

In's and Out's of Iron Supplementation

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1. Check serum ferritin and Complete Blood Count (CBC).
2. If ferritin is low (< 20 ng/ml) and/or planning altitude camp, take the iron cocktail.
3. Iron Cocktail Ingredients
 - a. Liquid ferrous sulfate elixir (9mg of elemental iron per milliliter elixir). This is available over-the-counter from most pharmacies, but one usually has to ask the pharmacist. Often they have to order it and it is delivered in 24-48 hours.
 - b. 4-8 oz of Citrus juice (acidic, some Vit C, tasty). Any acidic, tasty beverage will do, but orange juice is most commonly used.
 - c. 200-500mg of powdered Vit C
4. Iron Cocktail Prescription
 - a. Add 5 mls of iron elixir (45 mg) to glass of Citrus juice
 - b. Add ~250 mg of powdered Vit C and stir.
 - c. Drink cocktail 30 minutes before, or 2 hours after a meal. (Often first thing in the morning before breakfast is a good time.)
5. Things to watch out for:
 - a. Drink the cocktail directly. Don't play with it in your mouth or it might stain your teeth brown. If they get stained, whiteners can reverse it.
 - b. Sometimes, in some people, the cocktail can cause either a stomach ache or loose stool. If bothersome, take a couple of days off until stomach or stools are normal and then restart the cocktail at half the dose (2.5 mls of liquid iron in glass of OJ).
 - c. It is **MANDATORY** to get your serum ferritin checked and not just start the cocktail. Occasionally, an athlete will have the genes to develop hemochromatosis and if they take iron, it will hasten the development of liver failure. One usually knows of this condition from their family history, but proof you don't have it, is gained by documenting a normal or low serum ferritin.
6. After 4-6 weeks of taking the iron cocktail, (or after your altitude camp), recheck your ferritin to confirm normal adequate iron stores (30-100 ng/ml). Continue the supplementation as long as ferritin is <100 ng/ml (up to 200 ng/ml is not a problem, but if over 200, stop the supplementation). If the ferritin is still low (<30 ng/ml), you can consider doubling the dose (either 10 mls iron elixir in the morning cocktail or using the 5 ml cocktail twice per day).

Why liquid iron supplementation over pills?

The problematic piece about all oral iron supplementation is having as much as possible of the iron you ingest, be absorbed into the blood stream. An iron molecule forms a complex with Vitamin C and Intrinsic Factor (secreted from the stomach lining) in an acidic environment (found in the stomach only) and that complex is absorbed into the blood in the first part of the small intestines (duodenum). So only the iron that forms this complex in the stomach, is absorbed and the rest is just passed through the body and not absorbed.

So what can we do to maximize the formation of the complex and subsequent absorption?

1. Take the supplement in liquid form to maximize forming the complex in the stomach. Note: pills take time to dissolve and do so unevenly and not as well as a liquid in the stomach.
2. Intrinsic Factor is secreted from cells in the stomach lining, so an empty stomach and a liquid supplement maximizes the chances of forming a complex.
3. Vit C is a necessary component of the complex, so provide some.
4. The complex forms best in an acidic environment. The stomach is normally acidic, but the acidic orange juice makes sure the mix in the stomach is acidic.

Iron supplementation recommendations for athletes going to altitude



It is strongly advised that you do not take iron supplements without having your serum ferritin tested first. Your personal physician is the best option. A second option is ordering a \$40 serum ferritin test yourself at www.healthcheckusa.com, which can be done depending on the state you live in. Additionally, it is strongly advised that you do not take more than the recommended dosage of iron listed below. It is always best that you work with your personal physician regarding iron supplementation.

Liquid ferrous sulfate elixir is recommended. It is sold in pint bottles, and you do not need a prescription. Can be ordered online at a number of sites. Cost is typically about \$5 a bottle. One bottle will last between 3 and 6 weeks, depending on the daily dosage taken. The elixir can come in strengths of between 44 and 65 mg of iron / teaspoon. The dosages below are for the the 65 mg/teaspoon strength. Iron in pill form is often not absorbed to the same extent as liquid form.

**Recommend that you take on an empty stomach, to aid absorption. Best timing is at least 30 min prior to or 90 min after meals. Take the recommended dose mixed in a small glass of orange juice (or mix in vitamin-C powder), as the vitamin-C aids in absorption. Brush your teeth immediately after, as iron can stain teeth (if a stain does develop, it easily comes off with a normal cleaning at the dentist). Avoid milk and tea products when taking the iron dose. Also note that some anti-inflammatories (ibuprofen) can impair iron absorption in some people. Stomach upset, diarrhea, and black stools can be common when taking iron. Staying well hydrated and starting with a smaller dose and building up can help. Recommended using a medicine dropper to aid in measuring the right amount of iron.

The table below is for MEN

If your ferritin value is	Recommended dosage routine
40 ng/ml and higher	5 ml 1 time per day
30 to 39	5 ml 2 times per day
20 to 29	Start with 5 ml 2 times per day. If no stomach upset / diarrhea after 5 days, go to 10 ml 2 times per day
Below 20	Start with 10 ml 2 times per day. If no stomach upset / diarrhea after 5 days, go to either 15 ml 2 times per day or 10 ml 3 times per day (whichever schedule you can be most compliant with)

The table below is for WOMEN

If your ferritin value is	Recommended dosage routine
30 ng/ml and higher	5 ml 1 time per day
20 to 29	5 ml 2 times per day
10 to 19	Start with 5 ml 2 times per day. If no stomach upset / diarrhea after 5 days, go to 10 ml 2 times per day
Below 10	Start with 10 ml 2 times per day. If no stomach upset / diarrhea after 5 days, go to either 15 ml 2 times per day or 10 ml 3 times per day (whichever schedule you can be most compliant with)

For athletes going to altitude, it is recommended that you measure ferritin and begin this supplementation routine ideally 4 wks prior to departure. Continue while at altitude and for 2 wks after return.