

♥ Fueling for Fitness: Basics of Sports Nutrition THE NATURAL GROCERS



1

---

---

---

---

---

---

---

---

♥ Disclaimer THE NATURAL GROCERS

This class is not intended to diagnose, treat, or mitigate any disease

Dietary supplements and foods can interact with prescription medications. If you are taking a prescription medication, become informed about the possible interactions

2

---

---

---

---

---

---

---

---

♥ The Natural Grocers Difference THE NATURAL GROCERS

1. Dedicated to providing science-based nutrition education
2. Committed to quality
3. Committed to Everyday Affordable Pricing
4. Committed to our community
5. Committed to our employees

3

---

---

---

---

---

---

---

---

♥ Is There More to Health than Just Eating Right? 21NATURAL  
GROWERS



Optimal health requires both a quality diet and regular physical activity

4

---

---

---

---

---

---

---

---

♥ What Happens if We Neglect Physical Activity? 21NATURAL  
GROWERS

**Sedentary lifestyle** – the absence of physical activity, or prolonged sitting

Neglecting physical activity and choosing a sedentary lifestyle puts you at risk of cardiovascular disease

Risk Factors for Cardiovascular Disease	
Cigarette smoking	
Dyslipidemia	
Pre-diabetes	
Hypertension	
Obesity	
Sedentary lifestyle	
Age	
Family history	

5

---

---

---

---

---

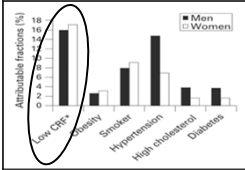
---

---

---

♥ What Happens if We Neglect Physical Activity? 21NATURAL  
GROWERS

Compared to other risk factors of CVD, neglecting physical fitness can be the deadliest!



This graph represents how influential these 6 risk factors are on all-cause mortality (i.e., any reason you might die). Low CRF stands for low cardiorespiratory fitness, which can also mean poor physical fitness.

6

---

---

---

---

---

---


---

---

♥ Physical Activity is for Everyone! THE NATURAL GYMWORKS

The American College of Sports Medicine recommends getting at least:

- **Cardiovascular fitness**
  - Brisk walk
  - 30 - 60 minutes for 5 days per week
- **Resistance training**
  - 2- 3 days per week
  - Multiple muscle groups
  - Strength training, yoga, contact sports, etc.



7

---

---

---

---

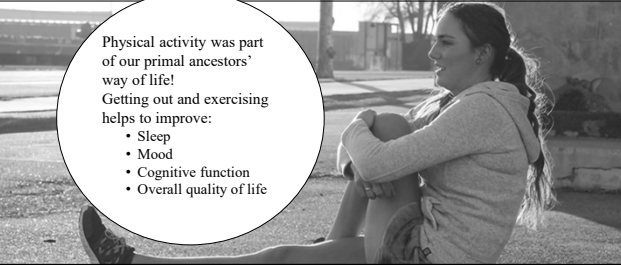
---

---

---

---

♥ Physical Activity is for Everyone! THE NATURAL GYMWORKS



Physical activity was part of our primal ancestors' way of life!  
Getting out and exercising helps to improve:

- Sleep
- Mood
- Cognitive function
- Overall quality of life

8

---

---

---

---

---


---

---

---

♥ Metabolism / Fuel THE NATURAL GYMWORKS

But what's the best way to fuel my fitness?



9

---

---

---

---

---

---

---

---

Metabolism / Fuel

But what's the best way to fuel my fitness?

In a university survey, **81%** of students reported that they thought **carbohydrates** were the best **fuel for endurance exercise**, and **76%** of students reported that they thought **protein** was the best **fuel for lifting weights**

10

---

---

---

---

---

---

---

---

Metabolism / Fuel

But what's the best way to fuel my fitness?

**FACT:**  
*Carbohydrates are the body's preferred fuel for both endurance and resistance exercise*

In a university survey, 81% of students reported that they thought carbohydrates were the best fuel for endurance exercise, and 76% of students reported that they thought protein was the best fuel for lifting weights

11

---

---

---

---

---

---

---

---

Time to Start Moving!

