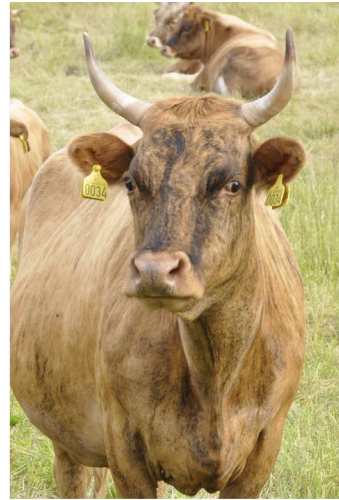


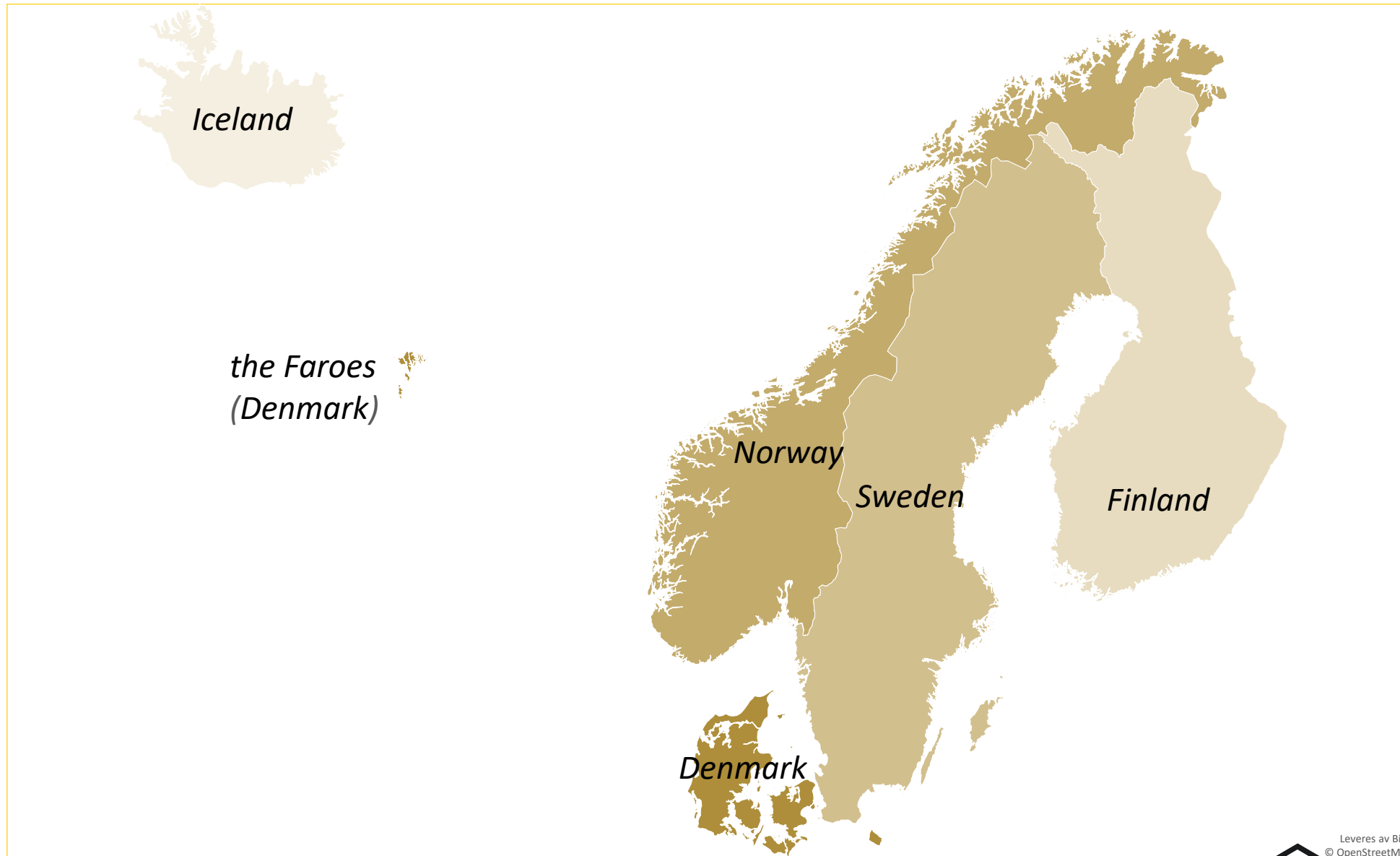
Genomic Characterisation of Norwegian and Nordic Cattle Breeds



Nina Svartedal, NC
ERFP Annual Assembly,
Hamburg, 6th Sept 2026



The five Nordic countries



This presentation is based on the results from the project

Genomic Characterization of Native Norwegian Cattle Breeds (2019).

Chaired by prof Peer Berg from Norwegian University of Life Sciences.

Co-authors: Anna Schönherz and Bernt Guldbrandtsen





Telemark Cattle

Agenda

- Genomic data sources
- The analytical approaches
- Results from the Admixture-analyses
- The overall output of the results

Genomic data sources

The six Norwegian local breeds:

