Genetic and environmental effects on individual wavenumbers of bovine milk InfraRed spectra

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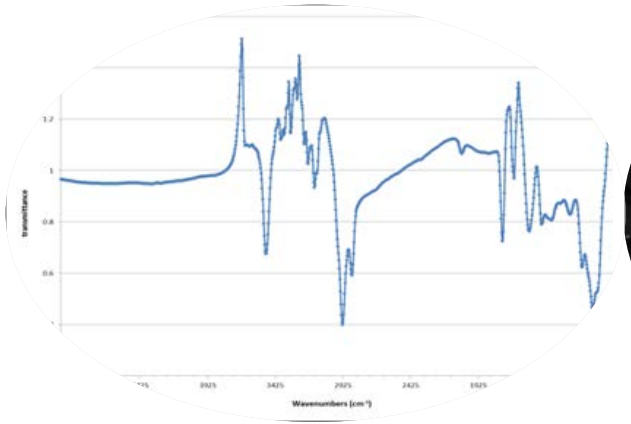

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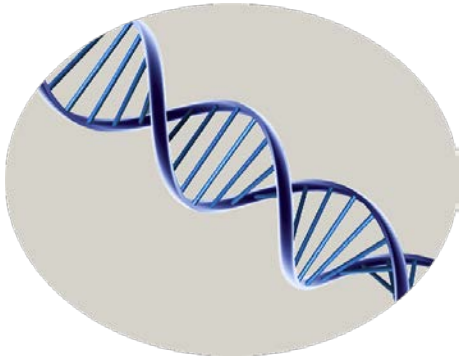
Introduction



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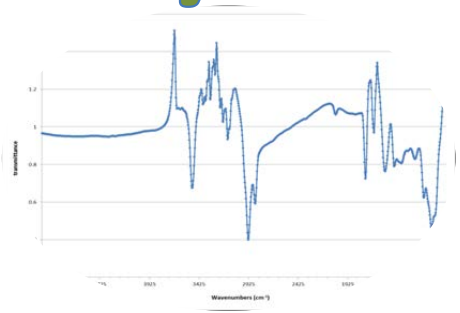


Data

- 1,748 first-parity Holstein cows
- 371 herds in the Netherlands
- 1 morning milk sample during a 2 month period
- 1,060 IR wavenumbers (925 to 5,008 cm^{-1})

