

# Whey protein and muscle function in sport

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Lifestyle Ingredients, Volac Ltd.



volac 

# About me

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**2007-2010**  
BSc Sport and  
Exercise Science



**2010-2011**  
MSc Sport and  
Exercise Nutrition





**volac**   
**2011-current**  
Nutritionist



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**volac** 



-  Independent privately owned company
  -  Providing nutrition out of dairy for over 40 years
  -  Over 10 years experience in sports nutrition
- 
- A thick, curved purple line that starts at the bottom left and sweeps upwards towards the bottom right, framing the content area.

In Europe

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Orwell



The Netherlands



Wales



# volac

## Agriculture



Milk replacers  
Animal health  
Feed supplements  
Forage  
Feeding equipment

## Lifestyle ingredients



Whey proteins for  
sports nutrition

## Dairy ingredients



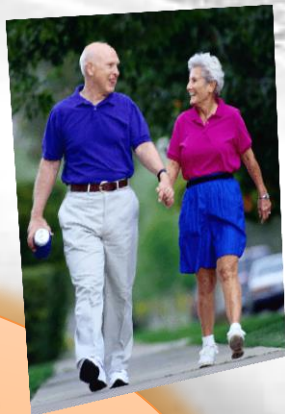
Food and feed  
ingredients whey  
permeate and  
lactose



Peak sports  
performance



Health and  
wellness



Independent  
living



Quality of life

# Trends in sports nutrition

Muscle  
mass  
rebuild

Energy  
and  
endurance

Health  
and  
fitness

Young  
athletes  
and adults

Everybody

Source: Euromonitor International, 2011.

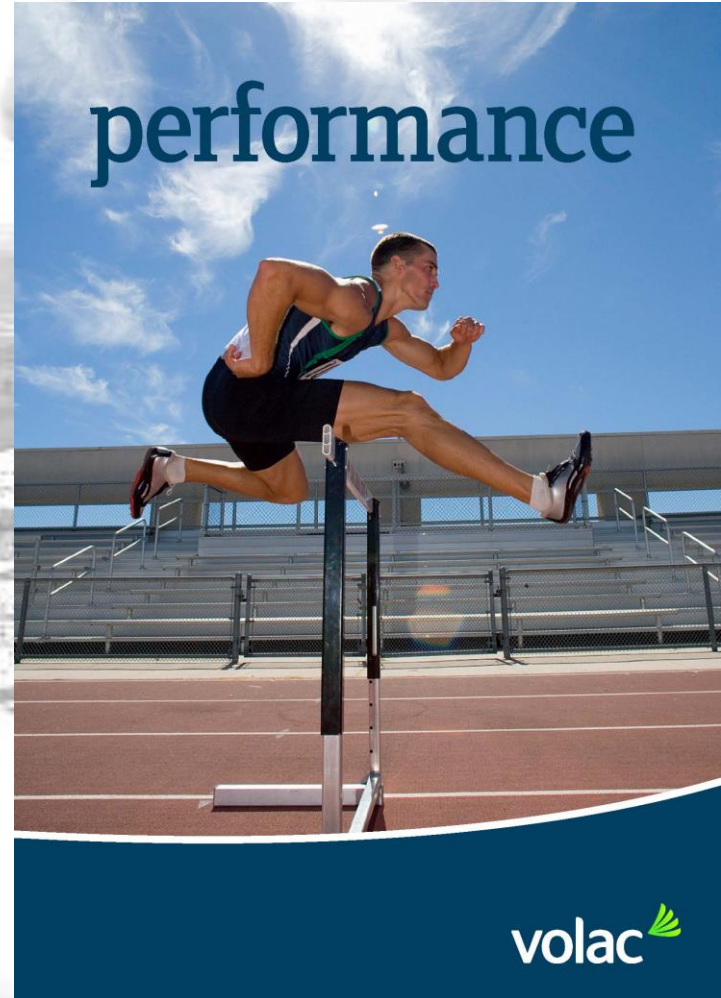
# Today we'll cover...

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- Whey protein and muscle reconditioning
- The role of protein quality
- Current experts opinions
- The future: healthy and active lifestyle



