

Introduction

- The incidence of iron deficiency (without anemia) in males is 2% (CDC statistics), as compared with 14% in females.
- Iron depletion is characterized by serum ferritin <20 ng/mL (1). Less than 40 ng/mL is associated with impaired performance.
- Iron deficiency anemia is characterized by hemoglobin values <13.5 g/dL.
- However, male distance runners and endurance athletes have increased iron losses due to excessive sweating, gastrointestinal bleeds, hematuria, and increased hemolysis due to foot strike (2).
- Iron deficiency, even with normal hemoglobin (Hb) values, may result in decreased athletic performance, decreased energetic efficiency with exercise, and increased muscle fatigue (3).

Iron Deficiency in Division III Male Cross Country Runners

S. Gervais, J. Walker, M. Campos, PhD, A. Olson, PhD

College of Saint Benedict and Saint John's University

Departments of Biology and Nutrition



Purpose

To determine the iron status of the male cross country running team at Saint John's University; to identify subjects who are iron deficient.



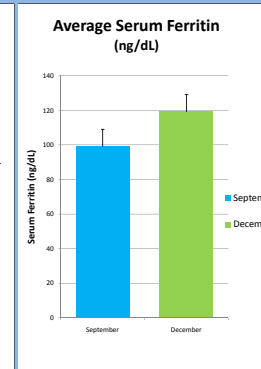
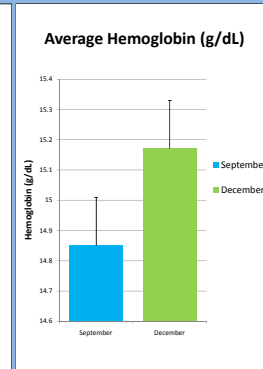
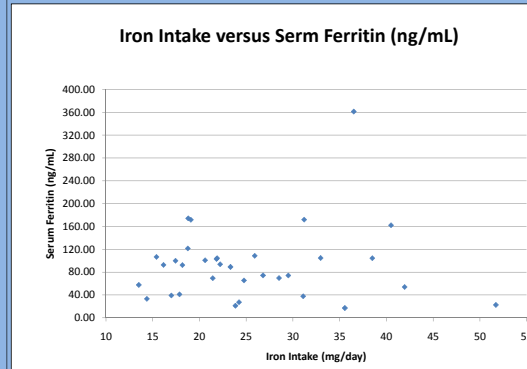
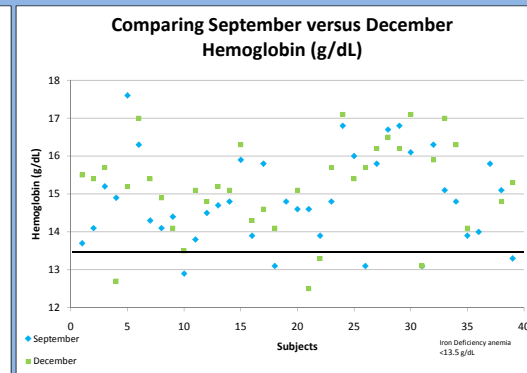
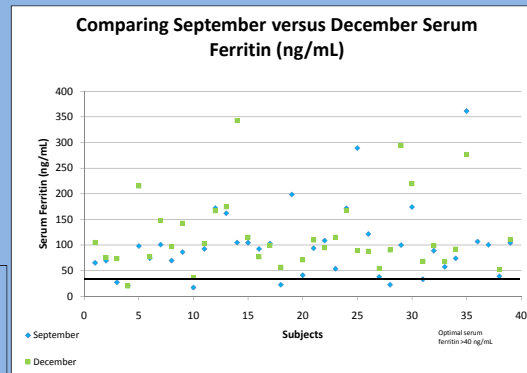
Results

- Average Serum ferritin values (ng/mL) for September were 99 ± 70 , and for December 126 ± 80
- Average hemoglobin values (g/dL) for September were 14.8 ± 1.2 , and for December were 15.2 ± 1.2 .
- Mean dietary iron intake (mg) was 25 ± 9 [AI is 8 mg]. All subjects had substantially higher iron intake than the AI.



Methods

- This study was approved by the Institutional Review Board of the College, and all subjects [n=37] signed informed consent forms.
- Initial blood samples were collected in September and again in December.
- Hemoglobin was measured using a HemoCue Whole Blood Hemoglobin System.
- Serum Ferritin was analyzed using CALBIOTECH Ferritin ELISA.
- Three day diet records were collected and analyzed using Diet Analysis Plus version 7.0.1.
- Subjects completed questionnaires to determine symptoms associated with iron deficiency; and supplement use.
- Subjects with low initial serum ferritin and hemoglobin levels were educated to improve their dietary sources of iron and to consider the use of a multivitamin supplement containing iron.



Conclusion

- The incidence of iron deficiency was 21.0% in this study, which is 10 times what we would expect for males in this age group; despite the fact that the subjects in this study had a substantially higher dietary intake of iron than what is considered adequate.
- For optimal performance, routine serum ferritin screening should be considered for all distance runners.

Acknowledgements

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References

- Fallon, K. (2004). *Clinical Journal of Sports Medicine*, 14:145-152.
- Peeling, P., Dawson, B., Goodman, C., Landers, G., Trinder, D. (2008). *European Journal of Applied Physiology*, 103: 381-91.
- Sinclair, L., Hinton, P. (2005). *Journal of the American Dietetic Association*, 105: 975-978.