



BEYOND PESTICIDES

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October 2, 2014

Ms. Michelle Arsenault
National Organic Standards Board
USDA-AMS-NOP
1400 Independence Ave. SW
Room 2648-S, Mail Stop 0268
Washington, DC 20250-0268

Re. HS: Activated Charcoal

These comments to the National Organic Standards Board (NOSB) on its Fall 2014 agenda are submitted on behalf of Beyond Pesticides. Founded in 1981 as a national, grassroots, membership organization that represents community-based organizations and a range of people seeking to bridge the interests of consumers, farmers and farmworkers, Beyond Pesticides advances improved protections from pesticides and alternative pest management strategies that reduce or eliminate a reliance on pesticides. Our membership and network span the 50 states and groups around the world.

Beyond Pesticides would support the relisting of activated charcoal if it were possible to annotate the listing. Activated charcoal is a substance that could meet the requirements of the Organic Foods Production Act with few restrictions, including limiting its use to filtering water and requiring steam activation. However, without those restrictions, we find it to present environmental and health problems and issues with compatibility.

1. Environmental and Health Impacts

According to the Technical Advisory Panel (TAP) review, activated carbon can be produced from a number of agricultural commodities, including hardwoods, grain hulls, corn cobs, and nut shells. Activation can be achieved by a number of methods, including treatment with steam or acids, bases, and other substances. Activated carbon can be recycled, reactivated, or regenerated from spent activated carbon. “[A] number of solvents, acids, and alkalis may be employed to remove the adsorbed substances. These include such things as carbon tetrachloride, hydrochloric acid, hydrogen peroxide, potassium hydroxide, sodium hydroxide.” According to a study not included in the TAP review,¹ “Although this process results in small uniform pores with high adsorption capacity, the carbon is usually contaminated with the dehydrating agent.”

¹ M.D. Sufnarski, 1999. The Regeneration of Granular Activated Carbon Using Hydrothermal Technology, master’s thesis in Chemical Engineering at the University of Texas. <http://www.dtic.mil/dtic/tr/fulltext/u2/a362534.pdf>

In view of the large number of chemicals that can be used in the activation and reactivation of charcoal, TAP reviewers suggested the annotation, “Must meet Food Chemicals Codex purity requirement and be manufactured from agricultural products by steam activation.” We concur with this recommendation.

2. Essentiality

The petitioned use was to clarify and improve the flavor of organic fruit juices. The TAP review proposed that better harvesting and processing methods could eliminate the need for activated charcoal. The review also suggested that that use is not compatible with organic practices. (See below.) On the other hand, activated charcoal is often used to remove chlorine and other chemicals from tap water, which may be essential in some cases. Thus, TAP reviewers also suggested the annotation, “Processing material for filtering water, only.” We agree with that recommendation as well.

3. Compatibility

The use, as petitioned, to improve the color and flavor of grape juice, is not considered compatible with organic production and handling. Moreover, although the nutritional value of the juice may be improved, it may also be diminished. According to the TAP review, “This depends on a number of complex factors: the nature of the activation of the carbon, the nutritional quality and chemical properties of the adsorbate, the preparation, and the various factors related to adsorption.”

4. Ancillary substances

According to the recommendation passed by the NOSB in the spring of 2013, the board defined “ancillary substances” as “additives added during the manufacturing of a non-organic substance and **not** removed.”

The NOSB went on to recommend the following policy:

The NOSB intends to review ancillary substances found in substances on and petitioned for the National List in accordance with OFPA criteria. Comprehensive review does not require these substances to be individually listed on the National List, however. The Board intends to follow the request by NOP to consider ancillary ingredients contained in substances as they come up for review or as new petitions are considered.

In each NOSB review checklist and recommendation cover sheet there will be a clear space to indicate what other ingredients are being reviewed and what restriction if any are placed on them as a result of the review. Restrictions on other ingredients will be included in an annotation and may be for specific individual components, for functional classes of ingredients, or by regulatory reference to another governmental agency such

as FDA. The other ingredients restrictions may be incorporated into a permitted substances database for Handling, such as the one that is coming out for crops.

The NOSB recommendation will include a note that the other ingredients were reviewed and accepted. The review of other ingredients will distinguish between synthetic and nonsynthetic ones, as well as agricultural ingredients that might be able to be organically produced. Any additional restrictions will be specified in an annotation.

