



**NATIONAL DEFENSE**  
UNIVERSITY

# *EXECUTIVE PHYSIOLOGY & STRENGTH TRAINING*



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# Executive Physiology: Learning Objectives



- Design and implement strategies to enhance food intake for sustainable energy
- Understand nutrition needs change across lifespan and activity levels
- Learn about supplements that may assist with mental health, bone health and physical health
- Apply suggested exercises to your workout routine while on travel or away from your home gym.

# Executive Physiology: Strategic Fueling



## Assessment Activity

- Fuel Assessment
  - 24-hour recall



## Typical Client

- Skips breakfast
- Restricts energy
- Skimps on protein
- Overeats in evening
- Exercises under fueled or fasted
- Performs workouts without a purpose or potential
- Neglects sleep

# Executive Physiology: Science



## Low Energy Availability (LEA)



# Executive Physiology: Strategic Fueling

## Power up your Plate: Fuel with a Purpose

- Fruits and Vegetables
- Carbohydrate
- Protein
- Healthy fats

*Half*

*Quarter*

*Quarter*

*Need to have some!*



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# Executive Physiology: Strategic Fueling



## Components of a Food Label

1. Serving Information

2. Calories

3. Nutrients

<b>Nutrition Facts</b>	
4 servings per container	
<b>Serving size</b>	<b>1 cup (227g)</b>
<b>Amount per serving</b>	
<b>Calories</b>	<b>280</b>
	<b>% Daily Value*</b>
<b>Total Fat</b> 9g	<b>12%</b>
Saturated Fat 4.5g	<b>23%</b>
Trans Fat 0g	
<b>Cholesterol</b> 35mg	<b>12%</b>
<b>Sodium</b> 850mg	<b>37%</b>
<b>Total Carbohydrate</b> 34g	<b>12%</b>
Dietary Fiber 4g	<b>14%</b>
Total Sugars 6g	
Includes 0g Added Sugars	<b>0%</b>
<b>Protein</b> 15g	
Vitamin D 0mcg	0%
Calcium 320mg	25%
Iron 1.6mg	8%
Potassium 510mg	10%

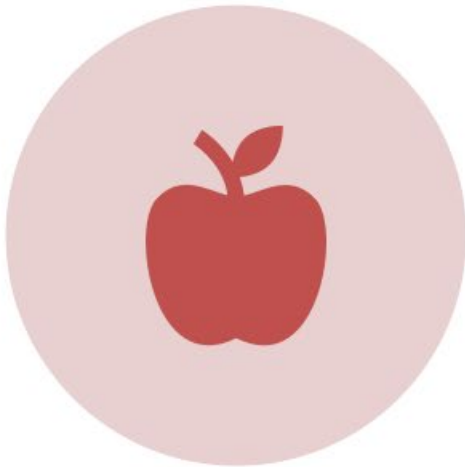
\* The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

4. Quick Guide to percent Daily Value (%DV)

- 5% or less is **low**
- 20% or more is **high**

1. Serving information
2. Calories
3. Nutrients
4. The percent of daily value

# Executive Physiology: Strategic Fueling



**NUTRITION FACT LABEL**



**ACTIVITY**

# Executive Physiology: Strategic Fueling



## FOOD: A

**Ingredients:** MILK PROTEIN BLEND (CALCIUM CASEINATE, WHEY PROTEIN ISOLATE, WHEY PROTEIN CONCENTRATE), BOVINE COLLAGEN HYDROLYSATE, GLYCERIN, MALTITOL, COCOA BUTTER, POLYDEXTROSE, WATER, DRY WHOLE MILK, SOY PROTEIN ISOLATE, SUNFLOWER OIL, CONTAINS LESS THAN 2% OF EACH OF THE FOLLOWING: NATURAL AND ARTIFICIAL FLAVORS, ...

## FOOD: B

**Ingredients:** Dates, almonds, cashews, lemon juice concentrate, dried lemon juice concentrate, and lemon oil

## FOOD: C

**Ingredients:** ORGANIC ROLLED OATS, ORGANIC BROWN RICE SYRUP, SOY RICE CRISPS (SOY PROTEIN ISOLATE, RICE FLOUR, BARLEY MALT EXTRACT), ORGANIC ROASTED SOYBEANS, ORGANIC TAPIOCA SYRUP, ORGANIC CANE SYRUP, CHICORY FIBER, UNSWEETENED CHOCOLATE, COCOA, ORGANIC SOY FLOUR, SUNFLOWER AND/OR SOYBEAN OIL, NATURAL FLAVORS, ALKALIZED COCOA, SALT, MIXED TOCOPHEROLS (ANTIOXIDANT)

## FOOD: D

**Ingredients:** Whole rolled oats, creamy natural peanut butter, ground flaxseed, honey, vanilla extract, mini chocolate chips, peanuts, unsweetened shredded coconut, pinch sea salt

