

Matt Kirkegaard: Well, thank you everybody, my name's Matt Kirkegaard, editor of Brews News, and thank you very much for joining us for this very first Brews New Live Webinar. It's part of our personal COVID pivot, and I'd like to thank Kegstar for helping us to make it possible.

The premise for today's webinar is quality. Innovation and quality. Because over the last two decades we've seen rapid shifts in the beer landscape, with the number of participants growing at a frenetic rate. With many of these new players seeking to push style and technical boundaries to gain attention in an ever-more-crowded market.

At the same time, notions of craft, the craft of brewing, that saw many smaller brewers enter the industry eschewing some of the techniques employed by larger brewers that nominally were there to designed to ensure characteristics such as beer quality and shelf stability, and they've eschewed them in the name of the craft.

Amidst all of this, we have seen arguably an increase in beer recalls and withdrawals, but also – at least I'm seeing – lots of social media about beers with, what could politely be called, aesthetic quality issues of gushing, leaking cans, floaties or more, in poured beers. Some argue that this is part and parcel of the craft and a sign that it's an industry pushing boundaries for the better; others don't. And I suspect from previous conversations with my panellists, that they have their own thoughts on it. I can see them holding back already, which is why I've assembled them for this panel discussion, as I mentioned, made possible by our good friends at Kegstar.

I am honoured and delighted to welcome Charlie Bamforth, former Anheuser-Busch Endowed Professor of Brewing Science, current Distinguished Professor Emeritus, University of California Davis, and Senior Quality advisor at Sierra Nevada Brewing Company. Welcome, Charlie.

Charlie Bamforth: Thank you, it's always nice to be with you.

MK: I wish you could be with us in person, but that will have to wait a while.

CB: I do, too.

MK: I'd also like to welcome Clare Clouting, Gage Roads Operation Systems Manager, and co-founder of BIRA, a not-for-profit laboratory proficiency scheme for the brewing industry, and something very germane to today's discussion.

And also, Diarmaid O'Mordha, who has been instrumental in pushing this conversation, as the Group Quality and Assurance and Sustainability Manager with Endeavour Drinks Group, and the Chair of the Wine Industry Sustainable Packaging Alliance, and in many ways the man works for the largest retailer in the country that has to tidy up sometimes, literally, sometimes when things do go wrong.

I guess in opening that, does anyone in the panel have any issues they want to raise with that premise behind the development and the ideas of craft over the last 20 years?

Diarmaid O'Mordha: What I would say is, I always bemoan the fact I don't actually know what craft really is, because over here in the States it's less than 6 million barrels of beer a year. But what I would insist is that every one of those barrels, and every can or every bottle should meet expectation and should have the ultimate quality, and I don't believe that there's any case for people saying, "Oh well, if it's not perfect that's because it's somehow crafted to be natural," or something like that. There are no excuses. Beer's been around for thousands of years and we know how to do it, we know how to do it well. And I don't think anybody on any scale should be doing it anything other than properly.

MK: Admittedly, Charlie, I haven't seen it here in Australia as much, but I have seen brewers in the United States point to the label that they'd put on the package saying, "Must Be Kept Refrigerated," as if that's an out if things go wrong. And I know, Diarmaid, we've spoken about that. Is it acceptable to just say, "Well, my beer should be refrigerated, treat it like milk"?

DO: No. No, not at all. I actually did see a cider do something similar, and we went into discussion with them around it, just to help 'em out and really understand. From a customer perspective it's not something that the common man knows and expects then to protect themselves from injury or from an exploding can that they gotta keep it refrigerated. So I think that premise around putting that kind of warning on, there's a level of slackness to it.

I think there's a lot more you can be doing at the brewery, with your supply chain, to ensure you've got a good quality product. And then having that good quality, safe products then not going to have to put the requirement of putting a warning label on your package.

Whatever, however, we want to find craft beer, but more that micro-moving from, "I'm a home brewer and I'd love to set up a little brewery," and that kind of movement that's brought a wave of craft brewers into the industry. Looking back where we had more industrial scale breweries, these were issues that were unheard of. And looking at the numbers now in the last couple of years, we have seen a steady increase in recalls, at least. Withdrawals as well, just from a precautionary perspective, and removing stock off shelf because we're concerned that the product may have a secondary fermentation happen.

The outcomes can be quite dangerous at times as well. We know of injuries, people with hand injuries with cans tearing their skin, but also if a secondary fermentation occurs in a glass bottle, you've got glass fragments flying through the air and somebody could get a glass fragment to the eye. I'm aware of a circumstance where somebody was driving home from one of our stores and had the can on their seat, and the can exploded in the car. That's the kind of circumstances.

Sometimes where I read, I don't get the sense it's taken seriously enough. And because it's not taken seriously enough, it's something that's just accepted. It really isn't something that should be accepted. The beer needs to be brewed to a point where there isn't a chance of a secondary fermentation occurring.

