Fuel to Play

How food turns into energy for practice and competition

A GUIDE FOR STUDENT ATHLETES

Your body is an engine. Every sprint, tackle, swing and stroke is powered by energy that started out as food on your plate. Eat too little — or at the wrong time — and you feel it as heavy legs, slow reactions, cramps and poor focus late in the game. Eat well, and you train harder, recover faster, and stay healthier all season.

From plate to performance

1. You eat
Carbohydrates
Fats
Protein

(plus water, vitamins, minerals)

→

2. You digest
Carbs → glucose
Fats → fatty acids
Protein → amino acids

Absorbed into the blood

→

3. You store
Glycogen in muscles & liver (limited!)

Fat in fat tissue (large supply)
Amino acids → repair

→

4. Muscles fire
Fuel is broken down to make ATP — the only molecule muscles can use directly to contract, sprint, jump and lift

The three energy nutrients

Nutrient	Cal	What it does for you	Good sources
Carbohydrates Main fuel	4 cal/g	Fastest, most efficient fuel for hard efforts. Stored as **glycogen** in muscles and liver — but only enough for about 90–120 min of hard exercise. Also the brain's main fuel (focus, decisions).	Rice, pasta, bread, oatmeal, potatoes, tortillas, fruit, milk, yogurt, beans
Protein Builder	4 cal/g	Repairs and builds muscle after training; supports immune system. A poor fuel source — the body uses it for energy mainly when carbs run low.	Chicken, fish, eggs, lean beef, turkey, Greek yogurt, milk, beans, tofu, peanut butter
Fat Backup fuel	9 cal/g	Big energy reserve for long, lower-intensity work; helps absorb vitamins A, D, E, K. Digests slowly, so keep it light right before playing.	Nuts, seeds, avocado, olive oil, salmon, cheese

Which fuel powers which effort?

Short & explosive ——————————→ *Long & steady*

Phosphagen (ATP-PC)	Anaerobic glycolysis	Aerobic (oxygen)
0–10 sec	10 sec – 2 min	2 min +
Fuel: ATP + creatine	**Fuel: Carbs (glycogen)**	**Fuel: Carbs + fat**
Sprint start, jump, throw	400 m, hockey shift, long rally	Distance run, recovery between plays

All three systems run at once — the length and intensity of the effort decides which one leads. Most team sports use all three every game.

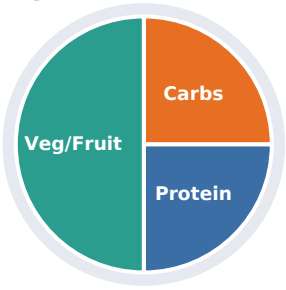
> **The key idea:** the harder you go, the more your muscles depend on **carbohydrates**. When glycogen runs out, you "hit the wall" — you can't hold your speed or power no matter how motivated you are. Eating enough carbs keeps your tank full.

When to eat: your fueling timeline

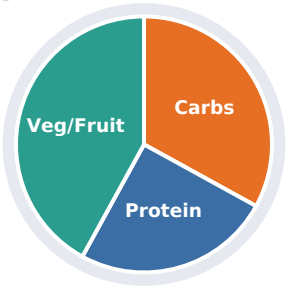
Timing matters as much as what you eat. Use this schedule for practices and competitions.

When	Goal	What to eat & drink	Examples
3–4 hours before	Top off glycogen	A full meal: mostly carbs, some lean protein, low in fat and fiber so it digests easily. Drink 16–20 oz of water.	Chicken, rice & veggies; turkey sandwich + fruit + milk; pasta with meat sauce
30–60 min before	Quick energy, no heavy stomach	Small, easy-to-digest carb snack. Skip greasy, spicy or high-fiber foods. Sip 8 oz of fluid.	Banana, applesauce pouch, pretzels, granola bar, a few crackers, sports drink
During (activity over 60 min)	Keep fuel & fluid up	Drink every 15–20 min. For long practices or tournaments, add about 30–60 g of carbs per hour.	Water, sports drink, orange slices, chews, half a PB&J between games
Within 30–60 min after	Refuel & repair	Carbs to refill glycogen + about 15–25 g of protein to repair muscle. Rehydrate.	Chocolate milk; Greek yogurt + granola; turkey wrap; smoothie with fruit & milk
Next meal (1–2 hr after)	Full recovery	A balanced meal using the plate below. Especially important with 2-a-days or games on back-to-back days.	Tacos with beans & rice; salmon, potato & salad; stir-fry with noodles

