



Fueling Strategies for Competitive Athletes

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Fuel ON!

Healthy Cells Recover Faster

- Every food has a purpose.
- Choosing the right foods will help you achieve your goals more quickly.
- Choosing the wrong foods can sabotage your progress.
- Our job is to help you know your purpose.





Formal Education

- Sports Medicine
- Kinesiology
- Biomechanics
- Anatomy/Physiology
- Biochem
 - **Metabolism**
 - **Ergogenic pathways**
- Sport Specific demands
- MNT
- Meal planning
- Food safety
- Pre/during and post competition nutrition
- Counseling
- Weight Management
- Public Speaking
- Management

Did you know?

You can specialize in sports Dietetics through the CDR.

CSSD: Board Certified Specialist in Sports Dietetics

ESPN

Education

Fuel On



“They won’t care how much you know until they know how much you care”

Rules

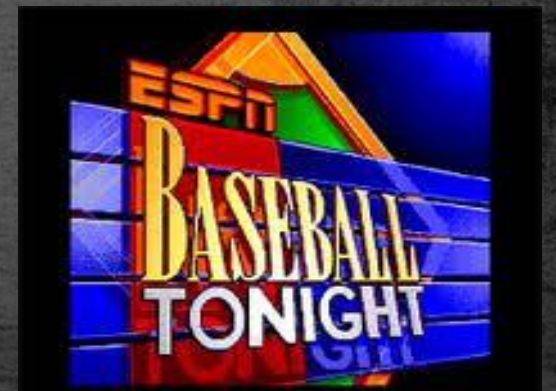
Lingo

Strategy

Positions

Nuances

Schedule



What do Athletes REALLY Need to Know?



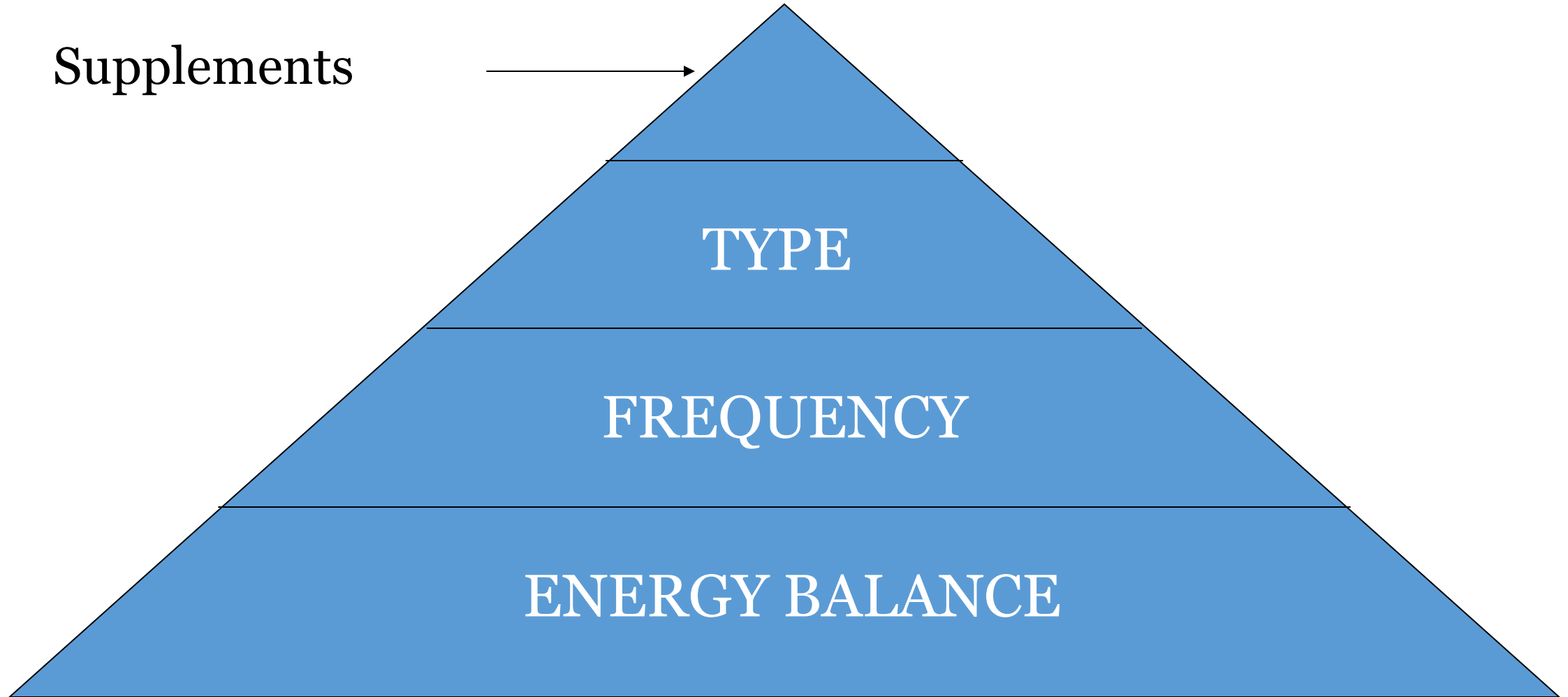
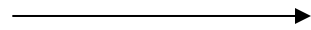
Purposeful Eating

