

Female athletes have unique nutrition needs. Understanding and adjusting for these needs can help female athletes maximize performance.

## Female Athlete Nutritional Needs

### Iron

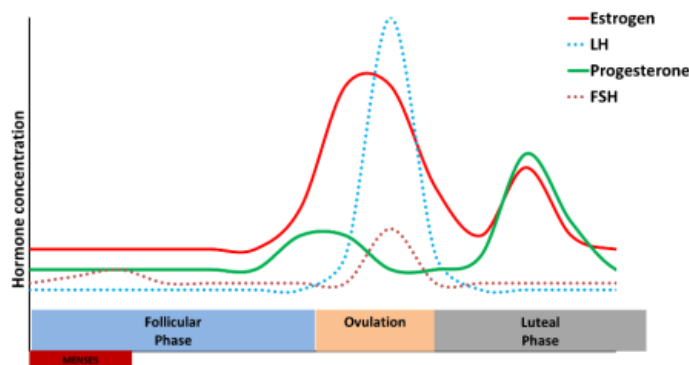
Iron is a mineral necessary for oxygen transport and energy production in the body. Female athletes have increased iron needs due to loss of iron and red blood cells through menstrual bleeding. Average menstrual blood loss varies from 10-90 mL over the course of the bleeding phase. Female athletes should prioritize a diet rich in both heme (animal-based) and non-heme (plant-based) iron sources to meet iron requirements and replenish any potential losses from menstrual bleeding.

### Calcium & Vitamin D

Calcium and vitamin D are necessary for proper bone growth and muscle contraction. Female athletes experience peak bone growth throughout adolescence until their mid-20s. Daily calcium and vitamin D recommendations for athletes are 1,000-1,300 mg and 1000 IU, respectively. When calcium is limited in the diet, the body will deplete calcium levels from bone, which may result in injury and long-term complications.

### Energy Balance

A female athlete is in energy balance when adequate calories are consumed daily to meet the combined energy demands from training, daily life and reproduction. There may be times during a training phase where a female athlete is not in energy balance either intentionally or unintentionally (i.e. changing body composition, travel/competition, increased training load without increased calorie intake). While these periods of intentional low energy availability may be necessary for sport, periods of energy balance should be the focus.



## The Menstrual Cycle Phases

Having a regular menstrual cycle is a sign that the body is in balance. Absence of a menstrual cycle is something to address with your healthcare provider, even if the reason is due to contraceptive use.

**Menstruation** is the bleeding phase during the menstrual cycle, often referred to as the period. Estrogen and progesterone are at their lowest levels.

**Follicular Phase** is a continuation of low hormonal levels ending in estrogen levels rising to prepare for ovulation.

**Ovulation** is indicated by a rise in estrogen, which triggers the ovaries to release an egg, preparing the body to potentially become pregnant if fertilized. Estrogen levels drop after the egg is released.

**Luteal Phase** begins after ovulation. Estrogen and progesterone levels rise and then decline during the premenstrual time period. Changes in hormones late in the luteal phase are when most symptoms occur.

## Hormones

The menstrual cycle is regulated by hormones. The primary hormones involved are luteinizing hormone (LH) follicle-stimulating hormone (FSH), and the estrogen and progesterone hormone groups.

**Estrogen (estradiol)** impacts skin, bone, heart health, immune function and mood. It increases sex drive and is an appetite suppressant.

**Progesterone** facilitates pregnancy, reduces sex drive, protects the bone, raises body temperature, alters mood, and is an appetite stimulant.

## Menstrual Cycle Tracking

Familiarity with the menstrual cycle can be important for performance. During the menstrual cycle, hormones change in a cyclical process throughout the month. Normal cycle lengths can vary from 21-35 days. The changes in hormones throughout the cycle can impact how the body feels.

Understanding the changes that occur in the body during each phase can lead to management of symptoms that may impact performance.

### How to Get Started Tracking

- Choose a menstrual cycle app to track symptoms
- Identify date of last menstrual cycle and length of cycle
- Track cycle and symptom patterns over time to learn how these might be connected to training and performance

## Symptom Management

Most females experience some form of menstrual cycle symptoms. However, these can vary significantly.

**Symptoms may include changes in mood, gas, cramping, bloating, cravings, fatigue, constipation, nausea, headaches and many others.** While these symptoms may be unavoidable, there are steps that can be taken to help minimize the severity of symptoms such as modifying diet, sleep, or recovery modalities.

During the pre-menstrual part of the luteal phase, progesterone spikes and may result in increased hunger levels and a slight increase in the total amount of calories needed per day (50-200/day). Pay attention to hunger and fullness cues during this phase, especially when cravings of processed or sweetened foods occur. Balance intake of these foods with whole grains, fiber rich carbohydrates, lean proteins, and fruit and vegetables.

## Impact of Contraceptives

Hormonal birth control (e.g. pill, IUD, etc.) works by suppressing the natural release of estrogen and progesterone by the body. However, there may be some variation in natural hormone levels when taking a hormonal contraceptive based on the amount and type of hormones present in the birth control.

The bleeding experienced when taking hormonal contraceptives is due to withdrawal from the hormones and is not considered a natural period. Some individuals do not experience a bleeding phase while using contraceptives. Contraceptive use may mask symptoms of low energy availability.

Hormonal contraceptives may influence weight and body composition. Pay attention to potential changes when starting or changing contraceptives.

## Nutrition Checklist

There is evidence to suggest that hormonal fluctuations in the menstrual cycle may contribute to inflammation and a small increased need for protein. Eating a variety of foods that are rich in **antioxidants, healthy fats, vitamins & minerals, and protein** may be beneficial to help reduce inflammation, meet protein needs, and result in decreased overall menstrual cycle symptoms.

### Foods to Include

**Nuts:** almond, cashew, walnut, pecan, pistachio

**Seeds:** sunflower, hemp, pumpkin, flax, chia

**Heart-healthy oils:** olive, avocado, canola

**Fish rich in omega 3 fatty acids:** salmon, tuna

**Fruits:** red and blue berries, purple grapes, citrus

**Vegetables:** dark green and orange options

**Fresh juices:** pomegranate, blueberry, cranberry, cherry

**Protein:** chicken, turkey, lean beef, pork, tofu, tempeh

**Note: The research involving female athletes and the menstrual cycle is evolving. To date, there is no conclusive evidence that supports adjusting training based on menstrual cycle phases. A personalized approach should be taken based on the severity of symptoms a female athlete experiences.**