

**Conference for Food Protection  
2016 Issue Form**

**Issue: 2016 III-030**

<b>Council Recommendation:</b>	Accepted as Submitted _____	Accepted as Amended _____	No Action _____
<b>Delegate Action:</b>	Accepted _____	Rejected _____	

*All information above the line is for conference use only.*

---

**Issue History:**

This is a brand new Issue.

**Title:**

Amend Food Code – Clarify sprouting as a specialized process

**Issue you would like the Conference to consider:**

A recommendation is being made to change the 2013 FDA Food Code Section 3-502.11 (H) to include a clarification on sprouting that requires a variance and Hazard Analysis Critical Control Point (HACCP) plan.

The FDA Food Code Section 3-502.11 discusses specialized processing methods that require a variance from the regulatory authority. A clarification on what is considered "sprouting seeds or beans" is needed to provide both industry and regulatory personnel guidance on proceeding with variance submittal and HACCP Plan development.

**Public Health Significance:**

The FDA Food Code Annex 3 explains the rationale for FDA Food Code Section 3-502.11 by stating: "specific food processes that require a variance have historically resulted in more foodborne illness than standard processes." Also, these methods require specialized equipment or knowledge by food employees to be done safely, and can present a significant health risk if not done properly<sup>1</sup>. When a variance is required, the FDA Food Code Section 8-201.13 states that a HACCP Plan must be prepared by the permit applicant or permit holder and approved by the regulatory authority. Creation of HACCP Plans by food service establishments can be costly<sup>2</sup>, and therefore it is important to eliminate confusion regarding sprouting which requires a HACCP Plan.

Consumption of seed sprouts is a growing trend among the public, with raw seed sprouts being served on many restaurant menus for decades. Raw seed sprouts from manufacturers have been linked to many foodborne illness outbreaks<sup>3</sup>. The contamination seems to come from the seed itself and the dark, warm growing conditions that are present for growth<sup>3,4</sup>. Because of this, producers of raw seeds sprouts have taken steps to eliminate contamination prior to sprouting<sup>3</sup>. Microgreens are also growing in popularity among high end restaurants, and because they can be grown quickly in small quantities<sup>5</sup>, could be produced by the food service establishment for use. Microgreens are grown in soil

and require light to grow<sup>4</sup>, which is different from the growing conditions for a raw seed sprout. This means that the high risk associated with the growth of raw seed sprouts would not be the same as the growth of microgreens.

Both microgreens and raw seed sprouts would meet the dictionary definition of sprouting, which is "to produce new leaves<sup>6</sup>." Clarifying that this only applies to sprouting that is done from a raw seed sprout and not microgreens would help to eliminate the development and review of unnecessary HACCP Plans. The clarification needs to be made that the sprouting would be considered a special process only when the intention is for the seed itself to be consumed, since that is where the potential contamination is found.

#### References:

1. "Annex 3." FDA 2013 Food Code. College Park, MD: U.S. Dept. of Health and Human Services, Public Health Service, Food and Drug Administration, 2013. 465. Print.
2. Sharma, A., Roberts, K., & Seo, K. 2010. HACCP Cost Analysis in Retail Food Establishments. Food Protection Trends.
3. Thompson, S., Powell D.A. Risks Associated With The Consumption of Fresh Sprouts. Food Safety Network Technical Report # 16. July, 2000
4. R. Holmer, G. Linwattana, P. Nath, J.D.H. Keatinge, eds. High Value Vegetables in Southeast Asia: Production, Supply and Demand. AVRDC-WorldVegetableCenter, 2013.
5. Treadwell, D., Hochmuth, R., Landrum, L., Laughlin W. Microgreens- A New Specialty Crop. Florida Cooperative Extension Service. April 2010.
6. Sprout [def.1]. In *Merriam-Webster Online*. Retrieved January 8, 2016. <http://www.merriam-webster.com/dictionary/sprout>.