- Purpose of Macronutrients
- Nutrient Timing
- Portion Size
- Nutrition Periodization
 - Pre-season
 - Competition
 - Bulking Phase



YOU CAN'T OUT TRAIN BAD NUTRITION

Supplements

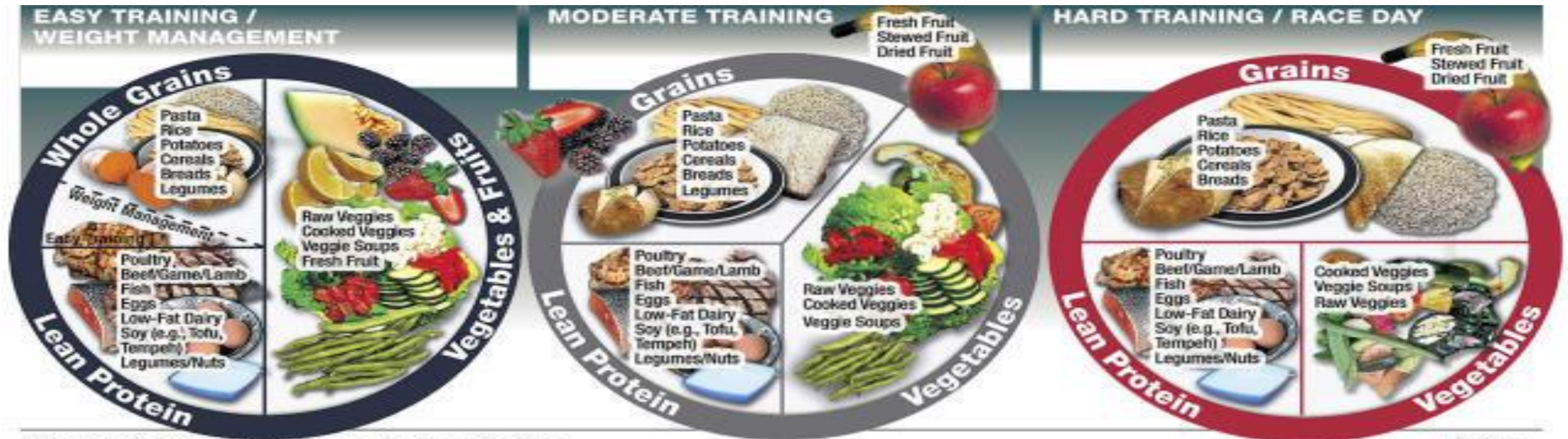


TYPE

FREQUENCY

ENERGY BALANCE

Adjust your Fueling to your Training



SOURCE: United States Olympic Committee Sport Dietitians
University of Colorado Sport Nutrition Grad Program

BRAIN / HYPOTHALAMUS

(+)

(+)

(+)

(+)

(+)

↑ Testosterone/Estrogen
- Bone Formation
- Muscle Growth

↑ Growth Hormones
- Build Lean Muscle
- Bone Formation

↑ Thyroid Hormones
- Normal Metabolic Function

Normal Stress Hormone Levels
↑ Fat Metabolism

Leptin

Adequate Food

Recovery Goals:

- Tissue Repair
 - Training is intentional trauma that creates micro tears in tissues.
 - Recovery nutrition's ultimate goal is to speed the hypertrophy of the connective tissue, muscle and skeleton to create a more resilient athlete.
- Improved Blood Flow
 - Vasoconstriction due to the stress response propagates the inflammatory process.
 - Increasing vessel size allows for improved nutrient delivery at the cellular level.
- Decreased Fatigue
 - Electrolyte replacement and buffering of lactic acids to improve endurance.
 - Carbohydrate ingestion to prevent muscle breakdown.
 - Boost Immune System

Typical symptoms of overreaching in trained endurance athletes

Designed by
@YLM SportScience



Reduced performance and high perceived fatigue



Decreased heart rate values at all exercise intensities, including at exhaustion



Altered cognitive performance above lactate threshold

Increased rate of perceived exertion at submaximal intensities



Reduced blood lactate concentration at both submaximal & maximal intensities



Higher prevalence of infections



Disturbed sleep quality

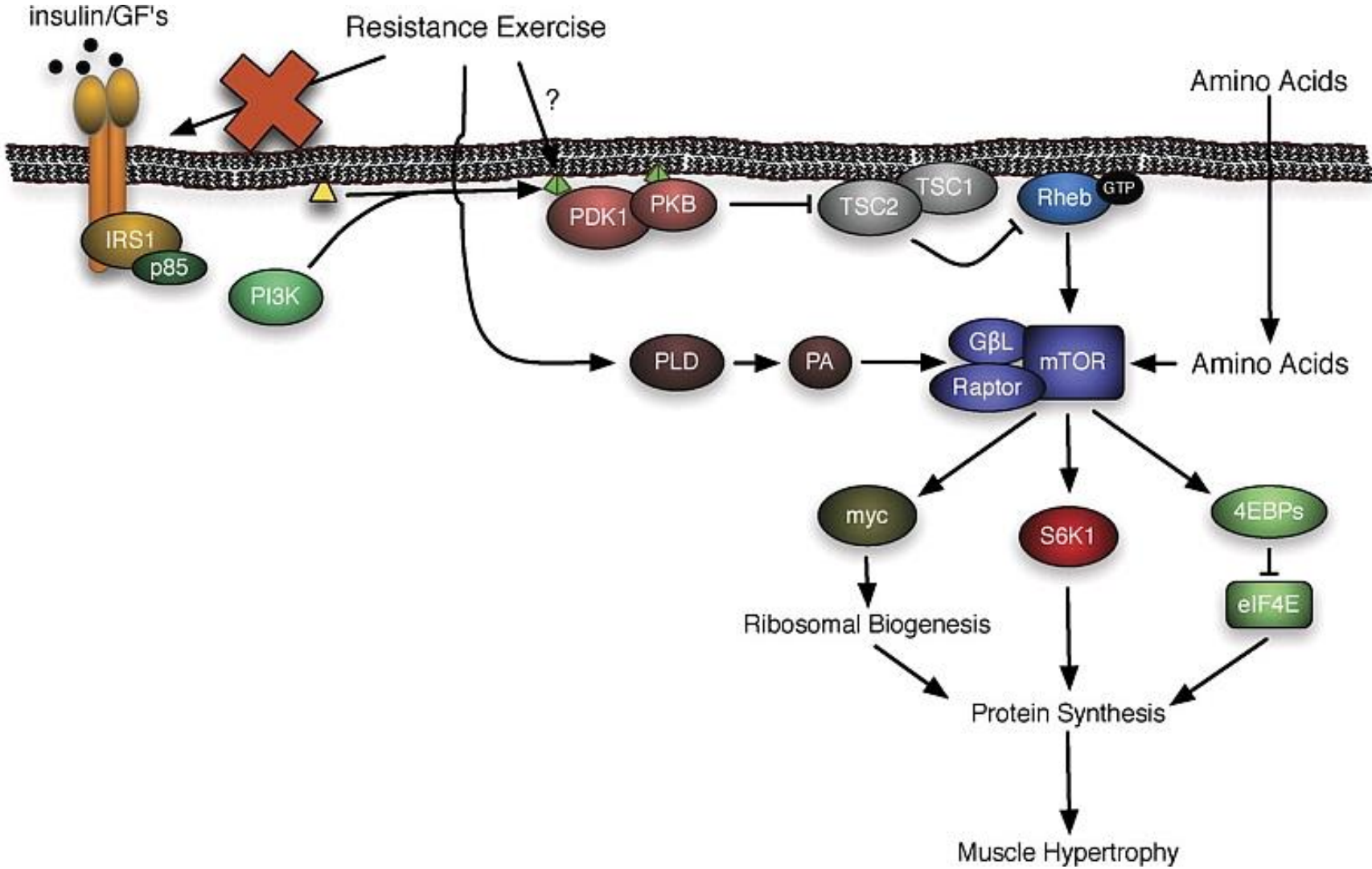


Disturbed mood

Beyond the Basics



Tissue Repair



Whey - Leucine



- 20% of cows milk is **whey** protein
- **Whey** is considered the *fast* protein due to its quick digestion and absorption which means **you can get the protein to the muscles faster and start the recovery process**
- Whey has the highest bioavailability of any protein
- Why should I consume whey?
 - High intensity or prolonged activity can result in decreased leucine stores up to 30%
 - Important to consume post-workout to replenish Leucine

Whey protein is high in the amino acid leucine (about 10%)

- Recommended to have at least **2.5g** at each meal
- Leucine is highest in **whey protein**, **Greek yogurt**, and **steak**

3 egg omelet = 1.5g leucine



1 serving Greek yogurt = 2.5g leucine