# Protein and muscle reconditioning



# Protein and muscle reconditioning

Recondition:  
synthesis of new muscle protein



1.2-2.0g protein/kg bw/day

Timing of intake

Around exercise

Optimal quantity

20-30g protein

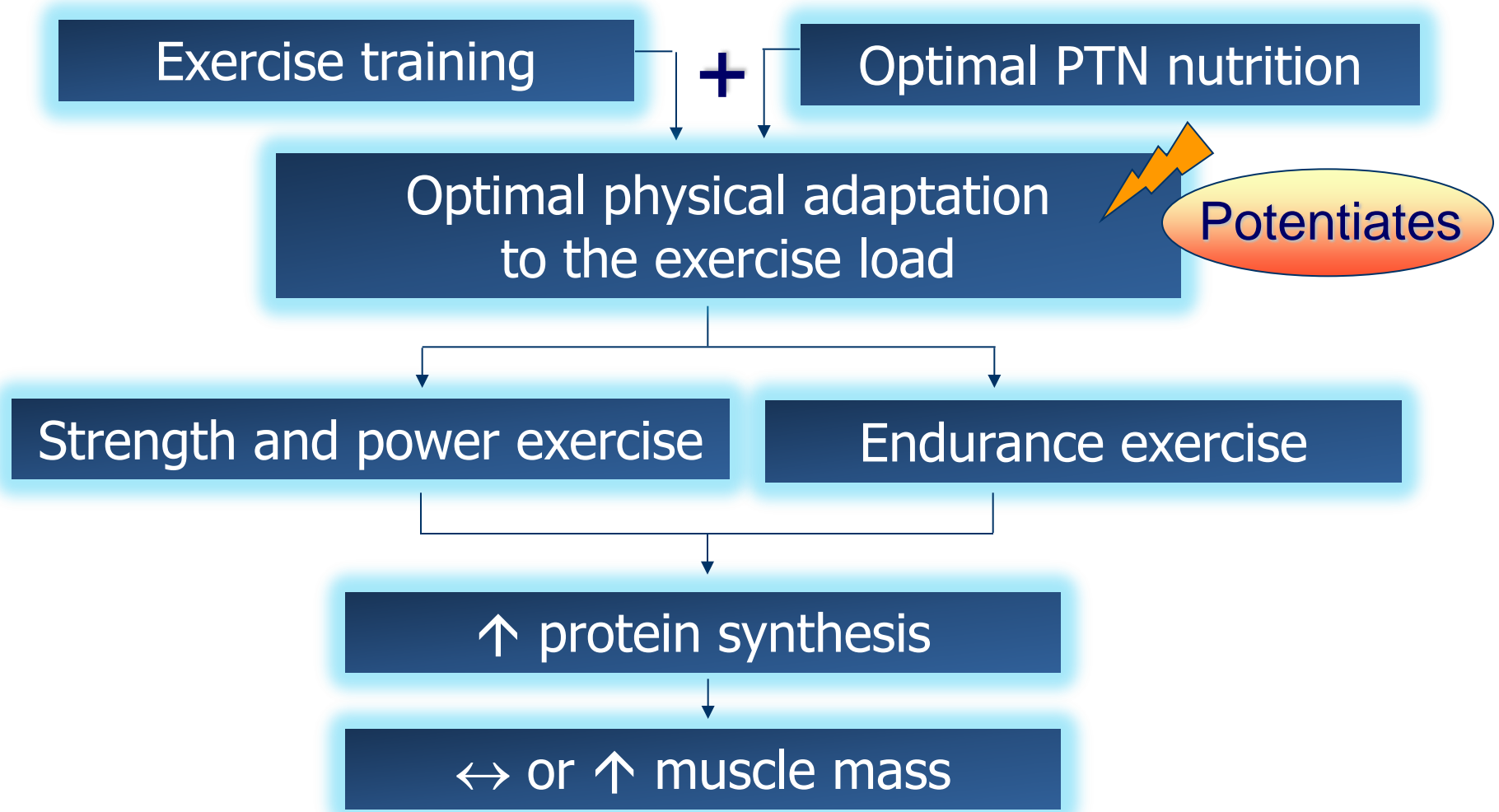
Quality

EAA's, Leucine,  
bioavailability

Layman, 2009; Wackerhage and Ratkevicius, 2008; Mekata *et al.*, 2008; Phillips *et al.*, 2008 and 2007; Hawley *et al.*, 2007; Gibala *et al.*, 2007; Burke *et al.*, 2004

# Protein and muscle reconditioning

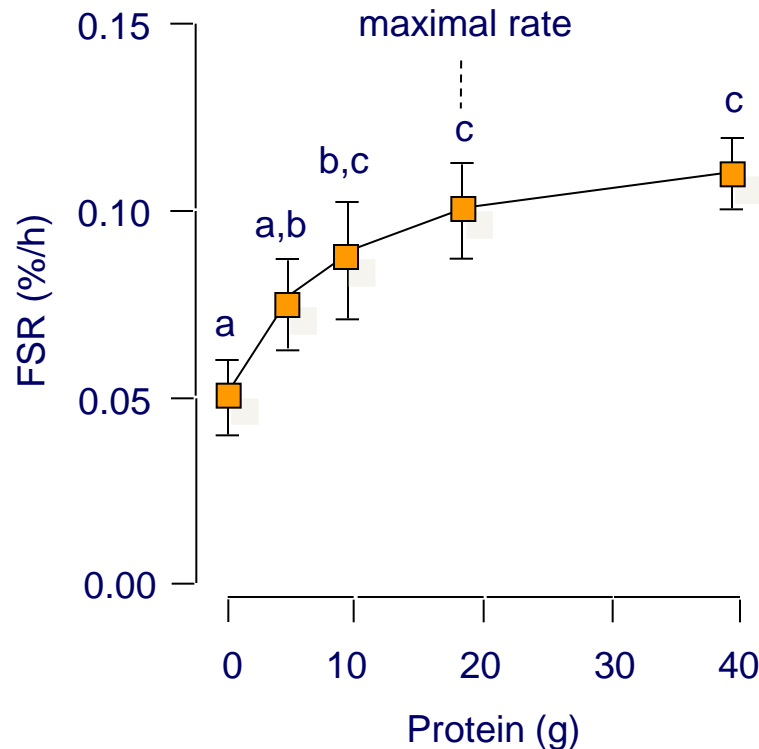
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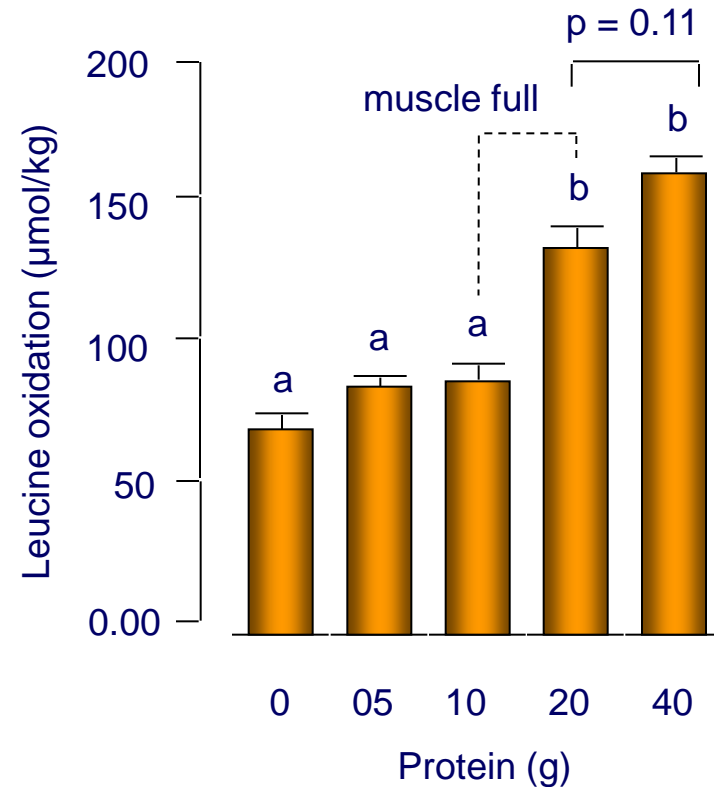
# Protein and muscle reconditioning