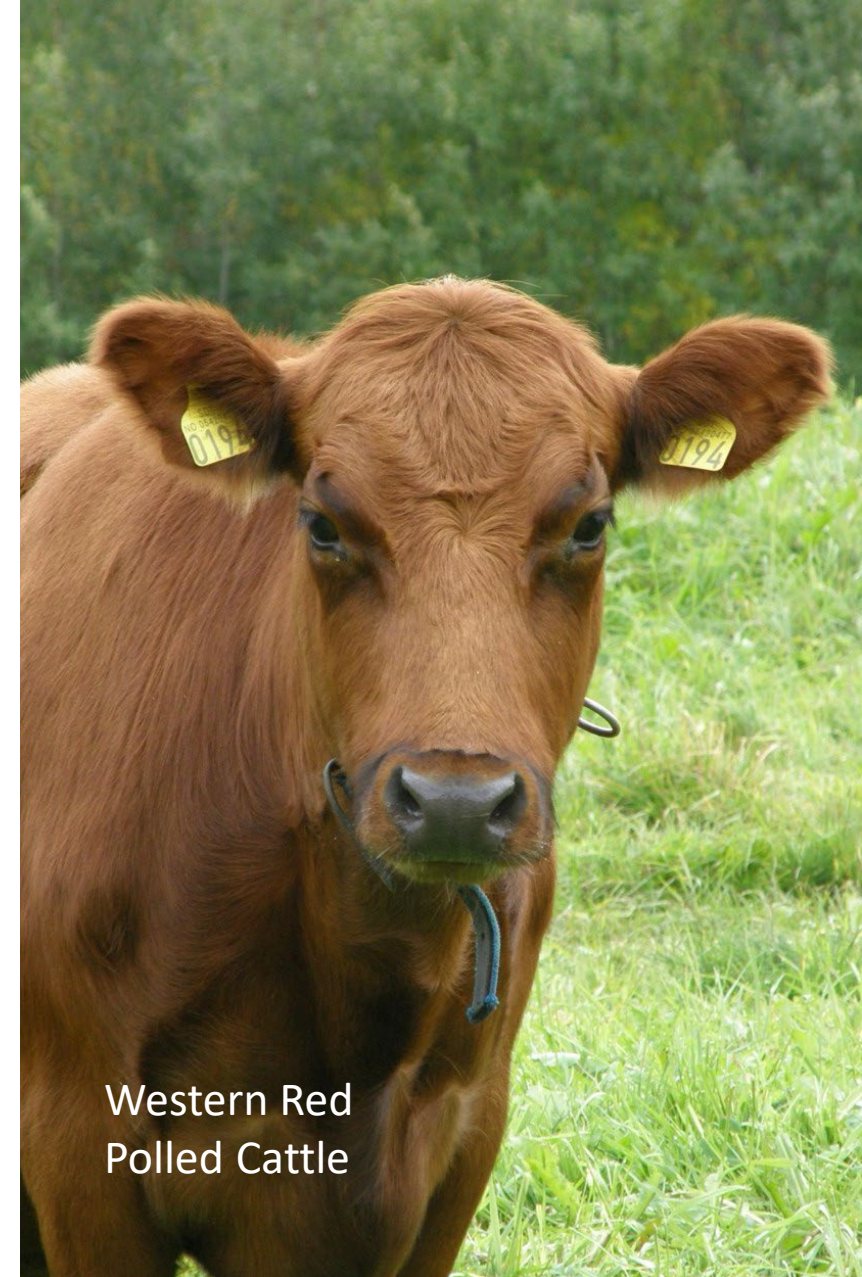
- Semen samples from the Norwegian cryo gene bank
- 16 bulls from each breed

Genotyping

- High-density SNP chip
- 777,000 SNP markers

23 reference breeds:

- Norwegian Red (NRF) and 22 Nordic and European cattle breeds
- Genomic data for these breeds were sourced from the ReDiverse project, the 1000 Bull Genomes Project, and WIDDE.



Western Red
Polled Cattle

The analytical approaches

- Four complementary approaches
 - Principal Component Analysis (PCA)
 - ADMIXTURE analysis
 - TreeMix analysis
 - Runs of Homozygosity (ROH).



Western Fjord Cattle



The overall output of the results

About the four different analysis:

- No single analysis provides a complete picture; however, they are complementary to each other.

About the Norwegian breeds:

- All of them are distinct separate breeds.
- None of them are genetically isolated.
- They are genetically connected to several Nordic breeds.

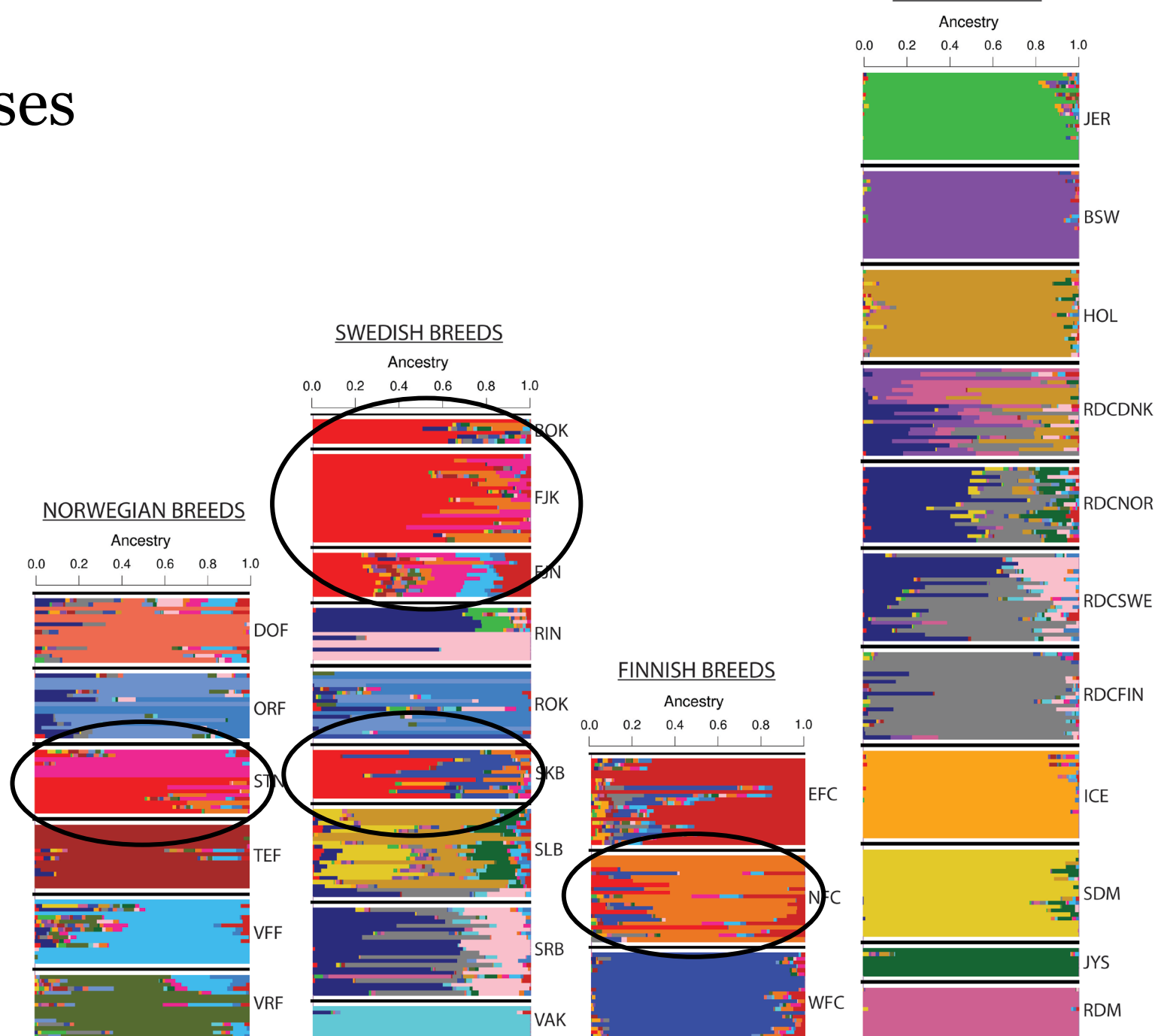


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The Admixture-analyses

- Provide an intuitive visual illustration of how genetic components are distributed across the breeds.
- The genetic components
 - are statistical patterns identified by the model and are useful for visualising genetic relationships between breeds.
 - should not be interpreted as distinct historical populations or biological entities.