Ancillary substances in general product categories that are currently on §205.605 and §205.606 and currently used in certified organic processed product will continue to be allowed until they go through their next sunset review and subsequent Rule amendment.

The ancillary substances associated with this material have not been reviewed or even listed. This is an important piece that needs to be incorporated into the review of every material during sunset.

5. Conclusion

Beyond Pesticides opposes the relisting of activated charcoal as currently allowed. We would support a listing that limits its use to filtering water, and requires steam activation.

A word about the process of the Handling Subcommittee. It is critical that the subcommittee and Board prepare a more robust review for public discussion at the first meeting on a Sunset 2016 material. Since the Fall 2014 meeting is scheduled to be the only public NOSB meeting during which the Handling Subcommittee and Board members can share their thinking and receive “timely” public input on the checklist and assessment of the material in accordance with OFPA criteria, the lack of prepared written analysis by the subcommittee for this meeting makes for an incomplete and truncated assessment process. We appreciate the subcommittee’s question on essentiality of the material, but believe that the subcommittee and Board have a responsibility to bring to the public a comprehensive set of questions that address all OFPA criteria with a preliminary assessment of the data it has, and it should have prepared a preliminary checklist.

Under the current process, information brought to the Board at the Spring 2015 meeting will be considered “untimely.” While we recognize that the Board has embarked on a new two-stage process, the first stage, or first meeting on sunset materials, must be a more robust review process if the Board’s assessment of exempt prohibited materials, like this one, on the National List is to be viewed by the public, including users and consumers, as credible. The process requires this, if there is to be continuing and building public trust in the assessment process and the organic food label.

We have attached a checklist in which we provide the Board with answers to questions, based on available TAP reviews, that are required to be considered as a part of a sunset review that is in compliance with the Organic Foods Production Act (OFPA) and the implementing regulations. Thank you for your consideration of these comments.

Sincerely,

A handwritten signature in black ink, appearing to read "Terry Shistar". The signature is written in a cursive, flowing style with a long horizontal stroke at the end.

Terry Shistar, Ph.D.
Board of Directors

**National Organic Standards Board
Handling Subcommittee
Petitioned Material Checklist
Activated charcoal**

[Date of Vote]

Summary of Proposed Action:

Evaluation Criteria (see attached checklist for criteria in each category)

	Criteria Satisfied?
1. Impact on Humans and Environment N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
2. Essential & Availability Criteria N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
3. Compatibility & Consistency N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
4. Commercial Supply is Fragile or Potentially Unavailable N/A as Organic (only for §205.606)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>

Substance Fails Criteria Category: [] Comments:

Subcommittee Action & Vote, including classification proposal (state actual motion):

Classification Motion: Move to classify [substance] as [synthetic, nonsynthetic, agricultural]

Motion by:

Seconded by:

Yes: # No: # Absent: # Abstain: # Recuse: #

Listing Motion: Move to list [substance] on section **205.6xx** of the National List [with the annotation]

Motion by:

Seconded by:

Yes: # No: # Absent: # Abstain: # Recuse: #

Proposed Annotation (if any):

Basis for annotation: To meet criteria above Other regulatory criteria Citation

Notes:

205.605(b) Activated charcoal (CAS #s 7440 - 44 - 0; 64365 - 11 - 3) - only from vegetative sources; for use only as a filtering aid.

Approved by Subcommittee Chair to Transmit to NOSB

Name, Subcommittee Chair

Date

NOSB Evaluation Criteria for Substances Added To the National List Handling

Category 1. Adverse impacts on humans or the environment?

Substance:

Question	Yes	No	N/A	Comments/Documentation. (TAP; petition; regulatory agency; other)
<p>1. Are there adverse effects on the environment, or is there a probability of environmental contamination during use or misuse of the substance? [§205.600(b)(2), [§6518(m)(3)]</p>	X			<p>The primary use for activated carbon is the treatment of water, including potable water (24% of all use); wastewater (21%) and groundwater remediation (4%) which accounts for approximately half of all the use in the US (Baker et al., 1992). ... Non-agricultural ingredients—such as enzymes—are also often purified by the use of activated carbon (Aikat et al., 2001). Both can result in products processed by activated charcoal used to process food and beverages. (TAP lines 103-108) [A] number of solvents, acids, and alkalis may be employed to remove the adsorbed substances. These include such things as carbon tetrachloride, hydrochloric acid, hydrogen peroxide, potassium hydroxide, sodium hydroxide (Mine Safety Research Corp., 1970). (TAP, lines 176-178)</p>
<p>2. Are there adverse effects on the environment or is there a probability of environmental contamination during manufacture or disposal of the substance? [§6518(m)(3)]</p>	X			<p><i>Activated charcoal</i> is prepared from wood and vegetables (Budavari, 1996). (TAP, line 57) Activated carbon can be produced from a number of agricultural commodities. Among these are hardwoods, grain hulls, corn cobs, and nut shells (Young, 1996). Steam activation can also be used with food-grade carbonaceous material (Burdock, 1997). Acid treatment is also common. For example, pecan shells can be activated by treatment with hydrochloric acid, then heated in an electric furnace</p>

				<p>for four hours at 800-1,000°C. in an atmosphere of carbon dioxide (Young, 1996). (TAP, lines 59-62) Any given carbon sources may be prepared, treated, or manufactured by a wide variety of methods. These may or many not involve synthetic acids, bases, and other substances in a stream of activating gases such as steam (H₂O), nitrogen (N₂) or carbon dioxide (CO₂). Yields and quality can be improved by the removal of moisture (UN FAO, 1985). Microwaves can be used to pyrolyze the carbon source (Holland, 1994). Lignite and peat are made into activated charcoal by low-temperature charring, followed by treatment with either superheated steam or potassium hydroxide. Carbon can be made into a cation-exchange resin by sulfonation, or by nitration and reduction.. (TAP, lines 82-87) Activated carbon can be recycled, reactivated, or regenerated from spent activated carbon. Activated carbon used to treat hazardous waste could be considered to be hazardous waste itself (Shapiro, 1996). (TAP, lines 92-93.) [M]any applications will concentrate the toxic substances that it removes and captures, thus becoming toxic itself. (TAP line 275.)</p>
3. Are there any adverse impacts on biodiversity? (§205.200)	X			Removal of carbon from ecosystem. (TAP 348-350)
4. Does the substance contain inerts classified by EPA as 'inerts of toxicological concern'? [§6517(c)(1)(B)(ii)]			X	
5. Is there undesirable persistence or concentration of the material or breakdown products in the environment? [§6518(m)(2)]	X			Disposal can be problematic when toxic materials are removed in filtration. TAP lines 373-375.
6. Are there any harmful effects on human health from the main substance or the ancillary substances that may be added to it? [§6517(c)(1)(A)(i); 6517(c)(2)(A)(i); §6518(m)(4), 205.600(b)(3)]	X			Can cause respiratory problems to those who handle it, especially as particle size decreases. Inhalation causes cough, trouble breathing, black sputum, and fibrosis (Patnaik, 1992). There is also a

				<p>potential for it to spontaneously combust and incomplete combustion produces carbon monoxide (Cheremisinoff, 1999). TAP, lines 281-283 "Although this [chemical activation/reactivation] process results in small uniform pores with high adsorption capacity, the carbon is usually contaminated with the dehydrating agent."²</p> <p>Ancillary substances have not been reviewed.</p>
7. Is the substance, and any ancillary substances, GRAS when used according to FDA's good manufacturing practices? [§205.600(b)(5)]	?			
8. Does the substance contain residues of heavy metals or other contaminants in excess of FDA tolerances? [§205.600(b)(5)]	?			

² M.D. Sufnarski, 1999. The Regeneration of Granular Activated Carbon Using Hydrothermal Technology, master's thesis in Chemical Engineering at the University of Texas. <http://www.dtic.mil/dtic/tr/fulltext/u2/a362534.pdf>