## Protein quantity

- Dose-response for protein (egg) as well as pure EAAs:



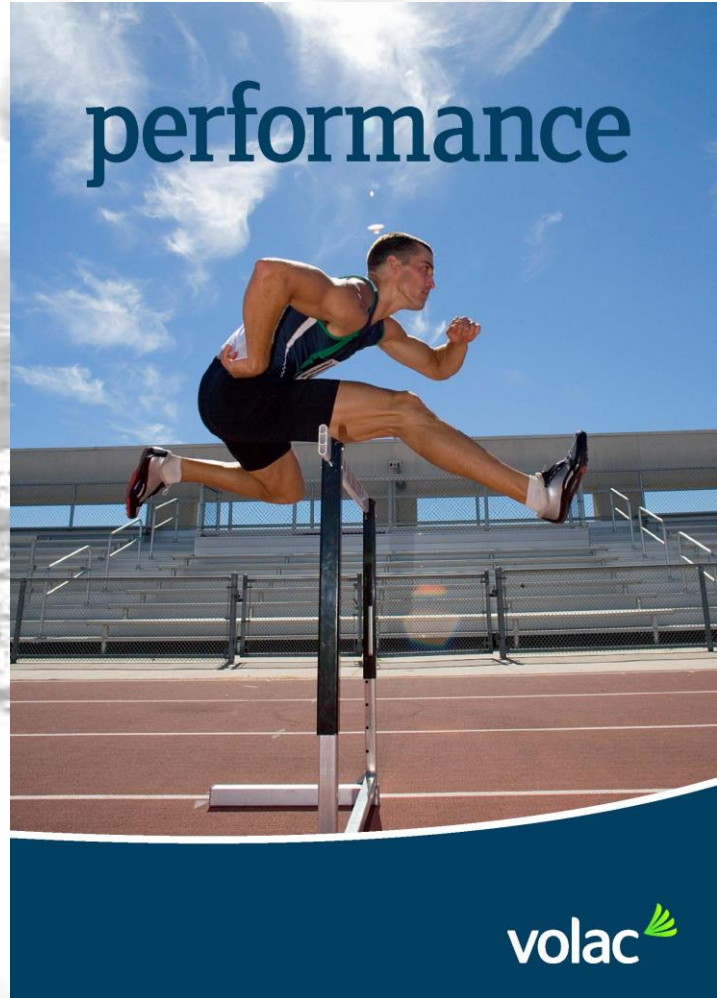
- Leucine oxidation:





# The role of protein quality

performance



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# The role of protein quality

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## Protein quality

Composition of EAAs

Bioavailability of AAs

Protein quality  
(PDCAAs, WHO/FAO/UNU, 1991; 2007)

