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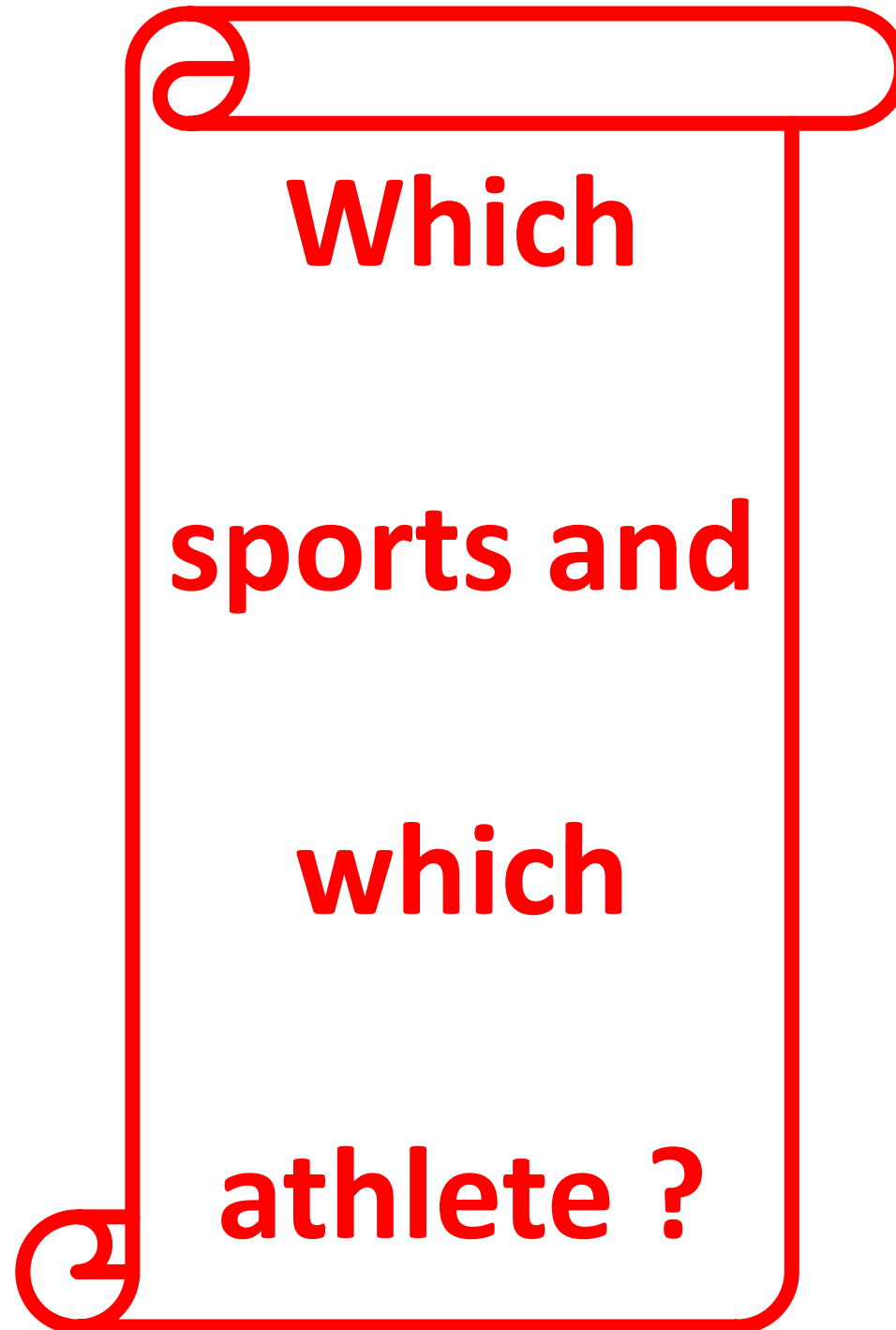