The connection between food and physical activity

**CARBOHYDRATES**  
**FAT**  
**PROTEIN**

12

---

---

---

---

---

---

---

---

Time to Start Moving!

The connection between food and physical activity

**CARBOHYDRATES**

**FAT**

**PROTEIN**

Carbohydrates provide the body with glucose, which is an important fuel for exercising muscle, and it helps to regulate certain hormones that may support your health and fitness goals. You can primarily get carbohydrates in your diet from fruits and starchy vegetables.

13

---

---

---

---

---

---

---

---

Time to Start Moving!

The connection between food and physical activity

**CARBOHYDRATES**

**FAT**

**PROTEIN**

Fats pack in a little more than twice the metabolic fuel than do carbohydrates, making them an efficient fuel source for its size, and help to fill you up and reduce hunger from interrupting long bouts of endurance exercise. You can get fats in your diet from eating meat, dairy fats (such as butter, and cream), and nuts and seeds.

14

---

---

---

---

---

---

---

---

Time to Start Moving!

The connection between food and physical activity

**CARBOHYDRATES**

**FAT**

**PROTEIN**

Protein provides structural support and repair to abused muscle tissue.

Protein does not serve as a primary fuel source for exercise. You can get protein in your diet from eating meats, dairy, nuts, seeds, and properly pairing certain plant-based foods.

15

---

---

---

---

---

---

---

---

♥ The Value of a Carbohydrate Natural Growth

The Role of Glucose in an Exercising Body		
Metabolism	Hormonal Support	Muscle Sparing
Carbohydrates provide energy for exercising muscle	Maintaining healthy glucose availability supports insulin and cortisol balance.	When you run low on carbohydrates, your body starts looking for alternative fuel, and will breakdown muscle tissue to gain access to amino acids to be used as fuel.
Is necessary to support fat metabolism during exercise	Insulin additionally helps amino acids into your muscle tissue	

16

---

---

---

---

---

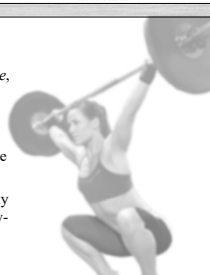
---

---

---

♥ Burning Carbs or Burning Fat? Natural Growth

- The greater the exercise intensity, the greater your reliance on carbohydrates for fuel
- Many people confuse *fuel source* for *fitness outcome*, and assume that you must burn fat as a fuel in order to lose fat
- Fat loss is more strongly determined by hormonal responses and total caloric expenditure, and has little to do with fuel source during exercise
- Many power and high intensity exercises hormonally pave the way for greater fat loss than exercising low-and-slow in the “fat burning zone”



17

---

---

---

---

---

---


---

---

♥ Burning Carbs or Burning Fat? Natural Growth

**So what do we get out of burning fat for fuel?**

- Spare carbohydrate fuel
  - Burn through your carbohydrate “tank of gas” slower
- Endurance adaptations to burning fat for fuel increase the:
  - quantity of enzymes in fat metabolism
  - the quantity and size of mitochondria in our working muscle
  - and develop a denser network of capillaries to active muscle for improved blood flow



18

---

---

---


---

---

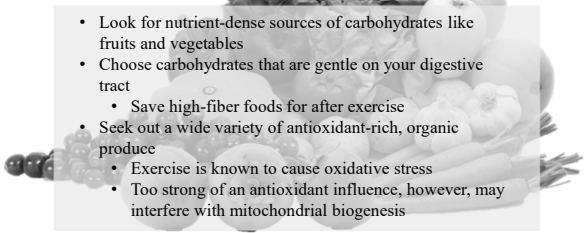
---

---

---

 **Choosing the Right Carbohydrate** NATURAL CHOICES

- Look for nutrient-dense sources of carbohydrates like fruits and vegetables
- Choose carbohydrates that are gentle on your digestive tract
  - Save high-fiber foods for after exercise
- Seek out a wide variety of antioxidant-rich, organic produce
  - Exercise is known to cause oxidative stress
  - Too strong of an antioxidant influence, however, may interfere with mitochondrial biogenesis



