



## Wonderful World of Edibles: Are They Safe? Webinar Questions and Answers - June 16, 2017

**Q: In your state regulations, do you require testing for any analytes with maximum allowable limits?**

A: (Gaither) Arizona does not require testing for analytes nor are their standards for limits. The only reference in the current rule requires dispensaries to list analytes (herbicides, pesticides, etc.) on the label.

A: (Nascarella) Massachusetts defines testing requirements based on the product type and production process. Finished plant material that is considered a finished medical marijuana product (FMMP) is required to meet defined upper limits for heavy metals, pesticides and plant growth regulators, and microbiological contaminants. Concentrates and resins that are produced from dried plant material with the use of residual solvents are required to meet defined upper limits for residual solvents. All FMMP, including marijuana-infused products, resins and concentrates, are required to meet defined upper limits for microbiological contaminants. For additional information, refer to the [Protocol for Sampling and Analysis of Finished Medical Marijuana Products and Marijuana-Infused Products for Massachusetts Registered Medical Marijuana Dispensaries](#).

**Q: Do the manufacturers of edibles properly heat the extracted cannabinoids to convert the acid forms to the neutral forms? For example, THCA to THC? >90% of all cannabinoids in the plant material are found in the acid form.**

A: (Gaither) Yes, dispensaries that process edibles heat the active ingredients so THC is the primary form.

**Q: Could THC be viewed as an "unapproved food additive" in your state, and thus be embargoed as an "adulterated food"?**

A: (Gaither) Arizona does not consider edibles as an approved food additive (only Coconino County included edibles into our Food Code).

**Q: How many commercial cannabis analytical labs does AZ have?**

A: (Gaither) The number of labs has varied, but currently there are four labs in Arizona that analyze edibles.

**Q: Are you requiring all producers/manufacturers to produce HACCP plans?**

A: (Gaither) Currently, only those that produce low acid foods are required to submit HACCP plans.

A: (Rice): This would vary from state to state. MA regulations currently recommend that producers to develop a food safety plan, based on HACCP principles, as a best practice. Marijuana Infused Products are not recognized by the FDA as a legitimate product, so federal laws do not apply here, as they do to other food manufacturers.

**Q: Does THC affect the final pH of the processed food?**

A: (Gaither) That's an excellent question – we are currently waiting to receive results from the voluntary recall. However, testing results from other states indicate that extractant pH is usually below 4.6.

**Q: Would it have been possible to test the pH and water activity while the product was on hold to prevent destruction?**

A: (Gaither) Yes, if the dispensary had sent it to a lab that tests for THC. However, they decided not to do so and recall all products.

A: (Rice) Yes, product testing could have been done. Sometimes lab testing takes time, though, and product is in jeopardy while results are being evaluated. The same is true with pathogen testing.

**Q: Were the labs that tested these products certified in analysis of edibles in Arizona?**

A: (Gaither) Currently, there are no existing standards or third-party certification available for labs that test edibles.

**Q: How do processors account for the change in strength of THC (from delta-9 to delta-11 THC) in the gut?**

A: (Nascarella) Massachusetts does not define any potency or dosing limits for medical use of marijuana products. Massachusetts requires that all product labels contain the cannabinoid profile, at a minimum, the percentage by dry weight (i.e., the weight of the material remaining after it has been thoroughly dried) of delta-9 tetrahydrocannabinol (delta-9-THC), cannabidiol (CBD), tetrahydrocannabinolic acid (THCa), and cannabidiolic Acid (CBDa). It's important to note that not all individuals metabolize delta-9 THC to 11-OH-THC the same in the body due sensitivity differences amongst individuals (e.g., liver function).

**Q: Do you have a THC/CBD threshold percentage before you start regulating?**

A: (Gaither) No because in Coconino County the medible ordinance is part of our food code and all types of food operations are required to be regulated.

**Q: Are you aware of any work evaluating occupational exposures to the workers making the edibles?**

A:

**Q: Do you feel that microbes can be introduced at the retail level from selling plant material from jars?**

A: (Nascarella) Microbiological contaminants are inevitably present in our daily environments. Appropriate packaging and storage principles (e.g., HACCP) should be practiced to prevent unwanted introductions of microbiological contaminants.

**Q: In MA, do you test for mycotoxins?**

A: (Nascarella) Massachusetts requires that all product meet defined upper limits for mycotoxins, including alfatoxin B1, alfatoxin B2, alfatoxin G1, alfatoxin G2, and Ochratoxin A. For additional information, refer to the [Protocol for Sampling and Analysis of Finished Medical Marijuana Products and Marijuana-Infused Products for Massachusetts Registered Medical Marijuana Dispensaries.](#)

**Q: Cannabis and hemp are known to take up radiation. Have you seen this or is it tested?**

A: (Nascarella) Massachusetts does not require radionuclides testing in cannabis products.

