



DALL'ALIMENTO AL NUTRIENTE: Dal Pesce agli Omega-3



Pesce nell'Alimentazione

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Pesce = $\Omega-3$!

" Sano come un pesce "

- ✘** Protezione contro le malattie cardiovascolari,
 - ✘** Riduzione del rischio di demenza senile,
 - ✘** Effetti positivi sul rischio di diabete,
 - ✘** Efficacia nel prevenire le malattie allergiche,
 - ✘** Miglioramento nel tono dell'umore,
 - ✘** Controllo dell'appetito
-
- ✘** E in più è anche buono!

***NFI – Nutrition Foundation of Italy
(modificato)***

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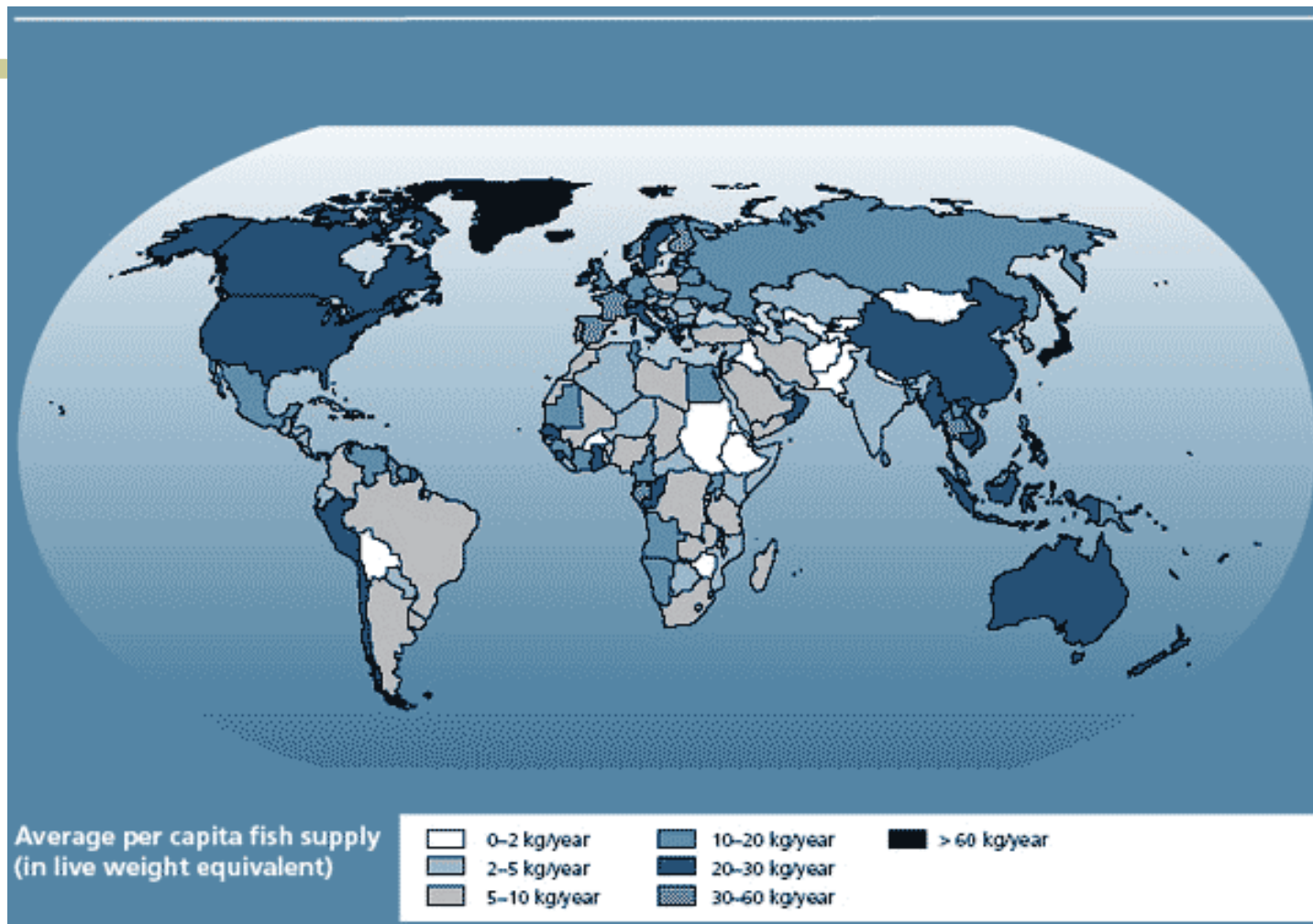


Quali gli elementi da considerare ?

- ✓ Consumi
- ✓ Produzione / Disponibilità
- ✓ Percezione / gradimento
- ✓ Nutrienti di «eccellenza»
- ✓ Impatto sulla salute
- ✓ Comunicazione



Consumo di Pesce nel mondo FAO (media 2003 -2005)



Selected groups and countries	Per capita supply of fish (live weight equivalent)			Annual change	
	1985	1995	2005	1985–1995	1995–2005
	<i>(Kilograms)</i>			<i>(Percentage)</i>	
Africa	7.5	7.1	8.3	-0.6	1.5
Sub-Saharan Africa	7.8	7.0	7.6	-1.0	0.8
North Africa	6.4	7.6	11.9	1.8	4.6
Oceania	19.7	19.9	24.5	0.1	2.1
Australia and New Zealand	17.3	19.9	24.9	1.4	2.3
Other Oceania	27.2	19.8	23.4	-3.1	1.6
Europe (+ Cyprus and Israel)	18.3	18.5	20.8	0.1	1.2
EU(27)	18.9	20.9	22.5	1.0	0.7
Non-EU countries	10.9	14.2	17.4	2.7	2.0
North America	19.0	21.9	24.1	1.4	1.0
United States of America	18.8	21.8	23.4	1.4	1.0
Canada	19.7	22.7	24.1	1.4	0.6
Other countries in North America	63.4	59.5	61.1	-0.6	0.3
World	12.6	14.9	16.4	1.7	1.0
Low-income food-deficit countries	6.8	11.6	13.8	5.5	1.8



FAO 2008 (modificato)

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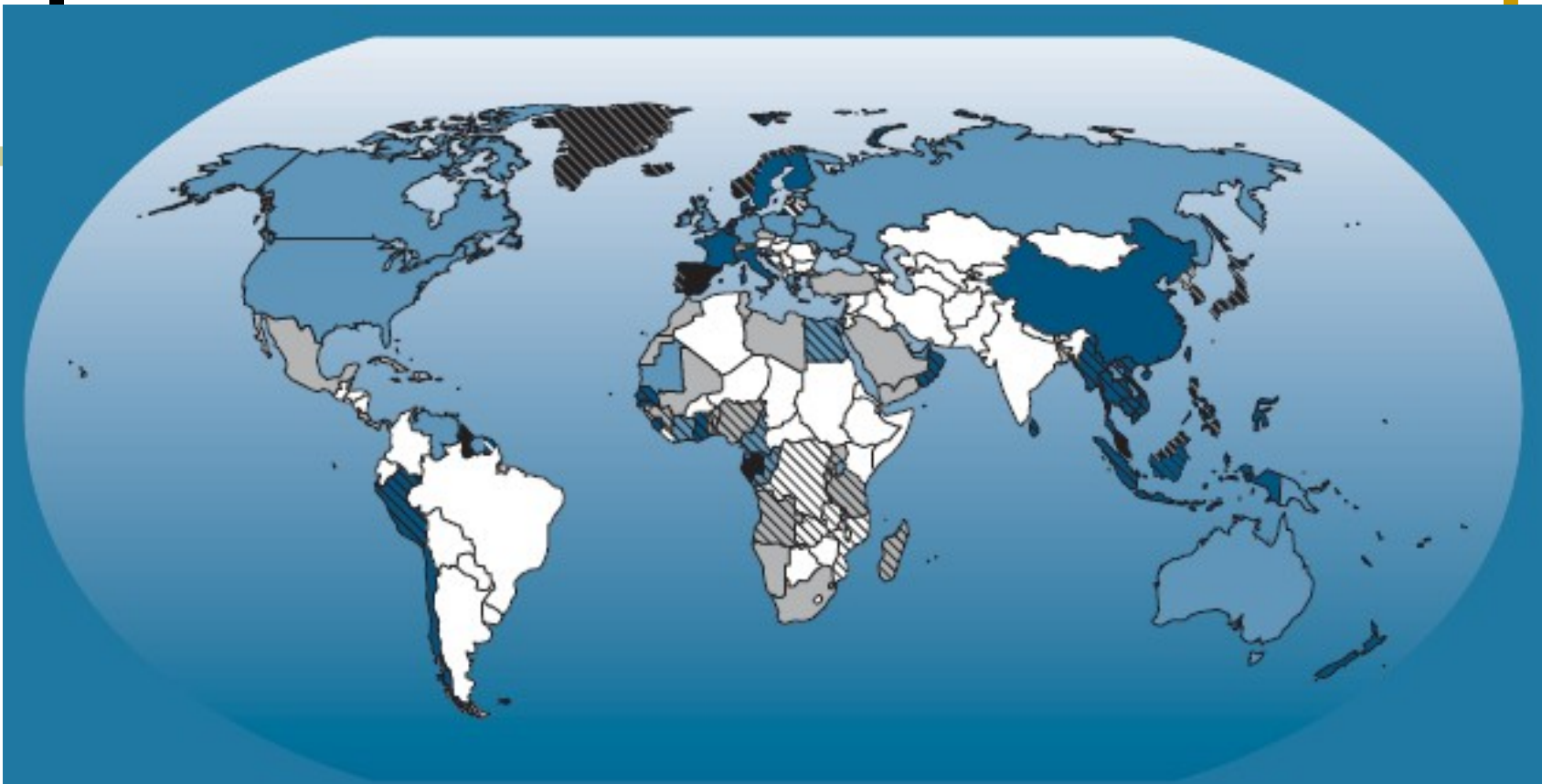
Consumi procapite in EU 27