19

---

---

---


---

---

---


---

---

 **Choosing the Right Foods** NATURAL CHOICES

This meal wheel demonstrates a nutrient dense template for all your daily meals

Prioritize organic produce, quality protein, and healthy fats



\*Optional / Additional

20

---

---

---


---

---


---

---

---

 **Metabolism / Fuel** NATURAL CHOICES

- Coconut oil is a great source of medium-chained triacylglycerols (MCTs)
- The rate at which MCTs are absorbed and metabolized match dietary carbohydrate, making MCTs an effective food fuel before and during exercise in moderate quantities



21

---

---

---


---

---


---

---

---

 **Pre-Workout Blood Flow**

- Beet root juice has been shown to help produce nitric oxide, a local metabolite responsible for vasodilation
- This supports blood flow to active muscle for improved oxygen delivery
- Studies suggest drinking a serving of beet root juice 1.5 – 3 hours before exercise for optimal effect



22

---

---

---


---


---

---

---

---

 **Pre-Workout Summary**



- Fuel up with some carbohydrates
  - Grab some fruit!
    - For recreational physical activity (~30 minutes), a large apple should provide enough carbohydrate to fuel your fitness
    - For longer activity, like going on a long hike, you'll need more fuel. Try a fruit smoothie with some coconut oil!
- Beet root juice may support long, endurance activity where oxygen delivery is stressed
- Many amino acids for muscle support are best absorbed with the assistance of carbohydrate

23

---

---

---


---

---


---

---

---

 **Nutrient Timing: During Activity**

- Exercise stimulates the “fight or flight” response of our nervous system
- Eating stimulates the opposing nervous system response for “rest and digest”
- Eating too much food during prolonged exercise can create conflicting signals in the body



24

---

---

---

---


---

---

---

---




 **Nutrient Timing: During Activity** © Natural Growth

2 goals for eating while exercising:  
Fuel  
Manage hydration

Hydration and fueling during a workout is primarily recommended for prolonged endurance exercise and/or exercise in hot or humid environments

- Marathon running
- Soccer
- Football



25

---

---

---


---

---

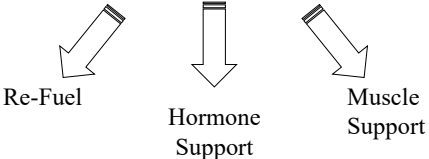
---

---

---

 **Eating After Physical Activity** © Natural Growth

The roles of food after physical activity



Re-Fuel      Hormone Support      Muscle Support

26

---

---

---


---

---

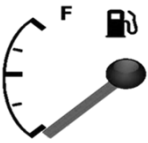
---

---

---

 **Re-Fueling After Activity** © Natural Growth

- Intense exercise for 1 hour can reduce your body's stored carbohydrate by about half
- Strenuous exercise for 2 hours can nearly deplete your body's stored carbohydrate
- Your body will need to refuel on carbohydrates to restore what was lost



27

---

---

---


---

---


---

---

---

 **Protein Powders and BCAAs** NATURAL GROWERS

- Protein is broken down and put to use in the body within 3-hours of ingestion
- Glucose stores as glycogen
- Fat stores as adipose
- Amino acids are in a transient pool, and do not have long-term storage
- 10 – 20 g of protein every 3-hours supports health and fitness



28

---

---

---


---

---

---

---


---

 **Muscle Support: Inflammation** NATURAL GROWERS

Physical activity can induce inflammation and oxidative damage

Inflammation and muscle fiber tearing is often the reason for feeling sore after exercise

Certain foods and supplements, like fish oil, can help with the inflammatory impact and support your muscle tissue



29

---

---

---


---

---

---


---

---

 **Muscle Support: Inflammation** NATURAL GROWERS

Fish oil supports physical activity by modulating the post-exercise inflammatory response and normalize the markers of oxidative stress

Doses of 1,500 – 3,000 mg of fish oil have also been seen to support body composition, hormone balance, healthy inflammatory response, muscle recovery and improve lean body mass



30

---

---

---

---

---


---

---

---

**♥ Muscle Support: B-Vitamins** NATURAL VITALITY

- B-Vitamins are necessary for healthy metabolism
  - They support metabolic enzymes and B2 and B3 play a direct role in the final stages of energy production
- Studies show that athletes need more B-Vitamins per day to support additional carbohydrate and fat metabolism



