

Weight Loss Recommendations while on Semaglutide/Tirzepatide (GLP-1 agonists)

Losing weight requires you to burn more calories than you consume

Healthy, balanced eating pattern to promote weight loss – emphasize protein and vegetables, and reduce simple carbohydrates and sugars

In general, you should get 10-35% of your daily calories from protein and you should burn 500 calories more than you eat to lose weight

For weight loss (especially if you are very active) you should consume 1-1.5grams of protein per pound of your goal weight

You should only eat between 25-35 grams of protein as a time as that is usually all that can be absorbed at one time

Animal based proteins are generally more easily absorbed than plant proteins

Protein sources:

eggs, dairy, fish/seafood, legumes (chickpeas, green peas, kidney beans, lentils), meats (like chicken, lean beef, turkey, pork) nuts, grains, seeds, nut butter, tofu

Protein supplements – want high protein/low carbohydrate, less than 5 grams added sugar.

Bear in mind when you drink protein/calories, it is less filling than eating healthy protein

High protein diets are not recommended for people with kidney disease. In this case, you would need to get recommendation from your PCP or nephrologist regarding the total grams of protein you can safely consume daily

Don't eat within at least 4 hours of lying flat to reduce heartburn

Weigh yourself daily – at the same time of day (preferably in the AM)

Strength and cardio exercises at least 3 times a week

These drugs cause your brain to experience fewer sensations of hunger, the stomach feels fuller with less food, and they delay food emptying the stomach

Due to the reduction in appetite and the consumption of less food - there is an increased risk of developing nutritional deficiencies

With the decreased intake, it is important to consume good quality foods in order to meet nutritional needs

If the appetite is over suppressed – can develop muscle loss, nutritional deficiencies, dehydration

Due to the possible side effects (nausea, vomiting, diarrhea, constipation, indigestion) – dietary modification is helpful

Consume smaller/more frequent meals

Stop eating prior to feeling full

Avoid foods/beverages that may worsen symptoms (high fat foods, spicy foods, alcohol, carbonated beverages)

TABLE 1 Nutritional recommendations for patients receiving AOMs (macronutrients and other dietary components)

Dietary component	Recommended intake	Recommended sources	Signs and symptoms of deficiency	Additional considerations
Fluids	>2–3 L/d	<ul style="list-style-type: none"> • Water • Low-calorie beverages (e.g., tea, coffee) • Nutrient-dense beverages (e.g., low-fat milk, soy milk) • Limit sugar-sweetened beverages • Limit alcohol and caffeine 	Hypotension, tachycardia, dizziness	<ul style="list-style-type: none"> • Older individuals may be at greater risk of dehydration and associated complications • Very low-carbohydrate, ketogenic diets may increase the risk of dehydration
Energy	<ul style="list-style-type: none"> • Goals for intake during weight loss should be personalized • 1200–1500 kcal/d for most women • 1500–1800 kcal/d for most men 	A healthy dietary pattern emphasizing vegetables, fruits, whole grains, lean protein foods, low-fat dairy or dairy alternatives, and healthy fats	Reduced fat and lean mass, decreased strength and functional capacity	<ul style="list-style-type: none"> • Aging is associated with decreased energy expenditure
Fiber	<ul style="list-style-type: none"> • 21–25 g/d for women • 30–38 g/d for men 	<ul style="list-style-type: none"> • Whole grains • Vegetables • Beans, peas, and lentils • Fruits • Nuts and seeds • Fiber supplementation may be recommended when intake from whole foods is insufficient 	Constipation	<ul style="list-style-type: none"> • Dietary component of public health concern for the general US population • Plant-based foods contain both soluble and insoluble fiber
Protein	<ul style="list-style-type: none"> • 10%–35% of energy intake • >60–75 g/d and up to 1.5 g/kg body weight/d is typical; >1.5 g/kg body weight/d may be considered on an individual basis 	<ul style="list-style-type: none"> • Beans, peas, and lentils • Nuts, seeds, and soy products • Seafood • Lean meat, poultry, low-fat dairy foods, and eggs • Meal-replacement products (typically containing 15–25 g protein/serving) may be recommended when intake from whole foods is insufficient 	Loss of lean body mass, weakness, edema, hair loss, skin changes	<ul style="list-style-type: none"> • Aging and acute illness are associated with an increase in protein requirements compared with that in healthy adults
Carbohydrates	<ul style="list-style-type: none"> • 45%–65% of energy intake (~135–245 g/d for a 1200–1500-kcal/d diet) • RDA is 130 g/d for nonpregnant adults • Limit added sugars to <10% of energy intake 	<ul style="list-style-type: none"> • Whole grains • Fruits • Vegetables • Nuts and seeds • Dairy foods (milk, yogurt) and dairy alternatives (e.g., soy milk) 	Although there is no absolute dietary requirement for carbohydrates, very low-carbohydrate (ketogenic) diets may increase the risk of dehydration, fatigue, halitosis, and other adverse events	<ul style="list-style-type: none"> • Very low carbohydrate intake may lead to restricted intake of fruits, vegetables, and whole-grain foods, which are important sources of micronutrients and dietary fiber
Fats	<ul style="list-style-type: none"> • 20%–35% of energy intake (~27–58 g/d for a 1200–1500-kcal/d diet) • Limit saturated fat to <10% of energy intake 	<ul style="list-style-type: none"> • Nuts and seeds • Avocado • Vegetable oils (limit palm and coconut oil) • Fatty fish and seafood 	Essential fatty acid deficiency: dry skin, hair loss, impaired wound healing	<ul style="list-style-type: none"> • Adequate fat intake may promote gallbladder emptying, thereby reducing the risk of cholestasis during weight reduction • Individuals with malabsorptive gastrointestinal tract disorders or a history of malabsorptive bariatric surgery (especially duodenal switch) are at increased risk of deficiency of essential fats and fat-soluble vitamins (vitamins A, D, E, and K) • Consumption of high-fat meals may cause gastric distress

