

Nutrition

Nutrition is the study of food, nutrients, and the physical processes that occur between food selection and consumption, and the utilization of nutrients by our bodies to produce energy and support optimal health. Nutrition plays a key role in managing energy, performance, health, and our engagement with others.

In addition to food - water and sleep are also necessary for energy management and renewal.

Physiology of Food, Water, and Sleep

Food

- ❖ Digested and absorbed by our body.
- ❖ Nutrients used to produce energy and support physical and metabolic processes.
- ❖ Extra nutrients are stored until needed.

Water

- ❖ Makes up 45-65% of our total body weight.
- ❖ Absorbed into the body when it is needed, and excreted when it is not.
- ❖ Essential to almost all physical and metabolic processes.

Sleep

- ❖ An unconscious state whereby our bodies are inactive for several hours.
- ❖ Allows our bodies to recuperate from the physical and mental stresses of each day, store and process memories, and renew energy.

Nutrition and Energy

Our bodies require fuel to function and expend energy each day. Food provides us that fuel in the form of **nutrients**.

The 3 energy-yielding nutrients, the **macronutrients**, are:

- ❖ Carbohydrates
- ❖ Proteins
- ❖ Fats

Overview:

Nutrition
 Nutrition and Energy
 Nutrition and Health (Supply vs Demand)
 Eating Too Much/Too Little
 Tips for Energy balance
 Effects of Aging
 Helpful vs. Harmful foods
 Renewal and the Brain (Hydration/Sleep)
 Triggers for Getting Hijacked (HALT)
 Self Evaluation
 Action Plan for Change

90%/10% Rule:

If 90% of your calories each day come from healthy foods that provide adequate vitamins, minerals, and energy, then the remaining 10% of your calories can come from whatever foods you want*.

* It is not recommended to splurge on junk food every day.

Energy Values of Macronutrients

Each macronutrient has a specific energy value, expressed as **calories**.

- ❖ Carbohydrates – 4 **calories** per gram
- ❖ Proteins – 4 **calories** per gram
- ❖ Fats – 9 **calories** per gram*

The **total energy** value of a food is the sum of its calories from macronutrients (see box for example).

*Fat has over twice the calories of carbohydrates and proteins.

Example: How to calculate total energy

If a food contains:

5 grams carbohydrates
4 grams fat
8 grams protein

What is its **total caloric value**?

5g carb x 4 calories/g = 20 calories
4g fat x 9 calories/g = 36 calories
8g protein x 4 calories/g = 32 calories

Total = 88 calories

Micronutrients

The **micronutrients**, vitamins, minerals, and water – are required to convert carbohydrates, proteins, and fats into expendable energy and support optimal health.

They have **no caloric value** (provide zero calories) yet they are essential to life.

Packaged foods are obligated to have nutrition facts tables, which provide a breakdown of the food's nutritional information. For information on how to read nutrition facts tables go to <http://www.hc-sc.gc.ca/fn-an/label-etiquet/nutrition/index-eng.php>

Energy Balance

- ❖ There are significant differences between what foods we **need** and what we **want**. We often crave sugar and high fat foods, but our bodies require more vitamins and minerals and less fat and sugar.
- ❖ **Energy intake** - Calories consumed through food and drink.
- ❖ **Energy output** - Calories burned through the breakdown of food, physical activity, sleep, and metabolism.

Weight gain: Intake > Output	Weight loss: Intake < Output	Weight maintenance: Intake = Output
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- ❖ As demonstrated above, to maintain weight we must consume only as much energy as we expend through physical activity, metabolic activity, and sleep.

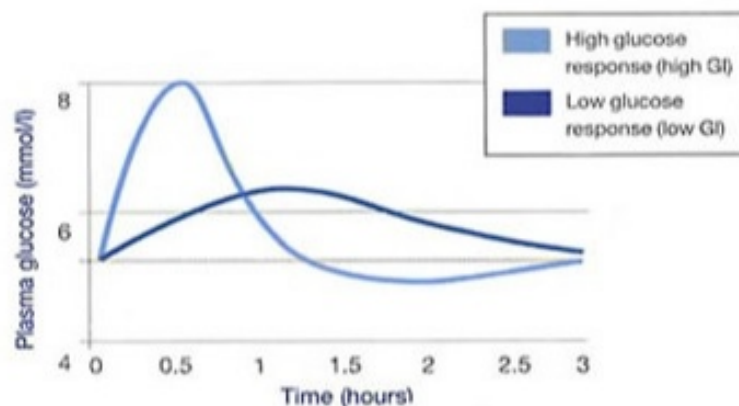
Low Glycemic Index for Sustainable Energy

Our bodies use blood glucose to produce energy – maintaining steady and consistent blood glucose levels throughout the day is key to having constant renewable energy.

