

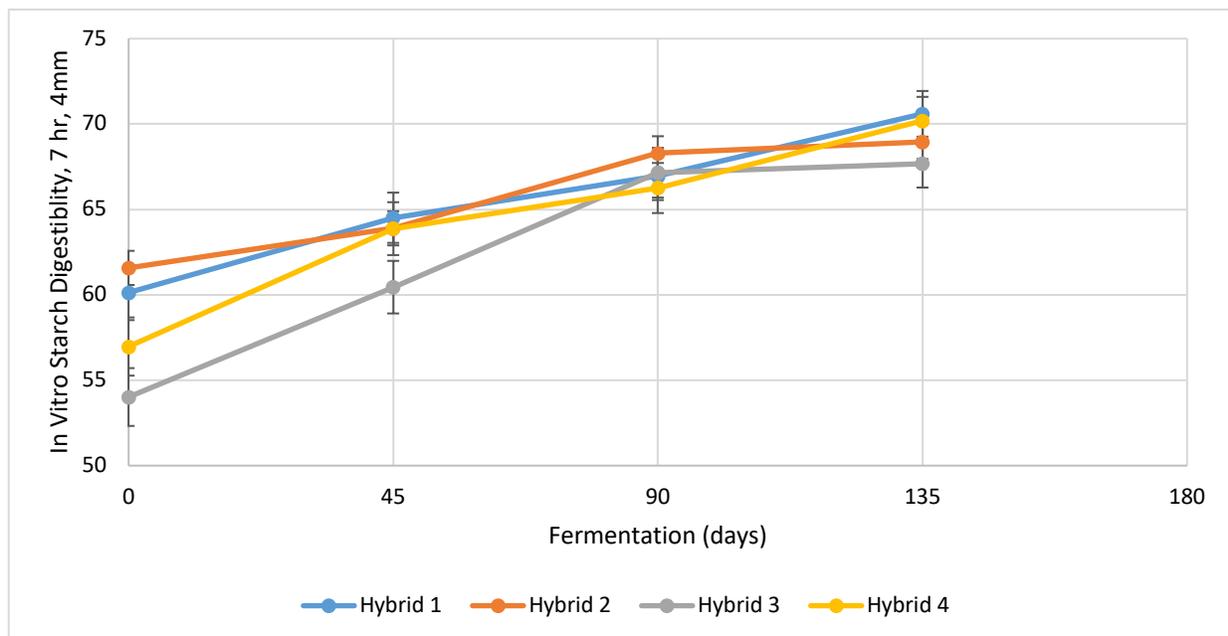
FACT SHEET 3: Impacts of fermentation

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An adequate duration of time for fermentation is often cited as a critical management tool for silages. The first reason is to allow the fermentation process to stabilize the forage as feeding unstable forage can lead to disruptions in animal feeding patterns and health. In the case of hay crop silage, this is the main consideration, and therefore guidelines often suggest that feed-out can begin after approximately four weeks in storage. With corn silage, there is another consideration, as fermentation plays a role in improving starch digestibility. While evidence is not consistent that fiber digestibility changes during fermentation, numerous studies have documented improved starch digestibility as fermentation time increases. Current guidelines suggest waiting a minimum of three to four months before feeding out corn silage, although additional gains can be realized even past this point. Data from this study are consistent with the current understanding of the topic (**Figure 1**).

FIGURE 1

Average change in *in vitro* starch digestibility for four hybrids over six site years.



During the 2018 and 2019 growing seasons the New York Farm Viability Institute funded a project led by Cornell PRO-DAIRY to better understand a number of field factors related to CSPS. Project collaborators include: Cornell Cooperative Extension, Miner Institute, SUNY Morrisville, Cornell University Ruminant Center, Corteva Agri-Science, Seedway, Dairy Support Services, Pominville Dairy, Hilltop Divine Dairy and Kingston Farm.

FERMENTATION AND CORN SILAGE PROCESSING SCORE

As discussed in the first article in this series, [Corn silage kernel processing](#), the difference between starch digestibility and starch availability needs to be recognized. While fermentation increases the digestibility of the starch, the animal's ability to utilize it is still dependent on the rumen microbe's ability to access the starch.

In recent years, some industry professionals have suggested that the fermentation process can also improve the CSPS of a silage. This study allowed for the evaluation of CSPS at four time points, from zero days of fermentation (green samples) to 135 days of fermentation, to determine if there was a relationship between ensiling time and CSPS.

There was no indication that fermentation time had a consistent effect on CSPS as measured by forage laboratory analysis (i.e. CSPS did not increase with increased fermentation time). An example of this effect is presented in **Figure 2** for one farm in the study. The same trend, or lack thereof, was observed at all three farms. It is important to recognize that this finding is specific to the fermentation process alone, as this work was performed in a mini-silo environment where the silage was not subject to other factors that could affect particle size (and possibly CSPS), such as the packing and feed-out equipment utilized on commercial operations.

The lack of a relationship between fermentation time and changes in CSPS is important to recognize as it suggests that CSPS needs to be within the target range at harvest. While the fermentation process improves starch digestibility, this data suggests that it does not consistently or significantly improve starch availability, as measured by CSPS.

FIGURE 2

Lack of relationship between fermentation time and Corn Silage Processing Score (CSPS) for one farm over two growing seasons.

