Dosing Donkeys: Replies to Comments

Comments are highlighted in yellow and our responses are highlighted in green to make it easier to read.

**Reviewer 1:**

Comment: “Yes, there was a very clear goal of providing a model that had better interpretability and accounted for proportionate adjustments. The conclusion provides two situations in which each of the two proposed models may be used. My only criticism would be to state your overall goals in the introduction rather than at the end of section 2 which discusses previous work to make it clearer/more digestible for someone that may be skimming your work. “

Response: Thanks for the helpful suggestion! We previously had a sentence discussing our goals in the introduction, but your comment made us realize it wasn’t super clear/explicit. We’ve changed the structure of the introduction a bit to incorporate the goals in a more concise way.

Comment: “Yes, plenty of equations along with their rationale and specific tests are provided to give the reader a clear understanding of the exact steps that the authors took. The subsections are clearly labeled and follow a logical order that guides the reader through a natural flow of the analysis.”

Response: Thank you!

Comment: “Yes, the two models discussed in the conclusion are given a discussion about which may be more appropriate to use in a situation. The authors also aimed to provide better interpretability with comparable performance to the Milner and Rougier model and discussed the relative error of their models with a table of Beta values with their confidence intervals.”

Response: Thank you! We are glad that made sense!

Comment: “All of the tables help illustrate important points that the authors discuss in the paper and validate results or confirm findings. Though the authors are limited by the page length, I would suggest adding a plot with a graphical representation of the author’s loss function overlaid so that readers can compare it with what was presented in Milner and Rougier. I would also argue for removing Figure 1 which shows the log transformations; this was a preliminary check and was not necessary to include; the Appendix may have been a more appropriate place. I would have also liked captions on the plots; the tables don’t really need captions but for people that are skimming the paper, captions on plots would bring out the main takeaways from those diagrams.”

Response: Thank you for the feedback! We did not overlay our loss function with the paper’s since their loss function is on relative error whereas ours is on the log scale. We also decided to keep Figure 1 because we felt that it would be nice for the reader to visually confirm that our model was promising and that it didn’t violate assumptions.

Comment: “Yes, there was a substantial discussion of how the authors validated their work. They used cross validation on their final model to evaluate performance. They also discussed appropriateness of a linear model and provided a plot to support their claims. They also discussed normality of residuals and constant variance assumptions and conducted a Breusch-Pagan test to confirm whether their model violated any assumptions. They’ve also conducted sensitivity analysis for height. Though the authors have discussed how sensitive the predictions can be for changes in beta, I would have liked to see a graphical interpretation of this or some sort of table illustrating this.”

Response:

Comment: “There were quite a few functions that I didn’t automatically have and had to figure out what packages to install (pracmath, olsrr, lmtest). I also had considerable trouble using the paranomo package that Milner and Rougier provided; I would exclude that package in the code and load in the data differently because it took a bit of time to figure out that I wasn’t going to get it to work.”

Response: These are good things to note- we fixed our code to use the donkeys.Rda file as opposed to the paranomo package.

Comment: “Yes, the flow of the paper is very easy to follow and there are sufficient subheaders that it makes it easy to understand. The paper is generally free of typos and grammatical errors and easy to read.”

Response: This is good feedback for us and good to hear!

Comment: “The authors discussed how this model provides better results than Mliner and Rougier and has several disadvantages including interpretability of coefficients, interpretability of intercept, and applies proportional adjustments for BCS and Age. They discussed their limitations of not knowing the exact loss function used in Milner and Rougier and how predictions could be improved if this were known. I would have liked more discussion of limitations of their approach in the field (Shiny app vs. nomogram).”

Response: Thanks for this feedback. We have now hosted our Shiny App so that it is accessible on mobile devices. We added a discussion addressing the convenience and simplicity of our app in the last paragraph.

Comment: “Would it be possible to remove the colored boxes used as links to the figures? I found this to be a bit distracting and it may be better to underline in a different color instead.”

Response:

Comment: “Did you consider recoding the age variable like Milner and Rougier to reduce the number of levels?”

Response: This is a great point and something we haven’t really considered in our first draft. We ended up recoding the Age variable and binning all donkeys above the age of 5 together.