TABLE 2 Micronutrient deficiencies and considerations for patients receiving AOMs.

Micronutrient	Dietary source ^a	Symptoms and signs of deficiency	Additional considerations
Fat-soluble vitamins			
Vitamin A	<ul style="list-style-type: none"> Vitamin A (preformed retinol): liver, fortified foods (e.g., milk, cereals), egg yolk Provitamin A carotenoids: yellow, orange, and dark green leafy vegetables (e.g., sweet potato, carrot, spinach, kale); deep-orange fruits (cantaloupe, apricots, peaches) 	Eye diseases including night blindness and xerophthalmia, susceptibility to infections, rough skin (follicular hyperkeratosis), impaired growth, impaired fertility	<ul style="list-style-type: none"> Inadequate intake in >50% of people with obesity Deficiency in 14%–24% of people with obesity Increased risk with: <ul style="list-style-type: none"> malabsorptive disorders history of bariatric surgery
Vitamin D	Fatty fish, fortified foods (e.g., milk, cereals), egg yolk	Impaired bone mineralization (osteomalacia in adults; rickets in children), muscle weakness and pain, hypocalcemia	<ul style="list-style-type: none"> Dietary component of public health concern for the general US population Deficiency or insufficiency in up to 90% of people with obesity Increased risk in/with: <ul style="list-style-type: none"> individuals with reduced skin vitamin D synthesis due to limited sun exposure (e.g., use of sunscreen, covered clothing style, residence in latitudes 40° north or south from the equator), increased skin pigmentation, or advanced age malabsorptive disorders history of bariatric surgery
Vitamin E	Wheat germ, vegetable oils, nuts, avocado, green leafy vegetables, fish	Neurologic symptoms including ataxia, peripheral neuropathy, myopathy, retinopathy	<ul style="list-style-type: none"> Inadequate intake in >90% of people with obesity Deficiency in 2% of people with obesity Increased risk with: <ul style="list-style-type: none"> malabsorptive disorders history of bariatric surgery
Vitamin K	<ul style="list-style-type: none"> Green leafy vegetables, canola and other vegetable oils Synthesized by gastrointestinal tract bacteria 	Hemorrhage, bruising, impaired bone mineralization	<ul style="list-style-type: none"> Increased risk with: <ul style="list-style-type: none"> malabsorptive disorders liver disease chronic antibiotic therapy history of bariatric surgery
Water-soluble vitamins (must be consumed daily)			
Thiamin (vitamin B1)	Fortified cereals, whole-grain and enriched-grain products, pork, fish, beans, peas, lentils, nuts	<ul style="list-style-type: none"> Dry beriberi: peripheral neuropathy, muscle weakness Wet beriberi: tachycardia, congestive heart failure, edema, dyspnea Cerebral beriberi: Wernicke-Korsakoff syndrome (ataxia, abnormal eye movements, cognitive impairment) 	<ul style="list-style-type: none"> Deficiency in 15%–29% of people with obesity Increased risk in/with: <ul style="list-style-type: none"> older adults history of bariatric surgery alcohol-use disorder chronic diuretic therapy

