Macronutrient Education

PERFORMANCE FUELING

WARRIOR ATHLETE
READINESS & RESILIENCE

TOTAL CALORIES

- Needed to support all types of training:
  - High-Intensity
  - Long-Duration
- Inadequate Calories can result in:
  - Weight Loss
  - ↓ Muscle Mass, Bone Density & Recovery Time
  - ↑ Fatigue, Illness & Injury

MDRIs

Recommended Daily Intake (kcals)

Activity Level	Men	Women
Light	3000	2100
Moderate	3400	2300
Heavy	3700	2700
Very heavy	4700	3000

Reference Weight: Men 187lbs, Women 150lbs.

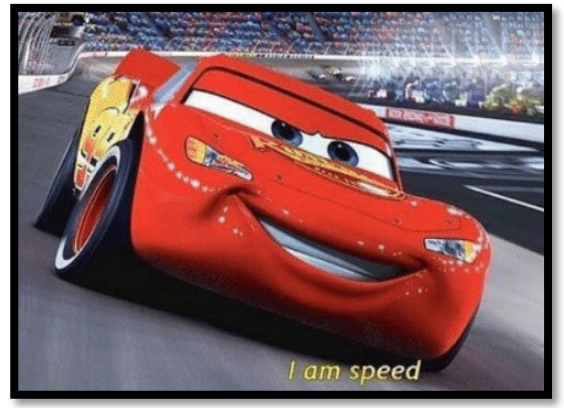
Takeaway: Marines have higher calorie needs during training and operations. Achieving Total Calorie Intake will support training and recovery time.

WARRIOR ATHLETE
READINESS & RESILIENCE

MACRONUTRIENTS

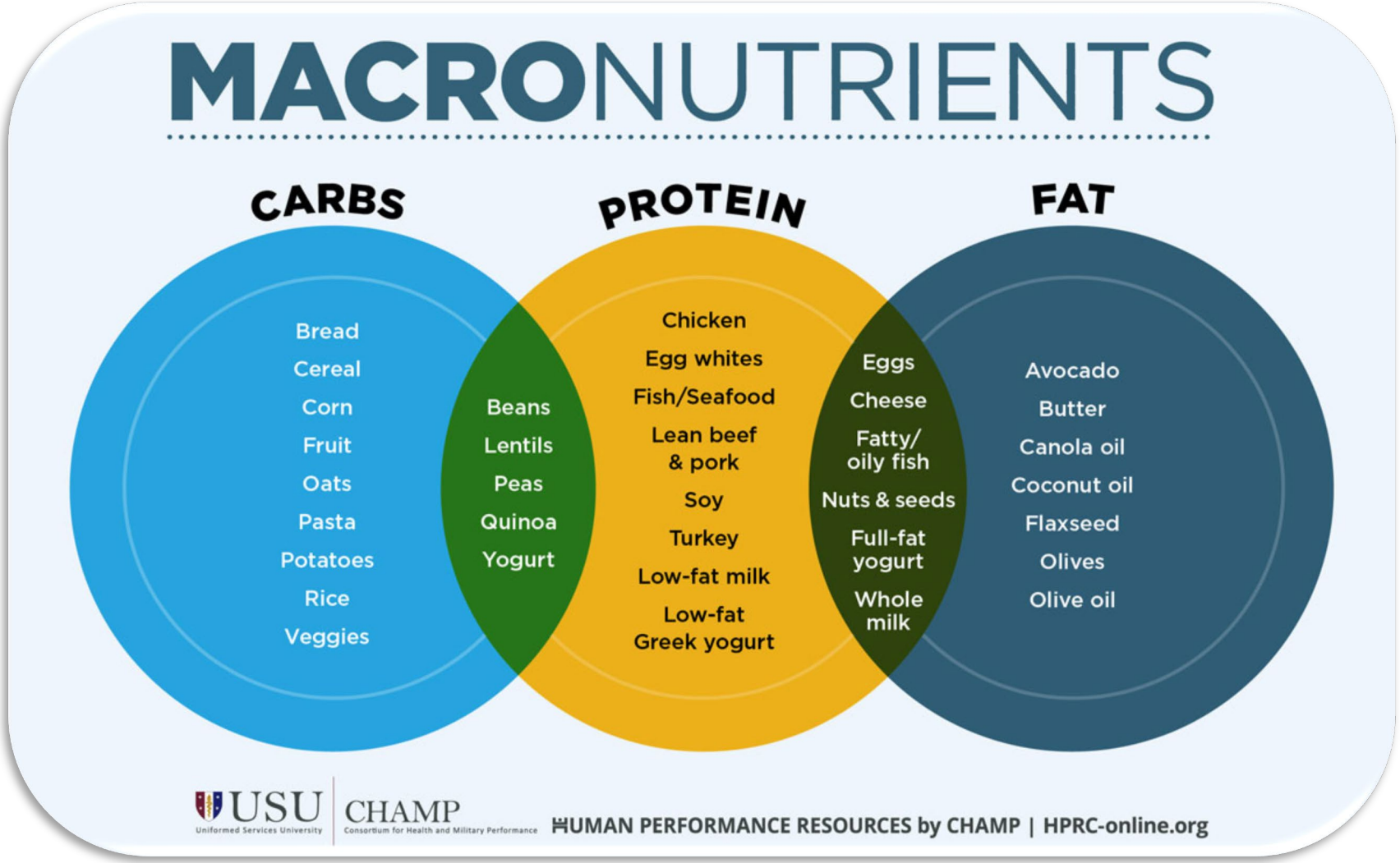
- Carbs: Fuel for Intense Training [GO FAST!]
- Proteins: Repair damage from training
- Fats: Fuel for Low & Slow Training,

  Absorbs Nutrients, & for Brain Health



Takeaway: Carbs are fuel. Protein rebuilds your body. Fats provide energy, aids in absorbing nutrients and for brain health.

WARRIOR ATHLETE
READINESS & RESILIENCE



Takeaway: Foods can be classified as one or multiple Macronutrient Categories. No one food group should be eliminated.