I'll have to recognize, though, the brewers that I have worked with have been very proactive in this space, and when we have brought it to their attention, they've been very quick on the mark to get a recall out and basically isolate and bring back any of those affected products.

CB: it's amazing, if you think of any product in the marketplace – I'm talking generally, about all sorts of things – the worst thing in the world is failure in the trade, you know? You think of all the

automobiles, recalls for seatbelts that prematurely get going and so on and so forth. It's just the same in brewing. The last thing in the world that anybody should have or tolerate is a failure in the trade. And it doesn't only bring that company down, it brings the whole industry down if people are not responsible and they're not delivering quality expectations.

Clare Clouting: I think it's important to note as well, the beer industry for many years, and it's a fairly well-known fact that when you issue a recall at a consumer level, you get very little of that product actually back. You may be advertising in store and papers, or it might be the Facebook page or something like that, but I know from dealing with previous recalls in another type of food, it was very few packets actually got returned. So it's a bit like shutting the gate after the horse has bolted, which really worries me.

MK: And in my introduction I talked about craft beer not to spark that discussion of what is craft beer, and that was more... I saw a comment a while ago when there had been a consumer issue that someone had reported on Facebook, and the response that came from somebody associated with the product was, "It happens with all beers," and I see you shaking your head there, Charlie, because I don't actually recall – and it's not a small vs. large, craft vs. mainstream – but I don't recall a recent quality issue regarding mainstream beer.

CB: They do occur from time to time, but it is unusual. But it can happen to the best, as well. So if it can happen to the best, it is always a risk, and people have always got to be on their toes. The most recent I can recall is, there was a problem with the glass, it had to be. It wasn't the beer, it was actually the glass bottle. And it was prone to the neck breaking. And that company very responsibly withdrew, or bought the product back. I did ask the company, "Was it just you?", and the answer was no, but they're the only ones that actually did it properly.

MK: Funnily enough, that was the last one that I recall in Australia from a large, aligned brewery as well.

CB: And I remember my old company in the UK, Bass, which is of course a fairly sizeable company. I mean, they managed to put out beer with cooling agent in it. The glycol cooling agent used in the heat exchanger, there was a leak, and it got into the beer. I'm sure a lot of people would've ignored that, but they didn't. They withdrew from trade, it was a disaster. I mean the share prices, the stock price, fell down very rapidly.

So it can happen despite how careful you are. However, it should be unusual, and it shouldn't be accepted. It should be viewed as an absolute crisis if anything goes wrong. It's the worst thing in the world and people should realize that it does nobody any favours to put out shoddy product.

MK: Diarmaid, I did cast it in terms of innovation and beer quality. Is it a relatively fair generalization to say that the styles of beer that we are seeing being prone to recall are beers where they're non-traditional beer styles? That they may be beers that brewers are looking at newer techniques, or less-established techniques that are going out into a retail environment?

DO: I wouldn't call them off-kilter, out-there beers. I think some of the ones... we've seen stouts, we've seen porters, we've seen fruit beers, ciders, yeah. So it's a general mix, it's not generally, I think the trend would be towards fruit additions, but I wouldn't say that then leaves out the possibility of your stout then going into a secondary ferment. We've seen stout go into a secondary ferment with diastatic.

MK: Somebody in the chat room has just reminded me that Guinness 0.0 was recalled this month. That I haven't looked into, but I presume it had something to do with the low alcohol, or the...

CB: It's alcohol free, and I think the problem was, therefore it was susceptible to pathogens. Pathogens won't grow in a regular beer, but if you've got no alcohol there and you've got a problem. I'm assuming they pasteurise that product, if there was a pasteuriser issue or something like that, but again, they recalled it. They didn't accept it, they didn't close their eyes. So it can happen to the biggest of companies.

MK: So Diarmaid, what are we seeing in retail in terms of issues? Moving away from the straight recall, because I believe that we're seeing seaming issues or presentation.

DO: Just from a craft perspective, these beers are the higher end of the market from a price perspective. A customer can pay from \$15-20 a can for some of these beers. Anything less than perfect just can't be accepted. If a lower-priced beer can deliver on aesthetic and quality and flavour and consistency, then the expectation has to be there for the higher end, particularly with that higher value price point.

The issues we're really seeing, and it's certainly not a high frequency, but the ones of concern and the ones you'd question, "Why are we having these issues?" would be leaking cans, so from improper seals. Cans just being sticky in general, not been properly washed down post seamer. And one of the other ones I'd go, just a general, some of the shelf-lives we're giving these products. I've seen NEIPAs with 12-month shelf life, and that to me, yeah. It's just, it's not possible. You're either just wanting to, you're just kind of picking a date and putting it on the can and going, "Yeah, 12 months is fine," or have you actually—

MK: Just before we move on from that point, because that's one of the things that you always hear is that it's the major retailers with long logistics streams that are requiring that 12-month date.