31

---

---

---

---

---


---

---

---

**♥ Muscle Support: Minerals** NATURAL VITALITY

- **Calcium** – our muscles need calcium to contract, and a steady supply of calcium is regulated by thyroid hormones during and after exercise. Our skeletal system absorbs calcium greater after exercise than compared to non-exercising absorption rates
- **Magnesium** – important for metabolism and maintaining the electrical potential in nerve and muscle cells
- **Additional Electrolytes** – sodium, chloride, and potassium are lost in sweat and need to be reintroduced into the body



32

---

---

---

---

---

---

---

---

**♥ Putting it All Together** NATURAL VITALITY

	Before Exercise	During Exercise	After Exercise
FAT	Limited	Limited	Normal consumption
PROTEIN	Approximately 10 – 20 g. every 3 hours. Emphasize BCAAs before and immediately after exercise		
CARBOHYDRATE	Eat starchy vegetables or 1 – 2 pieces of fruit about an hour before physical activity	6 – 8% carbohydrate sports drink. Replenish sweat related fluid loss	Have another piece of fruit or two, or starchy vegetables after your exercise. Meals after exercise should emphasize pairing carbohydrates with quality protein

33

---

---

---

---

---

---

---

---

Additional Resources

Great books for sale that address Primal eating and physical activity!

34

---

---

---

---

---

---

---

---

References

1. ACSM. (2014). *ACSM's resource manual for guidelines for exercise testing and prescription* (7th ed.). Baltimore: Lippincott Williams & Wilkins.
2. Areta, J., Burke, L., Ross, M., Camera, D., West, D., Broad, E., . . . Coffey, V. (2013). Timing and distribution of protein ingestion during prolonged recovery from resistance exercise alters myofibrillar protein synthesis. *The Journal of Physiology*, 559(9), 2319-2331.
3. Blair, S. N. (2009). Physical inactivity: The biggest public health problem of the 21st century. *British Journal of Sports Medicine*, 43(1), 1-3.
4. Fink, H. H., Mikesky, A. E., & Burgoon, L. A. (2012). *Practical applications in sports nutrition* (3rd ed.). Burlington: Jones & Bartlett Learning.
5. Gray, P., Chappell, A., Jenkinson, A. M., Thies, F., & Gray, S. R. (2014). Fish oil supplementation reduces markers of oxidative stress but not muscle soreness after eccentric exercise. *Sports Nutrition and Exercise Metabolism*, 24, 206-214.
6. Kodama, S., Saito, K., Tanaka, S., Maki, M., Yachi, Y., Asumi, M., et al. (2009). Cardiorespiratory fitness as a quantitative predictor of all-cause mortality and cardiovascular events in health men and women. *Journal of American Medical Association*, 301(19), 2024-2035.
7. Lee, D., Amano, E. G., Sui, X., & Blair, S. N. (2010). Mortality trends in the general population: The importance of cardiorespiratory fitness. *Journal of Psychopharmacology*, 24(11), 27-35.
8. McArdle, B., Katch, F., & Katch, V. (2015). *Exercise physiology: Nutrition, energy, and human performance* (8th ed.). Baltimore: Lippincott Williams & Wilkins.
9. Nisanto, H., Chavez, D., & Lancha Jr, A. (2013). An overview of branched-chain amino acids in exercise and sports nutrition. *Nutrition and Enhanced Sports Performance*, 5(37), 367-375.
10. Noreen, E., Sato, M., Crowe, M., Pabon, V., Brandauer, J., & Averill, L. (2010). Effects of supplemental fish oil on resting metabolic rate, body composition, and adiposity verified in healthy adults. *Journal of the International Society of Sports Nutrition*, 7(1), 1-7.
11. Thorsdottir, L., Tomason, H., Gunnarsdottir, I., Gisladottir, E., Kistly, M., Perra, M., et al. (2007). Randomized trial. *International Journal of Obesity*, 31, 1560-1566.
12. Wolf, K., & Manzoni, M. M. (2006). B-vitamins and exercise: Does exercise alter requirements? *International Journal of Sport Nutrition and Exercise Metabolism*, 16, 453-484.

35

---

---

---

---

---

---

---

---