



# Fueling for Success

# Topics

- Hydration
- Electrolyte Replenishment
- Fueling Requirements
- Recovery
- Race Fueling Strategies

# **Your body is like a car engine**

## **It Needs**

- **Coolant - Hydration**
- **Oil - Electrolytes**
- **Fuel - Nutrition**





# Without the proper plan

- You will burn out early

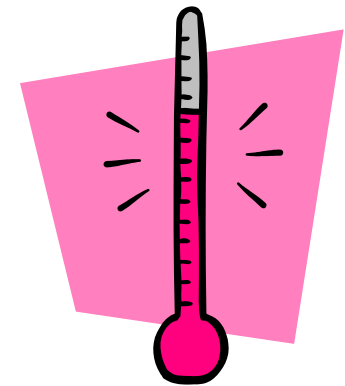


# Hydration - Coolant

- Your body is ~60% water
  - a drop in body water as small as 2% can lead to significant drops in performance
  - a drop of 15-20% can be fatal
- What does water do for us?
  - transports nutrients and oxygen
  - lubricates joints
  - maintains body temperature & electrolyte concentrations

# Hydration

- Effects of Dehydration
  - Reduced skin blood flow
  - Reduction in stroke volume
  - Increased core body temperature



# Hydration

- On average lose one liter per hour

To maintain proper hydration:

- Drink  $\frac{1}{2}$  body weight (lbs) per day (oz). Example: 150 lb person needs 75 oz fluid.
- Avoid caffeinated, carbonated, and alcoholic beverages
- During an event drink 16-28 oz every hour
  - You CAN drink too much
- Drink **BEFORE** you are thirsty
  - *American College of Sports Medicine experts “Thirst alone is not the best indicator of the body’s fluid status.”*

# Hydration

Water bottle = 21-24 oz  $\approx$  1- 1.5 hours



- Hydration pack = 50-100 oz  $\approx$  2.5 – 5 hours





## Electrolytes - Oil

Electrolyte minerals maintain smooth performance of vital functions such as muscle contraction.

- Important in all temperatures
- Salt tablets alone cannot sufficiently satisfy electrolyte requirements
- Balanced blend of minerals – Calcium, Magnesium, Potassium, SodiumChloride
- Don't wait for cramping before using. By the time you cramp your body has been compromised for some time

## **Nutrition - Fuel**

- Energy for sports comes from carbohydrates (glycogen) and fat stored in the body
- Glycogen is a form of energy stored in muscle

# Simple vs. Complex Carbs

## Simple Sugars

- = ose (fructose, sucrose, glucose, dextrose), also syrups
- Low absorption rate, weak concentrations required, 6-8%
- Higher concentrations not effective, body still absorbs at lower rate
- May cause stomach distress and cramping as body diverts water and electrolytes from other areas to help dilute concentrations

# Simple vs. Complex Carbs

## Complex Carbs

- Maltodextrins, glucose polymers (not the same as glucose)
- Rapidly absorbed at higher concentrations, 15-18%
- Empty the stomach at same rate as normal body fluids but provides up to 3X more energy

## Protein - Soy vs. Whey

- Soy protein is best used prior to and during exercise, primarily because it has less potential for producing ammonia, a primary cause of muscle fatigue.
- Each scoop of Hammer Soy provides 25 grams of the highest quality 100% GMO-free (genetically modified organism) soy protein, without any fillers, added sugar, and artificial sweeteners or flavoring. Add Hammer Soy to juices, smoothies, or other soy-based drinks to make a satisfying and healthy meal.



## Protein - Soy vs. Whey (cont)

- Whey protein's amino acid profile contains the highest percentage of essential amino acids, 25% of which are the BCAAs (branched chain amino acids) leucine, isoleucine, and valine, the most important for muscle tissue repair. Each scoop of HAMMER WHEY also contains six grams of glutamine, providing even more muscle rebuilding and immune system enhancing benefits.
- Whey protein concentrate contains anywhere from 35% to 80% actual protein, the remainder being fat and lactose. Isolate, on the other hand contains 90% - 97% protein, with little, if any lactose or fat, making it the purest form of whey protein available. Because isolate contains almost no lactose, even those with lactose intolerance find it an easily digestible protein source. Hammer use only isolates in all their whey containing products.