(kg/capita/year)	2007
Portugal	61.6
Spain	44.8
Lithuania	37.6
France	34.2
Finland	31.7
Malta	31.7
Sweden	28.5
Luxembourg	28.0
Belgium	24.2
Denmark	22.3
Italy	25.4
Cyprus	27.3
Ireland	21.4
Greece	20.9

(kg/capita/year)	2007
United Kingdom	20.3
Netherlands	19.0
Estonia	16.4
Germany	15.3
Austria	15.4
Latvia	12.6
Czech Republic	9.9
Slovenia	10.2
Poland	10.9
Slovakia	8.1
Romania	5.3
Hungary	5.1
Bulgaria	4.2
Europe	22.1
World	17.1



Source: Fishery and Aquaculture statistics.
 FAO yearbook 2008
<http://www.fao.org/docrep/013/i1890t/i1890t.pdf>



**Fish proteins
(per capita per day)**

□ < 2 g
 ◻ 2-4 g

◻ 4-6 g
 ◻ 6-10 g

◻ > 10 g

**Contribution of fish
to animal protein supply**

◻ > 20%

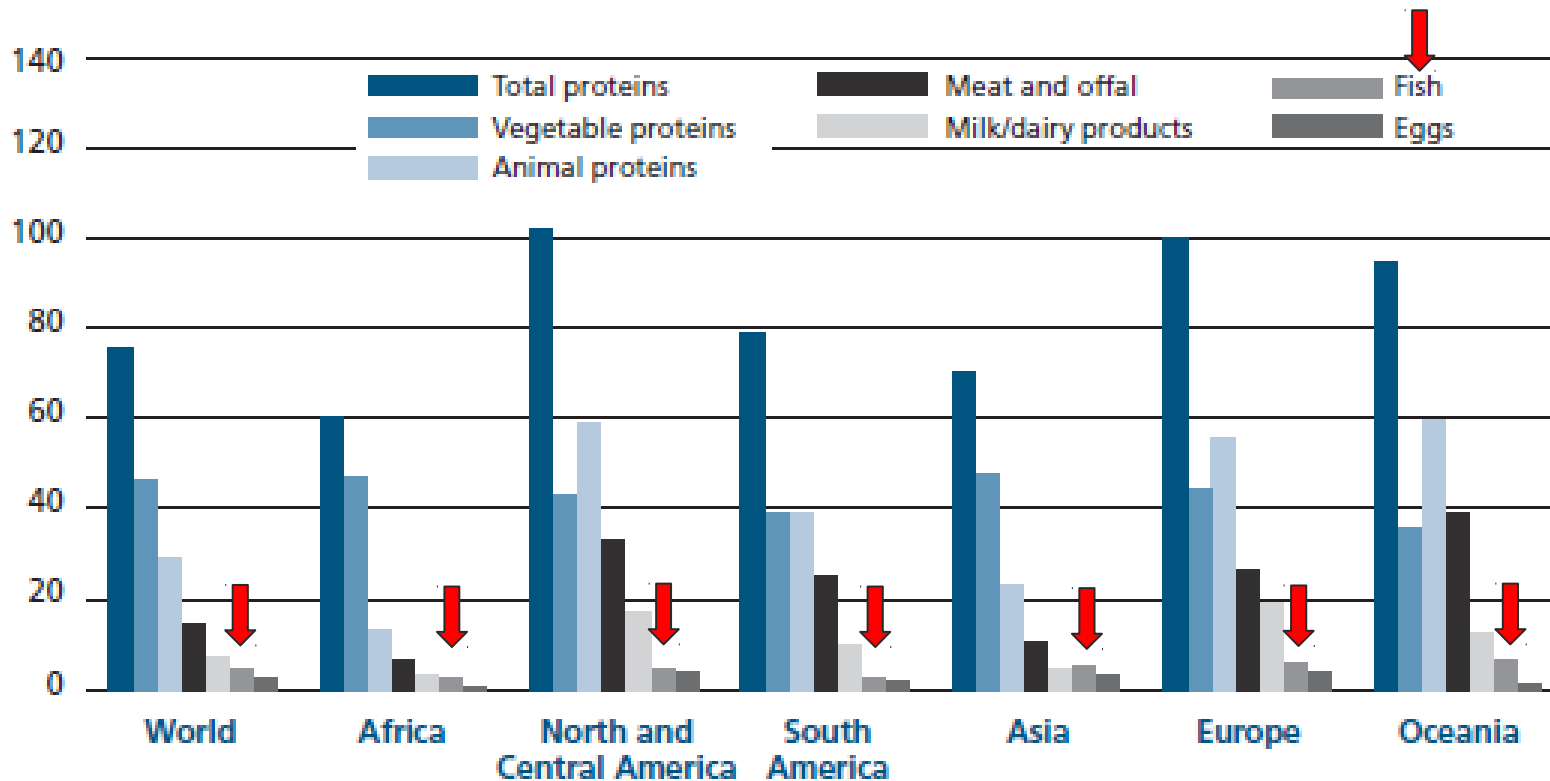


FAO 2008

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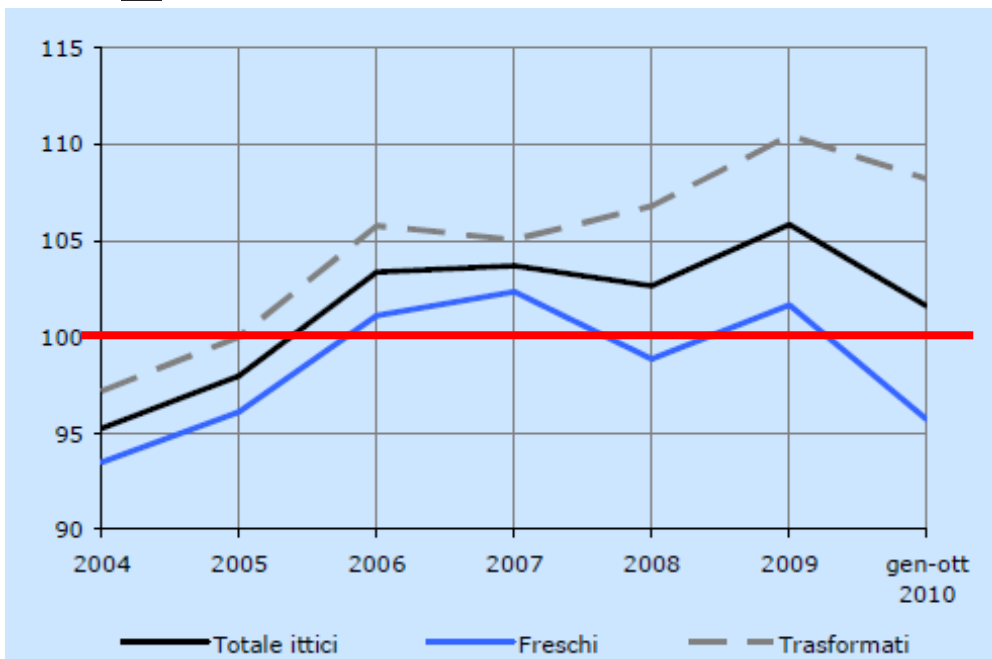
Total protein supply by continent and major food group (2003–05 average)

g/capita per day



Variazioni % delle Quantità acquistate dalle Famiglie in Italia

(Indici concatenati 2000 = 100)



