WATER IS OUR WORLD

FINA-Yakult Nutrition for Aquatics

Dr. Margo Mountjoy FINA Bureau – Sports Medicine

Session Overview

General Principles

Swimming

Open water swimming

Periodization of energy needs

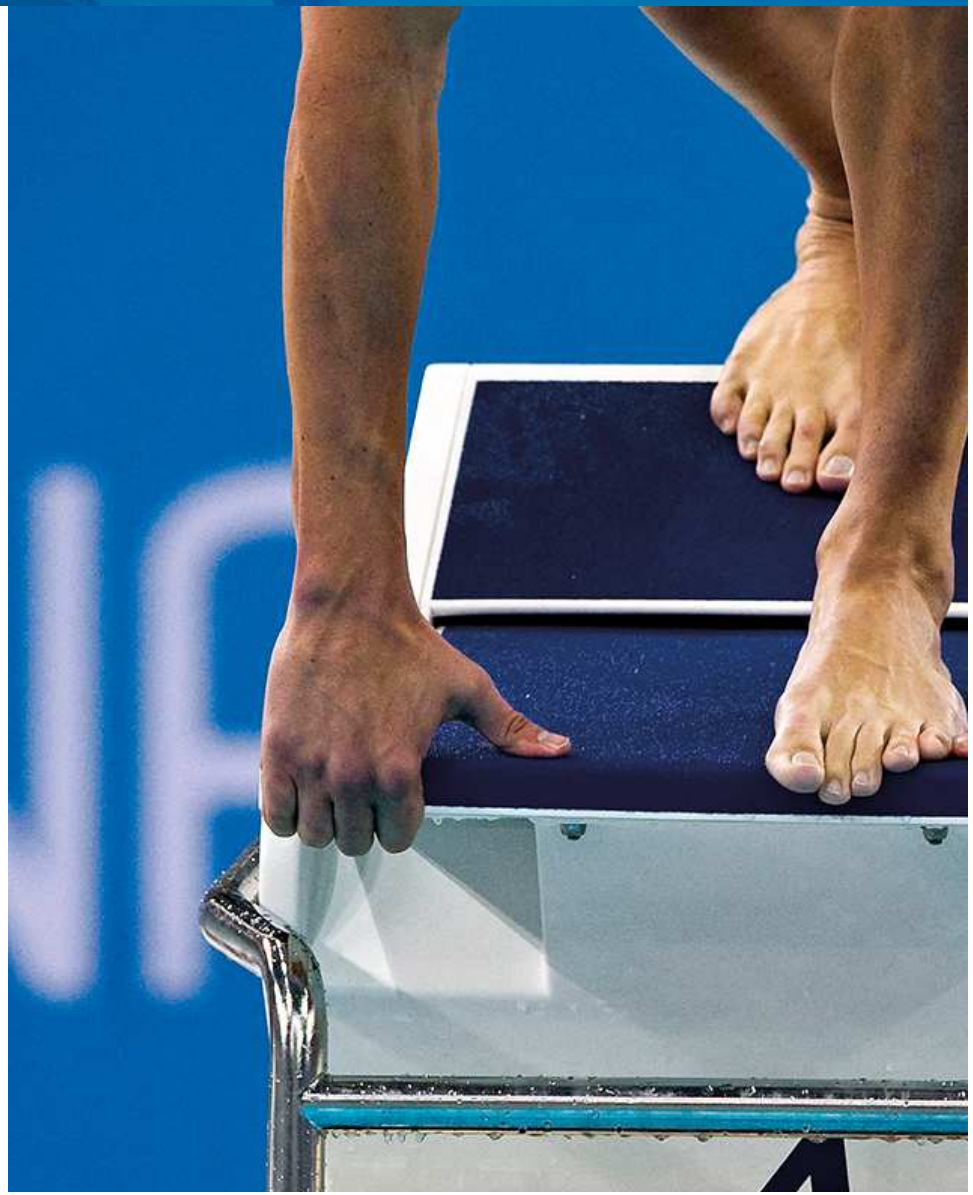
Fuelling swimming sessions

Body composition

Race day nutrition planning

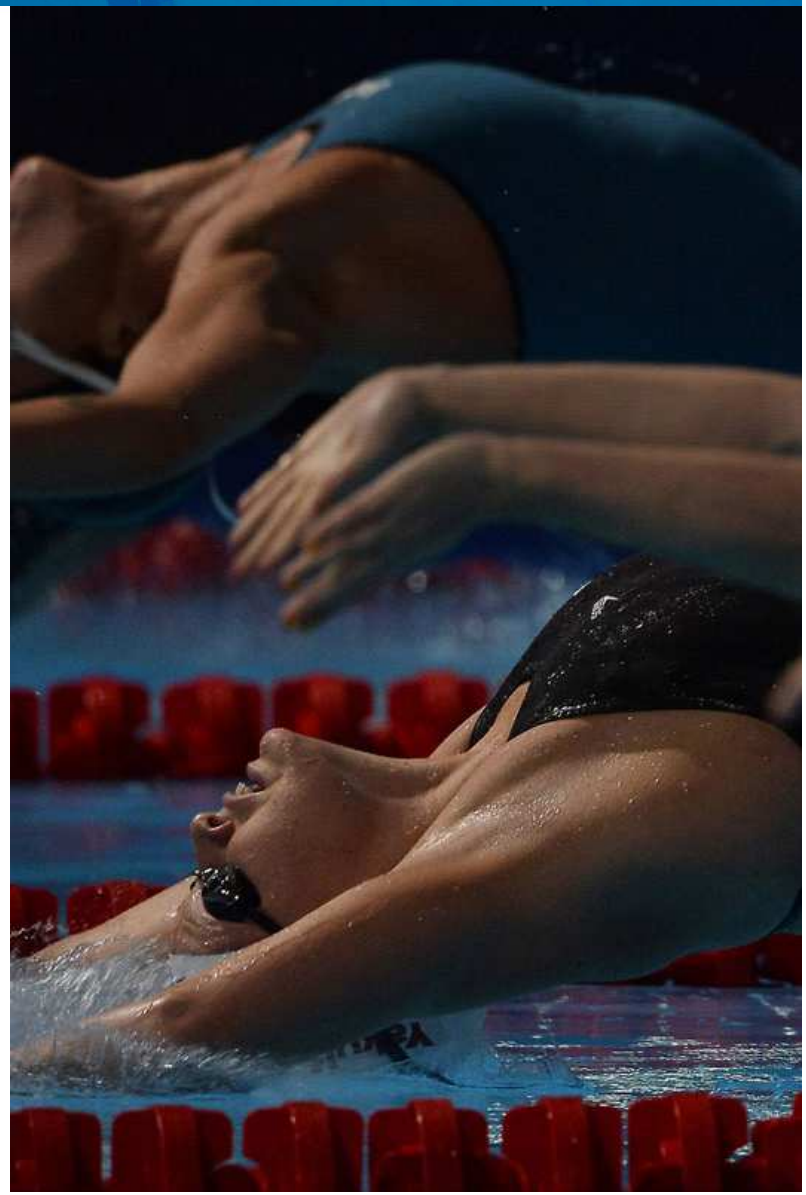
General Principles

“An effective nutrition plan is critical to success in all aquatic sport disciplines for athletes at every stage of their development.”



General Principles

“ A well-designed, periodized training program remains the fundamental cornerstone of peak performance outcomes, but this will mean little if nutrition needs are ignored.”