DO: Not at all. No, absolutely not. I think the business model were now operating has changed considerably. We do, now, direct-to-store deliveries, so direct-to-store deliveries, brewer brews the beer, packages it, and can deliver directly into our fridges. So that model is quite a short supply chain. The beautiful thing about that, it's localised, so you've got a brewery that's supplying maybe 10 local BWS or Dan's stores, but the expected shelf life on those products, it's pretty much a week old by the time it hits the store. If it's got six-month shelf life, or even four, that's fine. That's the time that we have to sell it. We're comfortable taking those beers with that shelf life into the business.

I think the point I'd make, back to the brewers, which really helps – and you always gotta put the customer, it's all about the customer. We're an entire river here, okay? So we've got the hops and malts up in the mountains, and then the brewers are down in the valley. We're the point at the mouth of the river into the ocean, and the ocean is the customer. So making sure that river's looked after and cared for ensures that the water going into the ocean is healthy. Getting together and working with the brewers and helping them understand what's happening on our end, and we understand what's happening on theirs, we'll get a really good quality product to the customer.

It's a shelf-life issue. It doesn't, three months, four months, no problem. But just know what it is. But then, back to the point for the customer, share with them when you packed it and when you'd like them to consume it by. So that, to me, that's gold standard, key information for a customer.

Customers do want the freshest beer, so packaged, I know it's fresh, and this is when I should consume it by.

MK: But even that, there are practical challenges with that, and I'm famous for discussions I've had with someone like Greg Koch about ten years ago saying he just doesn't want his beer in Australia because you can't get it to Australia fresh, and then obviously realistic concerns take over and it goes there and—

CB: Having said that, though, and as you know, I'm associated with Sierra Nevada these days, they ship that beer refrigerated everywhere. The beer is shipped refrigerated. Very expensive, but you know if you keep it cold, you will buy flavour life. Now early on we talked about refrigeration as being touted as a solution to everything. It's not. But when it comes to flavour stability and freshness, the two main things you can do are keep out the oxygen and keep the beer cold. It is perfectly possible to ship beer large distances, but again, you can't expect it last forever.

Diarmaid's absolutely right, the most important date on there is when it was packaged. That's the most important thing. And also, as he says, how long realistically can it last? A lot of people hate to talk about the big guys, but I can think of one very large brewing company and it has the "born on" date, and it literally states how long before that beer is no longer acceptable. It's like 110 days, you know? And that's important information.

I know there are brewers that basically ignore it. They say it's going to go stale, and they just don't, they just ignore it and they slap on nine months. Nine months in the UK for years, and there's a hell of a lot of stale beer there. It's ridiculous. You've gotta be honest with the customer, in my opinion.

MK: Clare, how should brewers go about understanding what the shelf life of their beer is?

CC: I think you've gotta take into account the various challenges and cards that you're dealt. For instance, we're in Western Australia, and we're shipping quite a substantial amount of beer now to the eastern states, and we know we've got the Nullabor to contend with, particularly in the summer. So, for instance, at Gage we've invested massively in chilled storage this end. Everything we produce now is chill-stored until it's shipped, and then it goes straight into chill-store the other end as well. And that's made a massive difference for us.

And we also do a lot of shelf life testing, so we've got shelf-life tasting programs for most of our products. We taste them on four weeks, eight weeks, 12 weeks, and then through to the end of their shelf life, and that tells us a little bit about how they're traveling and what we can expect to get out of them.

The other thing we do, and this is a challenge because we're constantly trying to balance efficiency with how much to run and how big our production amount should be, with how fresh we want to keep it in the market. It's taken us a while to really estimate how much to produce to enable us to keep that supply into the marketplace fresh.

A good example was when Little Dove first won the Champion Beer. I think it's fair to say we produced quite a large amount of it, and then it just didn't pull through as quickly as we'd like. And it was such a shame, because people were getting it off the shelf having read about this great Champion beer, and it wasn't to the standard that we expected it to be. Luckily we fixed that now, but it's definitely something that's difficult to balance, particularly when you're looking at efficiency

of, it might be better for you to run six weeks' worth of stock rather than two weeks' worth, from a financial perspective. And particularly smaller breweries, that's a very real thing for them to balance, and a strain that they're under.

MK: Just step us back through your shelf-life testing. Is there a protocol you've got for that? For example, do you keep them all refrigerated for that period? Or do you keep some refrigerated, some at 20 degrees, some at 30 degrees, and see how the variation is across those temperatures across time? Talk us through your approach.

CC: Well generally we set up a nice little reference room, it's just got a little air conditioner in it, we keep it at 22.5, and the reason we do that is we think a lot of the supply chain and a lot of stores these days we can't guarantee how the beer's going to be kept, so ambient, it gives us a pretty good indicator of what our actual consumers are seeing, which we feel is important.

