

## U16 NW Female Team - Hockey Nutrition

### Goal of our Hockey Nutrition Plan

- Provide basic nutrition requirements for training and competition.
- Promote long term health.
- Promote adaptation and recovery between training/competition sessions.
- Ensure adequate pre-training/competition fuel stores.
- Promote maximum duration of fuel stores by using pre-competition planning/strategies and by supplementing fuel during competition.
- Prevent dehydration and the possibility of hyponatremia (your body is low on sodium & other critical minerals so it protects you from further loss by causing you to urinate any water consumed). Thus, you wind up dehydrated.
- Prevent gastro-intestinal discomfort through food choices and planning.
- Encourage optimal recovery after training/competition and ensure post-competition resupply of fuel stores.

### Hockey uses all three energy systems

*There are two things that can cause your body to change from one energy system to another:*

1. *Lack of fuel for the energy system being used.*
2. *Time.*

1. **Anaerobic Alactic** – We can work at **100% maximum effort** in this energy system. However, this system does not last long (5-8 seconds max). We use this system when we are trying to drive to the net on a break-away, after stopping followed with a quick start, shooting etc. *The fuel for this energy system is creatine phosphate.*
2. **Anaerobic Lactic** – This is our predominant energy system. We can work at **80-90% maximum effort for 30-45 seconds**. *That is why “shift length” is so critical. The fuel for this energy system is carbohydrates (glycogen).*
3. **Aerobic** – This system is used after we run out of carbohydrates or when we have had a long shift (more than 30-45 seconds). We can only work at **50-60% maximum effort** after 10 minutes of training/competition. *This system can burn carbohydrates (when protein is converted into carbs), protein and fat.*

*If you are trying to lose body fat, keep in mind that the aerobic energy system is the only system that uses fat as a fuel source. You have to keep your heart rate in the aerobic zone (low intensity) to burn fat.*

### Muscles and brain are doing the work – they need nutrients and water.

- Your blood delivers the nutrients and removes the waste.
- Your Gastro-intestinal tract (gut) is the gatekeeper.

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- **Hockey players need to:**
  - Eat the right foods at the right time
    - **The rule of thumb is** – the closer to training/competition time, the simpler the carbohydrates. The higher the glycemic index, the more sugar (glycogen/carbs).
  - In the proper amounts
  - **Hockey players need to:**
    - Like the right types of food
    - Have a plan to eat the right foods, at the right time

### Where do we get the fuel for the energy systems we use?

- **Anaerobic Alactic** – We get **creatine phosphate from eating meat** or by supplementing. Supplementation is only suggested if you are a vegetarian. If you do supplement, keep in mind that your body has a maximum threshold for creatine phosphate storage. ***Once your storage capacity is full, that's it - your body can't store anymore and you urinate, the excess creatine phosphate out!***
- **Anaerobic Lactic** – We get **carbohydrates from eating fruits, vegetables, grains, rice, pastas, cereals, potatoes, legumes, yogurt and milk.**
  - Muscle carbohydrate stores last 30 minutes at very high intensity training/competition.
  - 120 minutes at moderate-high intensity training/competition.
- **Aerobic** – If carbohydrates run out
  - Your body burns protein by converting it to carbohydrates. **Protein is a valuable nutrient; it is used to build muscle tissue.** If there is no protein available in your body, your body will break down its own muscle tissue and convert it to carbohydrates. This wastes energy and compromises your body structure.
  - Your body will also burn **fat**. This is a very slow process and although it will last a long time, you can't work at high intensities.

### Recommended Daily Carbohydrate (CHO) Intake

- **Females** – 6-8 grams of CHO /per kg of body weight/ per day - **pre and post training/competition days.**

### What are hockey player's muscles burning?

- **Intensity Level during training/competition:**
  - **Low** – 50% carbs – 50% fat
  - **Moderate-High** – 70% carbs, 30% fat
  - **High** – 100% carbs.

