



# The Ultimate Guide to Using SCiO for Consistent Milk Production

It's an exciting time in the dairy feed industry to be able to provide high impact decision making technology that fits in your pocket. What follows below are the farm proven methods for getting the most consistent production responses while using a SCiO device.

## Taking a sample



The preferred method for a SCiO device is to collect a forage sample in a pail. Using the ground or face of the pile directly can alter your scan results.

You can use freshly faced forages if you are sampling while the defacer is running. When collecting a sample from a freshly faced pile reach in to the center of the feed that has been defaced and grab full handfuls to place in a bucket. Walk the length of the freshly defaced feed and collect 5-10 handfuls for your pail. Immediately following a defacer will ensure a representative sample from the entire height and width of the pile provided that the facer can reach the top edge of the bunk and continues it's path all the way to the floor.



If defacing is not an option, taking several samples from multiple heights over the entire length of the pile is critical for a proper sample that represents the entire bunk face. If there are edges that will not be fed, avoid using them in your sample. When collecting samples directly from the bunk face dig into the pile with your finger 3 to 4 inches to remove feed that has been exposed to the current weather conditions. Typically, in any weather condition the forage immediately on the face is a different dry

matter than the feed a few inches in from the face. For this reason, taking fresh samples immediately after defacing the pile is the most accurate.

## How to handle baleage



Baleage is different than chopped forages in a bunk, bag, or silo. Its long stemmy nature is similar to dry hay but since it is harvested wet the moisture in the bale and the resulting dry matter scan can fool you. Some baleage will be cut in the baler and some will be long stem. Some farms will grind it before feeding and others will drop an entire bale in the mixer at once with little regard to weight. Baleage can present a real challenge in cattle feeding

operations but it's ease of use and flexibility warrants discussion here. If a farm is grinding before feeding the sample is easily taken in a pail from several spots in the pile after the bales are processed. If the farm is putting whole or part bales into the mixer without processing it is best to get a sample from the center portion of the bale and ideally using a few bales. Wet baleage bales tend to wick the moisture of the hay toward the outside and especially the bottom of the bale. If you use the outer layers of the bale to scan you will have inaccurate results. If only one bale a day is fed the bales should be sampled at least every 5 days. Baleage dry matters change often due to the small size of the bale compared to bunks and piles.

## How to scan properly

Once you have a forage sample in a pail. You can commingle the sample simply by stirring the forage with your hand. Open the SCiO App on your phone and select the forage you wish to sample. Turn on the device by depressing the button on the side. Your SCiO App should display the battery symbol once your phone is connected to the device. If you are not connected a red X will display in the top right-hand corner on your phone.

## Keeping light out



Once connected, using the optical shade is imperative for success while scanning. The device is ultimately reading a light beam that passes through the forage. Scanning inside the pail and using the optical shade both help to keep outside light from interfering with your sample results.

## Steady Pressure

Another important consideration when it comes to light is being careful not to apply additional pressure to the device while scanning. Let the device use its own weight to apply pressure to the forage for a proper scan. It is unnecessary for you to push the device down into the feed for a proper sample. Simply stand the device up perpendicular to the feed so the optic guard is coming in contact with the forage under its own weight to keep light out and produce a proper reading.

## Verifying the scan

With each successful scan the app will verify that the forage selected is actually the desired forage based on comparison from thousands of previous samples stored in the cloud. If you move the device while scanning, lose internet connection, or sample foreign matter the scan will not count that part of the sample and will require another scan. All forages require 10 verified scans to be completed. Those 10 scans are then averaged for 1 dry matter result. It is important to stir your sample and move your device after each verified scan.

## Internet Connectivity

The SCiO device will scan properly anywhere there is an internet connection. It will scan the sample if you don't have an internet connection and store it in your App as "Pending" once you are in range of internet signal the sample should verify and post the results for you automatically. If you have unreliable internet signal the best practice is to collect the feed

samples and the scan where the internet signal is strong. This can be a farm office if there is not good signal at the feed storage area. This step avoids pending and non-verified samples from delaying your scan results.

## Calibration

Occasionally you will not be able to scan because the device will tell you to calibrate before scanning. This can be time based or lens of the scanner is dirty. When this happens first check for obvious dirt on the lens. Then pop the device out of the protective case and put it back in the case backwards. There is a little pad in the top of the case for the eye to calibrate itself. Once you have the device in the case backwards you can press the calibrate button in the App. Don't worry if you cannot find the calibrate button. The App will let you know when it is time and you will not be able to scan without calibrating.

## Battery life



The battery icon is somewhat misleading on the SCiO device. Full is full, but anything less than full battery usually results in you getting to the pile to sample forages only to do one or two scans and have the device die on you. Connect to the charger after each use to ensure your SCiO is ready to go.

## Recording

The SCiO App will store your scan result. Be sure to label your results to keep your forages straight. Many operations can have multiple pile open at once and large carryover can result in different harvest years being fed at the same time. Label all forages by harvest year, cutting, and variety. For example- 1st cut, 2018, alfalfa or 2018 BMR CS. It's also a good idea to practice the habit of recording the results in a spreadsheet or calendar to quickly reference the trend of the samples. The greatest benefit of SCiO is the ease of multiple samples. Many data

points will lead to a more accurate result than any one sample. Recording individual samples will help make more informed feeding decisions against future outliers.