**Sided Trønder and
Nordland Cattle (STN)**



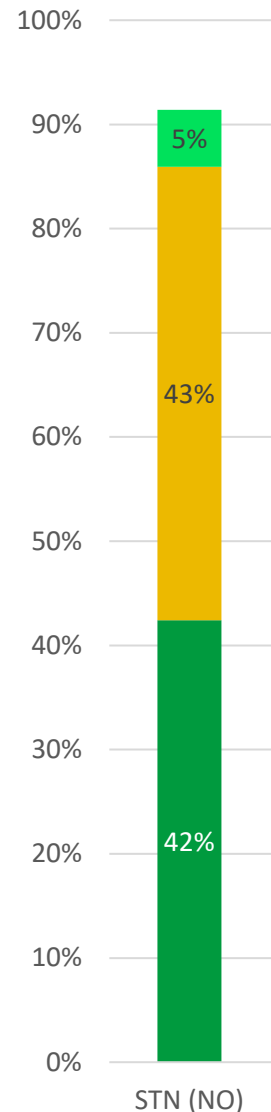
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**Sided Trønder and
Nordland Cattle (STN)**

Sided Trønder and Nordland Cattle



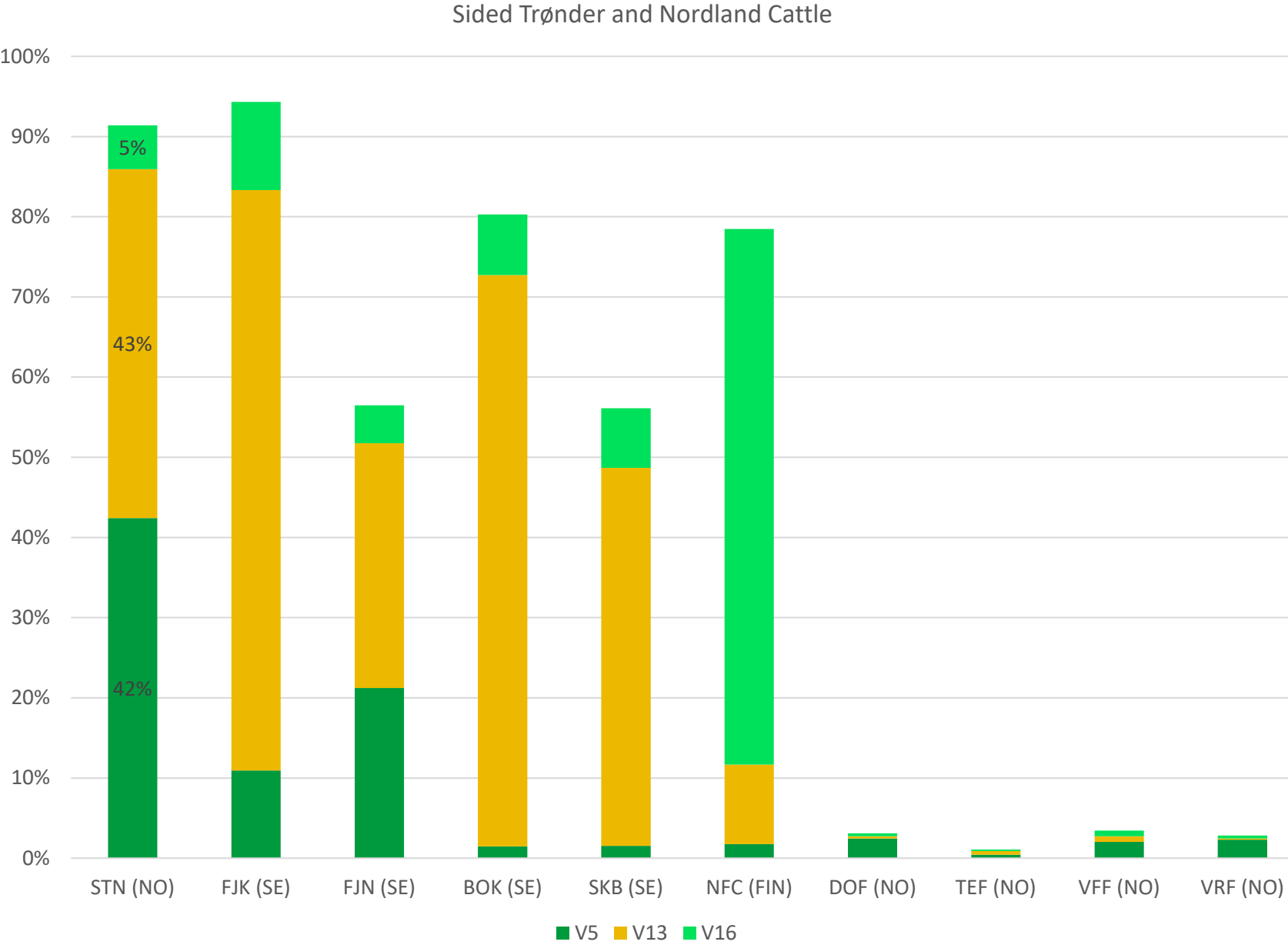
These are the three largest genetic components in STN

In the next slide you will see these genetic components' relative occurrence in other breeds.

