

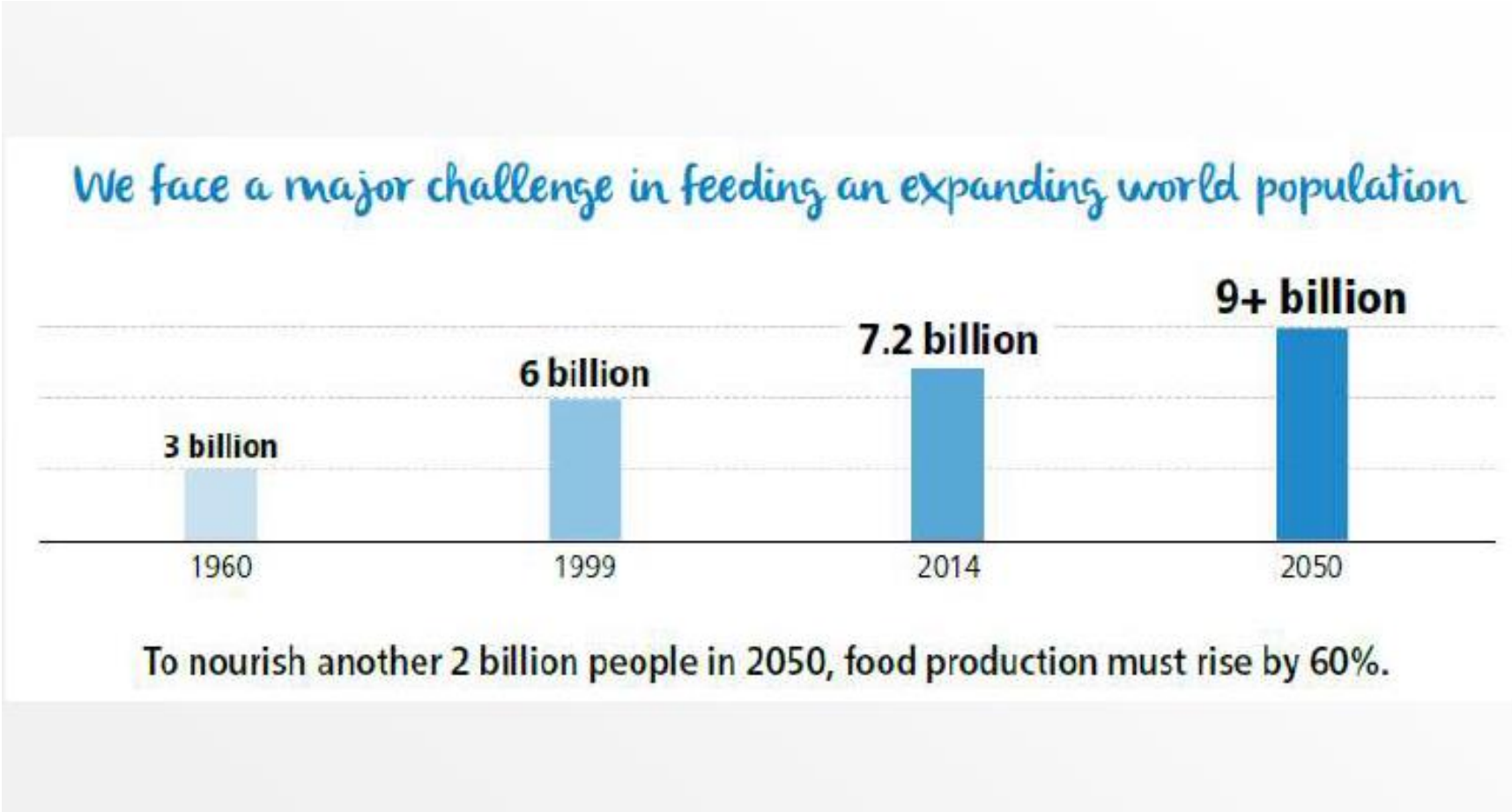


**SU ÜRÜNLERİ FAKÜLTESİ**  
Faculty of Fisheries

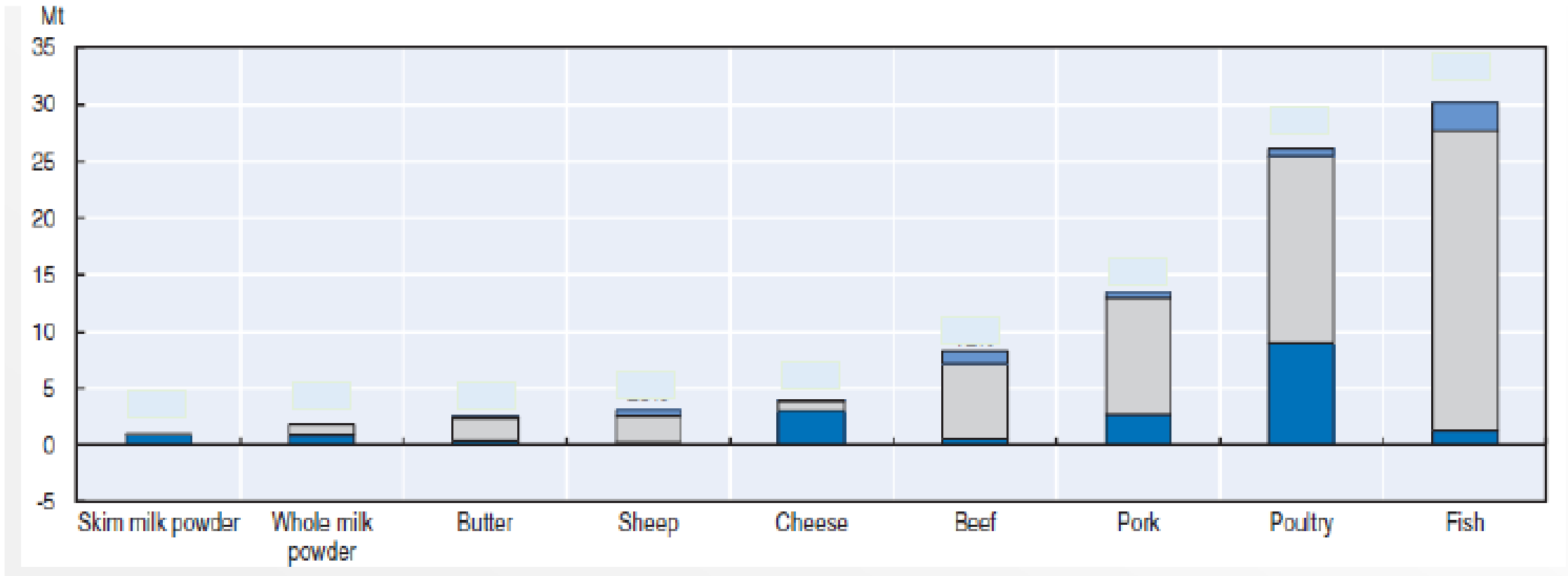
# **SU ÜRÜNLERİ YETİŞTİRİCİLİĞİ DÜNYA İÇİN NE ANLAM İFADE EDİYOR?**

*Murat Arslan*  
*Atatürk Üniversitesi Su Ürünleri Fakültesi*