We do often do chilled, particularly for Single Fin, which is our biggest brand. We do do a chilled versus an ambient storage, and we taste them next to each other, and that's just to tell us that that chilled storage is giving us the results that we want. But I think ambience is key, really. You want to see a worst-case scenario, and that gives you the ability to step into the consumer's shoes and then work out, realistically, how you are going. And I know people that don't store beer chilled at home, they might have a carton of six in their laundry for a few weeks and stuff.

I think it is best to work on that worst-case scenario, to be honest.

CB: The simple rule of thumb is that every 10°C increase in temperature, the beer will go stale three times faster. If people have got the beer in a refrigerator or they've got it at 20°C, it makes a huge difference.

I think the testing is very important, but ultimately what the brewer needs to make sure is, when they package that beer, it's got the least possible oxygen in it. It's absolutely critical that they know all the good practices so that they genuinely are delivering a product which will be able, as much as possible, to stand up to whatever is thrown at it. But there are limits.

MK: You actually anticipated my next question, Charlie, because I remember you have studied, and I just went looking for the article that referenced the speed at which beer stales at different temperatures.

Diarmaid, do you guys do your own monitoring as beer comes in, to see how it ages versus how brewers are telling you it's aged?

DO: We wouldn't have a set program, so I think what I'd share is we have a beer panel, and that panel gets together yearly and basically we do a mystery shopper, essentially. So it's not really getting the beer directly from the brewers themselves. It's going into our own stores, pulling the beer off, and getting the same experience that our shoppers would be getting. And then it's basically held as a judging. We don't know what beers we're looking at, we go through particular styles, and then that gives us a view of where we stand.

We obviously, with Endeavour we have Pinnacle Drinks, and that's making Endeavour's own beer brands, so we'd look at them, too, and use that as an opportunity to benchmark where our own beers are sitting against bigger beers on shelf.

The view there would be that once a year is, once every 12 months is not every month or so, but generally it's good. We learn a lot, and we do look at the dates of the products as well, and I think the challenging piece is where we've got beers saying it's 12-month shelf life, but the reality is once that beer goes past that six months, it's just not at its best. And I think, to Clare's point, it's a balance of getting the commercials right with the quality, but when it really comes back down to it, it really is that your reputation's in your can. Customer goes and looks at the can, connects to that brewery, and that experience that they have with that beer, that's their view then of the brewery. There's your reputation upheld or tarnished, so it's really important that every part of that value chain is doing its part to ensure that the beer's of the right quality.

Obviously we take, if we do get feedback from customers on off-tasting beer, product complaints, we are then pulling those beers in for tasting. That would be the other one. and that's where we get a bit more proactive, where if an issue's identified, we're pulling stock off shelf.

MK: I was just going to say, just before we move off the temperatures in beer, we've had a question in the group, "If force-ageing beer at 50°C for 1-2 weeks, is it equivalent to six-month-old beer at ambient temperature, or even reach end of shelf life?"

CB: No, let me give you... Historically when people have done experiments on flavour stability, they force age, and the two classic temperatures are 30°C for one month, and 60°C for one day. And it really does, if you say that three months at 20°C and you increase by 10°C it goes three times faster, so three months at 20°C is one month at 30°C, which is at 40°C, 12 days or something like that. And so you get up to 50°C, you're going to be about 4 days, something like that. It's just a guideline.

The other thing is, if you force age a beer at higher temperatures, the flavours you get are not the same ones you get if you store it naturally over a long period of time. You're going to exaggerate some of the cardboard flavours at higher temperatures, whereas at some of the lower temperatures, some of the other flavours are going to come through.

What I used to say is it's the gently flavoured beers that are the biggest problem, but that's necessarily the case. Some of the hoppy beers, they age very rapidly for all sorts of reasons. The hop aroma sticks onto the cap, or something like that. Different beers will age in different ways, and remember, there are a few beers – the higher alcohol beers – that might actually get better. But that's not the norm.

What I was going to say is, on a quality issue, just to show the importance the big guys have always placed on quality, I remember at Bass we had a new beer, and it was a very first production run of this beer, and the label on the bottle was ever-so-slightly skewed. It wasn't on true. And we just stopped the run and started again. We wouldn't put the product out just because the label was slightly not on there properly, and that is the commitment that I think all brewers at any level should give to the product.

MK: We'll park shelf life for a moment and look at some of the more significant issues affecting, such as refermentation in can. I'm also aware that there have been some tests conducted of alcohol as measured versus as registered on the can. There have been issues where it hasn't been meeting requirements.

What is going on that is seeing these sorts of issues? Is it issues in the brew house? Is it brewers doing things that they're not qualified or experienced to do? Or is it not caring? Does anyone have a feeling for what's going on?

CB: If a brewer knows what they're doing, they shouldn't run into these problems. If they've got refermentation taking place, there's a reason for that. It's either not properly fermented in the fermentor, or people talk – I hate this term – "hop creep". I absolutely hate that term, but you've got some of these hoppy beers and perhaps there are enzymes contributed there which are converting some of the residual dextrins into fermentable carbohydrate. And you've got yeast all there, but you've got to be alive to these things.

