PMCA Cannabis in Confections & Snacks Science Symposium Chemistry Panel Q&A

Seth Wong, TEQ Labs

1. **What level of challenge testing do you see edible manufacturers performing?**
   I think we need to see a basic level of challenge testing from a variety of organisms and concentration of microbes. There is a lot about these products that we have still not evaluated and the only way to do that will be to put them through the paces and do the studies on them. We have anecdotal evidence that some strains may have antimicrobial resistance, but we don't have any hard, scientific data to substantiate that claim and we don't know how that will impact products later downstream. Additionally, the state compliance testing in place by many states is deficient in a number of areas and we don't have a true comprehensive picture of what microbes are really on the plant, what the plant is susceptible to and what we should continue to be concerned about. Thus, I'd say at this point if we think it's a concern, to protect our brands and consumers, we should do extensive challenge studies.

2. **Please highlight the ingredients that most commonly cause interference in testing for potency.**
   It depends on the sample matrix – sometimes intrinsic properties in the plant are causing the interferences, sometimes it's ingredients from the edibles. It also depends on which cannabinoid you are looking for. We believe that everything from terpenes to chlorophyll to polyphenols and fatty acid have an impact on one of the many cannabinoids. Again, very little is known about the plant and more evaluations of matrices and the cannabinoid of interest need to be conducted. If you are unsure about specific interferences in your product, make sure to submit a blank sample with your samples to the lab. However, beware – not a lot of emerging cannabis labs know what to do with a blank sample.

3. **What state has most intense verification testing?**
   Overall, at this point in time, California has the largest range of testing. However, there are other states that have more frequent testing requirements and tighter restrictions, so this is a difficult question to answer directly.

4. **Does the cannabis industry adhere to Prop 65 for heavy metals? Are heavy metals a problem?**
   A lot of the cannabis industry is unfamiliar with Prop 65, but yes, we suspect and believe that California will require manufacturers and growers to comply with Prop 65. We do believe that heavy metals are a problem, especially with vape cartridges. Many concentrate vape manufacturers are new to the industry and do not necessarily understand that they have to vet their upstream ingredients and materials. This is also the case for edible manufacturers too – we

have come across individuals who are not using food grade ingredients, for instance, in a food-based product.

5. **Is there organic and non-organic cannabis?**
   There are some groups offering organic and non-organic certifications and we believe there are growers who are producing each of these products. Some folks also claim that because there is no pesticide with on-label approved use for cannabis application that they are growing natural products anyway and are thus meeting an organic initiative.

6. **In your opinion, given the tiny sample size for testing, what is the margin of error for over/under reporting of CBD/THC content? Do you find that clients "hope" for a particular result? I.e., are labs directed to test for target potency – e.g. spec?**
   Clients definitely "hope" for a specific particular result and in some cases hold the lab hostage and won't send product in for testing unless the lab guarantees a specific result. There are lots of issues around testing and manipulation of results and regulatory bodies are working hard to control them, but often don't have enough resources to enforce properly. It's equivalent to dry labbing, and with many of the new entrants into this industry, they don't realize its not legal. The margin of error can really vary on sample size, sample aliquot in the lab and then the QC criteria the lab is utilizing, thus it is difficult to give a specific value.

7. **Are the producers just sending the minimum size of samples due to economic reasons or are there other issues?**
   It depends on the producer. Some are sending in small sample sizes because they want to preserve product for sale. However, we also know that it's easier to adulterate small sample volumes and guarantee specific analytical results. We believe cherry picking can impact the sample size and results.

8. **Expand upon the effect of emulsification on test results in edibles.**
   Emulsification can skew the analytical result. If the laboratory processing and analyzing the edible cannot break the emulsification, the lab will have a reduced or unlikely, but possibly, overstated sample result.

9. **Do you think federal legalization would bring more uniformity, or should states count on having a lot of autonomy in testing and compliance standards?**
   We hope that federal legalization will bring uniformity and also resources to the industry. However, that will remain to be seen.

10. **What has been the scariest thing you've found in your testing?**
    I think the amount of poor handling and processing has been the scariest. There are a lot of general microbiological assays typically applied in food that we are not applying to cannabis, simply at the direction of state regulators and manufacturers are reluctant to go above and

beyond in testing, in that a positive result could mean the destruction of your process batch, but because of that many producers are not even testing products for a litany of microorganisms. This is also concerning because we have seen processing facilities that do not follow HACCP plans or GMP protocols and therefore have high potential contamination. In one facility we were in, the office with everyone's personal effects and even pets were in the processing kitchen while production was taking place. There are also a lot of people in the industry who process by feel, and while they may be accurate, we believe you need analytical data to back up your assumptions and ensure proper growth, formulation, extraction, etc. are taking place.