Optimizing Bioavailable Iron in Water

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My school, Cascades Academy, has a sister school in Peru named Casa Chapi. The students at this school struggle with anemia, which is not surprising considering that the World Health Organization estimates that 1.62 billion people worldwide (24.8%) are affected with anemia (de Benoist B et al., 2008). In Southeast Asia, anemia has been reduced by adding fish shaped iron bars to boiling soup (Armstrong et al., 2016). However, this solution is less effective in Peru because the local food is less acidic than the food in Asia, making iron less soluble. I tested the hypothesis that an electrical current running through iron bars would release more bioavailable iron. Small mild steel bars with different treatments (scratched, electricity through bar, electricity through water, and control) were placed in water filled jars. The water in the jars was boiled or stored to allow the iron to dissolve, before measuring iron content. This experiment shows no significant difference between the control and scratched treatments. However, there was a significant increase in dissolved iron for the iron bar that had electricity running through it. After only one day, the amount of dissolved iron in one liter of water nearly matched the NIH daily recommended iron intake. I also found that there was a significant decrease in dissolved iron for the electricity through water treatment. In conclusion, electricity running through iron produces more bioavailable iron which could be used to reduce anemia in Peru.

Awards Won: