

Review of: "Cooling Beer With a Wet Paper Towel"

Liam Stanton¹

¹ California State University, San Jose

Potential competing interests: No potential competing interests to declare.

The authors present their work "Cooling Beer with a Wet Paper Towel", in which theoretical, computational and experimental methods are employed to answer the question: does beer cool faster when wrapped in a wet paper towel? The conclusion is that beer does indeed cool faster using this method, but to limited effect, and that air convection plays a far more significant role in cooling.

I thoroughly enjoyed this manuscript as a comprehensive investigation that combined the three pillars of science in a problem that is not only accessible for undergraduate research but whose conclusions are likely of great interest to many college students as well. I would also like to point out that the article is well-written and clearly edited prior to submission, which is always appreciated in the review process.

I do have some comments that I believe might improve this manuscript further.

1) My biggest confusion would be why the wrapped and unwrapped beers started at different temperatures, as one might expect this to contaminate the results. For example, if the wrapped beer is measured from the time it hits 70 degrees, the wet towel is likely much lower than that 20 minutes into the experiment. That is, what is really being measured now is the effect of wrapping a beer in a *cold* wet towel. Do the authors expect this difference to affect the results? Is there a reason why this choice was made and/or necessary?

2) In Figure 3, what is causing the advection to the left? Isn't this a "no-advection environment"? Does the fact there still appears to be advection affect any of the other conclusions?

3) While the details of the model are further expounded upon in the Supplement (which is somewhat hard to find on the Qeios website), it would be nice if the full model were described in the main document. Specifically, in addition to the heat equation, the domain and various boundary conditions applied would be useful to give the reader a complete picture.

Lastly, I have a few comments on format/typos:

- In paragraph 2 of the Introduction, it appears that one of the references is broken (right after "slows cooling").
- What is the ordering of the data in Table 1? It might be easier to digest the results if the data were presented in groups of conditions (e.g., all 3 wrapped then all 3 unwrapped) or, say, in terms of increasing/decreasing cooling times.
- There are some jagged lines in Figure 2. Are these numerical artifacts or actual experimental results?

- The first sentence of the Conclusions describes an “approachable approach”. Perhaps “attainable”, “reachable”, “obtainable”, etc. might sound better?