# Executive Physiology: Gut Microbiome



## How to Better Your Belly

- **Unprocessed foods**
  - Foods in their whole form, most natural state, at time of purchase
    - Fruits, vegetables, seeds, fresh lean meats, fish, legumes and nuts
- **Processed foods**
  - Foods that have undergone changes that alter the natural state of the food – heating, freezing, dicing and juicing
    - Frozen fruits/vegetables, pre sliced fruits and vegetables, fresh juices, instant brown rice, nut butter, tofu, whole wheat break, extra virgin olive oil, plain yogurt and dried fruits
- **Ultra processed foods**
  - Foods to created mostly or entirely from substances extracted from foods or derived from food constituents with little intact
    - Snacks, drinks and ready-made meals

# Executive Physiology: Strategic Fueling



## Fuel Timing Plan

- Intermittent Fasting
- Time Restrictive Eating
- Intuitive Eating



# Executive Physiology: Strategic Fueling



## “Plant Eating Challenge”

Eating a wide variety of plants improves our gut microbiome, provides many essential ingredients, improves your mood, reduces the risk of chronic disease/inflammation and keeps you fuller for longer (think fiber). Additionally plant-based foods use less water and land and greenhouse gas emissions than animal –based foods, which means it’s better for the environment.

### How it Works

Commit to tracking your intake of plant-based food for one week. The goal is to eat 30 DIFFERENT plant sources in one week. Portions do not count in this challenge; a large and small banana counts both count as one point. You don’t need a specific amount or serving size to count – if you have a couple of grapes or a bite of an apple, you can count it as part of your total.

### What foods count as points (one point)

Whole grains: Oats, whole wheat pasta/crackers/cereal/quinoa, red rice, farro, buckwheat, brown rice, spelt

Nuts & seeds: Walnuts, cashews, peanuts, almonds, chia/flax, pumpkin, sunflower and hemp

Legumes: Lentils, chickpeas, kidney beans, black-eyed beans, butter beans, cannellini beans, garbanzo beans

Fruits and vegetables: Fresh, dried or canned (natural juices, no sugar)

Non-dairy yogurt: Plant-based yogurt (soy, almond, oat milk)

### What foods count as points (¼ point)

Turmeric, cayenne pepper, paprika, cumin, thyme, rosemary, black pepper, cinnamon, ginger, coffee, tea, dark chocolate, olive oil

# Executive Physiology: Strategic Fueling



## How to Build a Robust Belly



- Fiber
- Fermented foods
- Exercise
- Sleep

## Behaviors Destroy and Cause Havoc in Your Belly



- Antibiotics
- Artificial sweeteners
- Processed foods
- High sugar, saturated fats
- Low energy availability
- Fast foods

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# Executive Physiology: Supplements



## Supplements

Not regulated for legality, efficacy and safety

- What to look for in a supplement
  - Third-party organizations to review products quality
  - If certified, will have label and listed on company's website
  - Supplement label and no 3<sup>rd</sup> party certification = move on
- Use caution
  - Propriety blends
  - Herbal ingredients



# Executive Physiology: Supplements



## Supplements

### The Department of Defense Dietary Supplement Resource

- Operation Supplement Safety
  - DOD Prohibited Dietary Supplement Ingredients
    - <https://www.opss.org/dod-prohibited-dietary-supplement-ingredients>

# Executive Physiology: Supplements



## Supplementation

- Creatine
- Omega-3
- Vitamin D
- Magnesium



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# Executive Physiology: Supplements



## Supplements

- **Creatine**

- Body makes; obtain from protein-rich foods
- Supplies energy to muscles
- Improves mood and severity of depressive episodes
- Reduces mental fatigue and improves cognition
- Helps slow the decline in skeletal muscle and bone mineral density



- **Sources**

- Beef, pork, chicken, turkey, fish, daily

- **Supplementation**

- Creatine monohydrate
- 3-5 grams / day

# Executive Physiology: Strategic Fueling



## Supplements

- Omega 3-Fatty Acid
  - Decreases inflammation / assist with good cholesterol reduces risk of cardiovascular disease, reduces depression and anxiety
- Supplement Dose
  - 1-2 g/day but not more than 3 grams a day
  - TG based fish oil = increased bioavailability



# Executive Physiology: Supplements



## Supplements



- **Vitamin D**
  - Obtained from food and body makes it
  - Absorbs and retains calcium and phosphorous
  - Essential for immune function, heart health and muscle function
  - Consume with the presence of fat in a meal to enhance absorption
- **Sources**
  - Fatty fish (tuna, salmon, mackerel), egg yolks, fortified milk & cheese, ready-to-eat cereal, fruit juices and SUNSHINE
- **Supplementation – Vitamin D3**
  - 2,000 – 4,000 IU

# Executive Physiology: Supplements



## Supplements

- Magnesium

- Maintains blood pressure, muscle/nerve function
- Regulates blood sugar
- Protects of bone health

- Sources

- Leafy greens, black beans, bananas, brown rice, legumes, nuts, seeds, spinach whole grains, fish, poultry and beef

- Supplementation

- 310-320 mg /day Magnesium glycinate (sleep)

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