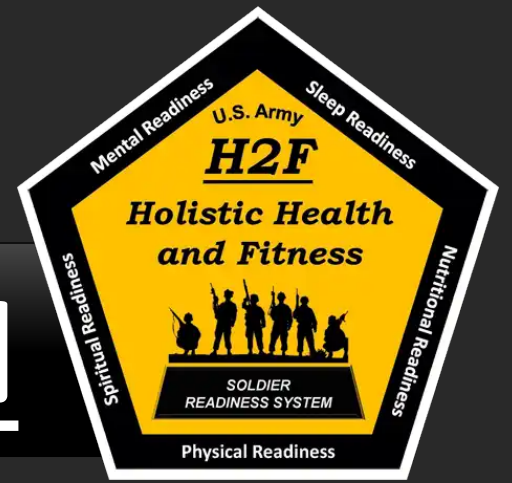


BODY COMPOSITION



Holistic Health and Fitness

Body Composition

The body is comprised of water, protein, minerals, and fat. A two-compartment model of body composition divides the body into a fat component and fat-free component.

The total amount of body fat consists of essential fat and storage fat. Fat in the marrow of bones, heart, lungs, liver, spleen, kidneys, intestines, muscles, and certain tissues throughout the central nervous system is called essential fat.

Nonessential body fat is called storage fat. Normal bodily function requires essential fat. Women have higher essential fat than men because it includes sex-characteristic fat related to childbearing. Storage fat is located around internal organs (internal storage fat) and directly beneath the skin (subcutaneous storage fat). It provides bodily protection and serves as an insulator to conserve body heat.

The relationship between subcutaneous fat and internal fat may not be the same for all individuals and may fluctuate during the life cycle.



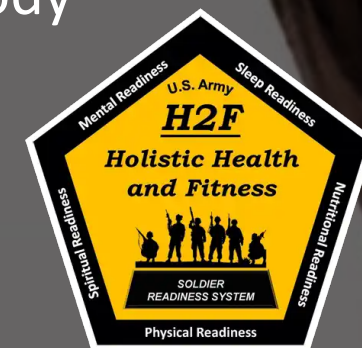


Lean body mass represents the weight of your muscles, bones, ligaments, tendons, and internal organs.

Lean body mass differs from fat-free mass (known as FFM). Since there is some essential fat in the marrow of your bones and internal organs, the lean body mass includes a small percentage of essential fat.

However, with the two-component model of body composition, these sources of essential fat are estimated and subtracted from total body weight to obtain the fat-free mass.

Practical methods of assessing body composition such as skinfold thickness (or caliper) testing, bioelectrical impedance analysis, air displacement plethysmograph, and hydrostatic weighing are based on the two-compartment (lean body mass and fat-free mass) model of body composition.





Optimal lean body mass to fat-free mass ratios for Soldiers differ depending upon their primary and secondary mission roles. Dietitians consider chronic disease risk, individual illness and injury patterns, body composition history, ethnicity, and specific mission requirements when determining their most effective task specific body composition. Soldiers should be reminded that physical performance cannot be accurately predicted solely based on body weight and composition. A single and rigid optimal body composition should not be recommended for any physical training event or unit of Soldiers.

Following a healthy eating pattern (consuming the number of servings of carbohydrate, protein and healthy fats from the food groups to meet individual calorie needs) supports a healthy body composition. The frequency, intensity, and type of physical activity also impact body composition. To perform optimally at any physical task requires proper nutrition combined with physical training. All Soldiers are encouraged to achieve and maintain body composition.

See AR 600-9 for standards for body fat.

BODY MASS INDEX

Body mass index (BMI) is a population screening measure commonly used to rapidly assess health

and classify individuals as underweight, normal, overweight, or obese.

$BMI = \text{weight (in kilograms)} / \text{height (in meters)}^2 = \text{kg/m}^2$

Reference standards developed for the United States population by race and gender, so that individuals at risk for obesity can be easily identified. However, the reference value for the U.S. population does not always apply to special populations, such as Soldiers, who may have a higher BMI but acceptable body composition. BMI is a screening tool that just assesses height to weight ratio but does not indicate body composition.

Leaders may refer their Soldiers to a registered dietitian or the Army Wellness Center for more accurate body composition analysis to track progress. AR 600-9 indicates the weight for height ratio screening tool for Soldiers. Leaders can use monthly weigh-ins and taping to keep track of changes in a Soldier's body composition. However, all Soldiers must adhere to the body fat guidelines outlined in AR 600-9.



$$BMI = \frac{\text{weight (kg)}}{\text{height (m)}^2}$$

WEIGHT LOSS

For some Soldiers, injury, stress, lack of time, frequent travel, or other reasons might contribute to a higher-than-optimal weight. They need to determine what might contribute to a body composition higher in body fat. It is important to evaluate the amount of food and calorie-containing beverages consumed each day and to reduce the total number of calories per day to reduce body fat. It takes dedication to make adjustments to eating habits, portion sizes, food choices, physical activity, sleep hygiene, and stress management.

