

NUTRITION CONSIDERATIONS FOR FIREFIGHTERS

Firefighters face many challenges throughout their career including: shift work, long hours, load carriage, extreme heat, high stress, and time away from family. In addition to the daily physical and mental struggles, firefighters are at a higher risk of several chronic conditions that can affect them long after retirement. Nutrition influences each risk factor facing firefighters today.

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Health Risks

Cardiovascular Events	Cancer	Behavioral Health & Sleep	Obesity
<p>43% of LODD (line of duty deaths) in the past 10 years are caused by a cardiovascular event¹</p> <p>Increased cardiovascular strain during firefighting causes by multiple factors, including^{3,4}:</p> <ul style="list-style-type: none"> • Type of work performed • Environmental pollution • Gear and thermoregulation • Fitness status • Hydration status 	<p>9% increase in cancer diagnosis related to the general population¹</p> <p>14% increase in cancer-related deaths related to the general population¹</p> <p>In 2021, the IARC categorized “occupational exposure as a firefighter was classified as carcinogenic to humans (Group 1) on the basis of sufficient evidence for cancer in humans”²</p>	<p>30% of first responders develop behavioral health conditions like depression and PTSD.¹⁰</p> <p>104 firefighters and EMTs died by suicide in 2021. This is an estimated number by the Firefighter Behavioral Health Alliance, but actual numbers may be higher.⁵</p> <p>Prevalence of sleep disorders in firefighters includes 31% for shift work disorder, 30% for obstructive sleep apnea, and 28% for insomnia and excessive daytime sleepiness.</p>	<p>73-88% of firefighters are overweight or obese.</p> <p>BMI is an accurate way of classifying weight status of firefighters.⁸</p> <p>Obesity increases the odds of a fatal cardiovascular event by 1.5-6.6 times.⁶</p> <p>3x increase in workers compensation injury claims among those with a BMI >30 compared to a normal BMI <25.⁷</p> <p>Obese firefighters are more likely to suffer from hypertension, high LDL cholesterol, high triglycerides, low fitness, and more frequent cardiovascular events.⁷</p>



Common Barriers and Pain Points

	Lack of Time	Lack of Energy	Lack of Money
Common Reason	<ul style="list-style-type: none"> • Forced or planned overtime • Long commute • Children • Side jobs/businesses • Catching up on sleep from shift before • Deployments (wildland or urban search and rescue teams, typically +14 days) 	<ul style="list-style-type: none"> • Multiple calls after midnight • Busy stations • High intensity calls (ex. Fire or physically intense training drill) • Repeated exposure to trauma • Other responsibilities (kids, side jobs) 	<ul style="list-style-type: none"> • Often perceived lack of budget for health/wellness • Single income household with children • Recent divorce or other financial challenges • At the station - typical dinner budget is \$5-6 per person with at least 2-3 times the “normal” portion per person. Leftovers are often used for the next shift’s lunch
Common Dietary Compensation	<ul style="list-style-type: none"> • Reliance on fast or convenience food • Low intake of fruits and veggies • Forgetting to drink water • Forgetting to pack snacks • Reliance on MREs or whatever is available on deployments • Eating fast due to fear of interruption by calls, leading to larger portions and low satiety • Tendency to rely on fad diets, supplements, and quick fixes 	<ul style="list-style-type: none"> • Excess caffeine (coffee, energy drink, pre-work-out supplements) • Poor food choices • Eating whatever they get their hands on (and a lot of it) after a high intensity call • Skipping meal or snack prep • Difficulty adhering to “realistic” health changes due to declining mental health 	<ul style="list-style-type: none"> • Reliance on fast or cheap food

<p>Suggested Strategies</p>	<ul style="list-style-type: none"> • Guides on healthier fast or convenience foods • Emphasize need for antioxidants and fiber, provide portable and quick veggie/fruit options • Emphasize hydration strategies at work and on the fireground • Recommend packing several portable healthy snack options • Guides on nutrient dense, non-perishable foods for deployments • Discuss how to eat slower, including benefits and how to trial it off-shift • Discuss fad diets pros/cons, including a breakdown of the science and alternatives that consider shiftwork 	<ul style="list-style-type: none"> • Strategies for reducing or managing caffeine intake • Healthier options when craving salty/sweet food • Recovery strategies after a high intensity call, workout, or training drill (hydration, protein, carb replacement) • Quick meal prep ideas or recommend “contracting out” to meal prep services. Consider calling companies in the area and ask for a discount for the department. • Collaborate with a trusted mental health provider that specializes in first responders 	<ul style="list-style-type: none"> • Low cost, portable healthy meals • At the station -emphasis on high fiber, high protein meals with extra veggies on a budget
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IMPROVING HEALTH AND PERFORMANCE

