InsideTracker

5 BLOOD BIOMARKERS ALL ATHLETES SHOULD KNOW

Optimize athletic performance and recovery through blood testing.

WHY IS BLOOD TESTING IMPORTANT FOR ATHLETES?

Blood analysis provides a unique window into the health and performance of athletes. Athletes can now rely on blood testing to pinpoint biomarkers that may be helping or hurting their game and get insights on implementing effective changes to improve their performance and recovery.

Here are 5 blood biomarkers not frequently tested at yearly physicals that all athletes should know with recipes to help improve them:
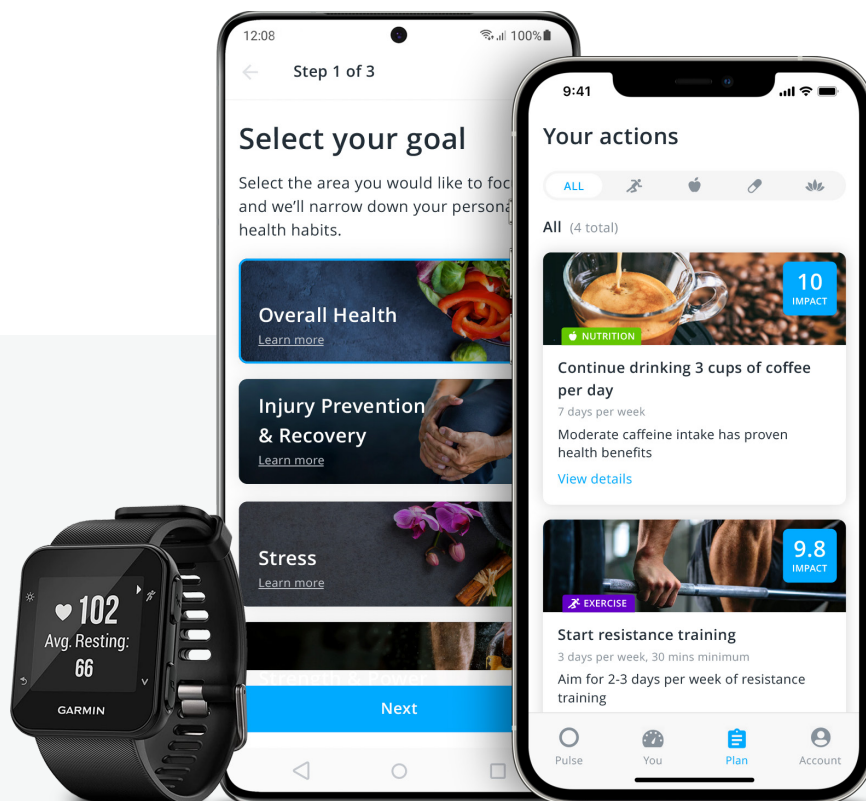
1 Vitamin D **2** Ferritin **3** Creatine kinase

4 Cortisol **5** Liver enzymes

VITAMIN D

PERFORMANCE

• Improves bone health
• Reduces inflammation
• Increases muscle mass and strength
• Increases the size and number of muscle fibers used for short bursts of speed and power[1,2]
• Supports immune health

Low levels are linked to:
• Low testosterone in men
• Risk of stress fracture and acute illness
• Suboptimal muscle function[3]

Mediterranean halibut

Improves: Creatine kinase, vitamin B12, vitamin D

Prep: 5 mins   **Cook:** 10 mins

INGREDIENTS

• 1 halibut fillet
• 1 tbsp capers
• 1 tbsp olives, chopped
• 1 tbsp lemon juice
• 1/2 tomato, diced

RECIPE DIRECTIONS

Preheat oven to 425°F. Line a baking sheet with parchment paper. Lay the halibut on the baking sheet and top the fish with the capers, olives, lemon juice and tomatoes.

Cook the fish in the oven for about 12 minutes, or until it can be easily flaked with a fork.

FERRITIN

PERFORMANCE

Ferritin is a protein that stores iron and is the best indicator of iron in the body.

Iron

- Helps form hemoglobin, a protein responsible for transporting oxygen throughout the body
- Supports energy metabolism
- Acts as a cofactor in neurotransmitter production
- Aids in the production of some immune cells

Low levels are linked to:
- Physical and mental fatigue
- Risk of injury
- Weakened immune system
- Irritability
- High exercise heart rate

Black bean salad

Improves: Iron, testosterone, liver enzymes, glucose, magnesium, folate

Prep: 15 mins

INGREDIENTS

- 1 cup beans
- 1/2 yellow pepper, chopped
- 1/2 mango, chopped
- 1/2 onion, chopped
- 1 jalapeno pepper, chopped
- 1 1/2 tbsp vinegar
- 1/2 tbsp lime juice
- 1 tbsp olive oil
- 1/4 tsp cumin
- 1/2 tsp paprika
- 1/2 tsp black pepper

RECIPE DIRECTIONS

Combine beans, yellow pepper, mango, onion, and jalapeno pepper.

Whisk together vinegar, lime juice, olive oil, cumin, paprika, and pepper. Pour over bean mixture.

Serve room temperature or refrigerate to serve cold.

CREATINE KINASE (CK)

RECOVERY

- Shows how the body reacts to training load and intensity
- Peaks two to four days after intense exercise

Chronically elevated CK levels are linked to:
- Muscle pain and soreness
- Muscle damage
- Weakness
- Injury
- Overtraining

Tuna with fennel and orange

Improves: Testosterone, magnesium, creatine kinase, vitamin B12, vitamin D

Prep: 5 mins   **Cook:** 20 mins

INGREDIENTS

- 1 tbsp olive oil
- 1 tsp whole fennel seeds
- 1/4 red onion, sliced
- 1/2 tsp dried thyme
- 6 oz tuna fillet
- 1 orange
- salt and pepper to taste

RECIPE DIRECTIONS

Preheat oven to 350°F. Heat olive oil in oven-safe skillet over medium heat. Add fennel seeds and cook for 30 seconds. Add sliced red onion and dried thyme, cook until onion is softened. Sear tuna steak on each side for two minutes. Squeeze juice of half the orange into pan. Slice remaining half of orange into thin discs and add to the pan.

Bake in over for 10 minutes or until tuna is cooked to desired internal temperature.

CORTISOL

RECOVERY

A stress hormone that responds to physical or mental stress
- Boosts energy to help the body handle stress
- Influences the sleep/wake cycle, blood sugar, and blood pressure

A consistently high cortisol level is linked to:
- Risk of chronic fatigue
- Higher blood sugar levels
- Impaired weight control
- Poor sleep

Soba noodle stir-fry

Prep: 15 mins   **Cook:** 15 mins

INGREDIENTS

- 1 cup soba noodles
- 1 boneless, skinless chicken thigh
- 1 tbsp sesame oil
- 1 green onion
- 1 clove garlic
- 1/2 inch ginger root
- 1 cup frozen broccoli
- 1/4 cup frozen edamame

RECIPE DIRECTIONS

Cut chicken thigh into bite size pieces. Mince garlic and ginger. In a large frying pan, heat the sesame oil on high heat. Cook soba noodles according to directions on package.

Add chicken, garlic, and ginger to the frying pan and cook until chicken is done. Remove the chicken from the pan and set aside. Add broccoli and edamame to the pan and saute until they are tender. Add the chicken and cooked soba noodles into the pan and saute for 2-3 minutes until warmed through.

LIVER ENZYMES: ALT & AST

RECOVERY

Enzymes found in the liver and in the muscle
• Supports detoxifying pathways and energy production
• Increases with muscle damage

Elevated ALT and AST are linked to:
• Strenuous exercise and can be high for seven or more days after an event
• Resistance and endurance training
• Excess calorie consumption
• Some medication use

Berry soy yogurt parfait

Improves: Iron, liver enzymes, inflammation, glucose, cortisol, testosterone

Prep: 5 mins   **Cook:** 1 min

INGREDIENTS

• 1 tbsp wheat germ
• 1 container (6oz) soy yogurt
• 1/3 cup granola
• 3/4 cup sliced strawberries
• 3/4 cup blueberries

RECIPE DIRECTIONS

In a serving bowl, stir wheat germ into yogurt until it is evenly distributed. Add in granola and top the mixture with sliced strawberries and blueberries.

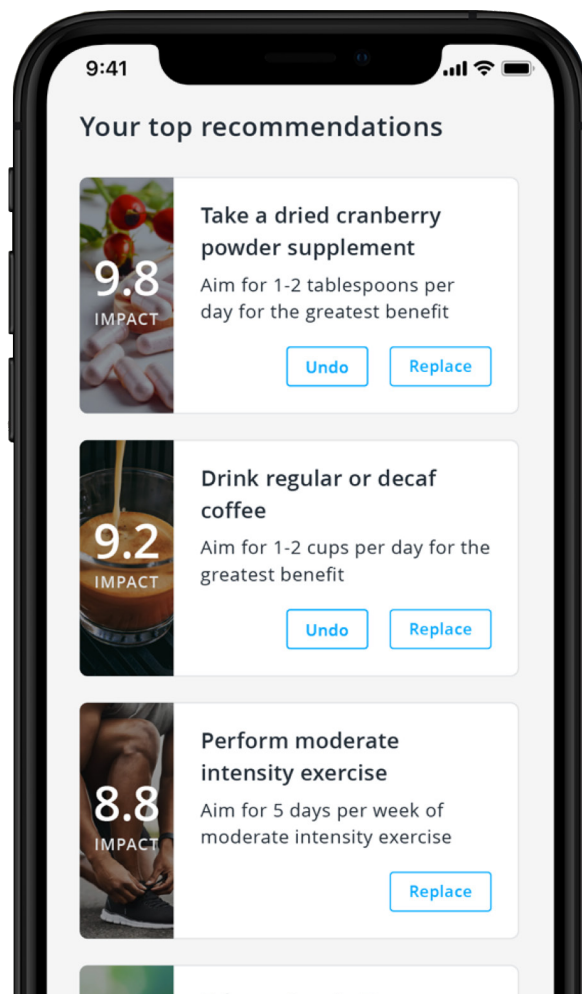# WHY SHOULD ATHLETES USE INSIDETRACKER FOR BLOOD TESTING?

- Get insights into biomarkers not typically measured during yearly labs through insurance (like vitamin D, ferritin, creatine kinase, and cortisol)
- Know *your* optimal zone—normal lab values aren't granular enough for athletes
- Receive personalized recommendations for improving unoptimized biomarkers

Blood testing is a largely untapped medium for fairly achieving an edge in athletics. To optimize your body's physical capabilities, it's necessary to have scientific evidence about your unique blood biochemistry. But a basic blood panel at a yearly doctor's appointment doesn't provide granular data or all the blood biomarkers you need for a complete look at what's going on internally.

InsideTracker is an ultra-personalized system that analyzes data from your blood, DNA, and habits. The InsideTracker team has spent years analyzing thousands of research papers to find the most critical biomarkers to improve physical performance and identify the nutrition, supplements, lifestyle, and exercise interventions to optimize them.

In total, InsideTracker analyzes 43 biomarkers, all with optimal zones determined by a sophisticated algorithm. For example, the normal range for a woman's ferritin level is between 12-150 ng/dL. But InsideTracker recommends a much more precise range based on age, sex, ethnicity, and activity level. A 25 year-old endurance athlete will have different needs and a different optimized zone compared to a 40 year-old woman who exercises recreationally.

If you're not in an optimized zone, the algorithm recommends effective and simple interventions involving diet, supplements, and training modifications that are specific to your needs. The InsideTracker app helps keep you accountable to these actions, helping you reach your goals.

Your top recommendations

9.8 IMPACT — Take a dried cranberry powder supplement
Aim for 1-2 tablespoons per day for the greatest benefit
Undo | Replace

9.2 IMPACT — Drink regular or decaf coffee
Aim for 1-2 cups per day for the greatest benefit
Undo | Replace

8.8 IMPACT — Perform moderate intensity exercise
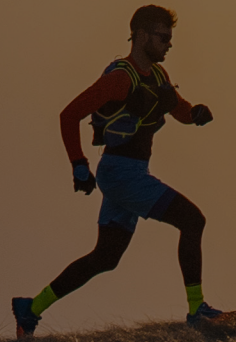Aim for 5 days per week of moderate intensity exercise
Replace

REFERENCES

1. Dahlquist, D. T., Dieter, B. P., & Koehle, M. S. (2015). Plausible ergogenic effects of vitamin D on athletic performance and recovery. *Journal of the International Society of Sports Nutrition*, 12, 33. https://doi.org/10.1186/s12970-015-0093-8

2. Hamilton B. (2011). Vitamin d and athletic performance: the potential role of muscle. *Asian journal of sports medicine*, 2(4), 211–219. https://doi.org/10.5812/asjsm.34736

3. de la Puente Yagüe, M., Collado Yurrita, L., Ciudad Cabañas, M. J., & Cuadrado Cenzual, M. A. (2020). Role of Vitamin D in Athletes and Their Performance: Current Concepts and New Trends. *Nutrients*, 12(2), 579. https://doi.org/10.3390/nu12020579