Fonte :
ISMEA
Il Settore Ittico in Italia
Check-up 2010

Prodotti	Var. % gen-ott		Var. %	T.v.m.a.
	10/09	09/08	09/08	04-09
Prodotti freschi ¹	-5,5	3,8	2,9	2,0
Prodotti trasformati ²	0,5	3,0	3,4	2,7
Totale prodotti ittici	-2,6	3,4	3,1	2,3
Totale agroalimentare	-0,5	0,4	0,5	0,8

Fish dependence day

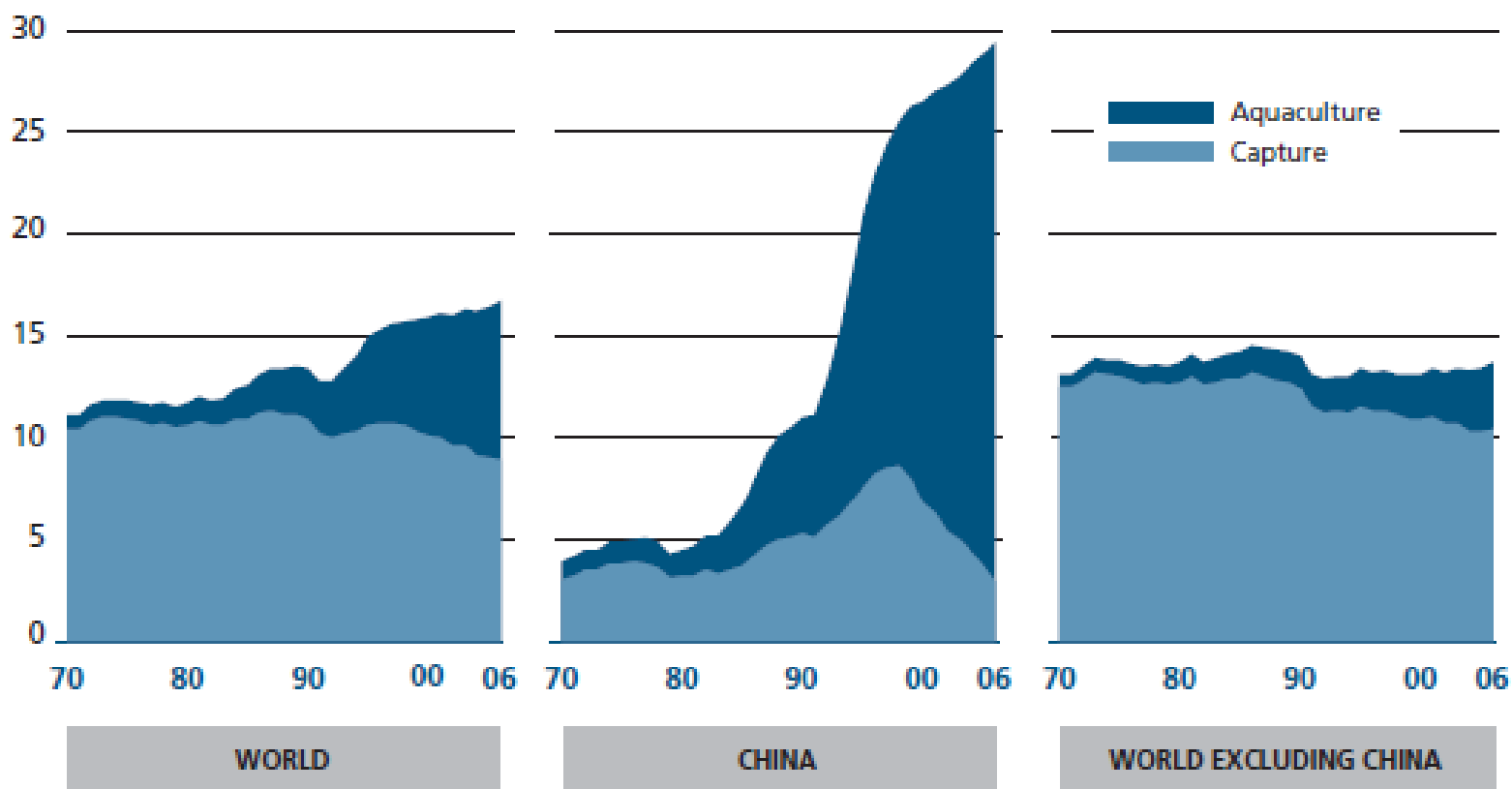
Autosufficienza Ittica = $\frac{\text{Produzione Nazionale}}{\text{Domanda Nazionale}}$

	1990	1995	2000	2005	2006	2007
EU27	-	-	4 Aug	25 July	9 July	2 July
EU15	2 Sep	2 Sep	3 Aug	24 July	9 July	3 July
Belgium	-	-	28 Feb	20 Mar	15 Apr	17 Mar
Bulgaria	-	-	27 May	27 Mar	08 Apr	27 May
Czech Republic	-	-	25 Apr	25 Apr	09 May	30 Apr
Denmark	>1 year	>1 year	31 Dec	7 Nov	15 Oct	14 Aug
Germany	30 Apr	18 Apr	13 Apr	3 June	05 May	27 Apr
Estonia	-	-	>1 year	>1 year	>1 year	>1 year
Ireland	>1 year	>1 year	>1 year	>1 year	>1 year	>1 year
Greece	20 Aug	4 Sep	29 Aug	6 Aug	28 Aug	7 Aug
Spain	18 June	26 May	28 May	6 May	10 May	8 May
France	6 Sep	26 July	25 July	20 June	20 June	13 June
Italy	29 June	22 June	24 May	5 May	6 May	30 Apr

Allevato / Pescato

FAO 2008

Fishery food supply (kg/capita)

