Formal Recommendation
From: National Organic Standards Board (NOSB)
To: the National Organic Program (NOP)

Date: April 27, 2016

Subject: Addition of squid byproducts at 205.601(j)(7)

NOSB Chair: Tracy Favre

The NOSB hereby recommends to the NOP the following:

Rulemaking Action: X

Guidance Statement:

Other:

Statement of the Recommendation:

Shoreside Organics, LLC submitted a petition in April 2015 to add "squid and squid byproducts" to the National List of Allowed and Prohibited Substances at section 205.601(j)(7) for use as a fertilizer. The petitioner wanted acid-adjusted squid products to be categorized as fish products for use in organic production. Squid byproducts make up 52% of the total body weight and include the squid ink, pen, skin, milt, liver and viscera and are typically discarded as waste. In general, squid byproducts are chopped, heated, digested with natural enzymes and stabilized with an acid such as phosphoric, sulfuric or citric acid to prevent microbial growth.

Squid are commercially harvested primarily for calamari. Fishermen target spawning squid because they die shortly after reproduction. There are several squid fisheries throughout the world. There are two main squid fisheries in the US including along the Atlantic coast for long-finned squid and along the Pacific coast for market squid. The US Pacific squid fishery is managed by the California Department of Fish and Game, the National Oceanographic and Atmospheric Administration (NOAA) Fisheries, and the Pacific Fishery Management Council. Atlantic squid are managed in federal waters by NOAA Fisheries in conjunction with the Mid-Atlantic Fishery Management Council. Management includes seasonal catch limits, timed fishery closures, administration of permit issuance and limitations on using lights to attract squid to ensure uninterrupted spawning. Sustainable harvesting practices should be monitored in order to prevent ocean degradation and overharvesting.

The reason the squid byproducts need to be added to the National List is that they are stabilized with acid to lower the pH. The Subcommittee proposal listing motion only intended to allow squid from the processing waste stream; the proposal was not intended to allow the use of whole squid in the manufacture of fertilizers.

Rationale Supporting Recommendation:

The addition of squid byproducts is consistent with the National List listing for liquid fish products that are pH adjusted with synthetic sulfuric, citric or phosphoric acid (7 CFR 205.601(j)(7)). Only squid

byproducts originating from the food processing waste stream are acceptable for use in organic agriculture. Whole squid caught for fertilizer purposes would not be included in this listing.

NOSB Vote:

Classification Motion: Move to classify squid and squid byproducts (pH adjusted with synthetic acids) as synthetic.
Motion by: Carmela Beck
Seconded by: Zea Sonnabend
Yes: 15 No: 0 Abstain: 0 Absent: 0 Recuse: 0

Listing Motion: Motion to amend the listing motion to strike the words “squid and”.
Motion by: Carmela Beck
Seconded by: Zea Sonnabend
Yes: 15 No: 0 Abstain: 0 Absent: 0 Recuse: 0

Listing Motion: Move to list squid byproducts at § 205.601(j) with the annotation – can be pH adjusted with sulfuric, citric or phosphoric acid. The amount of acid used shall not exceed the minimum needed to lower the pH to 3.5.

Motion by: Carmela Beck
Seconded by: Zea Sonnabend
Yes: 11 No: 4 Abstain: 0 Absent: 0 Recuse: 0

Motion Passed

National Organic Standards Board
Crops Subcommittee
Petitioned Material Proposal - Squid & Squid Byproducts
March 1, 2016

Introduction
Shoreside Organics, LLC submitted a petition in April, 2015 to add "Squid and Squid Byproducts" to the National List of Allowed and Prohibited Substances section 205.601(j)(7) for use as a fertilizer.

> 205.601 Synthetic substances allowed for use in organic crop production. …the following synthetic substances may be used in organic crop production: Provided, that, use of such substances do not contribute to contamination of crops, soil or water… (j) As plant or soil amendments. (7) Liquid fish products – can be pH adjusted with sulfuric, citric or phosphoric acid. The amount of acid used shall not exceed the minimum needed to lower the pH to 3.5.

The petitioner would like acid-adjusted squid products to be categorized as fish products for use in organic production.

Background
The use of squid and squid byproducts for use in agriculture date back to the 1800's when much of the product was shipped from CA market squid fisheries to Asian countries for consumption and fertilizer applications. Squid byproducts make up 52% of the total body weight and include the squid ink, pen, skin, milt, liver and viscera and are typically discarded as waste. There are several uses for these byproducts including food, medicinal and soil amendment uses. Squid and squid byproducts are the starting ingredients in the production of enzymatically produced hydrolysates with N-P-K values ranging from 2-2-2 to 3.3-7.3-2 or more. Seafood derived hydrolysates, including squid and squid byproducts, have been used both as foliar sprays and soil amendments for propagating cranberries, cherries and apples. In general, squid byproducts are chopped, heated, digested with natural enzymes and stabilized with an acid such as phosphoric, sulfuric or citric acid to prevent microbial growth.

