Reviewer's report

Title: Polyphenolic compounds appear to limit the nutritional benefit of biofortified high iron black bean (Phaseolus vulgaris L.)

Version: Date: 2 December 2013

Reviewer: Visith Vhawasit

Reviewer's report:

Page/part/paragraph Comments
P1/ Front Appropriate title.
P2/ abstract/para 1 - It should be mentioned that bean is an affordable source of protein for developing countries.
- I don’t agree to use the term “high”. Normally, the term “high” is classified as nutrient claim which should be based on a standard level. The term “higher” may be more appropriate.
- What is the difference between “absorbable” and “bioavailable”? In this study, both terminologies were used.
P2/ abstract/para 2 - Iron in mg/kg # kg of what??
- Nothing mentioned on the other methods used.
- Check with the journal on the use of abbreviation for the 1st time in the article (should BW mentioned as body weight in the first time).
P2/ abstract/para 3 - From the result, ratio of phytate/Fe were not significant between 2 meals and total polyphenols of each line was not indicated. However, the discussion mentioned on significant effect of phenolic types. Therefore, not only level but type should be mentioned as well.
- The last sentence should not be mentioned.
P2/ abstract/para 4 - absorbable Fe?
- higher-Fe beans
- polyphenolics # polyphenolic compounds
- in vitro should be in italic.
P4/ introduction/para 1 - dietary iron additives =? Does it mean “supplementation”? 
- logistics and affordability problems should be mentioned since they are the reasons for biofortification.
P4/ introduction/para 2 - absorbable Fe?
- The term “high” should be used carefully as mentioned above.
P5/ introduction/para 2 - dry weight # dry basis
- The study with piglets is the best animal model which is comparable to human. Why did they have to do this study again?

P6/introduction/para 1 - in vivo

P6/mat. meth/para 3,4 - why don’t iron-free water such as reverse osmosis water is used?
- What is 18 omega water?

P7/mat.meth/para 3 - day 42nd
- 2-3 gr # 2-3 g
- 800C #80oC

P8/ mat.meth/para 2,3 - absorbance # absorbency
- Gallus gallus

P9/ mat.meth/para 1 - In vitro in italics
- Please check if the term “bioavailability” is appropriate. Should it be “bioaccessibility”?

P9/ mat.meth/para 4 - m/z =?
- Full terminology for UPLC/MS for the first mentioning-

P10/ mat.meth/para 1,3 - TM should be added as a superscript in many places such as Waters Metabolynx, Waters, MassLynx
- use # uses
- Full terminology for ESI
- 5/s # is there a unit?

Materials and Methods Overall, need references in certain parts

Results May I suggest to combine results with discussion, which will be easier to understand and did not need to repeat the numbers in the Tables.

Discussion - More discussion should be done on gene expression
- Number for day should be mentioned as 14th, 21st etc.
- Discussion on polyphenolic profile is good.
- Can the total phytate represent total phenolic compounds? Can we assume from the phenolic profile that the total values represent the total phenolic compounds? This is very important since the phytate/Fe ratios are not different in both meals. If the profile analysis can cover most of phenolic compounds, the total phenolic content should be reported in Table 4. Otherwise, the discussion should emphasize only on the profile but not content.
- Which kinds of phenolic compounds are the promoters of Fe uptake?
- Italics for in vitro and in vivo should be adjusted in many places.

Conclusion - CONCLUSION
- I don’t agree with the sentence “We conclude that ………………dietary staple.” It does not relate to the results.
Abbreviations - BE # BW
Acknowledgements Misspelling# ACKNOWLEDGEMENTS
References Check for italics of the scientific names.
Table 4 The numbers for Caffeic acid should be incorrect.
Overall Well-written and easy reading

Quality of written English: Acceptable

Statistical review: Yes, and I have assessed the statistics in my report.

Declaration of competing interests:
I declare that I have no competing interests.