# Tartışma: 2050 de 10 milyar nüfus nasıl beslenecek?

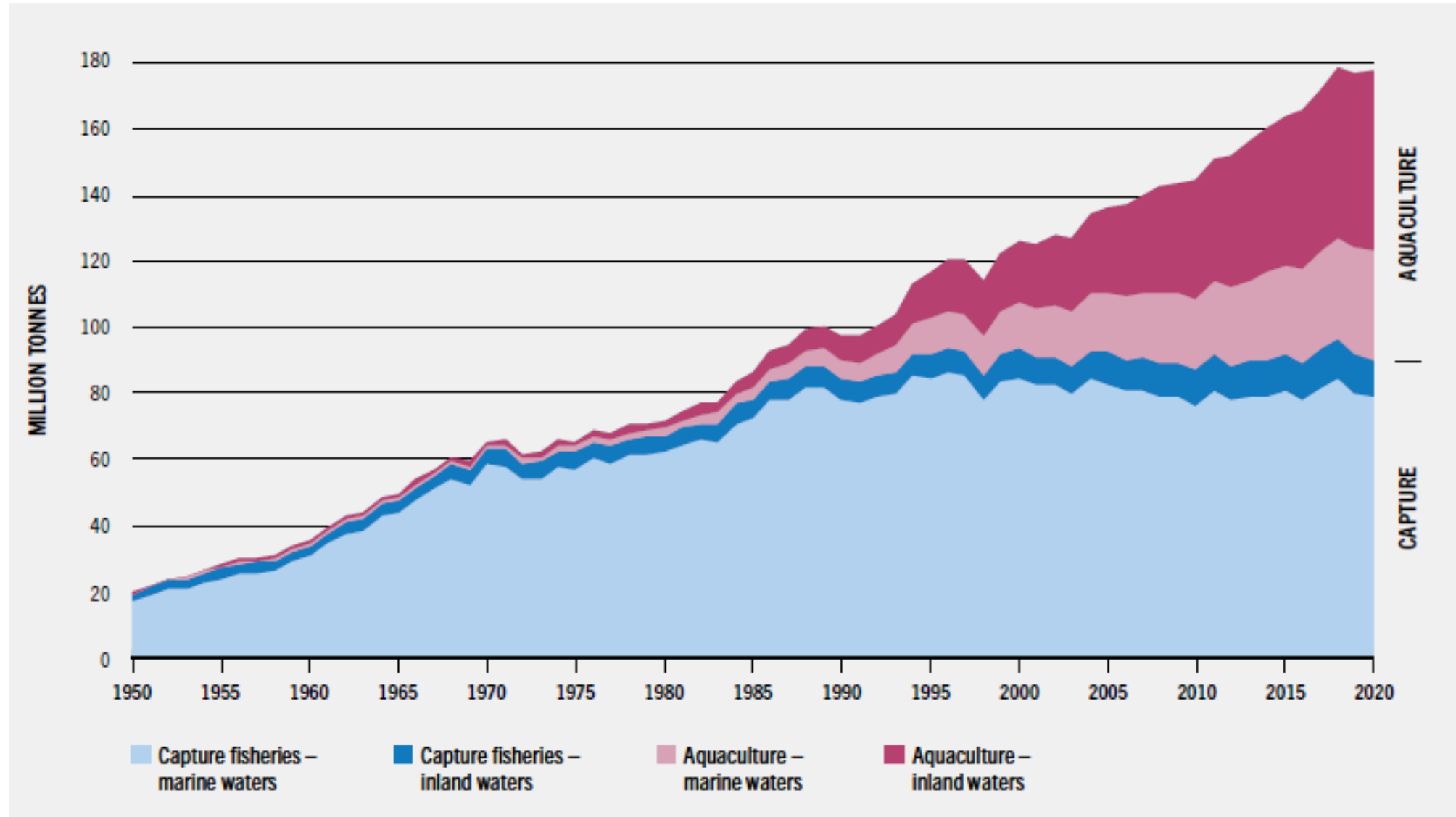


# 2010 – 2030 yılları arasında beklenen gıda üretimi artışı

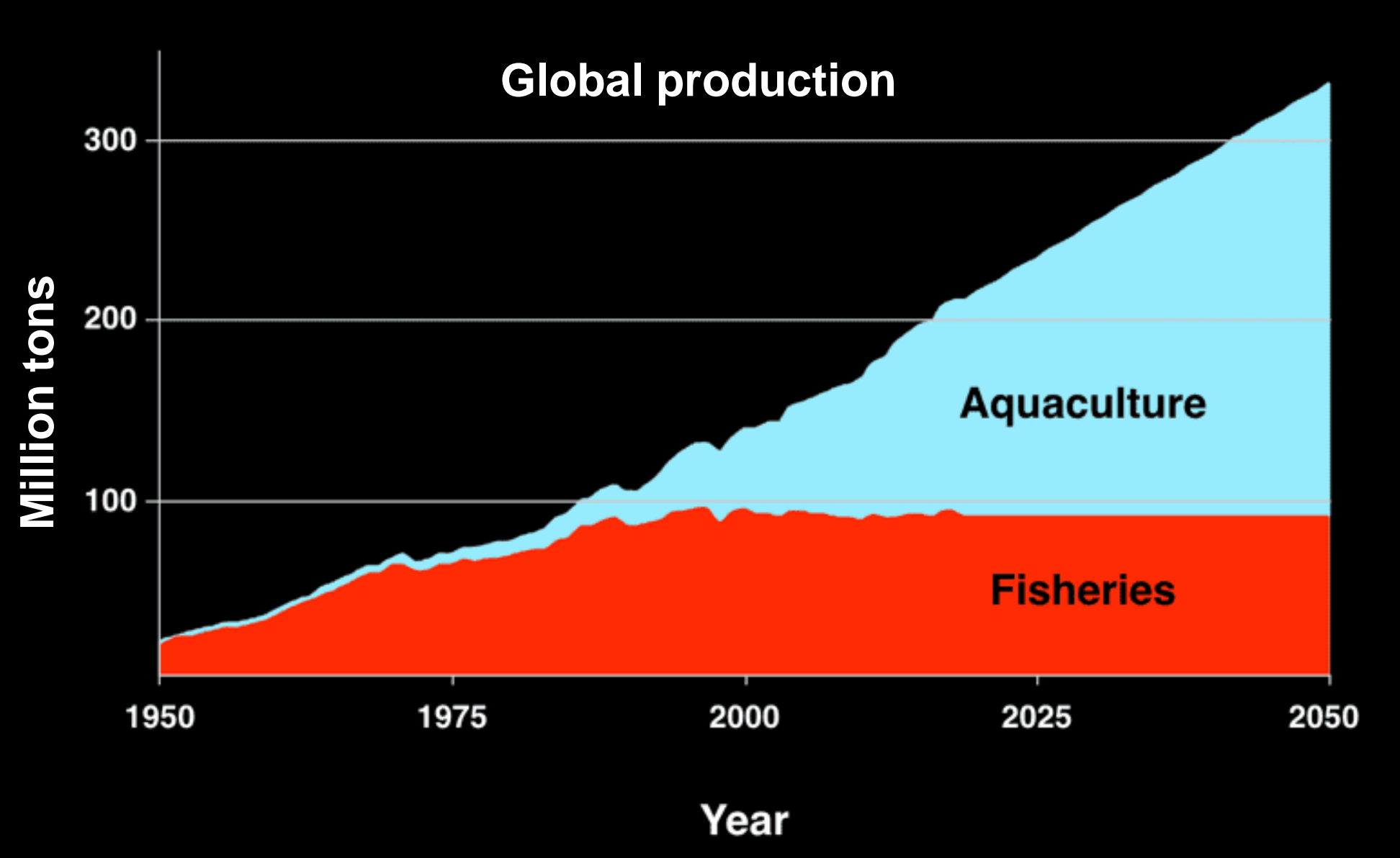


WORLD BANK REPORT NUMBER 83177-GLB

# Dünya su ürünleri üretimi: avcılık ve yetiştiricilik

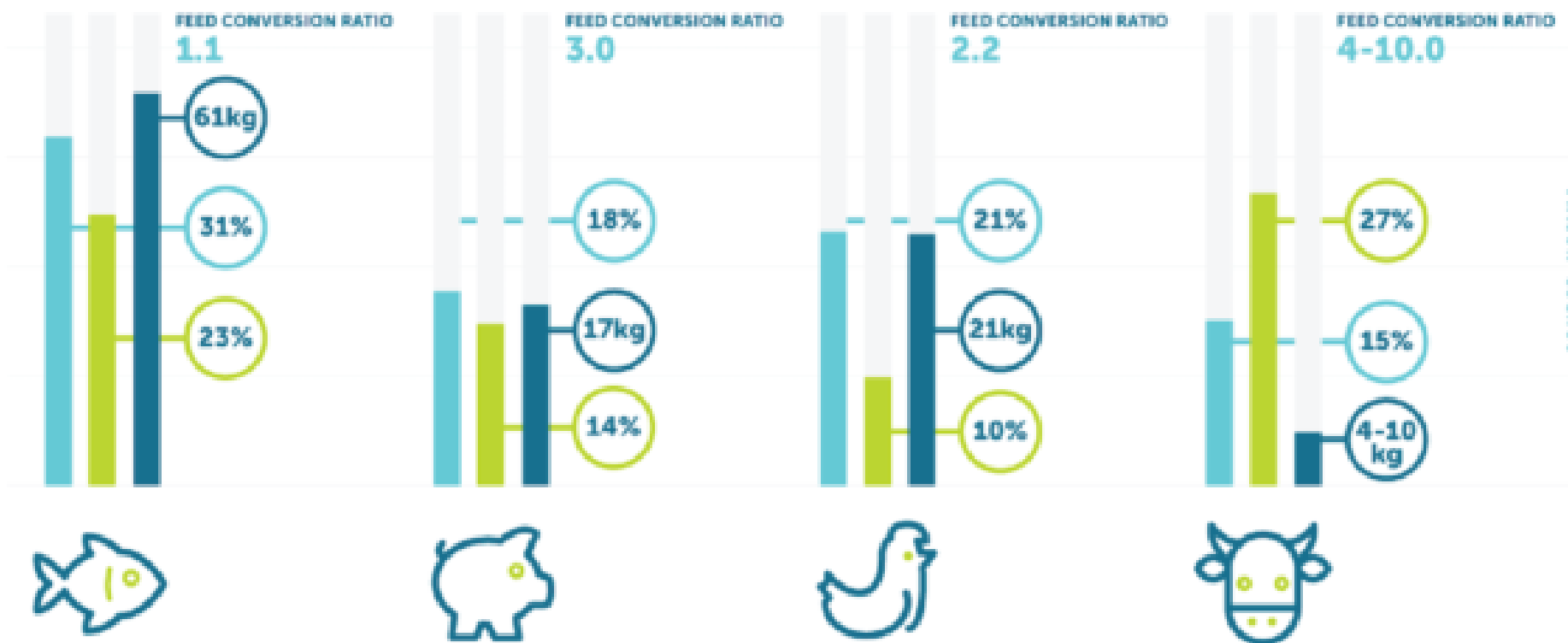