■ V5 ■ V13 ■ V16



Sided Trønder and Nordland Cattle (STN)

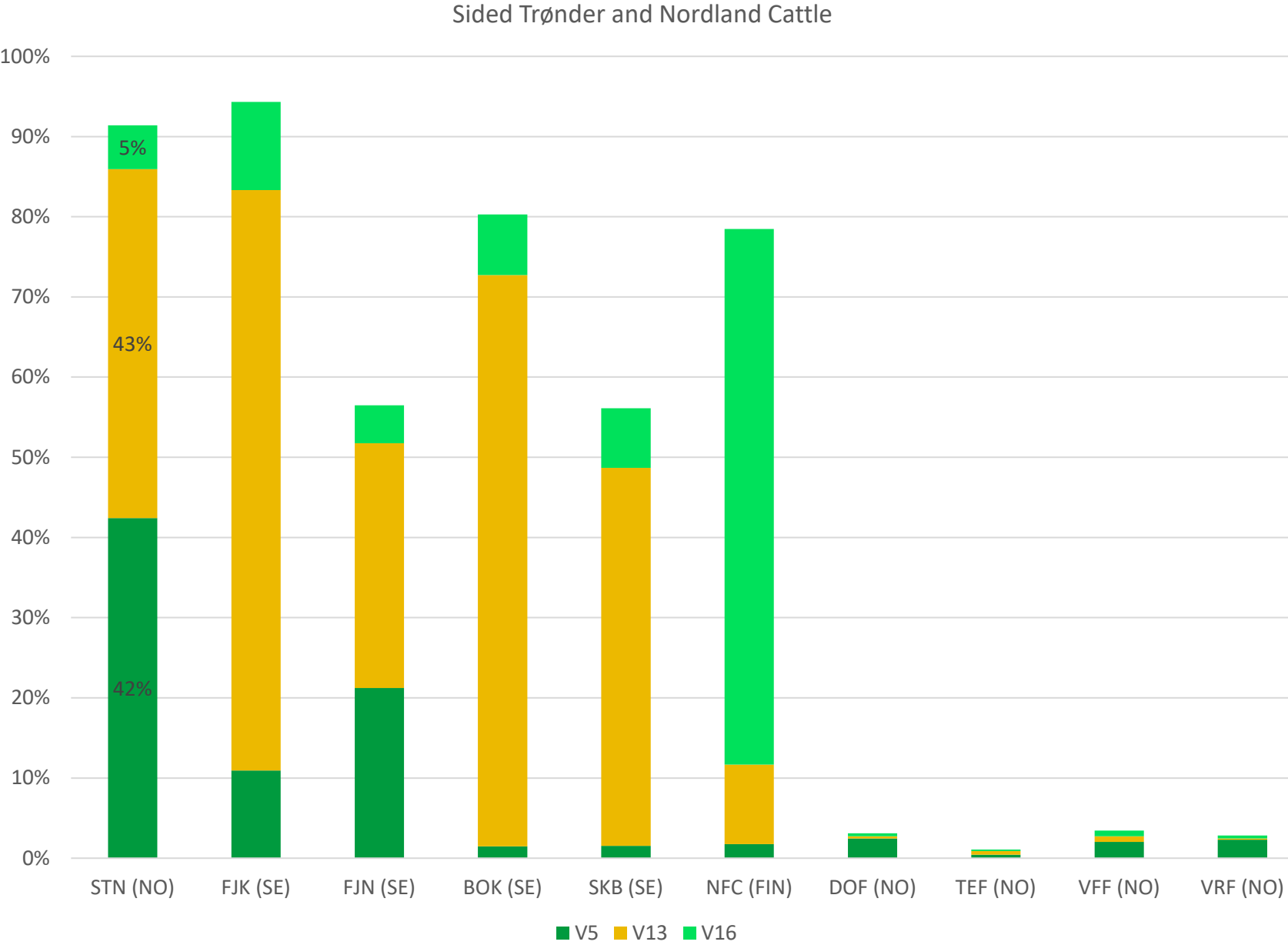


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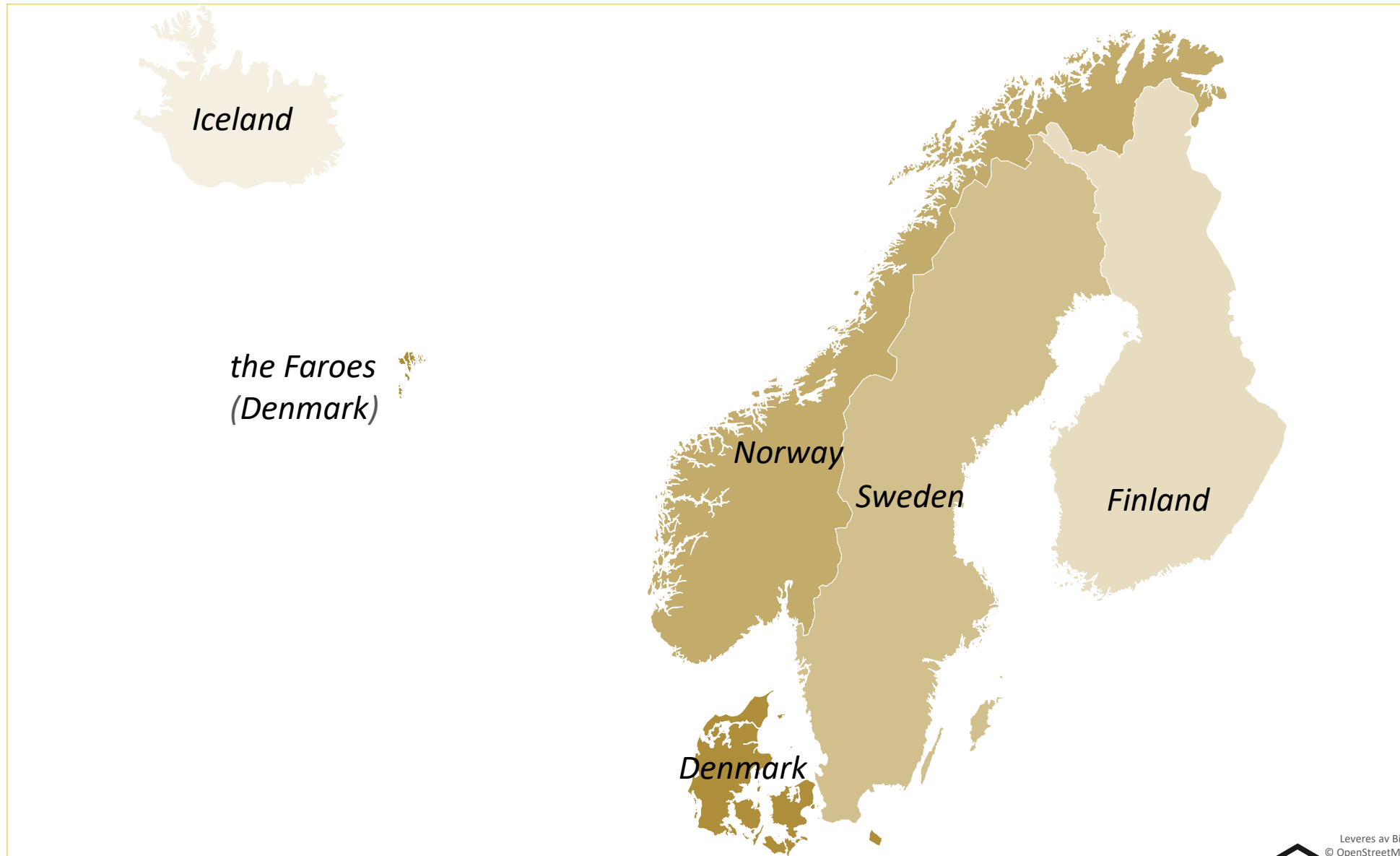
Sided Trønder and Nordland Cattle (STN)