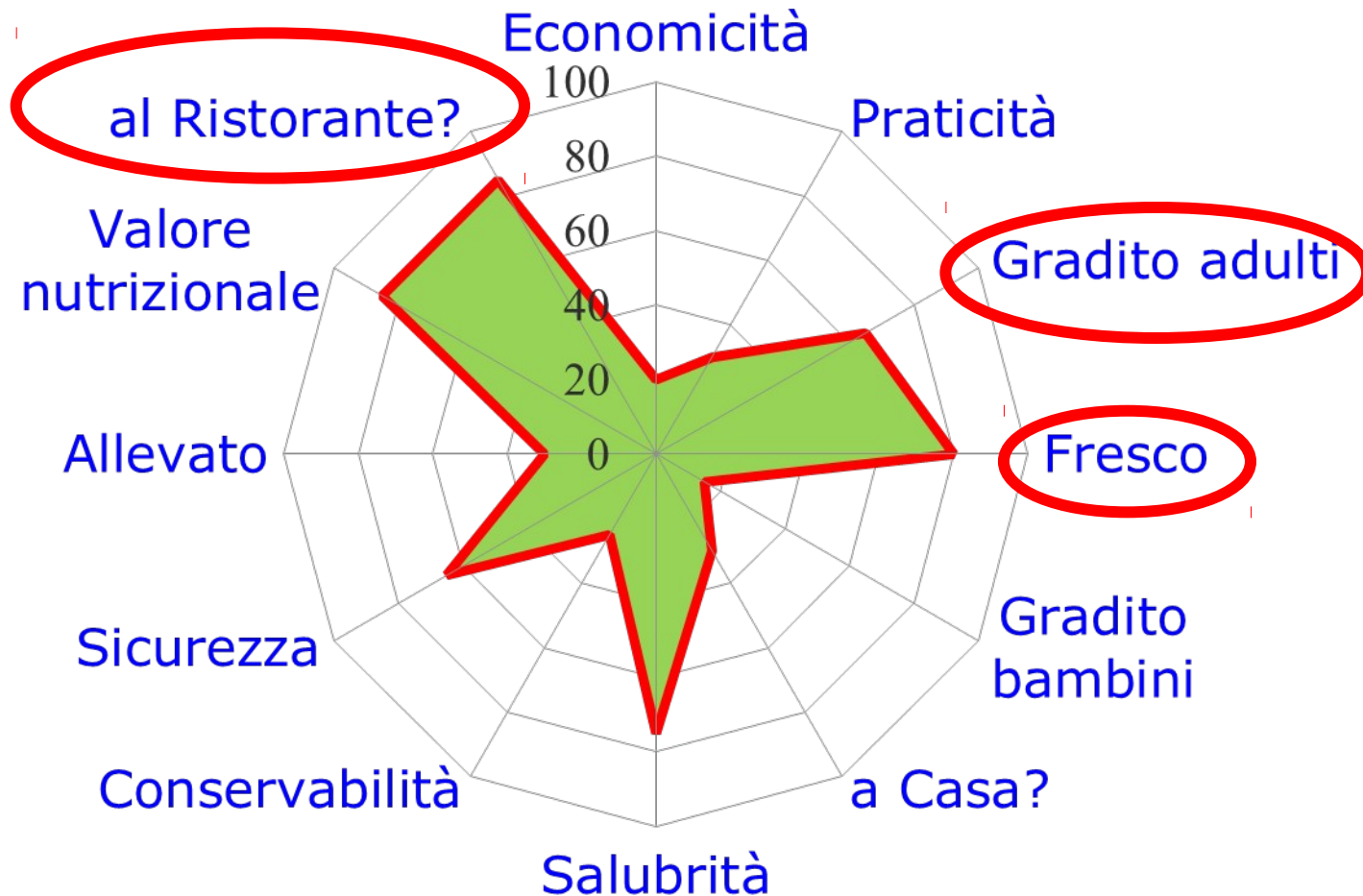


Dieta italiana: Aderenza allo Stile Mediterraneo (Food Balance Sheets)

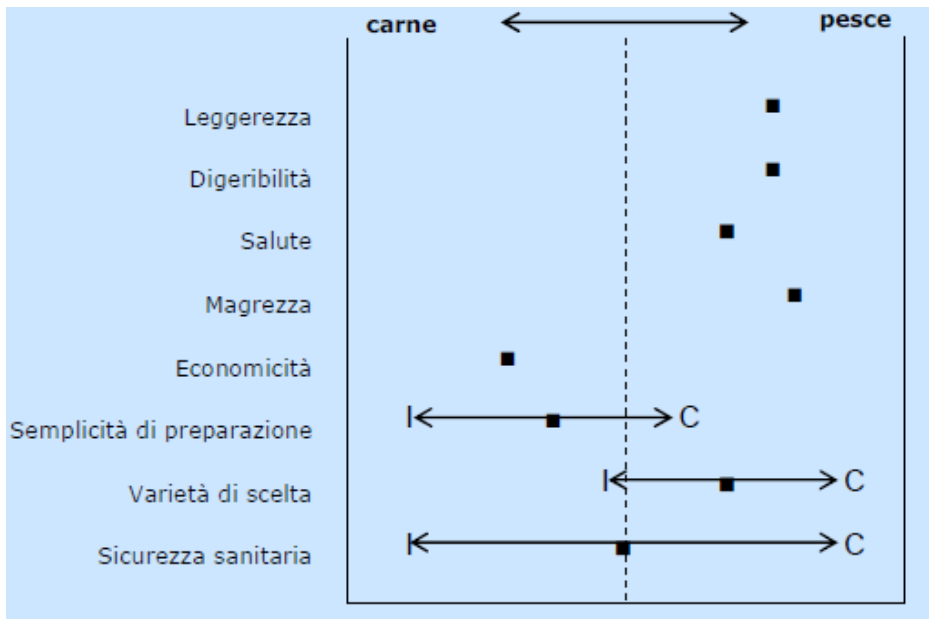
	1961	1965	1975	1985	1995	1997	2000
Pesce (g/die)	41	45	38	59	64	64	67
Carne (g/die)	84	111	169	216	229	233	252
Olio di oliva (ml/die)	25	27	31	31	33	33	39
Frutta e verdura (g/die)	620	720	763	788	812	800	894
Legumi (g/die)	13	16	10	10	14	15	16
Cereali (g/die)	489	488	491	433	431	436	439
Latte e derivati (g/die)	396	415	550	752	647	695	725
Ac. Grassi saturi (% E)	6	6,5	7,5	9,2	9,5	9,3	10,1
Monoinsaturi/Saturi	1,8	1,8	1,7	1,5	1,6	1,6	1,6
Aderenza	5	4	4	3	3	3	3



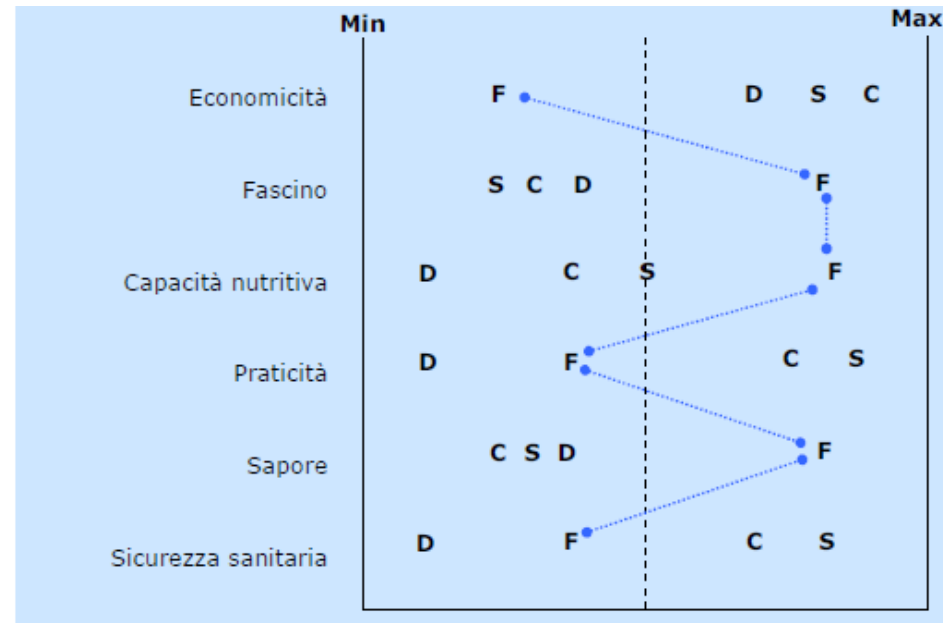
Indagine ISMEA 2009



Indagine ISMEA 2009



Legenda: "C" sono le zone costiere, "I" sono le zone interne.