# Gelecek projeksiyonu



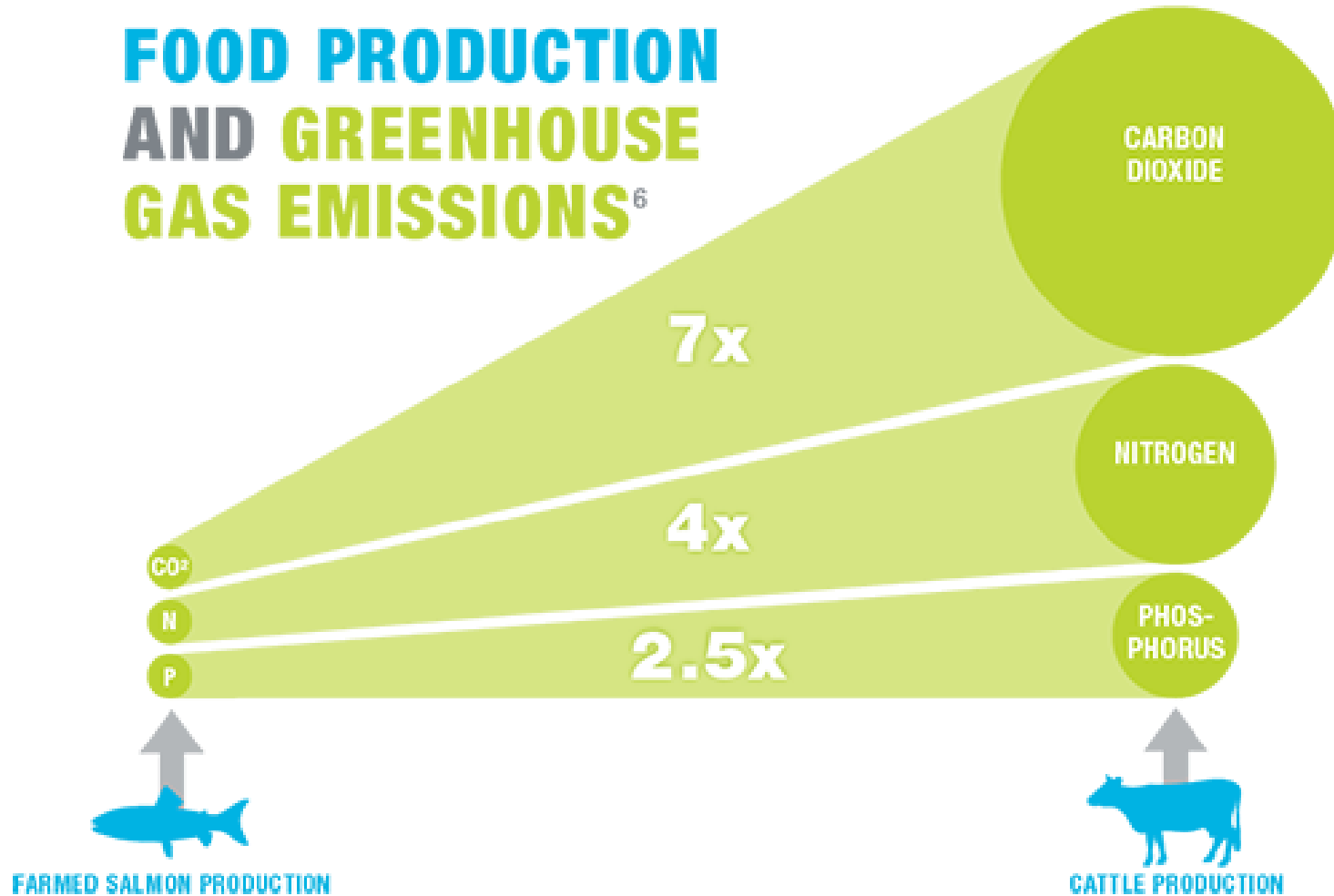
# Avantajlar

## HOW RESOURCE EFFICIENT IS AQUACULTURE?



# Avantajlar

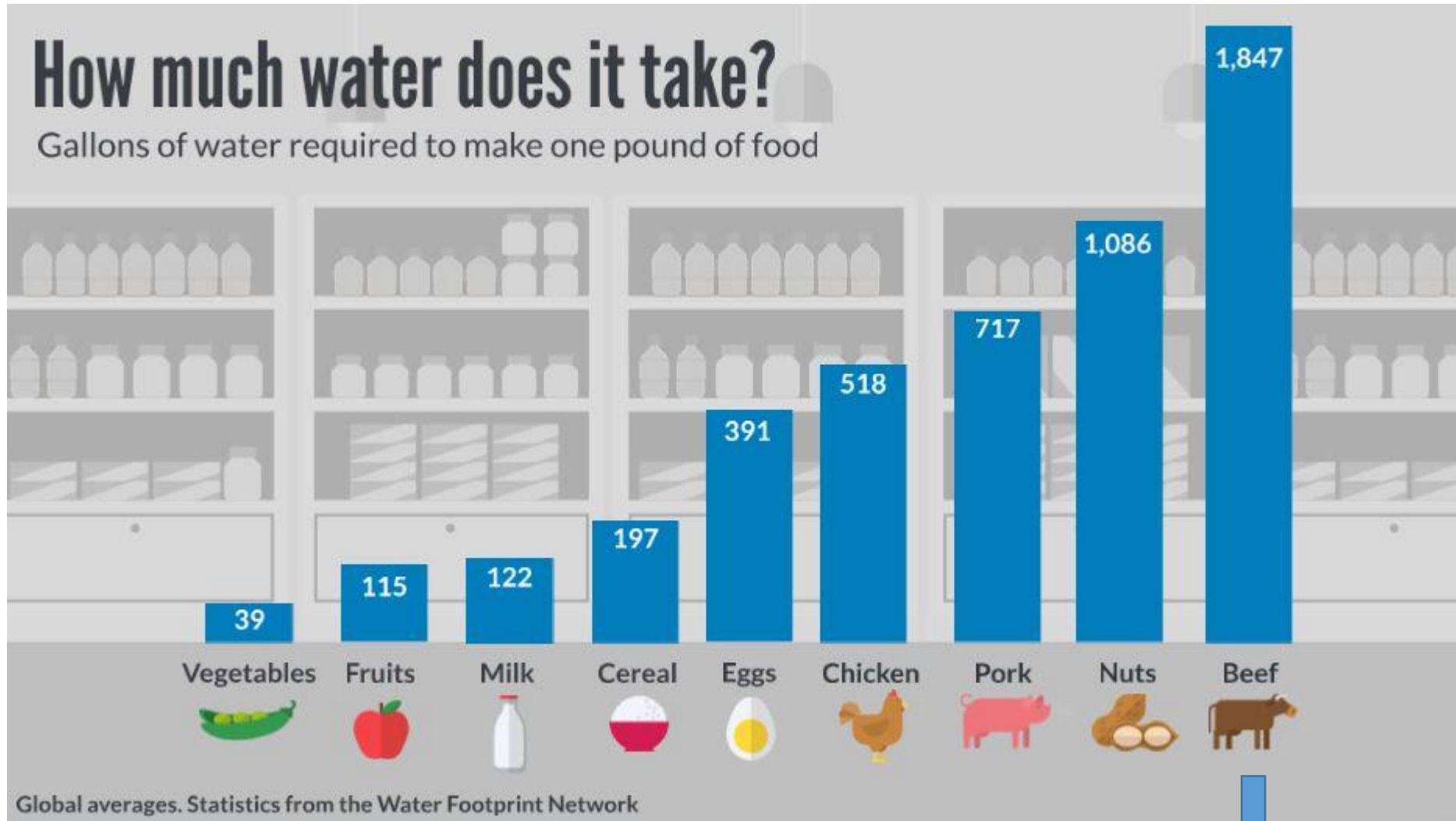
## FOOD PRODUCTION AND GREENHOUSE GAS EMISSIONS<sup>6</sup>