Sample	Date	Dry Weather	Rain/Snow
Corn Silage	7/14	35%	
Corn Silage	7/17		32%
Corn Silage	7/20	35.5%	

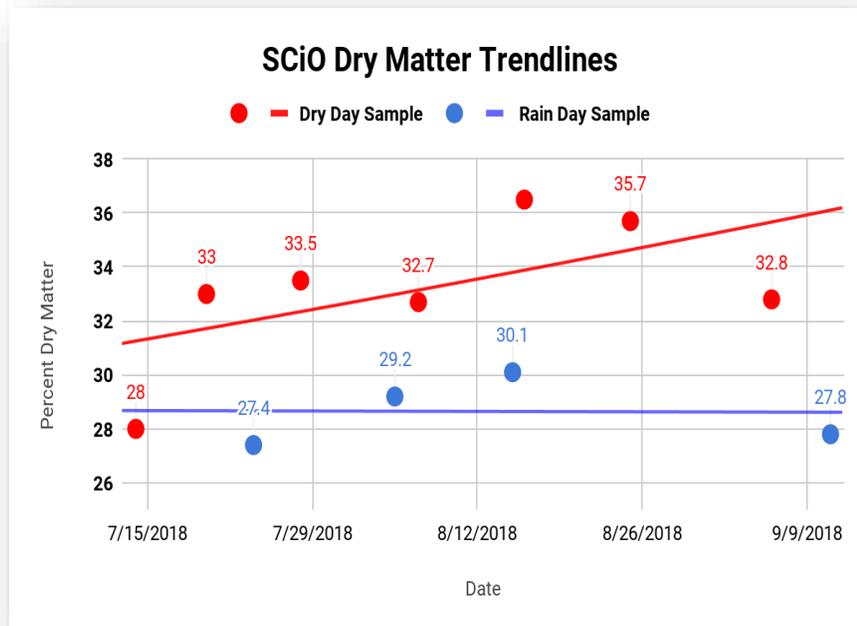
## Tracking results

Whatever system you choose to adopt to track your SCiO test results should be convenient for you to average your last few samples. Samples should be averaged in sets of 3. Volume based samples are preferred but time-based samples are more meaningful. 3 samples taken in the last three days will be more accurate than 3 samples taken over the last three weeks.

## Adjusting for time

With time-based samples a 3-day, 7-day, or 10-day average will be most beneficial for dry conditions. Based on your total number of samples use the last three but do not exceed a 10-day time frame. Sampling for dry matter only once per week does not give you 3 samples in a 10-day period. Sampling twice a week is a minimum for most progressive operations. True production consistency will take place once an operation commits to sampling dry matters at least 3 times in a seven-day time period.

## Result Averaging



With the flexibility of SCiO to produce multiple data points in a short period of time, result averaging is fairly straightforward. Simply average your last 3 results and adjust to the trend. If your last three results for corn silage are 35%, 35% and 32%- This average should result in 34% and be fed at 34% even though your last result is 32%. The overall trend is going down and lowering your target dry matter is acceptable. Taking the feed from 35% to 32% is too big of a drop to be considered accurate with no weather changes, the cows will notice. Conversely, if the last 3 samples are 35%, 35% and 38% they should be average to a result of 36%. The 36% is acceptable to feed immediately as the trend is going up but increasing the inclusion rate in the diet from 35% to 38% is too big of a jump for the cow. Averaging the last 3 samples is the preferred method for maximum dry matter intake while compensating for sampling errors.

## Rain and snow



There is nothing that will mess with dry matter results and feeding performance faster than rain and snow events. You can use the device in the rain. The best way to account for precipitation events is to take three samples on a rain day and use the SCiO on each sample. Then average those results. As an example, if you were to take three corn silage samples in the rain and the results were 28%, 26%, and 29.5%. You would average those and get a result of 27.8%. You would enter that 27.8% into your ration or TMR software for that one rain event day. Once the rain event is over you can adjust your dry matter percent back to your dry weather baseline numbers. **Do not average rain event samples with dry day samples in you sample history.** Rain days should be treated as standalone events. Each rain brings a different volume of water and should be treated individually. Farms with both larger herds and larger feed surface areas will see the impact of these changes the most. Precipitation events are the single greatest opportunity for SCiO to demonstrate its value to large herds

## Handling outliers

Even with careful precautions and a well-trained user you will have outlier samples from time to time. Simply throw them out. Loose hay, light colored forages, and really bright areas will affect your sample results. If your haylage sample is 39%, 37%, 55%, chances are the 55% is an outlier and you should disregard that scan and sample again. Changing fields, piles, tubes, or feed sources can have that kind of a drastic change but three samples should always be taken

to confirm the wide swing. The same is true for an extremely low dry matter number. If that same haylage sample is 39%, 37%, 22% over three days, that 22% should be confirmed with more tests before that is considered a fair and accurate scan result.

## Interpreting results

Properly following each of these steps is critical to finding consistent results with a SCiO device. Your results with each scan will vary when compared to other systems such as Koster Testers and drying ovens. Taking many data points with one system and then averaging those results to the trend line is the optimal way to find a true working result that maintains both animal performance and minimizes forage shrink.