

# Survey of potentially zoonotic *E. coli* of serogroup O26, O103, O111, O145 and O157 in Norwegian cattle

10<sup>th</sup> Annual Workshop of the NRLs for *E. coli*  
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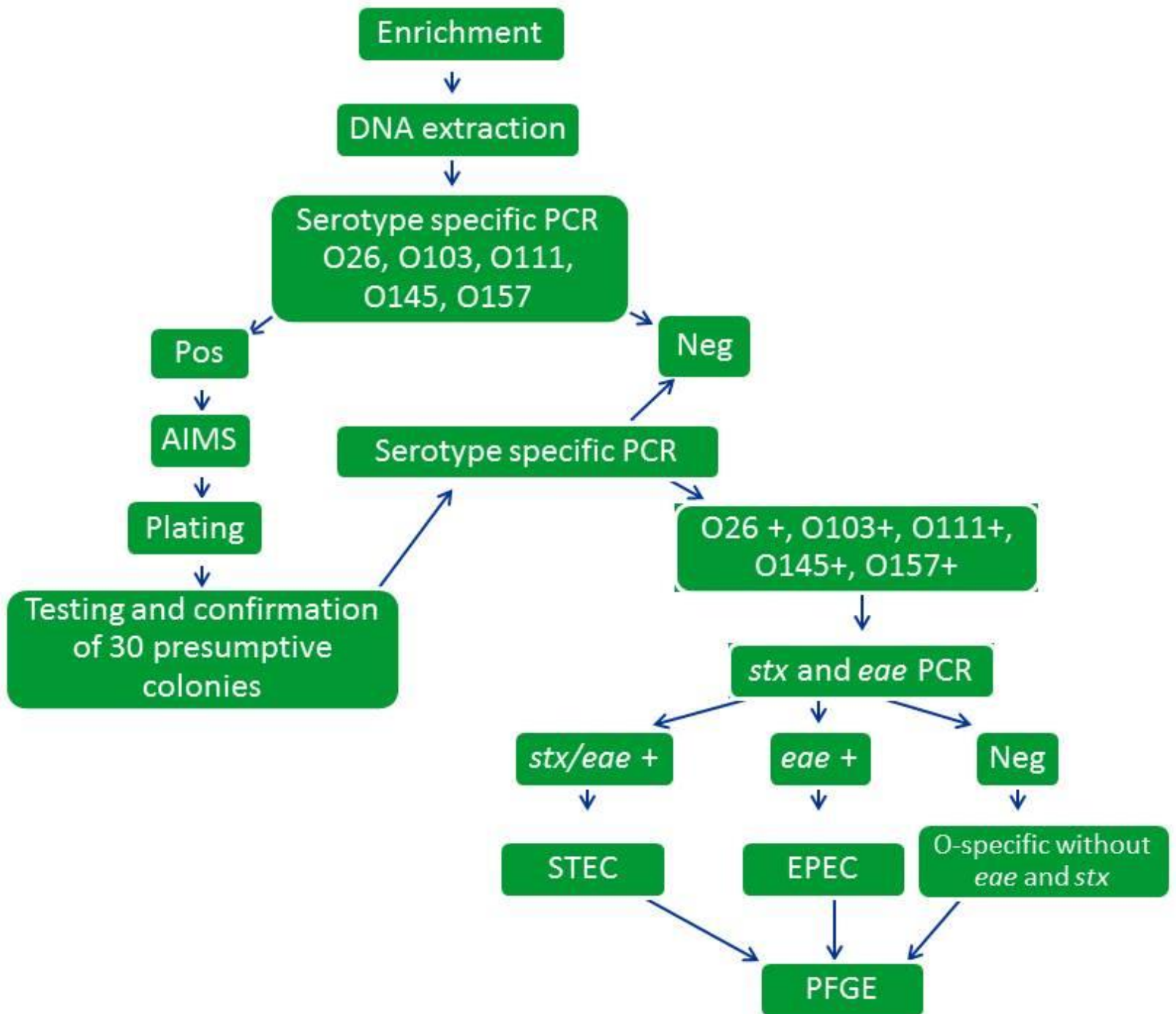


**Veterinærinstituttet**  
Norwegian Veterinary Institute

# Introduction

- Nationwide survey in cattle 2014
- Investigating the occurrence of STEC serogroups: O26, O103, O111, O145, O157
- 179 dairy herds with >50 cows





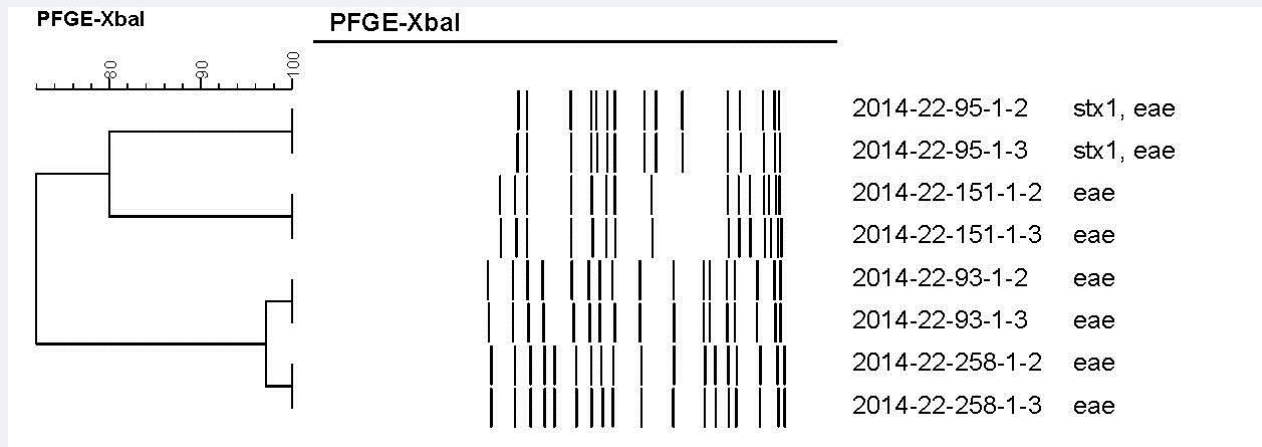
# Results O111 in cattle

- 3 PCR positive samples (Ct values 39.7-41.6)
  - 30 colonies per herd (n=90)
    - 3 aggl+/indol+ from 1 herd
  - 3 colonies for MALDI
- Presumptive O111 were identified as *Morganella morganii* with MALDI



# Results O145 in cattle

- PCR positive herds: 4 (Ct values 38.5-42.4)
  - 30 colonies per herd (n=120)
    - 47 aggl+/indol+
  - 5 colonies per herd for MALDI and PCR characterization
- Culture confirmed positive herds: 4 (2.2%)
- O145, *stx*<sub>1</sub>, *eae* 1 herd
- O145, *eae* 3 herds