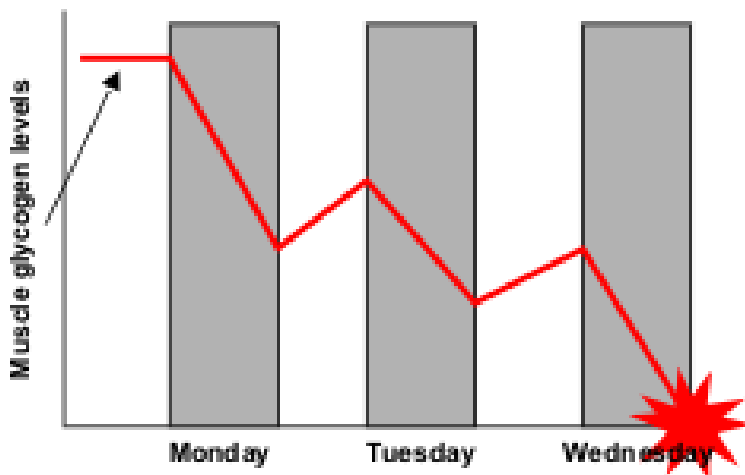
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**This is what happens after you train or compete** – If you have planned ahead and eaten properly pre-training/competition, your muscle glycogen levels will be topped up to their maximum level. After training/competition you drain your carb stores and then you eat a bit and your carb storage level increases, **but note** - they do not come back up to previous levels.

The diagram below is a prime example of what would happen to our glycogen (CHO) stores at a tournament or the BC Winter games, where we have had to compete 3 times during one day, or after several days of competition.

If we want to compete at our best, it is absolutely critical that we stay in the anaerobic lactic energy system (80-90% max effort), as much as possible. We know that the source of fuel for this energy system is carbohydrates (CHO). Thus, it is critical that we keep our carbohydrate stores topped up as high as possible.

The only way to top up your carbohydrate stores is to eat properly (the right types of carbs, at the right times).



[a] without proper carbohydrate feeding  
2 hour quality training sessions...

*Remember, when we run out of carbohydrates (glycogen) our body will automatically switch to the aerobic energy system and we will only be able to compete at 50-60% max effort (after 10 minutes of hockey).*

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### What happens to our body when we have a shortage of carbohydrates?

- Slower movements
- Sluggish brain activity
  - Excess fat in blood
  - Hypoglycemia (your brain needs carbs to function properly)
- Hypoglycemic stress response
  - Immune system is weakened (we get sick easier)

### Quality of carbohydrates

- **Fruit** - eat lots of fruit – stick to low fibre fruit close to or during competitions.
- **Sport Drinks** – mostly water, sugar and sodium – high glycemic fruit like watermelon is better for topping up carbohydrates, but the sodium in the sports drinks is helpful in preventing hypernatremia.
- **Glycemic Index** – the higher the glycemic index, the quicker the glycogen reaches the muscles and the brain.

### Pre-training/competition carbohydrates

- **Pre-training/competitions meals/snacks can**
  - Top up fuel (carbs)
  - Increase carbohydrate use (more ATP per litre of oxygen)
  - Prevent hypoglycaemia
- **How to top up carbs**
  - 3-4 hours pre-training/competition
    - Eat 2-2.5 grams of CHO/kg body weight
  - 1 hour pre-training/competition
    - Drink or eat 1 gram/kg of body weight
  - During training/competition time = smaller amounts (0.5-1 grams/kg weight/hour)
    - Banana, orange, slice of watermelon etc.
    - Glass of fruit juice
  - During intermissions or on the bench
    - Continue to eat or drink simple carbs (preferably high glycemic)
  - **Things to avoid pre-event**
    - Protein – takes away your hunger for carbs.
    - Unfamiliar foods – the night before a big game is **not** the time to be trying new foods.
    - Stay away from high fibre foods close to training/competition time – you will have to poop!
    - Stay away from fat – it is the most difficult type of food to digest!

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### Why do we eat carbohydrates post-training/competition?