The Glycemic index (GI) of a food is an indicator of the **glycemic response** that food produces. Glycemic response is measures how fast blood glucose levels rise after eating a particular food – high GI foods cause blood glucose to spike very quickly, while low GI foods produce a modest rise and fall in blood glucose levels (more steady).

When blood glucose rises quickly, our bodies compensate by releasing a spike of insulin, causing the blood glucose levels to fall. This means that in a short period of time after eating (~2 hours), blood glucose will be very low, leaving you feeling tired and ineffective for managing your energy.

Low GI foods provide more consistent blood glucose levels and are more effective in sustaining high energy levels.



Examples:

Low GI

- ❖ Whole grains
- ❖ Peanuts
- ❖ Beans
- ❖ Milk and yogurt
- ❖ Most fruits and vegetables

High GI

- ❖ White pasta
- ❖ White bread
- ❖ Potatoes
- ❖ Sports drinks and sugary beverages
- ❖ Baked goods

Eating a diet rich in fruits, vegetables, whole grains, and lean meats will not only produce more steady energy levels through a low glycemic response, but also give you adequate amounts of vitamins and minerals every day.

Food: Healthy Demand – Effective Supply

- ❖ We have individualized energy, vitamin, mineral, and water requirements based on our age, weight, gender, and activity level.
- ❖ A diet with an appropriate amount of **nutrient-dense*** foods (see box) supplies our body with the energy and nutrients required to function normally without consuming too many calories.
- ❖ Proportions: 40/40/20 – 40% Grains, 40% Fruits and Vegetables, 20% protein rich foods. These proportions help provide the body with sustainable energy while balancing nutrients and physiological needs.
- ❖ Eating only the amount of energy (calories) that is needed is key to maintaining a healthy body weight.

*Nutrient Density

A measure of a food's micronutrient (vitamin/mineral) value relative to its energy value (calories).

Nutrient dense foods provide a sufficient amount of vitamins and minerals and few calories.

The opposite of nutrient dense is **energy dense** – meaning a food provides a lot of energy but minimal nutrients (empty calories). Energy dense foods are inadequate and contribute to weight gain and malnourishment.

Eating Too Much

When we eat too much food our body stores the extra energy as **fat**.

Increased supply vs demand

- ❖ Excess glucose is not necessary to cells and remains in bloodstream
- ❖ Increased blood glucose stimulates insulin release and fat storage
- ❖ Result is decreased energy and lack of engagement.

Chronic overeating and lack of exercise leads to **weight gain**. It also **increases our risk** of diabetes, hypertension, cardiovascular disease, and stroke.

Signs and Symptoms

- ❖ Weight gain
- ❖ Feeling full and tired after every meal.
- ❖ Eating when bored or stressed.
- ❖ Eating large portion sizes.
- ❖ Lack of discipline in eating habits
- ❖ Eating high-fat and sugary foods frequently.

Eat strategically – benefits of eating light and eating often

- ❖ Stabilize blood glucose
- ❖ Maintain high energy levels
- ❖ Maintain a lean body mass
- ❖ Improve brain function and mood
- ❖ Improve metabolism
- ❖ Control cravings and overeating
- ❖ Decrease fat storage

Tips for Energy Balance

Eat frequently

Eating 5 or 6 times throughout the day will keep you from feeling overly full or hungry and give your body the nutrients it needs every few hours.

Eat small portions

Serve meals on a small plate and refrain from eating seconds if you feel satisfied. Ensure that snacks are no more than 150-200 calories.

Choose whole foods over processed

Whole foods have less saturated fat, salt, sugar, and overall calories and more vitamins and minerals than processed or refined foods.

Increase output and decrease input

Combine eating fewer total calories with more physical activity to maintain or lose weight.

Don't starve yourself

Ignoring hunger pangs now may cause overindulging later. Eat once at least every 3 hours.

Drink water

Drinking water before, during, and after each meal helps with digestion and satiety.

Eat slowly

Satiety signals will travel to the brain faster and cause less energy intake.

