

ESTIMATED NUTRIENT REQUIREMENTS FOR FIREFIGHTERS

Average estimated requirements for males, age 19-24, weight 72 kilograms (~160 lbs), working at endurance sports capacity. Broad recommendations are based on RDA's⁽¹⁾ and ADA Sports Nutrition Guidelines.⁽²⁾

Basic Nutrient Requirements:

<u>Fluid:</u>	6 to 8 liters per day minimum*
<u>Calories:</u>	5000 to 6000 calories per day
<u>Carbohydrate:</u>	55 to 60 % of total calories
<u>Protein:</u>	15 % of total calories or 0.8 grams protein per kilogram of body weight
<u>Fat:</u>	≤ 30% of total calories
<u>Sodium:</u>	5000 + milligrams per day
<u>Potassium:</u>	3000 to 4000 milligrams per day

*(The most effective method for determining individual fluid requirement utilizes several factors including body weight, environmental temperature and humidity.)

Important Basic Concepts

- Virtually all nutrient requirements can be met by consuming a nutrient-dense diet of a wide variety of foods, and this is the best advice for athletes.²
- The longer and more effectively an athlete trains the more efficient the body becomes at burning calories and using oxygen.²
- Water may be the single most important nutrient for athletic performance.²
- Exercising under hot and humid conditions may produce water losses greater than 2 liter per hour.²
- A 2 % loss of body weight by dehydration can impair the bodies ability to dissipate heat and 4% loss can cause exhaustion.²
- Thirst is not a reliable indicator for fluid loss. Exercise blunts the thirst mechanism.²
- Formula to estimate the amount of fluid that should be consumed during work or competition.²
Your body weight x 0.03 (3%)=_____lb.
- The major cause of heat cramps is whole-body salt deficiency.²
- Thirst may not be triggered until a deficit of approximately 700 ml of water, equivalent of an approximately 1% loss of body weight.²
- Acute altitude exposure usually results in a somewhat easier water loss and, therefore, a greater chance of dehydration.²
- In hot conditions , water loss through sweat can exceed 2 liter an hour and may peak around three liters per hour in an acclimatized athlete.²
- A good practice would be to offer a choice of both water and carbohydrate-electrolyte (sports drinks) beverages.²

ANALYSIS OF FIRE-EATER MEALS³

Fire Eater Meals:

1 breakfast, 1 main meal, 1 side dish and snack provides the following:

	% of Calories based on 2576 total		
	<u>Carbohydrate</u>	<u>Protein</u>	<u>Fat</u>
870 cc fluid			
381.4 gm carbohydrates	1525.6 cal	282.8 cal	767.7 cal
70.7 gm protein	59.2%	11%	29.8%
85.3 gm fat			
2243 mg sodium			
2496 mg potassium			
2576 calories			

Est. percentage of Basic Nutrient Requirements met by one Fire-Eater Breakfast & Main Meal Pack

<u>Provides</u>	<u>Percentage of Estimated Requirements</u>	
870 cc fluid	14.5 % of fluid requirement	(below guidelines)
2576 calories	46.8% of caloric requirement	(below guidelines)
381.4 gm carbohydrates	59.2% of total calories	(meets guidelines)
70.7 gm protein	11% of total calories	(meets guidelines)
85.3 gm fat	29.8% of total calories	(meets guidelines)
2243 mg sodium	44.8% of sodium requirement	(below guidelines)
2496 mg potassium	83% of potassium requirement	(below guidelines)

Suggested Supplemental Pack Items

(Not included in Fire-Eater Meals)

<u>1 lb. Trail Mix</u>	<u>480 cc Gatorade</u>	<u>8 oz. Trail Mix</u>	<u>240 cc Gatorade</u>
2096 calories	78 calories	1048 calories	39 calories
203.2 gm carbohydrate	20.5 gm carbohydrate	101.6 gm carbohydrate	10.5 gm carbohydrate
62.4 gm protein	220 mg sodium	31.2 gm protein	110 mg sodium
132.8 gm fat	50 mg potassium	66 gm fat	25 mg potassium
1040 mg sodium		520 mg sodium	
3104 mg potassium		1552 mg potassium	

Sample Daily Food Pack
(Fire-Eater Breakfast, Main Meal Pack & Supplemental Items)

Total weight of Sample Pack:

Breakfast	2.2 lbs
Meal Pack	2.9 lbs
Trail Mix	1.0 lb *(salted nuts recommended)
Gatorade (16 oz)	1.0 lb
H ₂ O 1 gal	<u>8 lbs.</u>
	15.1 lbs.

Total Estimated Nutrient Requirement of Sample Pack:

5190 cc fluid	86.5% of minimum fluid requirement
4915 calories	89% of minimum requirement
605 gm carbohydrate	49.3% of total calories
133.1 gm protein	10.8% of total calories
218.1 gm fat	39.9% of total calories
3503 mg sodium	70% of minimum requirement
5650 mg potassium	141% of minimum requirement

*Salted nuts will enhance sodium intake.

1 cup	=240 cc
1 pt.	=480 cc
1 qt	=960 cc or approx. 1 liter
1 gal	=3840 cc or approx. 4 liters
1 lb	=2.2 kilograms

- 1) *Recommended Dietary Allowances*. 1989 by the National Academy of Sciences. Published by National Academy Press Washington, DC.
- 2) *Sports Nutrition: A guide for the professional working with active people*. Second Edition, 1993. The American Dietetic Association.
- 3) *Fire-Eater Meals*, ABLE Industries, Tulare CA

NUTRIENT ANALYSIS

One Fire-Breakfast & one Fire-Eater Main Meal Pack

	Fluid cc	Calories	Carbohydrate gm	Protein gm	Fat gm	Sodium mg	Potassium mg
Breakfast	480	858 est.	146.2	21.7	26.3	572	1083
Snacks	390	1099 est.	182.3	17.4	37.6	56.2	911
Lasagna	0	302 est.	27.2	22.2	11.8	885	363
Side Dish	0	228 est.	25.7	9.4	9.6	730	139
Total	870 cc (29 oz)	2576*	381.4	70.7	85.3	2243.2	2496

*Calculated on carbohydrate, protein, and fat content.

Calorie: A unit measurement of heat. One calorie is the amount of heat required to raise the temperature of one kilogram of water by one degree Celsius or one lb. of water 4 degrees Fahrenheit.