NOSB Evaluation Criteria for Substances Added To the National List Handling

Category 2. Is the Substance Essential for Organic Production? **Substance:**

Question	Yes	No	N/A	Comments/Documentation. (TAP; petition; regulatory agency; other)
1. Is the substance agricultural? [§6502(1)]		X		
2. Is the substance formulated or manufactured by a chemical process? [§6502(21)]	X			Thermal decomposition of carbohydrate. TAP lines 471-476
3. Is the substance formulated or manufactured by a process that chemically changes a substance extracted from naturally occurring plant, animal, or mineral sources? [§6502(21)]	X			See above.
4. Is the substance created by naturally occurring biological processes? [§6502(21)]		X		Thermal decomposition.
5. Is there a natural source of the substance? [§ 205.600(b)(1)]		X		Activated charcoal does not occur naturally. TAP line 564
6. Is there an organic substitute? [§205.600(b)(1)]	X			Could be made from organic plants, which would raise cost and remove carbon from organic system. TAP lines 634-635.
7. Is the substance essential for handling of organically produced agricultural products? [§205.600(b)(6)]		X		The petitioned use is to clarify and improve taste and aroma of an organic fruit beverage. The use of activated carbon to clarify the juice would remove antioxidants and minerals, lowering the nutritional value of the juice. Better fruit harvest and processing should help eliminate the need for clarification, and several natural materials could replace activated carbon in this processing step. TAP lines 698-701.
8. Is there a wholly natural substitute product? [§6517(c)(1)(A)(ii)]		X		Substitutes are practices. See #7 above.
9. Are there any alternative substances? [§6518(m)(6)]		X		Substitutes are practices. See #7 above.
10. Is there another practice (in farming or handling) that would make the substance unnecessary? [§6518(m)(6)]	X			See #7 above.
11. Have the ancillary substances associated with the primary substance been reviewed? Describe, along with any proposed limitations.		X		TAP reviewer points out that a number of chemicals may be used in the production, but it isn't clear which might remain. Ancillary substances have not been reviewed.

**NOSB Evaluation Criteria for Substances Added To the National List
Handling**

Category 3. Is the substance compatible with organic handling practices? Substance:

Question	Yes	No	N/A	Comments/Documentation. (TAP; petition; regulatory agency; other)
1. Is the substance consistent with organic handling? [§6517(c)(1)(A)(iii); 6517(c)(2)(A)(ii)]	?			It depends. It can be made using toxic chemicals, or not.
2. Is the manner of the substance's use, manufacture, and disposal compatible with organic handling? [§205.600(b)(2)]	?			It depends. It can be made using toxic chemicals, or not.
3. Is the substance compatible with a system of sustainable agriculture? [§6518(m)(7)]				It depends. It can be made using toxic chemicals, or not.
4. Are the ancillary substances reviewed compatible with organic handling [?		X		Have not been reviewed.
5. Is the nutritional quality of the food maintained with the substance? [§205.600(b)(3)]				In some cases, nutritional quality is diminished and in other cases it is enhanced. Often there is no change. This depends on a number of complex factors: the nature of the activation of the carbon, the nutritional quality and chemical properties of the adsorbate, the preparation, and the various factors related to adsorption. TAP lines 379-381
6. Is the primary use as a preservative? [§205.600(b)(4)]		X		
7. Is the primary use to recreate or improve flavors, colors, textures, or nutritive values lost in processing (except when required by law)? [§205.600(b)(4)]	X			As petitioned, its use in grape juice is designed to improve flavor and color.

NOSB Evaluation Criteria for Substances Added To the National List: Handling Category 4. Is the commercial supply of an organic agricultural substance fragile or potentially unavailable? [§6610, 6518, 6519, §205.2, § 205.105(d), §205.600(c)] **Substance:**

Question	Yes	No	N/A	Comments/Documentation. (TAP; petition; regulatory agency; other)
1. Is the comparative description as to why the non-organic form of the material /substance is necessary for use in organic handling provided?	X			Could be made from organic plants, which would raise cost and remove carbon from organic system. TAP lines 634-635.
2. Does the current and historical industry information, research, or evidence provided explain how or why the material /substance cannot be obtained organically in the appropriate form to fulfill an essential function in a system of organic handling?				
3. Does the current and historical industry information, research, or evidence provided explain how or why the material /substance cannot be obtained organically in the appropriate quality to fulfill an essential function in a system of organic handling?				
4. Does the current and historical industry information, research, or evidence provided explain how or why the material /substance cannot be obtained organically in the appropriate quantity to fulfill an essential function in a system of organic handling?				
5. Does the industry information about unavailability include (but is not limited to) the following?:				
a. Regions of production (including factors such as climate and number of regions);				
b. Number of suppliers and amount produced;				
c. Current and historical supplies related to weather events such as hurricanes, floods, and droughts that may temporarily halt production or destroy crops or supplies;				
d. Trade-related issues such as evidence of hoarding, war, trade barriers, or civil unrest that may temporarily restrict supplies; or				
e. Other issues which may present a challenge to a consistent supply?				