And if hop creep exists as an issue, it exists for any brewer that's producing this type of product, and not all brewers have the problem, so it's not insurmountable. Fundamentally, though, if you understand the factors that influence fermentability, if you understand controlling the amount of yeast that is or is not left behind there, if you know all the ins and outs about fermentation and CO2 control and so on, this can be sorted. There's no excuses.

MK: Just had an observation in the chat room from Tina Panoutsos, who could easily be joining us on this panel. We might even look at doing something with her coming up. She makes the observation, "The ageing process isn't linear, it's more exponential. It also depends upon the beer style."

There are no hard and fast rules when it comes to these things, is there, Charlie?

CB: No. As I said, different beers will age in different ways. For some, it's a loss of certain characters, in others it's the development of new characters. Yeah, in a blander beer, some of the things will come out more obviously, but some of the stronger beers you'll lose some of the flavour, it'll change. It's not entirely predictable, but you've just got to know what you're doing and what is best for your product. And what is realistic for your product.

CC: What I was going to say, and I think Diarmaid also touched on this with your secret shopper, and to Charlie's point, you've got to get to know your products as best as possible. We go out and buy stuff from the stores, so I go and buy Single Fin, I go and buy most of our beers from time to time so that I can see what's on the shelf and how it's ageing, and get a feel for it in the marketplace. And although it can take a long time to get that data, the more you go out and do that and go out and buy the product as a consumer and taste it, the more you get a feel for how that product's going to age.

The force ageing, it doesn't do the same as letting it age naturally, because we can pick up penny and papery characteristics, but at the same time, there's some residual hop and some quite nice aroma going on in the background. Sometimes we find in some of our beers that we've got the darker malts in, they develop more of a caramelly, malt oxidation characteristic. And they're things that, if we had heated them up to 60°C for a few hours in the lab, we would get a completely different outcome.

It is about setting the time aside and learning about your beers, almost in the shoes of the consumer, and then deciding where to set your shelf life.

MK: Looking at the participants, or the attendees, there's quite a range. If we look at the smaller end of the market, brewers at the smaller end of the market that say, "Well, I can't afford a dedicated quality control person such as yourself, I can't afford a \$40,000 alkaliser, I can't afford all this equipment," what should they be doing as a bare minimum to guarantee the quality of their product? What sort of processes should they put in place?

CC: I think the one thing that any brewery can do that's free is risk assessment. And it sounds very formal, but it's as simple as taking into account all of the possibilities, and really sitting and thinking, "I'm making a fruit beer," perhaps, "What are the potential watch-outs? What can happen?" And then making sure that you've got something within your own means to control that risk. And it might be as simple as coming down to asking yourself whether that particular product would be better on keg versus, should you be packaging it? And have you got the means to package it safely?

And then with regards to spending and stuff, quality is like an insurance policy. It's all a ratio, really, with regards to loss of reputation, with what you've got at stake. For instance, talking about sticky cans, if you're a small manufacturer but it's going to cost you less than \$1500 to put a washer at the exit of your can blower, I think that's a no-brainer. It might be if you're making 5 million litres upwards a year, then really having an oxygen analyser is probably a no-brainer. It's all relevant to the amount of beer you're putting out, and the reputation, and the size of risk to your reputation.

But not to forget, there's two ways that qualities work. The first thing is protecting your reputation, but the other side is growing it. And that's the thing, if you're not putting out great beers, you're not going to grow your business, either. It's hard to put a finger on it when it comes to quality because often it's seen as cost-avoidance, and you can't come up with this magical figure that it's going to save your business, but it's a good investment, particularly for growth as well.

CB: You don't need terribly fancy equipment. In terms of something like refermentation and avoiding problems and trying to control alcohol levels, if you understand the relationship between original gravity and degree of fermentation and you control your fermentation to the extent that you can, and you understand the relationship between gravity and ABV, if you know what you're doing, you can keep it fairly simple.

And I think that some of the problems that people have is when they try to be, they wanna keep being more and more adventurous and they keep experimenting with products that... And they can't necessarily predict what's going to happen, but they think it's sexy and exciting to keep pushing the board out. Keep it simple. Keep it simple. It's once you're able and skilled enough to make the straightforward products without problems, then you're in a position, perhaps, to experiment and invest more. But you'll be able to invest when you're more successful with simple products that you do well.

MK: It's funny you say that, Charlie. I had a conversation with somebody this week looking at whether beer competitions should have every brewer has to have a qualifying lager, and it's almost like, "You have to be this high to go on this ride," before you start putting some of the other ones into market.

CB: Well I have been known to say that it's only when you can make a decent pilsner that you should then embark on other things.

MK: That's just old men talking, Charlie.

CB: Well, I'm an old man.

MK: Clare, something that you've said in the past that strikes me as well, is the craft industry and the indie industry looks at things like the Independent Seal as being something that sells their beer very positively, but it links breweries in another way, doesn't it?