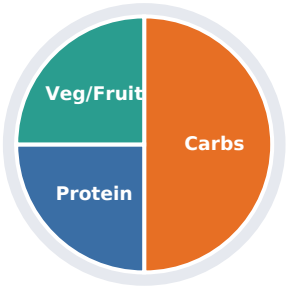
Build your plate for the day's workload



Easy / rest day
Light practice, recovery



Moderate day
Normal 1–2 hr practice



Hard / game day
2-a-days, tournaments, games

Protein stays about the same. Carbs grow as training gets harder. Add a thumb-sized portion of healthy fat and a drink to every plate.

How much do I need each day?

Needs depend on your size, sport and training load. A simple way to estimate carbs and protein is by body weight in pounds.

Training load	Carbs per day	Example: 150-lb athlete
Light (skill work, under 1 hr)	1.4–2.3 g per lb	210–345 g carbs
Moderate (about 1 hr/day)	2.3–3.2 g per lb	345–480 g carbs
High (1–3 hr/day, hard training)	2.7–4.5 g per lb	405–675 g carbs
Protein (all training levels)	0.55–0.9 g per lb	80–135 g protein, spread over 4–5 meals/snacks

For reference: 1 cup cooked rice ≈ 45 g carbs; 1 banana ≈ 27 g; 1 cup milk ≈ 12 g carbs and 8 g protein; 3 oz chicken ≈ 25 g protein. Ranges based on ACSM / Academy of Nutrition and Dietetics sports nutrition guidelines.

Hydration: the easiest performance boost

Losing just 2% of your body weight in sweat (3 lb for a 150-lb athlete) can hurt speed, endurance, and decision-making, and raises the risk of heat illness.

- **All day:** carry a water bottle and sip regularly — don't wait until you're thirsty.
- **Before:** 16–20 oz about 2–4 hours before; 8 oz about 15–30 min before.
- **During:** about 4–8 oz every 15–20 minutes.
- **After:** weigh in before and after practice. Drink 16–24 oz for every pound lost.
- **Sports drinks** help during hot practices, sessions over 60 min, or for heavy/salty sweaters (white streaks on clothes).

Check your color
Pale yellow — well hydrated
Light yellow — good
Yellow — drink more
Dark yellow — dehydrated
Amber/brown — drink now; tell your trainer

Sample game day

Time	Meal	What's on the plate
7:00 AM	Breakfast	Oatmeal with banana and honey, 2 scrambled eggs, glass of milk, water
10:00 AM	Snack	Greek yogurt with berries, handful of pretzels
12:30 PM	Pre-game meal (3–4 hr out)	Grilled chicken sandwich, rice or baked potato, fruit, water
3:30 PM	Pre-game snack	Banana or applesauce pouch, 8 oz sports drink or water
4:00 PM	Game	Water or sports drink at every break; orange slices at half
6:30 PM	Recovery	Chocolate milk right after, then pasta with meat sauce, salad, bread

Grab-and-go snacks for your bag or locker

Fast carbs (pre-game)	Carbs + protein (recovery)	Anytime staples
Banana, grapes, oranges	Chocolate milk	Trail mix
Pretzels, crackers	Greek yogurt + granola	Peanut butter packets
Applesauce pouch	PB&J or turkey sandwich	Hard-boiled eggs
Granola or cereal bar	Cheese stick + crackers	Beef/turkey jerky
Dried fruit	Fruit & milk smoothie	Whole-grain bagel

Common myths

Myth	Fact
"Carbs are bad for you."	Carbs are your muscles' #1 fuel for hard exercise. Low-carb athletes tire sooner.
"More protein = more muscle."	Past about 0.9 g per pound, extra protein doesn't build more muscle. Training + enough total food does.
"Skipping meals helps me stay lean."	Under-fueling leads to fatigue, injuries, stress fractures, illness and slower growth.
"I need supplements to compete."	Food first. Supplements aren't well regulated and can contain banned substances. Ask your trainer.
"Energy drinks give me energy."	They give caffeine, not fuel. They can raise heart rate and disrupt sleep. Not recommended for teens.