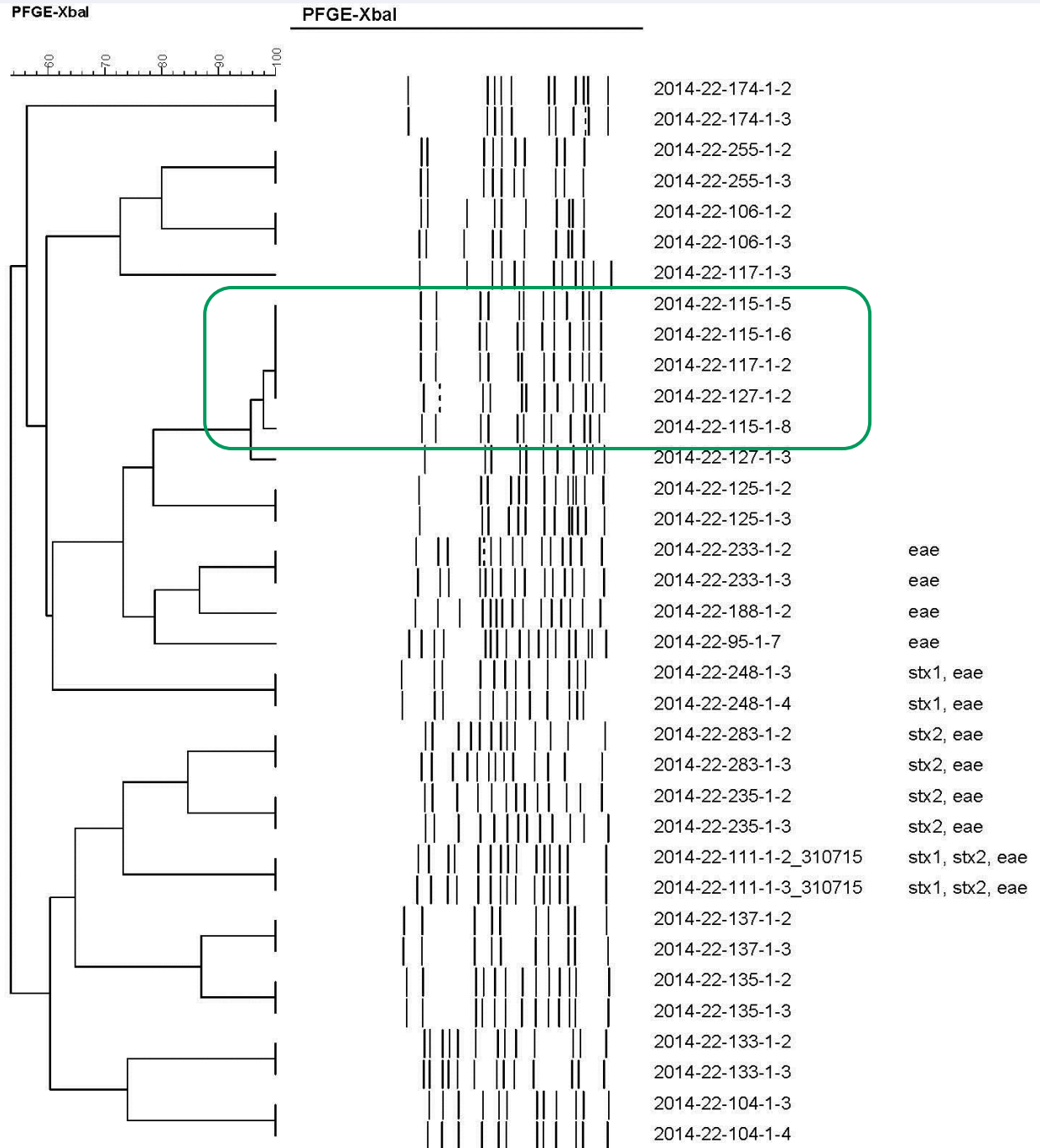
# Results O157 in cattle

- PCR positive herds: 31 (Ct values 31.9-43.7)
  - 19-30 colonies per herd (n=909)
    - 143 aggl+/indol+
  - 1-5 colonies per herd for MALDI and PCR characterization (n=74)
- Culture confirmed positive herds: 18 (10.2%)
  - STEC O157                      4 herds (2,2%)
  - EPEC O157                      3 herds (1.7%)
  - Other *E. coli* O157        11 herds



