Bee local: A comparison of productivity and pathogen load in local vs. California re-queened colonies.

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The question:

“Do locally-bred queens produce healthier, more productive colonies that are better adapted to their environment than imported queens?”

The basic premise behind this study

Mass Produced:

VS.

Hand-made:

The basic premise behind this study

Imported:

VS.

Local:

Experimental Design

- 20 colonies re-queened with Californian-bred queens
- 20 colonies re-queened local-bred (Vermont) queens
- Sampled for pathogens and productivity measures
- Sampled at different time points for 3 months

What did we sample for?

- Growth:
    - Colony Mass
    - Brood Production
- Foraging:
    - Pollen Production
- Pathogens:
    - Varroa
    - *Nosema spp.*
    - RNA Viruses

Honey Bee Pathogens:

- VIRUSES:
  - *Deformed Wing Virus (DWV)*
  - *Black Queen Cell Virus (BQCV)*
  - *Israeli Acute Paralysis Virus (IAPV)*

Deformed wing Virus
University of Florida,
Entomology Dept.

- PARASITES:
  - *Nosema (ceranae & apis)*
  - *Varroa Mite*

Varroa destructor
North Carolina State University,
Cooperative Extension

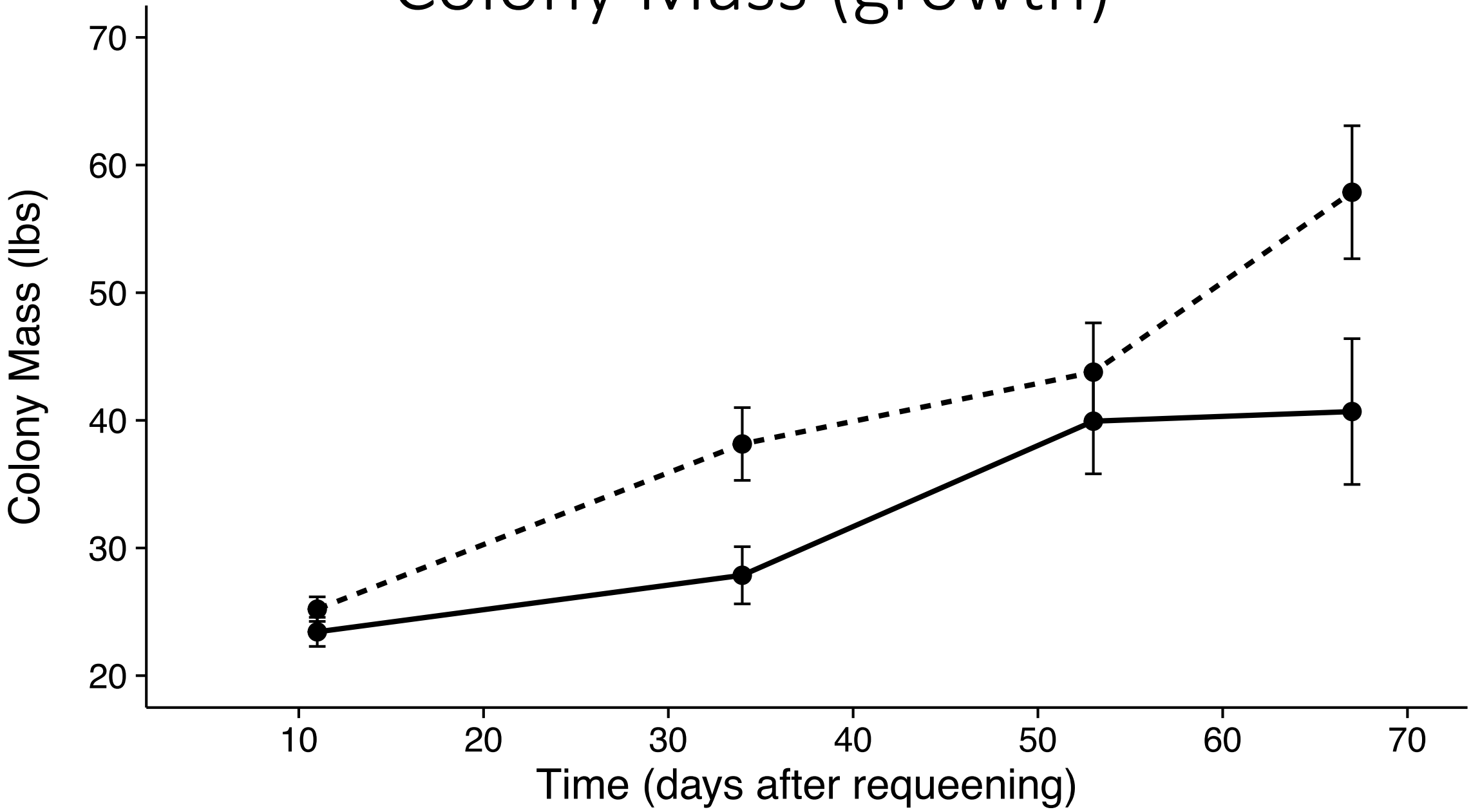
- OTHER PATHOGENS & Pests:
  - *American Foulbrood (AFB)*
  - *European Foulbrood (EFB)*
  - *Chalk Brood*
  - *Black shiny bee*
  - *Small Hive Beetle*