<http://www.nationalgeographic.com/foodfeatures/aquaculture>

<http://aquabounty.com/a-detrimental-disconnect-between-farming-land-and-sea>

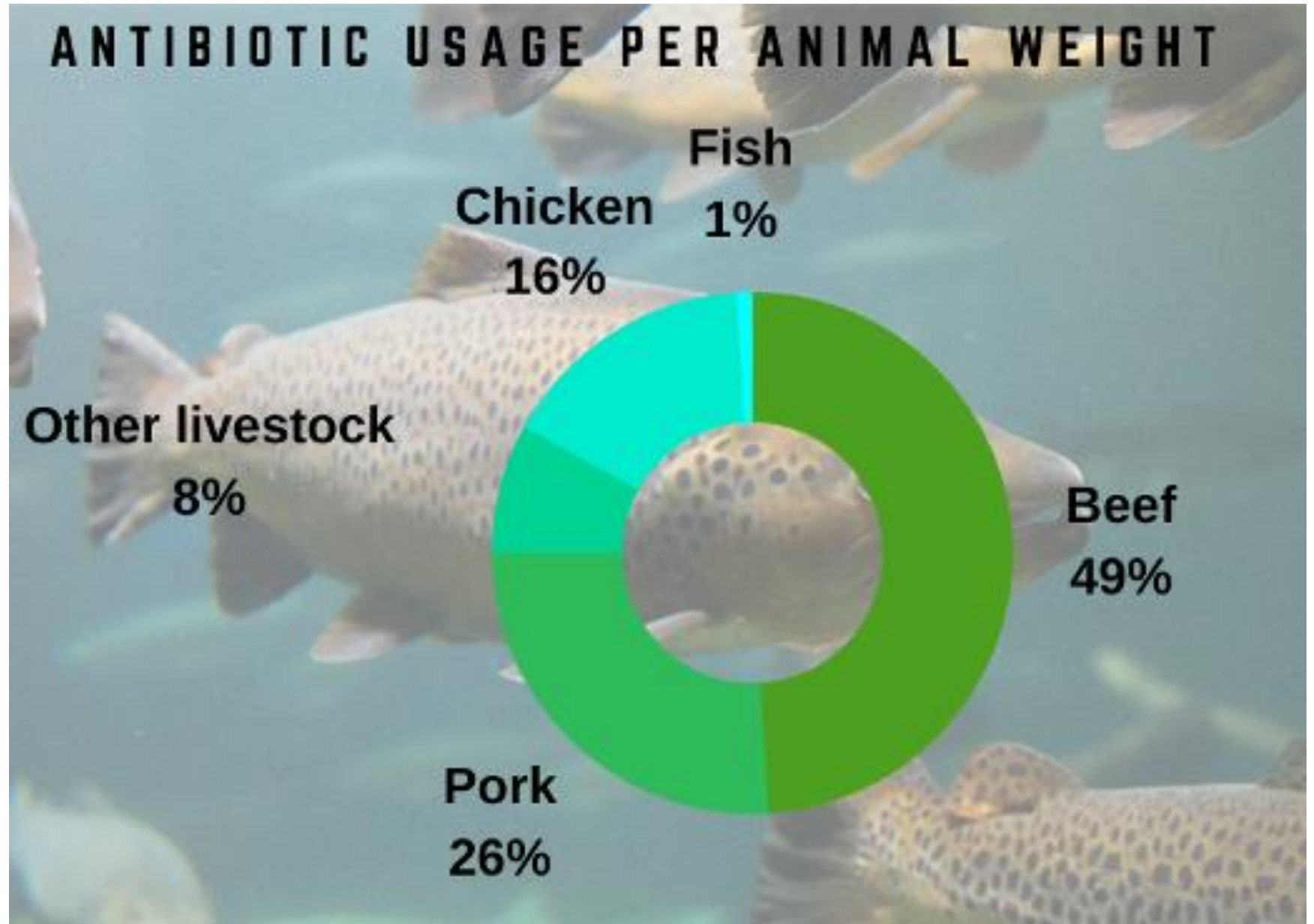
# Avantajlar



*1 kg beef costs 15 500L water*

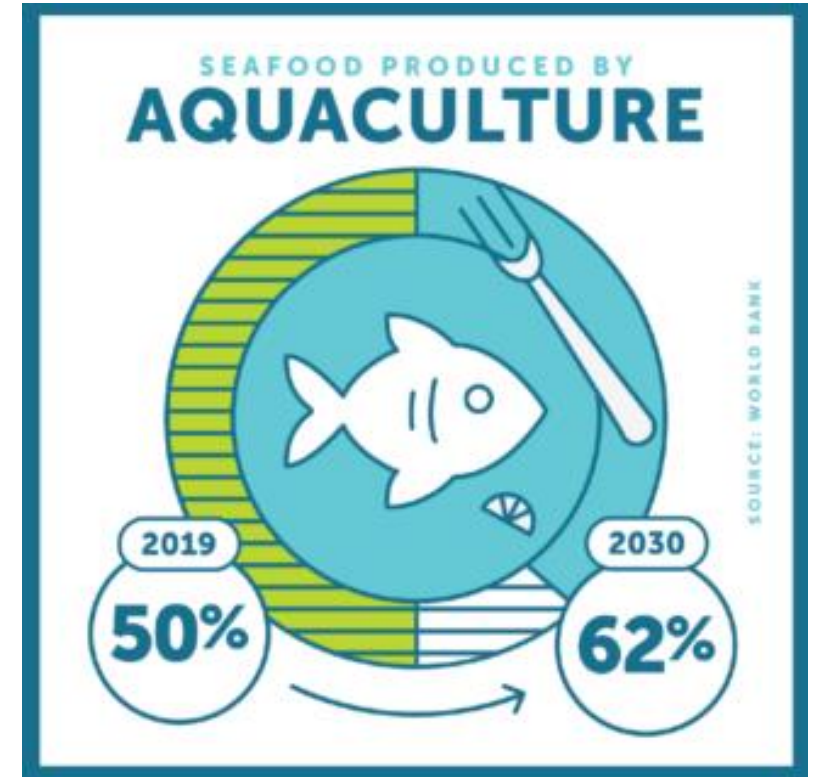
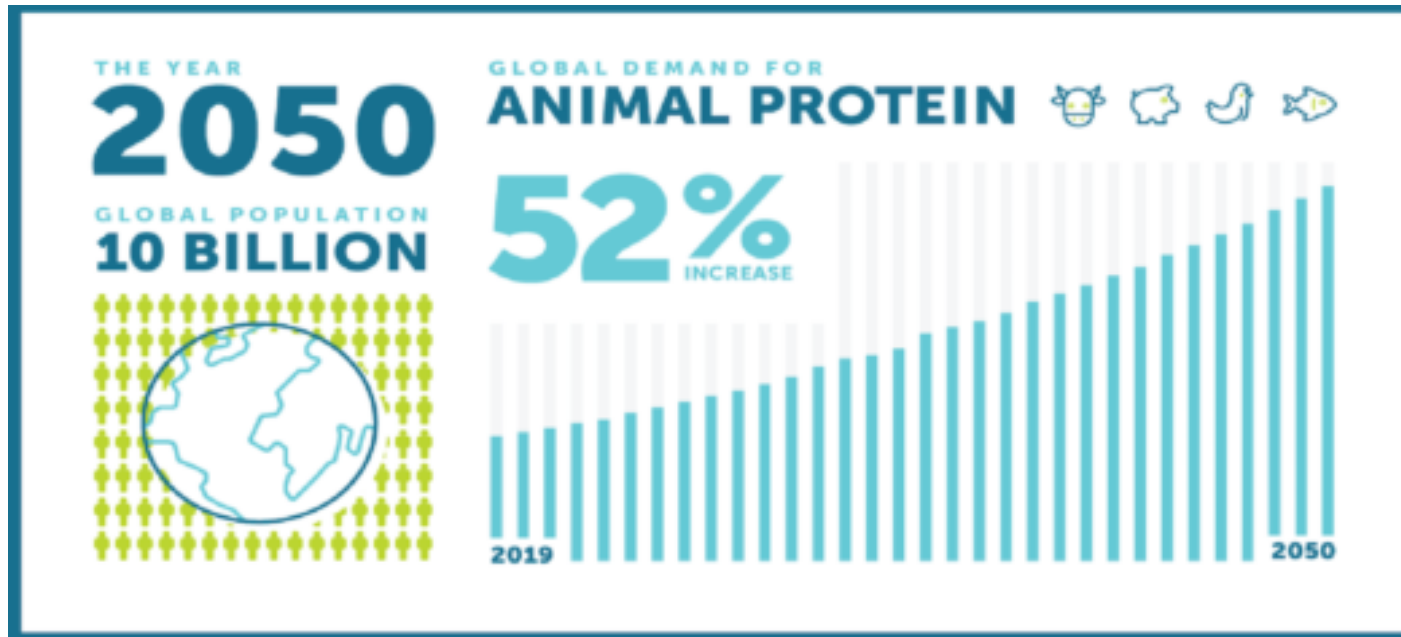


# Avantajlar



<https://www.aquaculturealliance.org/blog/todays-farmed-fish/>

# Toplarsak...



<https://www.aquaculturealliance.org/blog/what-is-aquaculture-why-do-we-need-it/>

# Su ürünleri – fonksiyonel gıda

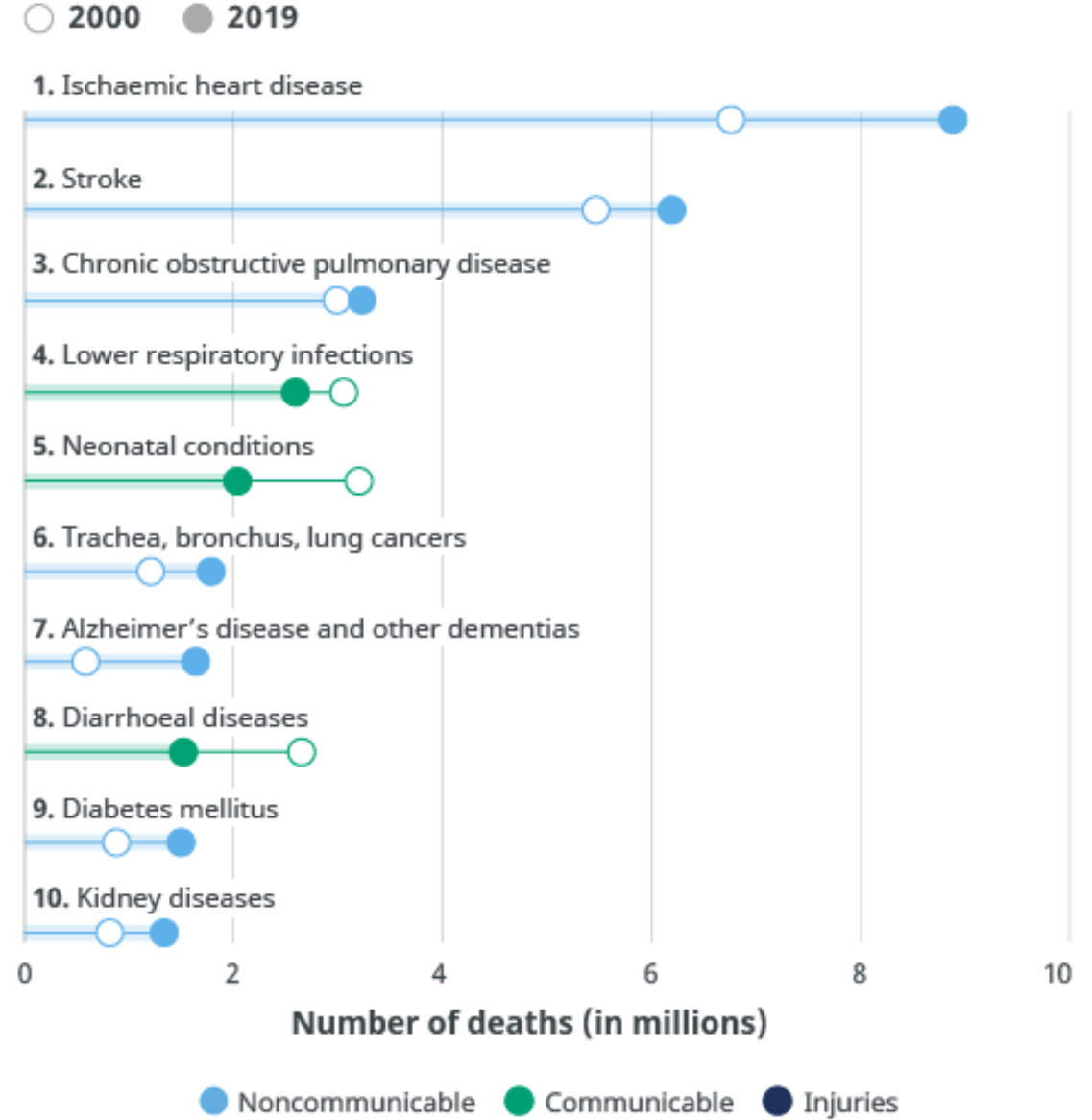
***Su ürünleri/balık sadece omega-3 değil aynı zamanda;***

- Yüksek kalite protein: kolay sindirilebilir, bütün esansiyel amino asitleri içerir,
- Bazı vitaminlerce zengin: A, D and B12,
- Mikro-besin maddeleri: selenyum, iyot, fosfor

# Dünyada genel sağlık durumu

- Bulaşıcı olmayan hastalıkları toplam ölümlerdeki payı %61'den (2000) %74'e (2019) yükseldi.
- Global seviyede, 300 milyondan fazla insan depresyon hastası...Dünya nüfusunun %4'ü.

