



Impact of gut bacteria in puberty



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Introduction



- Exposure to an immune challenge during puberty can have enduring effects on brain function and behavior.¹
- Although the mechanism is unknown, there are age and sex differences in immune response.
- A possible mechanism could be the gut microbiome because it is an important biological system that exerts a strong influence on immune and stress responses.

The objective of this study is to examine the effect of sex (male or female), immune challenge (LPS or saline) and the probiotic treatment (kefir or skim milk) on changes to sickness behaviour and gut microbial composition.

We predict that the administration of the LPS will increase the presence of harmful intestinal bacteria in the gut, but probiotic administration will decrease the change in microbial composition, serving as a protective factor.

Methods



Sex

Immune stressor

Probiotic

Male

Female

LPS

Saline (control)

Kefir

Milk (control)

1

Figure 1. Factorial plans in three criteria of classification. The sex (male or female), the immune stressor (LPS or saline) and the probiotic (kefir or skim milk) are three factors presenting each two levels.

3 weeks

5 weeks

6 weeks

7 weeks

10 week

Data collection

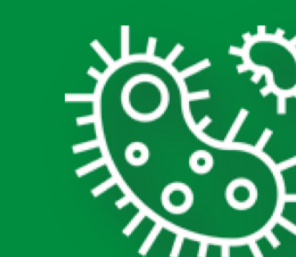
2

Arrival of the mice. Exposure to probiotics. Exposure to probiotics. Exposure to probiotics. 1 fecal sample. DNA extraction (16s).

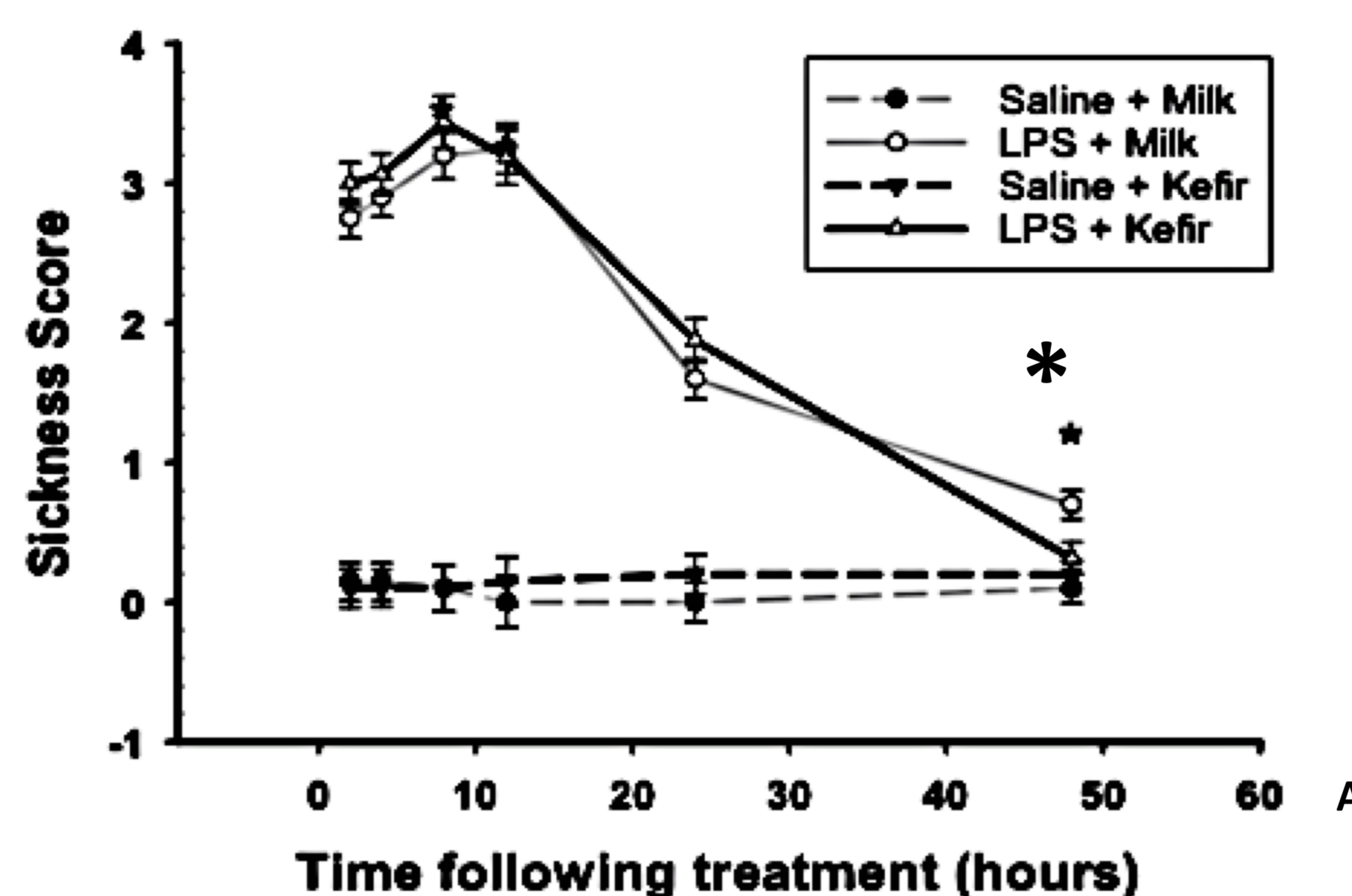
Exposure to probiotics. Administration of the immune stressor. 1 fecal sample. 2 fecal samples.