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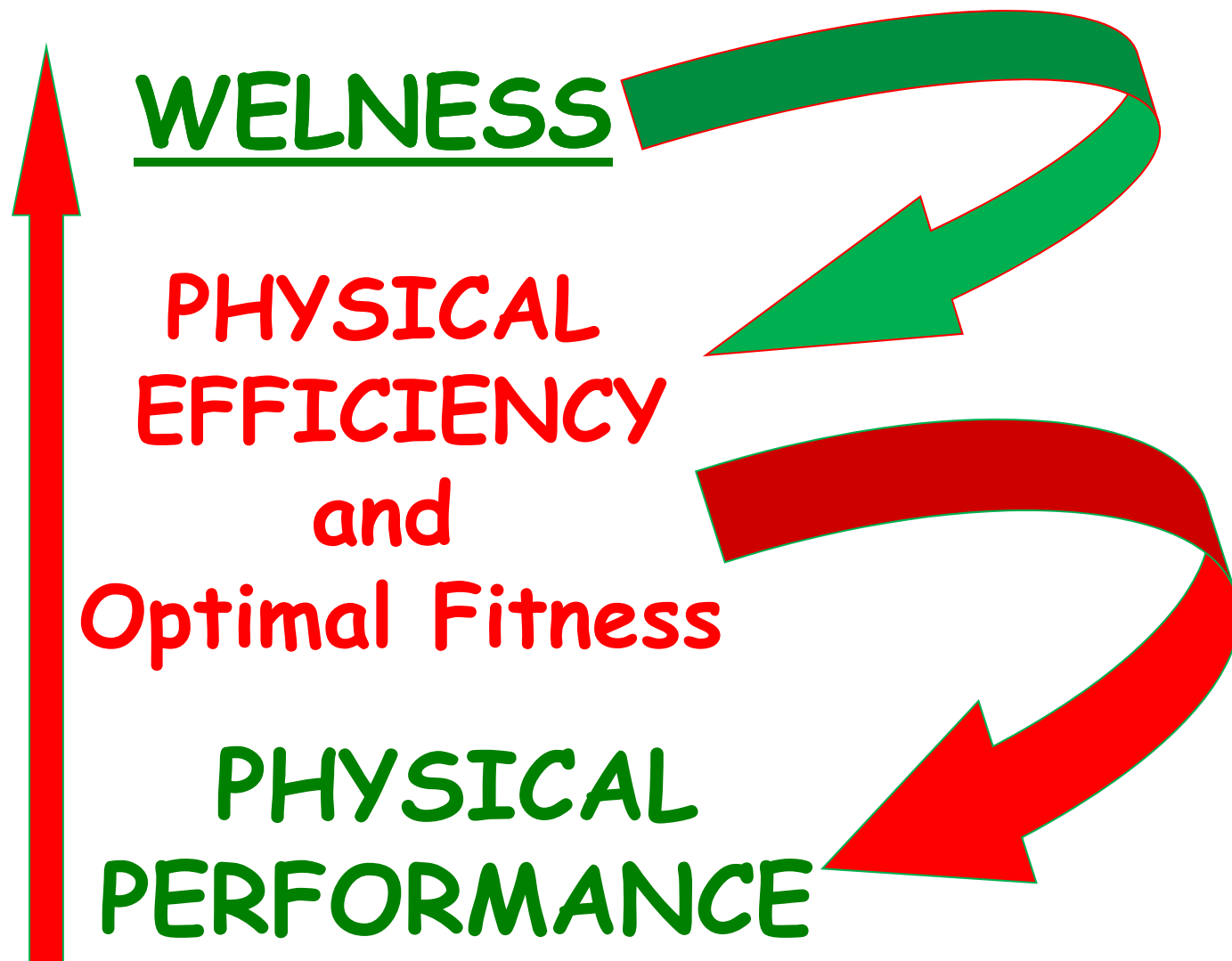


