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USDA/AMS/NOP, Standards Division
Attention: National List Manager
1400 Independence Ave. SW
Room 2642-So., Ag Stop 0268
Washington, DC 20250-0268

Dear USDA/AMS/NOP, Standards Division:

On behalf of Captain Carp Fisheries, I am submitting the following petition to amend the National Allowed and Prohibited Substances (National List) at 7 C.F.R. 205.600-205.606. The following includes the background for the request and the required information according to NOP 3011 National List Guidelines Rev01, Section 4.2.

Background:

This proposal will serve as a petition to the NOSB for its consideration for the use of potassium hydroxide as an production aid in the production of liquid fish products (with amount used limited to the amount necessary for emulsion of the fish and extraction of organic compounds).

Current status of potassium hydroxide per National Organic Program (NOP) indicates that potassium hydroxide is allowed for use as a production aid, for use as an extractant in the production of aquatic plant extracts and humic acid extracts (where amount used is limited to the amount necessary for extraction).

Since potassium hydroxide use has been approved for the production of liquid humic acid and aquatic plant extracts, our proposal would like the NOSB to consider its approval for essentially the same use but for the production of liquid fish products, i.e.. aquatic animal (fish) extracts. It also should be noted that potassium hydroxide is allowed for the extraction/emulsion of algae (as an "aquatic plant extract") even though algae is not a plant, so we do not find this to be a major change to the regulations.

We have included actual in-plant data as well as nutritional data to support our request. We believe, based on all scientific available information, that the use of potassium hydroxide is consistent with the logic and scientific reasoning for its previous approval as a process aid in a similar manner to plant, algae and humic acid extracts.

In our case, we use only whole fish and 100% of the fish we use in our process is invasive carp (sourced from an invasive species removal program run by the Illinois Department of Natural Resources). Per USDA/NOP guidelines whole fish may only be used if they are invasive species, as removal of the invasive species fish for production of fertilizer is seen as an environmental benefit in this special case. The invasive carp constantly consume large amounts of algae and plant materials that are digested in the fish gut, and because we use the whole fresh fish without eviscerating and dissecting it for filleting or other food use this algae and plant material is intact and available for extraction. By performing hydrolysis on the fish using potassium hydroxide we are not only able to extract nutrients and organic material from the fish flesh, skin and bones, but also extract the nutrients and organic material from the algae and plant matter in the fish gut.

It is our fundamental wish that the NOSB carefully consider our petition, our data, our logic and rationale for the use of potassium hydroxide as a production aid for liquid fish products and the potential environmental advantages and nutritional benefits for its use.

We are using the term “invasive carp” to describe fish previously known as “Asian carp” (which is a term that is going into dis-use). These fish species include *Hypophthalmichthys molitrix* (silver carp), *Hypophthalmichthys nobilis* (bighead carp), *Ctenopharyngodon idella* (grass carp), *Mylopharyngodon piceus* (black carp), and *Cyprinus carpio* (common carp).

Sincerely,



Michael Owsley
CEO
Captain Carp Fisheries

Petition Requirements:

Item A.1: Synthetic substances allowed for use in organic crop production (7 CFR 205.601)

Item A.2: OFPA Category

- Production aids

Item A.3: Inert Ingredients

- Not Applicable

Item B

- 1. Substance Name Provide the substance's chemical and/or material common name. The name of the petitioned substance should be consistent with any name(s) used by other Federal agencies (e.g., FDA, EPA, etc.)**

Potassium hydroxide: Its chemical formula is KOH and its common name is caustic potash.

CAS Name: Potassium Hydroxide
Synonym : Caustic Potash
CAS Number: 1310-58-3
Molecular Formula : HKO (commonly denoted as KOH)

- 2. Petitioner and Manufacturer Information. Provide the name, address, and telephone number for the petitioner and manufacturer (if different).**

Petitioner and Manufacturer are same.

- 3. Intended or Current Use Describe the intended or current use of the substance, e.g., use as a pesticide, animal feed additive, processing aid, nonagricultural ingredient, sanitizer, or disinfectant. If the substance is an agricultural ingredient, the petition must provide a list of the types of product(s) (e.g., cereals, salad dressings) for which the substance will be used and a description of the substance's function in the product(s) (e.g., ingredient, flavoring agent, emulsifier, processing aid).**

The intent is to use potassium hydroxide as a processing aid to facilitate emulsion of the aggressively invasive carp species and help support extraction of soluble organic compounds from the fish; by means of alkaline hydrolysis. Amount used should be limited to the amount necessary for emulsion of the fish by means of alkaline hydrolysis. Once this process is complete phosphoric acid is used to stabilize said product (per 7 CFR § 205.601(j)(8)).

