

Nutrition Guide for Pulmonary NTM Disease Patients

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The role of nutrition in managing NTM is very important. You should view achieving and maintaining a healthy weight and eating a balanced diet as part of your treatment plan. This guide will cover a variety of topics and provide some helpful hints for ways to combat common nutrition problems NTM patients encounter. You should actively participate in achieving proper nutrition and understanding the best things you can do to maintain a healthy weight. In many cases it is helpful to consult with your physician and/or a dietitian.

This nutrition guide provides suggestions for patients; it is not a medical document. Please consult with your physician or dietitian if you have questions or concerns.

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What is BMI?

Body mass index, or BMI, is a calculation of weight relative to height. It is important to know your BMI because it can be used as an indicator of overall health. It does not account for body composition of muscle and fat but it is a useful tool nonetheless. The formula is: [wt in kg/ht in meters²]. To calculate your BMI follow these steps:

1. Determine your weight in kilograms by dividing your weight in pounds by 2.2. (Example: Weight in pounds = 130, weight in kilograms = 59.1)
2. Determine your height in meters by multiplying your height in inches by 0.0254. (Example: Height in inches = 65, height in meters = 1.65)
3. Determine your height in meters² by multiplying your height in meters by your height in meters. (Example: height in meters = 1.65, height in meters² = 2.7225)
4. Divide your weight in kilograms by your height in meters² to determine your BMI. (Example: Weight in kilograms = 59.1, height in meters squared = 2.7225, BMI = 21.7)

You can also access a BMI calculator at this website:

<http://www.nhlbisupport.com/bmi/bminojs.htm>

Once you have calculated your BMI, determine what category you are in:

- ❖ Underweight: BMI < 18.5
- ❖ Normal weight: BMI 18.5-24.9
- ❖ Overweight: BMI 25.0-29.9
- ❖ Obese: BMI >30

If your BMI is below 18.5, focus on gaining weight. A good goal BMI while actively fighting NTM is at least 20.

Weight Loss

One common side effect of NTM is unintentional weight loss. Sometimes this happens before a diagnosis, sometimes after. Weight loss can happen because of a number of factors including your body's response to the mycobacterial disease, increased calorie (energy) needs, decreased appetite, early satiety (feeling full quickly), nausea, taste changes, side effects of medications, and fatigue.

The best way for you to gain weight is to eat more. However, frequently NTM patients experience a decreased appetite that coincides with weight loss, making it difficult to eat more. If possible, the first step in treating your decreased appetite is to treat the underlying cause. Treating conditions such as mouth sores, dry mouth, pain, or depression should help improve your appetite. Additional treatment for decreased appetite and associated weight loss may include appetite-stimulating medications, medications that help food move through the intestine, and nutritional supplement drinks.

Although you may not feel like eating, it is important to remember that proper nutrition and maintaining a healthy weight are important parts of overall care. Eating well can also help you better cope physically and emotionally with the effects of treatment.

Tips for Proper Nutrition When Your Appetite is Poor:

- ❖ Eat five to six small meals a day and snack whenever you are hungry.
- ❖ Determine what times of day you are most hungry, make sure to eat at those times, and do not limit how much you eat.
- ❖ Have snacks ready to eat, include 2-3 designated snack times each day between meal times.
- ❖ Eat nutritious snacks that are high in calories and protein.
- ❖ Keep your favorite foods on hand for snacking and meals (such as frozen dinners).
- ❖ Add calories and protein to foods by adding sauces, gravy, butter, cheese, peanut butter, cream, and nuts. Calorie-boosting ideas are listed later in this pamphlet.
- ❖ Fat is a concentrated source of calories. Small amounts of vegetable oil, butter or margarine can increase the calorie content of any food.
- ❖ Use higher calorie versions of foods you eat (butter crackers or cheese crackers instead of soda crackers).
- ❖ Avoid “lite” products (skim milk, low fat yogurt and cottage cheese, reduced calorie mayonnaise, low-fat salad dressings, etc).
- ❖ Don’t fill up on fluids. Drink fluids between meals rather than with meals. Drinking during a meal can make you feel full quickly.
- ❖ Avoid filling up on low calorie foods like salad at meal times; instead eat heartier foods first.
- ❖ Choose nutritious drinks, such as whole milk, milkshakes, and juices. Consider supplemental drinks such as Boost[®], Ensure[®], or Scandishake[®].
- ❖ Ask family members or friends to prepare foods when you are too tired to cook. Ask them to shop for groceries or buy pre-cooked meals.
- ❖ Try to eat in pleasant surroundings and eat meals with family or friends.
- ❖ Ask your doctor about ways to relieve gastrointestinal symptoms such as nausea, vomiting, and constipation.
- ❖ If your sense of taste is diminished, try adding spices and condiments to foods to make them more appealing.
- ❖ If you are experiencing a metallic taste when you eat, try using plastic utensils instead of metal.
- ❖ Try light exercise, such as a 20-minute walk, about an hour before meals to stimulate your appetite. (Consult your doctor before starting an exercise program.)
- ❖ Meet with a registered dietitian (RD) for additional advice on meal planning.
- ❖ Consider recording everything you eat and drink for a three day period to assess opportunities for improving your caloric intake. This journal can also be reviewed with your physician or dietitian.
- ❖ See the diet record page in the appendix for an idea of how to keep track of your food intake.