Squid are commercially harvested using nets directly above spawning grounds during mating season primarily for calamari. Fisherman target spawning squid because they die shortly after reproduction. There are several squid fisheries throughout the world. There are two main squid fisheries in the US including along the Atlantic coast for long finned squid and along the Pacific coast for market squid. The US Pacific squid fishery is managed by the CA Department of Fish and Game, the National Oceanographic and Atmospheric Administration (NOAA) Fisheries, and the Pacific Fishery Management Council. Atlantic squid are managed in federal waters by NOAA Fisheries in conjunction with the Mid-Atlantic Fishery Management Council. Management includes seasonal catch limits, timed fishery closures, administration of permit issuance and limitations on using lights to attract squid to ensure uninterrupted spawning.

Discussion
Squid are littoral invertebrates classified into the phylum Mollusca, class Cephalopoda and order Loligo (later renamed Doryteuthis). There are an estimated 300 squid species known throughout the world. Common to the northeastern Atlantic coast is the longfin squid, species *Doryteuthis (Loligo) pealli*. Common to the US west coast is the market squid, species *Doryteuthis (Loligo) opalescens*.

Per the TR, squid differ anatomically and phylogenetically from fish. The US Food and Drug Administration (FDA) defines "fish" to mean fresh or saltwater finfish, crustaceans, other forms of aquatic animal life (including, but not limited to, alligator, frog, aquatic turtle, jellyfish, sea cucumber, and sea urchin and the

roe of such animals) other than birds or mammals, and all mollusks, where such animal life is intended for human consumption. The term "fishery products" means any human food product in which fish is a characterizing ingredient. Molluscan shellfish means any edible species of fresh or frozen oysters, clams, mussels, or scallops, or edible portions of such species, except when the product consists entirely of the shucked adductor muscle. This definition is not inclusive of squid, despite its classification as a mollusk. Scientifically, squids are cephalopod mollusks; however, for legal purposes and because they are part of a defined fishery, squid can be included "as other forms of aquatic life" per the FDA fish definition. Squid and squid byproduct hydrolysate have potential uses as food products.

The Canadian Organic Standard allows for the use of fish products; in Canadian fisheries, the definition of fish includes marine invertebrates such as squid. The EU Organic Standard allows the use of molluscan (squid) products from sustainable fisheries and may be used in organic production of feeds for non-herbivores; squid products are not explicitly authorized for use in organic production. The Japanese Organic Standard permits the use of food industry byproducts of fish origin if they are derived from natural sources; mollusks (squid) are included in Japanese fisheries. IFOAM permits the use of fish and shell products and food processing of animal origin.

The Subcommittee recommends amending the current listing to read: Liquid fish and squid products – can be pH adjusted with sulfuric, citric or phosphoric acid. The amount of acid used shall not exceed the minimum needed to lower the pH to 3.5.

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

	Criteria Satisfied?		
1. Impact on Humans and Environment	☒ Yes	☐ No	☐ N/A
2. Essential & Availability Criteria	☒ Yes	☐ No	☐ N/A
3. Compatibility & Consistency	☒ Yes	☐ No	☐ N/A

Subcommittee Action & Vote

Classification Motion: Move to classify Squid & Squid Byproducts as synthetic.
Motion by: Carmela Beck
Seconded by: Zea Sonnabend
Yes: 6 No: 0 Absent: 1 Abstain: 0 Recuse: 0

Listing Motion: Move to list Squid & Squid Byproducts at §205.601(j) of the National List – with the annotation – can be pH adjusted with sulfuric, citric or phosphoric acid. The amount of acid used shall not exceed the minimum needed to lower the pH to 3.5.
Motion by: Carmela Beck
Seconded by: Zea Sonnabend
Yes: 6 No: 0 Absent: 1 Abstain: 0 Recuse: 0

Approved by Zea Sonnabend, Subcommittee Chair, to transmit to NOSB March 1, 2016

NOSB Evaluation Criteria for Substances Added To the National List - Crops

Category 1. Adverse impacts on humans or the environment? Squid & Squid Byproducts