# The role of protein quality

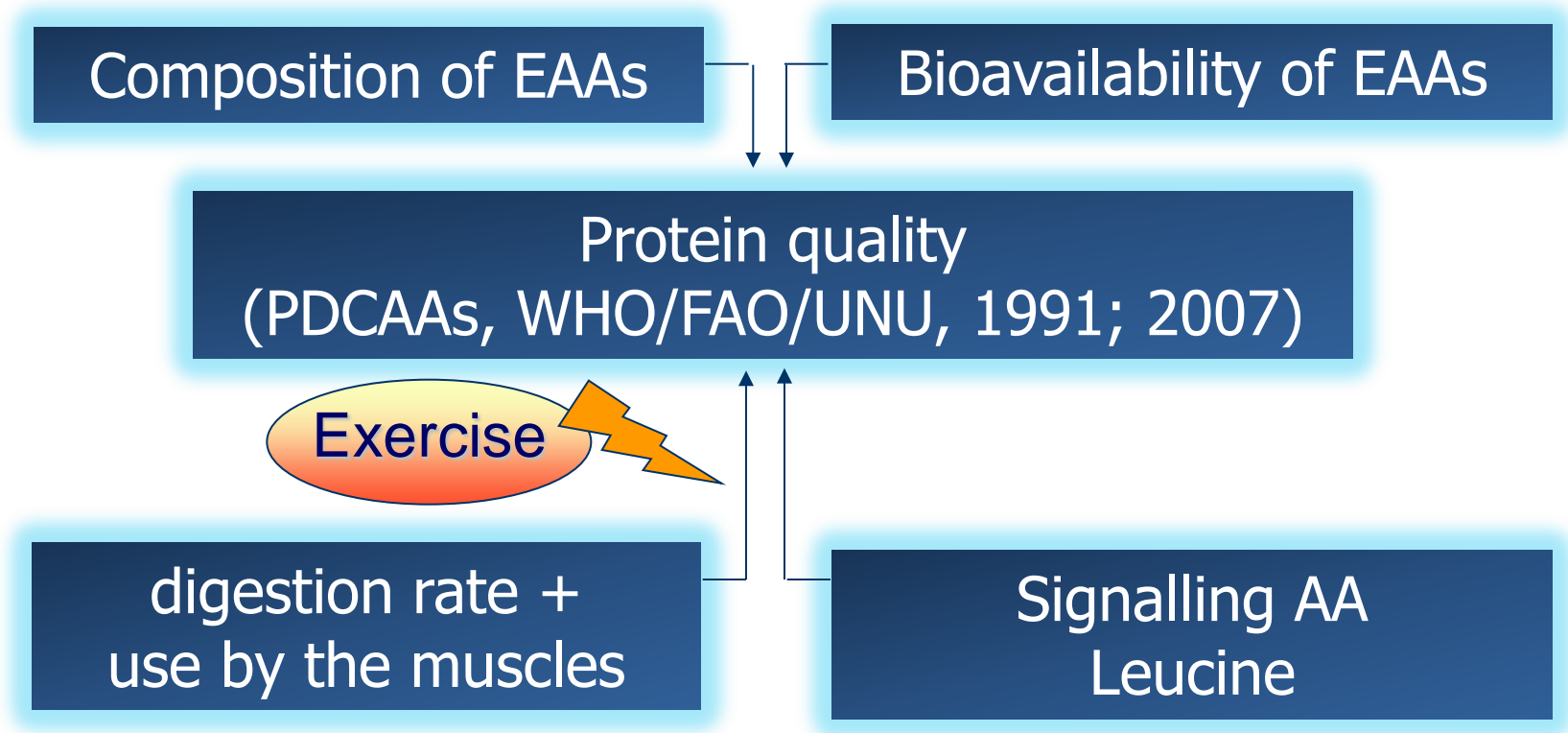
	Protein Efficiency Ratio	Biological Value	Net Protein Utilisation	PDCAAS*
Whey Protein	3.2	104	92	1.00
Casein	2.5	77	76	1.00
Milk	2.5	91	82	1.00
Egg	3.9	100	94	1.00
Soy protein	2.2	74	61	1.00
Beef	2.9	80	73	0.92
Wheat Gluten	0.8	64	67	0.25

\* The highest score is 1.0, which means that after digestion, the protein provides 100% or more of the indispensable amino acids required. Scores are truncated to 1.0. **Whey protein non-truncated score is 1.15.**

# The role of protein quality

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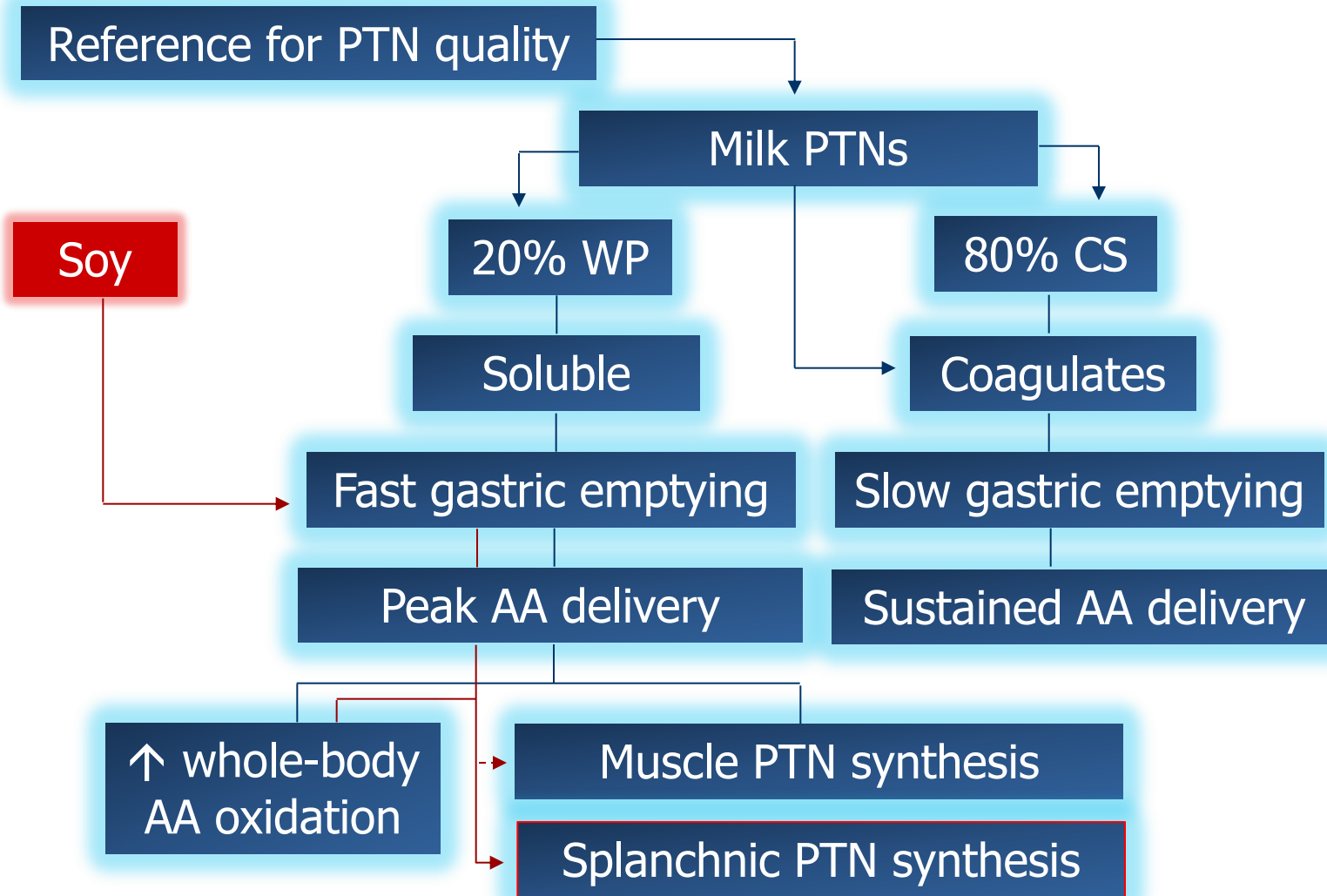
## Protein quality