- Genotypes of
  DGAT1
  SCD1
  κ-Casein
  β-Lactoglobulin

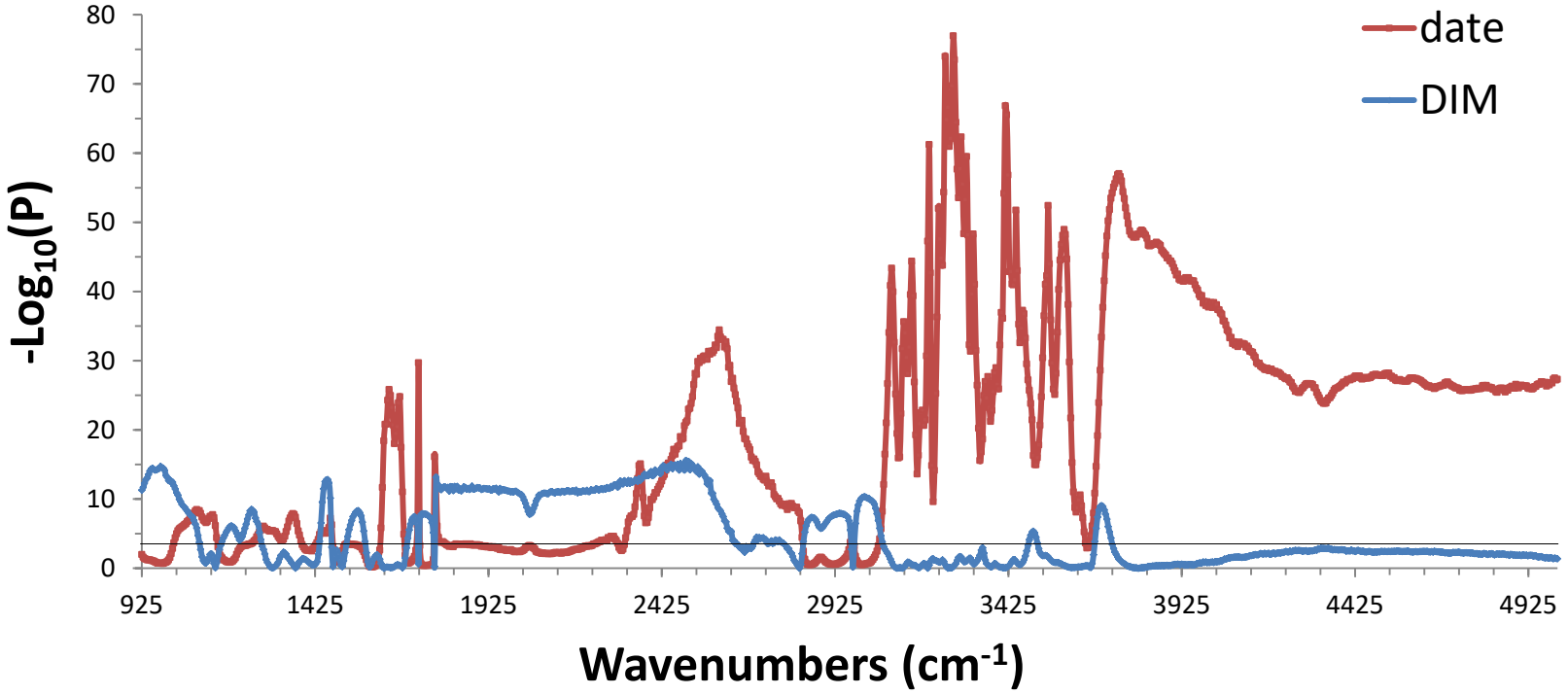
- Days in milk, age of calving, date of IR analysis etc.