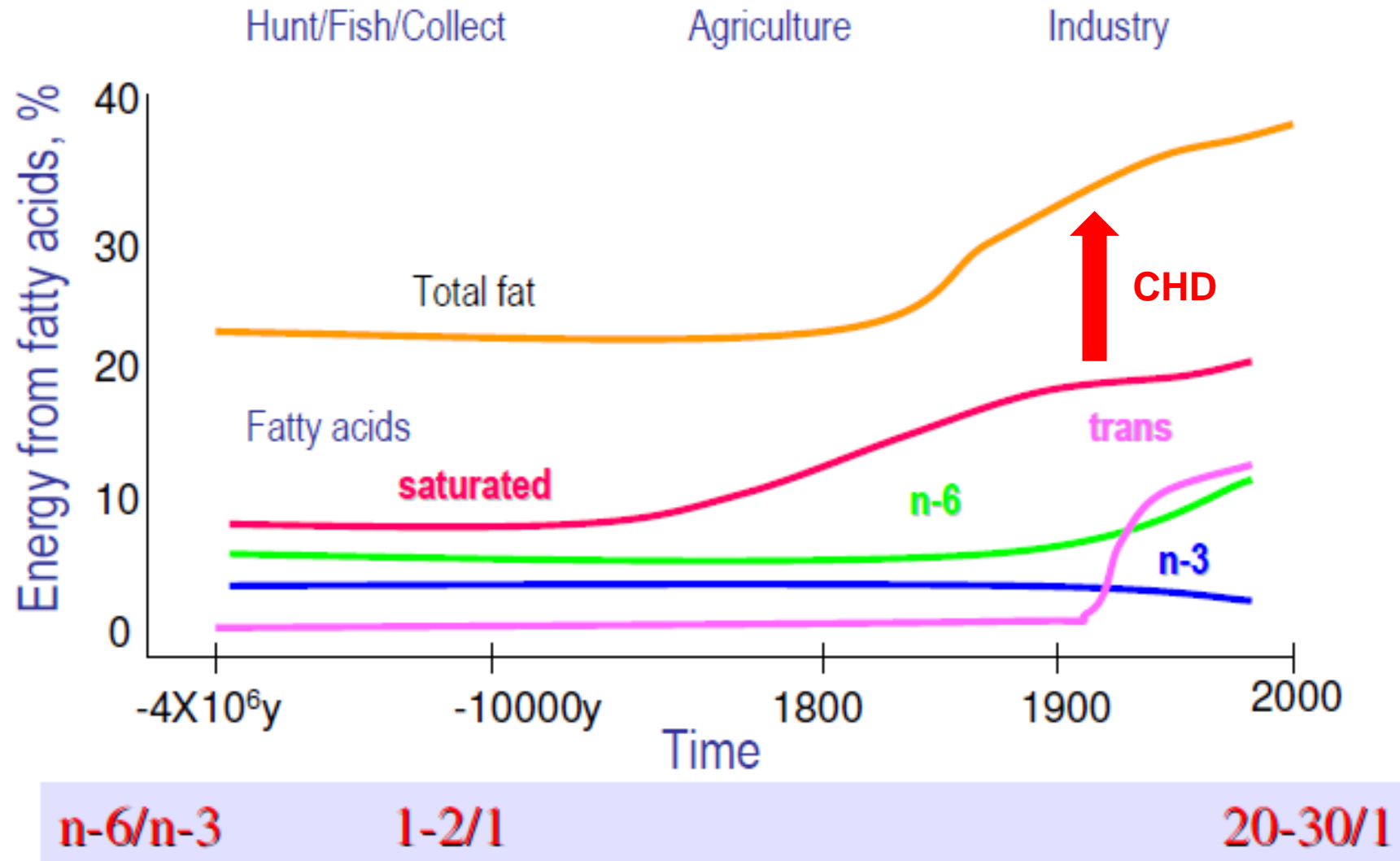
## Leading causes of death globally



World health statistics, 2022

<https://apps.who.int/iris/bitstream/handle/10665/254610/WHO-MSD-MER-2017.2-eng.pdf>

# Toplumlardaki gelişme ve diyetel enerji tüketimi



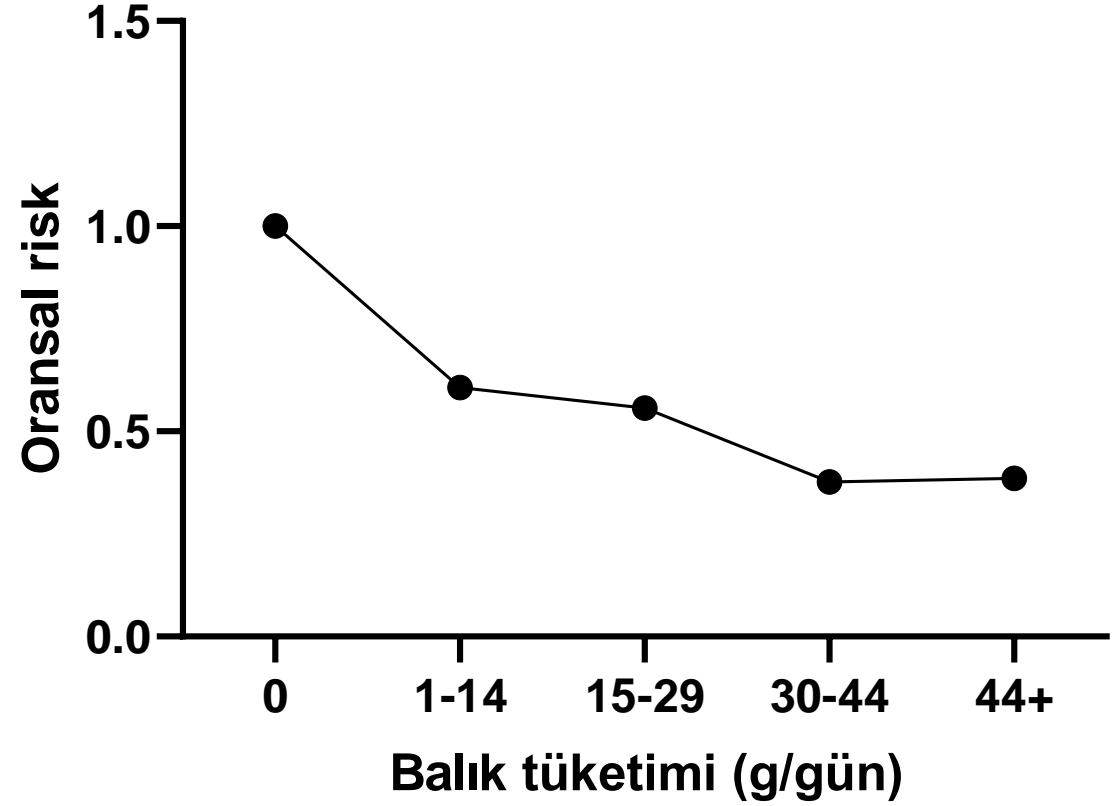
Leaf and Weber, 1987

# Omega-3 yağ asitleri neden çok önemli?

- Koroner kalp hastalıkları
- Kanser
  - Özellikle prostat ve kolon kanseri
- Mental sağlık
  - Depresyon, hiper aktivite, öğrenme güçlüğü, şizofreni
- Neuro-dejeneratif hastalıklar
  - Alzheimer
- Sarkopeni

# Balık tüketimi ve koroner kalp hastalığı

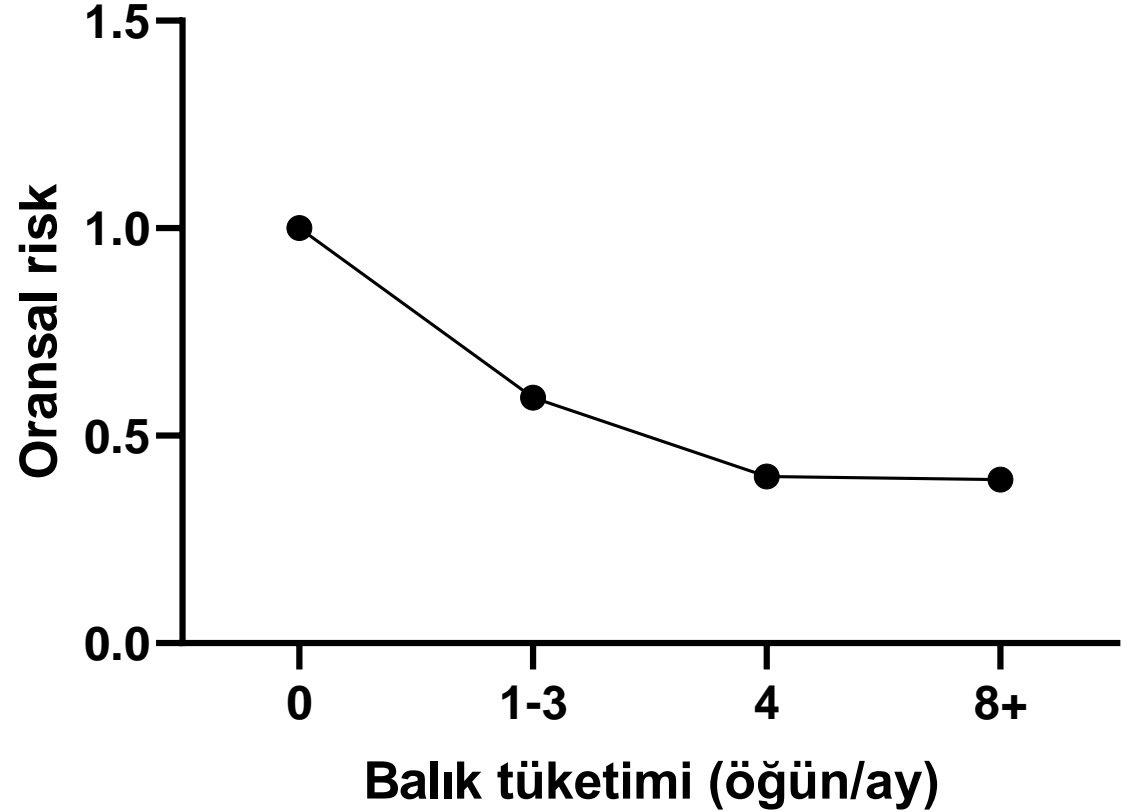
- 40 – 59 yaşları arasında 852 kişi (erkek)
- Detaylı besin analizi
- 20 yıllık takip
- CHD'den 78 ölüm