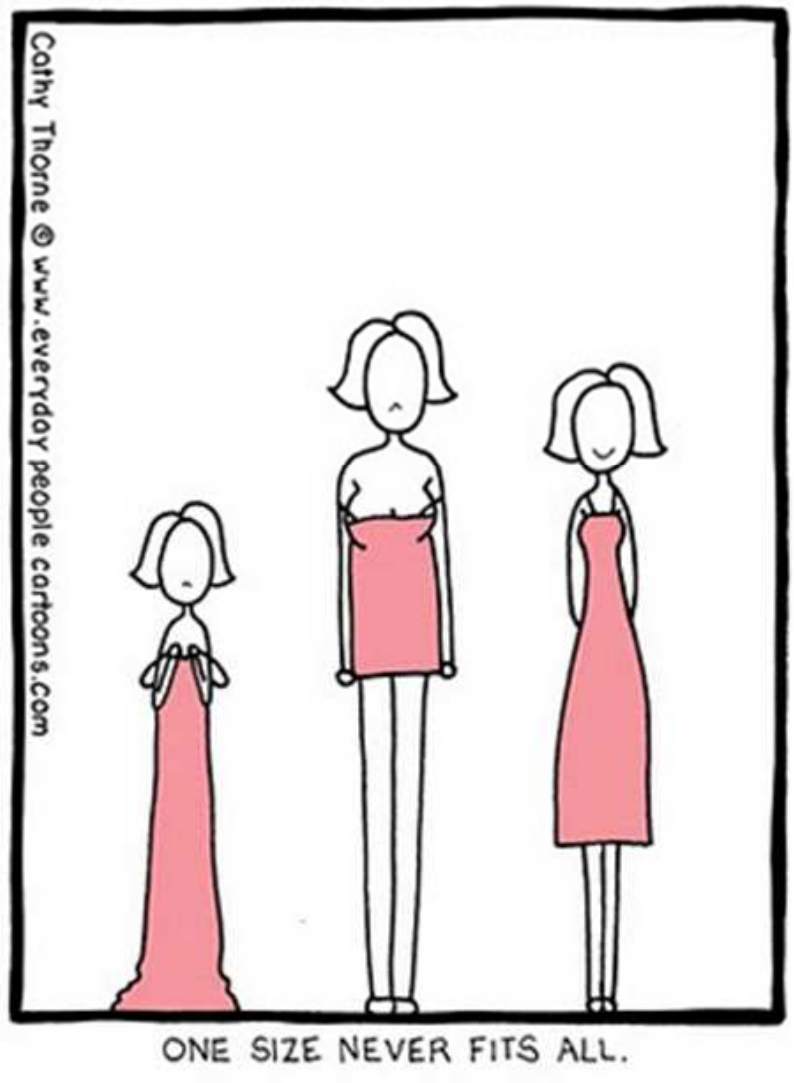


General Principles

Individualized Nutrition Plan

The needs of athletes also vary through:

- Maturation
- During periods of high energy expenditure
- Taper
- Competition
- Post-competition recovery

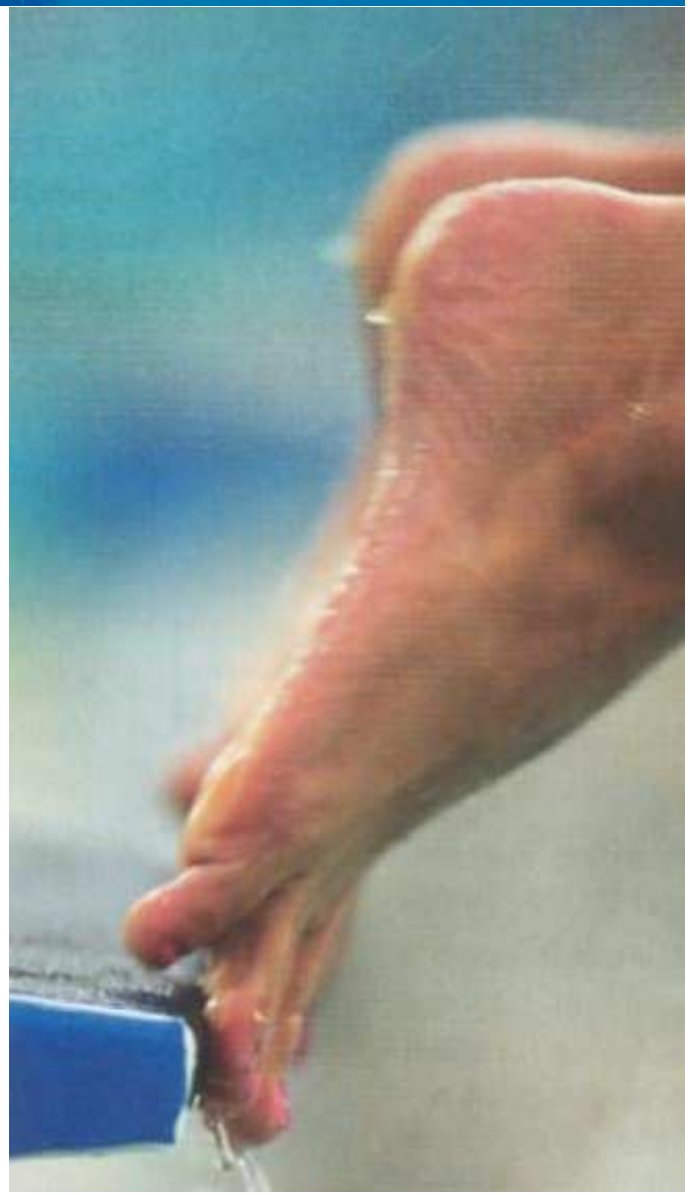


General Principles

Periodization

match the phase and type of training

including concurrent endurance and resistance training, altitude, overload and taper



General Principles

Recovery Nutrition Plan

- Post training or competition
- Restoration of body energy
- Promote adaptation to the exercise stimulus
- Preparation for optimal performance in the next session

General Principles

Body Mass Composition

Informed management of body mass and composition is key to ensuring that athletes achieve peak performance.

General Principles

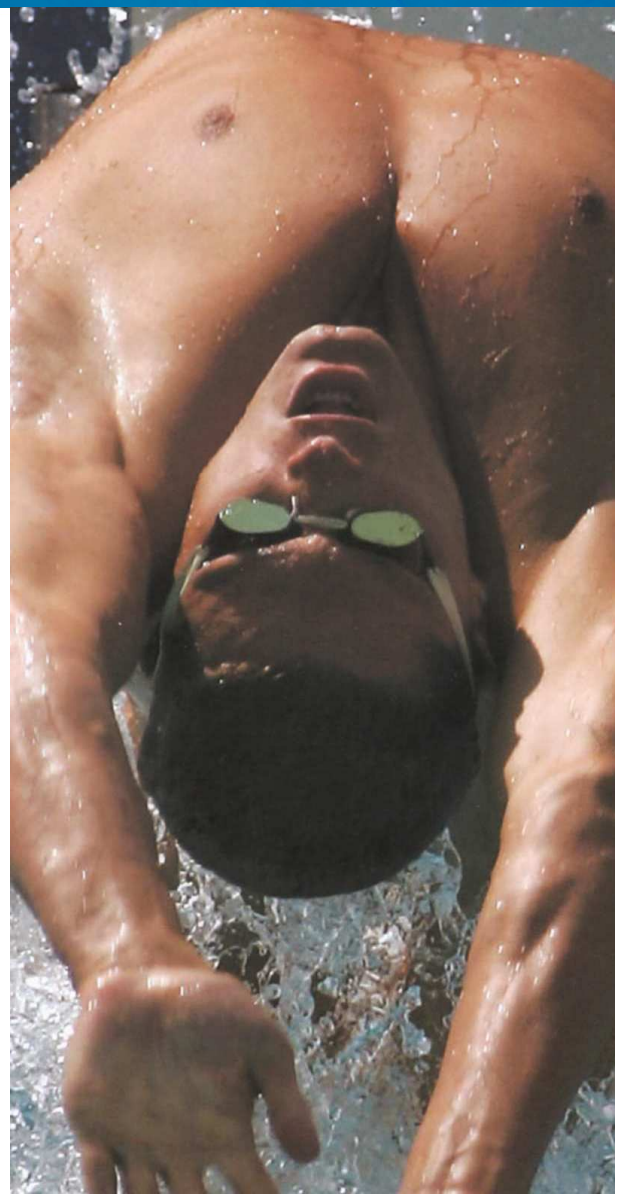
Recipe for Success

Aquatic athletes should consume a well-chosen diet with sufficient:

energy

macronutrients (CHO + protein)

micronutrients to maintain immune function and health (Vitamin D + iron)