WARRIOR ATHLETE
READINESS & RESILIENCE

VITAMINS & MINERALS

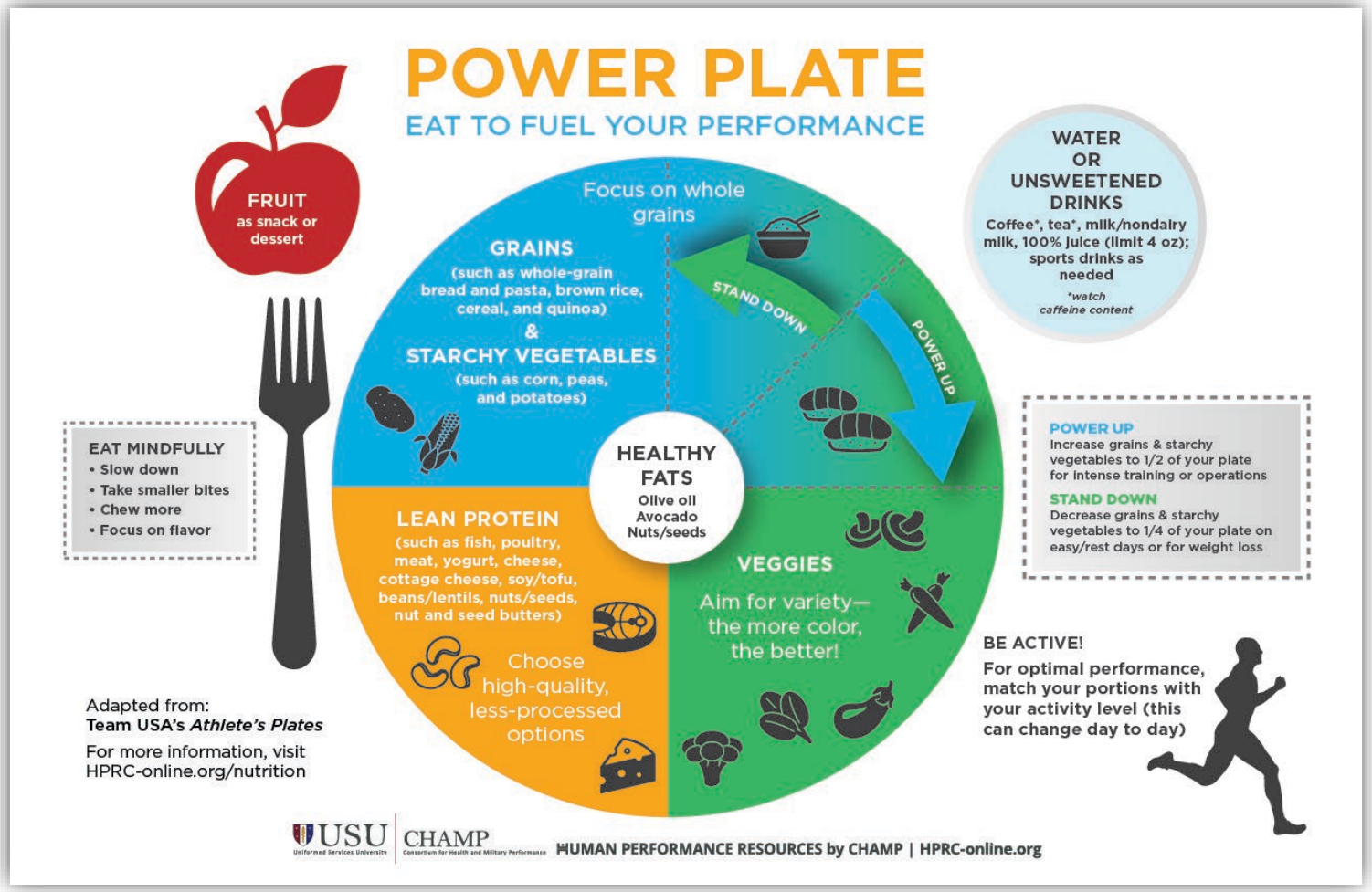
- Provide Antioxidants & Phytochemicals
- Required for oxygen transfer and delivery
- Required for tissue repair
- Supports bone health
- Needed to make food into fuel.

VARIETY IS KEY

Takeaway: Vitamins & Minerals are needed to support training, recovery & general health. No one food provides all nutrients a Marine needs.

WARRIOR ATHLETE
READINESS & RESILIENCE

PLATING YOUR MEAL



General Guidelines

- Rest Days: ↑ Vegetables ↓ Carbs
- Training Days: ↑ Carbs ↓ Vegetables
- Lean Proteins for every meal.
- Hydrate with every meal.

Takeaway: Follow this plate for breakfast, lunch & dinner based on your training/fueling goals.

WARRIOR ATHLETE
READINESS & RESILIENCE

HELPFUL TOOLS

USMC Fueled to Fight®

- Mess Hall Nutrition Education Program
- Stoplight color coding:

- GREEN = "Engage at will"
- YELLOW = "Well aimed shots"
- RED = "Check fire"

CHARGE by Sodexo

- Download on phone, select location and mess hall #
- App For:
  - Menus
  - Color coding of foods
  - Nutrition information

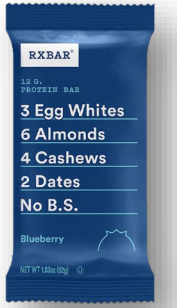
WARRIOR ATHLETE
READINESS & RESILIENCE

NAVIGATING MCX

PROTEIN

MEALS

CARBS



FRUITS/VEGETABLES

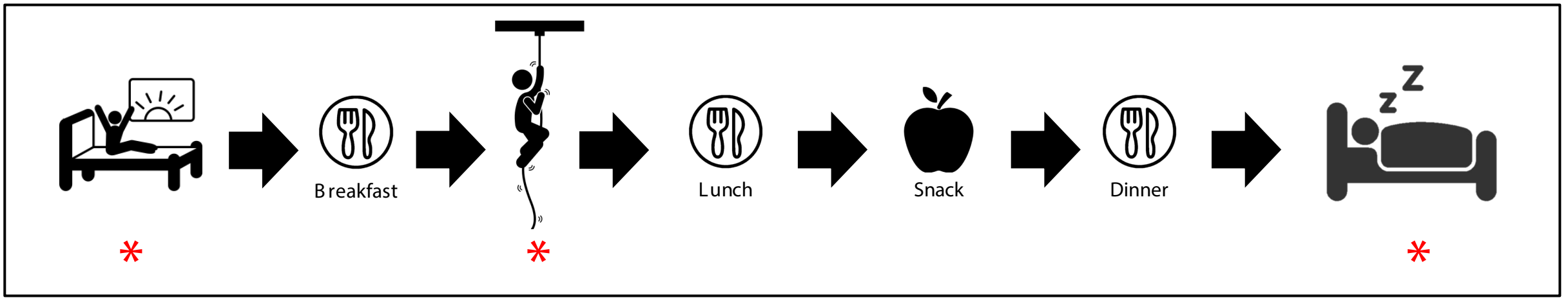
Takeaway: Types of foods at MCX to help with your fueling needs.

