Shifts on bacterial population of high moisture corn silages and its correlation with fermentation end-products

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High moisture corn silage

- Fermentation - Efficient strategy to store and process grain;

- To explore the benefits - Conservation process should be properly made;

- Establishment of distinct microbial communities in ensiled mass results in distinct fermentation patterns (good or bad).
Characterizing microbial communities present in silage may help on understanding of silage fermentation profile and aerobic stability.

How do bacterial communities behave during 120 days of ensiling?
• To determine the composition of bacterial communities in high moisture corn silage as well as their fermentation end-products and their correlations.
Material and methods

Harvesting time

- 1/2 milk line (ML)
- Black line (BL)
- Dry grain (DR)

IAC 8390

AG 1051

Storage time (0, 7 and 120 days)

Silage sampling

*Dry grain was reconstituted to 32% of moisture (DR silages).
Material and methods

Samples

0, 7 and 120 days

DNA Extraction

MiSeq™ (Illumina)

Chemical analyses

CANOCO

qlime

Quantitative Insights into Microbial Ecology
Results
Diversity of main bacterial genera obtained from the OTUs matrix data

*Genera included in “Others” represent less than 1% of the total bacterial population in samples analyzed.
Correlation of bacterial diversity with chemical parameters (RDA)

*Symbols indicate harvesting time (DR, BL and ML)

**Colors indicate storage period (0, 7 and 120 days).
Conclusion

• Fermentation end-products found corroborate that Clostridium dominated the fermentative process in DR silages.

• Kernel reconstitution did not ensure desirable fermentation.

• Treating DR with additives could be a possible strategy to prevent Clostridium development in silages.
Thank you
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