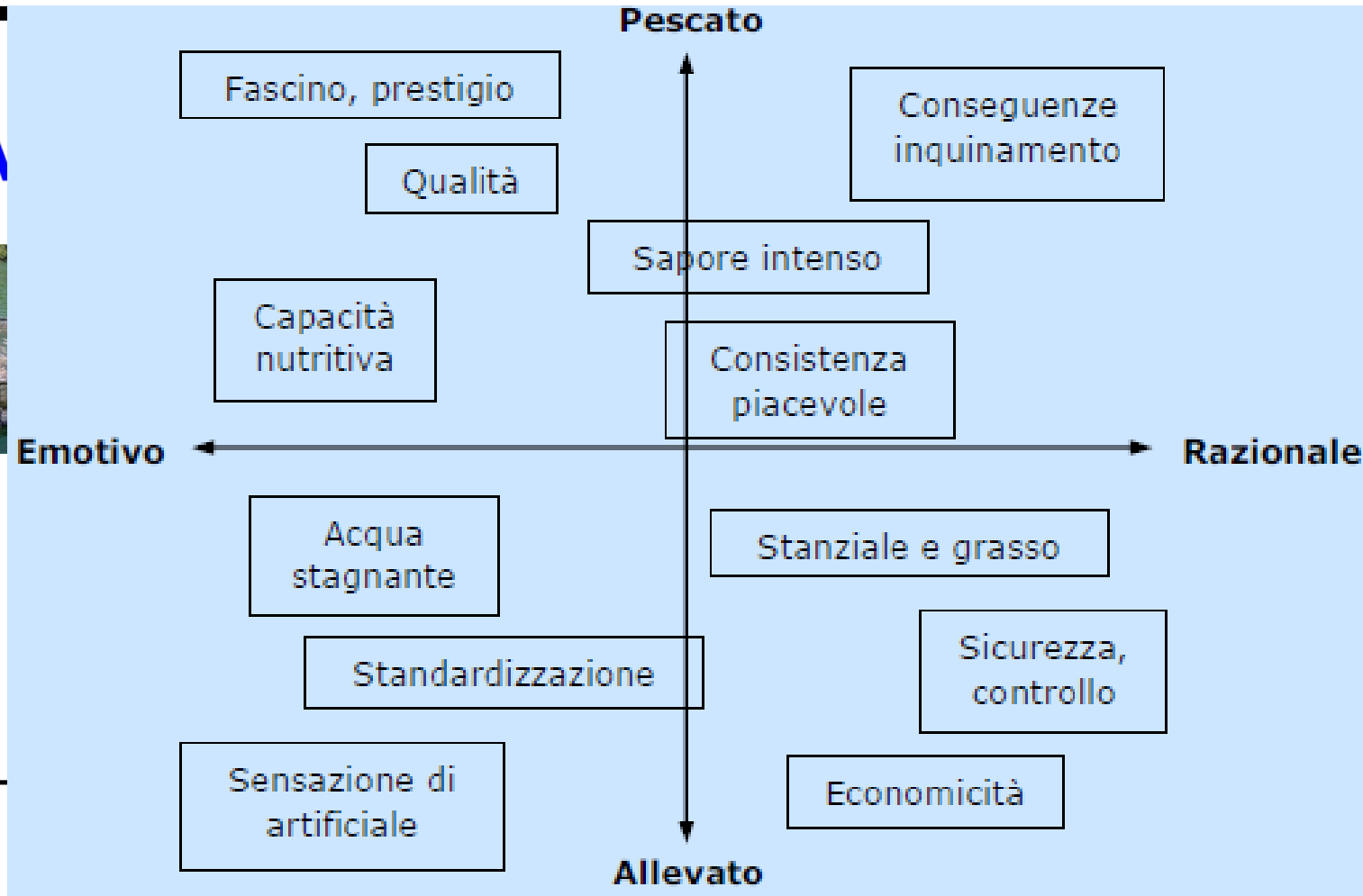


Legenda: "F" fresco. "C" congelato. "D" decongelato. "S" suraelato.

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Quali pesci pigliare ...!

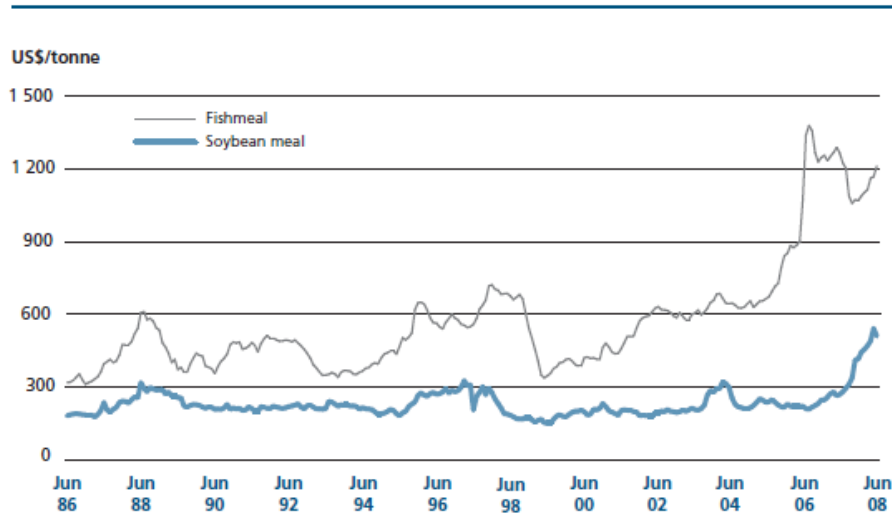


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Economicità

Fishmeal and soybean meal prices in Germany and the Netherlands

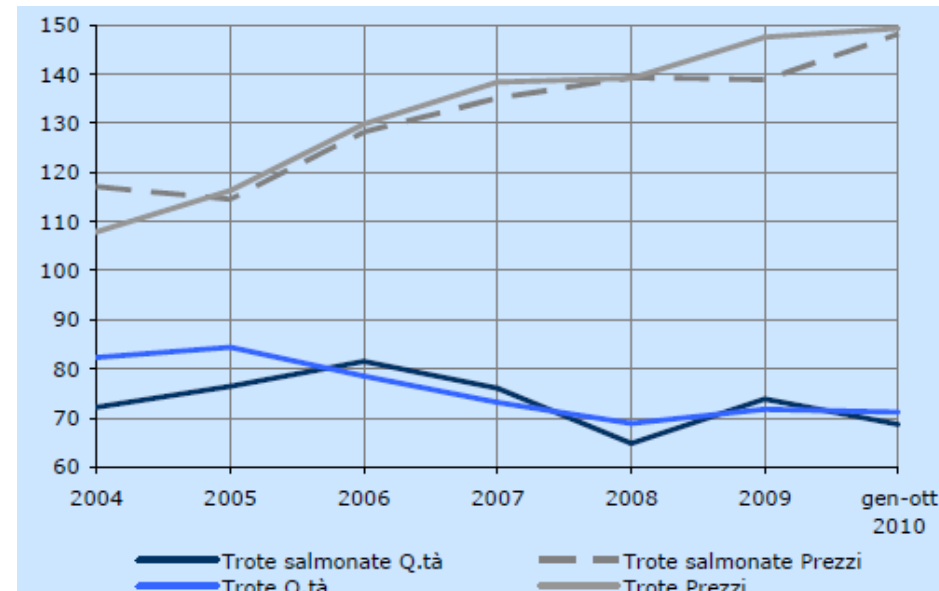


Note: Data refer to c.i.f. prices.
 Fishmeal: all origins, 64–65 percent, Hamburg, Germany.
 Soybean meal: 44 percent, Rotterdam, Netherlands.

Source: Oil World; FAO GLOBEFISH.

FAO 2008

Fonte ISMEA 2010



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Composizione ... del pesce

Nutrienti	g/ 100 g di parte edibile	
	Pesce	Carne bovina
Acqua	66 -84	75
Proteine	15 -24	21,5
Lipidi	0,1 - 22	3,4
Carboidrati	<1	<1

Proteine del pesce:

- | | | | |
|---|-----------------------|--------|----------------|
| <input checked="" type="checkbox"/> di sostegno | → Collagene | 3 % | delle proteine |
| <input checked="" type="checkbox"/> fibrillari | → Actina, Miosina ... | 67 % | delle proteine |
| <input checked="" type="checkbox"/> globulari | → Mioglobina ... | ~ 30 % | delle proteine |
- Collagene nella carne $\geq 5,3\%$ delle proteine



Aminoacidi essenziali

Aminoacidi	g/ 100 g di parte edibile	
	Pesce	Carne bovina
Arginina	6.59	6.31
Istidina	2.94	3.92
Isoleucina	4.69	4.39
Leucina	8.53	8.53
Lisina	10.2	9.17
Metionina + Cisteina	3.38 + 1.17	2.94 + 1.06
Fenilalanina	5.06	4.09
Triptofano	1.12	1.11
Tirosina	3.92	3.45
Treonina	5.17	4.18
Valina	5.23	4.78

ALIMENTI	Arg	Ist	Iso	Leu	Lis	Met	Fen	Tre	Tri	Val
Uovo intero	6,4	2,1	8	9,2	7,2	4,1	6,3	4,9	1,5	7,3
Albume d'uovo (bianco)	5,8	2,2	-	-	6,5	4,4	5,5	4,1	1,6	-
Tuorlo d'uovo (giallo)	8,2	2,6	8	9,2	5,5	3,6	5,7	3,6	1,6	7,3
Carne (media)	7,2	1,9	6,3	8	7,6	3,2	4,5	5,3	1,2	5,8
Pesce (media)	7,4	2,2	6	7,1	7,8	3,2	4,8	5,1	1,3	5,8
Fegato	6,6	3,1	5,4	8,4	6,7	3,2	6,1	4,8	1,8	6,2
Latte di mucca	4,3	2,6	6,2	11,3	7,5	3,3	5,3	4,6	1,6	6,6
Latte umano	6,8	2,8	7,5	10,5	7,2	2,5	5,9	4,5	1,9	8,8
Cervello	6,6	2,6	3,6	13,4	6,2	3	4,9	5,8	1,3	4,9
Proteine del siero ultrafilt.	2,9	2	6,2	11,8	10,1	2,1	3,9	7,5	2,1	6,4
Caseina	4,1	2,5	6,5	12,2	6,9	3,5	5,2	3,9	1,8	7,0
Avena	7,4	2,2	4,2	18	3	1	3	3,6	1,3	5,3
Riso	8,7	2,3	5,1	6,2	2,8	1,4	4,6	3,6	1,3	6,3
Grano	4,5	2	3,6	7,7	2,5	1	3,8	3	1,4	4,1
Orzo	4,5	1,8	3,8	6,8	2,4	1	5,7	3,6	1,1	5,1