Comment: “Why did you choose to define relative error differently?”

Response: We felt that predicted/actual makes more sense than actual/predicted. Predicted/actual gives you an idea of how well your model perform proportionally. Actual/predicted is the flipped interpretation and is less intuitive.

**Reviewer 2:**

Comment: “The case study is pretty clear in articulating the research goals. They could write a little more on the background motivating the problem. I think they could have also highlighted that comparison to Model 1 (the Milner and Rougier model) was also one of their goals, but their overall focus of optimizing and validating a model is stated and evaluated clearly. If I’m being nitpicky then a sentence clearly stating that the goal of the case study is “…” would have really solidified the objective overall.”

Response: Thanks for this comment! We added more to the introduction and restated our sentence to make it more clear that we would be discussing Model 1. We also reformatted our sentence to make our goals more clear.

Comment:

Overall, the analyses match the research questions and available data. Through the analyses, they identify important variables in estimating donkey weight, validate the model, and generate a tool (the Shiny App) for prediction of donkey weight. As I was reading through the paper, I had the following comments on the analyses:

Pros:

1. Do a good job of explaining issues with the previous model and motivating certain choices for the formulation of a new model (eg., proportionate adjustments for AGE and BCS)
2. Good comparisons to Model 1 (the MR model) throughout the paper
3. The Approach does a good job explaining how exactly you will validate the identified model
4. Effective preliminary checks to see if log transformation of variables affects the linearity relationship between variables

Cons:

1. What does applying the model mean? The preliminary checks section could do a better job to explain how this is relevant to the model being promising.
2. Having an output giving the MSE and mean relative squared error in section 4.3 (or how you calculated it) could be potentially useful Also is an MSE of 87.5 considered high? The report could do a better job of explaining the relevance of these statistics.
3. What do model diagnostics do? Including a sentence to explain the relevance of model diagnostics to validate your model in the results section could be useful (Edit: I see that there is a section in the discussion, but I still think adding a sentence in the result/more information in the caption could be clearer)
4. I think interpretation of beta values could do better in actually explaining what the beta coefficients mean to vets in the field since this case study is meant to be accessible to them

Response:

1. Thank you for such a detailed response! We realize “applying” the model may have been a big unclear and have clarified what we mean in that section. We added additional discussion in the preliminary checks section, including discussions about binning through looking at VIF to check multicollinearity.
2. To do
3. To do
4. We’re glad you brought this up- we have rewritten this section to address this!

Comment: “I think most of the methods are described in enough detail, but some parts of the methods section are lacking in clarity. Just reading section 4.5, I don’t fully understand what they did to generate table 2. Additionally, It would have been helpful if they had shown the equation/visualized the asymmetric loss function in some way. It is clear what approach and model were used to evaluate the hypothesis. I think including and Approach section gave a useful roadmap for how they were approaching their analyses.”

Response: We have modified our Section 4, so hopefully our methods are more clear now! We have added a visualization of the asymmetric loss function- thanks for bringing that up!

Comment: “I think the report includes a correct interpretation of results provided. Regarding effectiveness, I had some questions about how they defined interpretability (included in 2 and 10). My main clarity issues were in section 5.1. Overall, they did a really good job presenting and explaining their findings. Sensitivity analyses helped substantiate their conclusions. They included confidence intervals and p-values for their coefficients which was helpful.”

Response: Addressed in above response, but we have modified our sections discussing interpretability. Glad to hear our tables and sensitivity analysis was helpful!

Comment: “All tables and figures are clear. I do not think any need to be eliminated/new ones are needed, but I do think that figure captions should be more informative and titles should be on graphs, to stay consistent with general scientific writing. Right now, the captions do not give much information on what we can actually discern from the figures.”

Response: Todo

Comment: “The model is appropriately and thoroughly validated (through k-fold cross validation, predicted vs. actual plots, loss analysis, etc.) They went above and beyond to check model assumptions and confirm that they are valid (like using the Breusch-Pagan test). They conducted sensitivity analysis to check the model against other models to validate that their predictors were important. I do not think they needed any more validation.”

Response: Great!