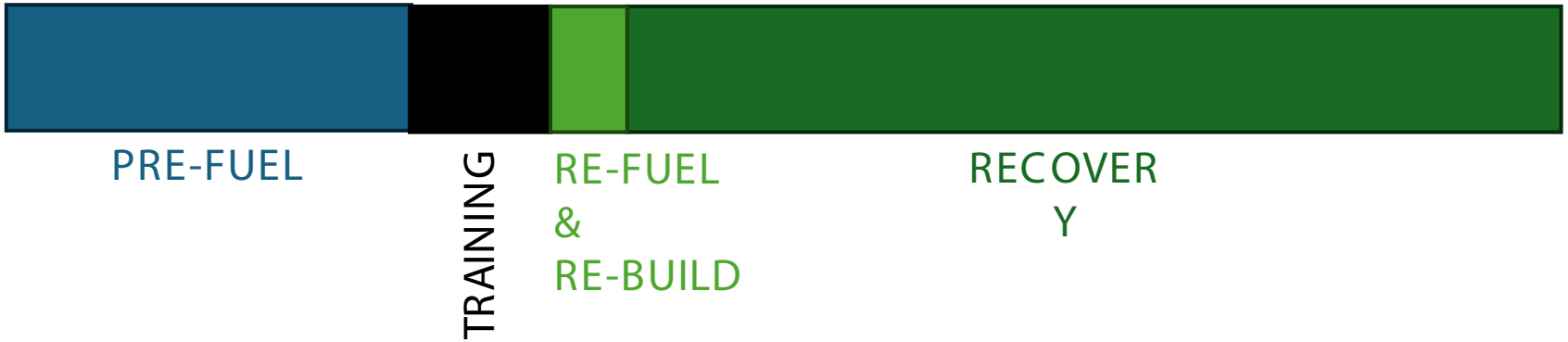
WARRIOR ATHLETE
READINESS & RESILIENCE

Nutrient Timing Considerations

WARRIOR ATHLETE
READINESS & RESILIENCE

TIMING OF MEALS



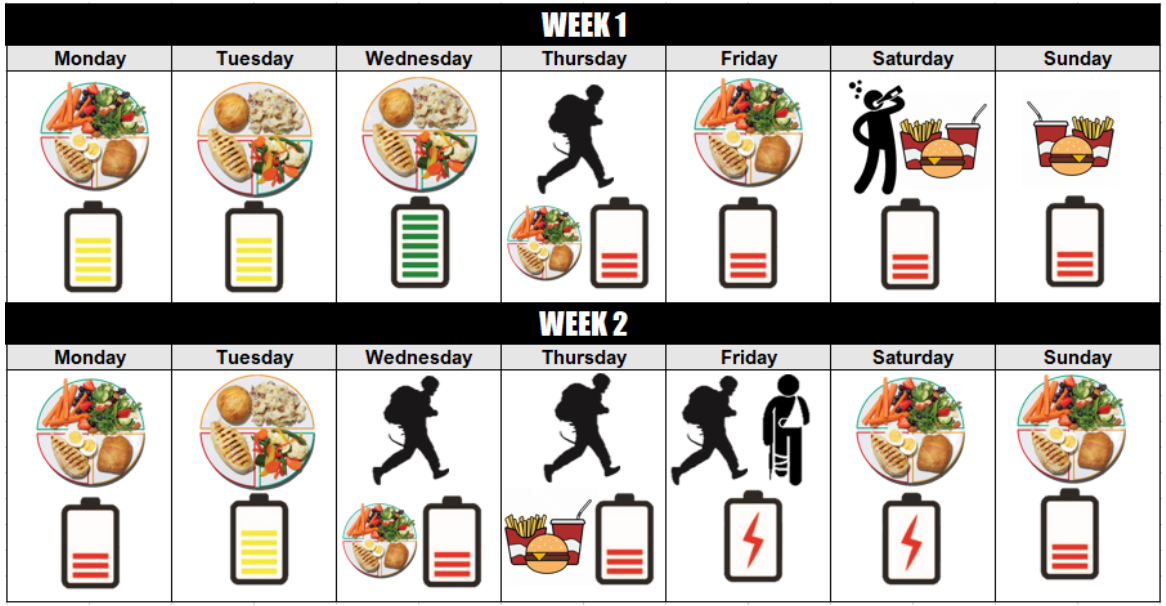


Takeaway: Meals are implemented around a Marine's schedule [Wake up, Training, & Sleep]. Post-Training, a Marine needs to Re-Fuel with carbs and Re-Build with protein to start the recovery process. Use Power Plate for recovery meals.

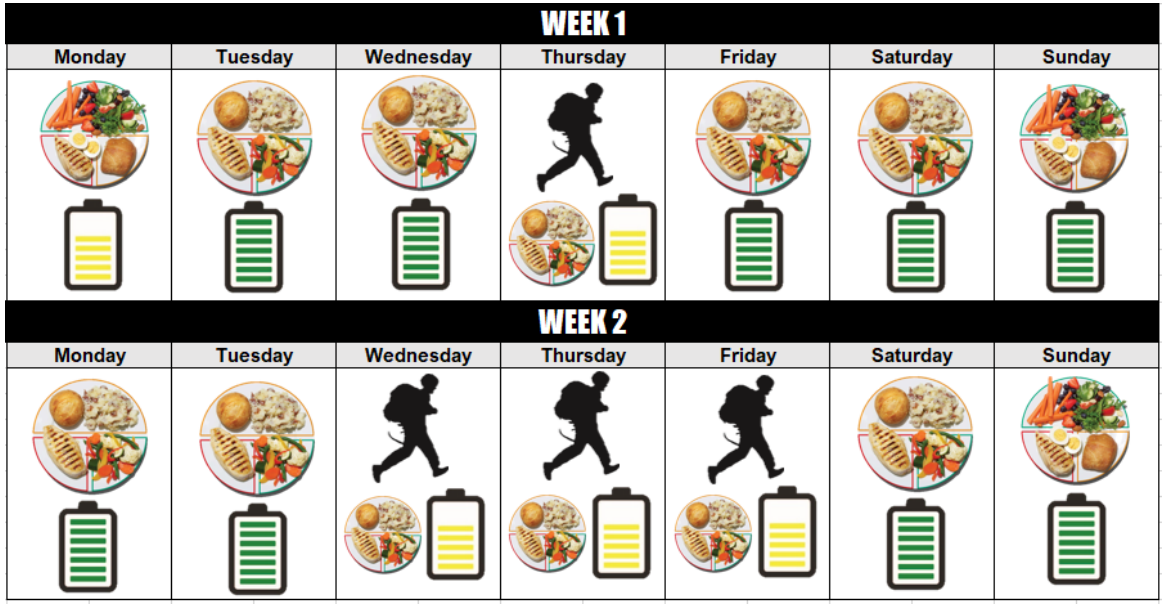
WARRIOR ATHLETE
READINESS & RESILIENCE

FUELING THROUGH THE WEEK

Typical Fueling



Ideal Fueling



Takeaway: Fueling and recovery is an everyday process. Weekends can be a great way to calorically catch up on the days in the week not able to properly fuel yourself.