General Principles

Nutritional Supplements

The use of supplements does not compensate for poor food choices

Contaminated supplements may cause a positive doping test

A few evidence-based supplements may provide a performance benefit for some athletes with no risk to health, but the scientific evidence specific to aquatic sports is limited or absent

General Principles

Environment + Travel

Nutrition interventions that might mitigate the negative environmental effects include:

adequate hydration

carbohydrate, protein and iron intake while at altitude

manipulation of fluid and carbohydrate intake during races according to the varying water and ambient temperatures

careful food and fluid hygiene practices when travelling

General Principles

Nutrition support in elite sport should be provided by qualified professionals

Education of the athlete support team, including coaches, health care providers, parents, and athletes themselves is a crucial step to improving nutrition practices

General Principles

Athletes should also be aware of the need for long-term dietary planning to ensure lifelong health and wellbeing and should recognise the pleasures of good food choices

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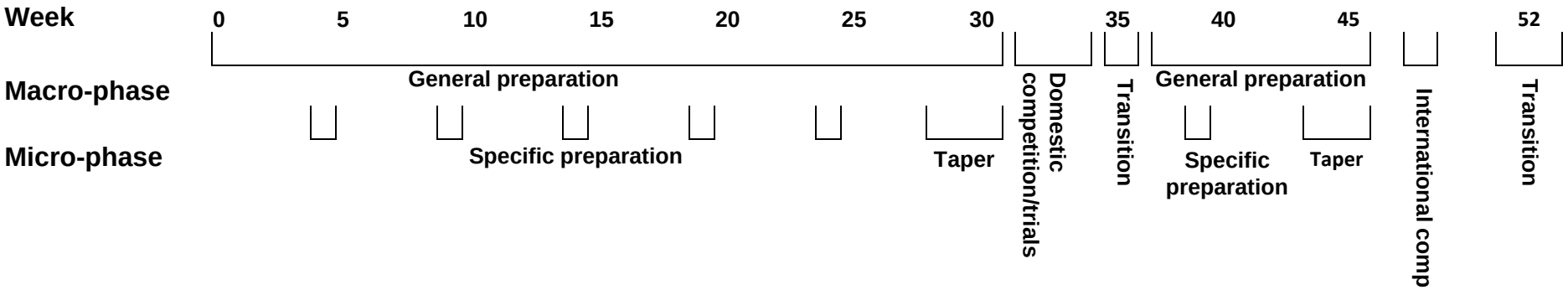
Swimming: Energy Periodization

LOWER
Offseason
Taper
Injury
Body weight/FM reduction

Energy needs

HIGHER
Heavy training
Growth/development
Training at altitude



	General Prep	Specific Prep	Taper / Competition	Transition
Training / Competition Focus	• High training volume (~5 to 12+ hrs/wk) / lower training intensity • Emphasis on aerobic development • Mixed training modalities including resistance, core and cross-training	• Maintained to lower volume (~4 to 10+ hrs/wk) / higher training intensity • Emphasis on anaerobic development, race-specific pace and increasing competitions • Increased specialised training / altitude camps	• Lower volume (~3 to 8 hrs/wk) / high training quality/intensity • Emphasis on race-specific intensities and neural-muscular power • Increased targeted competitions	• Volume and intensity very low to complete rest (~2 to 4 hrs/wk) • Physiological and psychological recovery to prevent over-reaching / training
Nutrition Focus	• High caloric intake to support training (~3500-5000 kcals/day for 70kg) • Support desired changes in body comp. • Recovery after training • Daily Macro. Target: ~8-12g CHO/kg BW/day ~1.5-1.7g PRO/kg BW/day ~1.5-2g FAT/kg BW/day	• Nutrition to support high intensity training (~3000-4500 kcals/day for 70kg) • Specific support/recovery for key specialised training • Daily Macro. Target: ~7-10g CHO/kg BW/day ~1.5-1.7g PRO/kg BW/day ~1-1.5g FAT/kg BW/day	• Nutrition to support high intensity racing (~2800-4300 kcals/day for 70kg) • Avoiding weight-gain with decreased training volume during taper • Daily Macro. Target: ~7-10g CHO/kg BW/day ~1.5-1.7g PRO/kg BW/day ~0.8-1.2g FAT/kg BW/day	• Nutrition for active to sedentary individuals (~2000-3000 kcals/day for 70kg) • Some minor weight gain expected • Daily Macro. Target: ~4-6g CHO/kg BW/day ~0.8-1.2g PRO/kg BW/day ~1-1.5g FAT/kg BW/day

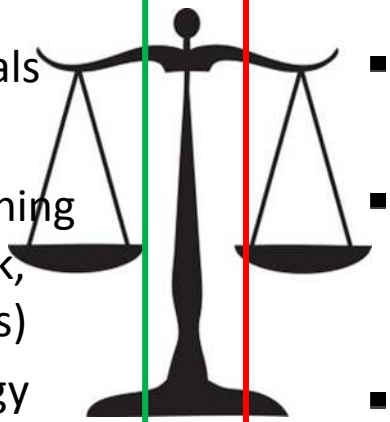
Adapted from Burke ISSSMC presentation & Stellingwerff, Boit, Res. J. Sport Sci., 25 (S1): S17, 2007.

Swimming: Energy Periodization

Matching energy intake to requirement

INCREASED ENERGY NEEDS

- Increase number of meals
- Add CHO-rich snacks
- Consume energy containing fluids (juice, sports drink, flavored milk, smoothies)
- Take advantage of energy dense sports products
- Fortify meals with vegetable oils and nuts and/or add a liquid meal supplement



REDUCED ENERGY NEEDS

- Reduce intake of energy dense low-nutrient snacks
- Consume foods high in volume and fiber (e.g. vegetables, fruits)
- Select foods high in protein and low in fat (e.g. low fat dairy, filets of fish/chicken)
- Reduce portion sizes
- Avoid “eating to boredom”

Swimming

Periodization of energy needs

Fuelling swimming sessions

Body composition

Race day nutrition planning

Swimming: Fuelling Sessions

"When it is important to train hard or with high intensity, daily carbohydrate intakes should match the fuel needs of training"

Swimming: Fuelling Sessions

Some sessions may be deliberately done with low CHO availability:

Low carbohydrate availability may enhance aerobic adaptation

Informed application to avoid any negative effects

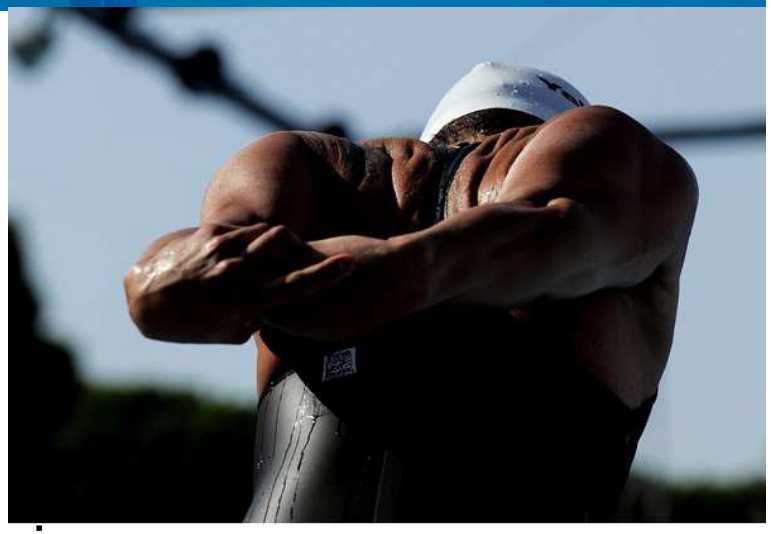
Swimming: Fuelling Sessions

Easy swim session < 90 min

water to limit dehydration

< 2% of body weight

Swimming: Fuelling Sessions



Low carbohydrate availability sessions

Water

Consider caffeine and candy/oral mouthwash

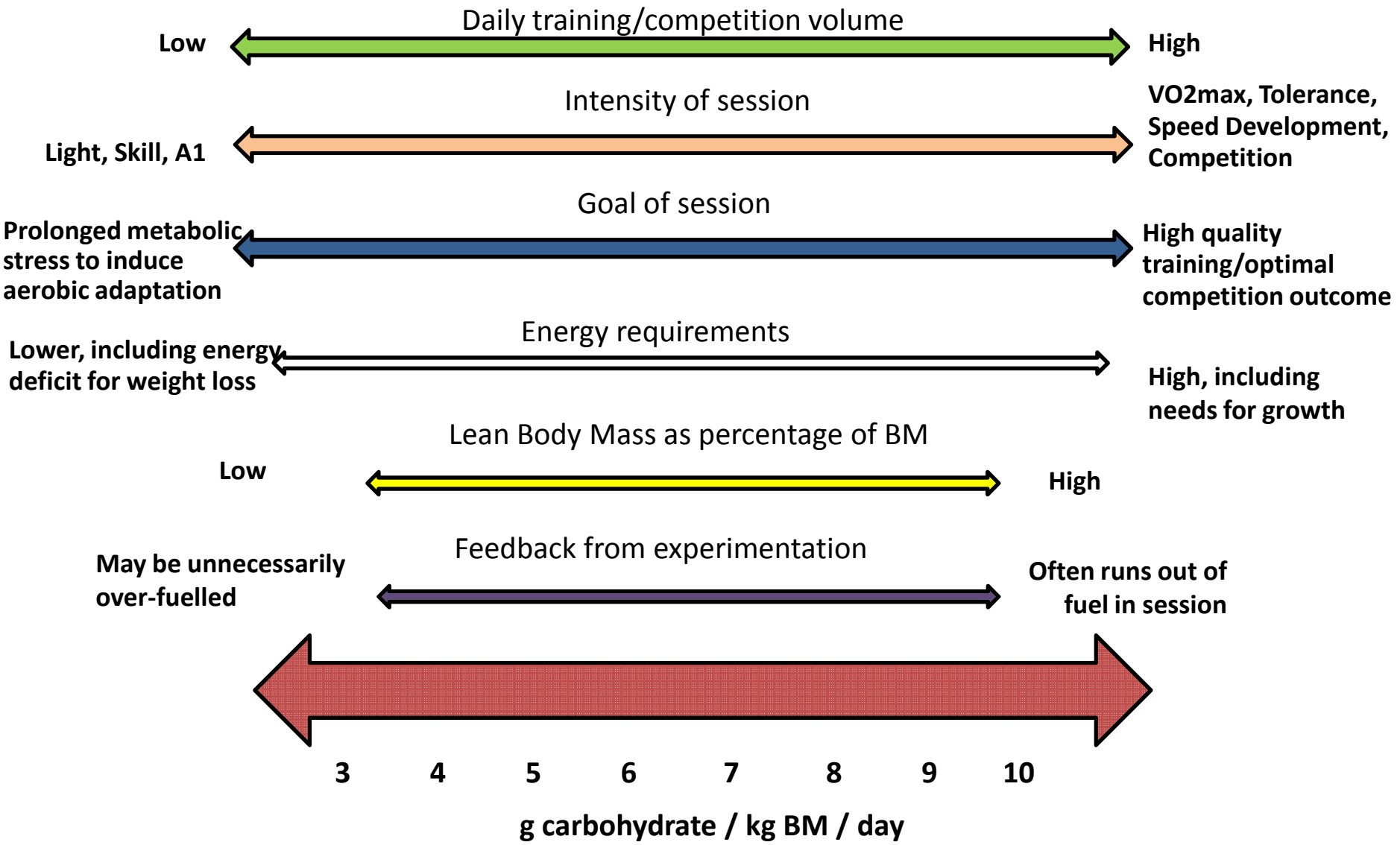
Swimming: Fuelling Sessions

High intensity sessions, high carbohydrate availability

sports drink and/or gel providing 30 - 60g CHO/h

fluids to match to individual sweat rate

Considerations in setting daily carbohydrate intake targets for aquatic athletes (Burke, Cox, Shaw, Stellingwerff))



Swimming

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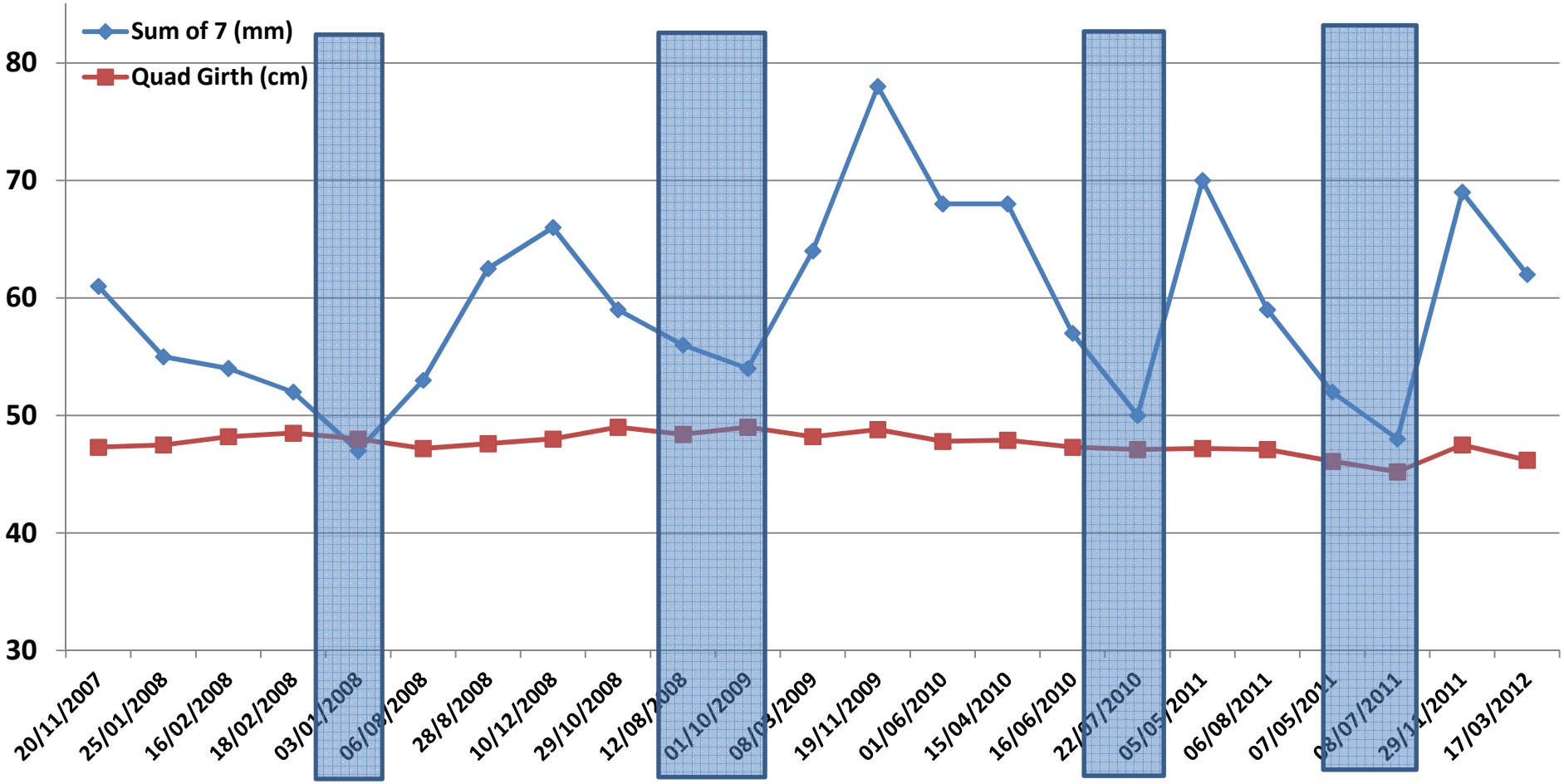
Swimming: Body Composition