Hunger Scale (1-5)

- 1 – Feel light-headed, unfocused and unproductive, stomach pains.
- 2 – Feel hungry, stomach is growling.
- 3 – Satisfied, no longer hungry, could eat more but do not need to.
- 4 – Feel full, bloated, feel as though you overate.
- 5 – Feel stuffed, don't want to move, regret eating so much..

Tips to Decrease Negative Habits

Have a healthy snack on hand

Ensure healthy snacks are available in and around your workspace. For example keep a bag of apples/oranges or bananas at your desk; have a box of granola bars in your car, etc.

Don't drink your calories

Pop and juice are loaded with sugar and provide inadequate nutrients. Substituting them for water can cut back on hundreds of calories daily.

Drink your tea or coffee black

They provide no calories and caffeine can have positive health effects when consumed in moderation.

Invest in a water bottle, and use it!

Keep a refillable water bottle with you throughout the day and drink constantly.

Plan your meals and limit fast food

Make time to prepare healthy lunches and snacks for while you are at work or on the road. Avoid the urge for fast food.

Stop eating before you are overly full

Pay attention to your satiation level and stop eating when you feel satisfied, but not full.

Moderation is key

It's okay to give in to cravings once in a while. Make sure to limit your portion sizes.

Aim for a **3** for each meal to have sustainable energy throughout the day.

Effects of Aging

Energy Intake

As we age our metabolic rate and calorie requirements decline. In order to maintain a healthy weight we must adjust our diets accordingly:

- ❖ By *reducing energy intake* or *increasing energy output*

When reducing energy intake it is essential to choose foods that are **nutrient dense** - contain lots of nutrients and few calories. Concrete examples are:

- ❖ **Fruits and vegetables** are full of vitamins, minerals, and water to support healthy eyes, bones, and hearts and can help maintain a healthy weight and lower our risk of age-related diseases.
- ❖ **Lean meat and fish** promote optimal health by supporting a healthy weight, strong bones and preventing loss of lean body mass (muscle).

Water

As we age our total volume of body water diminishes. Therefore, small changes in water intake can have large effects on the body.

Dehydration becomes more of a concern as we age because feelings of thirst are not as strong. It is important to consciously drink water or other fluids throughout the day to stay hydrated and alert.

So... *What should we eat to have high energy?*

Eat a variety of nutrient dense foods daily to ensure you consume adequate amounts of vitamins and minerals. Eat “junk food” and baked goods in moderation and limit alcohol consumption.

Recommendation*

Don't go more than 4 hours without eating as it impacts your performance as function decreases in all energy dimensions. After 4 hours, the brain perceives the body to be in a state of starvation – metabolism slows and lean body mass declines. Your body needs energy and so it often craves sugar and fat (high energy) so that adequate glucose can be provided to your cells. This is an unhealthy reaction and should be avoided.

Healthy Choices

Fruits and vegetables

- ❖ High in vitamins and minerals and low in calories.
- ❖ Can prevent the onset of certain diseases like heart disease, hypertension, diabetes, and cancer.

Lean meats, fish, poultry, legumes, nuts and eggs

- ❖ High in healthy (unsaturated) fats and protein and low in saturated fats.
- ❖ Help support a lean body mass therefore improving our overall health.

Whole grains

- ❖ High in vitamins, minerals, and fiber compared to refined grains.
- ❖ Help support good digestion and overall health.

Milk and milk products

- ❖ High in protein, calcium, and other vitamins and minerals.
- ❖ Help support strong bones and teeth.
- ❖ Can be high in fat – choose low-fat or fat free options when available.
- ❖ Soy and almond milk are also great milk alternatives.

To Renew Energy: Limit consumption of...**Added sugar**

- ❖ Extra calories with no nutrient value (empty calories)
- ❖ Spikes insulin levels because of high blood glucose, leaving you with a lack of energy and decreased interest in engaging with tasks and/or people.
- ❖ Contributes to weight gain and malnourishment.

Salt

- ❖ In excess, raises blood pressure
- ❖ Increases risk of atherosclerosis and heart disease.

