



College of
Veterinary Medicine
University of Missouri

Canine microbiota fluctuation during boarding



Veterinary Research
Scholars Program
University of Missouri

Jessica A. Issleib, Aaron C. Ericsson, Craig L. Franklin
Department of Veterinary Pathobiology and MU Metagenomics Center,
College of Veterinary Medicine, University of Missouri, Columbia, MO

Background:

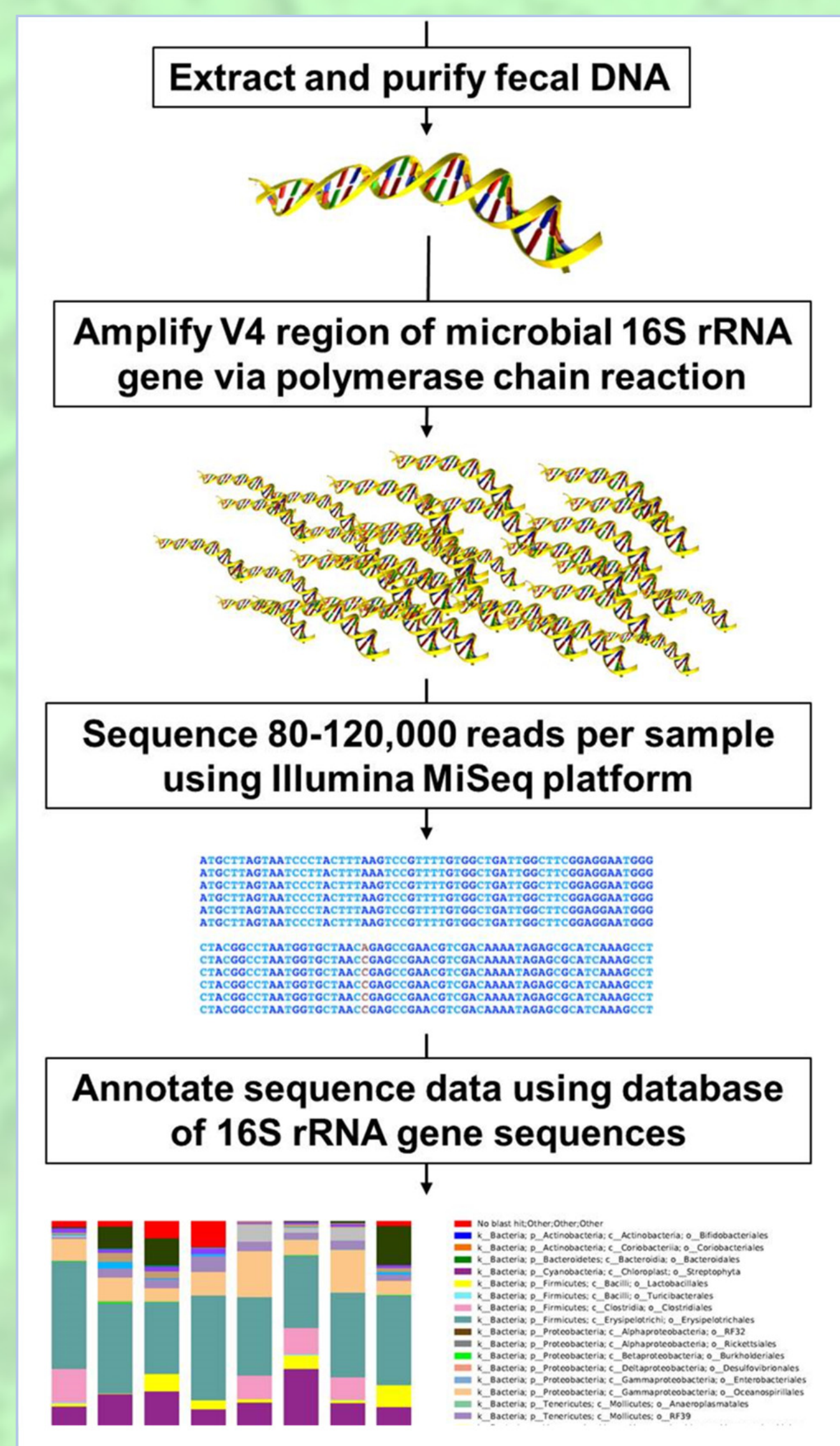
- Thirty million dog owners board their dogs in kennels or veterinary clinics each year.
- While canine microbiota changes have been characterized in certain diseases, it is unknown if changes in daily routine alter microbiota.

