Review of: "Incidence risk of major reproductive disorders of dairy cows and cow-level risk factors in Wolaita Sodo town, southern Ethiopia"

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This is a really interesting study on reproductive disorders in dairy cattle in Ethiopia. I completely agree with Hirpassa, Mekibib and Abebe about the importance of improving dairy farming management practices, such as proper feeding of cows, considering the size of sire and dam while using AI or natural mating, closer monitoring of pregnancies in larger farms and observing cows during the postpartum period. The manuscript has been written really well and and the tables are relevant and easy to read.

However, there are a few points regarding internal and external validity that need addressed. In no particular order:

1. The authors report that 74 (52.86%) [of the cows] had at least one of the reproductive problems identified during the study period. Table 1, however, shows that in total 74 new cases of any of the diseases have been reported. I guess that there have been a number of cows that have had more than one disease, so the number of cows with at least one reproductive problem must have been lower.

2. The authors use an incidence risk as a measure of morbidity. This measure becomes problematic, when the observation time and the cow's risk of disease is different between the different subjects (cows). In the study, all pregnant cows on the selected dairy farms scheduled to calve during the study period were enrolled in the study and assessed for reproductive health disorders every two weeks until the end of the study. Therefore, the start of follow-up for each cow has been at very different stages of pregnancy and the end at very different stages post partum. Cows that have been followed up from early pregnancy, for example, have a much higher risk of having an abortion during follow-up. Unfortunately, this is quite a complicated problem, where some sort of survival analysis might help for diseases that can occur over a longer period at risk, while those with a short period at risk (e.g., dystocia) could be defined as number of cases per calving (excluding cows that have aborted). Use a lactational incidence risk for diseases post parturition for any cow that calved and had been observed throughout the first part of lactation?

3. Some of the tables are a bit problematic to read. Table 1 holds 126 and 140 cows at risk - what happened to the 14 cows for some of the disorders? If they were lost to follow-up, this might have implications. Table 2 shows that 'natural breeding method' had a 0.4 times lower RR, while the Incidence risk was higher than AI. Table 3 shows a RR for poor BCS of 9.9 (3.0,2.5) - this CI is impossible. The authors might want to check all the tables for entry errors.

4. I am not entirely sure about some of the case definitions. Did the authors discuss with the livestock holders definitions of, for example, dystocia? It might mean different things for the reader of the manuscript, so an incidence risk of 13.5% is very complicated to interpret.

5. Similarly, some of the definitions or risk factors are a bit unclear. For example, average milk yield/day needs a time period - average over what period during lactation?

6. Ideally, the statistical analysis needs to take into account that the incidence of disease in cows of the same herd are correlated (multi-level analysis). STATA will have methods to adjust for that correlation.

7. The discussion rightly points to difference in management system, study design, sample size, animal breed, and environmental conditions prevailing in the study areas when comparing the study results to other studies. Would it be possible to dig a bit deeper into those differences? For example, what 'environmental conditions' in other studies would effect the incidence of disease? Why would sample size effect the incidence of disease?

8. The manuscript very nicely describes the study population, I especially like the description of the study area. The authors rightly are careful to define the target population as 'all cows on dairy farms in the town of Wolaita Sodo', for which the study population is a reasonable sample. I wonder, however, if and how the results could be extrapolated to the wider population (say, to the cattle population of South Ethiopia Regional State).

9. The acronym RR (relative risk / risk ratio) should be spelled out at the first usage.

10. In sample size section – provide final sample size?

11. Questionnaire ethics – were participants identifiable or anonymous?

12. Results – risk of metritis 6.4 times higher in multiparous cows in the abstract, but 6.4 times higher in heifers in results section?