Saturated fats

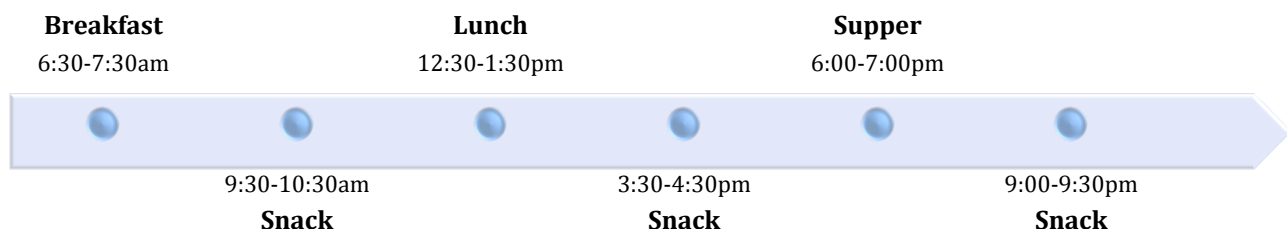
- ❖ Raise cholesterol levels and increase risk of heart disease
- ❖ Ex: Fatty meats, milk, milk products, hydrogenated foods

Trans fats

- ❖ Raise cholesterol and increase risk of heart disease
- ❖ Ex: baked goods, chips, crackers, deep fried foods.

When should we eat?

Overnight your body has been fasting. It is important for energy regulation to eat your first meal of the day **within an hour** of waking and before the workday starts. From then, continue eating snacks/meals every 3 hours or less to replenish vitamins, minerals, and energy. Eat small portion sizes and don't overindulge.

**Focus on *where* calories come from...**

Calories are essential- although they sometimes have a bad reputation. The most important thing to consider when choosing a food is what makes up the calories:

Protein is good and helps promote a lean body mass.

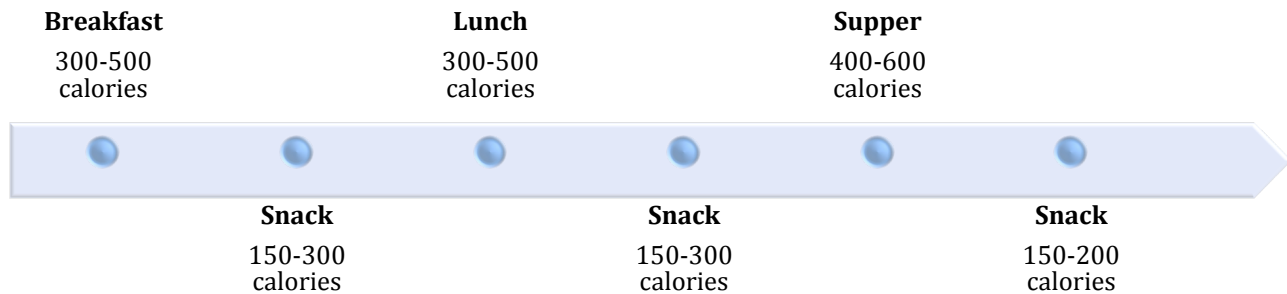
Fat is essential. *Unsaturated* fats have positive health benefits and are important to include in our diet. *Saturated* and *trans* fats are unhealthy and should be limited.

Carbohydrates make up at least half of our energy intake and are easily converted to energy by the body. Whole grains have more fiber and less sugar to support a healthy diet.

Be weary of "low calorie snacks" – its true they have low calories but they typically come from fat and sugar and provide few vitamins and minerals.

How much should we eat?

To control energy intake, each meal or snack should satiate hunger but not make you full or tired.



Renewal and the Brain

Nutrition, water, and rest

Brain cells require energy from carbohydrates as well vitamins, minerals, water, and rest to function properly.

Vitamins and minerals play a role in

- ❖ Short-Term Memory
- ❖ Problem Solving
- ❖ Cognition
- ❖ Brain Signaling
- ❖ Mental Health
- ❖ Focus and Vision
- ❖ Decision Making
- ❖ Stress Management
- ❖ Managing Emotions

When our body has all of its **energy** and **nutrient** requirements met through a healthy diet, our brain and body can function normally so that our full attention can be given to the present task.

Drink water throughout the day (on-going)

- ❖ Water is the best choice for staying hydrated and it provides zero calories.
- ❖ Adequate water consumption helps cleanse the body and rid it of toxins.
- ❖ Drinking water before and during meals can help lower energy intake and increase fullness, helping you to control energy intake to manage energy and renewal.
- ❖ Slight dehydration causes receptors in our bloodstream to send thirst signals to the brain, distracting us from the task at hand.
- ❖ Staying hydrated allows us to focus our energy on what needs to be done.
- ❖ Drinking water throughout the day will help you to think more clearly, be more productive, and have higher energy levels all day long.