CC: Yes. It intrinsically links all of our reputations together as well. Somebody has a bad experience with a product that's got the Indie Seal on, there's obviously risk to all of our reputations being linked together. That's a concern.

I head up the IBA Quality Project Group and we've been working on a number of fact sheets, we're going to be hosting a webinar soon, and we're starting to put together a big sensory program to help everybody level the playing field, really, as far as quality and quality expertise and skills, just to try and support that Indie Beer Seal a little bit in terms of quality and consistency.

MK: Can you also explain what BIRA is, which you're a founder of?

CC: Oh yes, so that's a laboratory proficiency testing scheme, which can be super expensive to be part of. So a group of us from some Australian craft breweries, we've got John from Brick Lane Brewing, he's the President, we've got Thomas from Stone & Wood, Dan McCulloch, who was at Young Henry's at the time, and then Greg who runs Vintessentials Laboratory, so they're quite involved in beer testing. We got together and looked at how we can have an affordable Proficiency Testing Scheme in Australia, so we run it as not-for-profit, and basically how it works, it just takes group analysis of a similar sample, and then we run a statistical report on it and it tells the group how they're going.

So whether you're testing is performing well and it's accurate, or whether you're actually outside of the allowable limits. Because we've got a certain level of expertise, we can help people with regards to fine-tuning or working out what the problem is. We do ABV, which is, of course, really important for many reasons. We do allow our participants as well to even calculate ABV and take part, because obviously some of the smaller brewers don't have alkalisers, so that's good for them.

But we do things like IBUs, so bitterness, because a lot of people are actually putting that on their packaging these days. We also do colour, in-pack carbon dioxide, and EA. There's a few things we do. It's just nice for people, once every quarter, to know that their testing's on track and that they're getting the results they need. Luckily at quite a small cost.

MK: We'll make sure we include that in the show notes so people can find out about it. Are there other resources? I know that the QLD Government has invested in its brew lab in Queensland, it's theoretically a place that small brewers can go, and they've invested heavily in things like alkalisers and some of the other things. There is a small fee for being involved, but it's certainly much cheaper than spending the \$30 or \$40,000 on an alkaliser or some of that lab equipment.

Should they be testing their beer? Or should they be relying on touch and feel, the way that craft brewers want to?

CC: I think it's good to at least, I think quarterly, which is why we set it at quarterly, ideally more if you can, to 42.08 or alcohol testing, particularly in light of things like ATO requirements as well.

Recently I was talking to a manufacturer – I won't say who – of alkalisers, and they had been going around to different breweries showing off this quite affordable alkaliser, and they were finding beers that were quite a bit higher, including some mid-strengths, than were actually being advertised on the packaging, which is a bit of a worry.

MK: That's something that I've been hearing a lot about.

CC: And that's a massive concern, particularly for the mid-strengths. People are making decisions about driving and all sorts consuming those.

And the other thing we're going to talk about, we've got a BIRA webinar coming up, is using standards in your laboratory. We have got bigger breweries, you can go and buy a VB or another beer off the shelf and you can use that as a reference in your laboratory to make sure that your testing's on point, because you can guarantee that some of these beers from the bigger breweries will be reliable standards to use.

MK: I will just say to the participants now, if they'd like to post any questions. We're 15 minutes from the end so now's a good time if anyone does have any questions they would specifically like to ask any of the panel, now's a good time to pop those into the question & answer box.

Charlie, what are you seeing in the US? I know that you're a huge fan of Sierra Nevada, even before you were consulting to them, and I think you've said to me in the past that quality was one of the things, it wasn't just their beer and being first to market, it was a focus on quality that has seen their growth drive.

Stepping outside of Sierra Nevada, are you seeing small breweries in the US investing in quality? Or is it an issue over there as well?

CB: Many of them are, and quality is certainly variable. There are some newer companies coming in that really have a lot to learn, but overall there's a pretty good attitude going on here. I haven't run into too many disasters recently of the type that we're talking about now, and it's a very strong undercurrent of support, a lot of interaction taking place, so it's a good society over here in terms of brewing.

MK: One last topic I'd like to touch on, and it's almost the elephant in the room for craft brewing, and that's pasteurisation. It seems that if I speak to brewers about it, there is a very strong feeling that pasteurisation represents a line that they won't cross when it comes to compromising their beers, which seems an odd thing when you see brewers willing to compromise their beers by sending them halfway across the country or around the world.

I'm trying to work out whether there is a legitimate concern around pasteurisation, or the cynical part of me thinks that maybe it's the thing that brewers don't want to embrace because they are expensive pieces of machinery, and they'll embrace anything that they can afford.

Does anyone have any observations on that?

CB: I used to work for Bass, we pasteurised. It wasn't for some sort of get-out-of-jail card, it wasn't something where we don't need to worry about other things, we'll just pasteurise, it'll be okay. We attended to hygiene throughout the plants. Pasteurisation was just the belt and braces thing, and people have got this image of boiling cauldrons. It's not like that. As long as you've got the oxygen

under control and as long as you're using very low PUs, pasteurisation units, the impact on beer flavour is fairly limited. Minimal.