1 cup milk = 1 gram leucine



100% WHEY
CONCENTRATED & ISOLATED WHEY PROTEIN - VANILLA 6lbs/2722g
NATURALLY AND ARTIFICIALLY FLAVORED

Nutrition Facts		NUTRITION HIGHLIGHTS			
		PROTEIN	CARBS	FAT	CALORIES
Serving Size 6tbsp (36g) (1 scoop) Servings Per Container 75		27g <small>per serving</small>	3g <small>per serving</small>	2.5g <small>per serving</small>	140 <small>per serving</small>
Amount Per Serving		4.7g[†] <small>per serving</small>	2.84g[†] <small>per serving</small>	1.63g[†] <small>per serving</small>	1.53g[†] <small>per serving</small>
Calories 140		<small>† Includes Amino Acids from complete proteins.</small>			
<small>Calories from fat 25</small>					
<small>% Daily Value*</small>					
Total Fat 2.5g	4%				
Saturated Fat 1.5g	8%				
Trans Fat 0g					
Cholesterol 70mg	23%				
Sodium 115mg	5%				
Potassium 160mg	5%				
Total Carbohydrate 3g	1%				
Sugars 2g					
Protein 27g	54%				
Calcium 10%		Phosphorus 8%			
Magnesium 4%					
Not a significant source of Vitamin A, Vitamin C and Iron.					
<small>*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:</small>					
Calories:	2,000	2,500			
Total Fat	Less than 65g	80g			
Saturated Fat	Less than 20g	25g			
Cholesterol	Less than 300mg	300mg			
Sodium	Less than 2,400mg	2,400mg			
Potassium	3,500mg	3,500mg			
Total Carbohydrate	300g	375g			
Dietary Fiber	25g	30g			
Protein	50g	65g			
Calories per gram: Fat 9 • Carbohydrate 4 • Protein 4					

GLUTEN FREE

NSF Certified for Sport™

L76030 - REV04.12/12

Are you Gelatin-'n

Background

- Your ligaments connect bone to bone and tendons connect muscle to bone
- Strong ligament and tendons are crucial for prevention of ACL injuries which are 4 times as high in female athletes compared to males. Collagen is the protein that strengthens those

What is it?

- Gelatin is an animal derived protein that contains high amount of proline and glycine which is important in building collagen



Why?