Body contours affect drag

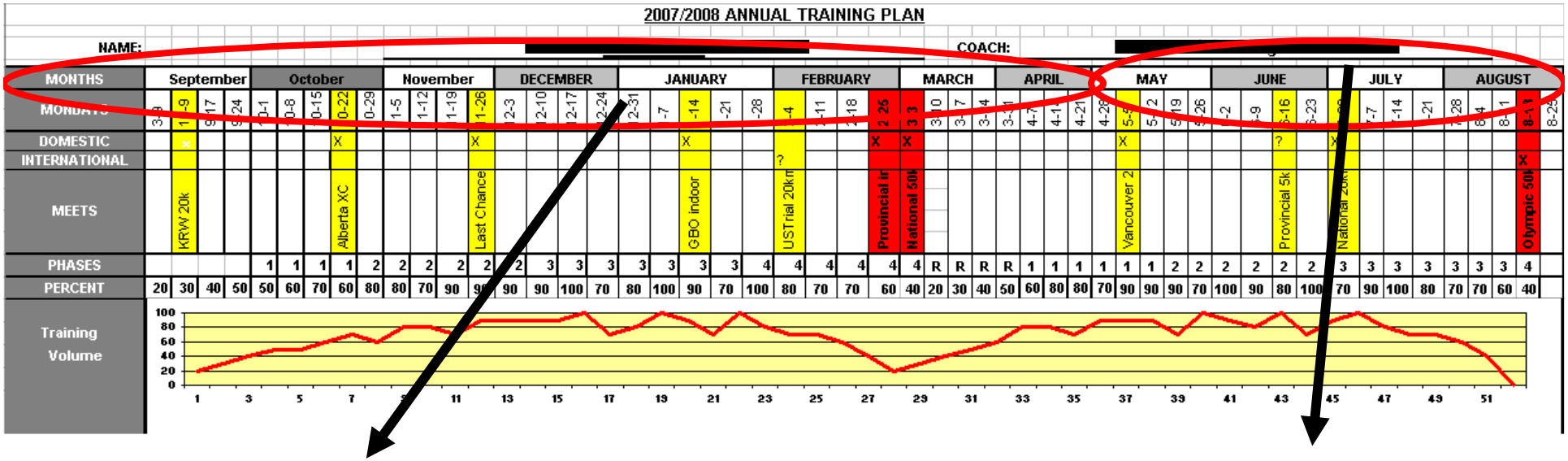
Aesthetics / body image

Periodized body composition throughout the year



Competition Phase

Practical approaches to periodized body comp



Majority of training year

- being 4 - 6% above race competition weight / % body fat is OK
- fully eating to handle training volume
- good wholesome nutrition the cornerstone, periodic treats are OK
- focus on recovery, less immune system problems

Realizing ideal championship body comp (only a few months / year)

- fully focus on very healthy food (no extra fat in diet, skip treats)
- Intensity of training, with slightly smaller meal portion sizes will strip off weight and result in ideal body comp
- Focus on smaller snacks that include fruit and some protein (milk, or protein shake)

Losing and/or Maintaining Weight

THE GOOD:

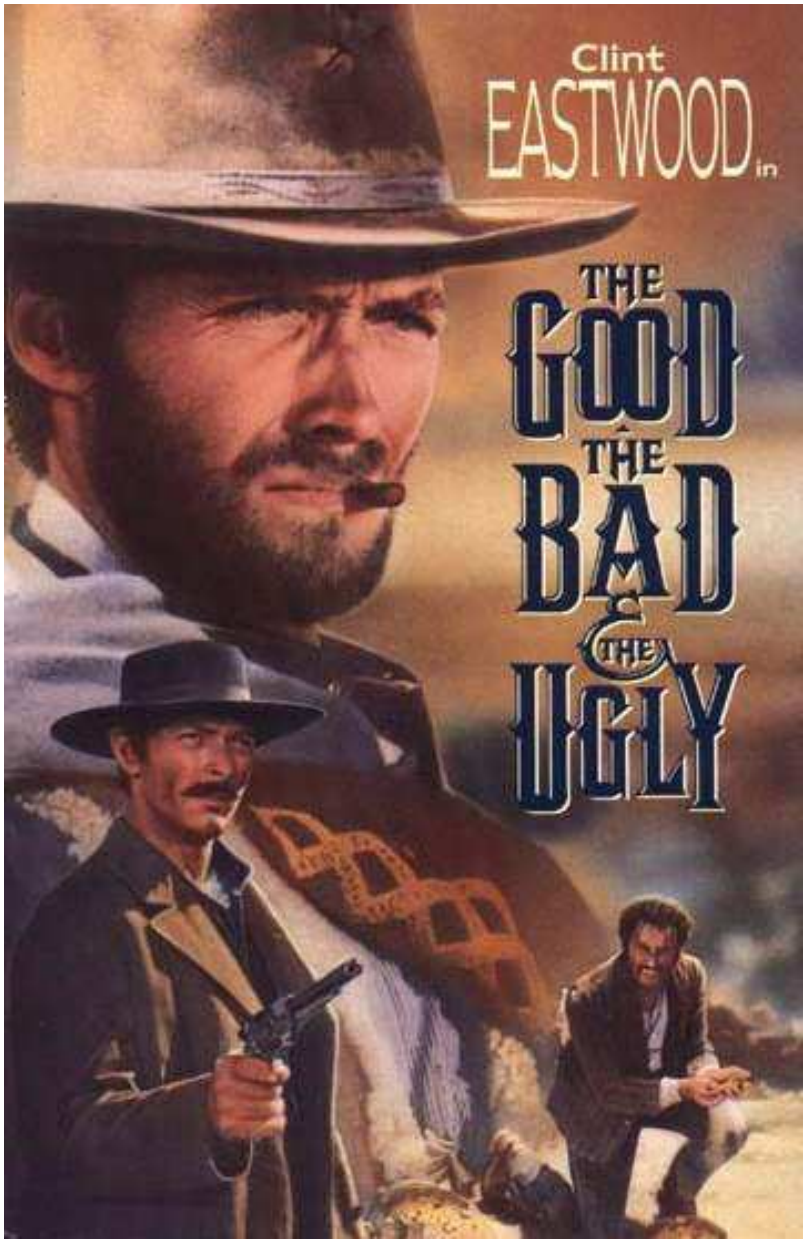
- long term plan for weight class
- slow reduction of weight over time
- decrease fat mass, not lean muscle mass

THE BAD:

- unrealistic weight goals
- constant state of energy deficit
- skipping meals totally
- not meeting minimum requirements for certain vitamins and/or minerals

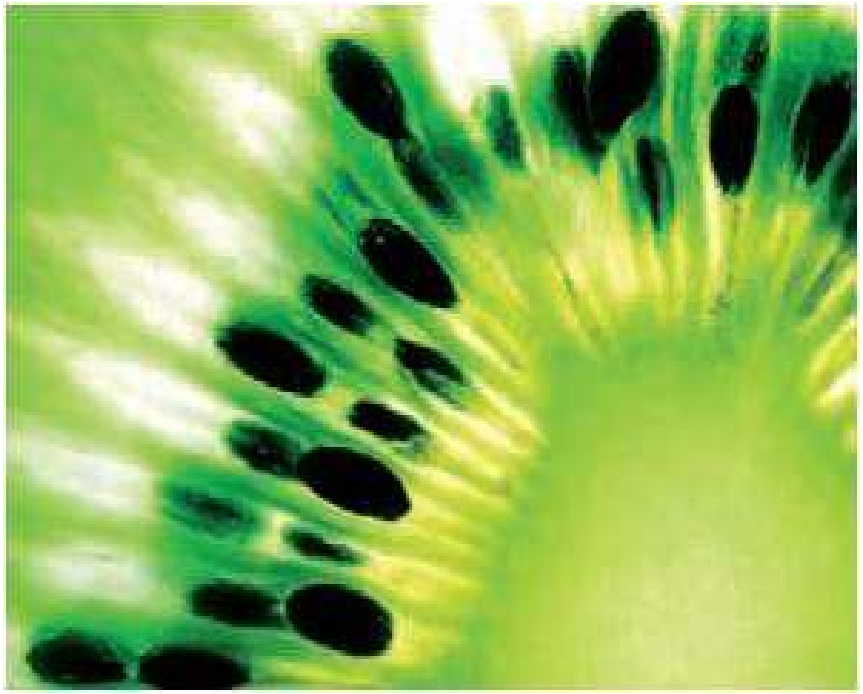
THE UGLY:

- binging and purging
- eating disorders
- diuretics and/or laxatives
- deaths!