I personally have not got a problem with pasteurisation, as many companies over here that just don't. If you are going to go for a... Certainly for lower alcohol products, it should allow you to sleep in your bed at night. So I personally have no difficulty with the concept of pasteurisation, but it doesn't excuse you getting everything else right.

MK: Clare I know that you obviously don't have an objection to pasteurising?

CC: No, no. And it goes back to what I was saying about risk assessment and scope and what's right for your brewery and your products. I'm 100% behind Charlie here, it is a very small part of overall quality. What is far more important is the hygiene, the back end when you're brewing, making sure your tanks are clean and you're not getting infections. It is about oxygen control. I think those things are so much more important to focus on.

And then, absolutely, if all of those things are correct and you've got all those ducks in a row, for us, adding a few very low-level pasteurisation enables us to ship very consistent product all around the country knowing that people who buy our products are always going to get an expected level of quality that they know they can trust in.

Obviously, I do understand why other breweries don't do it and it's not right for them, but i think it comes down to risk and what's right for your individual circumstance.

MK: Quick question from the discussion board is, "What are some examples of basic (relatively inexpensive) QC equipment that small craft breweries can invest in to improve their product qualities? Breweries that can't afford alkalisers or CB Ox (48:31), for example?"

CB: First of all, the absolute basics: a microscope should be the first thing that anybody makes sure they've got, a fairly small, modest, cheap microscope. But you know, the ability to measure specific gravity with a hydrometer or something like that, and as long as you're monitoring fermentation, as long as you know when you've reached attenuation and these sorts of things. Using simple equipment but founded on your understanding of what is going on. I think that's one of the big problems with some people in the craft brewing industry, they just don't understand, they've not been trained. They don't know about beer, they don't know about the brewing process.

If you understand the brewing process, then using some very simple instrumentation, you should get there or thereabouts. I'll never forget, briefly, years ago I was at a brewery in the Midlands of England and this guy gave me a beer and I said, "It's quite bitter, isn't it?" He said, "It is," I said, "What is the bitterness?" He said, "Well the last time we measured it, it was 45." I said, "When did you last measure it?" He said, "1946."

And it was all because he knew what the hops, the alpha acid was on the hop, and he knew his brewery, and he knew how long he was going to boil for, and he would get within 10% of the actual IBU, I'm pretty confident of that. Without spending money on equipment to actually measure it.

So the most important thing is understand what you're doing, and then take advantage of simple technology.

MK: Diarmaid, was there anything else that you wanted to raise as part of the, we've talked about aesthetics, non-compliance with alcohol, and secondary fermentations. Was there anything else that you wanted to raise? For example, is quality a consideration that Endeavour Drinks Group has when they range product? Would you range a very very hyped but inconsistent brewery, for example?

DO: I think the first, it's what customers want. We are definitely customer-driven. Then coming back to customers tell us what we want, and we give them what they ask for. We, I love, this is Charlie's quote, but I do love it and I do use this myself. It's "Selling products that don't come back, to customers that do." If we've got beer that we know they're going to come back and say, "Actually you got this in, thanks for that, but really when I've tasted it it's not that great," then it's a one-time experience. So we really want to see customers, customers trust us to provide them safe, quality products. That's what we stand by.

As simple as it is, we're a retailer, we sell a product, we want to be proud of that product, and we stand by, we know it's safe. To that question, yes. But it's not to say we wouldn't be looking, then, if customers were asking us for a particular product. If we felt it just didn't meet, if there was concerns about the brewery in producing a safe product or a product that was questionable in quality, then yeah, it more than likely wouldn't happen.

MK: You work very closely with your brewers, and if they become aware of an issue you are very open to them to discuss.

DO: The relationship's great, to be honest. I've been a brewer myself, I understand what's happening further down the value chain, and I've been there, I've worked in breweries, I've worked in packaging lines, worked through logistics, and now I've got the privilege of being in retail, so it's like the whole value chain.

That river analogy really does say it for me, and I think there was another one there, I think it was United Airlines with the treatment of one of their customers coming off a flight in Louisville back to Chicago or something like that. They basically manhandled a guy off the plane because the plane was full and they needed to get some of their staff back for the morning flight. That whole experience getting videoed, and the response by the CEO, and it was one company, had quite a detrimental impact on the perception of that airline, but also the NPS score, the satisfaction score for the entire airline industry, actually went down as a result.

We really do, it's a shared ecosystem, we'll look after it to ensure we're doing the right thing in selling products that are good quality, great quality, safe. Brewers, supply chain need to do the same, and then it's really then a customer can come in and they trust us. They trust us to supply great product, and then the breweries we're partnering with, they trust those breweries, too.

