



How Blood Donations Deplete Iron

A reader asked me a question that stumped me at first, so here's the question, and my answer as to how blood donations deplete iron.

Q: "How is it possible to remove as much or more iron as ordinary food rapidly replaces? When I count the number of things whose contents individually constitute 100% of "RDA" or even higher, it strikes me that I'd have to just about bleed out every day to get rid of it all.

"Can you show an "iron balance", with quantification showing elimination rates from various actions vs intake from various foods? That would be very helpful."

A: Your question genuinely stumped me at first. I was wondering whether I had overlooked something. A blood donor loses about 250 mg of iron from his body iron stores with each donation, out of total body iron stores of 3 to 4 grams.

According to the NIH, average daily iron intake for an adult American man is about 20 mg, although not all of that is absorbed; as little as 10% is absorbed, or 2 mg, depending on lots of factors like food macro composition, alcohol intake, sugar consumption, use of supplements, etc.

Meanwhile, the RDA is 8 mg (0.8 mg absorbed) so you see the problem: intake is 2.5 times the minimum necessary, which can ultimately lead to high body iron stores (high ferritin).

At that rate of 2.5 mg a day absorbed, in 100 days, you've made up for the blood donation. But we do know that donating blood lowers iron levels quite well, so what gives?

The answer is that the 2 mg of iron absorbed daily is at a steady-state of body iron. Iron overload, unless extreme (genetic or some other reason) happens over years, slowly. Somewhat like if you gain 1.5 ounces of body weight a month, in 10 years you're 10 lbs overweight.

Normal daily iron losses for an adult man are about 1 to 2 mg. So the iron you absorb daily just keeps even with losses. If you donate blood, and lose a lot more, absorption increases.

But if you lose blood via donation, phlebotomy, or being mauled by a bear, it will take longer than 100 days to make up for your lost iron at steady-state rates. If you lose a lot of blood, absorption really ramps up.

In my book, I calculated that one annual blood donation is enough to keep ferritin in a low normal range, assuming low normal ferritin to start with. (With a high starting ferritin, a higher rate of donations is necessary to get down into the low normal range.) That's ~250 mg a year of iron.

I calculated [here](#) that 75 mg of aspirin might get rid of 25 mg of iron daily, which exceeds daily intake.

I trust that all makes sense. The iron you ingest daily isn't all added to body iron, because you lose a small amount daily, and when you donate blood, the same applies.

I discussed other aspects of blood donation, iron, and transfusion [here](#).