# PFGE 0157

Isolates from 3 herds



# Results O26 in cattle

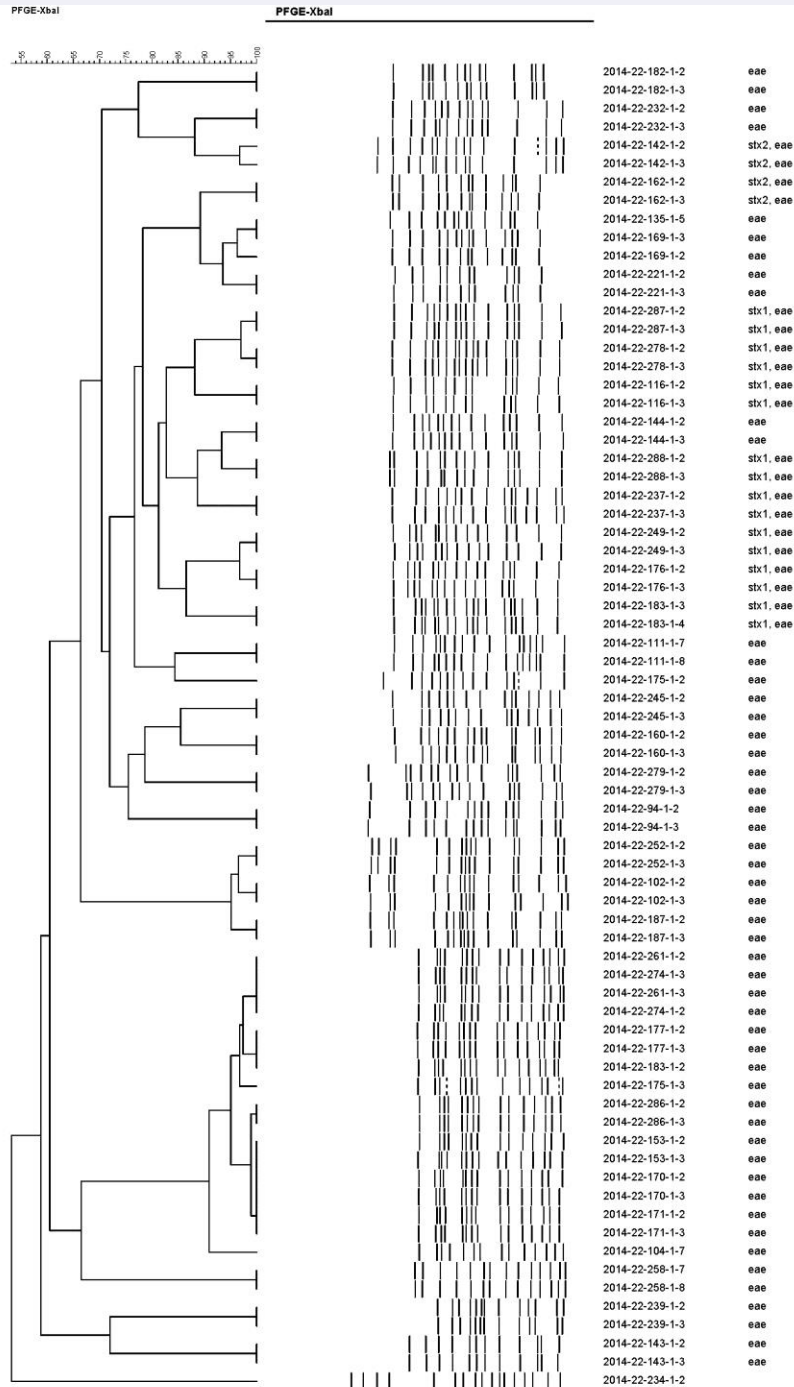
- PCR positive herds: 70 (Ct values 27.7-43.4)
  - 25-30 colonies per herd (n=2083)
    - 381 aggl+/indol+
  - 1-5 colonies per herd for MALDI and PCR characterization (n=160)
    - 5 colonies were not *E. coli*
- Culture confirmed positive herds: 37 (20.7%)
  - STEC O26 10 herds (5,6%)
  - EPEC O26 27 herds (15.1%)