*Kromhout et al. (1985) New Engl. J. Med. 312, 1205-1209*

# Balık tüketimi ve Alzheimer's

- Chicago'da 815 yaşlı insan
- Yaş 65-94
- 4 yıllık takip
- 131 Alzheimer's

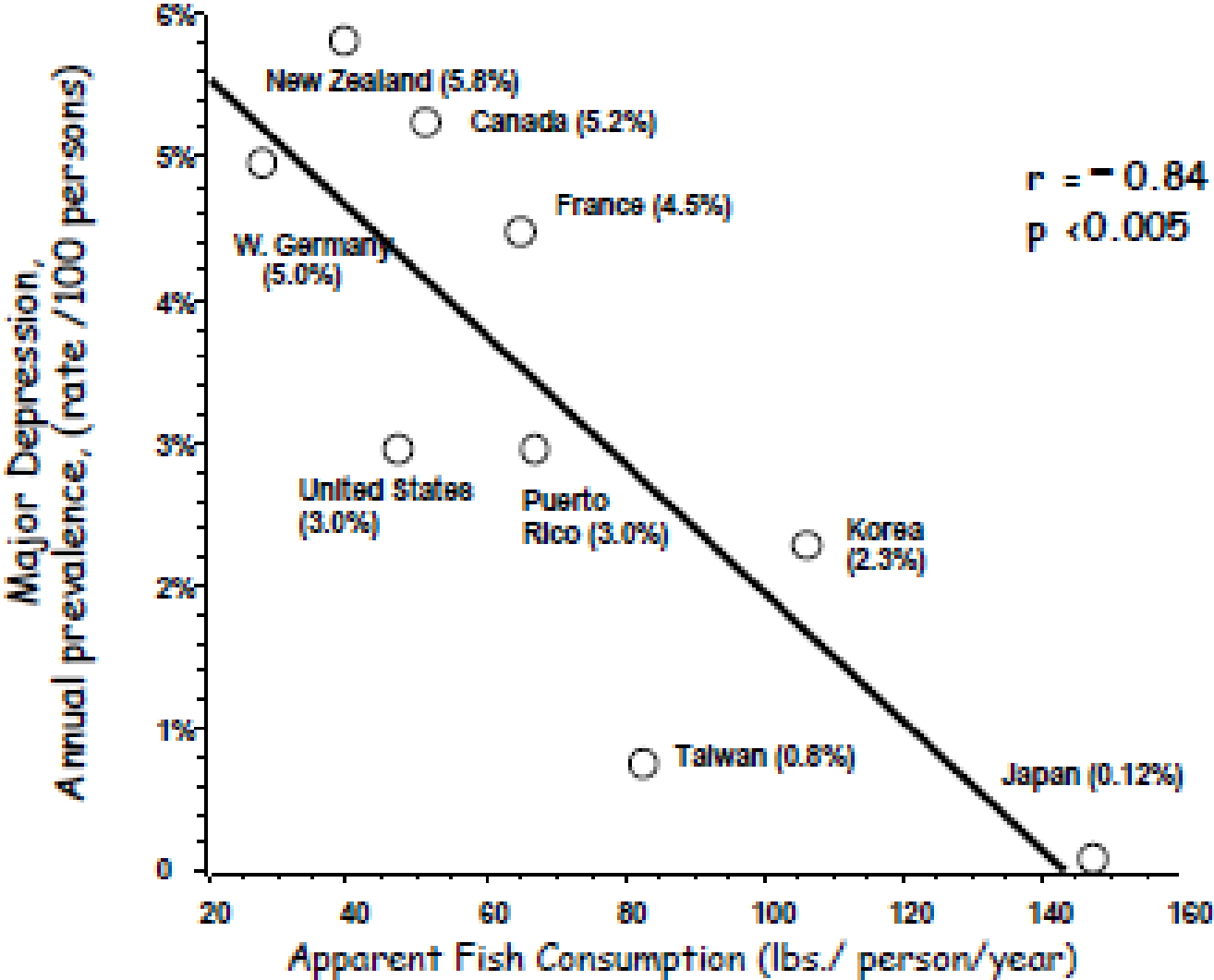


*Morris et al. (2003) Arch. Neurol. 69, 940-946*



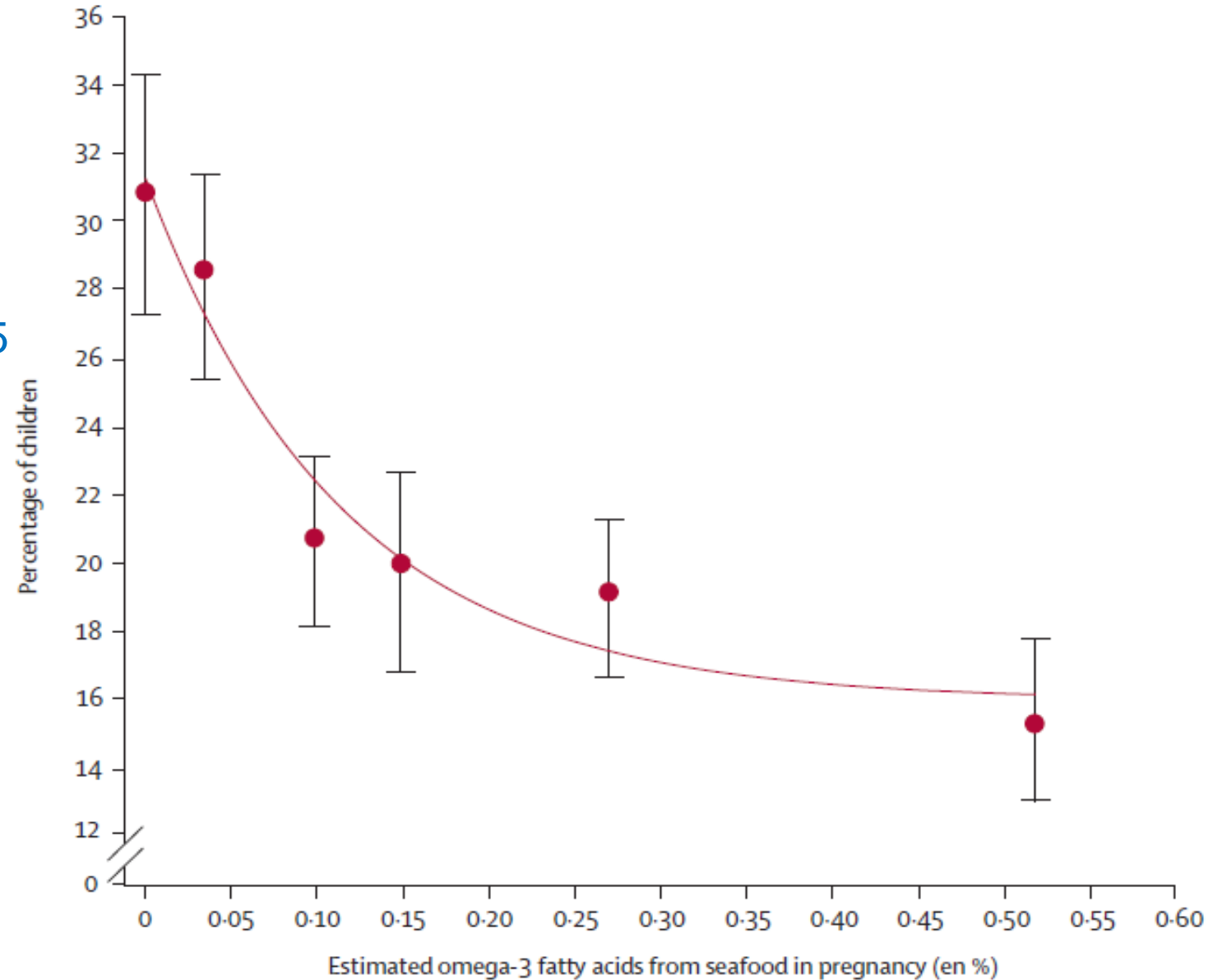
# Balık tüketimi ve depresyon

Hibbeln, 1998; Lancet 351, 1213



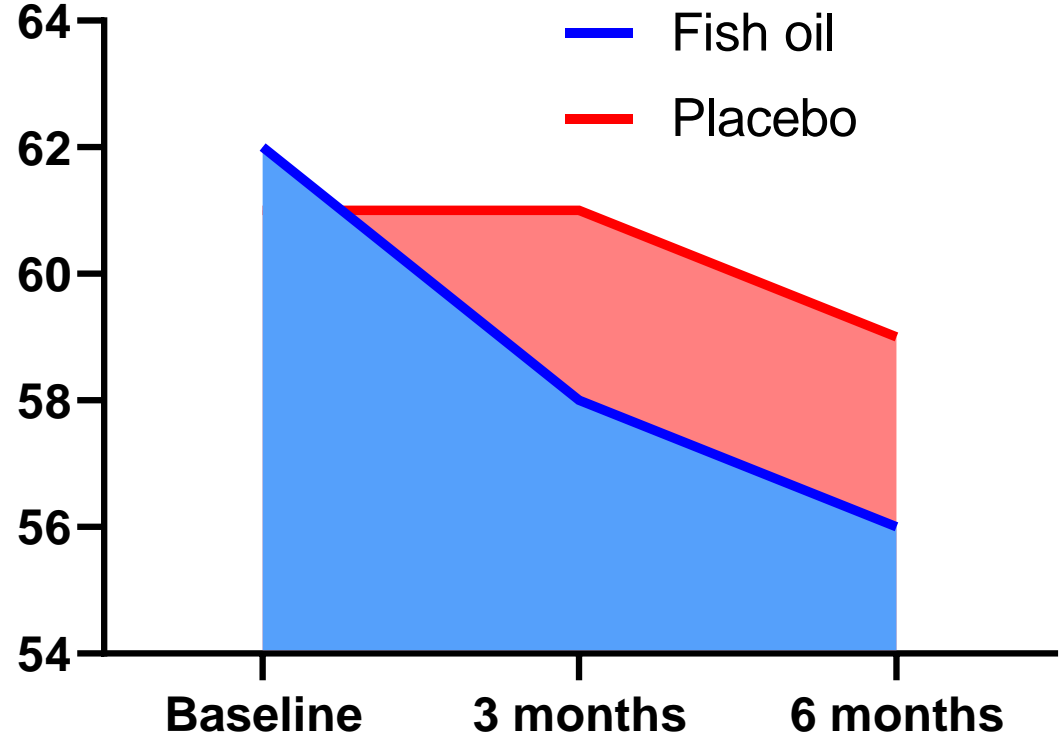
# Hamilelikte omega-3 tüketimi - çocuklarda düşük verbal IQ