Phillips *et al.*, 2007; Rennie *et al.*, 2006; Blomstrand *et al.*, 2006; Dangin *et al.*, 2001; Nair *et al.*, 1992.



# The role of protein quality



Bilsborough and Mann, 2006; Lacroix *et al.*, 2006; Phillips *et al.*, 2005; Bos *et al.*, 2003 and 2000.

Current  
experts  
opinions



“Foods or snacks that contain high-quality proteins should be consumed regularly throughout the day as part of the day’s total protein intake and in particular soon after exercise, in quantities sufficient to maximise the synthesis of proteins to aid in long-term maintenance or gain of muscle and bone and in the repair of damaged tissues”.

<http://www.olympic.org/Documents/Reports/EN/CONSENSUS-FINAL-v8-en.pdf>

(27<sup>th</sup> October 2010)

“Ingestion of foods or drinks providing 15-25 g of such protein after each training session will maximise the synthesis of proteins that underpins these goals”.

<http://www.olympic.org/Documents/Reports/EN/CONSENSUS-FINAL-v8-en.pdf>

(27<sup>th</sup> October 2010)



# Nutrition and Health Claims Regulation



The screenshot shows the European Commission website. At the top is the European Union flag and the title 'Food Safety - From the Farm to the Fork'. Below this is a navigation bar with links: 'EUROPA > European Commission > DG Health and Consumers > Overview > Food and Feed Safety'. To the right of this bar is a 'Site Map | V' link. Below the navigation bar is a horizontal menu with links: 'General Food Law', 'Animal Nutrition', 'Labelling & Nutrition', 'Biotechnology', 'Novel Food', 'Chemical Safety', 'Biological Safety', and 'Official controls'. The main content area has a sub-header 'Health & Nutrition Claims'. The text in this section states: 'In December 2006, the Regulation on nutrition and health claims made on foods was adopted by the Council and Parliament. For the first time, this Regulation lays down harmonised rules across the European Union for the use of nutrition claims such as "low fat", "high fibre" or health claims such as "reducing blood cholesterol".' It continues: 'This Regulation foresees implementing measures to ensure that any claim made on foods' labelling, presentation or marketing in the European Union is clear, accurate and based on evidence accepted by the whole scientific community. Consequently foods bearing claims that could mislead consumers will be eliminated from the market. In addition, in order to bear claims, foods will have to have appropriate nutrient profiles which will be set. This will enhance the consumers' ability to make informed and meaningful choices.' Further, it states: 'Further, this Regulation respects fair competition and protects innovation in the area of foods. It also facilitates the free circulation of foods bearing claims as any food company will be able to use the same claims on its products everywhere in Europe.' Finally, it mentions: 'In order to have a comprehensive overview of the permitted nutrition claims and of both permitted and rejected health claims, the Commission has established a Register which will be regularly updated.' To the right of the main text is a 'Topics' sidebar with a list of links: 'Introduction', 'Background', 'Health Claims', 'Nutrition Claims', 'Nutrient Profiles', 'European Union Register', and 'Seminar on enforcement 9th March 2010'.

**Food Safety - From the Farm to the Fork**

EUROPA > European Commission > DG Health and Consumers > Overview > Food and Feed Safety Site Map | V

General Food Law Animal Nutrition Labelling & Nutrition Biotechnology Novel Food Chemical Safety Biological Safety Official controls

### Health & Nutrition Claims

In December 2006, the Regulation on nutrition and health claims made on foods was adopted by the Council and Parliament. For the first time, this Regulation lays down harmonised rules across the European Union for the use of nutrition claims such as "low fat", "high fibre" or health claims such as "reducing blood cholesterol".

This Regulation foresees implementing measures to ensure that any claim made on foods' labelling, presentation or marketing in the European Union is clear, accurate and based on evidence accepted by the whole scientific community. Consequently foods bearing claims that could mislead consumers will be eliminated from the market. In addition, in order to bear claims, foods will have to have appropriate nutrient profiles which will be set. This will enhance the consumers' ability to make informed and meaningful choices.

Further, this Regulation respects fair competition and protects innovation in the area of foods. It also facilitates the free circulation of foods bearing claims as any food company will be able to use the same claims on its products everywhere in Europe.