- A combination of vitamin C and gelatin has been shown to improve collagen levels helping to strengthen the ligaments and tendons before a workout

Recommendation

- 2-5grams or 1 packet Knox Gelatin with 1000mg vitamin C (2 cups orange juice) 30-60min BEFORE practice

Collagen builder smoothie

Ingredients:

- 1 cup kale/spinach
- 1 cup frozen blueberries
- 6 oz plain greek yogurt
- 1 packet Knox gelatin
- 1 Tbsp Chia seeds
- ½ banana

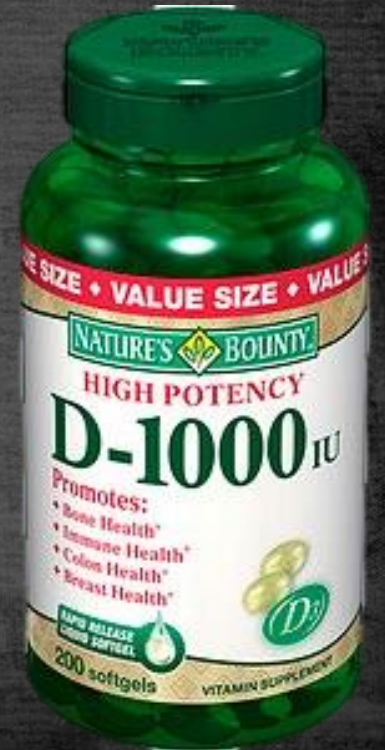


Vitamin D

- Body naturally produces vitamin D, however many athletes are deficient even in sunny locations
 - Deficient:
 - Poor muscle function (especially in fast-twitch muscle fibers)
 - Greater risk for stress fractures, muscular pain, viral respiratory infections, various diseases
 - Decreased neuromuscular control = poor coordination
 - Unable to produce force and velocity at the optimal level.
- Vitamin D helps the body absorb calcium, which is crucial for bone health
- Acts directly on the muscle to increase protein synthesis
- Increases cellular integrity and hormone function to boost immunity... especially in respiratory disease.

Ideal level for athletes is about 50ng/ml

Take Home: In those who are deficient in vitamin D, supplementation resulted in improvements to athletic performance.



Tart Cherry Juice

- Speed recovery
- Reduced inflammation
- Deeper/restful sleep
- Facilitate healthy nerve function
- Data shows efficacy for cherry juice in decreasing some of the symptoms of exercise induced muscle damage.
- Most notably, strength loss averaged over the four days after eccentric exercise was 22% with the placebo but only 4% with the cherry juice.





Beets

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High in betalins and beta-carotene making it top of the charts for antioxidants (important for immune and staying healthy) and anti-inflammation. *Careful when cooking – long cooking times kill betalins*

Beets are a vasodilator which increase the blood flow and therefore nutrients to muscles

Beets also are unique in their high content of **nitrate**s

Dietary nitrate supplementation, in the form of beets or beet root juice, has become popular in light of recent studies documenting its ergogenic effects on exercise economy/efficiency and endurance performance (Jones, 2014).

This means that it requires less energy (calories) to perform at the same intensity – prolonging how long you can perform.

Acute Supplementation:

- 5-7mmol dietary nitrate 2.5 hrs before training
 - 2 concentrated beet root juice shots
 - 3-5 beets – raw/juiced



To prepare:

- Juice beets
- Chop and steam for 15 minutes/roast for 30
- Add cooked beets or raw leaves to salads, quinoa, etc.
- Add raw beet to smoothies

Did you know?

Beet **tops** are higher in nutrients – specifically nitrates – than the beet root. Try blending them into smoothies or sautéing them with other vegetables!

Juicing

When we say *juicing* we don't mean an all juice diet, popular in fad diets.

Juicing can be a healthful boost to any diet if consumed within energy needs.

Juicing is a great way to get a **variety of nutrients** into your body **quick** without the full feeling of eating a lot of fruits and vegetables since the fiber is removed. There is no benefit to consuming the juice versus the fruit itself, but you can get a higher amount of nutrients with juicing, especially for those who struggle to eat vegetables.

The high content of vitamins, minerals, and antioxidants promote general wellness, boost your immune system to keep you in the game, attack free radicals, guard against cellular damage, and reduce inflammation.