American Foulbrood
Bee Informed Partnership

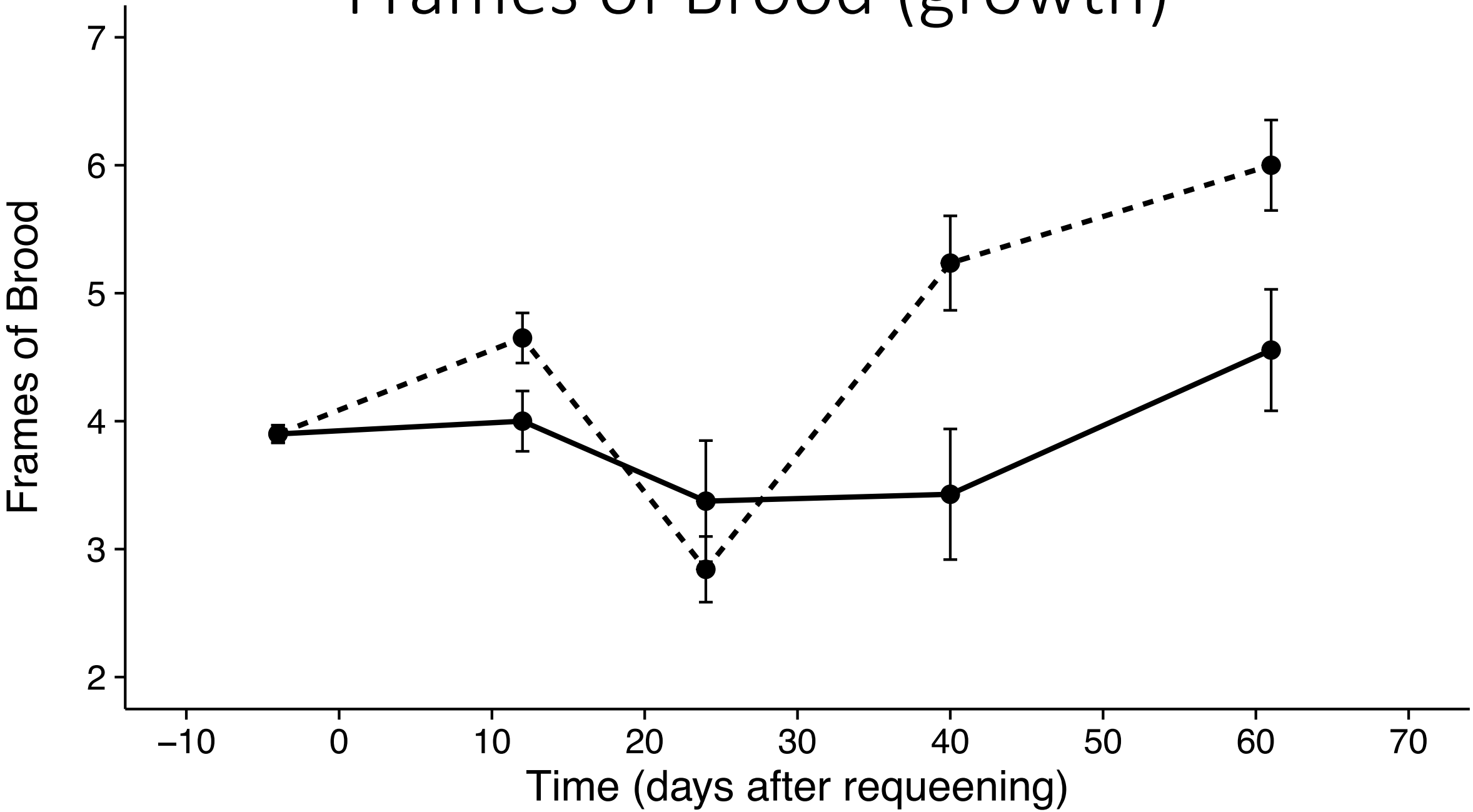
Our Hypotheses:

