



From Plate to Pillow

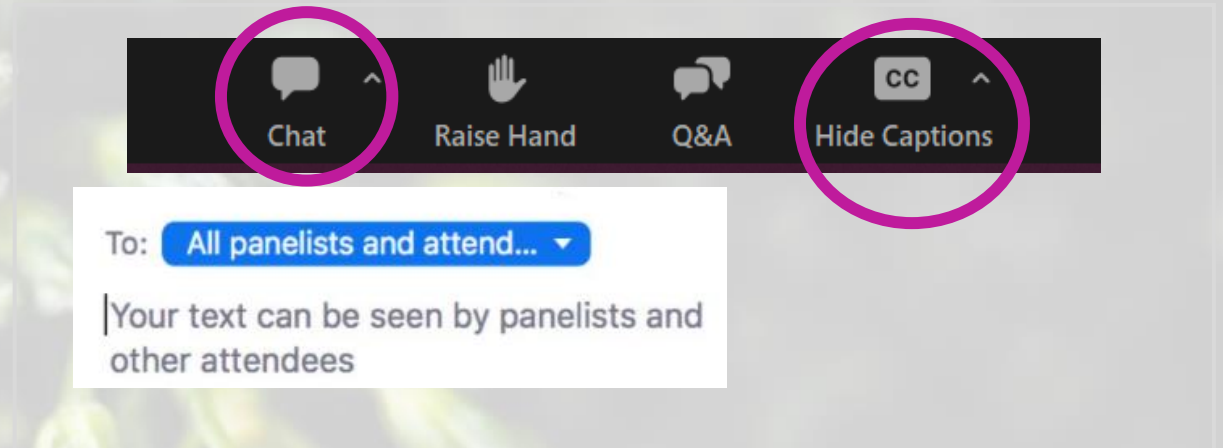
Nutrition for Improved Sleep

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Reminders

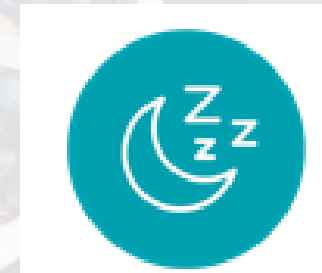
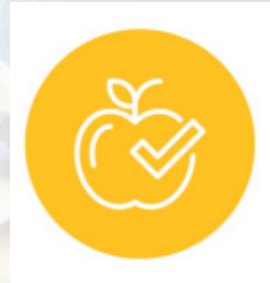
- **Today is about you!**
 - Please participate in the way that you are most comfortable
- **Questions are always welcome!**
 - Please use the chat to All Panelists or All Panelists & Attendees
- **Closed Captions**
 - Toggle on/off
 - Language options
- **Technology!**



Pillars of Health and Wellness



 Today's focus is on:



Outline

- Sleep and nutrition have a bidirectional relationship
 - Falling short of sleep needs impacts our nutrition choices
 - Nutrition choices can influence sleep
- Hormones are influenced by sleep and food choices
- Foods that promote better sleep quality
- Foods that hinder sleep quality
- Strategies for improving nutrition and sleep
- Dietary modifications as a result of lifestyle and food allergies
- Let's get cooking! Demonstrating sleep promoting recipes.





The impact of sleep on nutrition and health

Hunger hormones and appetite



Poor sleep has also been shown to throw leptin and ghrelin levels out of balance

Leptin: satiety hormone
Ghrelin: hunger hormone



Short sleep is associated with increased ghrelin levels and decreased leptin levels

More hunger, less satiety
Increased caloric intake

Poor sleep influences food choices

- Less sleep stimulates cravings for high fat, high carbohydrate, lower protein
 - A [meta-analysis](#) found that sleep-deprived individuals ate almost 400 extra calories per day compared with people who got enough sleep. Researchers reported the sleep-deprived individuals ate higher fat, lower protein foods and were prone to food cravings
 - Increased craving for foods with high carbohydrate content, particularly in the afternoon and evening hours
 - [Brain imaging studies](#) have found that the reward-seeking portion of the brain is stimulated by fewer than 7 hours of sleep per night, increasing the desire for refined-carbohydrate foods that spike blood sugar