*Hibbeln et al., 2007; Lancet 369: 578–85*



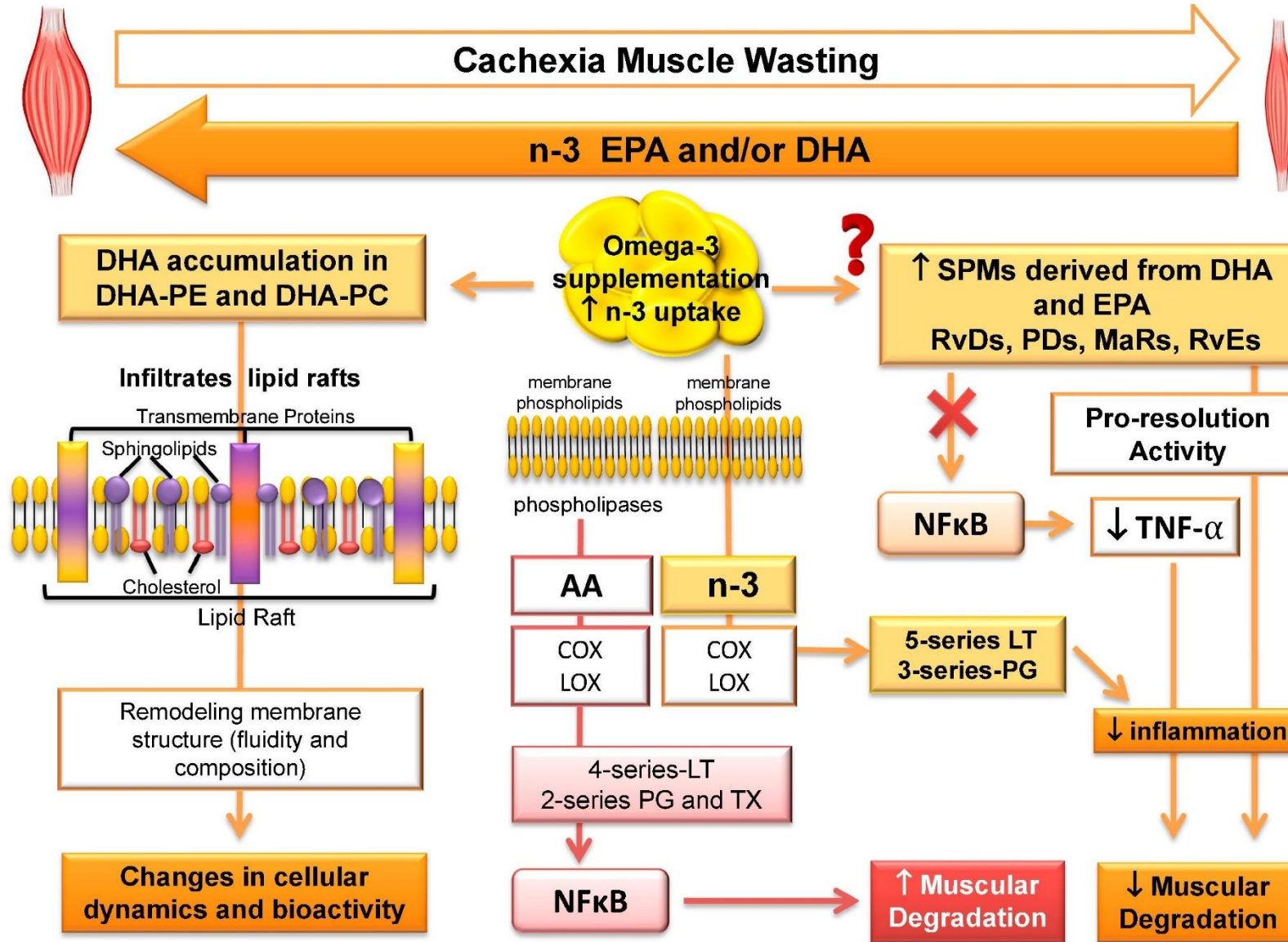
# Omega-3 ve hiperaktivite

- 5-12 yaşlarında 112 çocuk,
- Koordinasyon problemi (hiperaktivite),
- Fish yağı kapsülü vs placebo 3 ay
- Sonraki 3 ay tüm gruplar balık yağı kapsülü

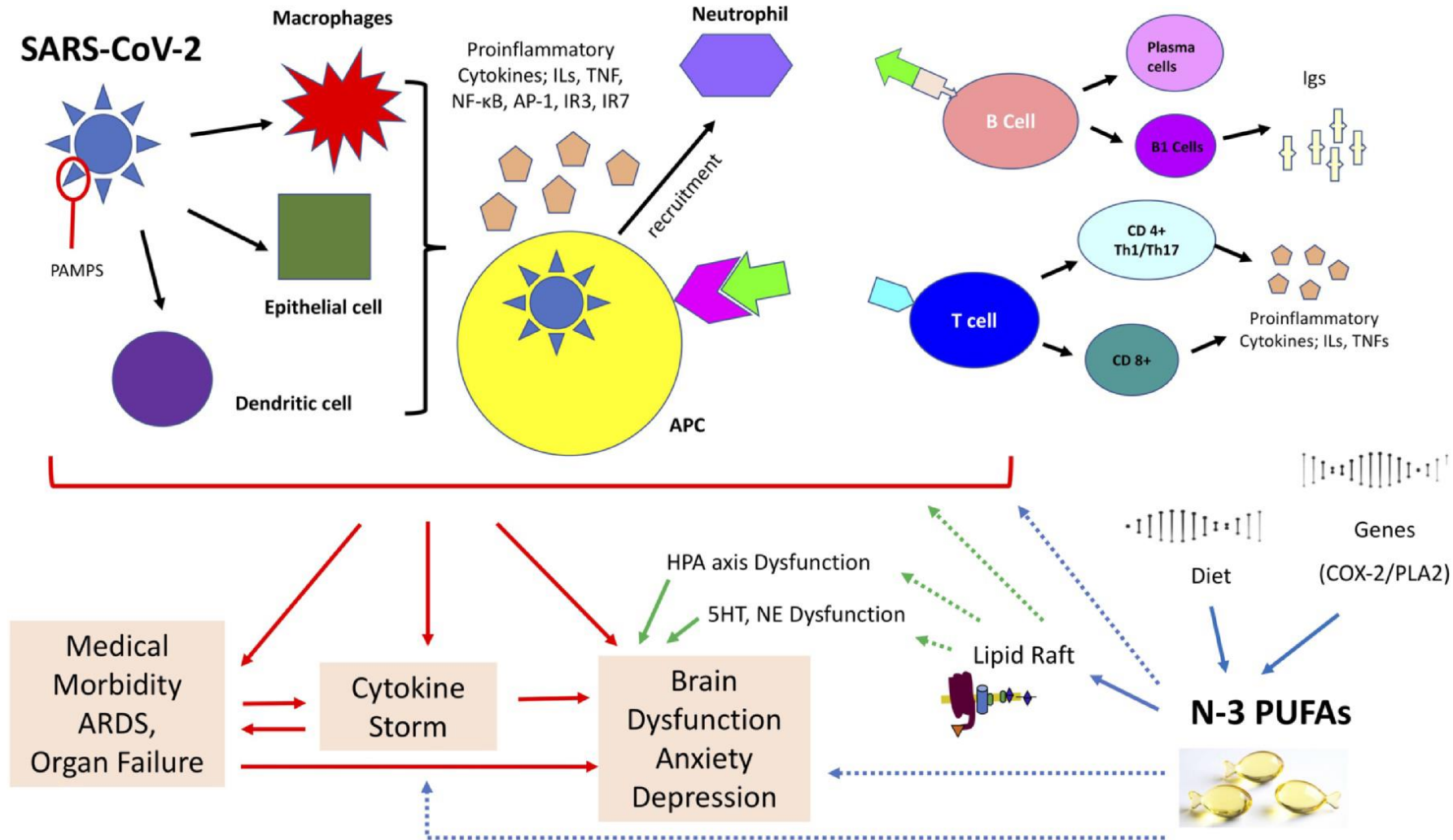


*Richardson & Montgomery (2005) Pediatrics 115, 1360-1366*

# Omega-3 and kas kaybı



# COVID-19'un fiziksel ve metal etkisine karşı n-3'lerin immün sistem geliştirme potansiyeli

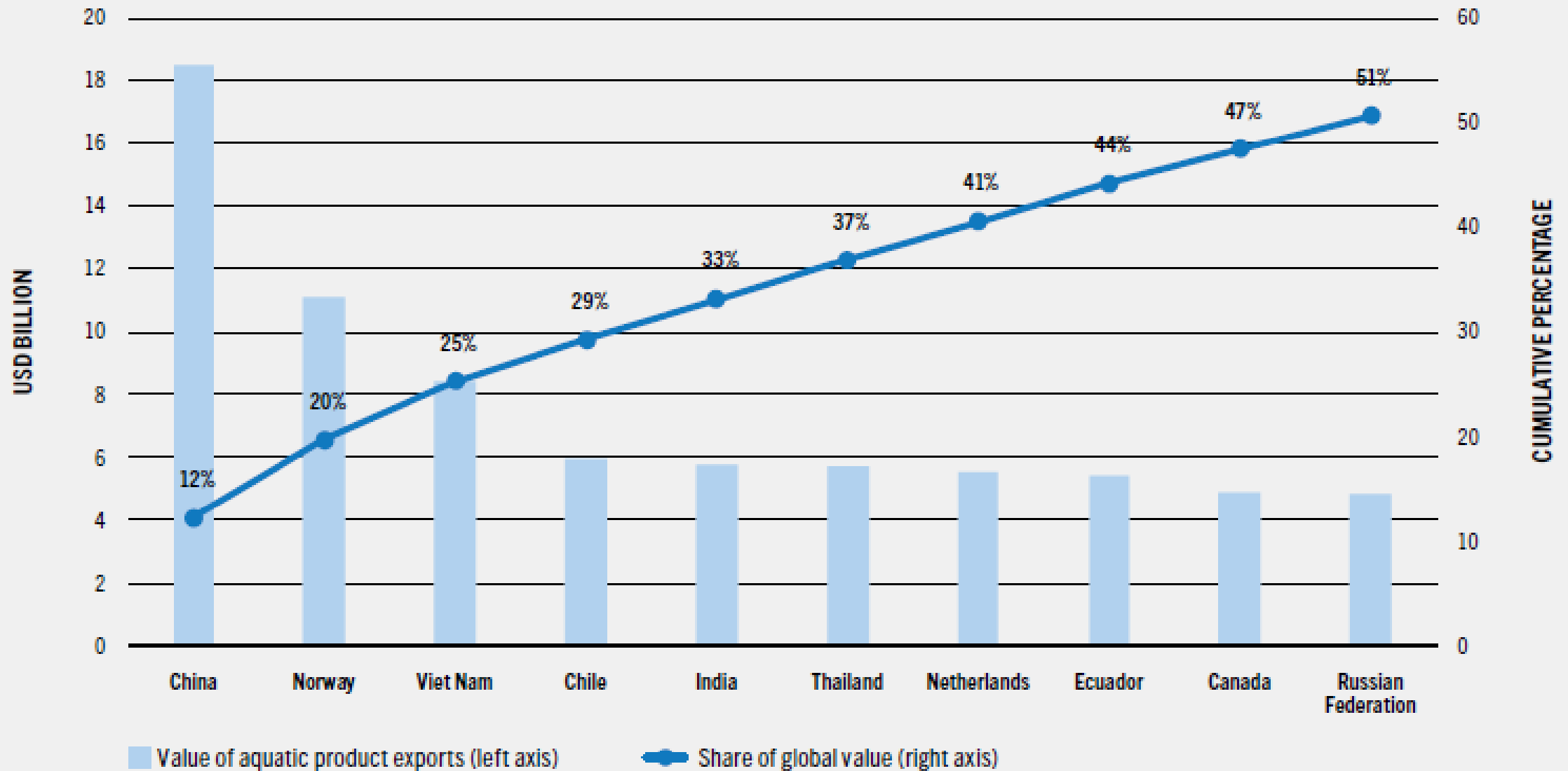


Chang et al. 2020; Prostaglandins, Leukotrienes and Essential Fatty Acids 161, 102177.