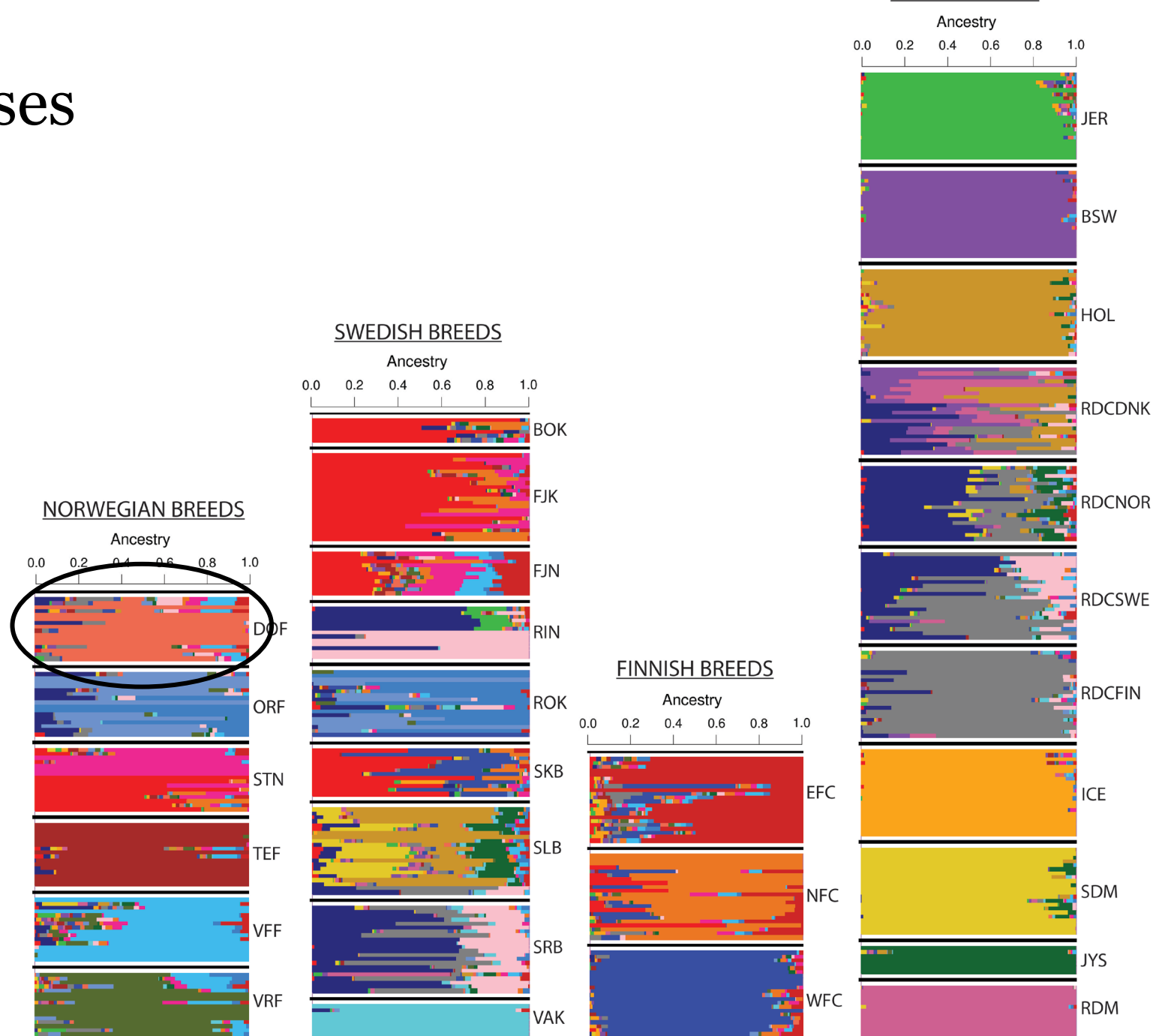
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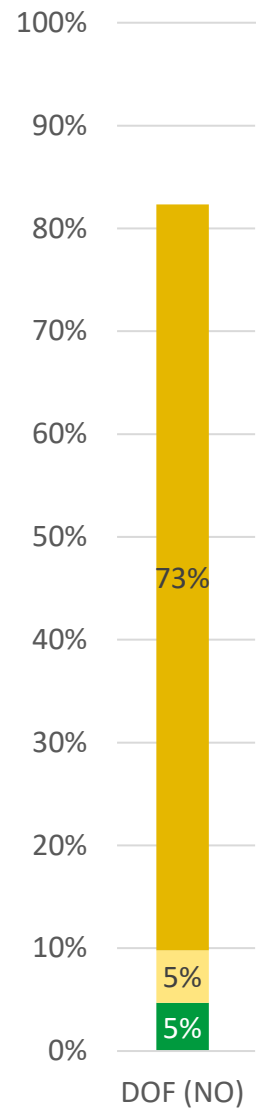
The Admixture-analyses





Døla Cattle

Døla Cattle (NO)



DOF (NO)