WARRIOR ATHLETE
READINESS & RESILIENCE

HOW TO Pre-Fuel

3-4 Hours	
1-2Hours	
<1Hour	

CARBS: Complex & High in Fiber

PROTEIN: Lean [↓ Fat] FAT: Power Plate Recs

CARBS: Mix of Complex, Simple & Low in Fiber

PROTEIN: Lean [↓ Fat] FAT: Low to None

CARBS: Simple [Fast Digesting] & No Fiber

PROTEIN: None or Whey [Fast Digesting]

FAT: None

TRAINING BEGINS

Takeaway: The closer a Marine gets to a training session the less amount of fat and fiber you need to limit stomach upset and allow food to be digested for body to use as fuel.

WARRIOR ATHLETE
READINESS & RESILIENCE

TIME	FUEL & FLUID	EXAMPLE for a 185-lb Warfighter on a 16-mile ruck march
Night before event 	• Eat a power plate that's high in carbs with lean protein and healthy fats. • Drink water, milk, or milk alternatives.	**(1800)** • Grilled chicken breast (5 oz), roasted garlic potato wedges (2 cups), roasted broccoli with olive oil (2 cups), mixed fruit salad (1 cup), and chocolate chip cookies (3 small) • Water
1 hour before boots on the ground 	• Eat 1–2 g carb/kg (adjust to your preference). Limit foods high in fiber and fat to avoid stomach upset too. • Drink 16 fl oz water.	**(0500)** • Single-serving cup of oat ring cereal (2), low-fat milk (8 oz), and a medium apple • 16 fl oz water
During (every hour) 	• Eat 30–60 g carb (at least 1–2 carb options) every hour. If longer than 3 hours, eat up to 90 g carb. • Sip 16–32 fl oz water and/or sports drink every hour. Don't gulp and don't exceed 48 fl oz in an hour.	**(0700)** • 18 gummy bears • 16–32 fl oz water **(0800)** • 2 squeezable fruit pouches • 16 fl oz water and 16 fl oz sports drink **(0900)** • ¼ cup raisins and 2 squeezable fruit pouches • 16 fl oz water and 16 fl oz sports drink
After (within 2 hours) 	• Eat a carb-rich meal with 15–30 g lean protein and healthy fats. • Drink 16 fl oz water and/or sports drink *per lb lost* during ruck march. • Rehydrate with electrolytes from food, drinks, or both.	**(1100)** • MRE *or* peanut buter (2 Tbsp) and jelly (1 Tbsp) on whole-wheat bread (2 slices) and trail mix (½ cup) • 16 fl oz water and/or sports drink per lb lost or drink regularly until urine is pale yellow

Application

Pre-pack in small Ziplock bags:

- 1 cup pretzels
- Crackers, 10-15
- ¼ cup raisins or crasins
- Uncrustable, 1
- Fig newtons, 6
- ½ bagel
- Sports chews, gels, jellybeans
- 2 cups apple and orange slices

Takeaway: Guideline can be used to fuel any mile ruck.

WARRIOR ATHLETE
READINESS & RESILIENCE

Performance Hydration

WARRIOR ATHLETE
READINESS & RESILIENCE

HYDRATION REQUIREMENTS

Food Sources

Vegetables

Fruits

Starting Recommendation

- Drink half your body weight in fluid ounces per day

Ex: 150 lbs. / 2 = 75 fluid oz.

Your needs may be higher dependent on physical activity & environment.

Reference Amounts

1 canteen = 30 ounces

Half Gallon = 64 ounces

1 Gallon = 128 ounces

Takeaway: Stay well hydrated by drinking fluids and eating foods high in water content through out the day. Your needs may be higher if more physically active, wearing gear, or in hot/humid environment.

