Nutrition for high performance athletes involved in rowing

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Many athletes with many different needs
Training load

- Specific on water training
- Ergometer training
- Non specific aerobic activities (cycling)
- Resistance training

- Intensity and proportion of the training depends on the phase of the season
- Training is periodised 20-25 hours / week (incr. intensity - decr. duration)
Comparison energy expenditure rowing v. football

- Energy cost of a 2000m race (5-8 minutes) ≈ 200-250 kcal.
- 1-2 hour training session may utilise 1000-2000 kcal
- Total daily energy expenditure is depending on the type of rower and period of training.
  - Lightweight male rower ≈ 6000 kcal / day
  - Lightweight female rower ≈ 4500 kcal / day


- Field training ≈ 647 kcal ± 158 kcal
- Matches ≈ 1368 kcal ± 350 kcal
- The mean total daily energy expenditure for an in-season main training day ≈ 4406 kcal and match day ≈ 4562 kcal

Consume sufficient calories

Power output key for optimal performance

- Decreased muscle strength
- Decreased endurance performance
- Increased injury risk

Decreased glycogen stores
- Depression
- Irritability
- Decreased concentration
- Decreased coordination

Impaired training

Rib stress fractures

Technical movement patterns

The IOC consensus statement: beyond the Female Athlete Triad—Relative Energy Deficiency in Sport (RED-S)

Margo Mountjoy, Jorunn Sundgot-Borgen, Louise Burke, Susan Carter, Naama Constantini,5 Constance Lebrun, Nanna Meyer, Roberta Sherman, Kathrin Steffen, Richard Budgett, Arne Ljungqvist
No magic bullets

- Increased energy intake should be based on the rowers' training and individual needs by increasing total energy, carbohydrate and protein intakes (Maughan and Shirrefs, 2010).

- Also, increase the dietary intake of fruit and vegetables (antioxidants) for improved immunity.
Somatotype of lightweight v. heavy weight

Mahe height: 2.01 m
Mahe weight: 101 kg

More mesomorphic and less ectomorphic
Average height rower: 1.90m and 1.95m
Average weight rower: 90-95kg

James height: 1.85 m
James weight: 78kg out of season / 70 kg racing

Less mesomorphic and more ectomorphic
Average height: 1.80m (elites tend to be taller)
Average weight: 70 kg
Somatotype of heavy weight v. lightweight

Emma

height: 1.85 m
weight: 74 kg

More mesomorphic and less ectomorphic
Average height rower: Average height: 1.80m-185m
Average weight rower: 70-80 kg

Julia and Sophie

height: 1.68-1.72 m
weight: 57 kg

Less mesomorphic and more ectomorphic
Average height: 1.70m-1.80 m
Average weight: 57-65 kg
Weight making strategies

**Acute weight loss** (performance that requires high aerobic and anaerobic capacities can be compromised)
- Rowing in sweat gear
- Restricting fluid intake
- Restricting food intake

**Chronic weight loss**
- ACSM and FISA focus on slow weight loss instead of acute weight loss strategies
- Reduced energy intake whilst still consuming sufficient protein and carbohydrate to cope with training
Performance triangle

- Foundation of good eating habits
- Nutrient timing around exercise
- Supplements
Main substrate: Carbohydrate

Effect of exercise intensity on rates of muscle glycogen utilisation
Strategies to meet the carbohydrate intake

• Nutrient timing
  • Place carbohydrates before exercise
    *Pre training meal 1-4 hours before exercise containing substantial amount of CHO*
  • Place carbohydrates during exercise
    > 90 minutes - 30-60 g CHO / hour
    < 90 minutes with high intensity – mouth rinse
    < 90 minutes - water
  • Carbohydrates for recovery post exercise
    *Athletes who ingest 1-2 g CHO / kg body weight within 30 minutes after exercise experience a greater rate of muscle glycogen re-synthesis compared to when supplementation is delayed by two hours, largely due to a greater sensitivity of muscle to insulin at that time*
Protein requirements

• Rowers require slightly more protein than recommended for general population. A varied diet that meets energy needs will generally provide protein in excess of requirements.

• **Pulse protein over meals and snacks consumed over the day**

• Consume foods or snacks containing high-quality proteins regularly throughout the day, 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.
What does 20 g Protein look like:

- 525 ML Milk
- 300 ML Yoghurt
- 3 Whole eggs
- 300 g Lentils
- 75 g Edam Cheese
- 90 g Chicken
- 80 g Ground beef (raw)
- 60 g Lean beef (raw)
- 95g Lamb (raw)
- 95g Pork fillet (raw)
Protein recovery post training / racing

- Maximise protein synthesis by ingestion of foods or drinks providing 0.3 g protein / kg body weight of rapidly digested protein post exercise.
- Whey protein fits this profile.

Muscle is stimulated to increase its protein synthetic rates for up to 24 hours after a workout.
Need for supplements?

Foundation of good eating habits

Nutrient timing around exercise

Supplements
Evidence for multiple supplements in the field

Beta Alanine ≈ +3%
Sodium Bicarbonate ≈ +2%
Caffeine ≈ +2%
Creatine ≈ +3%
Beetroot ≈ +3%

Supplementation combination studies in the (very) elite have shown smaller effects of 0.5 to 2% increase in performance.
Little changes could make a big difference