Reviewer’s report

**Title:** Changes in body composition measured by mobile whole body MRI during a 4,486km transcontinental ultramarathon. Results from the TransEurope FootRace Project.

**Version:** 2  **Date:** 2 August 2012

**Reviewer:** Gregoire Millet

**Reviewer’s report:**

1. Is the question posed by the authors new and well defined?
   
   No, the study is mainly (too) descriptive and there isn’t any sound and relevant hypothesis.

2. Are the methods appropriate and well described, and are sufficient details provided to replicate the work?
   
   The methods (mobile whole body MRI) are of high quality.
   
   However, it seems that other relevant data to this topic (e.g. IMCL) are not included in the present study.
   
   This shows a wish to segment the data in a detrimental manner while crossing the various fields would strength the overall analysis.

3. Are the data sound and well controlled?
   
   The field setup led to some approximation in the quantification of the different volumes and the relative error is not provided.
   
   The weakest point is that there isn’t any quantification of the energy intake and nutritional plan. Therefore, the estimation of the energy balance is not possible and the reported changes in the different compartments cannot be explained.

4. Does the manuscript adhere to the relevant standards for reporting and data deposition?
   
   There are too many figures reporting single case data. Some other figures are not well explained.

5. Are the discussion and conclusions well balanced and adequately supported by the data?
   
   This is another weak point. The discussion is elusive, purely comparative with previous studies (most of them from the same research group) but the comparison with other ultra-endurance events (as cycling or triathlon) is not always appropriate.
   
   There aren’t any mechanisms suggested (due to the impossibility to report energy balance). Some topics as gender differences or effects on injuries that are not supported by the present results are (poorly) discussed.
6. Do the title and abstract accurately convey what has been found?
Yes, but since there aren’t any hypothesis, the title shows the descriptive nature of this study.

7. Is the writing acceptable?
The discussion is elusive and doesn’t show an overall coherence. The manuscript needs a proof reading.

- Major Compulsory Revisions
Provide data on the relative error and reproducibility for the quantification of the different volumes and tissues.
Provide clear hypotheses regarding your study that appears as exclusively descriptive.
Modify the discussion to discuss the most important results. The current discussion is very elusive. Beyond the exceptional setup of your data record, the novelty of your results remains unclear

- Minor Essential Revisions
P2 – Methods:
MR – not defined
MRI – not defined
T1, TSE – not defined
P2 – Results:
All abrev are not defined (TV, …)
P2 – conclusions:
Energy balance was not measured
The sentence “the relative amount…” is not supported by data reported in the abstract.
P3 – introduction:
Ref 1,2 – too many self-citations with many in low-quality journals. I would recommend you choose more wisely your references.
Mean age.. please provide SD.
P3 – Material and Methods:
Due to various reasons: please provide details.
Body fa = body fat
P4- Image post-processing
Please detail the error due to the absence of INF. How did you guarantee that this absence of INF?
Report the CV in % for all volumes, tissues and compartments.

P5
Why is the mean difference in TAT so important 8.13% when compared to other tissues??

P6 – Performance
P-value is mentioned twice.

P6 – Results – Casuistry
We don’t understand how the Figure 4 (a case report) shows that non-standardized position of the subject did not affect the validity and accuracy of your methods.

P8 – Finisher vs non-Finisher
Please provide a clear view of the respective number of F vs NF at the different measurements (also in Figure 16 and 17).

P 8 – discussion
I would suggest you reorganize your discussion for highlighting first your main results. The discussion on the validity of the methods should come later.

P9 – Ultra-endurance related to changes in body composition
Since you compare with other UM events, please provide explanations. It remains purely comparative
Which mechanisms might explain that “with defined breaks, body mass remains stable…”

P9 – Mass loss.
Similarly the comparison between UM running vs cycling or triathlon event is of interest only if you suggest some mechanisms for the differences.

P9 – Adipose tissue vs age/gender
This chapter is not relevant since 1. You don’t have the sample for such comparison ; 2. The discussion is vague and sometimes inappropriate (“obese patients” ?)

P10 – VAT
Again the discussion on the redistribution of adipose tissue for health-related problem is very vague and your data not appropriate for summarizing that “a very good and effective way… is endurance running”.. Where is the novelty of such statement? how did your results improve running-exercise prescription in such
patients ??

P10 – Metabolic changes
Again a lack of documentation of the energy intake would reduce your results to pure description.
please detail such optimization of running style in the UM events.

P11 - F vs NF
Most of the discussion here is on data either reported in your previous study or not reported at all. The influence of the bone tissue on the stress fracture or shin splints would be of high interest but your present data don’t enable such analysis.

P11 – Body composition and performance.
Here again, purely comparative with (self.cited) other UM events.

References
You should reduce the number by at least one third and reduce the self.citations.

Figures
The number should be reduced. For example, Fig 3, 4, 5 are not so interesting.
Provide the n in all figures for all sub-groups (e.g. F vs NF)

Quality of written English: Needs some language corrections before being published

Statistical review: Yes, but I do not feel adequately qualified to assess the statistics.