WARRIOR ATHLETE
READINESS & RESILIENCE

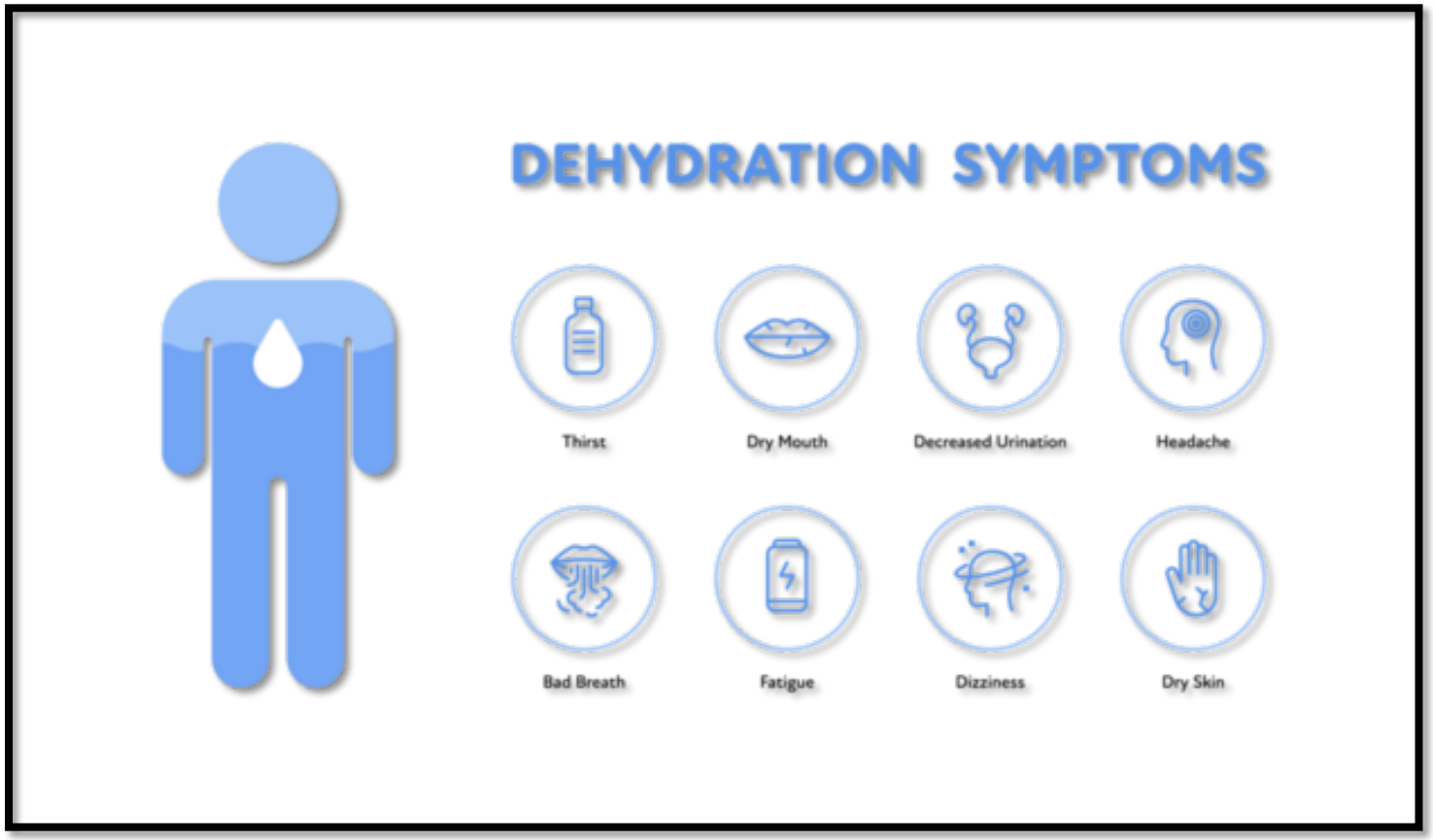
DEHYDRATION

Loss of 2% Body Weight

- ↑ Perceived Effort
- ↓ Performance by 10-20%
  3lbs. for 150lbs person

Loss of 3-5% Body Weight

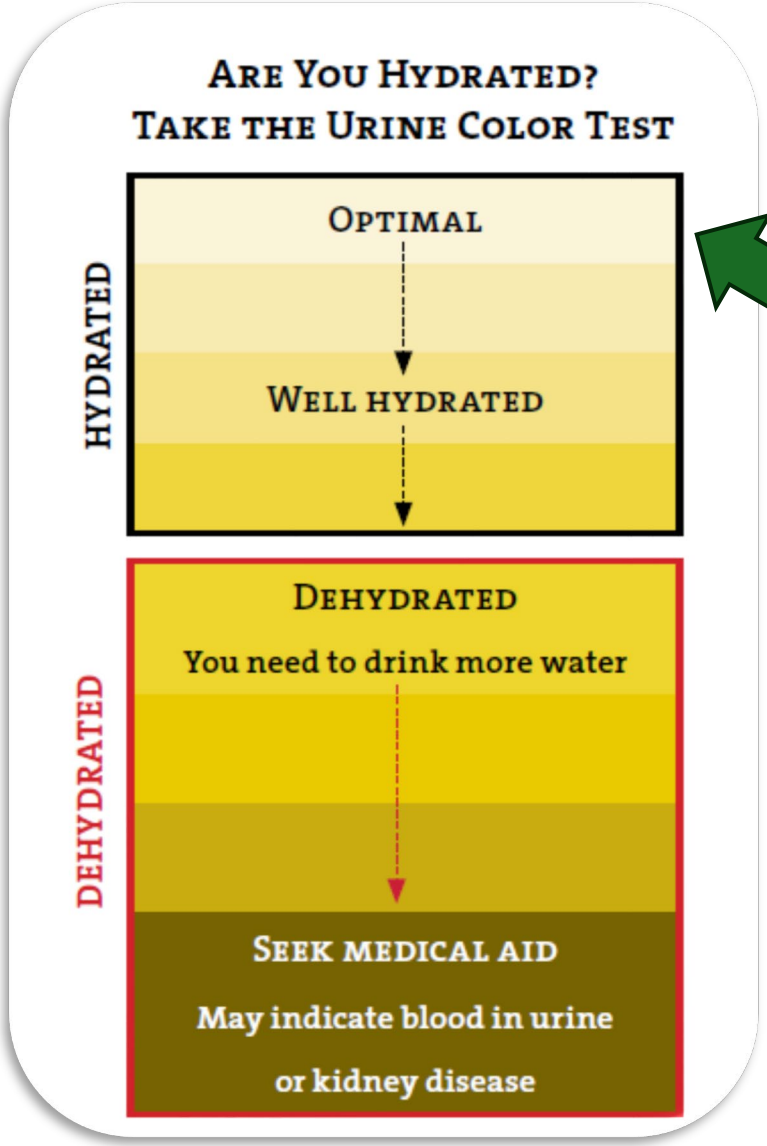
- ↓Reaction Time, Judgment, Concentration
- ↓ Muscular Endurance & Strength
- ↑ Risk of Cramping & Heat Exhaustion
  4.5-4.7lbs for 150lbs person



Takeaway: Small amounts of dehydration can greatly affect performance.

WARRIOR ATHLETE
READINESS & RESILIENCE

HYDRATION CHART



This color chart is not for clinical use.

Some vitamins and supplements may cause a darkening of the urine unrelated to dehydration.

CLEAR IS NOT THE GOAL

Remember:
Light Like Lemonade

Takeaway: Use this chart to monitor if you are drinking enough fluids.

WARRIOR ATHLETE
READINESS & RESILIENCE

HEAT ILLNESS

Heat Cramps

- Mild form of heat illness
- Muscle cramps and spasms occur
- Happens during or after intense exercise and sweating in high heat.

Takeaway: Heat illness can show up in different forms and if not addressed right away can lead to sever health risk and death.

WARRIOR ATHLETE
READINESS & RESILIENCE

HEAT ILLNESS RECOVERY

Recovery from heat stroke may be 2 weeks or more depending on severity of the incident.

- Specific return-to-duty strategy should be implemented under supervision of an Athletic Trainer and/or Physician.

- General Return-To-Duty Program will consist of gradual heat tolerance during training.

Potential Lasting Effects

- Increased Resting Heart Rate
- Difficulty in regulating Heart Rate during exercise
- Difficulty in regulating heat
- Organ damage

Takeaway: Recovery from heat illness is dependent on severity of incident and return-to-duty program should be under medical supervision.

WARRIOR ATHLETE
READINESS & RESILIENCE

REDUCING HEAT ILLNESS

Key points to help reduce heat illness

Hydration

- Keep in well hydrated zone
- Decreasing amount of body % loss seen during exercise
- Drinking fluids pre, during and post exercise
- Utilizing electrolytes during hot/humid environments

Fitness

- More fit a Marine is the better they are at handling heat
- Start to acclimatize to heat prior to training/operations in hot environments

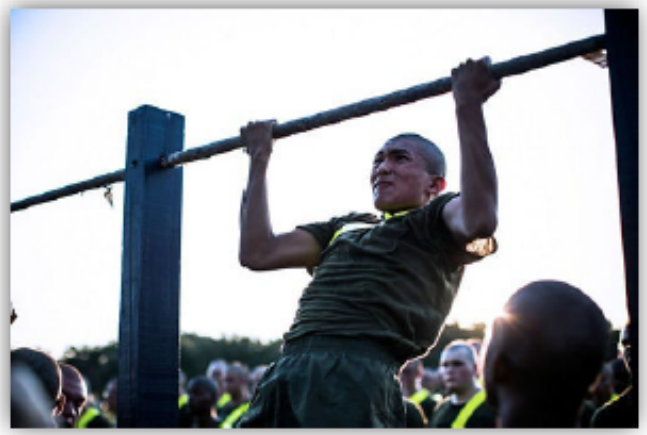
Takeaway: Proper Hydration and improvement of Aerobic Fitness are key to mitigating heat illness.

