



Feed Ours First! Byron Seeds™ Real Differences in Masters Choice Corn Silage Hybrids by Larry Hawkins, PAS
Fertile Fields. Higher Yields. Plan On It.

For the last five or six years, Byron Seeds' Masters Choice has done very well at the World Dairy Expo Forage Analysis Super Bowl (FASB). This quality forage contest has selected the winners based mainly on fiber digestibility plus starch levels. The starch level criterion assumes that the starch, unlike the fiber, is highly digestible. But starch digestibility varies, especially during the early fermentation process. This is important because corn silage is typically about 50% fodder and 50% corn. Yield is a third factor that, along with fiber and starch digestibility, must be considered in evaluating a forage product.

Masters Choice strives to achieve the right balance between the three factors. We don't want to have a yield drag, for example, for the sake of fiber digestibility. Moreover, the commonly ascribed digestibility leader, BMR, has the most flinty (indigestible) corn. Similarly, we don't want a drag in fiber digestibility or yield for the sake of better starch.

The real test of starch availability on the farm is the "September slump" — the drop in milk production that can occur when cows are switched to new corn silage shortly after harvest if there isn't enough starch in the corn kernels to sustain milk production levels. Much expensive equipment has been designed to help minimize this effect, but an enhanced understanding of how starch changes in corn silage can go a long way to helping a farmer select the right forage.

CVAS Study of Starch Availability

The results of a study by Cumberland Valley Analytical Services (CVAS) that used the widely accepted seven-hour in-vitro starch digestibility (IVSD7) test* for evaluating starch levels are both interesting and instructive. Starting with a corn silage database consisting of tens of thousands of samples from the New England and mid-Atlantic regions, CVAS classified the samples by their arrival date in the lab, assuming that the arrival dates would be a good proxy for the approximate fermentation times. The researchers then regularly tested the samples and calculated three-week rolling averages to show how various parameters changed with fermentation times (see Table 1).

Two main trends emerged from this highly controlled study. The first was that soluble protein (SP), and SP as a percentage of CP, increased due to proteolysis (breakdown of protein) — which occurs to some extent in every fermented feed and therefore was neither a new nor an unexpected finding. The new, and very important, trend that the researchers identified was a change in starch availability (IVSD7) — from 62.56% in unfermented corn silage to what can be presumed to be an endpoint level of 76.58% (because the IVSD7 recorded for the last four measurement periods was within a narrow, almost constant, range).



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Table 1. 2012 Corn Silage, Three-Week Rolling Average, New England and Mid-Atlantic States

Date	Storage Week	DM%	CP%	SP%	NDF%	NDFD30 % NDF	Sugar %	Starch %	IVSD7 % Strch
Sep 1	0	36.7	8.30	2.30	36.90	59.12	1.53	37.12	62.56
Sep 22	3	35.2	8.36	3.26	38.82	61.45	1.30	33.80	65.89
Oct 11	6	36.2	8.22	3.35	38.30	61.11	1.08	35.09	70.57
Nov 3	9	36.4	8.15	3.61	38.50	60.76	0.94	35.28	72.42
Nov 24	12	36.4	8.13	3.89	39.05	60.89	0.91	34.84	74.41
Dec 15	15	37.3	8.20	4.09	39.54	59.75	1.19	33.59	75.22
Jan 5	18	36.0	8.23	4.31	39.39	60.32	0.92	34.31	76.88
Jan 26	21	36.4	8.15	4.33	38.96	60.85	0.88	34.54	76.32
Feb 16	24	36.5	8.14	4.42	38.52	60.99	0.80	35.08	76.83
Mar 9	27	36.5	8.08	4.39	38.50	61.48	0.85	35.02	76.58

Key: DM =dry matter; CP = crude protein; SP = soluble protein; NDF = neutral detergent fiber; NDFD30 = 30 hour digestibility of the NDF; IVSD7 = seven-hour in-vitro starch digestibility. Source: Cumberland Valley Analytical Services. Full report at <http://www.foragelab.com/Media/The%20Corn%20Silage%20Fermometer6.0.pdf>

It is noticeable that NDFD30 was virtually unchanged over the study period, indicating that NDFD30 has much more to do with corn genetics (BMR and Masters Choice high-sugar hybrids) and almost nothing to do with fermentation time.