Snack Ideas for Weight Gain

Applesauce*	Cream soup	Instant breakfast shakes*
Bread products*	Custard	Juice*
Popcorn*	Dips	Milkshakes
Cake	Dried fruit*	Nuts*
Cereal*	Eggs	Supplements (Boost, Ensure)*
Cereal bars*	Energy bars*	Peanut butter*
Cheesecake	Frozen yogurt*	Pizza
Chocolate milk	Fruit (fresh or canned) *	Pudding
Cookies	Gelatin *	Sandwiches
Cottage cheese	Granola*	Yogurt
Cream cheese	Ice cream	

*Denotes heart healthy choice

Another way to promote weight gain is to boost the calories in foods you already eat – some suggestions are listed below. An increase in 500 calories a day should result in weight gain of about one pound per week.

Calorie-Boosting Ideas

Granola: 1/4 cup = 130 calories

- ❖ Sprinkle on yogurt, ice cream, pudding, custard, and fruit.
- ❖ Mix with dried fruits and nuts for a snack.
- ❖ Layer with fruits and bake.
- ❖ Use in cookie, muffin, and bread batters.

Butter, margarine, and oils: 1 Tablespoon = 100 to 125 calories

- ❖ Add to soups, mashed and baked potatoes, hot cereals, rice, pastas, and vegetables.
- ❖ Dip bread in olive oil.
- ❖ Combine with herbs and seasonings to spread on cooked meats, burgers, fish, and egg dishes.

Cheeses: 1 oz = 75 to 130 calories

- ❖ Add to salads, vegetables, and include in main dishes.
- ❖ Slice cheese for snacks or use single serving cheeses.
- ❖ Try new cheeses for variety.

Mayonnaise: 1 Tablespoon = 100 calories

- ❖ Spread on sandwiches – on both pieces of sandwich bread.

- ❖ Mix into salads.
- ❖ Use in sauces and gelatin dishes.

Peanut butter: 1 Tablespoon = 90 calories

- ❖ Spread on crackers, celery, and fruits such as apples, bananas or pears.
- ❖ Use on toast or English muffin.
- ❖ Eat a spoonful of peanut butter right from the jar.
- ❖ Add to a sandwich with mayonnaise or cream cheese.

Cream cheese: 1 Tablespoon = 50 calories

- ❖ Spread on breads, muffins, fruit slices, bagels, and crackers.
- ❖ Add to vegetables.

Honey, jam, jelly, syrup, and sugar: 1 Tablespoon = 45 to 60 calories

- ❖ Add to bread, cereal, milk drinks, and fruit and yogurt desserts.
- ❖ Top buttered toast with cinnamon sugar or jam.
- ❖ Use as a glaze for meat and chicken.
- ❖ Mix with peanut butter for fruit dip or cracker spread.

Sour Cream: 1 Tablespoon = 25 calories

- ❖ Add to cream soups, baked potatoes, macaroni and cheese, vegetables, sauces, salad dressings, stews, baked meat, and fish.
- ❖ Use as a dip for fresh fruits and vegetables.
- ❖ Use as a topping for cakes, fruit, gelatin desserts, breads, and muffins.

Half and Half: 1 Tablespoon = 20 calories

- ❖ Use in cream soups, sauces, egg dishes, puddings, and custards.
- ❖ Put on hot or cold cereal.
- ❖ Mix with pasta, rice, and mashed potatoes.
- ❖ Pour on chicken and fish while baking.
- ❖ Add to milk in recipes.
- ❖ Make hot chocolate with half and half and add marshmallows.

Dried Fruits: Calories vary

- ❖ Cook and serve for breakfast, dessert, or a snack.
- ❖ Add to muffins, cookies, pies, breads, cakes, rice and grain dishes, cereals.
- ❖ Combine with cooked vegetables such as carrots, sweet potatoes, yams, and acorn squash, and add to cold salads.
- ❖ Combine with nuts and granola for a snack.

Food Preparation

- ❖ To increase calories: buy breaded foods or add breading to meats and vegetables.
- ❖ Sauté and fry foods when possible to add more calories than baking or broiling.
- ❖ Add sauces or gravies to foods.