■ V8 ■ V9 ■ V22

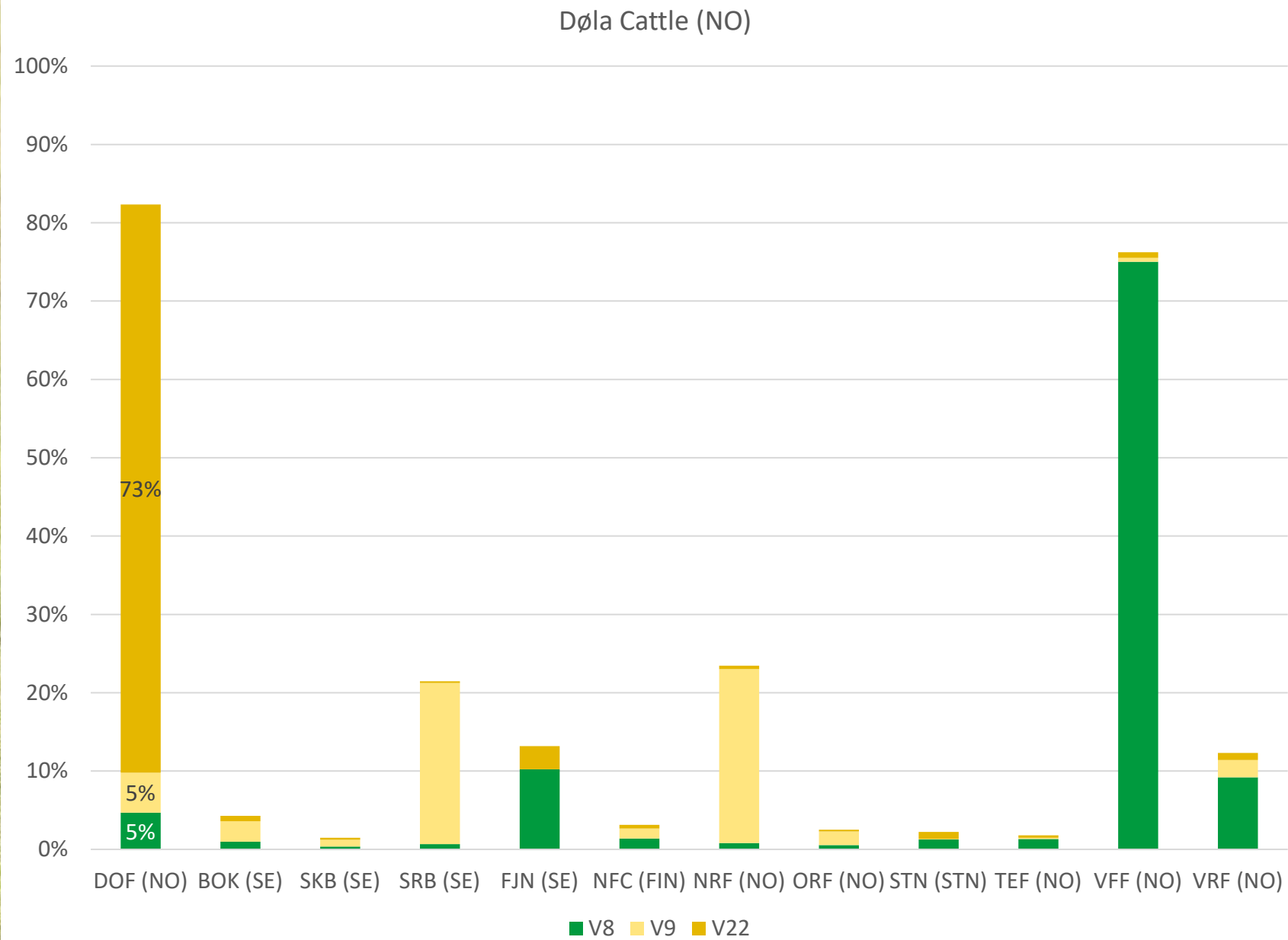


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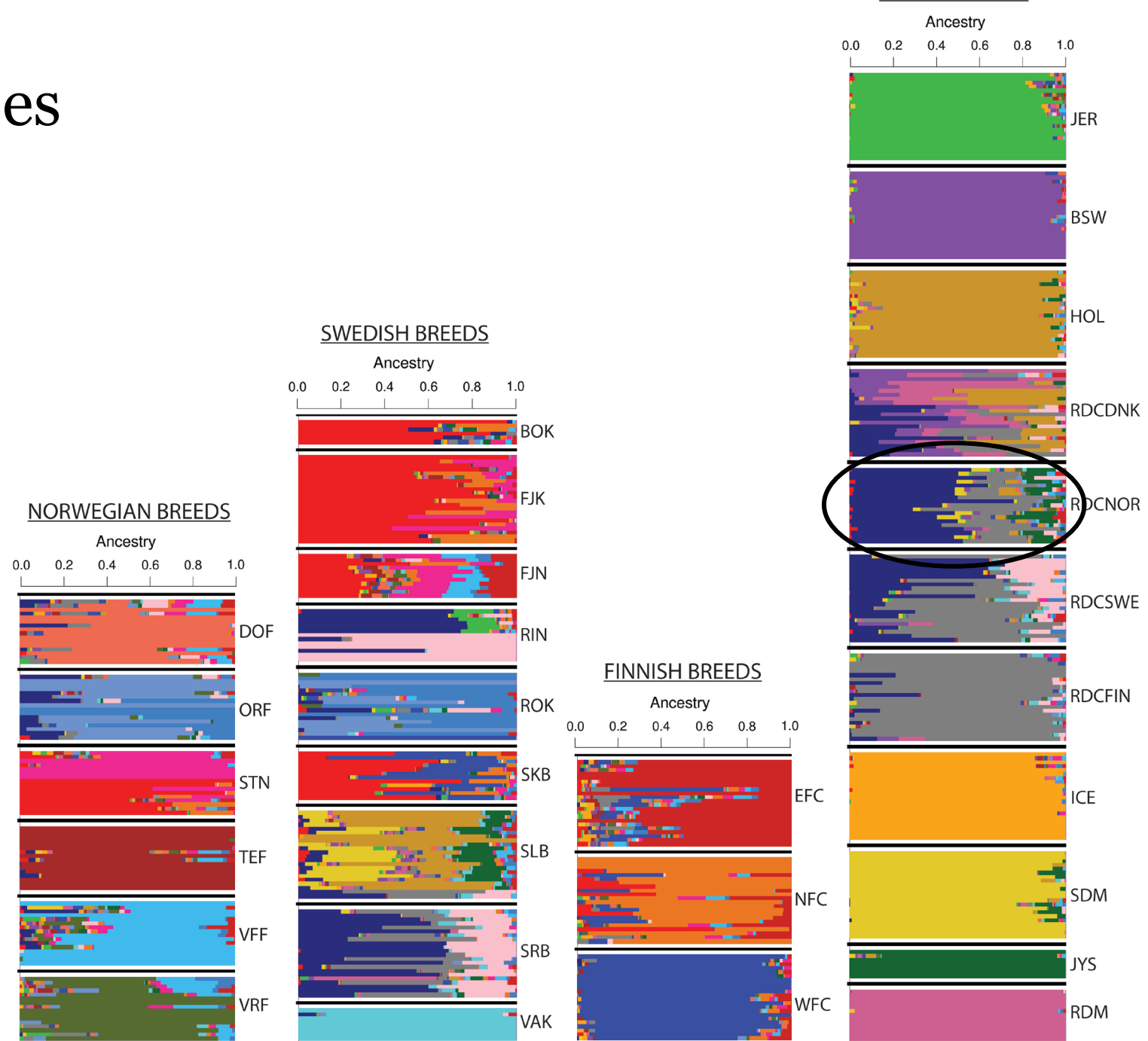
Døla Cattle