Lipidi

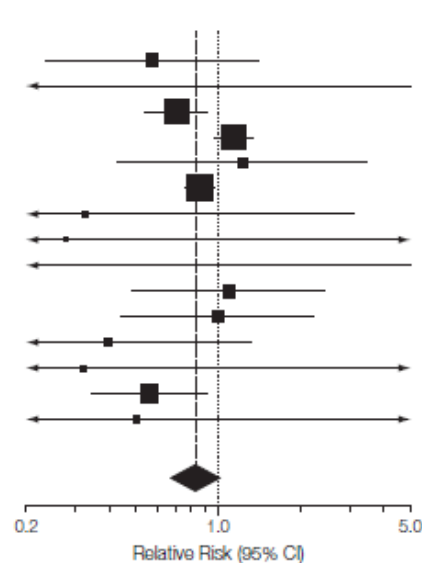
Alimenti	g Grasso x 100 g di alimento	Peso porzione g	Contenuto per porzione		
			Grasso Totale g	A. Grassi saturi g	Colesterolo mg
Burro	83,4	10	8,3	4,9	25
Carne di bovino (girello)	2,8	70	1,9	0,6	42
Carne di maiale (bistecca)	8,0	70	5,6	2,5	43
Acciuga o alici	2,6	100	2,6	1,3	61
Merluzzo o nasello	0,3	100	0,3	0,1	50



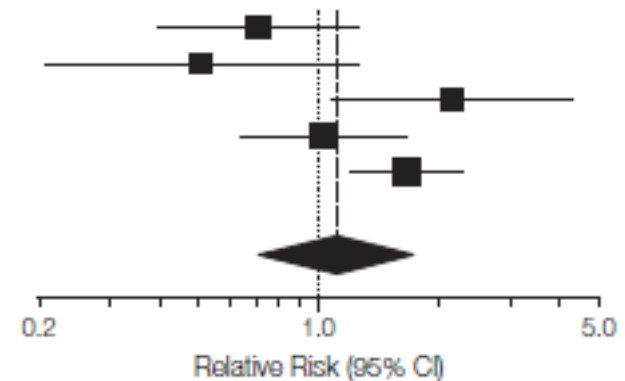
Pesce	Mercurio /100 g	Omega 3 /100 g
Pesce Spada	0.98 g	1.39 g
Tonno	0.38 g	0.36 g
Anguilla	0.19 g	3.6 g
Polpo	0.11 g	0.4 g
Merluzzo	0.11 g	0.11 g
Trota	0.07 g	0.75 g
Sgombro	0.05 g	2.1 g
Salmone	0.05 g	2.2 g
Sardina	0.02 g	4.7 g
Spigola o Branzino	0.01 g	0.3 g

Pesce, inquinanti e rischio CHD

Source	% Weight	Relative Risk (95% CI)
Brouwer et al, ⁵² 2006	3.9	0.57 (0.24-1.38)
Brox et al, ⁵⁷ 2001	0.3	0.17 (0.01-4.05)
Burr et al, ³ 1989	18.7	0.71 (0.55-0.92)
Burr et al, ⁵¹ 2003	24.4	1.15 (0.99-1.34)
Eritsland et al, ⁵⁸ 1996	2.9	1.23 (0.43-3.51)
Gruppo Italiano, ⁹ 1999	26.0	0.86 (0.76-0.97)
Johansen et al, ⁵⁹ 1999	0.7	0.33 (0.03-3.18)
Kaul et al, ⁶⁰ 1992	0.3	0.28 (0.01-6.78)
Leaf et al, ⁶¹ 1994	0.4	0.20 (0.01-4.18)
Leaf et al, ⁶¹ 2005	4.6	1.09 (0.49-2.46)
Nilsen et al, ⁶² 2001	4.6	1.00 (0.45-2.24)
Raitt et al, ⁶⁰ 2005	2.3	0.40 (0.12-1.32)
Sacks et al, ⁵⁵ 1995	0.3	0.32 (0.01-7.57)
Singh et al, ⁶³ 1997	9.9	0.56 (0.34-0.91)
von Schacky et al, ⁵⁷ 1999	0.6	0.50 (0.05-5.39)
Overall	100.0	0.83 (0.68-1.00)



Source	Study Design	No. of Events	Relative Risk (95% CI)
Ahloqist et al, ¹⁴⁴ 1999	Prospective	87	0.71 (0.4-1.26)
Hallgren et al, ¹⁴⁵ 2001	Prospective	78	0.51 (0.21-1.24)
Guallar et al, ¹⁴⁶ 2002	Retrospective	684	2.16 (1.09-4.29)
Yoshizawa et al, ¹⁴⁷ 2002	Prospective	470	1.03 (0.65-1.65)
Virtanen et al, ¹⁴⁸ 2005	Prospective	282	1.66 (1.2-2.29)
Overall			1.12 (0.71-1.75)



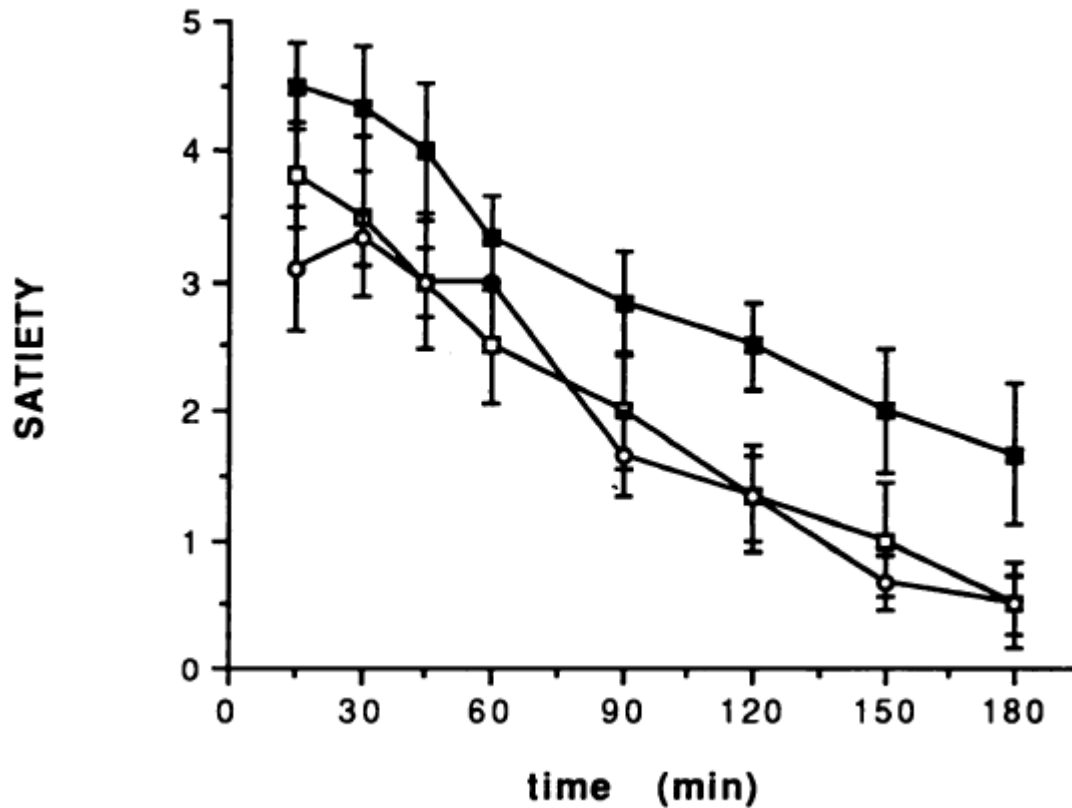
D. Mozaffarian e Eric B. Rimm, JAMA. 2006