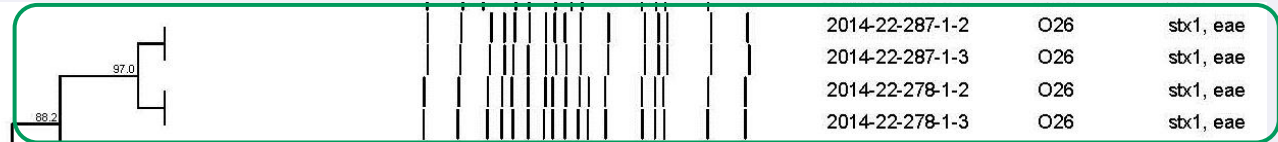


# PFGE O26

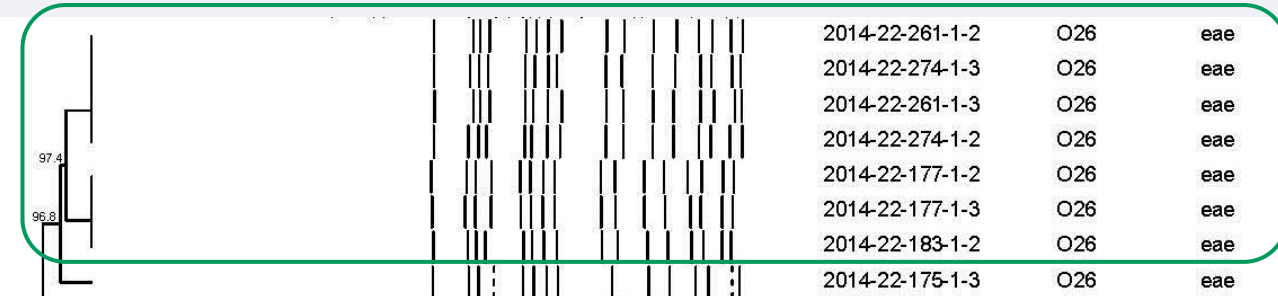


# PFGE O26

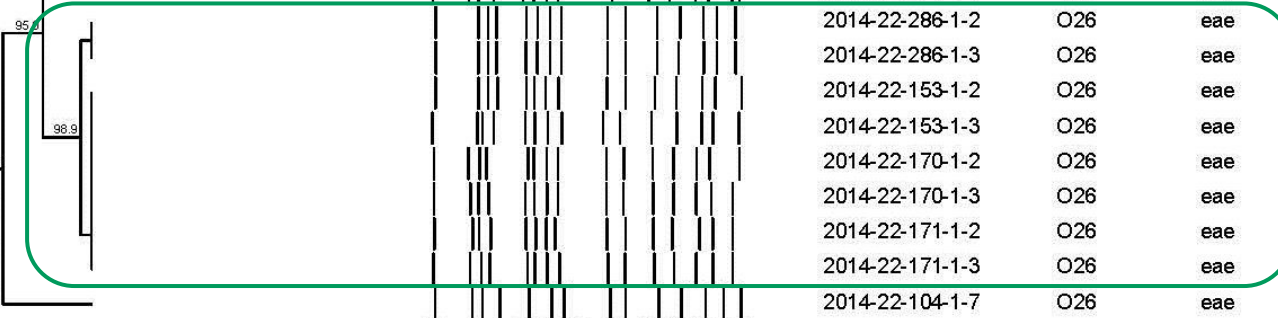
Isolates from 2 herds



Isolates from 4 herds



Isolates from 4 herds



# Results O103 in cattle

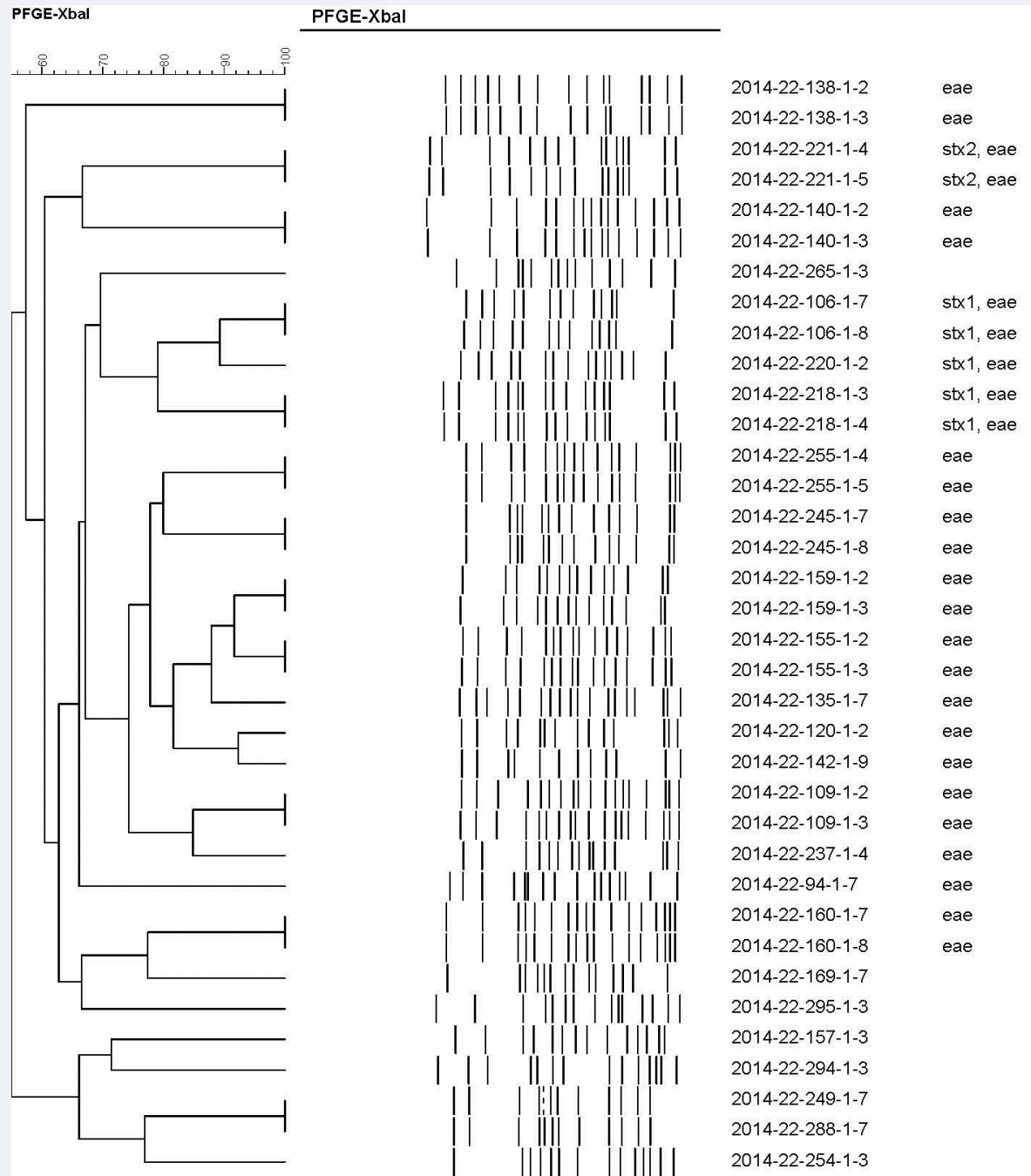
- PCR positive herds: 83 (Ct values 28.5-44.5)
  - 30 colonies per herd (n=2490)
    - 324 aggl+/indol+
  - 1-5 colonies per herd for MALDI and PCR characterization (n=177)
    - 3 isolates were Citrobacter or *M. morganii*
    - 45 isolates were not O103
- Culture confirmed positive herds: 46 (25.7%)
  - STEC O103                      4 herds (2.2%)
  - EPEC O103                      13 herds (7.3%)
  - Other O103 *E. coli*        30 herds





# PFGE 0103

Selected 8 eae-0103 for PFGE



# Further work

- Whole genome sequencing for a selection of isolates
  - One isolate per herd - different PFGE - two selected
  - For eae- O103 only 8 isolates are selected
- Use WGS for:
  - H-typing
  - Virulence characterization (stx subtype, eae, ehxA + others)
  - AB resistance genes
  - MLST and SNP typing
- Screen for serogroup O121, O91 and a specific *stx2a* PCR



# Summary

- Large difference between PCR pos. samples and culture confirmed samples
  - Pick colonies when positive real-time PCR regardless Ct value
- Relatively high prevalence of *E. coli* O26 and O103 in Norwegian cattle herds
  - Low prevalence of STEC
- More in-depth information about the isolates by WGS



# Acknowledgement