Game-day checklist: ☐ Ate a real meal 3–4 hr before ☐ Light carb snack 30–60 min before ☐ Water bottle filled ☐ Pale-yellow urine ☐ Recovery snack packed ☐ Slept 8–10 hours

The Four Pillars of Athletic Nutrition

Fuel, Build, Hydrate, and Recover

Great performance doesn't come from one meal or one supplement. It comes from doing four simple things well, every day. Think of them as the four pillars that hold up everything you do on the field, court, track, or mat.

1 FUEL

Carbohydrates = energy

What it does

Carbohydrates are your muscles' and brain's main fuel. Without enough, you get tired, slow, and lose focus late in practice or games.

How to do it

- Eat every 3–4 hours so your tank never runs empty
- Choose whole grains, fruit, potatoes, rice, and pasta
- Eat more carbs on hard training and game days

Try this: Never skip breakfast. It refuels you after a night without food.

2 BUILD

Protein = muscle repair and growth

What it does

Training breaks muscle down; protein builds it back stronger. It also keeps you full and supports a healthy immune system.

How to do it

- Include a protein at every meal and most snacks
- Aim for about 20–30 grams per meal (palm-sized portion)
- Chicken, fish, eggs, milk, yogurt, beans, lean meats

Try this: Spread protein through the day instead of eating it all at dinner.

3 HYDRATE

Water = performance and safety

What it does

Losing just 2% of your body weight in sweat can lower speed, strength, and focus, and raises the risk of heat illness and cramping.

How to do it

- Carry a water bottle and sip all day long
- Drink 16–20 oz about 2 hours before practice
- Drink 5–10 oz every 15–20 minutes during activity

Try this: Check your urine: pale yellow means you're on track; dark means drink more.

4 RECOVER

Refuel + rest = come back stronger

What it does

Recovery is when your body actually adapts to training. Good recovery means less soreness and more energy for tomorrow.

How to do it

- Eat carbs + protein within 30–60 minutes after practice
- Follow with a full, balanced meal within 2 hours
- Sleep 8–10 hours a night; muscles rebuild during sleep

Try this: Chocolate milk is a cheap, easy, and effective recovery drink.

Putting it together: Fuel before you train, Build at every meal, Hydrate all day, and Recover as soon as practice ends. Miss one pillar and performance starts to wobble.

General guidance for student-athletes. Athletes with food allergies, medical conditions, or special dietary needs should check with a doctor or registered dietitian.

Eat More Often: Not Just at Dinner

3 healthy meals + 2–3 healthy snacks every day

Many athletes eat a small breakfast (or none), a rushed lunch, and then one huge dinner. By the time practice starts, the tank is nearly empty. Your body works best when it gets steady fuel all day long: **3 balanced meals + 2–3 smart snacks, about every 3–4 hours.**

Why eating more often helps

- Keeps energy steady, with no mid-afternoon crash
- Gives muscles a steady supply of protein to repair
- Improves focus in class and at practice
- Makes it easier to eat enough total calories
- Prevents overeating late at night

The “one big dinner” problem

- Practice happens on an empty tank
- Low energy, slower reaction time, more fatigue
- Muscles miss the recovery window after training
- Hard to fit in all the nutrients an athlete needs
- Heavy late meals can disrupt sleep