The Importance of Sleep for Renewal?

When we sleep well, we wake up feeling refreshed, energized, and alert for our daily activities. Sleep affects how we look, feel, and perform on a daily basis, and can have a major impact on our overall quality of life.

To get the most out of our sleep, both quantity and quality are important. If sleep is cut short, the body doesn't have time to complete all of the phases needed for renewal, and we wake up less prepared to concentrate, make decisions, or engage fully in work and social activities.

How Does Sleep Contribute to Energy, Focus and Performance?

Sleep architecture follows a pattern of alternating REM (rapid eye movement) and NREM (non-rapid eye movement) sleep throughout a typical night in a cycle that repeats itself about every 90 minutes.

What role does each state and stage of sleep play?

NREM (75% of night): When first falling asleep we enter NREM sleep, which is composed of stages 1-4

Stage 1

- Between being awake and falling asleep
- Light sleep

Stage 2

- Becoming disengaged from surroundings
- Breathing and heart rate are regular
- Body temperature drops
- Onset of sleep

Stages 3 and 4

- Deepest and most restorative sleep
- Breathing becomes slower, muscles relax
- Blood supply to muscles increases
- Growth hormone, essential for growth and development, is released
- **Energy is restored**
- Blood pressure drops
- Tissue growth and repair occurs

REM (25% of night): First occurs about 90 minutes after falling asleep and recurs about every 90 minutes, getting longer later in the night

- Provides energy to brain and body
- Supports daytime performance
- Brain is active and dreams occur
- Body becomes immobile and relaxed

Sleep helps us thrive by contributing to a healthy immune system, and balancing our appetites by helping to regulate levels of the hormones ghrelin and leptin, which play a role in hunger and fullness. When we are sleep deprived, we may feel the need to eat more, which can lead to weight gain.

The one-third of our lives that we spend sleeping, far from being “unproductive,” plays a direct role in renewal and how full, energetic and successful the other two-thirds of our lives can be.

To Improve Sleep

- Aim to get at least 8 hours of sleep each night. Playing ‘catch-up’ on week-end does not renew the body's energy systems effectively and negatively impacts consistent daily performance;
- Work to go to bed and get up at the same time each day – even on week-ends;
- Create bedtime rituals that send signals to the brain that its time to sleep;
- Avoid caffeine-containing drinks and/or food i.e. coffee/ chocolate after 2:00 pm;
- Try deep breathing exercises to relax;
- Sleep in a dark, cool and quiet room;
- Exercise on a regular basis 3-4 times a week, ideally not more than two hours before bed.

Adapted from information from the National Sleep Foundation at: www.sleepfoundation.org

Impacts of Emotional Triggers, Amygdala Hijacks and Stress on Energy Management

The **amygdala** is the section of the brain where we process memory, past emotional experiences and reactions. When we feel a negative emotion (i.e. fear), our amygdala takes over the neo cortex in what is called an amygdala hijack, dismissing in the short term our ability to make rational decisions.

The **intensity** of an emotional trigger (stress) impacts the **depth and duration** of the amygdala hijack which can last from a few minutes, to days, weeks, or even years.

These hijacks are best represented in the self-defeating areas of the ineffective thinking styles of the LSI leadership assessment. These 'hijacks' play out as passive/defensive and aggressive/defensive behaviours. These ineffective thinking styles create the foundations of unhealthy stress and often have a big impact on energy reserves and our ability to function effectively.

During these strong emotional reactions, the amygdala stimulates a flood release of **stress hormones**, mainly cortisol and adrenaline, creating a fight-or-flight response. This reaction is often an exaggerated response to the "threat" at hand, which is perceived as a physical danger instead of an emotional one, causing us to overreact. The flood release of stress hormones also drains us of energy and can affect our energy management for the remainder of the day.

Three signs of an amygdala hijack:

1. Strong emotional reaction
2. Sudden onset
3. When you reflect later, you realize your behaviour was inappropriate.

Four main emotional states increase the trigger of a hijack (HALT)

1. **Hungry** - the physical sensation of desiring food.
2. **Angry** - one's psychological interpretation of having been offended or wronged or when something seems unjust or unfair.
3. **Lonely** - an unpleasant feeling in which a person feels a strong sense of emptiness.
4. **Tired** - a feeling of fatigue or exhaustion.

