FerriMetric: Bridging Nutrition & AI

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Say that your last meal had x milligrams of iron.
How much of those x milligrams did your body actually absorb? Do other nutrients in your meal have anything to do with how much iron is available for absorption? What can your bloodwork tell us about your body's ability to absorb iron?

TARGET USERS: Doctors or Nutritionists looking for a specific metric to indicate the bioavailability of iron for a more holistic assessment of iron levels in the body.

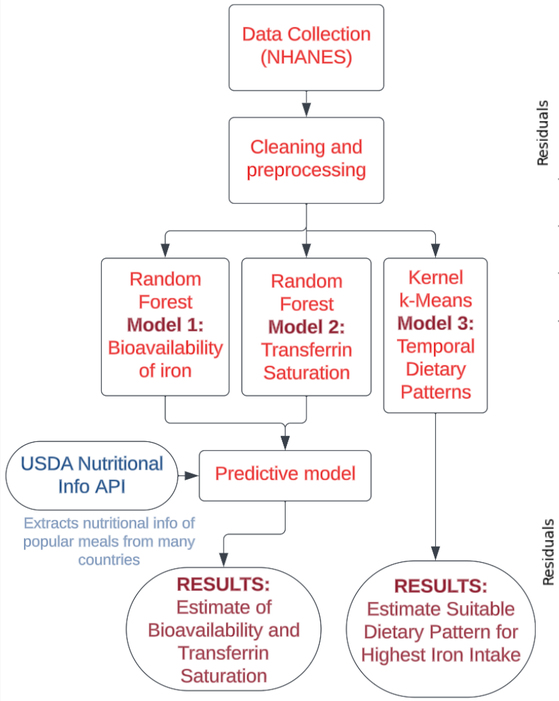
OBJECTIVE-1: Bioavailability

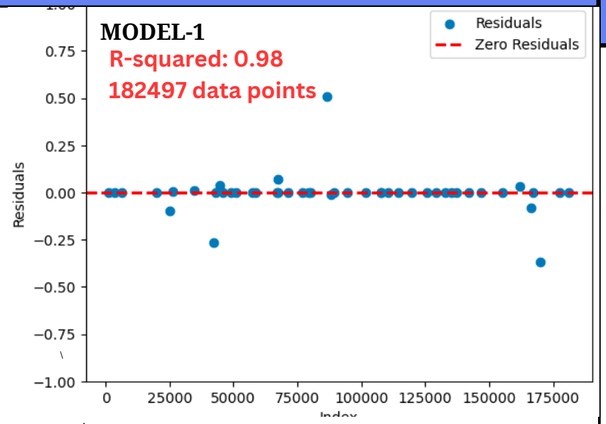
- FerriMetric provides a metric to assess bioavailability of iron.
- Considers the effects of enhancers, inhibitors and nature of meals to calculate how much iron is available for absorption by the body.
- **Feature Engineering of Estimated Iron Absorption** = (Total Iron Content x Heme Iron Adjustment) x (1 + Enhancers - Inhibitors)

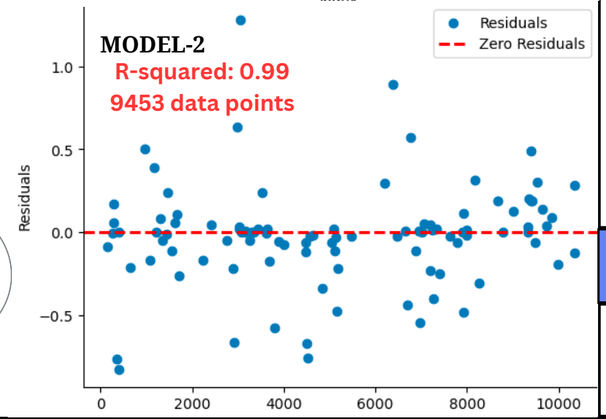
OBJECTIVE-2: Transferrin Saturation

- Transferrin is a protein in the blood with iron-binding sites.
- It is a percentage that represents how much iron is bound to those sites.
- Very low values indicate iron-deficiency anaemia, very high values indicate hemochromatosis.
- Considers laboratory values such as Iron Serum, UIBC and TIBC as input.

WORKFLOW & RESULTS

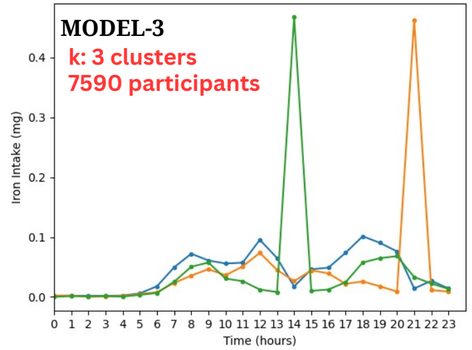






OBJECTIVE-3: Temporal Dietary Patterns

- Users will record their daily iron intake and the specific hour of consumption.
- Apply kernel k-means to cluster these 24-hour dietary records.
- Is there a pattern that yielded significantly higher iron intake? If so, which pattern? The goal is to recommend this pattern to users.



FUTURE WORK

- Considering other factors like age, comorbidities like diabetes, hypertension, etc
- Clinical Trials & deployment

DATASETS: NHANES, 80-20 train-test split.
API: USDA FoodData Central

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