WARRIOR ATHLETE
READINESS & RESILIENCE

PT for Heat Acclimatization

2 Strategies for Heat Acclimatization

- Strategy 1 (PT in heat)
  - 10-14 consecutive days of PT in heat exposure (minimum)
  - PT needs to be 60 mins + per day
  - Temp should be 95-100 (or at highest expected temp)
  - PT at moderate intensity should cause excessive sweating, perform PT that is task related to event or deployment



- Strategy 2 (No access to heat)
  - Post exercise sauna (176 degrees or greater) 20-40 minutes
  - Post exercise hot water emersion 104 degrees for 20-40 minutes
  - No access to Sauna or hot water emersion, PT in extra clothing to increase core temp (make sure to follow appropriate hydration protocols)

Takeaway: Use either strategy or a mix to optimally acclimatize to heat. Maintain high physical fitness; very more fit = handling heat better.

WARRIOR ATHLETE
READINESS & RESILIENCE

ELECTROLYTES

International Journal of Sport Nutrition and Exercise Metabolism, (Ahead of Print)
https://doi.org/10.1123/ijsnem.2019-0300

Human Kinetics
CONSENSUS STATEMENT

Sports Dietitians Australia Position Statement: Nutrition for Exercise in Hot Environments

Sodium [Na^+]

- Another term for Salt
- Water follows Sodium
- You lose Sodium when you sweat

Sodium Loading Before Training

- 1-2 Hours before prolonged constant training
- Improves body's ability to regulate heat

Recommendation

20-40mg Sodium [Na^+] + 10 ml/kg Total Body Weight [Fluid]
180lbs [82kg] Marine = 1,640-3,280mg Na^+ + 820ml [28fl oz] Fluid

Application

Takeaway: Ingesting sodium before long training sessions may help a Marine stay hydrated and improve regulating heat.

WARRIOR ATHLETE
READINESS & RESILIENCE

SALTY SWEATERS

Salt Crust

- Happens when person is a “Salty Sweater”
- Good indicator that you need to replenish with electrolytes:
  - Before
  - During
  - After Training

Takeaway: Notice Salt Crust when training, increase use of electrolytes when hydrating.

WARRIOR ATHLETE
READINESS & RESILIENCE

Operation Supplement Safety

OPERATION SUPPLEMENT SAFETY

THE GOLD STANDARD BSCG BANNED SUBSTANCES CONTROL GROUP WWW.BSCG.ORG CERTIFIED DRUG FREE

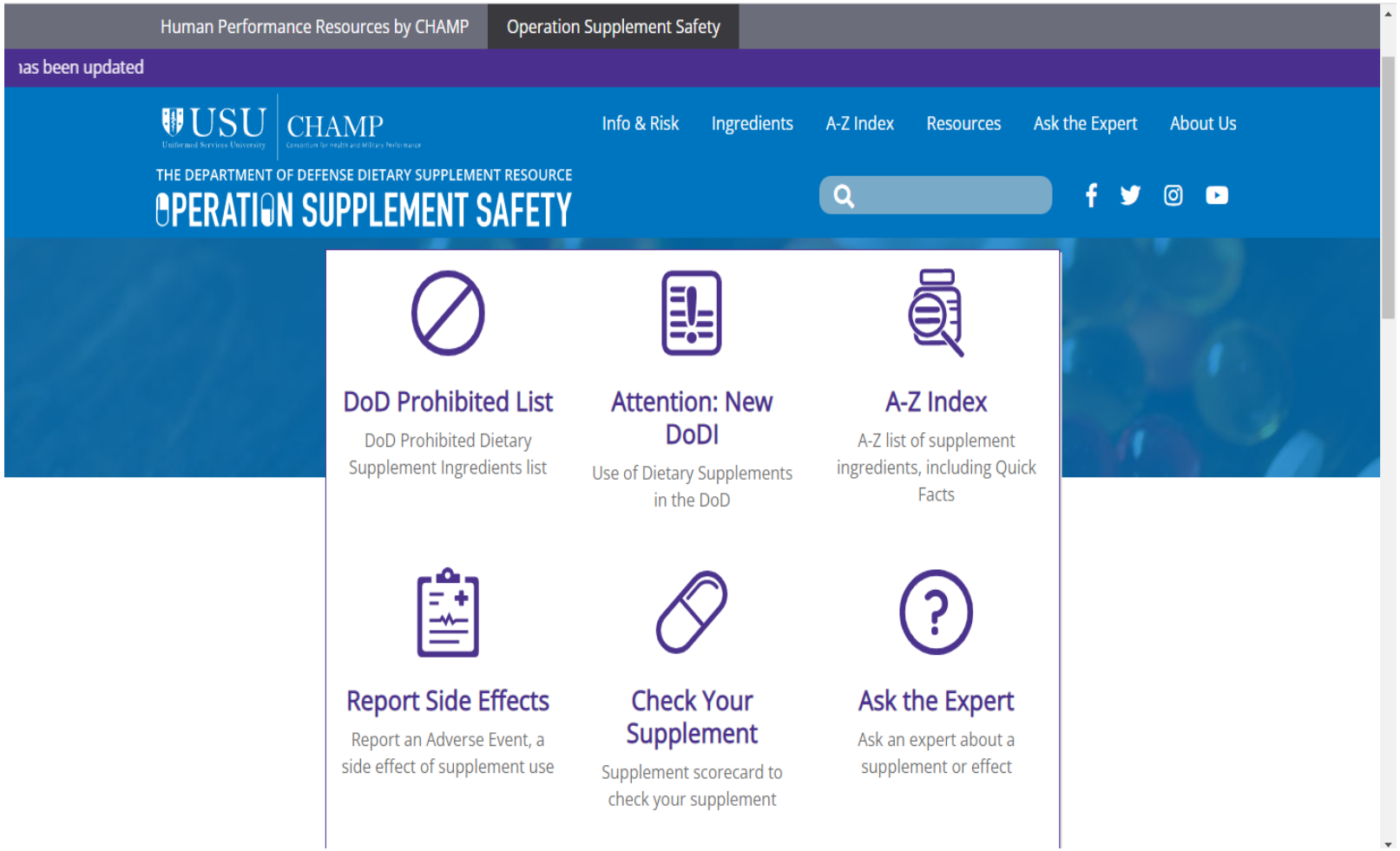
INFORMED-SPORT .com Trusted by sport

NSF CERTIFIED SPORT

DIETARY SUPPLEMENT USP VERIFIED

WARRIOR ATHLETE READINESS & RESILIENCE

www.opss.org



Takeaway: Marines can protect their career and health by using OPSS to check the safety of their supplement.