- Local queens (colonies) will have better growth through the season
- Local queens will be better foragers
- Local queens (colonies) will have lower pathogen loads

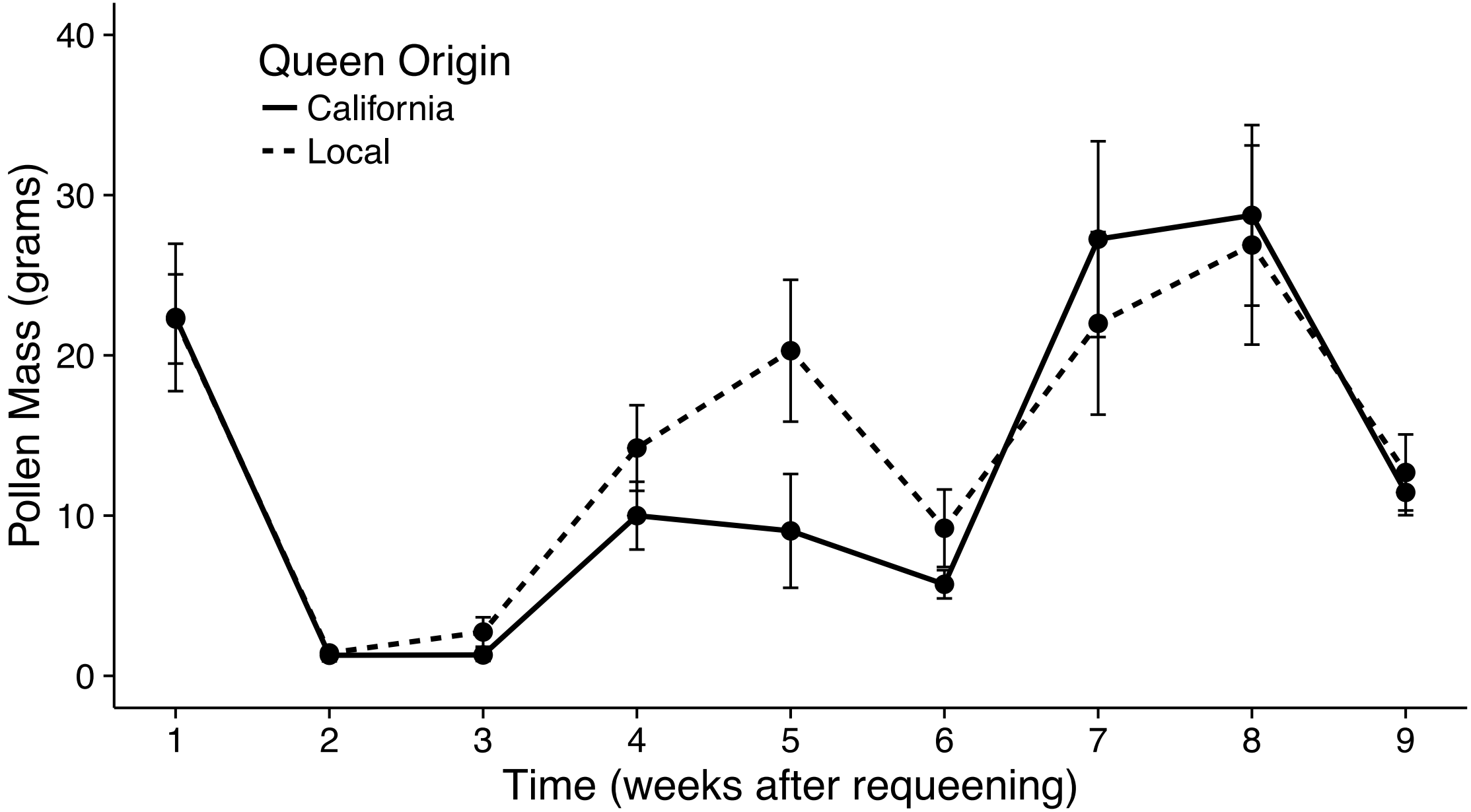
Colony Mass (growth)