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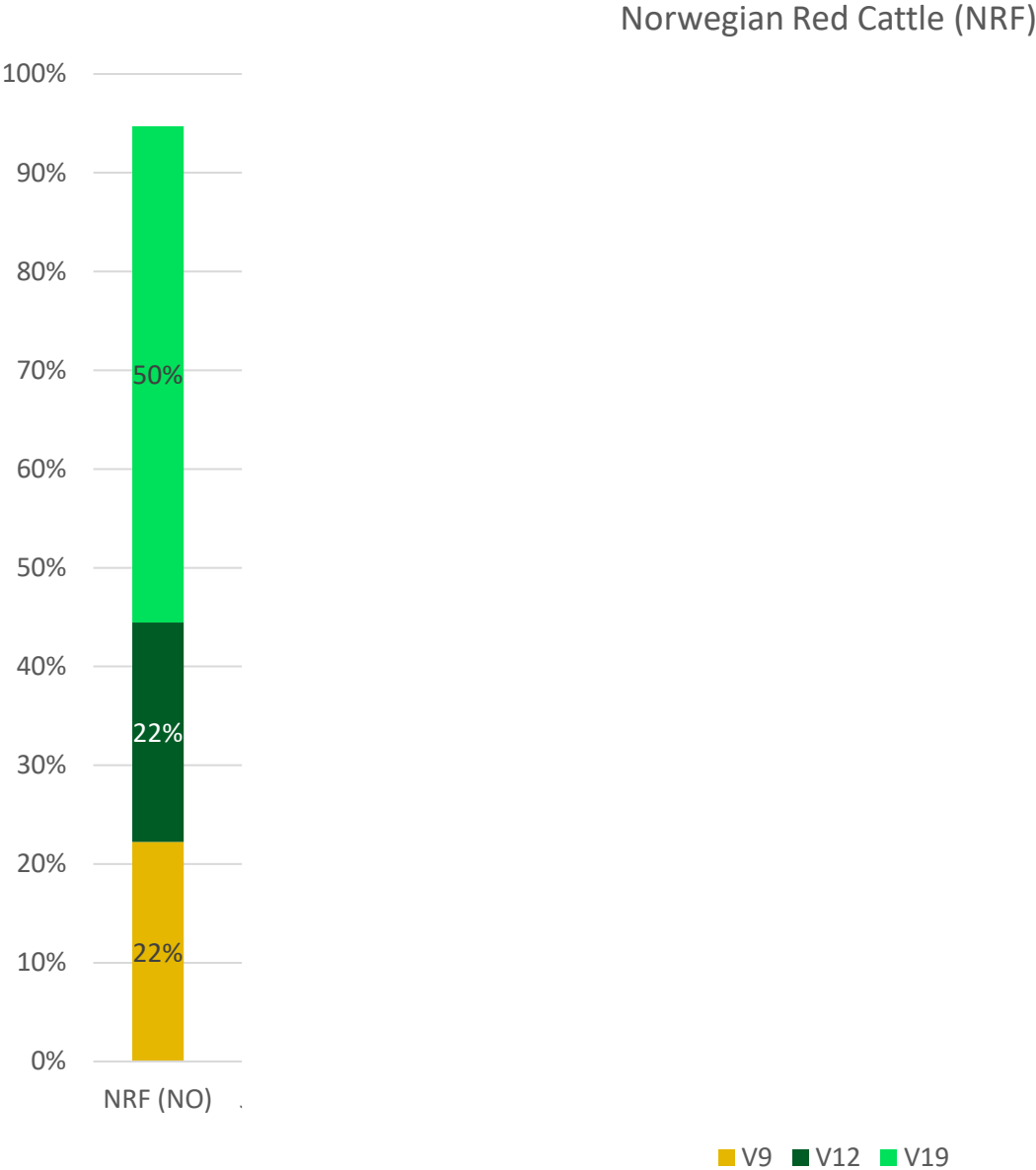
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The Admixture-analyses