Statistical Model

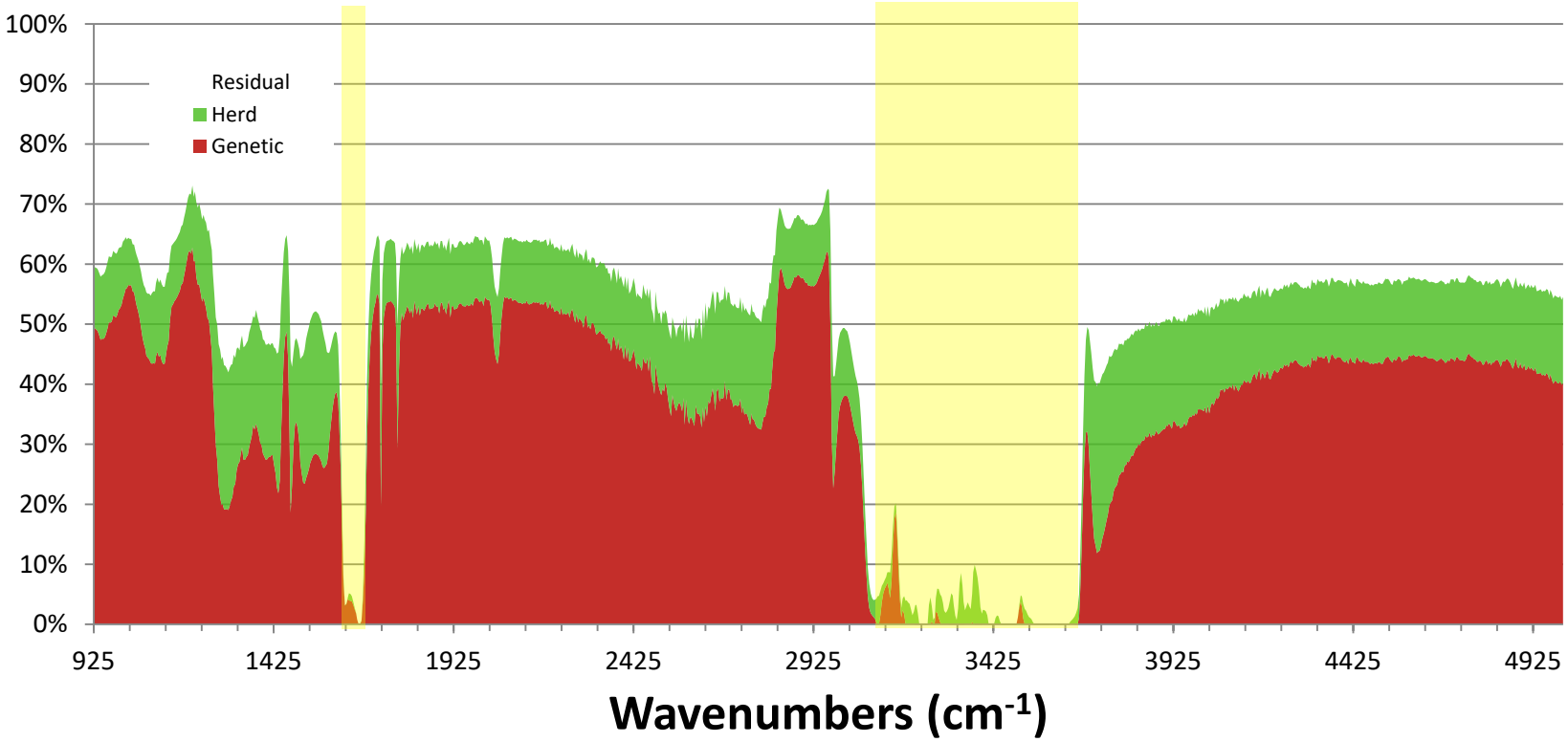
Univariate: 1,060 IR wavenumbers

- Fixed
  - Days in milk
  - Age of calving
  - Season of calving
  - Date of IR analysis
  - Genotypes
- Random
  - Animal
  - Herd
  - Residual