Starch Availability in Masters Choice Hybrids

To track the change in starch availability in Masters Choice hybrids, we sent corn silage samples from plots in the upper Midwest (278 samples) and the New England and mid-Atlantic regions (124 samples) averaging about one month in fermentation to CVAS for analysis shortly after harvest. As shown in Table 2, the Masters Choice IVSD7s start where the others quit. The lineup of Masters Choice hybrids had an average IVSD7 of just over 75% with a standard deviation of 6 — a remarkable consistency that shows the value of the MC corn-breeding program.

MC Hybrid	Average IVSD7
MC4050	75.79%
MC5250	76.03%
MC5660	76.36%
MC535	77.97%
MC6580	74.62%
MC590	74.64%
MC Lineup Average	75.09%

Where do Masters Choice hybrids end up in the starch availability department after six months of fermentation? Dr. Charles Sniffen, a prominent dairy scientist who has analyzed these data, has seen many Masters Choice hybrids hit IVSD7s of 90% or more after proper fermentation. We don't have a large



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controlled data set to prove this, but we've been working hard to discover this last piece of the puzzle. However, in the worst case scenario our Masters Choice customers avoid the "September slump" — without sacrificing yield or NDF quality. And if the Masters Choice IVSD7s keep on getting better after six months of fermentation, our customers have corn silage or HM corn that will be more efficient (less corn needed to produce the same or more milk) and more profitable.

Masters Choice Corn-Breeding Program

Masters Choice has had a 40-year program of breeding corn hybrids to have higher starch availability by striving for a hybrid that produces more sugar, the precursor to starch. The result is a hybrid that also has larger roots (to gain fertility) and wider, arching leaves (to absorb more sunlight), that retains the old-fashioned trait of flex (larger ears and bigger stalks with moderate planting populations) and that exhibits more natural plant health — and all this with a highly digestible NDF.

World Dairy Expo FASBs are won with high NDFDs and starch levels (bu/acre). But down on the farm, dairy profitability is won with hybrids that have NDFD and starch availability. The one place to get it all is from Byron Seeds and Masters Choice.

What Our Customers Say About Master Choice Hybrids

Our customers tell us that with Master Choice hybrids, they avoid the fall adjustment to new corn silage without having to invest in a four- or five-month inventory of last year's corn silage. They don't incur the cost of a long milk slump and/or the cost of extra silage. Moreover, although extra stored silage improves with age with regard to starch digestibility, every other parameter stays the same or gets worse, including the likelihood of storage loss.

Factoring in Yield

Of course, yield plays a big — perhaps the biggest — role in the profitability of raising a particular hybrid on your farm. Although not a factor in the results at FASB (or at CVAS), yield, along with quality, is a factor in university research trials. At these trials, every company enters its best hybrids, which compete with no interference from any partial agent, and judging is on a milk-per-acre ranking.

How has Masters Choice fared? Masters Choice has won or been at the very top percentiles in corn silage trials at the University of Wisconsin, the University of Minnesota, Michigan State University, Pennsylvania State University, the University of Georgia and the University of Florida. Our hybrids compete head-to-head without using GMO traits. We are the refuge acres of these plots and still win!

Give Masters Choice a Try

Masters Choice hybrids are winning the corn silage battles at the World Dairy Expo Forage Analysis Super Bowl and at university trials. Based on their outstanding track record, they deserve a trial on your farm as well. The big trial is to Feed Ours First! Give your local Byron Seed dealer a call.

*The test does not account for rumen starch disappearance and others factors that occur within the rumen.