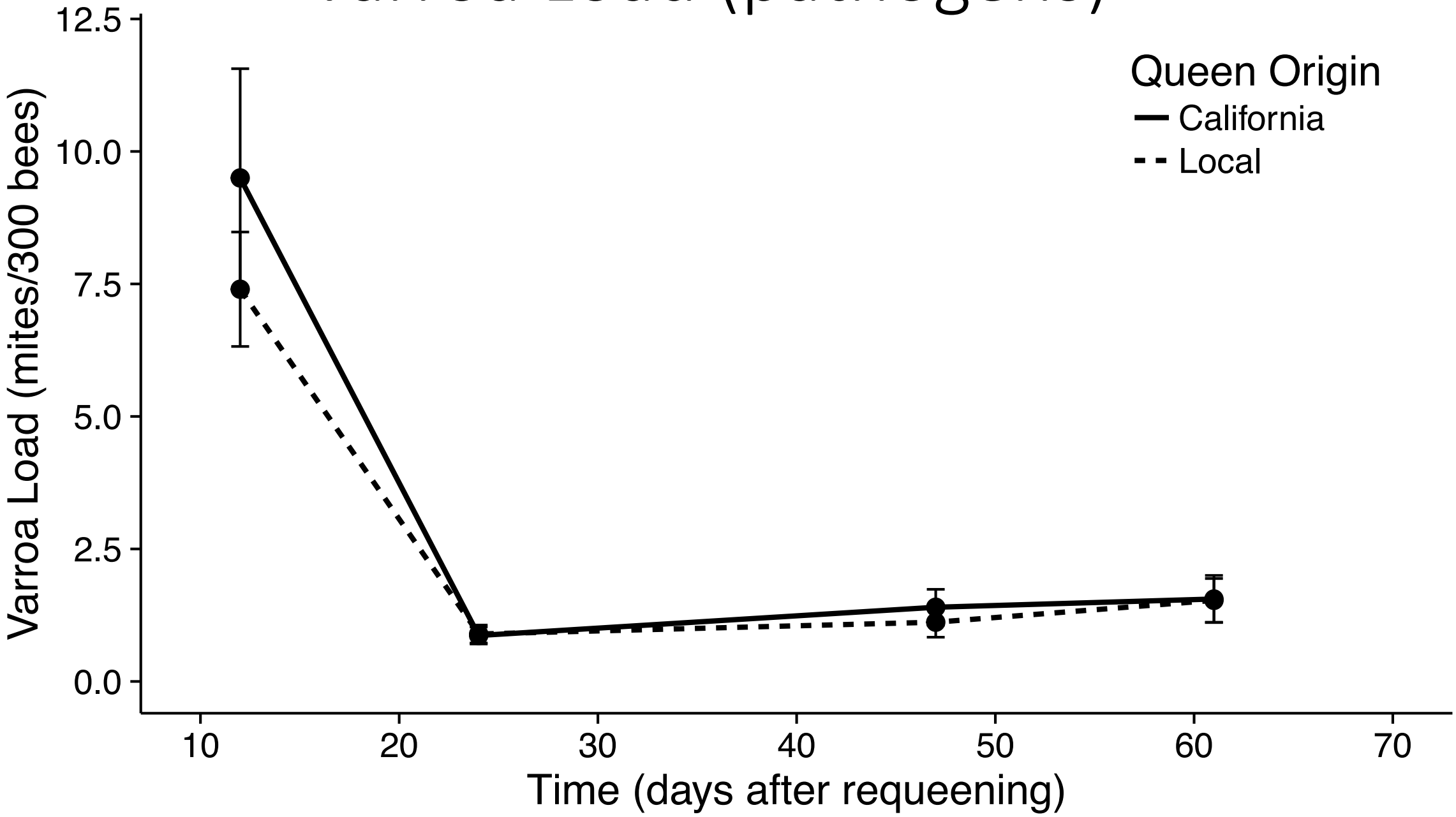
Frames of Brood (growth)