Swimming: Body Composition

RELATIVE ENERGY DEFICIENCY IN SPORT (RED-S)



Underlying Cause:

Energy deficiency

relative to the balance between the

energy intake

and the ***energy expenditure*** of:

- body functions
- physical activity of daily living
- sport activity

Swimming: Body Composition

RELATIVE ENERGY DEFICIENCY IN SPORT (RED-S)

How does it happen?

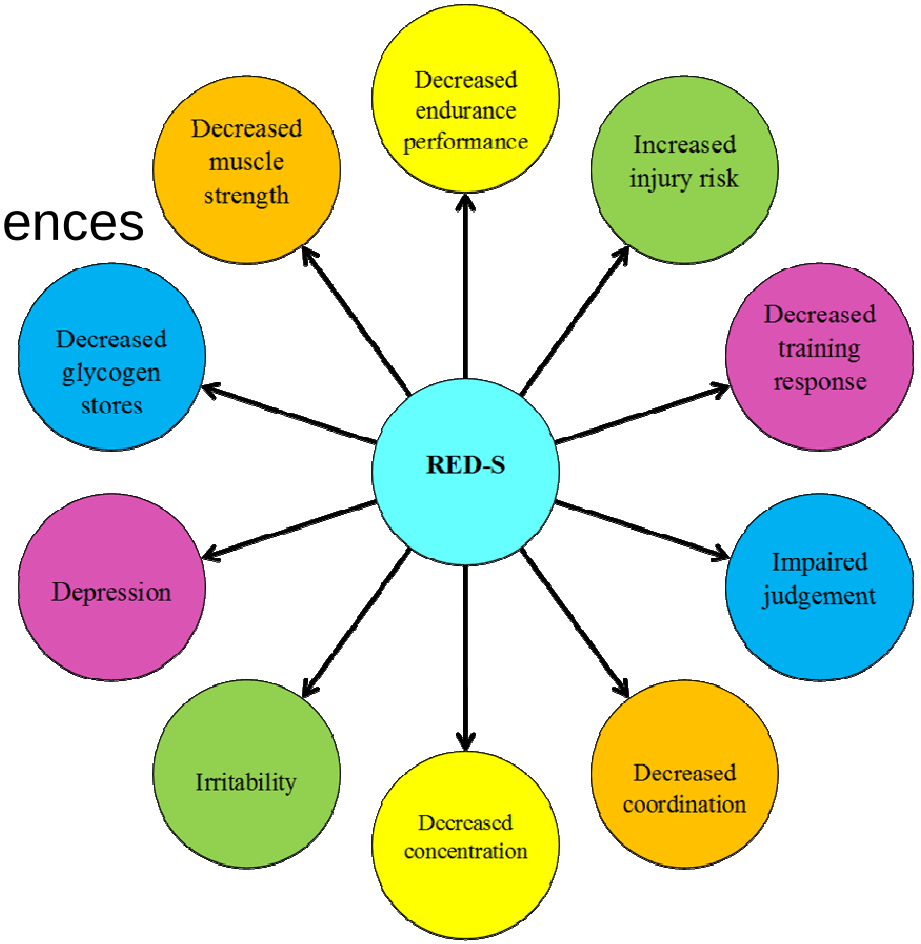
Disordered eating/eating disorders

Overzealous weight/fat loss

Failure of energy intake to match high energy expenditure

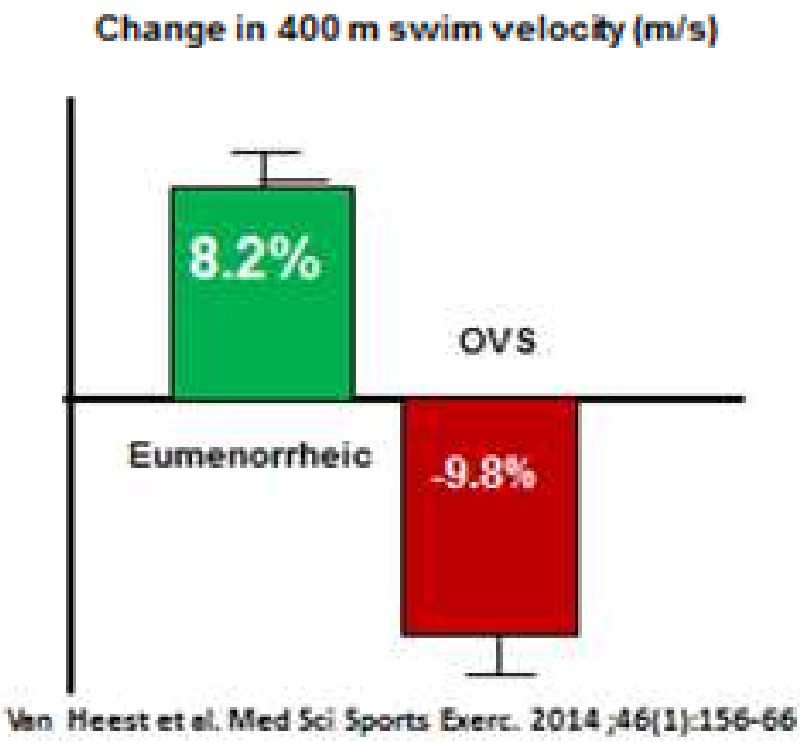
Swimming: Body Composition

RED-S: Performance Consequences



Swimming: Body Composition

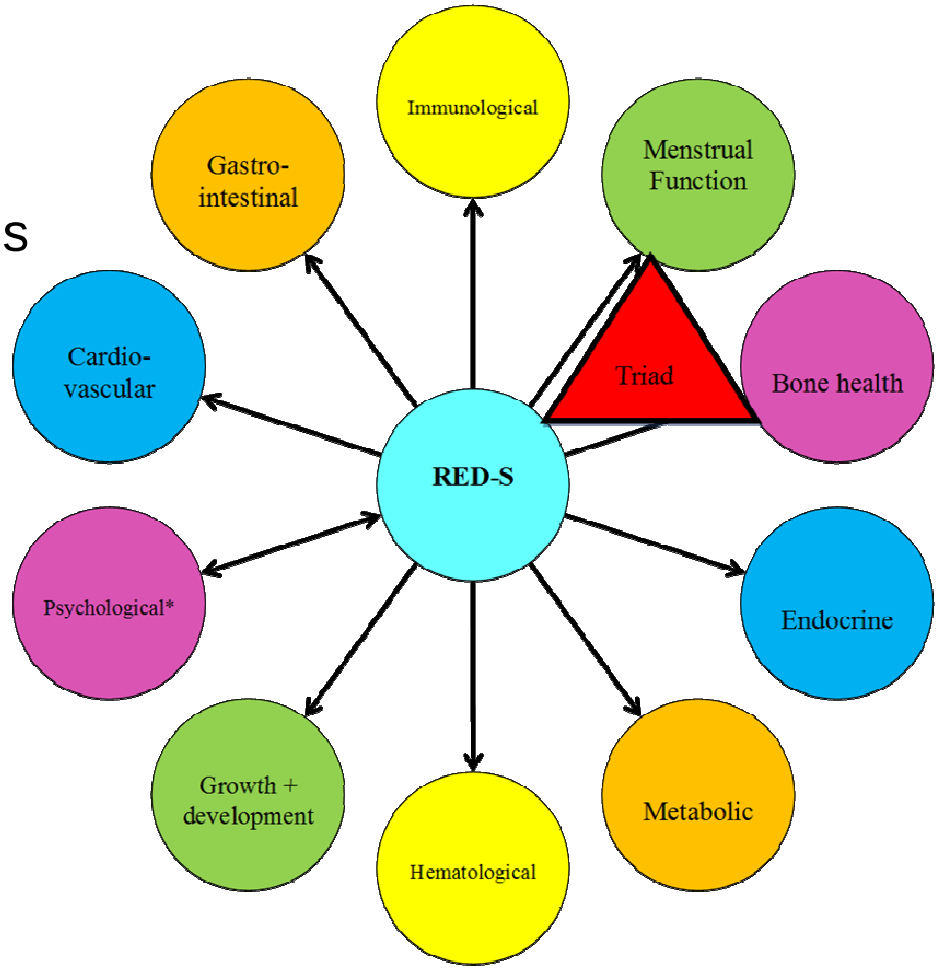