# Calories

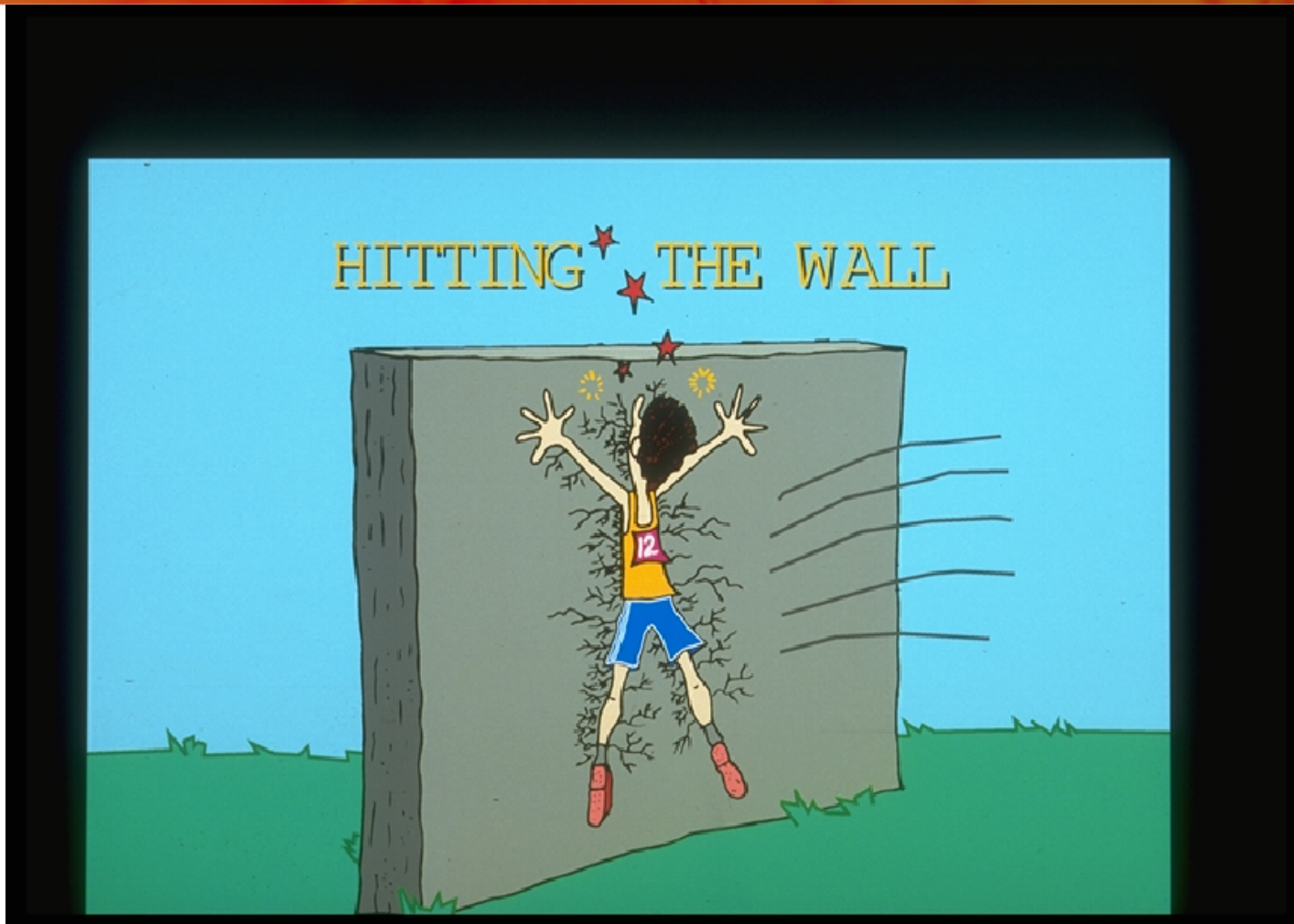
## How Much is Enough?

- Average calories burned in a MTB XC race = 500-800 calories/hour
- But we can only digest up to 240-280 calories per hour (guideline)
- Excess calories may result in gastric distress, poor performance
- Do not overcompensate if fall behind in fueling plan

# Result of improper caloric intake



# Result of improper caloric intake



# Recovery

- **Real gain of exercise occurs during recovery – body rebuilds itself more fit than before**
- **Rehydrate**
- **Replenishment of complex carbs and protein**
- **Maximum glycogen replacement rate occurs within 1<sup>st</sup> hour after exercise**
- **Recovery drink within 30 minutes of stopping exercise**

