Dear Dr. Dini,

Thank you for giving me the opportunity to submit a revised draft of our manuscript titled “**Lactation performances in primiparous Holstein cows following short and normal gestation lengths**” to FRONTIERS. We appreciate the time and effort that you and the reviewers have dedicated to providing your valuable feedbacks on our manuscript. We have been able to incorporate changes to reflect most of the suggestions provided by the reviewers. We have highlighted the changes within the manuscript. Here is a point-by-point response to the reviewers’ comments and concerns.

Sincerely,

Monica probo,

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**Reviewer 1**

**Comment 1:** I failed to find the originality of this paper. As you mentioned in the Introduction section, the effect of GL on lactation performance has well been investigated. In L77, you described "To the best of our knowledge, the effect of a very short gestation on lactation performances in cows is unknown", but what is new and valid in this research, and how do you think the knowledge obtained in this study should be used? Current statement in the Introduction section does not meet the criteria for original research. The authors fail to point out clearly how the results from this study will add significantly to the current knowledge pertaining to the topics at hand.

**Response**: First of all, thanks for raising this concern. However, common scientific literature benefits not only by papers bringing entirely novel insights. Papers like ours confirming older literature while Holstein genetics have markedly changed is valuable for science and the dairy industry. Upon your suggestion we have added some of these to the introduction.

**Comment 2:** What is the difference between the definition of Short GL and Abortion? How producers distinguish? Please add the definition.

**Response:** Our definition was purely based on gestation length and didn’t take into account observations from the calves perspective. When taking into account abort or born dead events from producers, case definitions would a/. influence our results and b/. heavily limit the amount of observed records as not all producers records these events meticulously.

Furthermore, the paper originally started from observations where Dutch Dairy farms would argue cows had calved after short days pregnant with subsequent normal lactation performance to avoid specific federal restrictions. We decided to not put this in the paper to avoid political (mis)usage of the paper.

**Comment 3:** I wonder that can you use aborted cows/extreme short GL cows for lactating? How do producers make decisions if this cow can lactate or not?

**Response:** This is an interesting question and perfectly fits with the aim of the paper as science has no idea on this. Our paper underlines that real-world farmers are actually trying to milk them even in case we did not expect cows to produce milk (very short GL sometimes).

**Comment 4:** I am in doubt about the soundness of GL's classification criteria. At first, this study excluded the records of GL longer than 283 d. This group must be included in this study. Next, this study used 0-1%, 1-5%, 5-25% and 25-75%, but this criterion would result in a large variation in the number of samples in each GL group. There was no description of the number of samples in each GL group, but authors should reconsider this point.

**Response:** We have added the number of samples per group. The low number is reflected in larger SE in table 1 for these categories. The lower limit of 283 days represent the 75-100% percentile as this group would mainly reflect missing or erroneous recordings of the insemination dates which was not the main goal of this paper.

**Comment 5:** No description was found regarding farm management such as number of milling per day, milking system, grazing system, pregnancy diagnosis and calving management.

**Response:** Using the MmmooOgle system no information on milking system, number of milkings, nor type of grazing system was available. Pregnancy diagnoses were available and used in the manuscript. Calving management was available for part of the herds but not all, hence ignored.

**Comment 6:** Lactation curve in each GL group should be provided as Figure.

**Response:** We add the individual lactation curves to the manuscript in Figure 2.

**Comment 7:** No perspectives for use or relevance of the results are presented in Discussion section. The authors fail to point out clearly how the results from this study will add significantly to the current knowledge pertaining to the topics at hand. The authors should mention about what you found from the experiment.

**Response**: We add some conclusion in the text especially on the decision making perspective for farmers when dealing with heifers’ short gestation length/abortion.

**Reviewer 3**

The manuscript presents a study related to lactation performance in Holstein primiparous cows depending on gestation length. Below you will find my recommendations, after the review:

**Comment 1:** L 31-37, I recommend rewriting the sentences with general information, introducing exactly the results obtained. The conclusion must be as succinct as possible.

**Response:** Modified as suggested by the reviewer

**Comment 2:** Improvements are needed at the introduction.

**Response**: Introduction was modified as suggested below by both reviewers

**Comment 3:** L 41 I think that the term "Looking at the literature" should be changed to "according to...", Although the authors mention the role of α-lactalbumin, I would prefer to include more information related to hormonal physiology (Mammogenesis, lactopoiesis) regarding the preparation, initiation and maintenance of lactation, such as the role of the hormone Prolactin, (and others).

**Response:** L 41 was changed as requested. Introduction was modified as suggested by the reviewer

**Comment 4:** L 89. "one dataset" - to specify which one.

Response: corrected.

**Comment 5:** In subsection 2.2. I recommend simplifying and clarifying the definitions, terminology and formulas with an update to the information in the legend. However, the exact size of C I-IV experimental groups/categories, the number of farms with their distribution by region, eventually, their age in relation to C I-IV must be included here.

**Response:** Region was not available as data was anonymized according to GDPR guidelines. The exact number of lactations in each category was added to Table 1. Furthermore the model corrected for age at first calving, there effect, although not the focus of this study is shown in the online repository on GitHub. This is mentioned in the materials and methods.

**Comment 6:** L 117-120 should be included in the Material and method category, not here in the Results. It should be mentioned what were the inclusion / exclusion criteria of the cow herds from the study (100 vs 94)

**Response:** L 117-120 are now moved to the material and methods section. The inclusion / exclusion criteria of the cow were added.

**Comment 7:** At point 3.2. it is necessary to use the results expressed in percentages, not only the number of animals.

**Response:** The percentages were added as suggested

**Comment 8:** The manuscript needs to be rewritten according to the technical editing norms specific to the FVS journal (pay attention to the way of citation).

**Response:** Manuscript is now formatted according to guidelines; thanks for reporting

**Comment 9:** The bibliographic references seem to be old, although we have to maintain a balance between old and recent publications, I believe that the authors are obliged to consult and cite more references from the last 3--5 years, especially in this field in continuous progress.

**Response:** We agree with the reviewer, as the literature regarding this topic seems to be quite dated by now, except for some very recent research (last 5 years). Two new references of Norman et al (2011) and Jenkins (2016) were added. We also referred to the review from Akers RM (2017), searching for some more recent literature, but with no success. If the reviewer has some specific reference to suggest, we would be thankful and keen to add them to the paper.