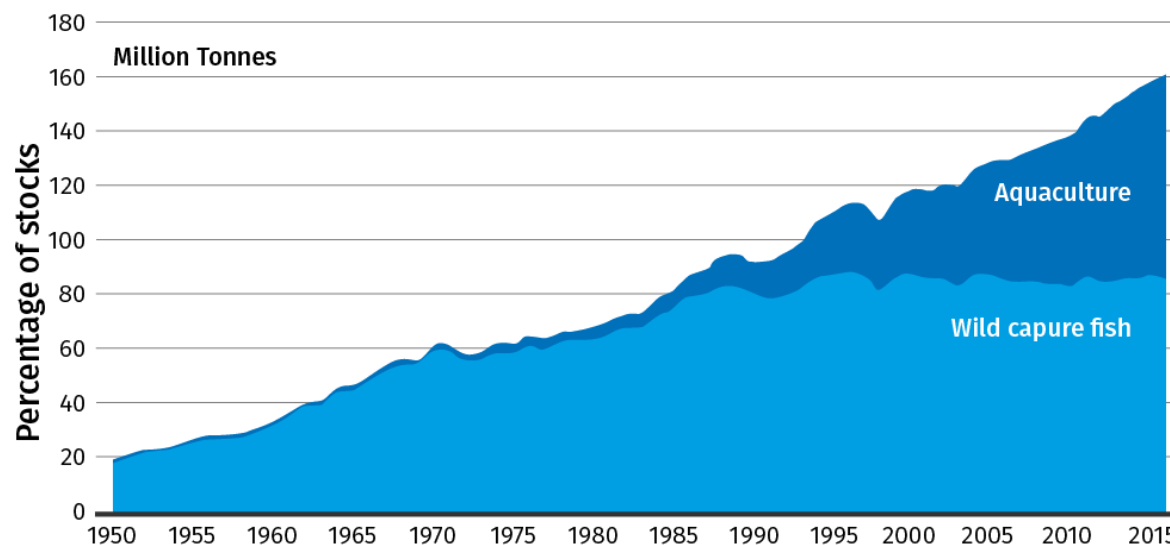


Pressure builds for IOTC ahead of special session, with several groups calling for urgent action

By Ned Daly  
March 5, 2021

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Wild capture fish is at its max capacity already for years

