BA Collab Hour Q&A: The Connected Brewer: Leveraging Real-Time Fermentation Monitoring to Boost Product Quality and Operational Efficiency

Do you have a smaller scale version to test this on the pilot system/homebrew scale or for breweries that are on the lower end of the microbrewery scale?
[38m 36s] Dave: We have two sizes of test systems right now – 7-barrel and 15-gallon. I run a lot of fermentation tests on those and it works very well. So, if you're on the smaller end, yes, it does work on something like a half barrel.

Does the sample taken for analysis go back into the fermentation vessel? What are the contact site materials? Worrying about cross contamination.
[39m 31s] Dave: Absolutely. I'm a microbiologist by trade, so that was really important to me. Yes, it does go back into the tank, recirculated through the sensor hub. All the contact materials are either polyethylene or stainless steel or Delrin, which are all sanitary rated and you can clean them all. We do have a CIP process that we run through for the sensor hub between each fermentation. It is mandatory that you run through it each time. You cannot start a fermentation without running the CIP process. That's how we keep everything clean. Cross contamination has not been an issue. That being said, we have not used anything on wild beers, mixed ferms, etc. (or at least I haven't), so I would probably suggest getting a separate sensor hub if you are looking to do a mixed ferm.
Erik: It also helps to understand exactly how the sensor hub hooks up to the tank: There is an attachment that goes in through a tri-clamp port that actually goes into the fermenter itself and allows uptake of beer. It has a screen on it to help filter solids from getting into the sensor hub itself. Then the sensor hub attaches to that and is attached to the tank throughout fermentation, so it actually cycles beer through the sensor hub and back into the tank. It's a centrifugal pump that's pulling everything through and pushing it back in at real time.

Have you tried this with fermenting cider? I would assume it would be the same, but I am curious.
[41m 54s] Dave: Yes, we have. We actually have a customer running right now on cider. It is honestly some of the best data we've seen. It's interesting – I've never made cider myself or been to a cidery (although I drank a lot of cider in college!), but the data is really fascinating because the pH change is not as significant obviously because you have more acidity in the juice to start with. This provides more buffering capacity because as you decrease pH value, the change goes slower – because it's logarithmic. So, we've noticed significantly less change in pH and the data overall is much better, mostly because we don't have as many factors to deal with like solids, dextrins causing foam, etc.

Can you take the parts apart and replace them? so you can have product specific parts?
[42m 58s] Dave: Currently, no. As of right now, we are working on building this out as a brew monitor specifically. It just comes with all of the components we mentioned and that's that. There has been discussion going forward to talk about different models specifically for different applications, but that's not where we're at this moment.

How long is data kept on the web application and can you download it?
[44m 34s] Dave: Indefinitely on the web app – it's cloud storage via Amazon Web Services. And yes, it's downloadable. All of the data is available through a CSV export, so if you want to take that data, put it

into Excel, work with it, make your own graphs, compare your data to previous data, you can. The data is all available to you and yours to play with.

Can you speak a little bit to the price points and customer support?
[45m 12s] Dave: I'm not aware of the price points, just because I'm not a salesman. I just do product development. Customer support, though, is pretty broad. Right now, we have an after-hours customer support phone line. And our customer support team is exceptionally responsive. For price points, I'd recommend reaching out to that email address (info@precisionfermentation.com) and they'll put you in contact with one of our salespeople who will be able to discuss that with you.
Erik: I can speak to this a little bit as a customer, though I don't want to give quotes of course. Each brew monitor has its own separate cost. We have 14 fermenters across our cellar and one brew monitor, so we use it specifically for beers that we are looking for data on rather than monitoring our entire fermentation. So, it really depends on your planned application.
Dave: That's a great point. If you are someone who is looking to outfit your entire cellar, every brew monitor comes with two different tank connectors. Mostly because we are not looking to sell you a million of these – we want you to just have as many as necessary. So, typically one sensor hub is good enough for two tanks because there will be down time in a tank when you are conditioning, dry hopping, etc. When there is no fermentation activity going on, you can pull that sensor hub off, clean it, and put it onto a separate tank.
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Can the system pay for itself at some point in time?
[47m 38s] Erik: It really depends on your brewery. If you're operating at capacity, the opportunity for this to pay itself off is pretty high. The ability to be efficient across your fermentations and cut time down so that you can have a higher throughout without adding in extra fermenters, etc. I think makes significant ROI pretty quickly. I think if you are pretty small and not operating at capacity, then ROI will more be about how you value the data and information you're looking for. It's really operation dependent. For a large brewery intending to operate swiftly, the ROI should be very quick.