Nutrition goals should be realistic as weight loss does not happen overnight. Soldiers can generally sustain a weight loss of 0.5-1 pound per week. To prevent lean muscle loss and nutrient deficiencies, women should consume no less than 1200 calories per day; men should consume no less than 1500 calories per day.



Soldiers use the following tips to achieve a healthy weight:



- > Track food intake using a daily food log.
- > Focus on an eating plan that consists of nutrient rich, lean sources of protein—including fish, poultry, beans, nuts, and dairy products—and incorporate whole grains, fruits, and vegetables.
- > Choose low calorie beverages such as water, low-fat milk (or soy milk), and unsweetened beverages with and between meals to stay hydrated.
- > Be mindful of hunger and fullness cues, keeping in mind it takes 20 minutes to feel full, so eating slowly and mindfully is helpful to prevent eating more calories than intended.
- > Keep a food log to stay aware of the number of calories consumed and to know whether the calorie goal is met or not. This supports understanding whether further changes in eating habits are required to support weight loss.
- > Stay hydrated and do not starve yourself. There is a balance in caloric consumption and expenditure to achieve the right amount of weight loss while not affecting physical performance.

Goals change depending on work schedules. For example, trainees who struggle to have enough energy to perform the physical components in BCT should not focus on losing weight; their current goal should focus on fuel to perform. Once they have passed the physical standards, then they can shift their focus to weight loss.

WEIGHT GAIN

Combat missions and training require muscular strength and endurance. To optimize performance and prevent musculoskeletal injuries while attempting to gain weight, Soldiers need to combine an appropriate strength training program with a well-planned nutritional strategy. The most effective method to increase muscle mass is to encourage a positive energy balance, for example, by consuming more calories than required to maintain current body weight. Theoretically consuming an additional 250–500 calories per day above typical requirements would result in a gain of one half to one pound per week.

Many Soldiers may believe more protein is the best way to gain weight, when in fact, eating more protein than the established recommendation does not provide any additional benefit. To encourage lean body mass growth, daily protein consumption should increase to 1.2–2.0 grams/kilograms (~0.55–0.9 ounces/pound) body weight.



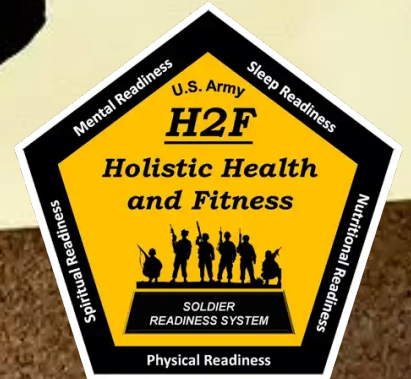
Soldiers use the following tips to help add more calories to their eating plan:

> Eat frequently. Plan to eat or drink a food or beverage that provides nutrition to the body every few hours, especially after a workout.

> Consume protein-rich foods. The best sources of protein come from whole foods such as lean meats, poultry, fish, beans, nuts, eggs, and low-fat dairy.

> Try smoothies, shakes, or soups. Liquids can be an easy way to load up on calories in a small volume. However, these food items should be nutrient dense,

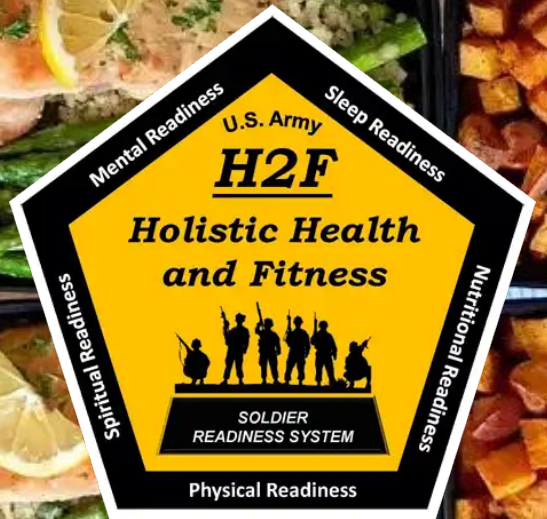
Helpful Tips



meaning they have a high amount of beneficial nutrients (for example, vitamins, minerals, fiber, and lean protein) in relation to their weight and low in added sugars. Add Greek yogurt, milk, soymilk, powdered milk, flaxseeds, or chia seeds to smoothies, shakes, and soups.

>Add healthful fats. Use avocado or nut butter in sandwiches or smoothies, and add a little extra olive oil, canola oil, or oil-based spreads during meal preparation.
OPERATIONAL NUTRITION

With a focus on foundational health through a deliberate everyday diet, Soldiers are better positioned to optimize task-specific performance nutrition through event fueling and post-event recovery, and arduous environment preparedness.



Health and Holistic Fitness section on Physical Readiness.