The importance of Carbohydrates and Pasta in Sports and Physical Activity

Michelangelo Giampietro - Erminia Ebner – Lorena Tondi



What Nutrition for Sports ?



Health benefits of a Mediterranean diet

A traditional Mediterranean diet reduces the risk of :

- ✓ Heart disease and strokes
- ✓ Type 2 diabetes
- ✓ Weight gain
- ✓ Cancer of the colon and breast

**It improves
physical efficiency
and sports performance**

Alexandra Schek

Is the Mediterranean diet also for top level athletes?

The study regards the problem of the influence of the consumption of carbohydrates and fats on sports performance. It is shown that with regard to an issue debated for decades, there is not only the problem of what percentage these nutrients should have in the energy balance, but above all the preferable type of fats or carbohydrates.

The problem is not just of quantity, but also of quality.

From this point of view, the study regards the role of the various types of fatty acids, and the concept of the glucose rate and glucose amount.

Finally, there is a description of the "cycle" of the **Mediterranean diet, showing the optimal composition of food not only for the training of top level athletes, but also for those who practice sports as recreation and for those who do not practice sports.**



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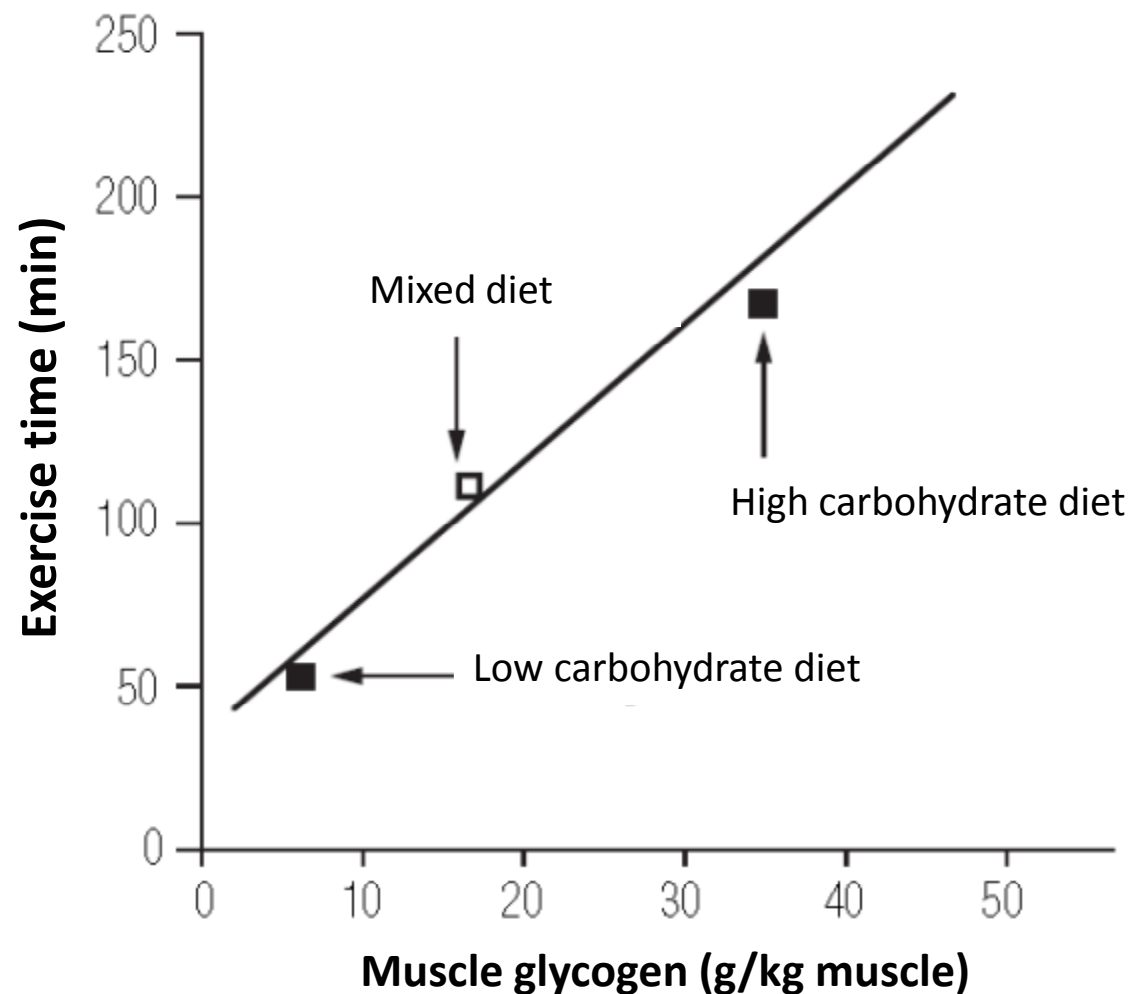
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Nutrition and Athletic Performance

JOINT POSITION STATEMENT

The fundamental differences between an athlete's diet and that of the general population are that athletes require additional fluid to cover sweat losses and additional energy to fuel physical activity. As discussed earlier, it is appropriate for much of the additional energy to be supplied as **carbohydrate**. The proportional increase in energy requirements seems to exceed the proportional increase in needs for most other nutrients. Accordingly, as energy

*JADA 2009 Mar; 109 (3): 509-527.
Med Sci Sports Exerc. 2009 Mar; 41(3):709-31*



Bergström et al., 1967

For several years it is known that , in the sports of long duration (greater than 40-60 minutes) the ability to maintain long a high aerobic performance is directly proportional to muscle glycogen concentration present at the beginning of the race



CAREFUL DIET for SPORTSPEOPLE

DAILY ENERGY NEEDS (D.E.N.)

- CARBOHYDRATES = 55-65 % D.E.N. (80 % complex, 20 % simple)
- PROTEINS = 12-15 % D.E.N. (1,0-1,5 - max 2 g/Kg b.w.)
55 % animal protein
- LIPIDS = 25-30 % D.E.N. preference for vegetable sources (unsaturated f.a.: oleic ac.; n-3 and n-6 essential fatty acids).
→ EXTRA VIRGIN OLIVE OIL

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**eat
right.**

American
Dietetic
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Nutrition and Athletic Performance

JOINT POSITION STATEMENT

KEY POINTS

Carbohydrate recommendations for athletes range from 6 to 10 g·kg⁻¹ body weight·d⁻¹ (2.7–4.5 g·lb⁻¹ body weight·d⁻¹). Carbohydrates maintain blood glucose levels during exercise and replace muscle glycogen. The amount required depends on the athlete's total daily energy expenditure, type of sport, sex, and environmental conditions.