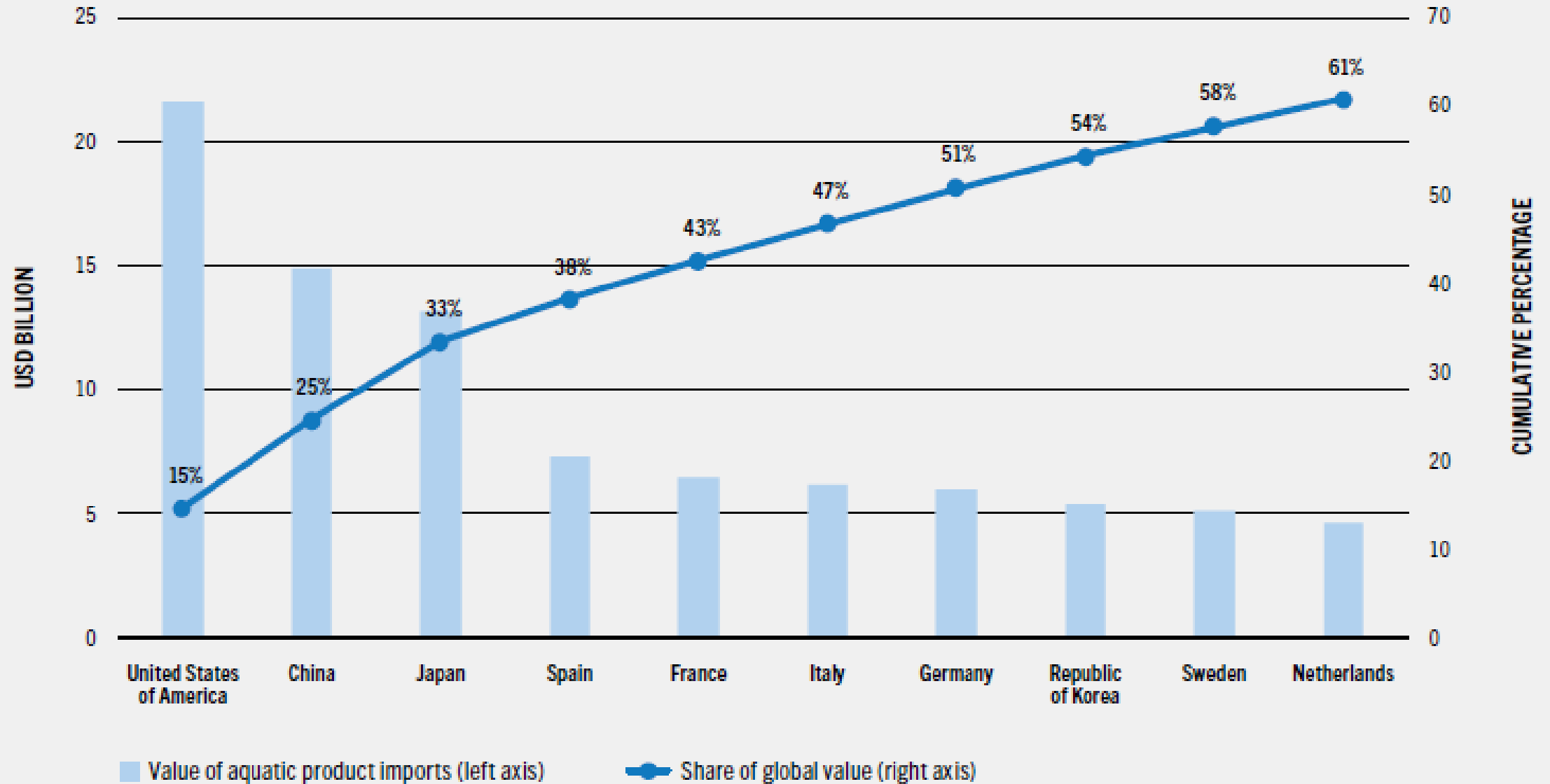
## Ekonomik deęer

- 2018 global üretim 179 milyon ton – toplam deęer 401 milyar \$ - global yetiřtiricilik deęer 250 milyar \$
- 2022 ihracat 68 milyon ton (toplamin %37'si) – ihracat deęer 190 milyar \$ (toplam dünya ticaretinin %1'i) – en çok uluslararası ticareti yapılan gıda ürünlerinden biri)
- Türkiye 2022 ihracat 252 bin ton – 1,7 milyar \$

# Satanlar



# Alanlar





# Istihdam

**58.3** Million

Workers Directly Employed in  
Capture Fisheries & Aquaculture in 2012



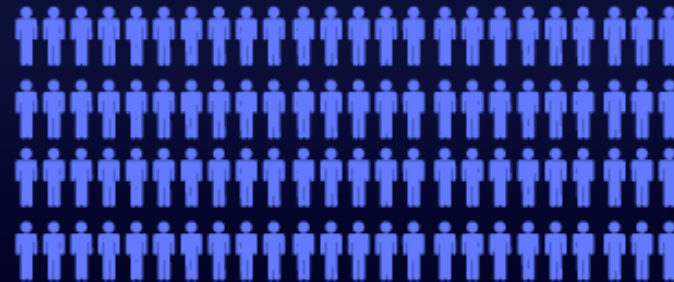
**233** Million

For Every 1 Person Directly Employed At Least  
3 Additional Jobs are Created in Activities that  
Support Fishing & Aquaculture



**923** Million

Each Job Holder Provides for Three Dependents or  
Family Members, on Average. Fisheries & Aquaculture  
Support the Livelihoods of 13% of the World's Population



SOURCE:

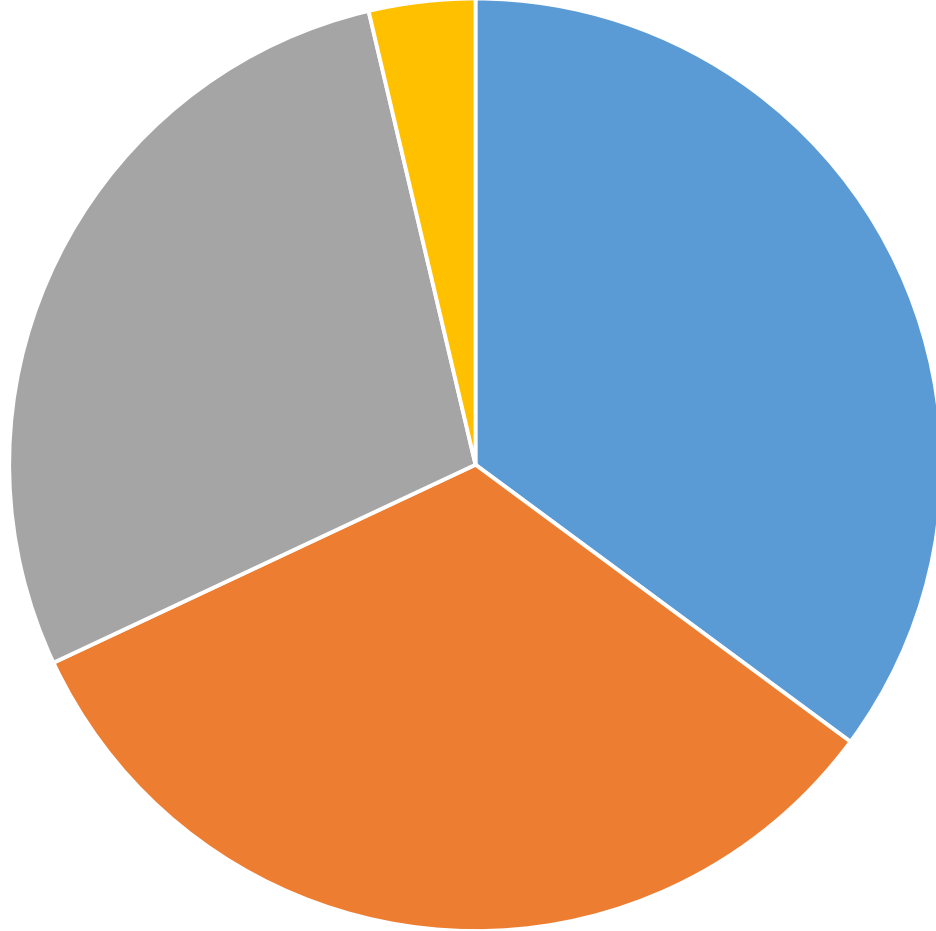
FAO, 2012. The State of the World's Fisheries and Aquaculture 2012.

FAO, 2014. The State of World Fisheries and Aquaculture 2014.

# Dünyada hangi balıklar üretiliyor

Top 10 species groups		World aquaculture (2017 quantity)			
Species group	ISSCAAP division	Number of ASFIS species items in the group farmed in global aquaculture	Number of countries farming the species group	World aquaculture production quantity of the species group (live weight; tonnes)	Share of world aquaculture production quantity of all species (%)
1. Carps, barbels and other cyprinids <sup>1</sup>	Freshwater fishes	38	92	28 345 338	25.32
2. Red seaweeds <sup>1</sup>	Aquatic plants	8	32	17 258 438	15.42
3. Brown seaweeds <sup>1</sup>	Aquatic plants	8	12	13 772 325	12.30
4. Tilapias and other cichlids <sup>1</sup>	Freshwater fishes	18	127	5 880 586	5.25
5. Oysters <sup>1</sup>	Molluscs	12	44	5 710 522	5.10
6. Clams, cockles, arkshells <sup>1</sup>	Molluscs	29	21	5 658 458	5.05
7. Catfishes <sup>2</sup>	Freshwater fishes	27	86	5 518 878	4.93
8. Marine shrimps and prawns <sup>3</sup>	Crustaceans	14	60	5 511 914	4.92
9. Salmon, trouts, smelts <sup>1</sup>	Diadromous fishes	20	83	3 476 845	3.11
10. Freshwater fishes nei <sup>4</sup>	Freshwater fishes	1	65	2 456 181	2.19
Other species		n.a.	n.a.	18 357 140	16.40
All species		424	196	111 946 623	100.00

# Biz hangi balıkları üretiyoruz?



2022

Toplam 515 bin ton

■ Alabalık %37 ■ Levrek %30 ■ Çipura %30 ■ Diğer %3

# Strateji?

- Özellikle tatlısu kaynaklarımızın alabalık yetiştiriciliğine uygun olup olmadığı değil, hangi suyun hangi balık/su ürünü için uygun olduğu... Uygunluk haritaları...
- Aynı suyun yıl içerisinde su kalitesi uygunluğuna göre farklı balık/su ürünleri yetiştiriciliği için kullanılması...
- Maliyeti düşük, çevresel toleransı yüksek türler büyük farklar oluşturabilir...
- Polikültür, entegre sistemler....



**Teşekkür ederim!**