Safety Tip: Remember to always wash the produce first and choose organic when using the peel



A great guide to juicing is (Aim for 3-1 vegetable to fruit ratio):

- Green vegetable as a base
- High-water fruit or vegetable for hydration
- Fruit (for sweetness)
- Kick (for flavor)

These are some ingredients to include:

- **Base:** kale, spinach, collard green, celery
- **High-Water:** Cucumber, watermelon, grapefruit
- **Fruit:** Apple, Carrot, Beet, pineapple
- **Kick:** ginger, cayenne, arugula, lemon

Go for Green Juice Recipe

Ingredients:

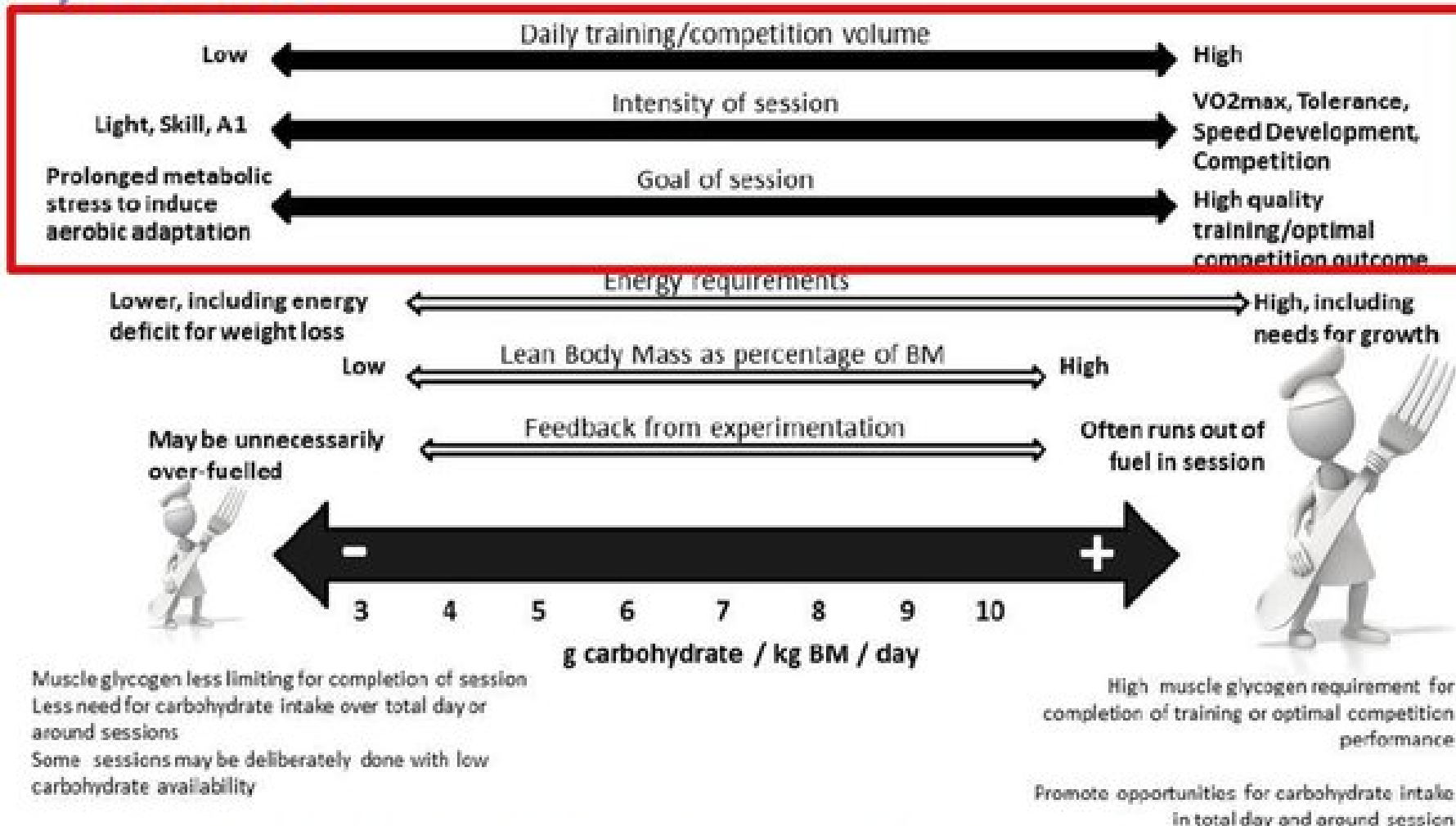
- 1 cup kale
- 1 cup spinach
- 1/2 cup pineapple
- 2 medium green apples
- 1 mint sprig





