16S rRNA gene sequencing a tool for process control

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INTRODUCTION
16S rRNA gene sequencing provide faster and much more detailed information compared to traditional microbiological tests, resulting in knowledge on the microbial composition in products and at production sites. This gives the producer the opportunity to act and ensure optimal shelf life and quality.

AIM
To demonstrate the use of 16S rRNA gene sequencing as a process control tool in the meat industry.

CONCLUSION
This study demonstrated, that 16S rRNA gene sequencing has the potential for use as a process control tool in the food industry for:

• Fast identification of bacteria causing spoilage.

• Identification of spoilage bacteria in freshly produced products and production environment.

• Next ongoing step is implementation in the food industry for trouble shooting and process control by providing the industry with an easy-to-use software.
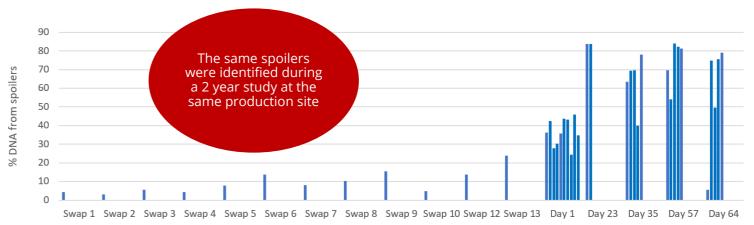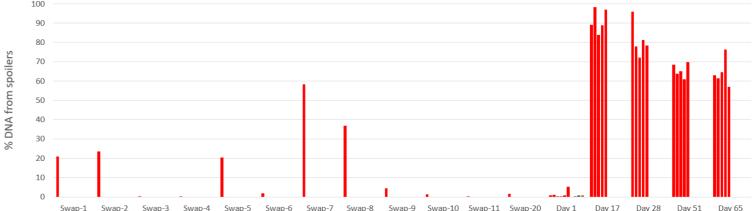
RESULTS

The same spoilers were identified during a 2 year study at the same production site

Figure 1: The dominating spoiler in deli meat at the end of shelf life, at packaging and in swab samples from the production line.

Example 1:

• Spoilage bacteria count for 80% of DNA at end of shelf life.

• A few days after packaging the spoilage bacteria count for 40% of DNA.

• DNA from the spoilage bacteria was identified in all samples along the production chain.

Example 2:

• Spoilage bacteria count for 60-90% of DNA at end of shelf life.

• A few days after packaging the spoilage bacteria count for just 1% of DNA.

• DNA from the spoilage bacteria was identified in high amount in a few sampling places along the production chain.