#### **Recommended Solution: The Conference recommends...:**

that a letter be sent to the FDA recommending the 2013 Food Code be amended to include clarifying language for "sprouting seeds or beans." Recommended language to read (new language is underlined):

3-502.11 Variance Requirement

A FOOD ESTABLISHMENT shall obtain a VARIANCE from the REGULATORY AUTHORITY as specified in § 8-103.10 and under § 8-103.11 before: <sup>Pf</sup>

(H) Sprouting seeds or beans for the purpose of human consumption of both the seed and the sprout, as in raw seed sprouts.

#### **Submitter Information:**

Name: Veronica Bryant  
Organization: NC DHHS/EH Food Protection Branch  
Address: 1632 Mail Service Center  
City/State/Zip: Raleigh, NC 27699  
Telephone: 704-718-7866  
E-mail: veronica.bryant@dhhs.nc.gov

#### **Supporting Attachments:**

- "Microgreens- A New Specialty Crop"

*It is the policy of the Conference for Food Protection to not accept Issues that would endorse a brand name or a commercial proprietary process.*

# Microgreens: A New Specialty Crop<sup>1</sup>

Danielle D. Treadwell, Robert Hochmuth, Linda Landrum, and Wanda Laughlin<sup>2</sup>

Frequently called “vegetable confetti,” microgreens are young, tender greens that are used to enhance the color, texture, or flavor of salads, or to garnish a wide variety of main dishes (Figs. 1 and 2). Harvested at the first true leaf stage and sold with the stem, cotyledons (seed leaves), and first true leaves attached, they are among a variety of novel salad greens available on the market that are typically distinguished categorically by their size and age. Sprouts, microgreens, and baby greens are simply those greens harvested and consumed in an immature state. Based on size or age of salad crop categories, sprouts are the youngest and smallest, microgreens are slightly larger and older (usually 2 in. tall), and baby greens are the oldest and largest (usually 3–4 in. tall).



Figure 1. Microgreens in this photo are predominantly in the cotyledon stage and are a few days away from harvest.



Figure 2. Microgreens are often termed “vegetable confetti.”

Both baby greens and microgreens lack any legal definition. The terms “baby greens” and “microgreens” are marketing terms used to describe their respective categories. Sprouts are germinated seeds and are typically consumed as an entire plant (root, seed, and shoot), depending on the species. For example, sprouts from almond, pumpkin, and peanut reportedly have a preferred flavor when harvested prior to root development. Sprouts are legally defined, and have additional regulations concerning their production and marketing due to their relatively high risk of microbial contamination compared to other greens. Growers interested in producing sprouts for sale need to be aware of the risks and precautions summarized in the FDA publication

1. This document is HS1164, one of a series of the Horticultural Sciences Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Original publication date April 2010. Revised July 2013. Visit the EDIS website at <http://edis.ifas.ufl.edu>.
2. Danielle D. Treadwell, associate professor, Horticultural Sciences; Robert Hochmuth, Extension agent IV, SVAEC; Linda Landrum, retired Extension agent IV, SVAEC; and Wanda Laughlin, senior ag assistant, SVAEC.

*Guidance for Industry: Reducing Microbial Food Safety Hazards for Sprouted Seeds* (FDA 1999).

The crops used for microgreens usually do not include lettuces because they are too delicate and wilt easily. The kinds of crops that are selected for production and sale as microgreens have value in terms of color (like red or purple), unique textures, or distinct flavors. In fact, microgreens are often marketed as specialty mixes, such as “sweet,” “mild,” “colorful,” or “spicy.”

Certain crops of microgreens germinate easily and grow quickly. These include cabbage, beet, kale, kohlrabi, mizuna, mustard, radish, swiss chard, and amaranth. Soaking some seeds prior to sowing, such as beets, helps facilitate germination. As many as 80–100 crops and crop varieties have reportedly been used as microgreens (Fig 3). Others that have been used include carrot, cress, arugula, basil, onion, chive, broccoli, fennel, lemongrass, popcorn, buckwheat, spinach, sweet pea, and celery. Growers should evaluate various crop varieties to determine their value as microgreens. Many seed companies are very knowledgeable about the crops and varieties to grow, and a number of them offer organic seed.



Figure 3. A variety of crops can be grown and sold as microgreens.

The commercial marketing of microgreens is mainly targeted toward restaurant chefs or upscale grocery stores. Prices for microgreens generally range from \$30 to \$50 per pound. The product is packaged in plastic clamshell containers that are typically 4–8 oz by weight but can be sold in 1 lb containers as well.

## Production

Microgreens may be grown by individuals for home use. Growing small quantities at home is relatively easy; however, growing and marketing high-quality microgreens commercially is much more difficult. Having the right mix at the perfect stage for harvest is one of the most critical production strategies for success. The time from seeding to harvest varies greatly from crop to crop. When seeding a mixture of crops in a single planting flat, growers should select crops that have a similar growth rate so the entire flat can be harvested at once. Alternatively, growers can seed the various crops singularly and mix them after harvest.

Microgreens can be grown in a standard, sterile, loose, soilless germinating media. Many mixes have been used successfully with peat, vermiculite, perlite, coconut fiber, and others. Partially fill a tray with the media of choice to a depth of 1/2 in. to 1 or 2 in., depending on irrigation programs. Overhead mist irrigation is generally used only through the germination stage in these media systems. After germination, trays should be subirrigated to avoid excess moisture in the plant canopy.

An alternative production system uses one of several materials as a mat or lining to be placed in the bottom of a tray or longer trough. These materials are generally fiberlike and provide an excellent seeding bed. Materials may include burlap or a food-grade plastic specifically designed for microgreens such as those made by Sure to Grow (Beachwood, OH). These mat systems are often used in a commercially available production system using wide NFT-type troughs. The burlap mat may be sufficient alone for certain crops or may require a light topping with a media after seeding. Seeding may be done as a broadcast or in rows. Seeding density is difficult to recommend. Most growers indicate they want to seed as thickly as possible to maximize production, but not too thickly because crowding encourages elongated stems and increases the risk of disease. Most crops require little or no fertilizer, as the seed provides adequate nutrition for the young crop. Some longer-growing microgreen crops, such as micro carrot, dill, and celery, may benefit from a light fertilization applied to the tray bottom. Some of the faster-growing greens, such as mustard cress and chard, may also benefit from a light fertilization because they germinate quickly and exhaust their self-contained nutrient supply quickly. Light fertilization is best achieved by floating each tray of microgreens for 30 seconds in a prepared nutrient solution of approximately 80 ppm nitrogen.

Microgreens are ready for harvest when they reach the first true leaf stage, usually at about 2 in. tall. Time from seeding to harvest can vary greatly by crop from 7 to 21 days. Production in small trays will likely require harvesting with scissors. This is a very time-consuming part of the production cycle and is often mentioned by growers as a major drawback. The seeding mat type of production system has gained popularity with many growers because it facilitates faster harvesting. The mats can be picked up by hand and held vertically while an electric knife or trimmer is used for harvesting, allowing cut microgreens to fall from the mat into a clean harvest container. Harvested microgreens are highly perishable and should be washed and cooled as quickly as possible. Some chefs are asking growers to deliver in the trays or mats and they will cut the microgreens as needed to improve quality. Wash the microgreens using good handling practices for food safety. Microgreens are usually packed in small, plastic clamshell packages and cooled to recommended temperatures for the crops in the mix. Growers should be aware that marketing agreements such as the National Leafy Green Marketing Agreement (NLGMA) have been proposed to reduce the risk of microbial contamination of mature and immature leafy greens. For the current status of the NLGMA, visit <http://www.nlgma.org/>.

## References

Food and Drug Administration. 1999. *Guidance for industry: Reducing microbial food safety hazards for sprouted seeds*. <http://www.fda.gov/Food/GuidanceCompliance-RegulatoryInformation/GuidanceDocuments/Produceand-PlanProducts/ucm120244.htm>.