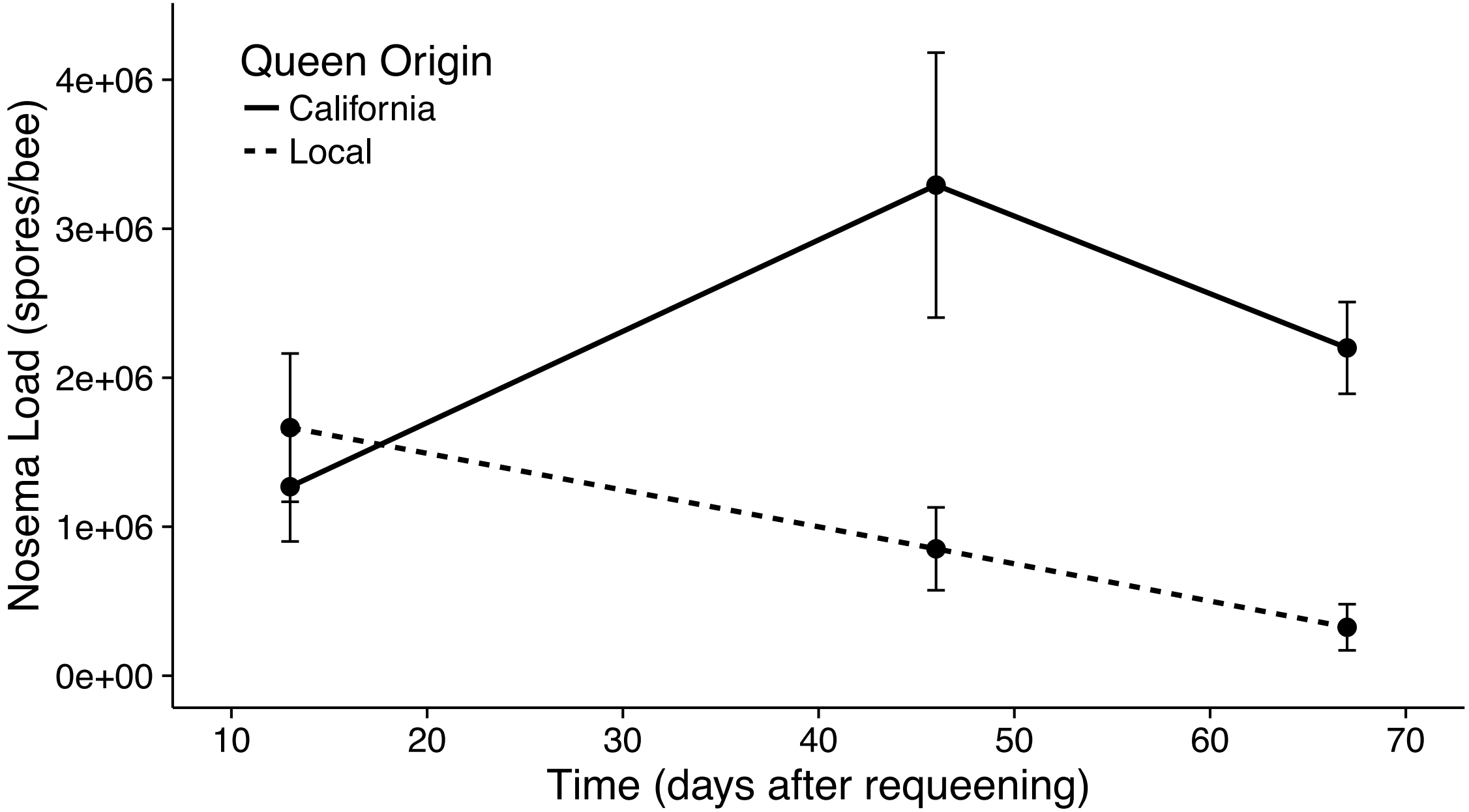
Pollen Collection (foraging)