In order to have a comprehensive overview of the permitted nutrition claims and of both permitted and rejected health claims, the Commission has established a Register which will be regularly updated.

#### Topics

- Introduction
- Background
- Health Claims
- Nutrition Claims
- Nutrient Profiles
- European Union Register
- Seminar on enforcement 9th March 2010

Consolidated text: <http://eur-lex.europa.eu/en/index.htm>  
> Simple search > Consolidated text (year 2006; number 1924).

# Nutrition and Health Claims Regulation

## SCIENTIFIC OPINION

Scientific Opinion on the substantiation of health claims related to protein and increase in satiety leading to a reduction in energy intake (ID 414, 616, 730), contribution to the maintenance or achievement of a normal body weight (ID 414, 616, 730), maintenance of muscle mass or growth or maintenance of muscle mass (ID 414, 616, 730) pursuant to Article 13(1) of Regulation (EC) No 1924/2006

EFSA Panel on Dietetic Products, Nutrition and

European Food Safety Authority (EFSA)

### SUMMARY

Following a request from the European Commission, the Panel on Dietetic Products, Nutrition and Allergies was asked to provide a scientific opinion on a list of health claims pursuant to Article 13(1) of Regulation (EC) No 1924/2006. This opinion addresses the scientific substantiation of health claims related to protein and increase in satiety leading to a reduction in energy intake, contribution to the maintenance or achievement of a normal body weight, maintenance of muscle mass, and growth or maintenance of muscle mass. The scientific substantiation is based on the data submitted by Member States in the consolidated list of Article 13 health claims received from Member States or directly from stakeholders.

## SCIENTIFIC OPINION

Scientific Opinion on the substantiation of health claims related to: dairy products (ID 1140, 1141, 1191), raw or processed food products of animal origin, plus bread and panification products (ID 1193, 1194), herbal yeast plasmolysate (ID 1815, 1816), apple polyphenols (ID 2713), rye flour (ID 1266), tomato juice (ID 1202), whey protein and algalactalbumin (ID 424, 430, 432, 725, 1433), "broccoli shoots", "broccoli sprout powder" and "*Brassica oleracea* var. *italica* (broccoli)" (ID 1362, 1481, 2844, 2845), honey (ID 1159, 1160, 1318, 4678, 4679), and *Cucurbita pepo* L. (pumpkin) seeds and seed extracts (ID 2029, 2365) pursuant to Article 13(1) of Regulation (EC) No 1924/2006<sup>1</sup>

EFSA Panel on Dietetic Products, Nutrition and Allergies (NDA)<sup>2, 3</sup>

European Food Safety Authority (EFSA), Parma, Italy

### SUMMARY

Following a request from the European Commission, the Panel on Dietetic Products, Nutrition and Allergies was asked to provide a scientific opinion on a list of health claims pursuant to Article 13 of

<sup>1</sup> On request from the European Commission, Question No EFSA-Q-2008-1211, EFSA-Q-2008-1217, EFSA-Q-2008-1219, EFSA-Q-2008-1512, EFSA-Q-2008-1879, EFSA-Q-2008-1880, EFSA-Q-2008-1898, EFSA-Q-2008-1899, EFSA-Q-2008-1930, EFSA-Q-2008-1932, EFSA-Q-2008-1933, EFSA-Q-2008-1941, EFSA-Q-2008-2004, EFSA-Q-2008-2055, EFSA-Q-2008-2099, EFSA-Q-2008-2170, EFSA-Q-2008-2218, EFSA-Q-2008-2548, EFSA-Q-2008-2549, EFSA-Q-2008-2762, EFSA-Q-2008-3098, EFSA-Q-2008-3446, EFSA-Q-2008-3577, EFSA-Q-2008-3578, EFSA-Q-2010-00631, EFSA-Q-2010-00632, adopted on 25 March 2011.

<sup>2</sup> Panel members: Carlo Agostoni, Jean-Louis Bresson, Susan Fairweather-Tait, Albert Flynn, Ines Golly, Hannu Korhonen,

## SCIENTIFIC OPINION

the substantiation of health claims related to protein and increase in satiety leading to a reduction in energy intake, contribution to the maintenance or achievement of a normal body weight, maintenance of muscle mass or growth or maintenance of muscle mass (ID 418, 419, 423, 424), increase in lean body mass during energy restriction (ID 421), reduction of body fat mass during energy restriction (ID 421), increase in muscle mass (ID 420, 421), increase in muscle mass (ID 420, 421), increase in endurance capacity during the after strenuous exercise (ID 428), skeletal muscle and faster recovery from muscle fatigue after strenuous exercise (ID 428), pursuant to Article 13(1) of Regulation (EC) No 1924/2006<sup>1</sup>

EFSA Panel on Dietetic Products, Nutrition and Allergies (NDA)<sup>2, 3</sup>

European Food Safety Authority (EFSA), Parma, Italy

Protein: <http://www.efsa.europa.eu/en/scdocs/doc/1811.pdf>

Whey protein: <http://www.efsa.europa.eu/en/scdocs/doc/1818.pdf>

Whey protein and algalactalbumin: <http://www.efsa.europa.eu/en/efsajournal/doc/2243.pdf>