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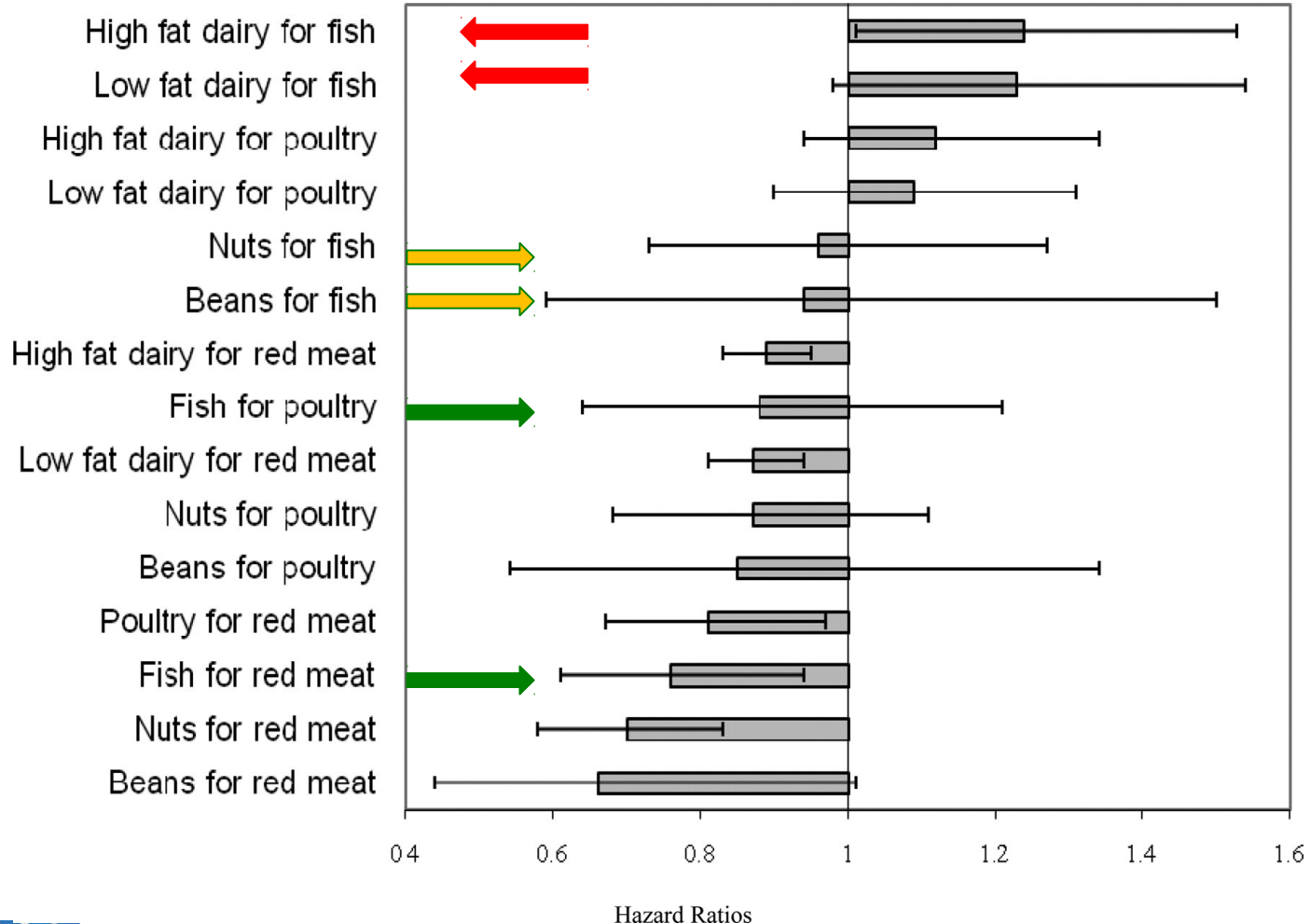
Pesce	Parte edibile	kcal	Proteine g	Grassi g	Ferro mg	Calcio mg	Vitamina C mg
Sgombro	80 g	168	17	11,1	1,2	38	2
Tonno	90 g	158	21	8	1,3	38	2
P spada	90 g	121	20	4			
Acciughe	75 g	96	16	2,6	2,8	148	
Sardina	70 g	129	20	4,5	1,8	33	2
Bovino adulto (lombata)	78 g	134	21.8	5.2	1.4	4	0
Tacchino (fesa senza pelle)	100 g	107	18.0	4.6	0.8	8	0

Sazietà

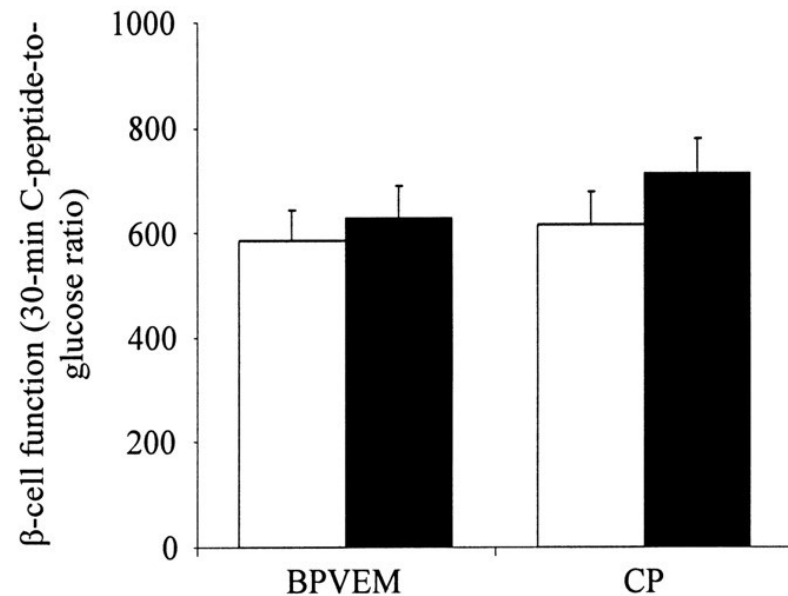
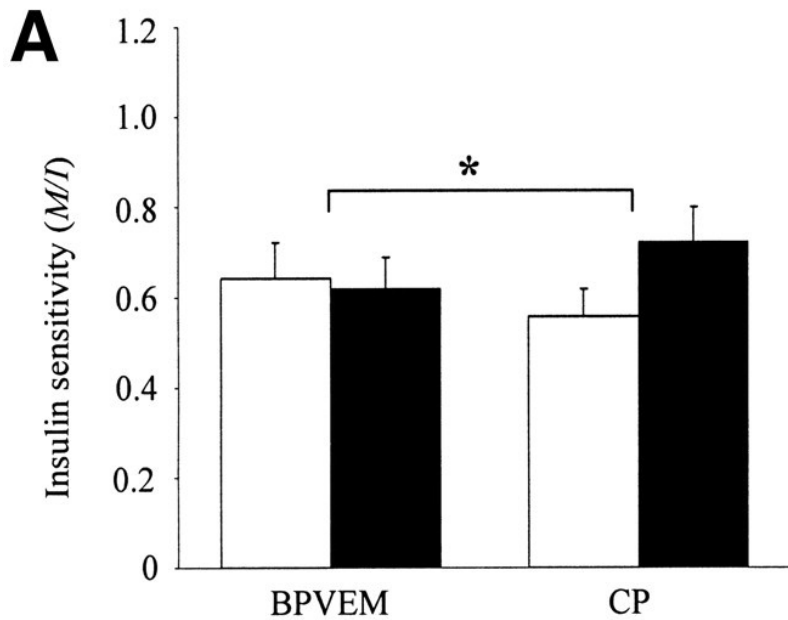


Satiety after meals of 50 g of protein in the form of fish (■) beef (□) and chicken (○)