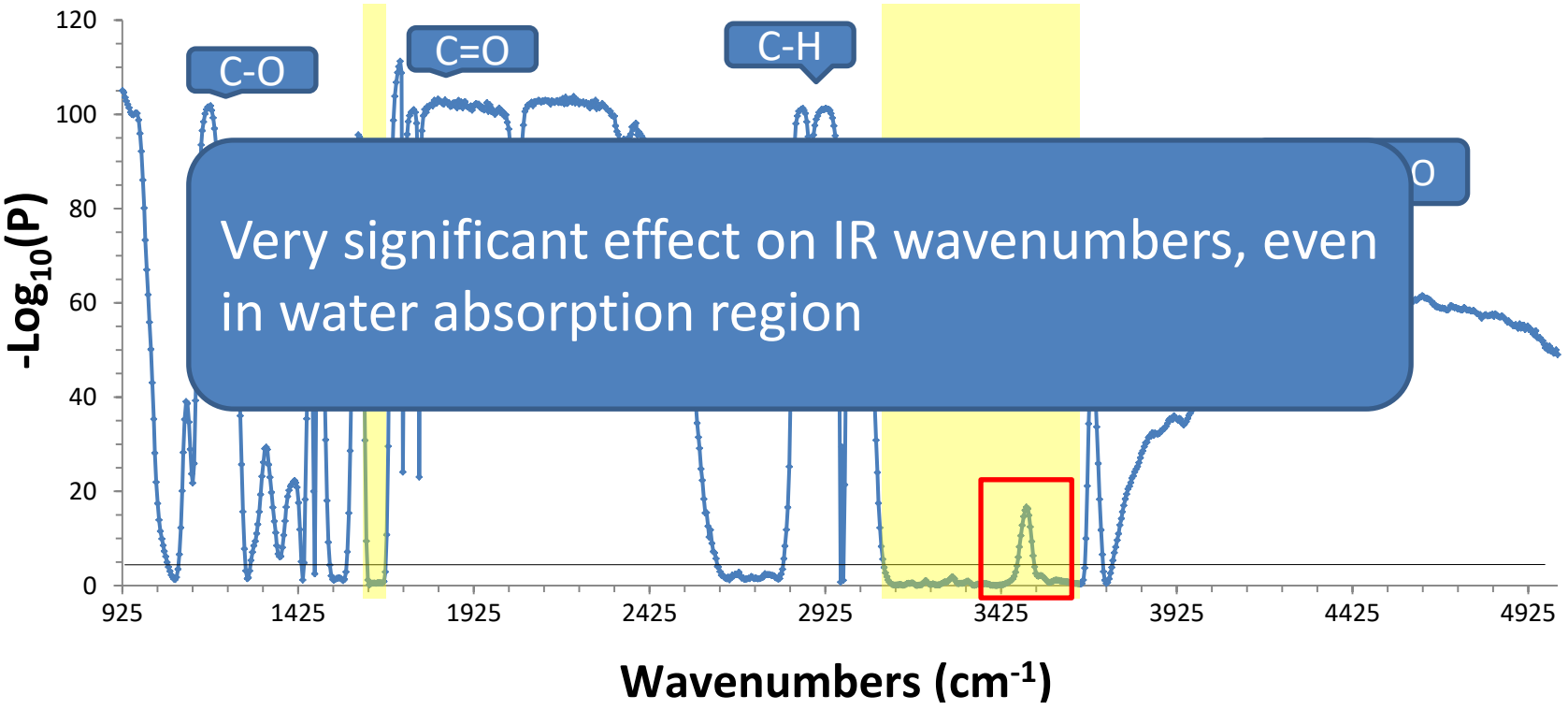
Results - fixed effects



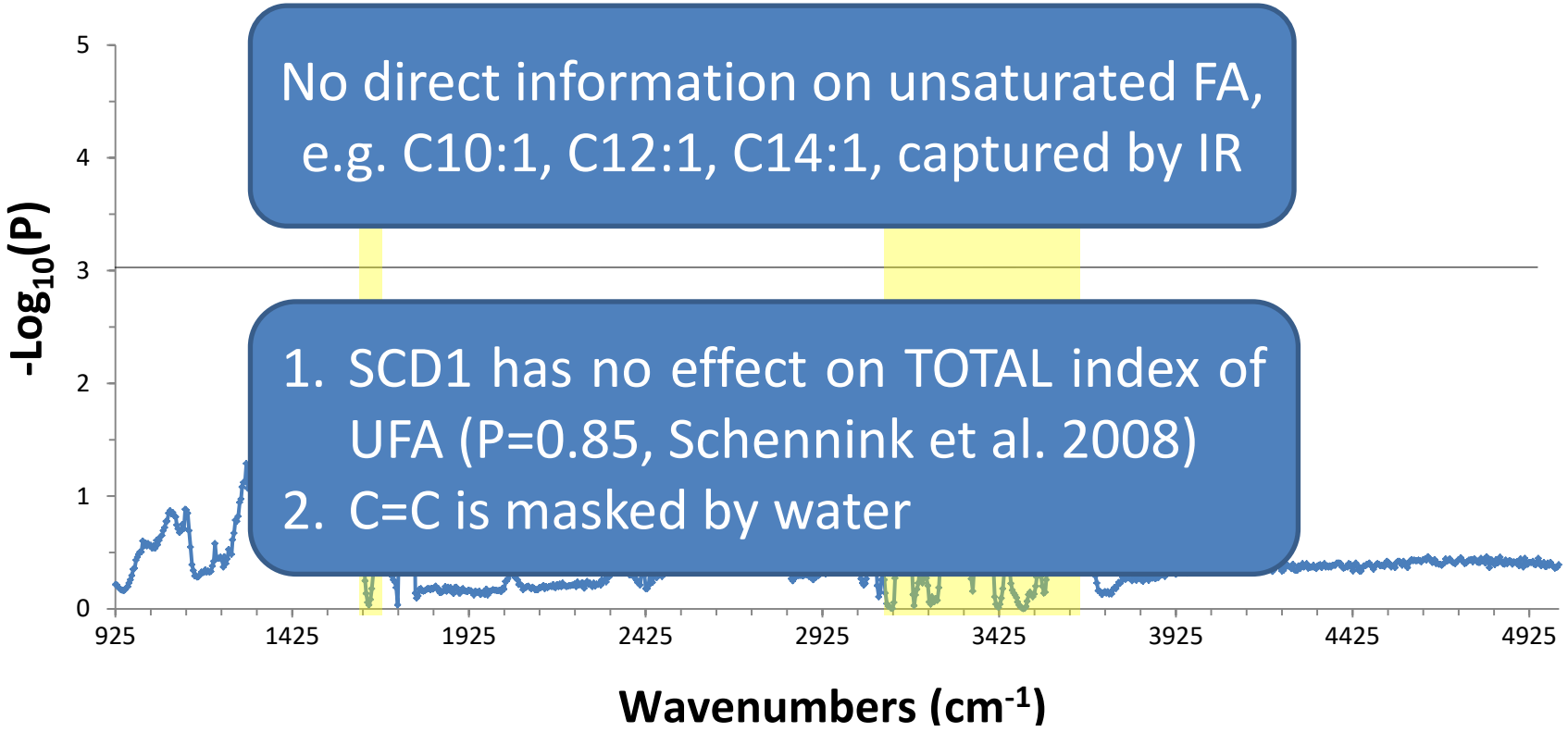
Results - variance components



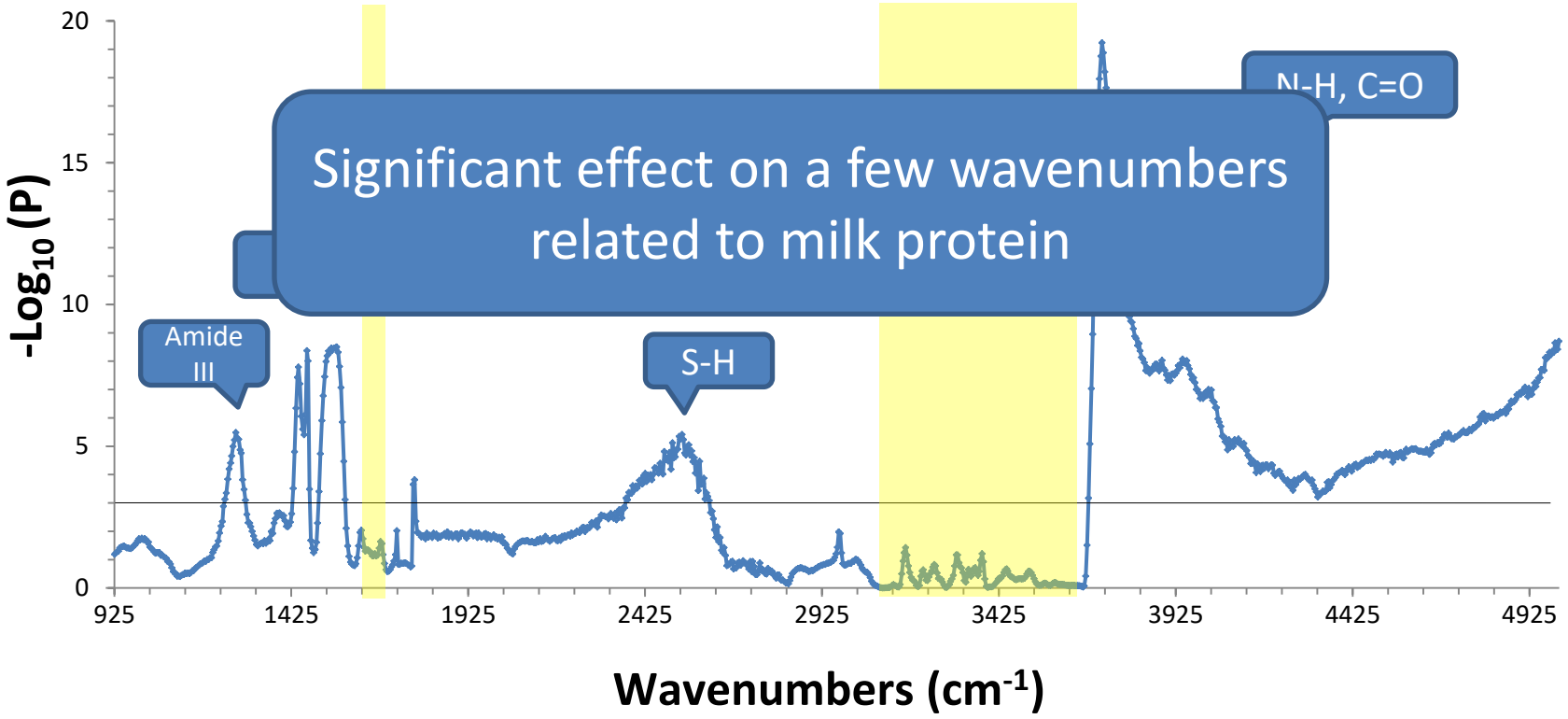
Results - *DGAT1*