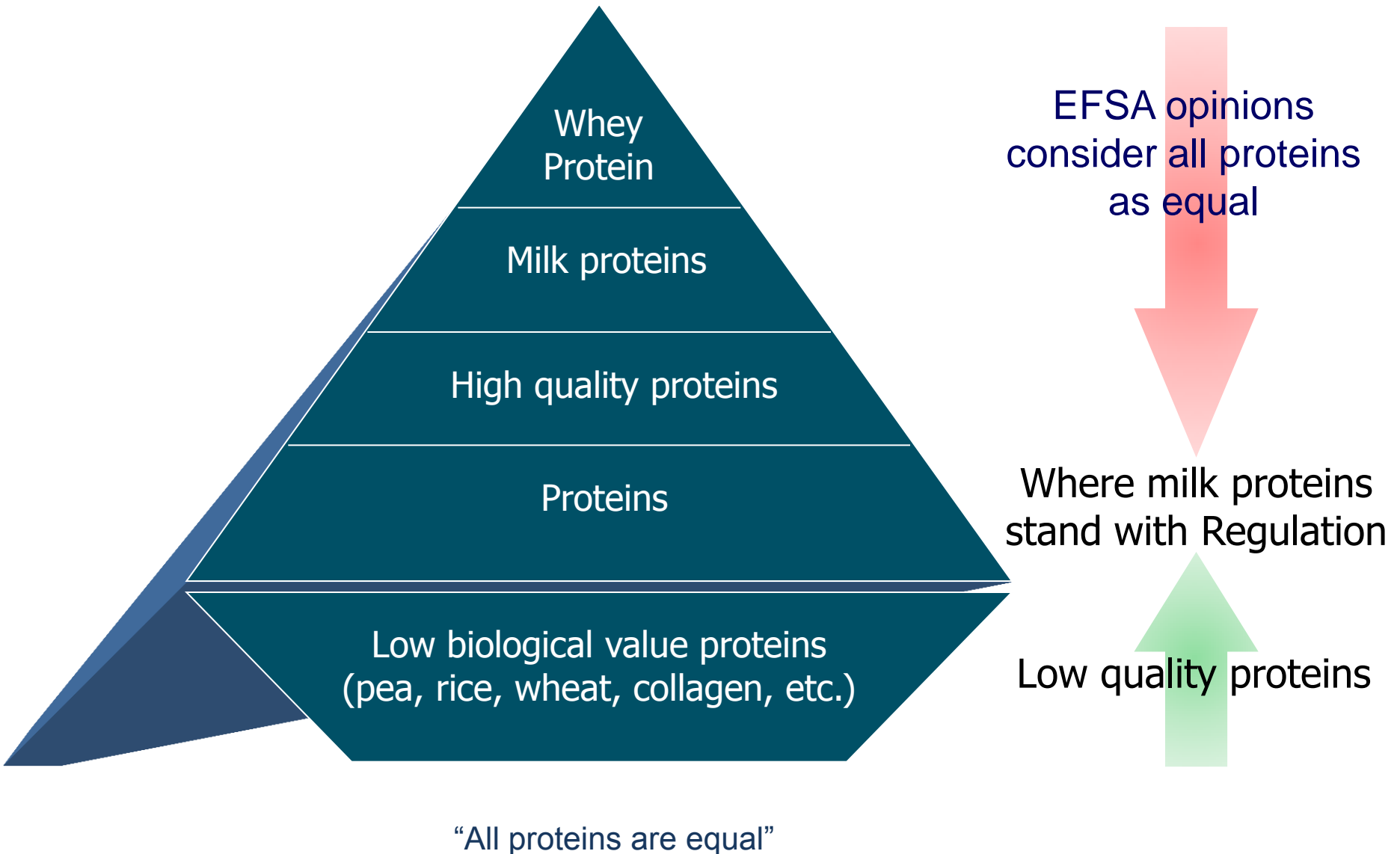
# Nutrition and Health Claims Regulation

Nutrient, substance, food or food category	Claim	Conditions of use of the claim
Protein	Protein contributes to a <b>growth</b> in muscle mass	At least a source of protein (Annex to Reg. 1924/2006)
Protein	Protein contributes to the <b>maintenance</b> of muscle mass	At least a source of protein (Annex to Reg. 1924/2006)
Protein	Protein contributes to the <b>maintenance</b> of normal bones	At least a source of protein (Annex to Reg. 1924/2006)

From adopted Article 13.1 Regulation, December 2011, which text has now gone to the European Parliament for scrutiny.