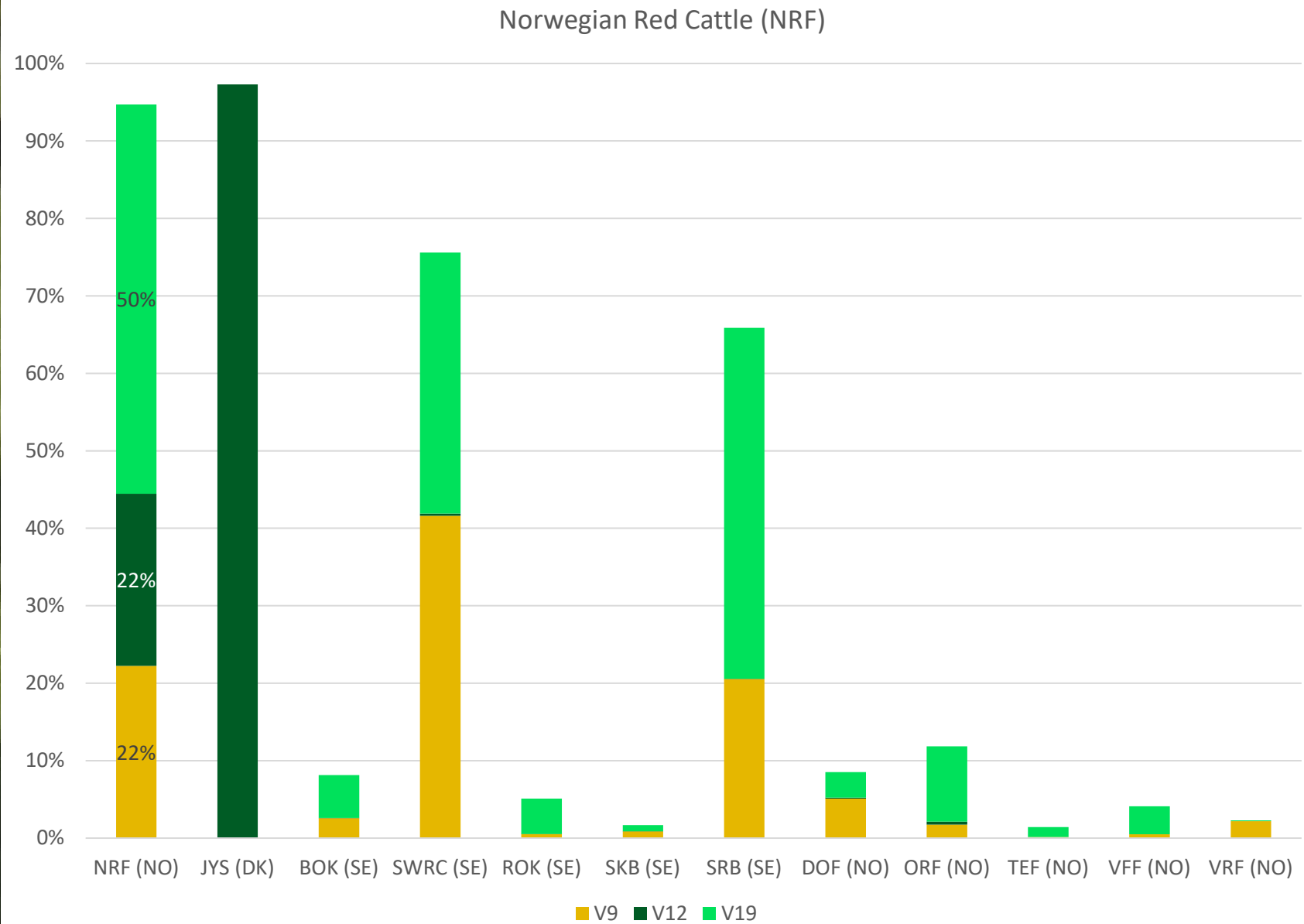


Norwegian Red Cattle (NRF)





Norwegian Red Cattle (NRF)

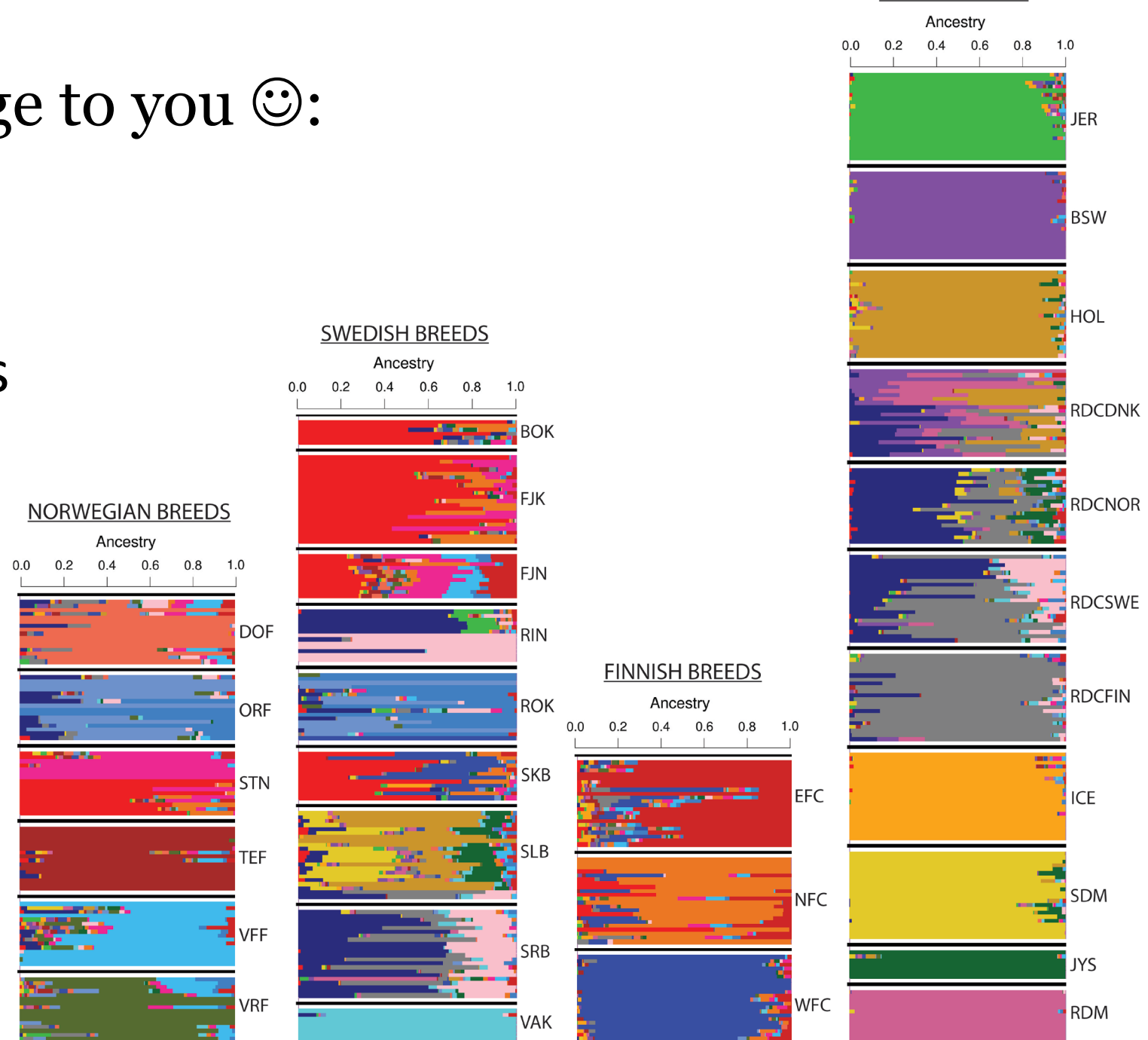


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My take-home-message to you 😊:

The genetic components from the Admixture-analyses visualise the genetic relationships between breeds.





Thanks for your attention!