Effects of poor sleep on metabolism and weight management

- Studies have also shown correlations between poor sleep and hypertension, obesity, diabetes, dyslipidemia, and metabolic syndrome
- Stress hormones are also impacted by sleep habits
 - Deep sleep neutralizes stress hormones
 - Lack of sleep triggers the release of stress hormones such as adrenaline and cortisol, increasing the risk of heart disease, abdominal adipose tissue, and muscle breakdown
- Impaired glucose metabolism and insulin sensitivity
- Cortisol and insulin prompt the body to hold on to fat and break down muscle for energy

Summary: Impact of Sleep on Nutrition and Health

- [Matt Walker: How sleep affects what \(and how much\) you eat | TED Talk](#)





The role of nutrition in sleep quality

Diet impacts sleep patterns and circadian rhythms



Closer proximity of dinner time to sleep time leads to poor sleep quality

Tip: allow 2+ hours between meal and sleep, if possible



Consuming a major portion of calories at night alters the gut microbiota to a pro-inflammatory state leading to misalignment of the circadian rhythm and poor sleep



People who have a more irregular meal routine have a higher risk of obesity and metabolic syndrome when compared to those with a more regular meal routine



A [study published in 2016 in the Journal of Clinical Sleep Medicine](#) found that diet quality can influence sleep. This study reported that eating less fiber, more saturated fat, and more sugar—even over the course of just one day—is associated with a lighter, less restorative sleep with more disruptions.

Key hormones & nutrients that affect sleep quality

Melatonin	Produced in the pineal gland and plays an important role in sleep onset and circadian rhythm	Plants, meat, mushrooms
Serotonin	Promotes better sleep and plays a modulatory role in the sleep-wake cycle. It's believed that 90-95% of our serotonin receptors are found in our stomach!	Fruits and vegetables, whole grains, lean meats, fish, nuts and legumes, low-fat dairy, olive oil.
Tryptophan	Necessary for serotonin synthesis. Tryptophan is an amino acid known to promote sleep. Tryptophan depletion leads to significant decreases in total sleep time, longer sleep onset latency, and sleep efficiency . Tryptophan deficiency is also associated with increased wake periods.	Pork, turkey, beef, seafood, soybeans, dairy, quinoa & oats, pumpkin & chia seeds
Magnesium	Helps with sleep by activating the parasympathetic nervous system (which calms your nerves) and relaxing skeletal muscles.	Almonds, black beans, avocados, whole grains, shellfish, bananas, kiwi, pumpkin seeds, Swiss chard and kale, dark chocolate

Key foods that can positively affect sleep

- **Tart cherries**

- high dietary melatonin concentration and phytonutrient profile. Tart cherries also exhibit anti-inflammatory characteristics that may improve sleep quality.

- **Beets**

- Nitrate supplementation with dietary beetroot juice is known to elevate plasma nitrate and to increase the efficiency of oxygen utilization. Nitrates dilate blood vessels, leading to a decrease in blood pressure which might help your body relax.

- **Kiwifruit**

- One study showed that consuming two kiwis an hour before bedtime improved serotonin levels, thus helping to increase total sleep time and sleep quality, with fewer post-sleep-onset awakenings in those experiencing sleep disturbances. Kiwi is rich in vitamins C and E and has a high antioxidant capacity, which is protective against free-radical damage; it is also a source of folate, which, when deficient, is related to insomnia.

- **Milk and dairy products**

- Milk is widely considered a sleep-promoting food in many cultures worldwide. Children are often given milk with turmeric before bedtime in certain Eastern cultures. Cow milk has high levels of tryptophan and is conducive to sleep, whereas curcumin found in turmeric has been shown to increase non-rapid eye movement sleep via histamine H1 receptor blockade in rats.

- **Hydration** throughout the day but limit liquid intake ~1 hr before bed

- Avoiding foods with a diuretic effect (watermelon, celery) too close to bedtime will also help.

