Sports Science Workshop: Nutrition and Hydration

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NYSI Sport Nutritionists

How do you think sports nutrition can help sports performance?

Let’s talk about...

The basics: Proper Eating Habits

Dietary strategies for performance

Hydration

Proper Eating Habits

Hydration

The basics:

Proper Eating Habits

Proper Eating Habits

Proper Eating Habits

Proper Eating Habits
What do athletes need to eat to give them energy?

Carbohydrates
- Key source of energy for training and competition
- Help build fuel reserves, delay fatigue and improve recovery
- Helps with concentration

Contains B vitamins & iron

What do athletes need to eat to help them with the building of muscles?

We recommend
That athletes eat their normal nutrient requirements + extra for their training and competition

Protein contains essential amino acids to build and repair muscle cells

What do athletes need to eat to keep their bones strong?

We recommend
Encouraging the athletes to have their low-fat milk, cheese, yogurt, calcium-fortified soymilk
What else do athletes need to eat to stay healthy?

Key Message

Eat a RAINBOW!!

Makes the strong base

Food First

- Proper eating habits
  - 5 food groups
- Optimal body functions
Dietary strategies
Dietary strategies are dependent on the purpose
• Training adaptation?
• Recovery?
• Refueling/energy?
• and so on...

Nutrient timing

Definition

After training/competition
(Also known as Recovery)
Definition: Nutrients needed that are consumed within four hours after training/competition. The best time to consume food is immediately after training/competition.

Food/beverages during training/competition
Definition: Beverages/food needed to sustain long periods of training/competition.

Before training/competition
(Also known as Pre-training)
Definition: Food that needs to be consumed one to four hours before training/competition.
## Purpose

<table>
<thead>
<tr>
<th>Training/ competition</th>
<th>Before</th>
<th>During</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stay hydrated</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Replenish/ maintain energy</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Repair</td>
<td>✓</td>
<td>X</td>
<td>✓</td>
</tr>
<tr>
<td>Repair Training adaptation (only applicable for training)</td>
<td>✓</td>
<td>X</td>
<td>✓</td>
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</tbody>
</table>

## Nutrient required

<table>
<thead>
<tr>
<th>Training/ competition</th>
<th>Before</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stay hydrated</td>
<td>Fluid</td>
</tr>
<tr>
<td>Replenish/ maintain energy</td>
<td>Carbohydrates, vitamin and minerals</td>
</tr>
<tr>
<td>Repair</td>
<td>Repairs: Protein, vitamin and minerals</td>
</tr>
<tr>
<td>Training adaptation (only applicable for training)</td>
<td>Training adaptation: Protein and Carbohydrates</td>
</tr>
</tbody>
</table>

## Pre-exercise meal/ snacks

- **Main meals (3 – 4 hours)**

- Best to drink water while eating main meals to hydrate better.

## Pre-exercise meal/ snacks

- **Snacks (1-2 hours) **

  * Only when hungry/ did not fuel enough
DURING TRAINING/ COMPETITION

During – Hydration

1. Check athletes' hydration status prior training and competition (see handouts).
2. Give athletes enough water breaks.
3. Remind athletes to take sips of water throughout the day.
4. Work with the athletes to develop a hydration plan.
5. For training and competition that lasts for >90 minutes, isotonic sports drinks are recommended.
6. Speak to a NYSI nutritionist if athletes are constantly dehydrated.

During – Carbohydrate intakes

<table>
<thead>
<tr>
<th>Timeframe</th>
<th>Endurance exercises/events (30g - 60g CHO/hour)</th>
<th>Ultra-endurance training/events (Up to 90g/hour)</th>
<th>Sustained high-intensity exercise/events (Small amounts)</th>
</tr>
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<tbody>
<tr>
<td>0 - 15min</td>
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<td>15min - 30min</td>
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<td>30min - 60min</td>
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<td>2hr - 2 ½hr</td>
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<td>23hr - 24hr</td>
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<td>24hr - 1day</td>
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AFTER TRAINING/ COMPETITION

Purpose

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Post-exercise meal/snacks

Window of Opportunity
Within 45 minutes post training and competition

More Recovery Food Ideas

Store perishable food in a cooler bag + ice pack if left out for more than 1 hour!
Activity:

- Try to think of one competition event or training sessions within a day.
- Let’s plan when meals and snacks should be consumed.