Any of these four emotional states (HALT) create a state of **stress**, and can negatively impact the eating habits that provide a good foundation for energy management.

❖ Some people eat *more* in response to stress; others eat *less* or may lose their appetite completely.

Chronic stress can lead to weight gain or weight loss and malnutrition. It can also catalyze a downward spiral of nutrition and illness:

- ❖ Stress can raise our basal metabolic rate and weaken our immune system.
- ❖ A weakened immune system leaves us vulnerable to illness and malnutrition.
- ❖ Illness and malnutrition can further exacerbate our stress levels.

It is important to *actively reduce* stress and pay attention to our emotional reactions and eating habits in times of stress to manage energy and renewal and avoid weight gain or malnourishment.

Self-Evaluation – Current Habits

Think about your daily eating habits during a normal week and fill in the spaces below.

I eat a variety of fruits and vegetables ____ days a week (variety = at least 2 of each).

I include whole grains in my meals ____ days a week.

I eat fast food ____ days a week on average.

I eat lean meat and fish ____ days a week.

I eat red meat and other fatty meats ____ days a week.

I eat high fat or sugary snacks ____ days a week.

Water is my first choice when I am thirsty: Yes ____ No ____

I drink pop and juice often (5 to 7 days a week): Yes ____ No ____

I typically get around ____ hours of sleep each night.

I feel rested and awake most mornings (5 to 7 days a week): Yes ____ No ____

I consume alcohol ____ days a week.

I drink caffeinated beverages ____ times a day.

	IDEAL	GOOD	POOR
Food	Eating a variety of fruits, vegetables, lean meats or fish, and whole grains each day. Eating limited amounts of sugar and fat. Consuming caffeine in moderation and limiting alcohol.	Eating some fruits, vegetables, lean meats or fish, and whole grains each day. Overindulging on fat and sugary snacks and eating large portions. Consuming caffeine in moderation and limiting alcohol.	Eating limited amounts of fruits, vegetables, lean meats and whole grains and overindulging on fast food and sugary foods. Over consuming caffeinated and alcoholic beverages.
Water	Actively drinking water throughout the day and with each meal.	Forgetting to drink water throughout the day but drink it with most snacks and meals.	Feeling thirsty often and not including water or other fluids with each meal.
Sleep	6-8 hours of restful sleep each night	6-8 hours of restful sleep more than 4 nights a week	Less than 6 hours of restful sleep each night or interrupted sleep most nights.

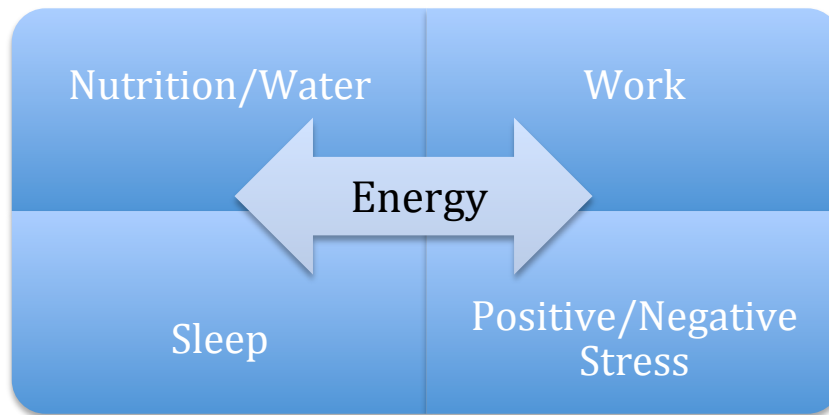
Are your nutrition habits ideal, good, or poor?

Action Plan

Achieving balance – Food, water, and sleep provide our bodies with energy to perform tasks at work and cope with positive and negative stresses in our lives.

Work and everyday stresses can also positively or negatively affect our food, water, and sleep habits.

A healthy goal is to **create a balance** in each aspect of your life so that an appropriate amount of time and energy can be dedicated to each to achieve proper energy balance and renewal.



Create a plan that is personal to you to help you create balance between nutrition and work. Then determine **what needs to change** or **improve**.

Food:

I am good at _____

I need to improve on _____

Water:

I am good at _____

I need to improve on _____

Sleep:

I am good at _____

I need to improve on _____

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