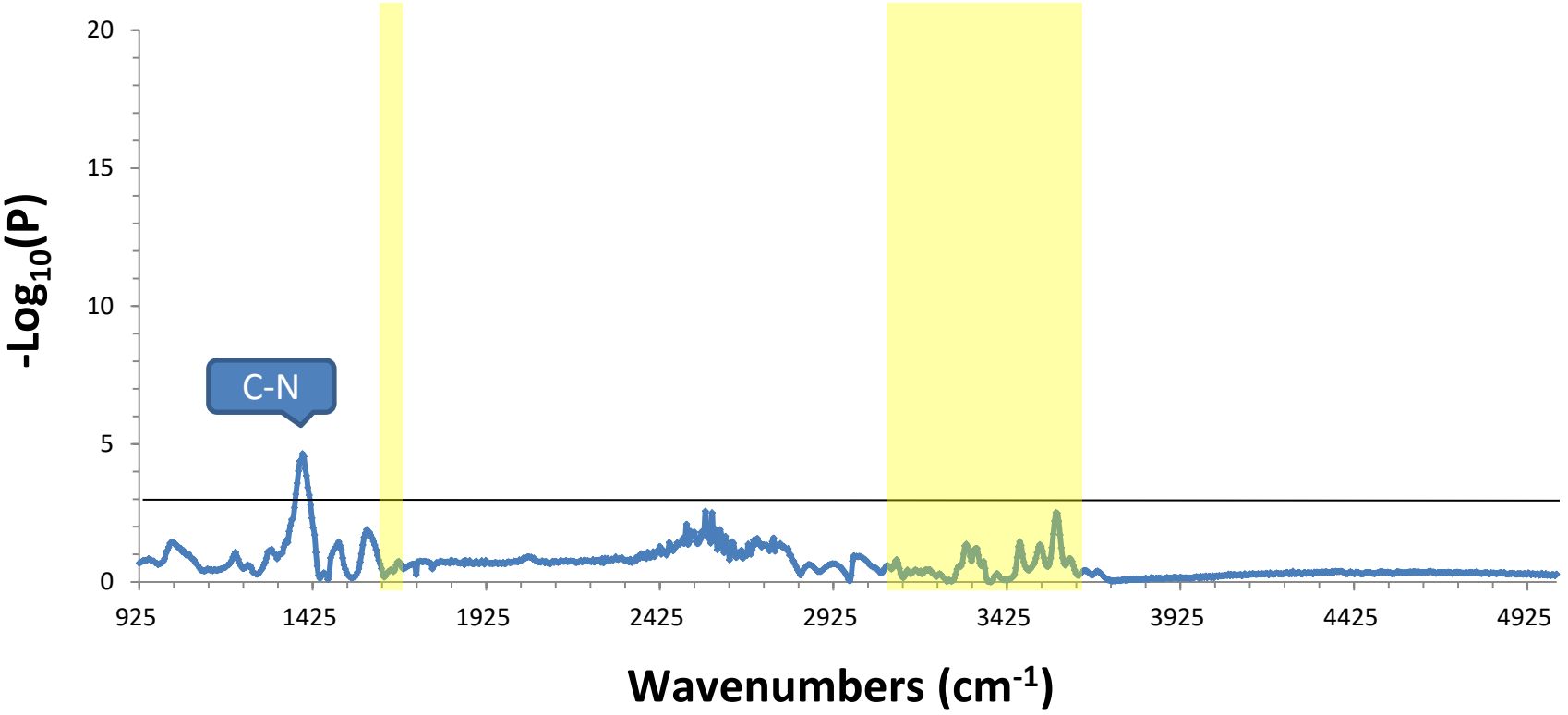
Results - *SCD1*



Results - *κ-Casein*



Results - *β-Lactoglobulin*



Conclusions and Highlights

- The genetic effect in milk IR spectra is great
- Herd variance is substantial
- And environmental factors play roles
- New findings: effect of genes on milk IR spectra
- Keep in mind: DGAT1 vs. SCD1

- Use of milk IR spectra could be better understood

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