Objective:

- This is an observational study seeking to understand changes occurring in the canine fecal microbiota during boarding, and if these changes correlate with stool consistency, behavior, or diet.

Methods:

- Owners completed a pre-boarding questionnaire detailing dog's temperament, anxiety level, boarding history, diet, etc.
- Fecal samples were collected each day the dog was boarded, and an additional questionnaire stating eating habits, behavior and health changes was completed.
- DNA was extracted and processed for microbiota analysis as outlined below:



Results:

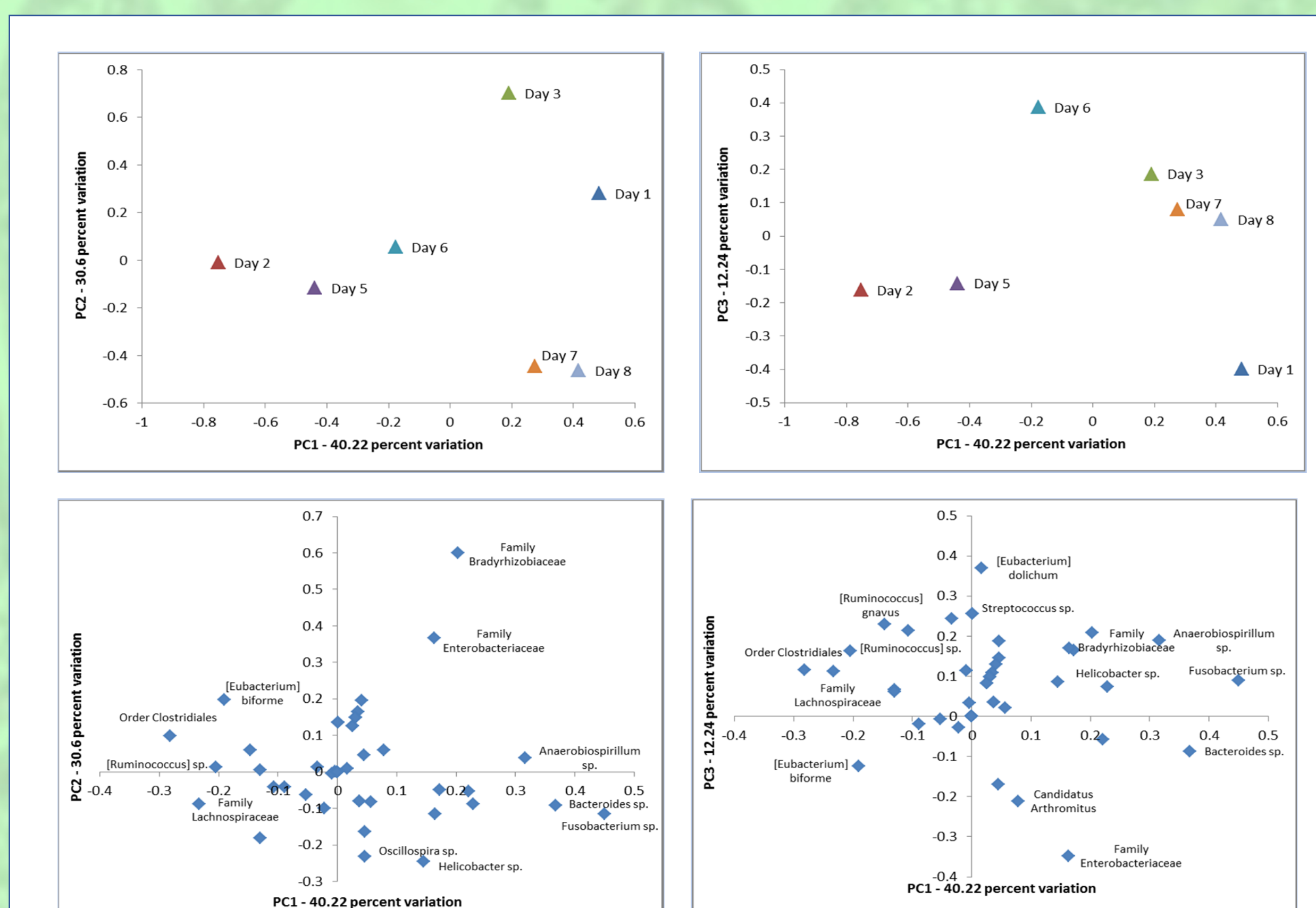
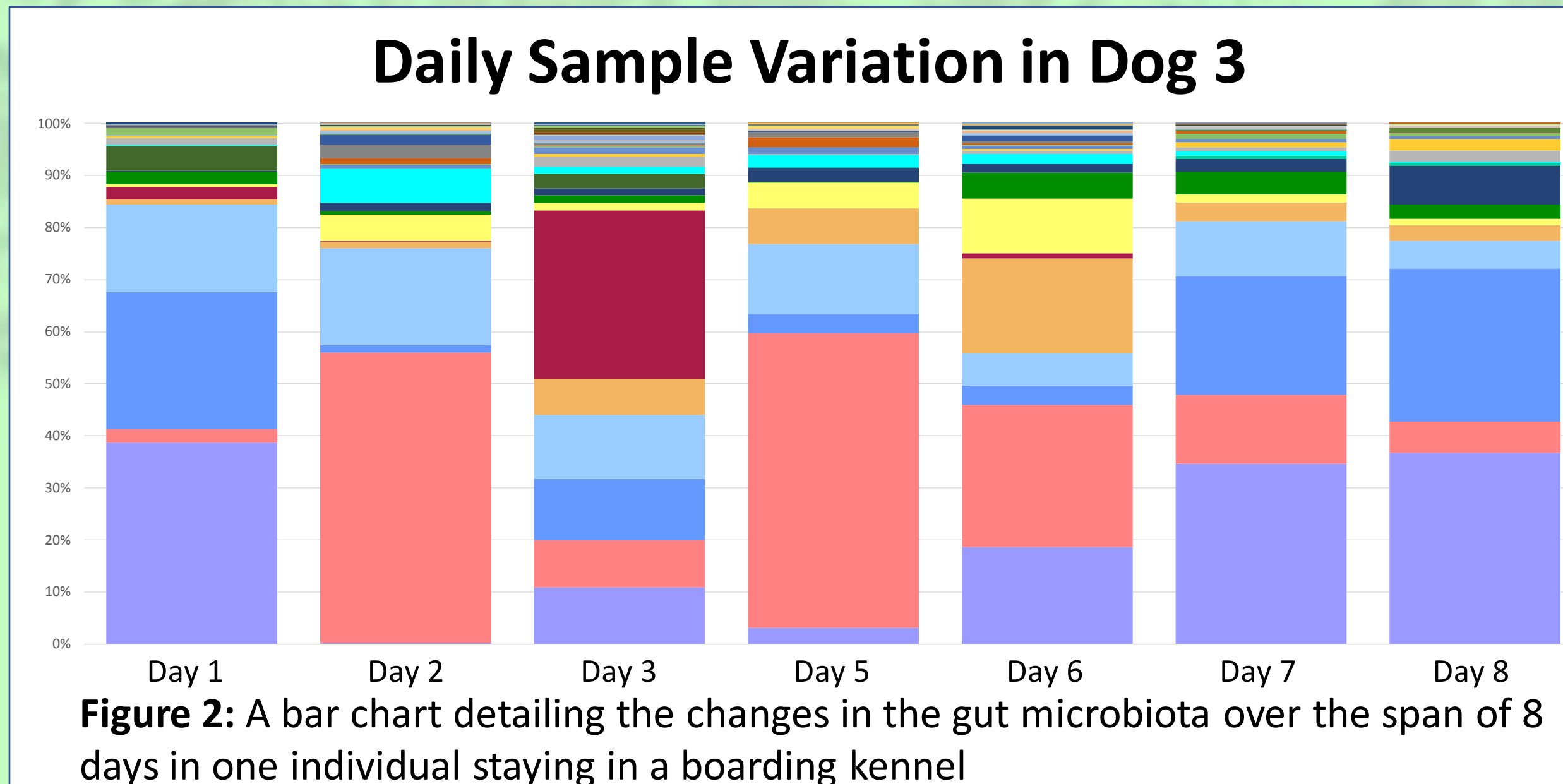
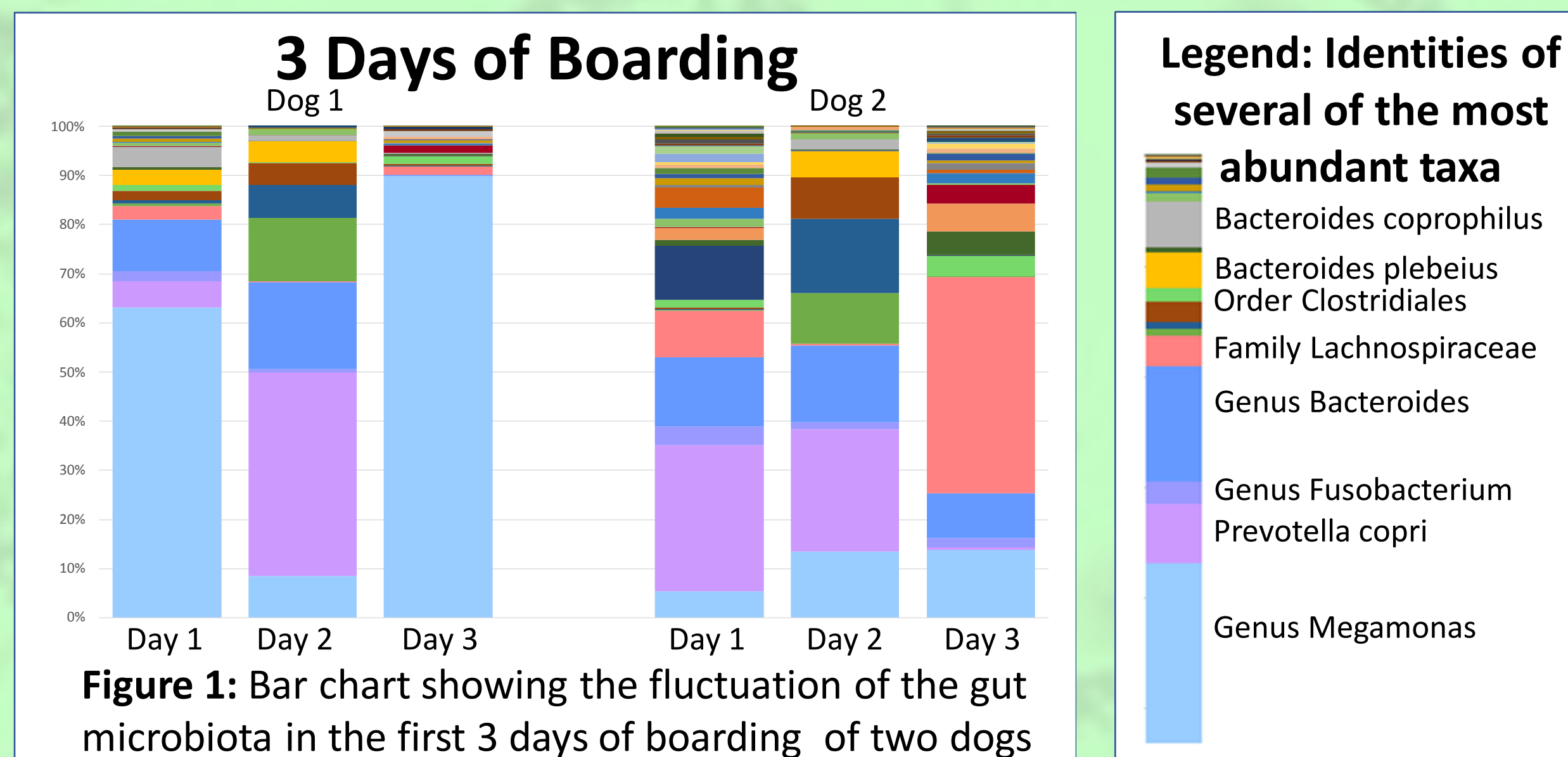


Figure 3: Principal Components Analysis of samples from Dog 3. The days in the top two panels (score plots) represent when the samples were taken, and the proximity of the points signify similarity of microbiota. The labeled points in the bottom two panels (loading plots) are bacteria contributing most to the variation in the samples.



Conclusion:

- Microbiota composition changed during boarding.
- Microbiota of one dog (dog 3) changed acutely and returned to that closely resembling the 'control' state (Day 1) at approximately Day 7 (Figure 2).
- Dog 3 was fed the same diet while boarding, suggesting that this factor can be ruled out as a confounding variable, lending support to the stress of a change in routine being the culprit of acute alteration of the microbiota.

Future Avenues of Study:

- Assess other changes in routine that alter the microbiota: moving, traveling, introducing a new pet to the household, etc.
- Assess the stability of the microbiota on a day-to-day basis when the routine remains constant.
- Assess whether larger, more stressful events (i.e. moving) take a greater amount of time for the microbiota to return back to pre-event status.
- Assess if administering prebiotics before boarding results in a dampened alteration of the microbiota.
- Utilize results of questionnaires once more samples have been collected to analyze role of temperament.

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