# Nutrition and Health Claims Regulation

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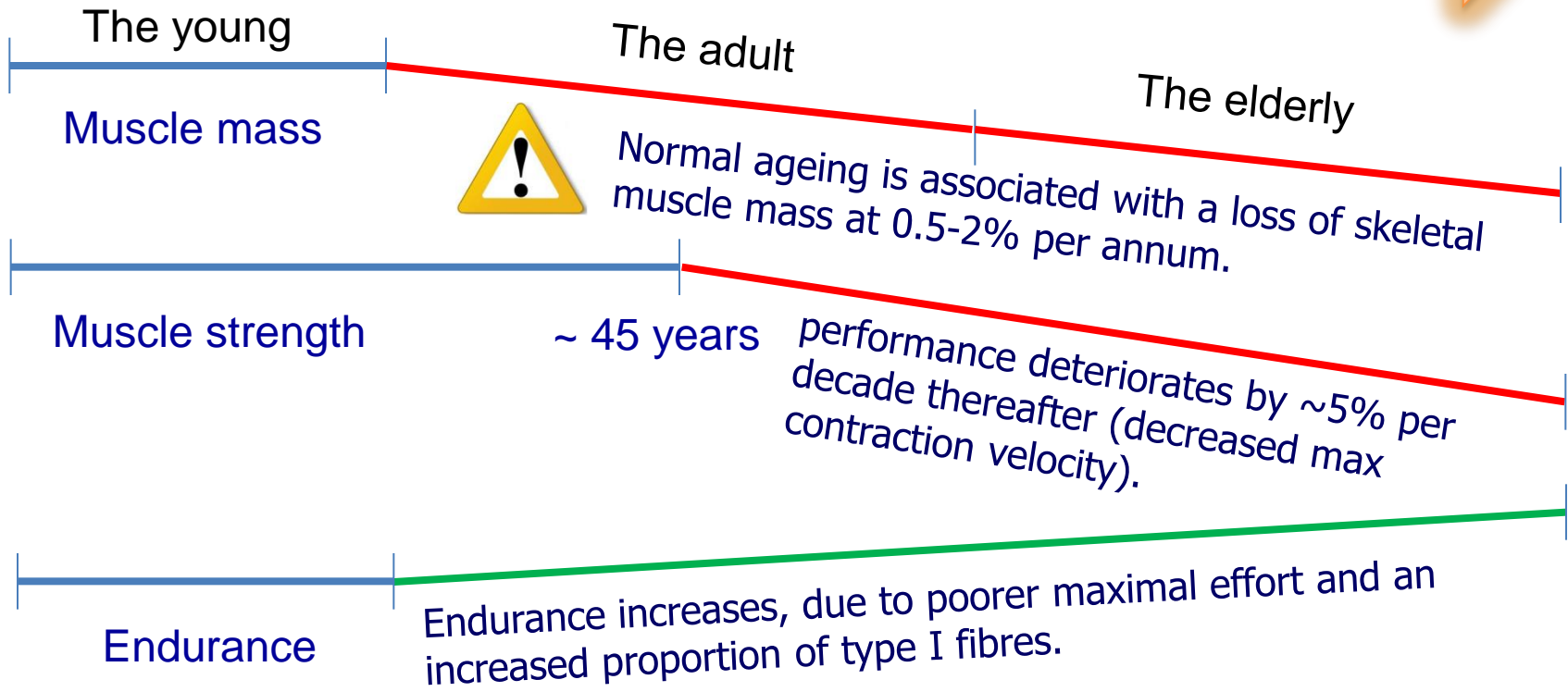




# The future: healthy and active lifestyle



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14 August 2010 Last updated at 01:19

22K



# Rise of the Mamils (middle-aged men in lycra)

By Dominic Casciani  
BBC News



Dominic Casciani (middle) with fellow Mamils

**Flashy sports cars are out, now no mid-life crisis is complete without a souped-up road bike. Why?**

Every weekend, across the nation's rolling countryside, watch out for the Mamils: middle-aged men in lycra.

And ladies, if you have a man at home taking an unusual interest in how you shave your legs, you may have a Mamil in the making too.

Research conducted by the retail analyst Mintel suggests there has been a surge in the number of middle-aged men choosing to get on two wheels.

In today's  
Magazine

The love affair  
ibuprofen

How useful is  
captured steal  
drone?

7 questions on  
landmarks for sale

Wednesday 14 December 2011

## The Telegraph

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### Wiggle thanks 'middle aged man in lycra' for record profits

Wiggle, the online bicycle retailer of which former Asda boss Andy Bond is a non-executive director, has sprinted to a record year with a 59pc increase in profits.



The strong results will come as a welcome boost to Andy Bond, the former Asda boss and a keen cyclist who joined Wiggle's board in August.

By Jonathan Sibun

6:00AM BST 06 Oct 2010

37 Comments

The company, launched with just £2,000 in 1999, increased sales by 67pc to £55.6m in the year to the end of January. Pre-tax profits hit £7.1m, according to accounts filed at Companies House, although the operating profit margin dropped half a percentage point to 12.8pc.

The strong results will come as a welcome boost to Mr Bond, a keen cyclist who joined Wiggle's board in August.

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Retail and Consumer  
Finance »  
Jonathan Sibun »

IN RETAIL AND  
CONSUMER



Portas: new magnets  
needed on high street



Graphic: decline of



# Adult participation in sports

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- Social Impact Assessment of Sports Foods Regulation (Leser, 2009). Participants mainly from clubs affiliated to UK and Ireland Governing Sports Bodies:

26% aged 35-44 years  
23% aged 45+ years

- Flora London Marathon 2008:

64% men and 53% women  
aged 35+ years  
~3% (n>1000) aged 60+ years

- European Cyclists Federation (ECF) (2003) survey in The Netherlands:

47% aged 35-55 years  
(largest group)

## UK NDNS (2008/09 – 2009/10)

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- Milk consumption overall had fallen for all those aged 11+ years compared with previous surveys, the largest decrease in adults 19-64 years.
- Milk and milk products were the major contributor to protein intake for children, but the contribution decreased with age to 14-17% for adults aged 19+ years.

# Protein recommendations for adults

## Nutrition & Metabolism



Commentary

Open Access

### ***Dietary Guidelines* should reflect new understandings about adult protein needs**

Donald K Layman

Address: Depar

Em

- Most adults benefit from PTN intakes above the minimum RDA to maintain muscle mass and bone health.

- Aging ↑ EAAs requirements for muscle PTN synthesis, i.e., greater density of EAAs/total protein.



# Take-home messages

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- Sports nutrition is reaching healthy active adults to whom muscle mass maintenance is crucial for healthy ageing and quality of life.
  - Dairy proteins are the reference for protein quality, yet the importance of protein quality is not recognised by EU regulatory authorities.
  - Research should focus on the adult population to establish the superior role of milk proteins in attending the particular needs of the ageing generation of sports enthusiasts.
-

# Thank you.

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