Nutrition that *hinders* sleep

- Caffeine
 - Stimulant
 - Delay caffeine intake 90-120 min after waking
 - Avoid drinking more than 100mg caffeine after 4pm max, 2-3pm latest is better
 - Late caffeine intake affects sleep architecture by reducing the amount of deep, slow wave sleep which is critical for feeling refreshed the next day
- Alcohol
 - CNS depressant
 - Alcohol consumption within four hours of bedtime leads to increased sleep fragmentation and awakenings
 - Body temperature, respiratory rate and resting heart rate go up after drinking
- Reflux-inducing foods
 - The consumption of fried fatty foods, spicy foods, and junk foods close to bedtime can lead to acid reflux and heartburn, which can cause nighttime awakenings and poor sleep quality
- Added sugar (versus naturally occurring sugar)
 - Natural sugars are found in whole foods, including fruit and vegetables. Natural sugars promote healthy sleep while added sugars may deteriorate the quality of your sleep.



Strategies for improving sleep and nutrition

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Create a balanced diet and meal schedule, when able (life happens!)

“Balanced” meal looks different for everyone

- Lean protein
- Complex carbohydrates
- Healthy fats



Strategies for improving sleep and nutrition

Create a balanced diet and meal schedule, when able (life happens!)

- Consistent mealtimes affect circadian rhythm
 - “Ideal” eating times will vary, listen to hunger cues
- Try not to eat a large meal too close to bedtime (2-3 hrs)
 - Digestion raises your core body temperature, which can disrupt sleep quality. You need to drop your core body temperature by about 2-3 degrees F to initiate sleep and to stay asleep
 - More likely to experience digestive issues when you lay down immediately after eating a large meal.
- Waking from sleep hungry?
 - High protein and complex carb snack before bed (e.g., cottage cheese, yogurt, protein oatmeal)

Strategies for improving sleep and nutrition

- Establish healthy sleep habits and routines, as possible
- Stress management- a common barrier to both nutrition and sleep

SnooZzze Mix

SnooZzze mix is a sleepy cousin of "trail mix". It's an excellent choice for a quick, sleep-promoting bedtime snack. It's also very customizable! Eat this mix on its own or:

- use as a yogurt, kefir or oatmeal topper
- make a sorbet out of frozen cherries or kiwifruit and top with this mix
- add oats and almond butter then roll into energy bites
- add a touch of honey and lightly toast to make a granola



NutZzz

Nuts like **almonds**, **walnuts**, **pistachios**, and **cashews** are good for sleep. They contain melatonin and omega-3's as well as minerals like magnesium and zinc, which together can help people sleep better. They also contain satiating protein.

1



Let's get cooking!

2

SeedZzz

Pumpkin seeds, **sesame seeds**, **sunflowers seeds** and **chia seeds** provide essential sleep nutrients like magnesium, zinc and tryptophan. They also add texture to the mix and healthy omega-3's and protein.



Dried Fruit

Dried tart cherries are the star here. They help synthesize melatonin and contain tryptophan. They are also rich in disease-fighting antioxidants and can help reduce blood pressure. **Dried kiwifruit** would also be a great addition, as it helps to increase serotonin. *Remember to look at nutrition fact labels- dried fruits are often high in added sugar. Look for products with low- to no-added sugar.

3



Bedtime tea elixir

This comforting beverage combines calming chamomile tea with melatonin rich tart cherry juice. Add cinnamon sticks and ginger for additional calming and anti-inflammatory benefits. If desired, top with milk, high in tryptophan. Together, these ingredients promote restful sleep. Sip slowly and savor the moment as you prepare to drift off into a night of deep, rejuvenating sleep.

Ingredients

- Chamomile tea, or calming herbal tea of choice
- Tart cherry juice (look for juice with no- or low-added sugar)
- Optional: cinnamon sticks, ginger, ~~tumeric~~
- Milk*

*Animal milk and soymilk alternative are high in tryptophan, an amino acid necessary for serotonin synthesis. Other milk alternatives may contribute to sleep due to concentrations of other key nutrients. For example, almond and oat milk alternative contain magnesium, a nutrient that reduces cortisol and increases melatonin.

Directions

1. In a pan, combine a 1:1 ratio of tart cherry juice to water. If your cherry juice already contains water, just add a cup or two of cherry juice to the pan. If adding spices, add those to the pan. Bring to a gentle simmer.
2. Remove from heat after a few minutes. Add 1 or 2 tea bags and steep; number of tea bags and length of steep time may vary based on desired tea strength.
3. Pour into a mug and top with milk. Enjoy!



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