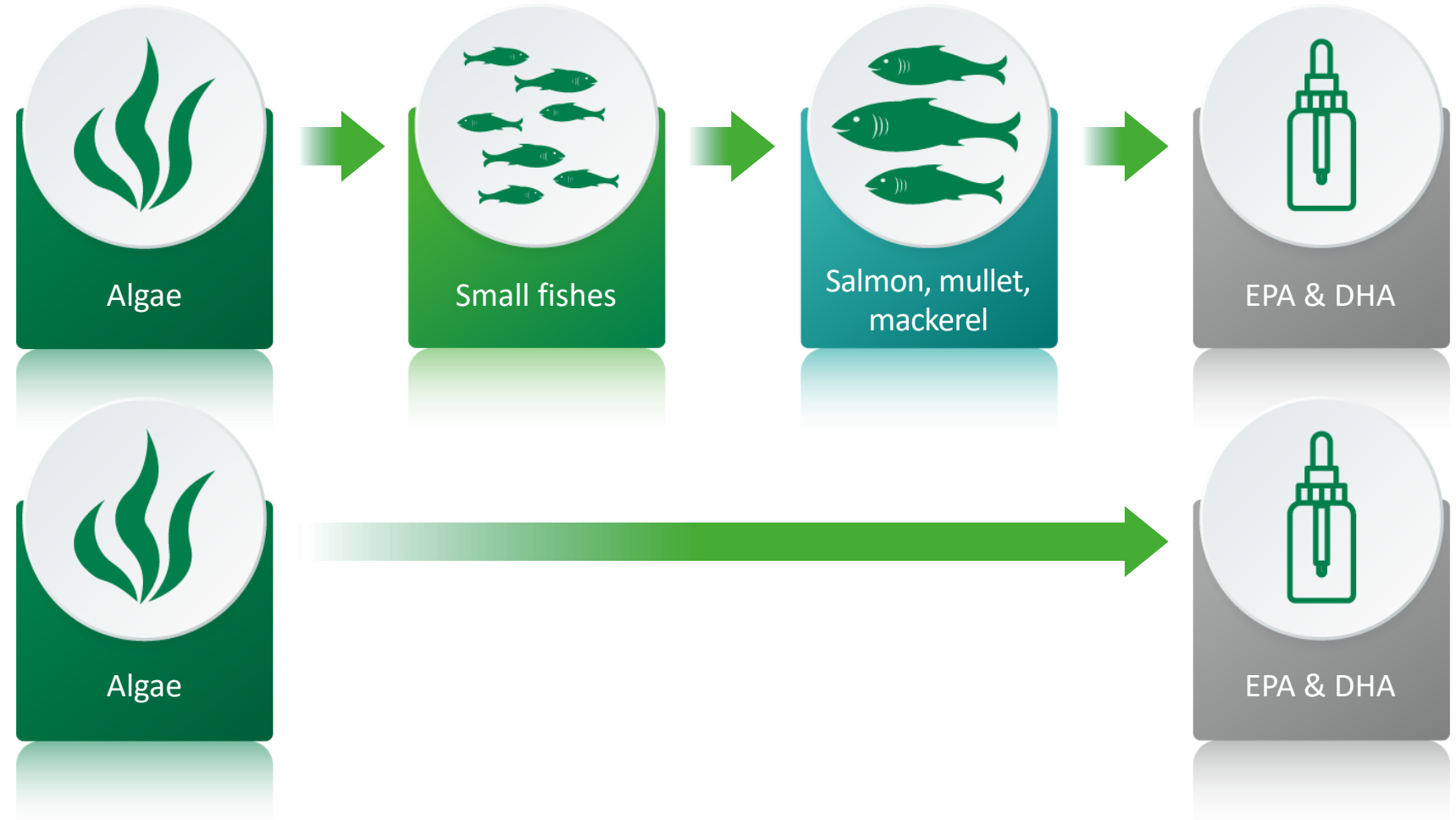


The state of the world fisheries and aquaculture

# An omega-3 FA source that is sustainable?

*Is there another ready source of Omega-3?*

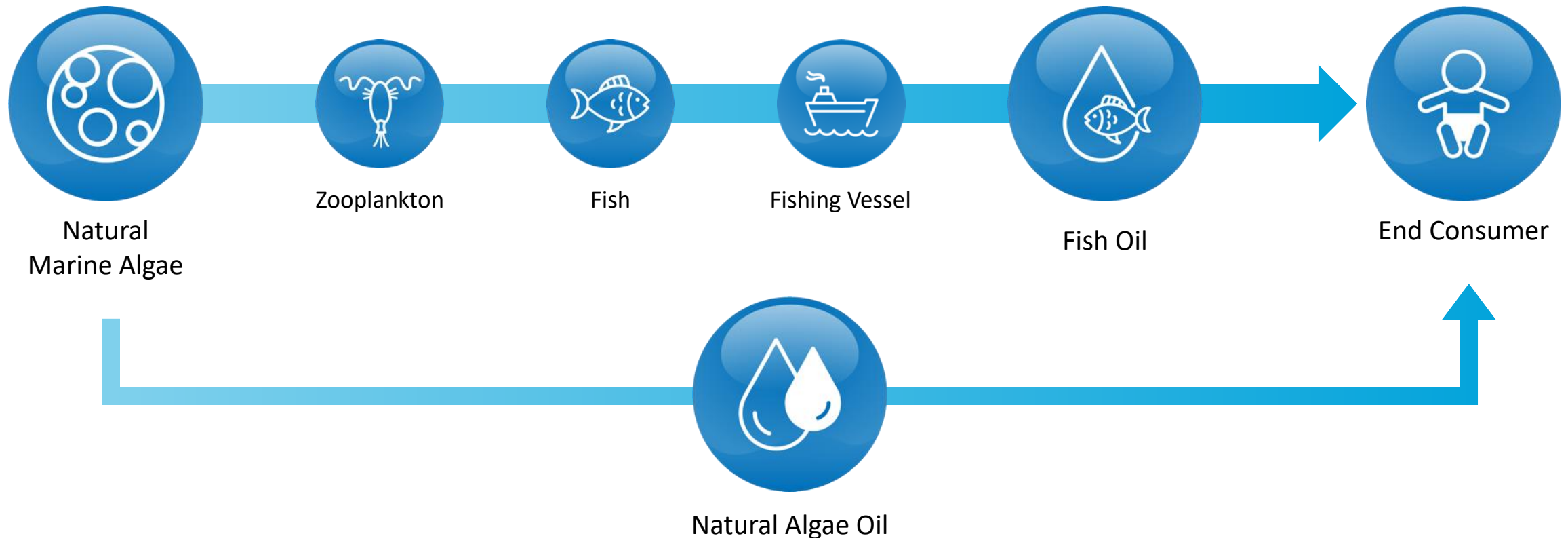
Oily fish is the most well-known source of DHA and EPA, however DHA and EPA are originally synthesized by microalgae, not by the fish. When fish consume phytoplankton that consumed microalgae, they accumulate the omega-3s in their tissues.





By going straight to the source of Omega-3,  
we can let marine ecosystems and fish populations recover

*While ensuring that humans big and small can enjoy the benefits of Omega-3*



## Key takeaways

- The first 1000 days of life represent a critical period to set the foundation for optimum health and development
- Pregnancy outcomes such as preterm birth can have tremendous impact on the survival and long-term health of the baby
- Substantial evidence on the role of omega-3/DHA in preventing preterm birth.
- Sustainable sources of omega-3 LCPUFA are important.



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