- Firefighters are tactical athletes that need specific, realistic strategies to improve health and performance. Job-specific strategies in a colorful, imagine-driven, and intuitive format are encouraged. Similar to athletes, firefighters can be influenced by various fad diets and quick fixes that don't support their physical or cognitive performance.
- 4% of calls are fire related, the remaining types of calls are EMS or service related (US Fire Administration). Types of calls vary drastically, and a structural firefighter might be lucky to get one fire a year while others may catch several fires in a month. Wild-land firefighters will have more exposure to fire and high intensity activity, with tours lasting 14 days straight or more. This is important to note because the focus may need to be more on general nutrition that fits into shift work, with some education on hydration and performance nutrition. Performance nutrition should emphasize healthier non-perishable food items that are inexpensive and can last 2-3 months in a bag.
- Due to the nature of the job, firefighters are at a significant risk of dehydration due to excessive fluid and electrolyte losses. Firefighters can lose up to 40 oz of sweat during 30 minutes of fire suppression activity (PMID: 27891237). Firefighters require a balanced diet filled with complex carbs to support training, protein to support recovery, and healthy fats to support health and energy production.



2,500 Calorie Meal plan for a 24 hour Shift

Most females or small males require about 2500 calories per day for maintenance. If a fire related call occurs, calories may increase drastically. Wildland firefighters on tour may require 4400-6000 calories per day.

***Meal plan developed by Megan Lautz*

Meal/Time	From Home	On The Go	Mixed
5am-8am Breakfast	16 oz coffee black 4 medium cooked eggs 2 slices Daves Killer Bread, thin 1/4 cup Mexican shredded cheese blend 2 tbsp sriracha hot sauce	16 oz coffee black 1 Chick-fil-a egg white grill english muffin 1 large Chick-fil-a fruit cup	6 oz coffee black 1 cup quick oats 1 scoop whey protein powder 1 tbsp chia seeds 1 medium banana
11am-1pm Snack	3/4 cup nonfat vanilla greek yogurt 1 scoop whey protein powder 1 cup mini wheats 1 cup grapes	1 7-Eleven select: hummus pretzels chipotle garlic	1 cup nonfat vanilla greek yogurt 1/4 cup granola 2 tbsp peanut butter, unsalted 1 medium apple
1pm-3pm Lunch	Buffalo chicken wrap (2): 2 whole wheat wraps 1/2 cup canned or shredded chicken 4 tbsp buffalo sauce 4 tbsp low-fat ranch or blue cheese 1/4 red onion 1 cup coleslaw mix dry 1 serving Lays Poppables	1 Chick-fil-a grilled market salad	Turkey burger: 4 oz ground turkey (93% lean) 1 slice cheddar cheese 1 whole wheat hamburger bun 3 tbsp ketchup 3 cup salad mix 2 tbsp Marie's balsamic vinaigrette
6pm-8pm Dinner	2 whole wheat english muffins 1 cup low sodium tomato sauce 1/2 cup part-skim shredded mozzarella 2 tbsp Marie's balsamic vinaigrette 1/2 cup black olives 3 cups Dole salad mix	Chipotle bowl: 1 order brown rice 1 order black beans 1 order chicken 1 order fajita vegetables 2 cups lettuce 1 order cheese 1 order guacamole	1 Chick-fil-a grilled chicken sandwich 1 Chick-fil-a waffle fries small
12am-3am Snack	1 100 cal pack oreo thins 1 cup blueberries	1 cup popcorn	Quest protein bar, smores

Fueling needs can vary based on activity, age, sex, and shift schedule. Please consult with a Performance Dietitian for specific fueling needs.

3,000 Calorie Meal plan for a 24 hour Shift

For higher energy needs, focus on distributing calories evenly throughout the day rather than lumping your extra fueling needs into one meal.

**Meal plan developed by Megan Lutz

Meal/Time	From Home	On The Go	Mixed
5am-8am Breakfast	16 oz coffee black 4 medium cooked eggs 2 slices Daves Killer Bread, thin 1/4 cup Mexican shredded cheese blend 2 tbsp sriracha hot sauce 1 banana	16 oz coffee black 1 Chick-fil-a egg white grill english muffin 1 large Chick-fil-a fruit cup 1 yogurt parfait	6 oz coffee black 1 cup quick oats 1.5 scoops whey protein powder 1 tbsp chia seeds 1 medium banana 1 tbsp peanut butter 1 tbsp raisins
11am-1pm Snack	3/4 cup nonfat vanilla greek yogurt 1 scoop whey protein powder 1 cup mini wheats 1 cup grapes t tbsp dark chocolate chips t tbsp chia seeds	1 7-Eleven select: hummus pretzels chipotle garlic 1 serving almonds	1 cup nonfat vanilla greek yogurt 1/4 cup granola 2 tbsp peanut butter, unsalted 1 medium apple 2 oz almonds 1/4 cup blueberries
1pm-3pm Lunch	Buffalo chicken wrap (2): 2 whole wheat wraps 1/2 cup canned or shredded chicken 4 tbsp buffalo sauce 4 tbsp low-fat ranch or blue cheese 1/4 red onion 1 cup coleslaw mix dry 1 serving Lays Poppables 1/3 avocado	1 Chick-fil-a grilled market salad 1 large cup mixed fruit 1 serving low-fat milk/ chocolate milk	Turkey burger: 4 oz ground turkey (93% lean) 1 slice cheddar cheese 1 whole wheat hamburger bun 3 tbsp ketchup 3 cup salad mix 2 tbsp Marie's balsamic vinaigrette 1/2 cup baked beans