Decreasing Fatigue

Considerations in setting daily carbohydrate intake targets for athletes *by Burke & Mujika IJSNEM 2014*



Daily carbohydrate intakes for athletes should be periodized according to a number of changing factors. Factors identified with solid black arrow represent the major factors that determine carbohydrate intake targets whereas the unfilled arrows represent factors that may modify carbohydrate intakes.

Probiotics for GI health

The gateway for
nutrients into the
body

WHAT IS IT?
Live micro-organisms found naturally within the digestive tract that support intestinal health and enhance immune function

WHY IS THIS IMPORTANT?
Strenuous training suppresses your immune system making you more vulnerable to illness
Illness will limit your time and ability to train effectively
Probiotics can improve the efficiency of your GI tract, improving your ability to absorb, utilize nutrients from food, and regulate bowel movements

RECOMMENDATION:
Try to consume 1 or 2 servings (1/2c-1c.) of yogurt either daily or every other day or consume 1 Good belly probiotic every day or every other day.

GOOD FOR YOUR GUT. PROBIOTICS

WHAT IS THE PERFORMANCE BENEFIT?
Athletes taking probiotic supplements reported less than half the number of days of respiratory symptoms/illness compared with those who did not supplement and those who were supplementing and still got sick reported lower severity of illness

Products shown include: Yoplait Greek yogurt, attune probiotic bars, Kombucha, GoodBelly probiotic drinks, and Nature's Bounty Acidophilus supplements.

Buffers

Fuel On






- Very-high-intensity events use the anaerobic energy system
- The body has systems to help buffer the excess acid (balance the pH)
- **Sodium bicarbonate** and **B-Alanine** have been used to provide extra buffering.
- Dose: about 0.13 grams (3 grams per kilogram) of bicarbonate citrate/pound of body weight, 1 to 2 hours before high-intensity events.
- **Negative**: gastrointestinal upset reported
- Supplementation of bicarbonate and beta-alanine elevated buffering potential by increasing muscle carnosine and blood bicarbonate levels, respectively.
- Results show that BA improved high-intensity cycling capacity
- B-Ala has been shown to increase exercise capacity and performance of several types, particularly where the high-intensity exercise range is 1-4 min



Supplements

How do you know
which ones are safe?



AIS Sports Supplement Framework	
The ABCD Classification system <i>Designed by @YLMsportScience</i>	
A	<p>Supported for use in specific situations in sport using evidence-based protocols</p> <ul style="list-style-type: none">Sports drink, gels & barWhey proteinIron & Calcium supplementMultivitamin/mineralVitamin DProbiotics (gut/immune)CaffeineB-alanineBicarbonateBeetroot juiceCreatine 
B	<p>Deserving of further research and could be considered for provision to athletes under a research protocol or case-managed monitoring situation</p> <ul style="list-style-type: none">QuercetinTart cherry juiceExotic berries (acai, goji etc.)CurcuminAnti-oxidants C and ECarnitineHMBGlutamineFish oilsGlucosamine 
C	<p>Have little meaningful proof of beneficial effects</p> <p>Category A and B products used outside approved protocols</p> <p>The rest – if you can't find an ingredient or product in Groups A, B or D, it probably deserves to be here!</p> 
D	<p>Banned or at high risk of contamination with substances that could lead to a positive drug test</p> <ul style="list-style-type: none">Ephedrine, StrychnineSibutramineMethylhexanamine (DMAA)Other herbal stimulantsDHEA, Androstenedione19-norandrostenedione/olOther prohormonesTribulus terrestris and other testosterone boostersMaca root powderGlycerol, Colostrum 

ULTIMATELY...

Athleticism is by and large genetic.

Great fueling allows the athlete to be **MORE RESILIENT**.

The Sports RDs job is to make sure the athlete understands food as fuel to aid in recovery.