Protein Intake

It is important to eat enough protein. Every cell in your body needs protein. It is a major component of muscles, enzymes, hormones and antibodies that fight infection. Remember that your need for protein is increased because your body is working harder than normal to help fight your NTM infection.

It is difficult to determine how many grams of protein you should eat daily. A good way to estimate your daily required protein intake is to take your weight in pounds and divide it by two. (Example: weight = 130 pounds, estimated daily protein needs = 65 grams.) If you have lost weight you should multiply that number by 1.2. (Example: weight = 130 pounds, estimated daily protein needs = 78 grams.)

Protein needs may increase with a variety of things including age, illness, weight loss, and pre- and post-surgery.

If you have kidney problems, be sure to discuss any dietary changes with your physician.

The average protein content of common foods

Food	Grams (g) of Protein
Meat, Poultry, Fish	7 g per ounce
Cheese	7 g per ounce or 1/4 cup shredded
Cottage cheese/Ricotta cheese	14 g per 1/2 cup
Egg, large	7 g each
Dried beans or peas	7 g per 1/2 cup, cooked
Milk	8 g per cup
Milk, powdered dry	10 g per 1/4 cup, dry
Yogurt	5-8 g per cup
Ice cream	6 g per cup
Ice milk/Frozen yogurt	6 g per cup
Peanut butter	4 g per tablespoon
Peanuts/Nuts	10 g per 1/4 cup
Cereal/Rice/Pasta/Vegetables	2 g per 1/2 cup
Slice of bread or tortilla	2 g each
Hummus	3 g per 1/4 cup
Soy nuts	15 g per 1/4 cup
Tofu, soft	9 g per 4 oz
Soy milk	7 g per cup
Rice milk	1 g per cup

You can add protein to your diet without increasing the quantity of food you eat. Try some of these hints to get some extra protein.

Dairy and Soy Products:

- ❖ Add two tablespoons of dry milk powder to the regular amount of milk in recipes.
- ❖ Use fortified milk for cooking and drinking (see recipe below for fortified milk).
- ❖ Add milk or soy powder to hot or cold cereals, scrambled eggs, soups, gravies, ground meat (for meat patties, meat balls, and meat loaf), casserole dishes, and desserts and in baking.
- ❖ Use milk, half and half or soy milk instead of water when making soup, cereals, instant cocoa, puddings and canned soups.
- ❖ Add shredded cheese to sauces, vegetables, soups and casseroles.
- ❖ Add cheese to meat sandwiches.

Meats:

- ❖ Add diced or ground meat to soups and casseroles.
- ❖ Add cooked shrimp, canned tuna, crabmeat, or diced ham to sauces and serve over rice, cooked noodles, buttered toast or hot biscuits.

Other Suggestions:

- ❖ Use peanut butter on crackers, waffles or apple wedges.
- ❖ Choose dessert recipes, which contain eggs or milk such as cheesecake, ice cream, egg custard or pudding.
- ❖ Have a spoonful of peanut butter right from the jar.

Fortified Milk

1 quart whole milk

1 cup instant non-fat dry milk

1. Pour liquid milk in deep bowl.
2. Add dry milk and beat slowly with beater until dry milk is dissolved (usually less than 5 minutes).
3. Refrigerate. The flavor improves after several hours.

Makes one quart.

Calories: 250 per cup

Protein: 19 grams per cup

Hydration

Patients with NTM disease need more fluids. Fluid is essential for thinning mucus secretions, which, in turn, helps the body remove mucus from the airways. Our bodies also need fluid to help regulate body temperature, carry nutrients to cells, metabolize medication, remove waste from the body, keep stools soft, and moisturize the skin and tissues. Despite its importance, water is often called "the forgotten nutrient."

We lose two and a half to three quarts (10 to 12 cups) of water daily through normal body functions. More water is lost in hot weather, with fever, or with increased physical activity. As we age, we lose more water due to a normal slow decline in kidney function. Fluid losses need to be replaced daily.

Thirst is not always a good indicator of fluid needs. It is common that a person does not feel thirsty until after they have already become dehydrated. You may not feel thirsty after strenuous exercise even though water lost through perspiration and the lungs needs to be replaced. People over 65 tend to experience a decreased sense of thirst.

A good way to estimate how many ounces of fluid you should drink daily is to take your weight in pounds and divide it by two. (Example: weight in pounds = 130, estimated ounces of fluid needed daily = 65)

Certain liquids can be counted toward your fluid requirement and others cannot. Alcoholic beverages are dehydrating, so they are not counted toward the daily goal. Caffeine (coffee, tea, and caffeinated soft drinks) may also act as a diuretic and worsen dehydration. In fact, they actually increase fluid needs.