**Q: Could you briefly discuss the changes that led to the decrease of heavy metals in the plant?**

A: (Nascarella) The observed reduction of heavy metals in Massachusetts cannabis products is likely the results of both operational improvements in cultivation (e.g., improved grow media), as well as enhanced analytical testing methods and analysis practices to meet the defined upper limit standards.

**Q: Is there a difference in heavy metal absorption depending on the grow medium? i.e. hydroponics, aeroponic or aquaponic?**

A: (Nascarella) This has not been investigated by the DPH in Massachusetts.

**Q: Do you plan to increase the # of pesticides that you will be testing for similar to the list that CA will be testing for?**

A: (Nascarella) Massachusetts does not allow the use of pesticides or plant growth regulators during the cultivation of cannabis. At a minimum, products must meet the defined upper limit for pesticides and plant growth regulators for the nine most commonly abused pesticides in cannabis cultivation. For additional information, refer to the [Protocol for Sampling and Analysis of Finished Medical Marijuana Products and Marijuana-Infused Products for Massachusetts Registered Medical Marijuana Dispensaries](#).

**Q: The tobacco industry has detected low levels of polonium in tobacco plant material. Do you feel that the cannabis industry should test for radionuclides, since cannabis is a bioaccumulator?**

A:

**Q: Are biological residues, such as rust mite bodies, tested?**

A: (Nascarella) Massachusetts does not require biological residue testing related to cannabis testing.

**Q: Since the labs test the plant, concentrate, dermal products, and edibles, does the labs have validated methods for each matrix?**

A: (Nascarella) All medical use of marijuana products intended for dispensation in Massachusetts must be tested at an independent analytical testing laboratory that is accredited to International Organization for Standardization (ISO) 17025 by a third party accrediting body and non-compliance with the analytical testing requirements in the Protocol for Sampling and Analysis of Finished Medical Marijuana Products and Marijuana-Infused Products for Massachusetts Registered Medical Marijuana Dispensaries. Independent testing laboratories are responsible for validating their own methods in accordance with Massachusetts regulation.

**Q: What part of the plant accumulates most of the heavy metals?**

A: (Nascarella) Some studies have found that the leaves of the plant tend to accumulate the highest concentration of heavy metals when compared to other plant parts (i.e., seeds, fibers and hurds) (Linger et al., 2002; Eboh & Thomas, 2005). While another study found that the roots of the plant contained higher concentrations of cadmium compared to the leaves (Linger et al., 2005).

Eboh, L. O., & Thomas, B. E. (2005). Analysis of heavy metal content in cannabis leaf and seed cultivated in southern part of Nigeria. *Pak J Nutr*, 4(5), 349-351.

Linger, P., Müssig, J., Fischer, H., & Kobert, J. (2002). Industrial hemp (*Cannabis sativa* L.) growing on heavy metal contaminated soil: fibre quality and phytoremediation potential. *Industrial Crops and Products*, 16(1), 33-42.

Linger, P., Ostwald, A., & Haensler, J. (2005). *Cannabis sativa* L. growing on heavy metal contaminated soil: growth, cadmium uptake and photosynthesis. *Biologia plantarum*, 49(4), 567-576.

**Q: Leafy greens and other produce products have been implicated in many recent foodborne illness outbreaks. You discussed mold but do you conduct any bacterial speciation on microbial contamination of marijuana?**

A: (Nascarella) Massachusetts requires that all product meet the defined upper limits for total viable aerobic bacteria, total yeast and mold, total coliforms, bile tolerant gram negative bacteria, *E. coli* (pathogenic strains) and *Salmonella* spp. For additional information, refer to the [Protocol for Sampling and Analysis of Finished Medical Marijuana Products and Marijuana-Infused Products for Massachusetts Registered Medical Marijuana Dispensaries](#).

**Q: Do you feel that marijuana infused products would better be served in food or nutraceutical regulations?**

A: (Rice) It seems that it would be best to incorporate the 2 areas, if possible. Foodhandling and testing procedures are critical for food safety of the food products, which would come under the natural jurisdiction of food regulators. But dosage controls are also important in the case of medicinal applications, which would be typical controls and regulations of the nutraceutical industry.

**Q: Do the State inspections apply to retail products as well as medicinal?**

A: (Rice) In MA, the state inspections apply to the medicinal products currently sold in the retail dispensaries.

**Q: For Mark: Since the product failure due to microbial is mostly due to yeast and molds, what do you feel is the best way to control fungal spread in a grow space? I understand that if mites are present, they ingest the fungal spores and can disseminate the fungus from plant to plant.**

A:

**Q: Are there public health doctoral programs focused on this topic?**

A: