

The effect of calcium on non-heme iron uptake, efflux, and transport in intestinal-like epithelial cells (Caco-2 cells)

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It has been suggested that calcium inhibits the absorption of dietary iron by directly affecting enterocytes. However, it is not clear if this effect is due to a decreased uptake of iron or its efflux from enterocytes. We studied the effect of calcium on the uptake, efflux, and net absorption of non-heme iron using the intestinal-like epithelial cell line Caco-2 as an in vitro model. Caco-2 cells were incubated for 60 min in a buffer supplemented with non-heme iron (as sulfate) and calcium to achieve calcium to iron molar ratios ranging from 50:1 to 1,000:1. The uptake, efflux, and net absorption of non-heme iron were calculated by following a radioisotope tracer of ^{55}Fe that had been added to the buffer. Administration of calcium and iron at molar ratios between 500 and 1,000:1 increased the uptake of non-heme iron and decreased efflux. Calcium did not have an effect on the net absorption of non-heme iron. At typical supplementary doses for calcium and non-heme iron, calcium may not h