Case study: Football competition

- Competition starts at 7pm and ends at ~8:30.
- Game is played:
  - 90 min game with 45min halves
  - Half time: 15min break

What you need when planning:

- Definition of pre-, during and post-training
- The practical needs of the event/individual

NYSI Hydration Project

<table>
<thead>
<tr>
<th>% Body Weight Loss</th>
</tr>
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<tbody>
<tr>
<td><strong>Low Intensity</strong></td>
</tr>
<tr>
<td>Average: 0.57%</td>
</tr>
<tr>
<td>Highest: 2.51%</td>
</tr>
<tr>
<td><strong>High Intensity</strong></td>
</tr>
<tr>
<td>Average: 0.31%</td>
</tr>
<tr>
<td>Highest: 1.40%</td>
</tr>
</tbody>
</table>
Why is hydration important for athletes?

Activity:
- Let's calculate the amount of water required!

Possible strategy to help to keep hydrated
DOES A YOUTH ATHLETE NEED SUPPLEMENTATION?

Supplementation

- Youth athletes have the potential to have greater performance enhancement through maturation and experience in their sport.
- As youth athletes are yet to be seasoned and well-trained, performance supplements should not be encouraged.

Supplementation

- Should be medically warranted.
- Used to treat clinical issues but cannot compensate for poor food choices and inadequate intakes.
**Performance supplements**

https://youtu.be/50Qbw11mvE

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**Did you know….**

**10 – 15%** Of the dietary/ performance supplements contain prohibited substances

Large % Not backed by evidence

80%

Did not contain what the label said

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**If something seems to be too good to be true, it usually is**

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**Did you know….**

Of the sports supplements have high levels of Estrogenic Disrupting Chemicals (EDC)

80%

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**What are EDCs?**

- Substances that can interfere with normal functioning of the body's endocrine system
- Endocrine system controls the way the body develops and functions
- Examples:
  - BPA
  - Dioxin
  - Lead
  - Arsenic
  - Mercury, etc.

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**NYTimes** http://well.blogs.nytimes.com/2015/02/03/new-york-attorney-general-targets-supplements-at-major-retailers/


WADA

- The WADA prohibited list is updated every year
- 2017 Prohibited list is out. Please spend the time to look at the updates – just to get familiar

https://www.wada-ama.org/en/what-we-do/prohibited-list

Therapeutic Use Exemptions (TUEs)

- Carded under Sport Singapore: MUST submit their applications at least 30 days prior to participating in an event.
  -- Recommended: submit TUEs as soon as medical condition that requires the use of prohibited substances or methods is diagnosed.

Therapeutic Use Exemptions (TUEs)

- Uncarded Youths: might have to give the anti-doping association the TUEs application -- Recommended: Get the application ready

Those that have the privilege to know, have the duty to act

"Albert Einstein"

Recent studies have shown low-fat milk, especially flavoured milk is an excellent post-training beverage.

4:1 or 3:1 (Carbohydrates:Protein)

Some of the readily available milk & calcium-fortified soymilk

- Milk
  - CHO: 24.3 Protein: 6.8
  - CHO: 19 Protein: 3.7
- Calcium-fortified soymilk
  - CHO: 19 Protein: 3.7
- Milk & Calcium-fortified soymilk
  - CHO: 19 Protein: 3.7

Carbohydrates: Protein

Fluids Sodium
So How much does my athlete need?

**Carbohydrates**

- These amounts depend on the intensity, duration and environmental conditions

<table>
<thead>
<tr>
<th>Activity level</th>
<th>Carbohydrate target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low intensity or skilled-based activities</td>
<td>3—5g/kg/day</td>
</tr>
<tr>
<td>Moderate exercise programme (~1 hour per day)</td>
<td>5—7g/kg/day</td>
</tr>
<tr>
<td>Endurance programme (e.g. 1 to 3 hours per day of moderate to high intensity exercise)</td>
<td>6—10g/kg/day</td>
</tr>
<tr>
<td>Extreme commitment (i.e. &gt; 4–5 hours per day of moderate to high intensity exercise)</td>
<td>8—12g/kg/day</td>
</tr>
</tbody>
</table>

**Protein**

- Take note that these estimated intakes can be generally be met through diet alone.

<table>
<thead>
<tr>
<th>Group</th>
<th>Protein intake (g/kg/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sedentary men and women</td>
<td>0.8–1.0</td>
</tr>
<tr>
<td>Competitive elite Youth athletes</td>
<td>~1.3–1.8</td>
</tr>
<tr>
<td>Youth athletes: during periods of intensified training/ reduced energy intakes</td>
<td>Up to 2.5</td>
</tr>
</tbody>
</table>

The End