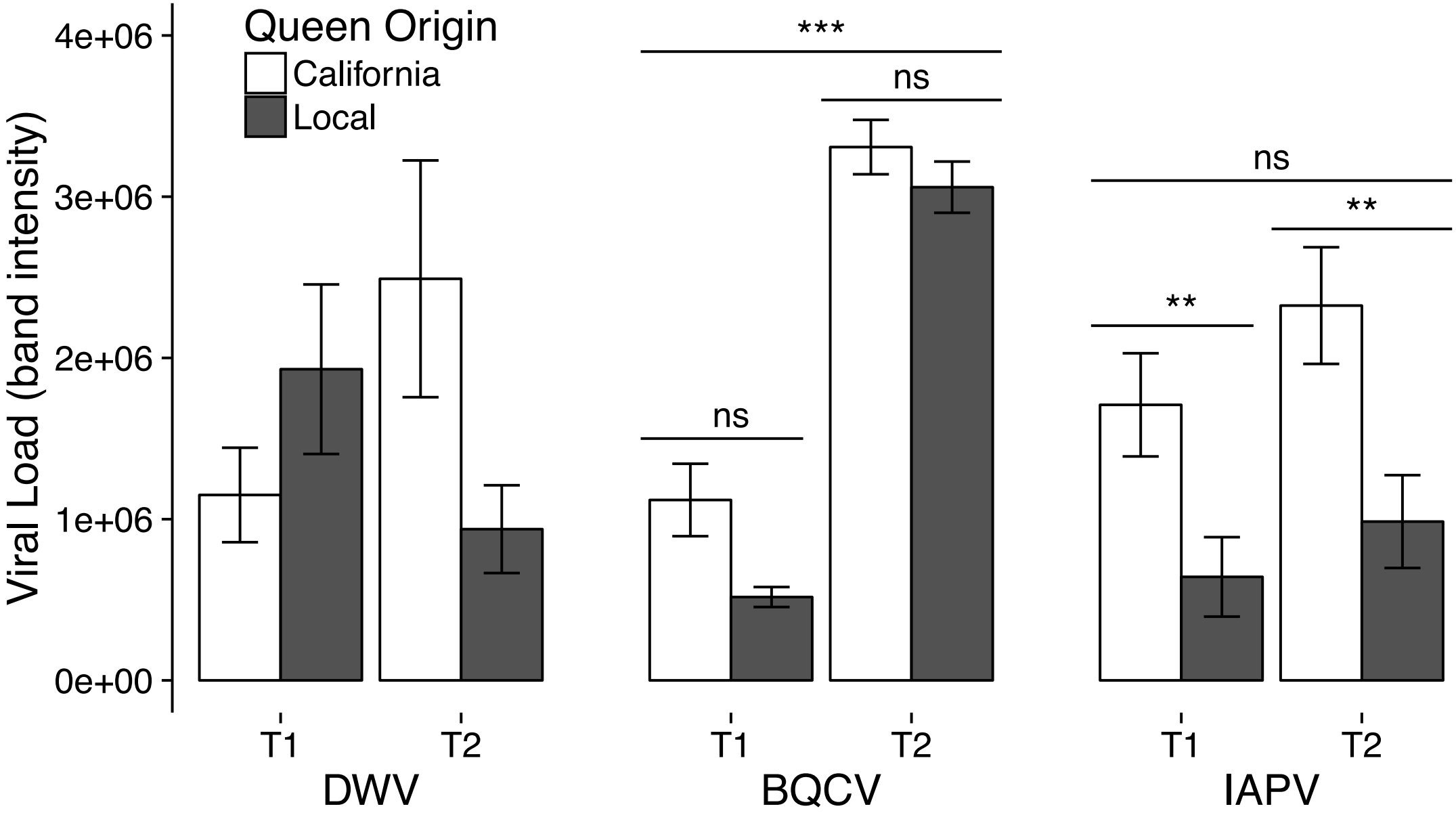
Varroa Load (pathogens)



Nosema Load (pathogens)



Viral Load (pathogens)



In summary:

- Overall, colonies re-queened with locally raised queens had higher growth

- Some pathogens seemed to have less of an affect on local queens and others had similar affects across both groups

Implications:

- Locally raised queens seem to be an overall better fit with the northern environment.

- This could be evidence for the importance of care in breeding stocks (mass produced vs. handmade)

- And/Or This could be evidence for local (genetic) adaptation (imported vs. local).

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Thank You!


Questions?