3 Healthy Meals: Examples

Meal	Option A	Option B
Breakfast	2–3 scrambled eggs, whole-wheat toast, banana, glass of milk	Oatmeal with peanut butter and berries, Greek yogurt, orange juice
Lunch	Turkey and cheese wrap, baby carrots with hummus, apple, water	Chicken and rice bowl with black beans, corn, salsa, and grapes
Dinner	Grilled chicken, brown rice, broccoli, side salad, milk	Whole-wheat spaghetti with lean meat sauce, green beans, fruit

2–3 Healthy Snacks: Examples

Greek yogurt + granola + berries Protein and carbs; great mid-morning	**Peanut butter on a banana or whole-grain crackers** Long-lasting energy	**String cheese + apple or grapes** Easy to pack, no prep
Trail mix (nuts, raisins, cereal) Fits in a backpack	**Turkey or PB&J half-sandwich** Solid pre-practice option	**Low-fat chocolate milk** Ideal right after practice

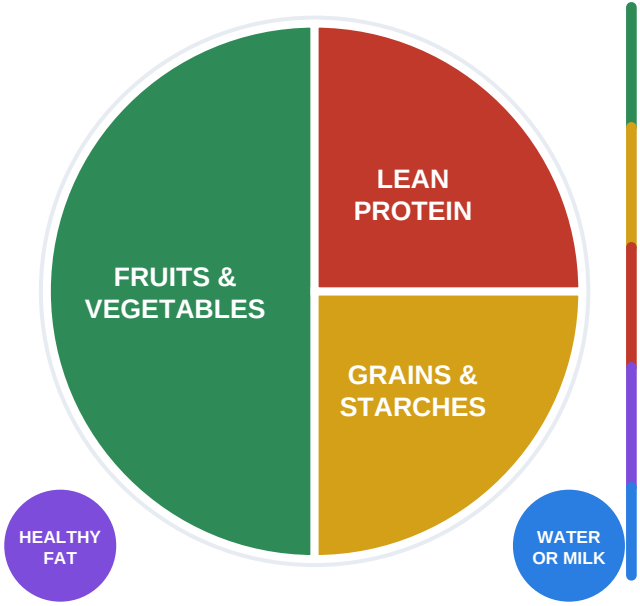
Simple rule: If it’s been more than 3–4 hours since you last ate, it’s time to eat. Keep a snack in your backpack or locker so you’re never stuck without fuel.

Build a Healthier Athlete's Plate

What a balanced meal looks like, plus one simple rule

You don't need to count calories to eat like an athlete. Use your plate as a guide. A balanced plate gives you energy to perform, protein to rebuild, and the vitamins and minerals that keep you healthy through a long season.

A balanced meal includes:



½ plate: Fruits & Vegetables
Vitamins, minerals, and fiber that support immunity and recovery. Aim for a mix of colors: broccoli, carrots, spinach, peppers, berries, oranges.

¼ plate: Grains & Starches
Your main energy source. Brown rice, whole-wheat pasta, potatoes, sweet potatoes, whole-grain bread, tortillas, quinoa.

¼ plate: Lean Protein
Builds and repairs muscle. Chicken, turkey, fish, eggs, lean beef, beans, tofu, Greek yogurt.

A little Healthy Fat
Supports hormones and long-lasting energy. Avocado, olive oil, nuts, seeds, peanut butter, salmon.

A Drink
Water or low-fat milk. Skip soda and energy drinks.

A SIMPLE RULE

Protein + Carb + Color

Every meal should have a protein, a carbohydrate, and at least one fruit or vegetable. Most snacks should have at least two of the three.

Adjust your plate to your training day

Easy / Rest Day

- ½ fruits & veggies
- ¼ grains
- ¼ protein
- Smaller portions of starch

Normal Practice Day

- 1/3 fruits & veggies
- 1/3 grains
- 1/3 protein
- Add a snack before practice

Hard Practice / Game Day

- ½ grains & starches
- ¼ fruits & veggies
- ¼ protein
- Extra carbs to fill the tank

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Why Carbohydrates Are Important

What to eat before practice and after practice

Carbohydrates are an athlete's **number one fuel source**. Your body breaks carbs down into glucose and stores it in your muscles and liver as **glycogen**, the fuel your muscles burn during sprints, lifts, and long practices. When glycogen runs low, you "hit the wall."