- Recovery of glycogen
  - Muscles
  - Liver
- Carbohydrate loading for next training session or competition.
- **If we have less than 17-24 hours to recover we need to eat:**
  - **High glycemic** foods **immediately**
  - We need 1 gram of CHO/kg body weight/hour until we have time to eat a full meal.
- **If we have more than 24 hours to recover we need to eat:**
  - **6-8 grams of CHO /per kg of body weight/ per day**

### High Glycemic Carbs

- Quick top up before training/competition
  - “Sugar crash” is uncommon in competitive athletes
- Quick supplement during training/competition
  - Over 90 minutes – start at 45-60 minutes
  - Multiple competition events
  - **Sports drinks and fruit are usually most tolerable**
- Quick recovery

### Low Glycemic Carbs

- Low glycemic index foods are great for
  - Fueling longer training/competition
  - Overnight recovery
  - Keeping you from getting hungry

### Protein for recovery

- Small amounts of protein combined with carbs may aid muscle protein recovery
  - ¼ gram of protein /per 1 gram of CHO/Kg body weight
    - **250 ml chocolate milk**
    - **250 ml Fruit Yogurt**

*Too much protein will abate hunger (make you feel full) and you will not eat enough carbohydrates to top up for the next training/competition. Too much protein also enhances dehydration.*

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### Fat

- If you are growing you will need more “good” fat for energy than someone who has finished growing
- **Quality of fat is critical**
  - Fat is an essential nutrient
  - Good fats are a source of essential amino acids (required to build muscle tissue)
  - Excellent Fats
    - Olive Oil & Canola Oil
    - Nuts & Seeds
    - Avocados
    - Legumes
    - Whole Grains
  - OK Fats (In moderation)
    - Lean meat (Beef)
    - Dark Chocolate
  - An athlete is getting too much “bad” fats if they are eating:
    - Heavily processed foods
    - Trans – Fats and Saturated Fats
    - Fast foods – French fries, burgers, hot dogs etc.
    - Pizza pockets, donuts, crackers, cookies, chips etc.
    - Desserts are usually very high in fat
    - Creamy salad dressings, butter, mayo etc.

***Minimum Fat required – 1 gram/Kg body weight (ideally <30% of total calories)***

### **Athlete is getting too little Fat if:**

- The athlete doesn't eat any meat
- The athlete avoids egg yolks, salad dressings, nuts, avocados, cheese, milk, butter/margarine and all fried foods.
- **The athlete excessively counts all of the grams of fat in their diet. *This can lead to eating disorders or be a sign of an existing eating disorder!***

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### Hydration

- Players need to prevent dehydration and electrolyte deficiency during training/competition
- Players need to replace fluid and electrolytes after training/competition
- Pre-hydration
  - 4 hours before training/competition – 5-7 ml/per kg body weight
  - 2 hours before training/competition – if athlete can't produce urine or urine is dark (sign of dehydration) drink another 3-5 ml/per kg body weight
  - Salty or high sodium foods (salted nuts, sports drinks) – help you retain fluid and increase thirst. *If you wait until you are thirsty to drink/hydrate you will already be dehydrated.*
- Post-hydration
  - Most athletes typical fluid replacement is only 50% of fluid lost
  - You need to replace 150% of fluid lost – if fluid loss is (2 kg = 2 litres) then you need to replace 3 litres of fluid.

*Players need 5 hours to partially recover after a training/competition and 17-24 hours to recover completely.*

- *Fill muscles first*
  - *Eat carbs*
  - *Hydrate*
  - *Avoid junk food; it only fills your stomach and you won't want to eat what your body needs to get ready for next training/competition.*
  - *Avoid Fat and excessive protein (abates hunger) and avoid caffeine*

*Stay away from drinks like Red Bull, Monster Energy, etc. These drinks are advertised as energy drinks – They are very highly concentrated with caffeine and other additives that are too concentrated for athletes.*

*All references are from the NCI/ICS – Level 4 coaching modules, 2008.*

- *Energy systems – Dr. Lynne Wolski*
- *Nutrition – Dr. Susan Crawford*

*Fred Hudson*

*Head Coach*

*BC - U16 Female – NW Team*