Fluids that can be counted toward your daily fluid goals include the following:

- ❖ Water
- ❖ Milk
- ❖ Juice
- ❖ Fruit drinks and punches
- ❖ Soda
- ❖ Coffee and tea
- ❖ Ice cream
- ❖ Sherbet
- ❖ Nutritional supplements (Boost®, Ensure®, Scandishake®)

The calorie content of various fluids is an important consideration. A few daily servings of artificially sweetened beverages may safely be included in your diet. If you need to gain weight choose higher calorie fluids such as 2% or whole milk, juices, milkshakes or nutritional supplements instead of water or low calorie beverages.

Oral Supplements

Drinking oral supplements can be a good way to increase your daily caloric intake. Most supplements can be found at the grocery store or pharmacy. Many can also be ordered online. You should not use supplements as meal replacements but they can be an important part of your weight gain and hydration.

SUPPLEMENT	CALORIES	PROTEIN (g)
Ensure® (8 oz)	250	9
Ensure Plus® (8 oz)	350	13
Boost® (8 oz)	240	10
Boost Plus® (8 oz)	360	14
Scandishake® (1 packet)	440	5
Scandishake® (with 8 oz whole milk)	600	13
Resource Breeze (8 oz)	250	9

Vitamin and Mineral Supplements

Taking a multi-vitamin/mineral supplement when fighting NTM is generally a good idea. It is difficult to consume all of the recommended vitamins and minerals in a day, especially if you are focusing on gaining weight. Some suggestions for taking vitamin and mineral supplements:

- ❖ Check with your doctor, pharmacist, or dietitian before starting a supplement regimen as supplements can interfere with some medications. This is particularly important for NTM patients who generally take several prescription medications at the same time.
- ❖ A multi-vitamin/mineral supplement should be taken with food. If taken on an empty stomach, poor absorption can occur along with possible upset stomach.
- ❖ Do not take multi-vitamin/mineral supplements at the same time as antibiotics. Minerals have a binding effect and can prevent medications from being absorbed. You should take supplements at least two hours before or after taking antibiotics.

Calcium and Vitamin D

Calcium and vitamin D are required for the normal growth, development, and maintenance of our bones throughout our lifetime. It is difficult to obtain the recommended daily intake of calcium from diet alone. Consider taking a calcium/vitamin D supplement along with a daily multi-vitamin/mineral supplement. Here are some guidelines for taking calcium supplements:

- ❖ Calcium is best absorbed if taken in separate doses, not exceeding 500-600 mg at one time.
- ❖ Calcium carbonate and calcium citrate are preferred sources.

- ❖ Calcium carbonate should be taken with food. Calcium citrate can be taken with or without food.
- ❖ Calcium citrate may be more absorbable for the elderly and those taking antacids due to decreased stomach acid production.
- ❖ Calcium citrate may result in less bloating, constipation, and stomach upset for some individuals.
- ❖ Do not exceed 2500 mg Calcium or 2000 IUs Vitamin D in supplement form daily.
- ❖ Remember to take these supplements at least two hours before or after taking antibiotics.
- ❖ Excess calcium intake can contribute to significant medical problems, including kidney stones or kidney failure in select patients. Discuss increased intake of calcium with your physician.

RECOMMENDED DAILY ALLOWANCES
Dietary Reference Intakes (DRI)-2004

Age	Calcium (mg)	Vitamin D (IU)
19-50 years	1000	200
51-70 years	1200	400
>70 years	1200	600

Probiotics

Probiotics are live microorganisms that can be beneficial to your gastrointestinal system. Taking a probiotic while you are on antibiotics for NTM can help decrease common GI complaints including nausea, diarrhea, bloating and cramping. Probiotics can be found in most pharmacies and health food stores. Follow instructions on the bottle and make sure to take the probiotic at least 3 hours before or after your antibiotic. One probiotic NTM patients seem to like is Jarro-Dophilus® which can be purchased at www.jarrow.com as well as at some retailers.

Food-Drug Interactions

Some prescription medications come with instructions to avoid certain foods when taking the medication or to avoid eating within a certain amount of time. Pay careful attention to directions given with medications to promote maximum absorption and efficacy.

Herbal Supplements

If you are considering taking an herbal supplement while on antibiotic treatment for NTM, check with a doctor, pharmacist, or dietitian to be sure there are no potential negative interactions between the supplement and the medication.

Alcohol

For many people a glass of wine with dinner or a cocktail when out with friends is a part of life. For the most part consuming a moderate amount of alcohol when on treatment for NTM is okay. Check with your doctor to make sure your liver is functioning properly and limit alcohol consumption to no more than one drink per day as alcohol has a dehydrating effect and can interfere with your medications.