If there's a player in that ecosystem that's not pulling their weight, they're not learning from their mistakes, because – and Charlie pointed it out and Clare pointed it out – mistakes happen. It's inevitable, it's a process, something shifts in the process and you don't pick it up on time, worst case scenario we're doing a withdrawal recall, but we have had cases where we do a distribution centre withdrawal, so we've stopped it there. And that's because the monitoring processes are working well at the brewery where they're able to go, "Hang on, we've just sent this out, where is it? Pull it back."

It is, we're all in it together. If we all work on it together, we add value to the industry and we ensure the industry's survival. I love what's been happening in the last 20 years since arriving in Australia and seeing the growth of microbreweries here in Australia. I love the communities that pull (cuts out) and just walking into a store and seeing that variety of beers, and long may they continue.

What could kill that and send people back to more safe, industrial, mainstream beers is that fear of, "I'm just about to spend \$15, fingers crossed, roll the dice. Is it going to be a good beer or not a good beer?" It's just not, they shouldn't, there shouldn't be a question of maybe. They have to have that trust that they'll pick it up and it's going to be good.

MK: Clare, how 'bout you? Obviously "Drink Gage Roads" is one of your messages, but stepping outside of the business, I'll include details for BIRA in the show notes. But you're also on the panel for the IBA, so I'd imagine that breweries that are eligible, you'd be encouraging them to get involved and participate in that.

Is there anything else that you would recommend brewers can do to lift the quality of their beer? Or concrete takeaways from today?

CC: Not really, I think we've touched on the things that I feel most passionately about. Going back to talking about putting yourself in the shoes of the consumer and looking at your beer with that critical eye. Looking at, whether if you – to Diarmaid's point – spend \$20 on this can of beer, or \$30 on this six pack, how you would feel about it, and trying to be as subjective as you can.

I think, really, just be true to your brand. Make sure that you're always creating value, because the amount of money our consumers spend on our products, they deserve to not be disappointed. Making sure that everything we put out into the marketplace presents as a good value proposition versus, from an indie perspective, we want them to pick up indie and not mainstream, mass produced beer. So it has to provide that value, because they will go back to mainstream beer if they're disappointed.

MK: And Charlie, just as we come close to the wind up, there's a question for you. "Charlie, are there any alternatives or emerging technologies that could be used to achieve what pasteurisation can?"

CB: There's all sorts of alternatives. Some people do sterile filtration and people have talked about high pressure and so on. Really I don't think there's one that's suitable on a small scale. What is the most important thing, I'll say it again, is hygiene, hygiene, hygiene, and making sure that the product has its best possible chance, realistic chance in the marketplace, even if it's not pasteurised. And that you really have the best possible cleaning systems in place.

If there is an investment to be made, perhaps in small-scale microbiology. And in relation to, I've said already, I think good training is so important. It's no secret I'm past President of the IBD and I think that IBD as a root to an education, which is increasingly online these days, is a great investment and will address getting people into a position where they really can brew great beer.

MK: And another question, from Bruce Peachey, who I believe you know.

CB: Hello, Bruce.

MK: He said hello to you earlier. "Are there any advancements in anti-oxidants?", which is an interesting, a vexing question in the world of craft beer.

CB: There's various suggestions and of course that butts heads with people's reluctance to use any additions and process aides and so on.

We did some work, and hopefully it's being carried on following my retirement, of ascorbate. There's a history of people putting ascorbic acid into finished beer, and I can tell you, it doesn't have any benefit whatsoever. But we did some work showing that you can use it in the brew to mop up oxygen in the brew, so I think there's some exciting mileage in that.

Vitamin C, what's not to like about Vitamin C?

MK: Goes with the silica and other good things in craft beer.

CB: Absolutely.

MK: Now I know you don't have anything to plug, but maybe if you would, you'd be plugging your latest book, Charlie. Apart from your other works, which I can highly recommend, do you have any one book that addresses beer quality that you would steer people to?

CB: Actually it's not one, it's a series of six books with the American Society of Brewing Chemists, but by the time you've bought all six, it's quite expensive.

MK: You could buy an alkaliser.

CB: Precisely. Just put my name into the web and there's all sorts of books there. I'm too modest to actually, I'm not brash enough to push it.

MK: I'll link to some in the show notes to keep your modesty intact, Charlie.

That is the hour that we'd allocated; if there aren't any other questions, I'd like to thank my panel, Clare, Charlie and Diarmaid. Thank you very much for making yourselves available and being willing to talk about this issue that can be a little bit hard to talk about.

Thank you very much for your time, and thank you very much to our attendees for attending, hopefully you got some value. Please shoot through any thoughts or suggestions because we will be doing more of these.

And finally, I'd like to thank our sponsors, Kegstar, without whom we would not have made today possible. And you might be interested in reading on Brews News today how Kegstar have announced that they're incorporating Internet of Things in interesting ways on their kegs, so you'll be able to find out all about that by subscribing to Brews News. Everybody, thank you very much, and look forward to, hopefully, as the restrictions ease, we can all have a beer and do it in person next time.