6pm-8pm Dinner	2 whole wheat english muffins 1 cup low sodium tomato sauce 1/2 cup part-skim shredded mozzarella 2 tbsp Marie's balsamic vinaigrette 1/2 cup black olives 3 cups Dole salad mix 1 serving lean ground turkey	Chipotle bowl: 1 order brown rice 1 order black beans 1 order chicken 1 order fajita vegetables 2 cups lettuce 1 order cheese 1 order guacamole	1 Chick-fil-a grilled chicken sandwich 1 Chick-fil-a waffle fries small Medium mixed fruit and kale salad
12am-3am Snack	1 100 cal pack oreo thins 1 cup blueberries 2 boiled eggs	1 cup popcorn 2oz mixed nuts	Quest protein bar, smores 1 banana

Fueling needs can vary based on activity, age, sex, and shift schedule. Please consult with a Performance Dietitian for specific fueling needs.

HYDRATION GUIDELINES

The Institute of Medicine recommends 2.7 liters (91 oz) of fluid per day for women and 3.7 liters (125 oz) of fluid per day for men. This includes water, sports drinks, and water content in food.

Firefighters working in the heat may need more than the 91-125 oz baseline. Prioritize electrolyte replacement during outdoor activity, as sweat losses can be significant. Firefighters in particular can lose up to 40 oz of sweat in 30 minutes of fire suppression activity. One liter of sweat (32 oz) can contain up to 1840 mg of sodium and 390 mg of potassium.



During trainings or drills, firefighters are encouraged to consume 8-12 oz every 15 minutes of a sports drink or oral rehydration solutions. Oral rehydration solutions (ORS) are recommended over sports drinks when heat and training intensity is high. ORS packets have double the electrolytes and half the sugar of sports drinks. The extra sodium will help replenish electrolytes and encourage rapid rehydration.

Note that sodium replacement is essential in hot environments due to sweat and metabolic losses. The baseline recommendation is 500-700 mg of sodium per hour. Tactical gear, heat, and individual variances may increase this need to up to 2000 mg sodium per hour! A bit of sugar (12 grams) helps pull sodium across the cell membrane, allowing rehydration to occur faster. Diet sports drinks and ORS packets will still help rehydrate, but at a slower rate.

SAMPLE GO BAG

At busier stations, a go or rehab bag is recommended in case of long or back-to-back calls. Include high protein, carbohydrate replacement, and hydration products.

1) Applesauce or Smoothie Pouches

Perfect for pre-workout or on the way to an intense call. Applesauce pouches are a quick source of carbohydrates that won't weigh you down.

2) Dried Fruit

Dried fruit is high in antioxidants and fiber. Watch the serving size though, the calories can add up quickly. A typical serving is $\frac{1}{4}$ cup or a small handful.

3) Carb-based Bars

Carb-based bars have 30-40g carbs with little to no protein. These are great pre-workout or during an intense call. Try Nature's Bakery Fig Bars, Cliff Bars, or Oatmega bars.

4) Whole Grain Cereal

Pack dry in snack baggies for a high-fiber treat. Cheerios, Raisin Bran, or Mini-Wheats are great options.

5) Nuts and Seeds

Nuts are a great source of healthy fats. Consider pre-portioned packs that have a variety of nuts and seeds.

6) Jerky

Jerky is a great source of protein in a pinch. However, keep in mind that jerky is processed meat. IARC classifies processed meat as a Group 1 carcinogen. This means processed meat is known to cause colorectal cancer. While this sounds scary, it means that you should save jerky for occasions at most. If cancer is a major concern for you, skip out on processed meat (including bacon and sausage).

7) Protein Bars

Watch for any chocolate-coated bars, as they tend to get messy when melted. Any bar that is lower in sugar and has 15-25g of protein is a good option.

8) Tuna or Chicken Packets

Tuna used to only come in a can but is now available in flavored pouches! These are great, high-protein options on the go.

9) Electrolyte Replacement

Water is only part of the rehydration strategy for hot, high-intensity calls. Electrolytes like sodium, potassium, and chloride are lost in sweat. Sodium also helps pull water across the cell membrane and can help maintain plasma volume when large volumes of fluid are needed to replace sweat losses. A bit of sugar can help enhance rehydration even further. Oral Rehydration Solution (ORS) packets contain the above and are more portable than sports drinks. A sports drink is still a great option for hot calls, but ORS will have double the electrolytes and half of the sugar.

10) Water Bottle

While water is typically available, having a 16 oz water bottle on hand will help keep you hydrated in case water is delayed. Consider a collapsible silicon water bottle to refill if no cups are available.



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