Why carbohydrates are important

- Main fuel for muscles during intense exercise
- Your brain runs on glucose: better focus and decisions
- Delays fatigue late in practices and games
- Spares protein so it can build muscle instead of being burned
- Refills glycogen stores for tomorrow's training

Signs you're not getting enough

- Heavy, tired legs or feeling "flat"
- Fading in the second half or late in practice
- Trouble concentrating, irritability, headaches
- Slow recovery and more soreness between sessions
- Getting sick more often

Before Practice

When	What to eat	Examples
2–4 hours before	A full meal: mostly carbs, some protein, lower in fat and fiber	Turkey sandwich + fruit + pretzels; pasta with chicken; rice bowl
30–60 minutes before	A small, easy-to-digest carb snack	Banana, applesauce pouch, granola bar, pretzels, crackers, dry cereal, orange slices

Avoid right before practice: greasy or fried food, large high-fiber or high-fat meals, soda, and energy drinks. They sit heavy and can cause cramps or an upset stomach.

After Practice

When	What to eat	Examples
Within 30–60 minutes	Carbs + protein to refill glycogen and start muscle repair	Chocolate milk; Greek yogurt + granola; PB&J + milk; fruit smoothie with yogurt; turkey wrap
Within 2 hours	A full balanced meal (Protein + Carb + Color)	Chicken, rice, and vegetables; spaghetti with meat sauce and salad; tacos with beans and veggies

Recovery ratio: aim for roughly **3 parts carbohydrate to 1 part protein** after hard training. That's why low-fat chocolate milk works so well. And don't forget to rehydrate: drink about 16–24 oz of fluid for every pound of sweat lost.

The Athlete’s Grocery List

Stock up on proteins, carbs, fruits, vegetables, healthy fats, and easy snacks

A good week of eating starts at the store. Use this list to stock your kitchen with foods that fuel training, build muscle, and make healthy snacks easy to grab. Check off what you need.

Proteins

- ☐ Chicken breast
- ☐ Ground turkey or lean ground beef
- ☐ Low-sodium deli turkey
- ☐ Fish: salmon, tuna (canned or pouch)
- ☐ Eggs
- ☐ Greek yogurt
- ☐ Milk (low-fat or regular)
- ☐ Cheese / string cheese
- ☐ Cottage cheese
- ☐ Beans, lentils, chickpeas
- ☐ Tofu or edamame

Carbohydrates

- ☐ Oatmeal / oats
- ☐ Whole-grain bread or bagels
- ☐ Whole-wheat pasta
- ☐ Brown rice or quinoa
- ☐ Potatoes / sweet potatoes
- ☐ Whole-wheat tortillas
- ☐ Whole-grain cereal
- ☐ English muffins
- ☐ Pretzels
- ☐ Whole-grain crackers
- ☐ Rice cakes

Fruits

- ☐ Bananas
- ☐ Apples
- ☐ Oranges / clementines
- ☐ Berries (fresh or frozen)
- ☐ Grapes
- ☐ Pears or peaches
- ☐ Raisins / dried fruit
- ☐ Applesauce cups or pouches
- ☐ Frozen fruit for smoothies
- ☐ 100% fruit juice (small amounts)
- ☐ Watermelon (in season)

Vegetables

- ☐ Broccoli
- ☐ Baby carrots
- ☐ Spinach / salad greens
- ☐ Bell peppers
- ☐ Tomatoes
- ☐ Cucumbers
- ☐ Green beans
- ☐ Corn
- ☐ Frozen mixed vegetables
- ☐ Sweet peas
- ☐ Salsa

Healthy Fats

- ☐ Avocados
- ☐ Peanut butter or almond butter
- ☐ Almonds, walnuts, cashews
- ☐ Sunflower or pumpkin seeds
- ☐ Olive oil
- ☐ Salmon
- ☐ Hummus
- ☐ Chia or ground flax seeds

Easy Snacks

- ☐ Granola or protein bars
- ☐ Trail mix
- ☐ String cheese
- ☐ Yogurt cups or tubes
- ☐ Low-fat chocolate milk
- ☐ Hummus cups
- ☐ Fruit cups (in juice)
- ☐ Beef or turkey jerky
- ☐ Single-serve nut packs

Smart shopping tips: Frozen and canned fruits and vegetables are just as nutritious and last longer. Choose “whole grain” as the first ingredient. Buy snacks in bulk and portion them into bags for the week. Limit chips, candy, soda, and energy drinks.

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A Sample School Day Eating Plan

Breakfast through evening snack for a practice day

Here's what a full day of fueling can look like for a student-athlete with practice after school. Adjust times to your schedule. The goal is to **eat about every 3–4 hours** and never show up to practice hungry.

Time	Meal	What to eat (example)	Why it matters
6:45 AM	Breakfast	2 scrambled eggs, whole-wheat toast with peanut butter, banana, glass of milk	Refuels after an overnight fast; starts the day with carbs + protein
9:30 AM	Morning Snack	Greek yogurt with granola, or a granola bar + string cheese	Keeps energy and focus up through morning classes
12:00 PM	Lunch	Turkey and cheese sandwich on whole-grain bread, baby carrots, apple, water or milk	Main fuel for afternoon practice
2:45 PM	Pre-Practice	Banana or applesauce pouch + pretzels or crackers; 16 oz water	Quick, easy carbs topped off 30–60 minutes before practice
3:15–5:30	Practice	Water bottle: sip 5–10 oz every 15–20 minutes; sports drink if over 60–90 min or very hot	Prevents dehydration, cramping, and fatigue
5:45 PM	Post-Practice	16 oz low-fat chocolate milk, or a PB&J + milk	Starts recovery within the 30–60 minute window
7:00 PM	Dinner	Grilled chicken, brown rice or baked potato, broccoli, side salad, fruit, milk	Rebuilds muscle and refills energy stores for tomorrow
9:00 PM	Evening Snack	Cottage cheese with fruit, or whole-grain cereal with milk	Protein before bed supports overnight recovery

Pack the night before

- Lunch, pre-practice snack, and post-practice snack
- A full water bottle (refill at school)
- One backup snack for your locker or bag

Game day changes

- Eat a carb-focused meal 3–4 hours before the game
- Keep the pre-game snack light and familiar
- Don't try new foods on game day

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Easy, Healthy Things to Start Now

Simple habits that make a big difference

You don’t have to change everything at once. Small habits, repeated every day, add up to big results. Start with these easy wins.

1 **Never skip breakfast**
Even something quick (yogurt + banana, or a PB bagel) beats nothing.

2 **Carry a water bottle everywhere**
Refill it at least 3–4 times during the school day.

3 **Pack a pre-practice snack**
Keep a banana, granola bar, or pretzels in your bag every day.

4 **Refuel within 30–60 minutes**
Chocolate milk or a PB&J right after practice jump-starts recovery.

5 **Add color to every meal**
Put at least one fruit or vegetable on every plate.

6 **Include protein every time you eat**
Eggs, milk, yogurt, meat, beans, cheese, or nuts.

7 **Swap soda and energy drinks**
Choose water or milk instead. Energy drinks are not recommended for teens.

8 **Sleep 8–10 hours**
Sleep is when muscles repair and grow. Set a regular bedtime.

9 **Plan ahead**
Pack lunch and snacks the night before so you’re never stuck.

10 **Check your urine color**
Pale yellow = well hydrated. Dark = drink more water.

This Week’s Challenge: pick 2 habits and track them

My habit	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Habit 1: _____	☐	☐	☐	☐	☐	☐	☐
Habit 2: _____	☐	☐	☐	☐	☐	☐	☐

Remember: You train your body every day. Fuel it every day too. Consistency beats perfection: aim to make good choices most of the time, and you’ll feel the difference in practice.

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