Sostituzione di proteine... & CHD



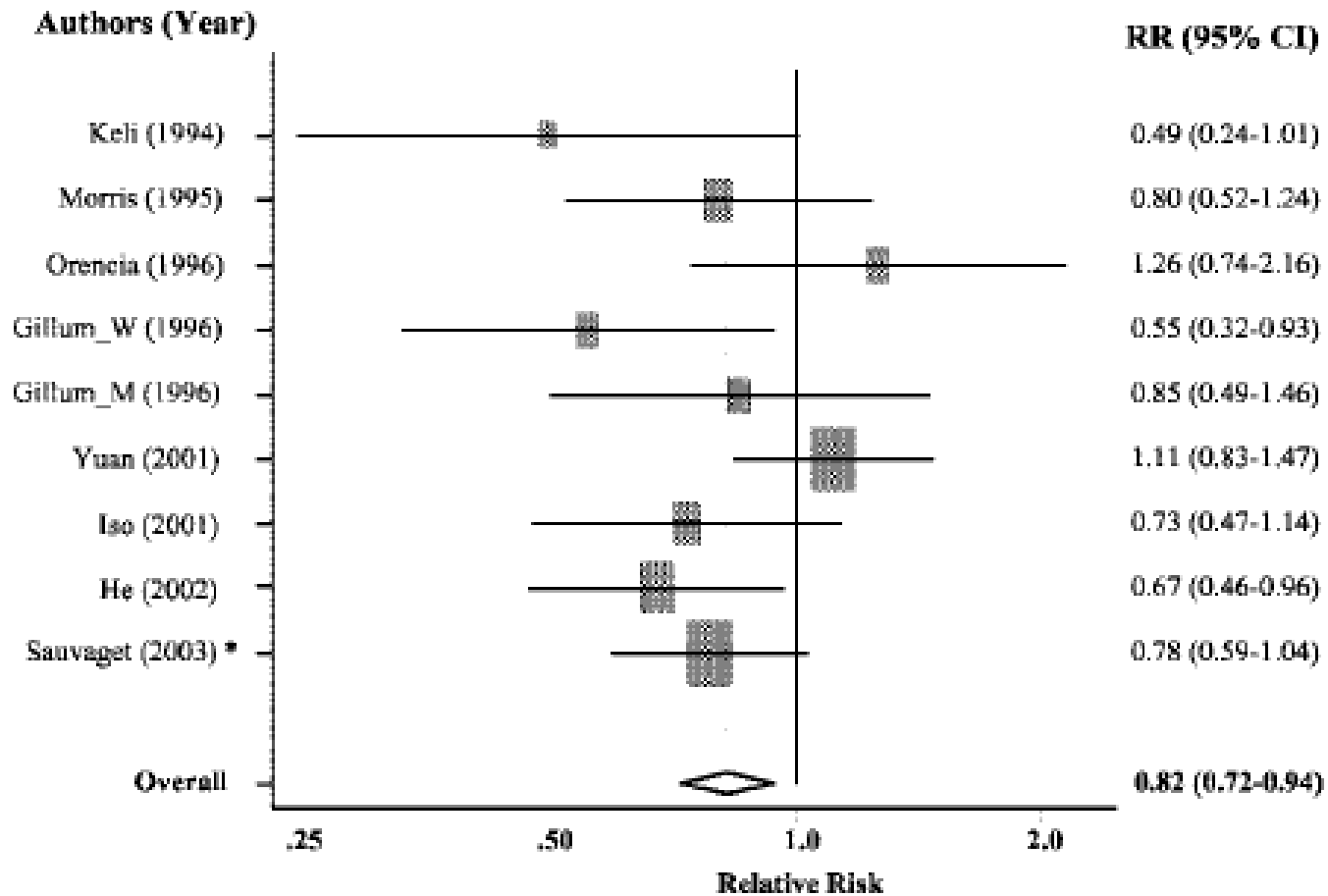
Proteine di merluzzo / insulino sensibilità



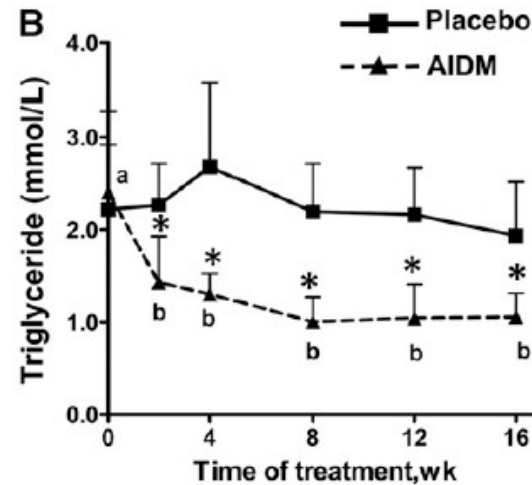
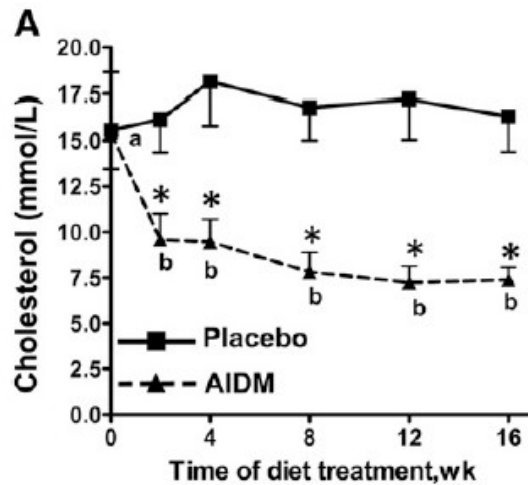
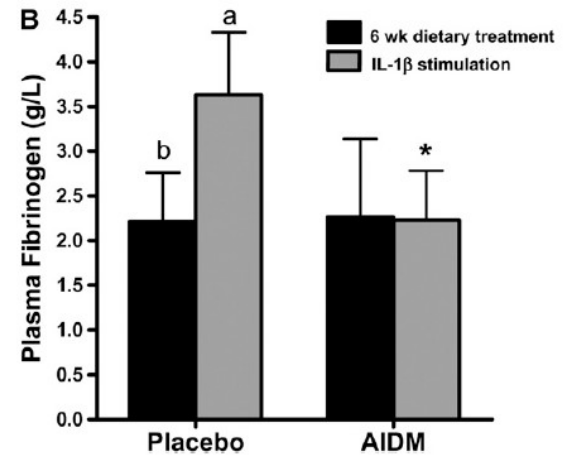
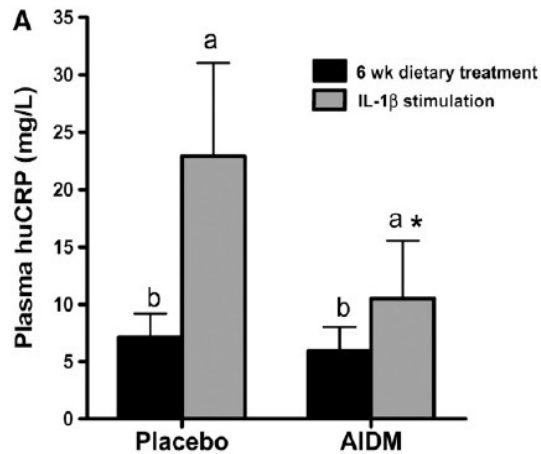
Ouellet V et al. Diabetes Care 2007



Pesce e Stroke



Antiinflammatory Dietary Mixture



Consumo di Pesce e Storia di CVD

«Cross sectional consumer survey»

	Belgium			Denmark			The Netherlands			Poland			Spain		
	CVD+	CVD-	p	CVD+	CVD-	p	CVD+	CVD-	p	CVD+	CVD-	p	CVD+	CVD-	p
	(n = 90) 10.5%	(n = 762) 89.5%		(n = 45) 4.0%	(n = 1065) 96.0%		(n = 88) 10.9%	(n = 721) 89.1%		(n = 87) 8.6%	(n = 928) 91.4%		(n = 41) 4.1%	(n = 959) 95.9%	
Total fish (≥ 1/ week)	67.8	50.1	.002	80.0	47.6	< .001	37.5	37.7	.967	54.0	54.8	.882	92.7	88.6	.421
Total fish (≥ 2/ week)	33.3	20.7	.006	46.7	24.0	.001	26.1	16.8	.030	24.1	22.7	.766	82.9	71.1	.101
Fatty fish (≥ 1/ week)	23.3	13.0	.008	42.2	32.6	.178	22.7	20.9	.699	47.1	41.9	.347	24.4	27.0	.711

Z.Pieniak et al. BMC Public Health 2008

Punti di forza

- ✓ ↑ *Grassi Insaturi, ma Non* !!!
- ✓ ↑ *Protein*
- ✓ Maggiore consapevolezza
- ✓ Maggiore conoscenza
- ✓ Maggiore informazione corretta
- ✓ ↓ *Masticabilità*
- ✓ ↓ *Livello calorico*



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Grazie