Question	Yes	No	N/A	Comments/Documentation (TAP; petition; regulatory agency; other)
1. Is there a probability of environmental contamination during use or misuse? [§6518(m)(3)]		X		TR (219-220; 562-563): If squid or squid byproduct fertilizers are over applied they can leach nitrogen and phosphate into the soil. Discharges of dead squid & wastewater boost ammonia concentrations & reduce oxygen content in the water posing a threat to marine life.
2. Is there a probability of environmental contamination during, manufacture or disposal? [§6518(m)(3)]		X		TR (191-192): Disposal is regulated as a solid waste by the US EPA.
3. Are there any adverse impacts on biodiversity? (§205.200)		X		TR (78-81): Even without fishing, the entire population replaces itself annually. The stock is entirely dependent on successful spawning from each generation coupled with good survival of recruits to adulthood.
4. Does the substance contain inerts classified by EPA as 'inerts of toxicological concern'? [§6517 (c)(1)(B)(ii)]			X	
5. Is there potential for detrimental chemical interaction with other materials used in organic farming systems? [§6518(m)(1)]		X		
6. Is there a toxic or other adverse action of the material or its breakdown products? [§6518(m)(2)]		X		
7. Is there persistence or concentration of the material or breakdown products in the environment? [§6518(m)(2)]		X		TR (489-490; 524-525): Squid & squid byproduct hydrolysate is used as fertilizer in crop production providing organic matter. At high levels of application there is greater potential for leaching of nitrogen and phosphorus.
8. Would the use of the substance be harmful to human health or the environment? [§6517 (c)(1)(A)(i); §6517 (c)(2)(A)(i); §6518(m)(4)]		X		TR (674-676; 718; 727-733) Manufacture waste of fats and oils must be properly treated or can lead to pollution. International squid fishing remains a concern of human rights advocacy particularly in SE Asia & NZ where debt bondage and captive enslavement are practiced. Illegal, unreported & unregulated fishing is a significant problem affecting the marine ecosystem (examples cited China, Chile, Thailand, and India).

9. Are there adverse biological and chemical interactions in the agro-ecosystem? [§6518(m)(5)]		X		TR (614-615; 622-623): Decomposition of squid & squid byproducts provide starting ingredients for humus formation which comprises much of the organic matter in soil. Microbial activity is higher in soils fertilized with squid & squid byproducts hydrolysate than comparable soils fertilized with other organic fertilizers or synthetic mineral products.
10. Are there detrimental physiological effects on soil organisms, crops, or livestock? [§6518(m)(5)]		X		

Category 2. Is the Substance Essential for Organic Production? Squid & Squid Byproducts

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			TR (464; 479-482): Squid and squid byproduct hydrolysates are similar in composition to fish emulsions. The addition of sulfuric and phosphoric acid are considered synthetic.
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			
4. Is the substance created by naturally occurring biological processes? [§6502(21)]		X		
5. Is there a natural source of the substance? [§ 205.600(b)(1)]	X			
6. Is there an organic substitute? [§205.600(b)(1)]		X		
7. Is there a wholly natural substitute product? [§6517(c)(1)(A)(ii)]		X		TR (738-739): Raw animal manure, composted plant and animal materials & uncomposted plant and animal materials.
8. Are there any alternative substances? [§6518(m)(6)]	X			TR (742-746): Aquatic plant extracts, elemental sulfur, humic acids, lignin sulfonate, micronutrients, & liquid fish products.
9. Are there other practices that would make the substance unnecessary? [§6518(m)(6)]	X			TR (775-781): Use of cover crops, crop rotations, no-till and the application of plant and animal materials.

NOSB Evaluation Criteria for Substances Added To the National List - Crops

Category 3. Is the substance compatible with organic production practices? Squid & Squid Byproducts

Question	Yes	No	N/A	Comments/Documentation (TAP; petition; regulatory agency; other)
1. Is the substance consistent with organic farming and handling? [§6517(c)(1)(A)(iii); 6517(c)(2)(A)(ii)]	X			
2. Is the substance compatible with a system of sustainable agriculture? [§6518(m)(7)]	X			
3. If used in livestock feed or pet food, is the nutritional quality of the food maintained with the substance? [§205.600(b)(3)]			X	
4. If used in livestock feed or pet food, is the primary use as a preservative? [§205.600(b)(4)]			X	
5. If used in livestock feed or pet food, is the primary use to recreate or improve flavors, colors, textures, or nutritive value lost in processing (except when required by law)? [§205.600(b)(4)]			X	
6. Is the substance used in production, and does it contain an active synthetic ingredient in the following categories: [§6517(c)(1)(B)(i); copper and sulfur compounds				
toxins derived from bacteria				
pheromones, soaps, horticultural oils, fish emulsions, treated seed, vitamins and minerals	X			(TR 298-304): OFPA does not specifically list squid or squid byproducts, however, it does list fish emulsion. In US law, the term “fish” is often taken to mean finfish, mollusks, crustaceans, and all other marine animal and plant life with the exclusion of marine mammals and birds. Squid are considered mollusks.
livestock parasiticides and medicines				
production aids including netting, tree wraps and seals, insect traps, sticky barriers, row covers, and equipment cleansers				