Med Sci Sports Exerc. **2009 Mar**; 41(3):709-31
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ENERGY SUBSTRATES AVAILABILITY

Storage

Capacity

Power

CARBOHYDRATES

SMALL

HIGH

- blood glucose ≈ 10 g
- hepatic glycogen $\approx 80-100$ g
- muscle glycogen $\approx 300-400$ g

FATS

GREAT

LOW

- adipose tissue $\approx 9,000$ g
- muscle tissue ≈ 500 g

PROTEINS



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Daily Needs for Fuel and Recovery:

	Situation	Carbohydrate Targets
Light	Low-intensity or skill-based activities	3-5 g per kg BM
Moderate	Moderate exercise programme (~1 hr / day)	5-7 g per kg BM
High	Endurance programme (i.e. moderate-to-high intensity exercise of 1-3 hr / day)	6-10 g per kg BM
Very High	Extreme commitment (i.e. moderate-to-high intensity exercise of >4-5 hr / day)	8-12 g per kg BM

Australian Sports Commission
www.ausport.gov.au/ais/nutrition

Glycemic Index Chart



Pasta di semola 100 g raw

Energy = 353 kcal

Proteins = 10,9 g

Fatts = 1,9 g

CHOs = 79,1 g

Starch = 68,1 g

Soluble = 4,2 g



Pasta is one of the best food choices for athletes, because if lightly seasoned and cooked "al dente", it is easily digested and provides a good amount of energy, much of the form of complex carbohydrates.



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KEY POINTS

Protein recommendations for endurance and strength trained athletes range from **1.2 to 1.7 g/kg body weight**.

These recommended protein intakes can generally be met through **diet alone**, without the use of protein or amino acid supplements.

Energy intake sufficient to maintain body weight is necessary for optimal protein use and performance.

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NUTRITION for increase lean body mass

- **↑ D.E.N. 200-500 kcal/day**
- **CHO (30-50 g) and PROTEIN (5-10 g) SNACK
BEFORE TRAINING FOR:**
 - ↓ catabolism induced by exercise
- **CHO (80-120 g) and PROTEIN MEAL (15-40 g)
WITHIN 2 HOURS AFTER TRAINING FOR :**
 - ↑ anabolic hormonal profile (window)
 - ↑ glycogen resynthesis

[R.B. Kreider, Sports Med. 1999, 27 (2): 97-110]



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Acute Fuelling Strategies:

1/2

	Situation	Carbohydrate Targets
General fuelling up	Preparation for events < 90 min exercise	7-12 g/kg per 24 hr as for daily fuel needs
Carbohydrate loading	Preparation for events >90 min of sustained/intermittent exercise	36-48 hours of 10-12 g/kg BM per 24 hour

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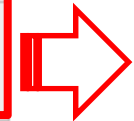


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Acute Fuelling Strategies:

2/2

	Situation	Carbohydrate Targets
Pre-event fuelling	Before exercise > 60 min	1-4 g/kg BM (consumed 1-4 hr pre-competition)
During brief exercise	< 45 min	Not required
During sustained high-intensity exercise	45-75 min	Small amounts including mouth rinse
During endurance exercise including "stop and start" sports	1-2.5 hours	30-60 g/hr
During ultra-endurance exercise	2.5-3 hours	Up to 90 g/hr using multiple transportable carbohydrates (glucose:fructose mix)
Speedy refuelling	< 8 hr recovery between two fuel demanding sessions	1-1.2 g/kg BM every hour for first 4 hr then resume daily fuel needs



Australian Sports Commission
www.ausport.gov.au/ais/nutrition

NUTRITION for COMPETITIONS

Optimum Hydration (100 g pasta raw = 200 g cooked
100 g water)

**High
digestibility**

- Optimal Reserves of glycogen (muscle and liver)
- Prevent Hypoglycemia
- Minimize any condition of gastrointestinal "distress"

**Glycogen
Super-
compensation**

- Minimum intake of lipid (extra virgin olive oil, raw)

L'alimentazione dello sportivo: principi di nutrizione

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JOINT POSITION STATEMENT

KEY POINTS

After exercise, dietary goals are to provide **adequate fluids, electrolytes, energy, and carbohydrates to replace muscle glycogen** and ensure rapid recovery.

A carbohydrate intake of approximately **1.0-1.5 g/kg** body weight during the first 30 min and again every 2 h for 4-6 h will be adequate to replace glycogen stores.

Protein consumed after exercise will provide amino acids for building and repair of muscle tissue.

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Michelangelo Giampietro - Erminia Ebner

High carbohydrate diet promotes daily recovery of muscle fuel stores