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TABLE 2 (Continued)

Micronutrient	Dietary sources ^a	Symptoms and signs of deficiency	Additional considerations
Riboflavin (vitamin B2)	Dairy foods, meat, fish, poultry, eggs, nuts, green vegetables, mushrooms, fortified cereals, whole-grain or enriched breads	Dermatitis, cheilosis and angular stomatitis (cracks or lesions on the lips or at the corners of the mouth), sore throat, inflammation and redness of the tongue ("magenta tongue")	<ul style="list-style-type: none"> Typically occurs in combination with other water-soluble vitamin deficiencies Increased risk with: <ul style="list-style-type: none"> alcohol-use disorder vegan diet thyroid hormone insufficiency
Niacin (vitamin B3)	Meat, eggs, poultry, fish, milk, whole-grain and enriched breads, fortified cereals and grain products, nuts, beans, peas, and lentils	Pellagra: sun-sensitive dermatitis, diarrhea, and dementia ("the three Ds"), bright red tongue, vomiting, anorexia, depression, behavioral changes, memory loss	<ul style="list-style-type: none"> Increased risk with: <ul style="list-style-type: none"> alcohol-use disorder malabsorptive disorders (e.g., Crohn's disease)
Panbthenic acid (vitamin B5)	Found in most plant and animal foods; meat, fish, poultry, dairy products, egg yolk, avocado, mushrooms, nuts, seeds, beans, peas, and lentils are good sources; also synthesized by gastrointestinal tract bacteria	Paresthesia (numbness, burning sensation) in the hands and feet, headache, fatigue, irritability, insomnia	<ul style="list-style-type: none"> Very rare; most commonly seen in combination with other micronutrient deficiencies in people with severe malnutrition
Vitamin B6 (pyridoxine, pyridoxal, pyridoxamine)	Chickpeas, meat, poultry, fish, shellfish fortified cereals, nuts, soy products banana, avocado, potatoes, spinach	Neurologic changes, e.g., seizures, irritability, confusion; skin disorders such as cheilosis, glossitis, and stomatitis; microcytic anemia	<ul style="list-style-type: none"> Usually occurs in combination with other vitamin B deficiencies Increased risk with: <ul style="list-style-type: none"> alcohol-use disorder chronic kidney disease use of certain medications, e.g., nonsteroidal anti-inflammatory drugs and oral contraceptives
Biotin (vitamin B7)	Egg yolk, meat, fish, seeds, nuts, avocado, sweet potato; also synthesized by gastrointestinal tract bacteria	Alopecia (hair loss); scaly dermatitis around the eyes, nose, mouth, and perineum; neurological changes, e.g., ataxia, paresthesia, depression, seizures	<ul style="list-style-type: none"> Increased risk with: <ul style="list-style-type: none"> chronic consumption of raw egg whites use of certain anticonvulsants alcohol-use disorder
Folate (folic acid, vitamin B9)	Green leafy vegetables, beans, peas, lentils, nuts, seeds, avocado, citrus fruit, melon, enriched breads and grain products	Macrocytic anemia, hypersegmented neutrophils, fatigue, weakness, irritability, ulcerations on the tongue and oral mucosa	<ul style="list-style-type: none"> Deficiency in up to 54% of people with obesity (less common in countries with food fortification, including the United States) Increased risk with: <ul style="list-style-type: none"> alcohol-use disorder malabsorptive disorders history of bariatric surgery tobacco use use of certain medications, e.g., methotrexate, triamterene, trimethoprim, sulfasalazine

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TABLE 2 (Continued)