RED-S: Performance Consequences



Van Heest et al. Med Sci Sports Exerc. 2014 ;46(1):156-66

Swimming: Body Composition

RED-S: Health Consequences



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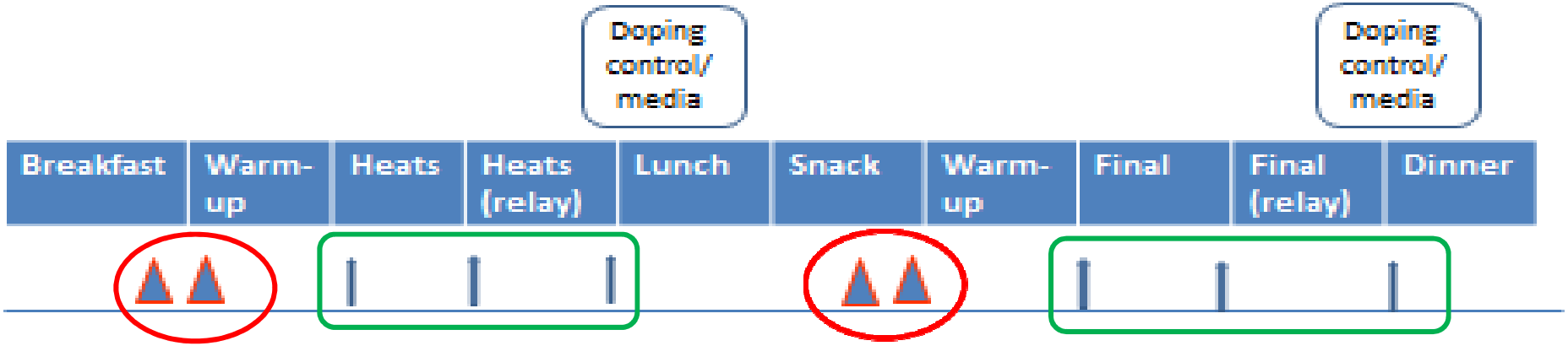
Swimming: Race Day Nutrition

Fluid and fuel

Ergogenic aid(s)



Type, amount and timing?
What is available?
What needs to be self-supplied?

Open Water Swimming

Fuelling swimming sessions

Hydration

Race day nutrition planning

Open Water Swimming

Fuelling swimming sessions

Hydration

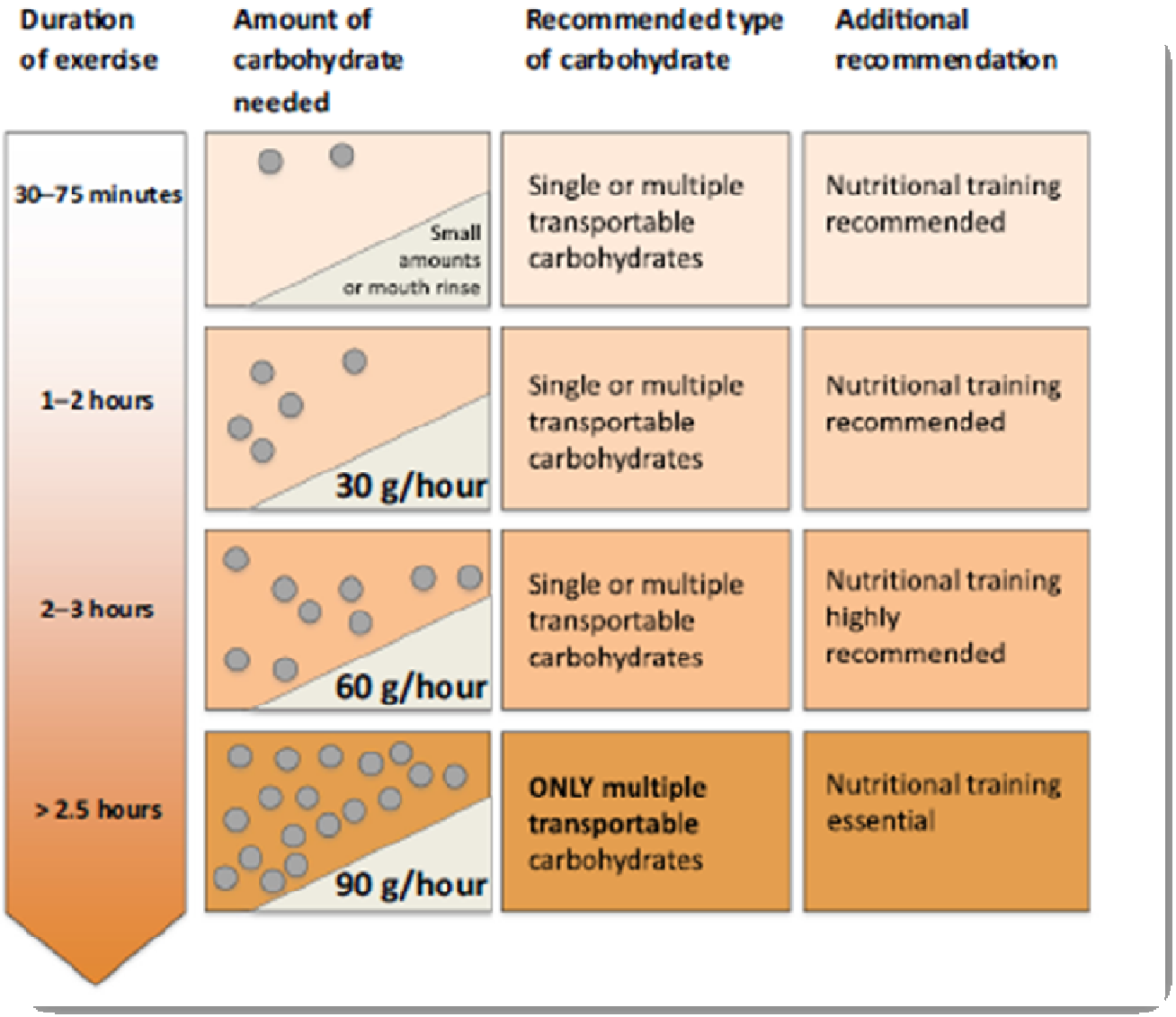
Race day nutrition planning

OWS: Fuelling Sessions

OWS events create unique physiological challenges to:

- thermoregulation
- hydration status
- muscle fuel stores

OWS: Fuelling Sessions



Open Water Swimming

Fuelling swimming sessions

Hydration

Race day nutrition planning

OWS: Hydration

Fluid needs during work-outs in water are lower than during dryland sessions

OWS: Hydration

Intensity and environmental factors effect the sweat rate of swimmers

Average 0.3-0.5 L /h may increase to 1.2 L /h racing in hot environment

OWS: Hydration

Sodium containing beverages should be ingesting during the longer races and/or when sodium losses are expected to be high

OWS: Hydration

Temperature of ingested fluid can be regulated for thermoregulatory purposes

Open Water Swimming

Fuelling swimming sessions

Hydration

Race day nutrition planning

OWS: Race day nutrition

Feeder practices

OWS: Race day nutrition

Athlete practices

OWS: Race day nutrition

Pre race hyper hydration
may be considered
when water temperature
is expected to be high
and opportunity for fluid intake is minimal

10ml/kg of a high Na^+ (~165 mmol/L) beverage]

OWS: Race day nutrition

5 km races

CHO mouthwash to enhance performance

candy in the oral cavity

OWS: Race day nutrition

10 km races

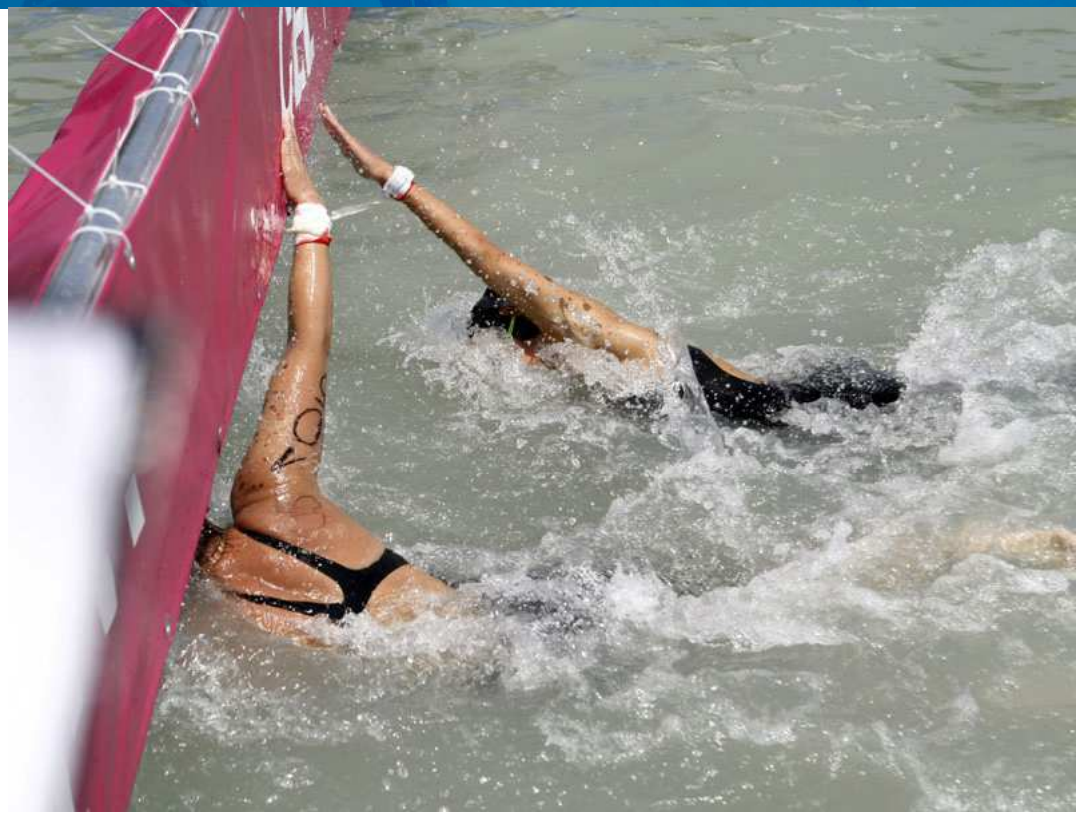
Multiple transportable CHO

up to 90 g/h

sports drink, gels, or foods

CHO feeding should to be practiced in training to improve GI tolerance and feeding technique

OWS: Race day nutrition



25 km races

Multiple transportable CHO

60- 90 g/h

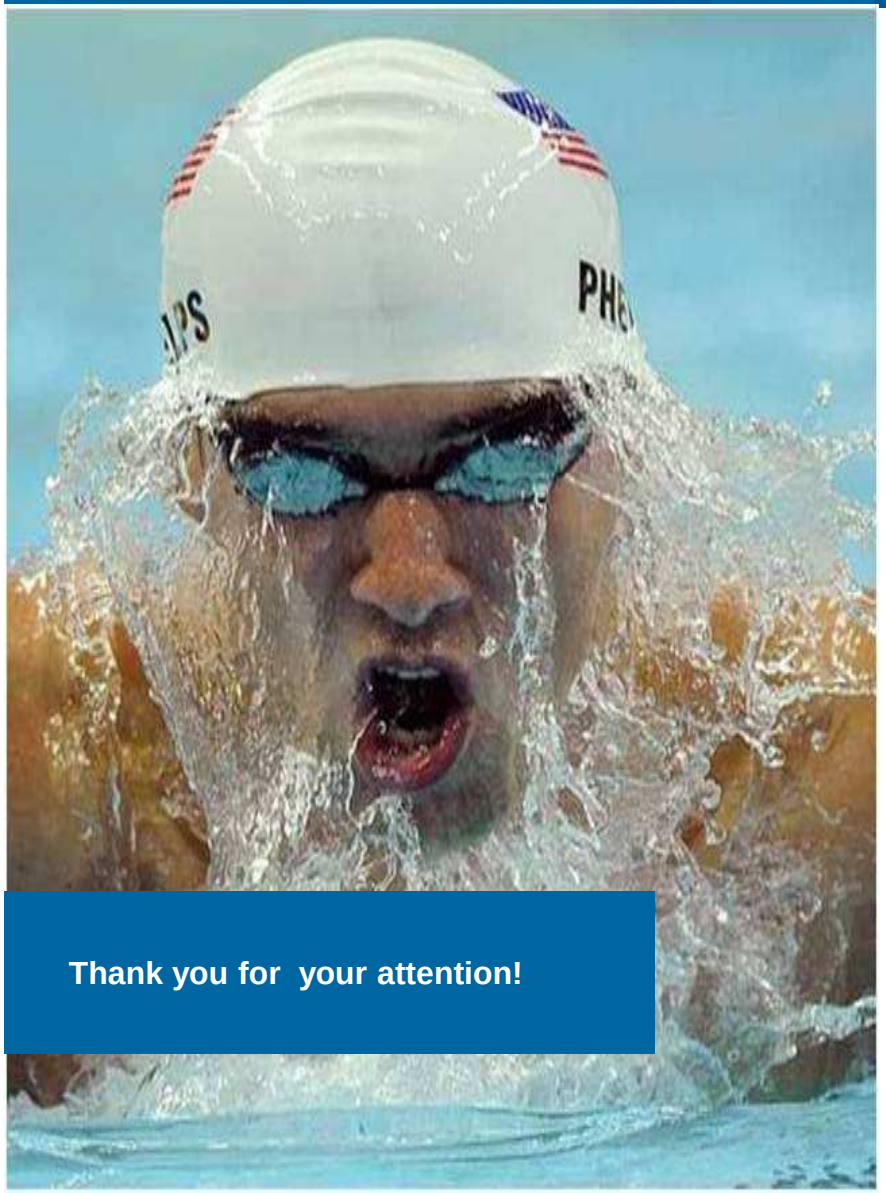
Be aware of flavour fatigue: take advantage of a wide range of salty and sweat foods/sports products

OWS: Race day nutrition

Recovery

Hydration and glycogen

Conclusion



Thank you for your attention!

“Sport-specific, individualized nutrition strategies

can enhance performance in training and competition

and help aquatic athletes to realize their potential”

Fina-Yakult Nutrition Experts

Thank you!

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Dr. Margo Mountjoy FINA Bureau – Sports Medicine