Figure 2. Timeline from the beginning to the end of the study.

Results



Sickness Score in milk or kefir exposed males following saline or LPS treatment



Sickness Score in milk or kefir exposed females following saline or LPS treatment

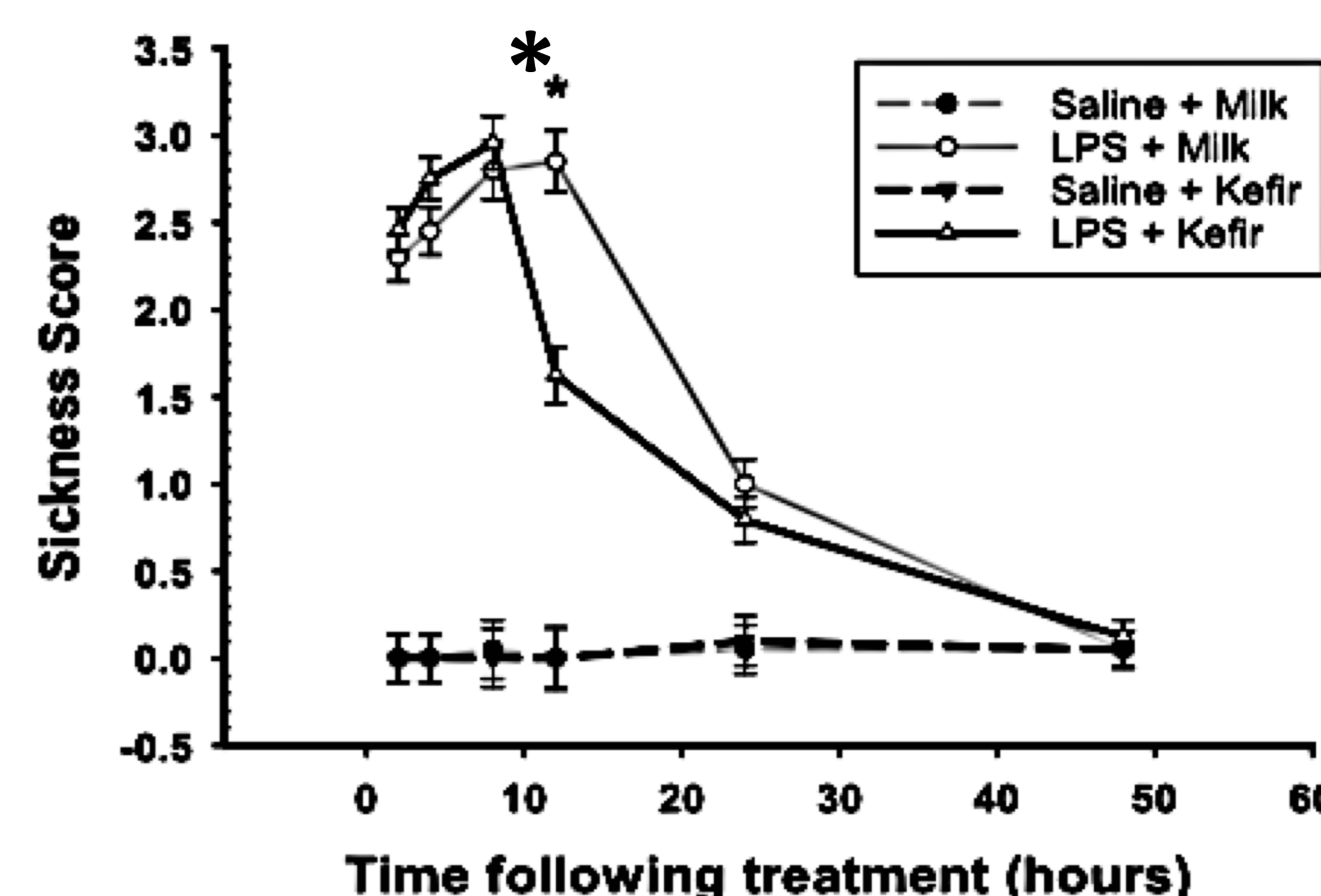


Figure 3. A) Our results show that male mice treated with LPS, and exposed to skim milk, showed significantly more sickness than LPS-treated mice exposed to kefir. B) Female mice treated with LPS and exposed to skim milk showed significantly more sickness than mice treated with LPS and exposed to kefir. The asterisks * present significant treatment differences.