Micronutrient	Dietary sources ^a	Symptoms and signs of deficiency	Additional considerations
Vitamin B12 (cobalamin)	Animal products: meat, fish, poultry, shellfish, milk, cheese, eggs, fortified cereals	Macrocytic anemia, glossitis, fatigue, neurologic complications, including memory impairment, paresthesia, and peripheral neuropathy	<ul style="list-style-type: none"> Deficiency in 2%–18% of people with obesity Increase risk in/with: <ul style="list-style-type: none"> history of bariatric surgery older adults (due to increased prevalence of atrophic gastritis) vegan diet use of medications, e.g., proton pump inhibitors, H2 blockers, metformin, colchicine hereditary intrinsic factor deficiency
Vitamin C (L-ascorbic acid)	Citrus fruits, berries, red pepper, cruciferous vegetables, tomatoes, potatoes	Scurvy; bleeding gums, loose teeth, bruising, perifollicular hemorrhage, poor wound healing, fatigue	<ul style="list-style-type: none"> Inadequate intake in >40% of people with obesity Increase risk with: <ul style="list-style-type: none"> restrictive, monotonous diets alcohol-use disorder tobacco use
Minerals			
Calcium	Milk and milk products, green leafy vegetables, sardines (with bones), tofu, beans	<ul style="list-style-type: none"> Bone loss Hypocalcemia is usually associated with impaired parathyroid function, chronic kidney disease, or severe vitamin D deficiency 	<ul style="list-style-type: none"> Dietary components of public health concern for the general US population Inadequate intake in >50% of people with obesity Increase risk of deficiency in/with: <ul style="list-style-type: none"> postmenopausal women history of bariatric surgery vegan diet lactose intolerance chronic kidney disease magnesium deficiency
Copper	Organ meats, seafood, nuts, seeds, whole grains, cocoa	Anemia, neutropenia	<ul style="list-style-type: none"> Increase risk of deficiency with: <ul style="list-style-type: none"> history of bariatric surgery malabsorptive disorders severe and persistent diarrhea chronic consumption of supplemental zinc (≥50 ng/d)
Iron	Red meat, fish, poultry, shellfish, green leafy vegetables, beans, peas, lentils, nuts, dried fruits, fortified cereals	Microcytic and hypochromic anemia, fatigue, weakness, tachycardia, dyspnea, pallor, cold intolerance, koilonychia (brittle spoon-shaped nails), glossitis	<ul style="list-style-type: none"> Deficiency in up to 45% of people with obesity Vitamin C enhances absorption of nonheme iron, whereas other dietary components (e.g., polyphenols in coffee and tea, soy protein, calcium) can inhibit iron absorption Increase risk in/with: <ul style="list-style-type: none"> women of childbearing age vegetarians history of bariatric surgery

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TABLE 2 (Continued)

Micronutrient	Dietary source ^a	Symptoms and signs of deficiency	Additional considerations
Magnesium	Nuts, seeds, beans, peas, lentils, dairy products, green leafy vegetables, fruits (e.g., banana, avocado), fish	Hypomagnesemia can cause muscle weakness and cramps, anorexia, nausea, and vomiting; it can also contribute to the development of hypocalcemia and hypokalemia	<ul style="list-style-type: none"> • Inadequate intake in >60% of people with obesity • Increased risk of hypomagnesemia in/with: <ul style="list-style-type: none"> ◦ prolonged diarrhea ◦ malabsorptive disorders ◦ increased renal magnesium loss (e.g., with diuretics or diabetes) ◦ alcohol-use disorder ◦ older adults ◦ recovery from prolonged malnutrition ("refeeding syndrome")
Potassium	Fruits, vegetables, nuts, seeds, beans, peas, lentils, dairy products	Hypokalemia can cause muscle weakness and cramps, fatigue, cardiac arrhythmias	<ul style="list-style-type: none"> • Dietary component of public health concern for the general US population • Increased risk of hypokalemia with: <ul style="list-style-type: none"> ◦ low-quality monotonous diets ◦ chronic kidney disease, nephropathy ◦ prolonged vomiting or diarrhea ◦ diuretics (e.g., thiazides, loop diuretics) ◦ laxative abuse ◦ magnesium deficiency ◦ recovery from prolonged malnutrition ("refeeding syndrome")
Zinc	Meats, seafood, poultry, whole grains, fortified cereals, beans, peas, lentils, nuts, dairy products, eggs	Dermatitis, impaired wound healing, impaired taste, decreased immune function	<ul style="list-style-type: none"> • Deficiency reported in 24%–28% of people with obesity • Increased risk of deficiency with: <ul style="list-style-type: none"> ◦ bariatric surgery ◦ severe or chronic diarrhea ◦ malabsorptive disorders ◦ alcohol-use disorder ◦ vegetarian diet (phytates in grains and legumes can inhibit zinc absorption)

Note: Adapted from Wilson et al. [74]. Additional information from Parrott et al. [83], Astrup and Bugel [84], and the Linus Pauling Institute [73].

Abbreviations: AOM, antiobesity medication.

^aTreatment of micronutrient deficiencies may require targeted micronutrient supplementation rather than reliance on food sources.