WARRIOR ATHLETE
READINESS & RESILIENCE

3rd Party Tests

- Tests for banned substances
- Certified Quality
- Complies with FDA Good Manufacturing Practices

- Certified Quality
- Pre and Post Market Banned Substance Testing
- Complies with FDA Good Manufacturing Practices

- Certified Quality
- Banned Substance Testing
- Complies with FDA Good Manufacturing Practices

- Certified Quality
- Does not contain harmful levels of contaminants
- Complies with FDA Good Manufacturing Practices

Takeaway: Not all 3rd Party Tests for supplements are the same, but consuming a product from the following list will help decrease a Marine's risk.

WARRIOR ATHLETE
READINESS & RESILIENCE

ENERGY DRINKS

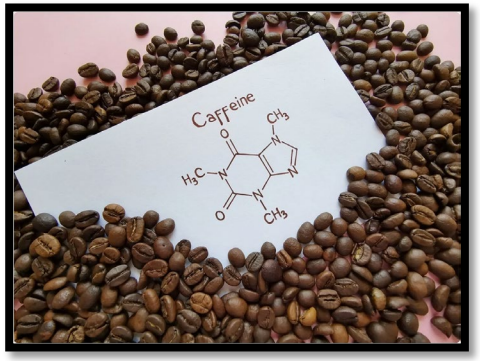
OPSS classifies them as having moderate potential benefit with moderate to high risk.

Can Be Used To:

- Stay awake
- Improve memory and concentration

Adverse Effects

- Heart Complications [Irregular Heartbeat/ Heart Failure]
- Anxiety
- ↓ Sleep Quality



Caffeine Recommendations

- 200mg
- 3-4 hours [maintain alertness]
- 90-60 minutes before endurance training

*Never exceed 600mg per day
Or
800mg for sustained operations*

Takeaway: There is a time and place for caffeine. A smart Marine can utilize the benefits, without putting them at risk.

WARRIOR ATHLETE
READINESS & RESILIENCE

Creatine

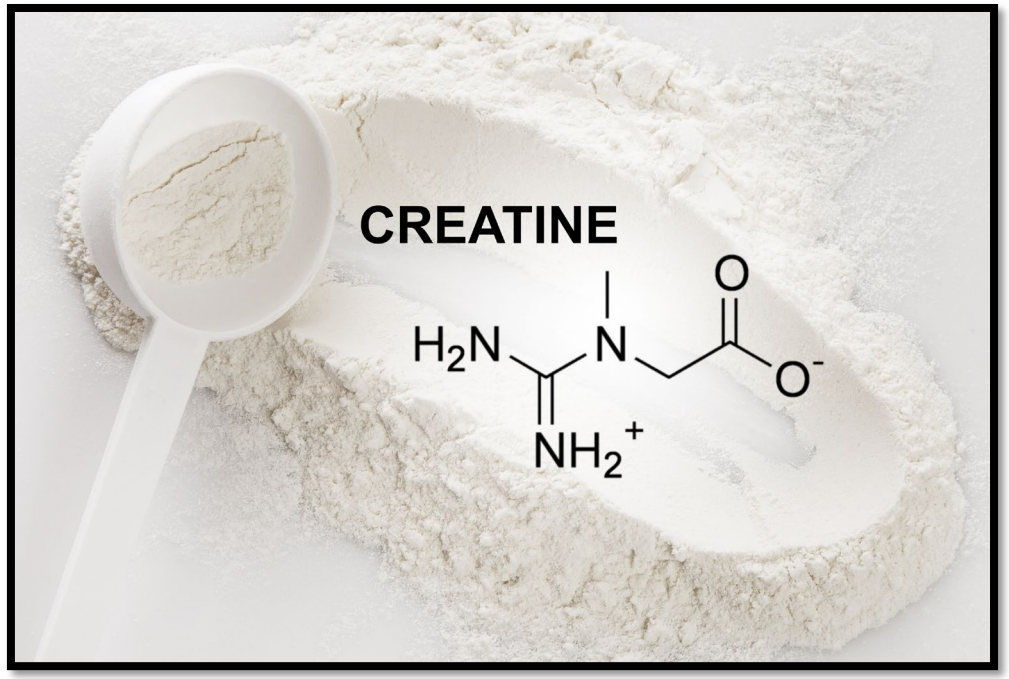
Most widely researched sport nutrition supplement for improving performance.

Can Be Used To Increase:

- Lean Muscle
- Strength

Adverse Effects

- Potential stomach upset if taken in large doses



Recommendations

- Loading Phase 1-week: 0.3g/kg body weight
  - Example. 150lbs male (68kg). 68kg * 0.3g/kg = 20g per day
- Maintenance Phase Post 1-week: 0.03g/kg body weight
  - Example. 150lbs male (68kg). 68 * 0.03g/kg = 2g per day

Takeaway: Creatine may improve a Marine's athletic performance through strength and power.

WARRIOR ATHLETE
READINESS & RESILIENCE

Beta-Alanine

May increase Marine's "buffering capacity" to prolong time to fatigue.

Can Be Used To:

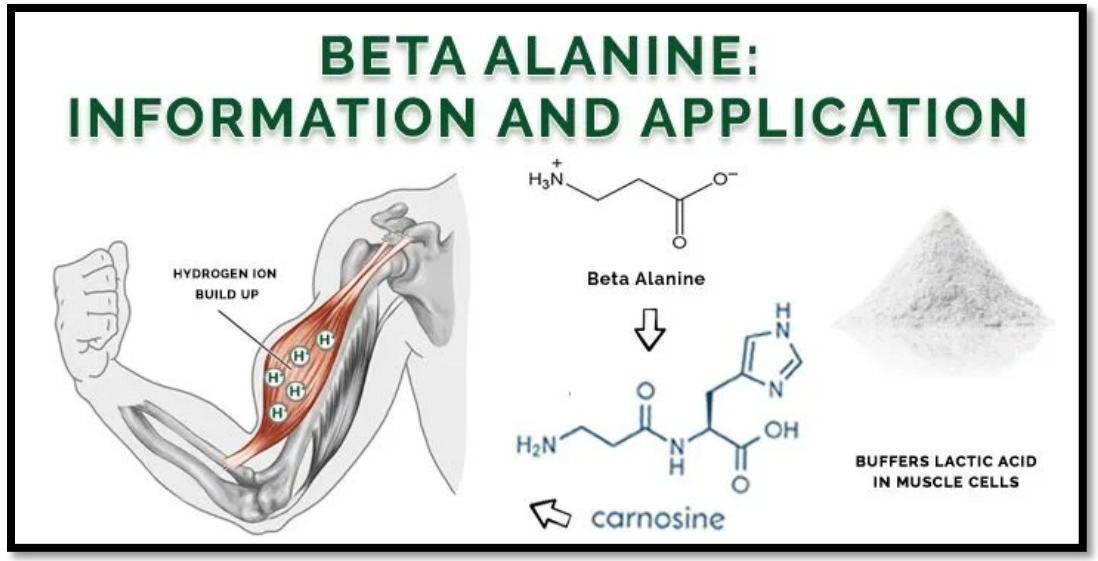
- Help prevent pH from dropping in muscles
- Reduce feelings of fatigue

Adverse Effects

- Itchy/tingling feeling in high doses

Recommendations

- 65mg/kg of body weight
- Taken in split doses throughout the day
  - (i.e., 0.8-1.6g every 3-4 hours)



Takeaway: Beta-Alanine may improve a Marine's athletic performance by decreasing time to fatigue when performing continuous high intensity training.

WARRIOR ATHLETE
READINESS & RESILIENCE

Omega-3

Essential fat that has shown to have positive effects on athletic performance.

Can Be Used To:

- Manage inflammation
- Enhance muscle recovery
- Protection of brain health (TBI) and function

Adverse Effects

- Fish burps

Recommendations

- 1-3g/day of EPA + DHA
- 2g/day DHA for neuroprotection

Takeaway: Omega-3s have a positive effect on athletic performance. Fish and animal products offer Omega-3, but supplementation may benefit if not able to consume those types or if needing to achieve a higher dose.

WARRIOR ATHLETE
READINESS & RESILIENCE

Vitamin D

Plays an important role in Marine's health, training and performance.

Can Be Used To:

- Help immune function
- Decrease risk for stress fractures
- Decrease inflammatory injury

Adverse Effects of High Doses

- Nausea, Weakness and Confusion
- Thirst and Frequent Urination

Recommendations

- 1500-2000 IU/day

Takeaway: Vitamin D plays a role in a Marine's performance by helping them stay healthy to train longer through out the year.

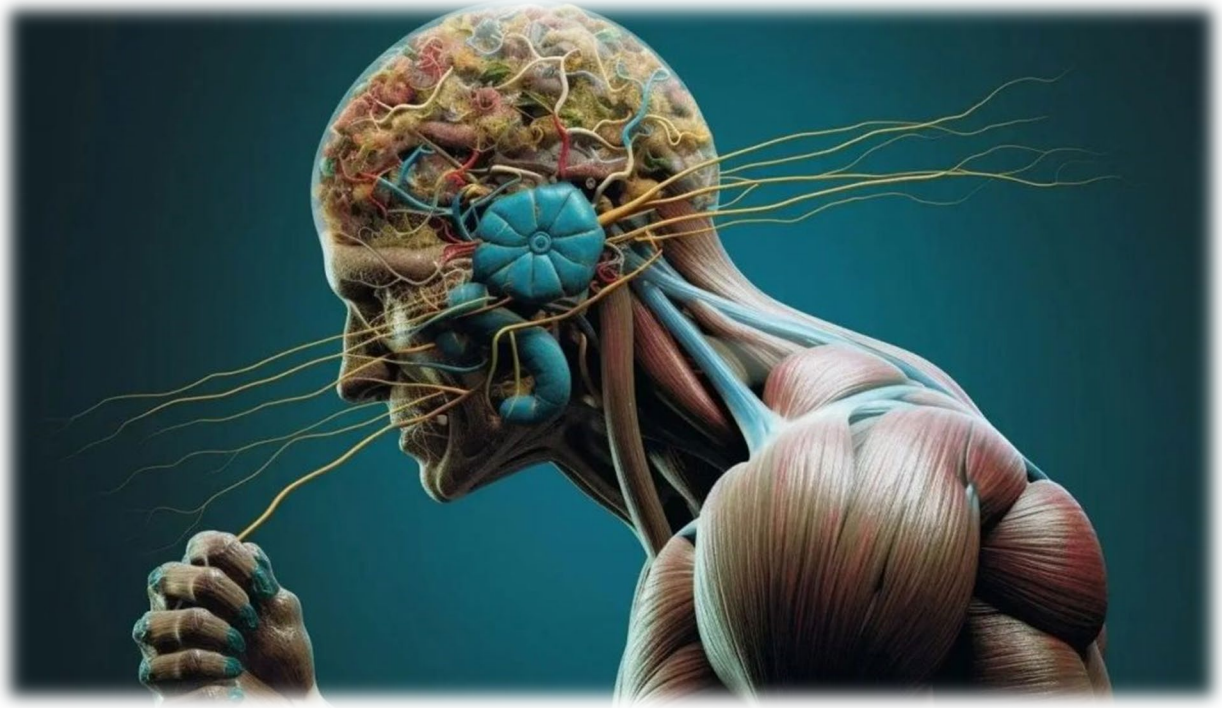
WARRIOR ATHLETE
READINESS & RESILIENCE

Alcohol & Performance

WARRIOR ATHLETE
READINESS & RESILIENCE

Effects on Nervous System

- Impairs:
  - Motor Skills
  - Coordination
  - Reaction Time
  - Balance
  - Decision Making



Takeaway: Alcohol disrupts the central nervous system decreasing the cognitive performance needed for training/operations.

WARRIOR ATHLETE
READINESS & RESILIENCE

Effects on Repair & Recovery

- Impairs rate of muscle protein synthesis to repair training damage
- ↓ Testosterone
- ↑ Cortisol levels
- Dehydrates the body, delaying recovery time

Takeaway: Alcohol delays the recovery process from training.

WARRIOR ATHLETE
READINESS & RESILIENCE

Effects on Sleep

- Disrupts time it takes to fall asleep (Sleep Onset Latency)
- Disrupts Restorative Sleep Cycles
  - Rapid Eye Movement (REM) Sleep
  - Deep Sleep

Takeaway: Alcohol disrupts the quality of sleep, delaying the recovery time and decreases the performance needed for the next day.

WARRIOR ATHLETE
READINESS & RESILIENCE

QUESTIONS?

WARRIOR ATHLETE
READINESS & RESILIENCE