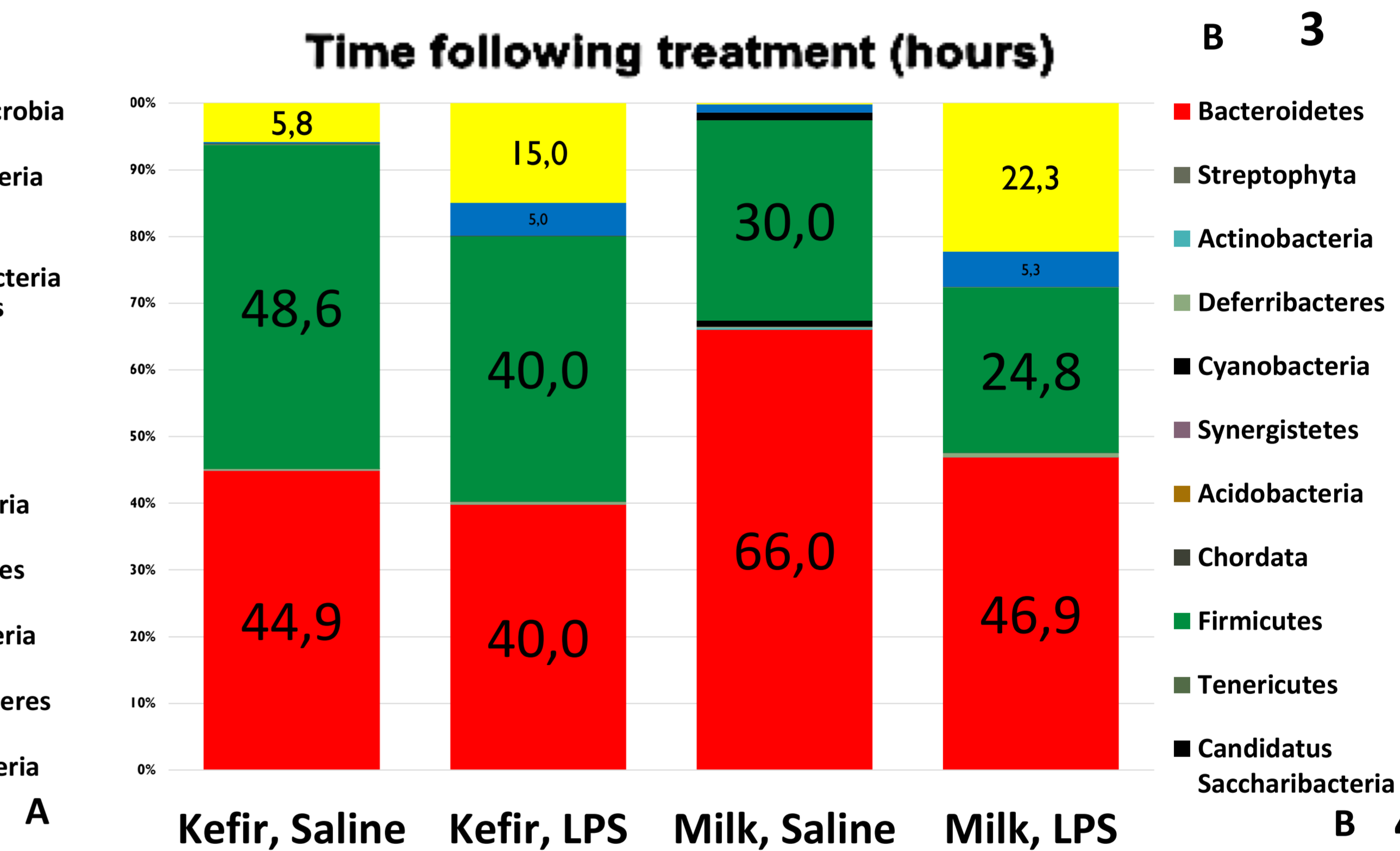
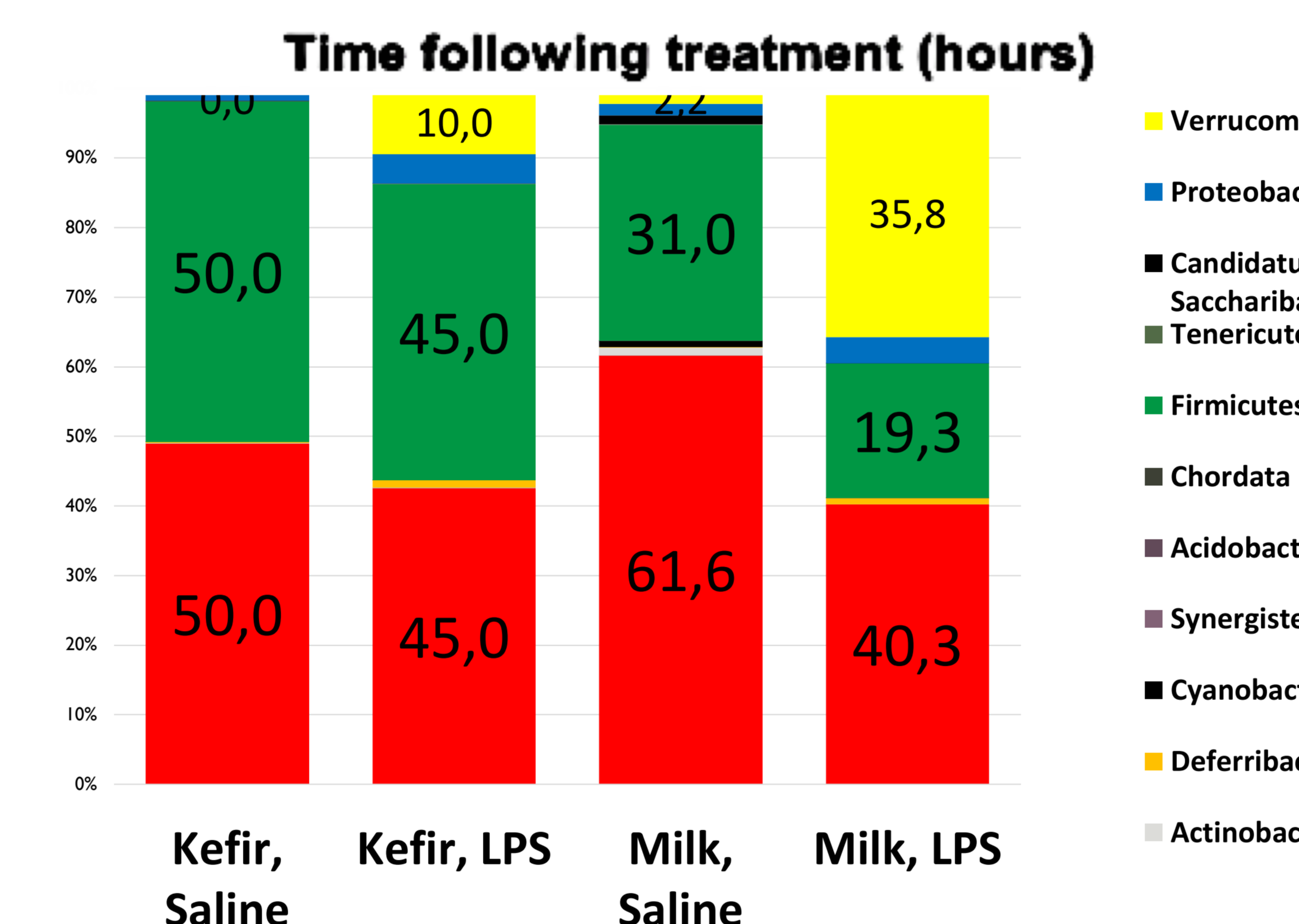


Figure 4. A) Male mice B) Female mice. Kefir will cause the gut microbial to be more protected so less changes after LPS. Kefir will increase the bacteria Firmicutes because lactobacillus in the kefir is part of these bacteria family.

Conclusion



The administration of the LPS leads a considerable increase of the presence of harmful bacteria. However, consumption of kefir speeds up recovering from sickness in a time specific manner and has a protective effect on the gut microbial composition.

These findings provide a better understanding of the mechanism involved in LPS-induced sickness and depression-like behavior and suggest a potential preventative approach.

After all, as so well said it Hippocrates, "All the diseases begin in the gut".

Reference

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