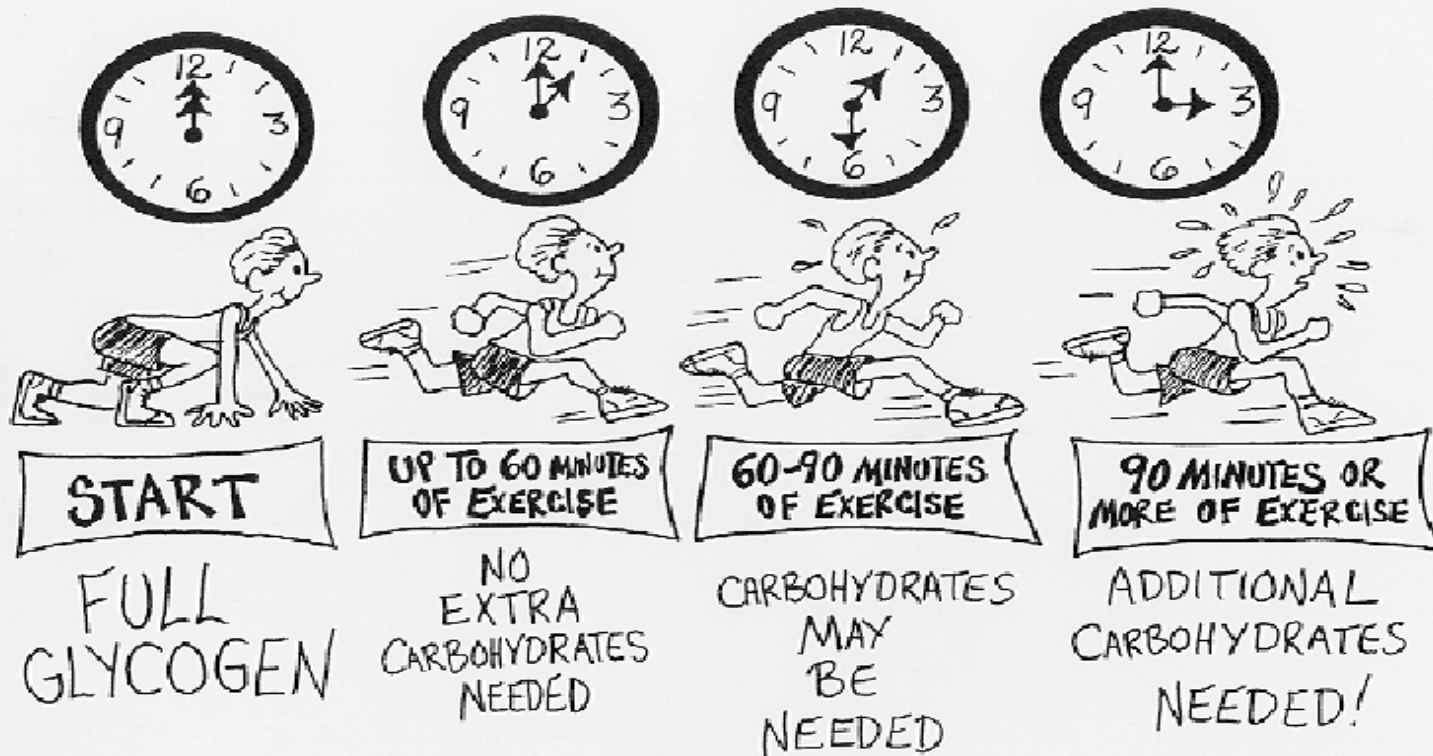


# Race Nutrition Strategies

## Pre-race Fueling

- Events longer than 90 minutes - limit food to 3 hours prior
  - If not possible have a small amount (100-200 calories) of easily digested complex carbohydrates 5-10 minutes prior to the start. (1-2 pkts Hammer Gel)
- Events less than 90 minutes - small amount of fuel an hour or so prior to the start or sip on a bottle of HEED in the hour leading up to the race
- Focus on complex carbs, starches, and a little protein for your pre-race meal.
- Avoid high fiber, simple sugars, and high fat in your pre-race meal.
- Drink 12-17 ounces fluid each hour up to 30 minutes prior to the start (24-34 ounces total fluid intake)

# Glycogen and Endurance Exercise



## Summary

1. Keep fluid intake during exercise between 16-28 ounces per hour
2. Restrict caloric intake to 300 cal/hr during exercise.
3. Avoid simple sugars in your fuels; use complex carbohydrates only.
4. Exercise over two hours requires protein, too.
5. Use soy, not whey, during exercise.

## Summary (cont.)

6. Use liquid fuels as your main energy source, even during prolonged training and races.
7. Remember to replenish electrolytes during exercise.
8. Don't rely on salt tablets to fulfill electrolyte requirements.
9. Don't use any new supplement or fuel, or supplement/fueling protocol, in a race without having first tested it in training.

## Summary (cont.)

10. Replenish your body with carbohydrates and protein as soon as possible after each exercise session.
11. Don't over-consume food the night before the race in the hopes of "carbo loading."
12. Finish a pre-race meal three hours prior to the start of the race.
13. Don't sacrifice sleep to eat a pre-race meal.
14. Consume appropriate amounts of high quality food for your pre-race meal.



# Resources

- Endurance Athlete's Guide to Success
- <http://www.hammernutrition.com>
- Endurance discussion forum <http://groups.yahoo.com/group/endurancelist>