Currently potassium hydroxide is allowed for extraction of aquatic plant extracts (per 7 CFR § 205.601(j)(1)) and humic acids (per 7 CFR § 205.601(j)(3)), and we believe this same process should also be allowed for use on fish.

It also should be noted that potassium hydroxide is allowed for the extraction/emulsion of algae (as an "aquatic plant extract") even though algae is not a plant, so we do not find this to be a major change to the regulations.

- 4. Intended Activities and Application Rate: Provide a list of the crop, livestock, or handling activities for which the substance will be used. If used for crops or livestock, the substance's rate and method of application must be described.**

Potassium hydroxide is added to a reactor vessel along with fish and water; and is agitated while heat is applied. Amount of potassium hydroxide added should be limited to the amount necessary for emulsion of the fish by means of alkaline hydrolysis.

- 5. Manufacturing Process Provide the source of the substance and a detailed description of its manufacturing or processing procedures from the basic component(s) to the final product.**

OPTIONAL – Potassium hydroxide is already on the National List.

- 6. Ancillary Substances: For substances petitioned for use in organic handling or processing, provide information about the ancillary substances (including, but not limited to, carriers, emulsifiers, or stabilizers) that may be included with the petitioned substance, including function, type of substance, and source, if known.**

OPTIONAL – Potassium hydroxide is already on the National List.

- 7. Previous Reviews: Provide a summary of any available previous reviews of the petitioned substance by State or private certification programs or other organizations. If this information is not available, this should be stated in the petition. If the substance has been previously reviewed and rejected by the NOSB, the petition must provide new information that was not submitted in an earlier petition or provided for in the previous technical reports for the substance.**

OPTIONAL – Potassium hydroxide is already on the National List.

- 8. Regulatory Authority: Provide information regarding EPA, FDA, and State regulatory authority registrations, including registration numbers. The information provided must confirm that the intended use of the substance is permitted under EPA or FDA regulations, as applicable. For food ingredients and processing aids, the substance must be approved by FDA for the petitioned use. For pesticide active ingredients, the substance must have an EPA tolerance or tolerance exemption, as applicable. If this information does not exist or is not applicable, the petitioner should state this in the petition.**

OPTIONAL – Potassium hydroxide is already on the National List.

- 9. Chemical Abstracts Service (CAS) Number and Product Labels: Provide the CAS number or other product numbers of the substance. If the substance does not have an assigned product number, the petitioner should state so in the petition. For food additives, the International Numbering System (INS) number should also be provided. This item should also include labels of**

OPTIONAL – Potassium hydroxide is already on the National List.

- 10. Physical and Chemical Properties: Provide the substance's physical properties and chemical mode of action including the following:**

- (a) Chemical interactions with other substances, especially substances used in organic production;
- (b) Toxicity and environmental persistence
- (c) Environmental impacts from its use and/or manufacture;
- (d) Effects on human health
- (e) Effects on soil organisms, crops, or livestock.

OPTIONAL – Potassium hydroxide is already on the National List.

11. Safety Information: Provide safety information about the substance including a Material Safety Data Sheet (MSDS) and a substance report from the National Institute of Environmental Health Studies. If this information does not exist or is not applicable, the petitioner should state so in the petition.

OPTIONAL – Potassium hydroxide is already on the National List.

12. Research Information: This item should include research information about the substance. The research should include comprehensive substance research reviews and research bibliographies, including reviews and bibliographies that present contrasting positions to those presented by the petitioner in supporting the substance's inclusion on or removal from the National List. For petitions to include nonorganic agricultural substances on the National List for organic handling, this information should include research on why the substance should be permitted in the handling of an organic product, including the availability of organic alternatives. If research information does not exist for the petitioned substance or for the contrasting position, the petitioner should state so in the petition.

Potassium hydroxide is classified as a synthetic, nonagricultural substance in 7 CFR 205.605(b).

Commercially available Potassium Hydroxide is manufactured by electrolysis of Potassium Chloride solution in the presence of a porous diaphragm (see 21 CFR § 184.1631), which is a chemical process.

While potassium hydroxide could be produced from the leaching of wood ashes such a source does not meet FDA's food grade specifications, is not readily available, and is still an artificial process. There are no other "naturally available" chemicals known to us with a high enough pH to support alkaline hydrolysis that are not extremely rare and therefore prohibitively expensive or impossible to obtain. This is because such a high pH substance is highly reactive and will quickly reduce and not persist in the environment (or in a plant or animal). A typical example of a naturally occurring source of high pH chemical is deep sea volcanic mud at extreme ocean depths (please see <https://www.geochemsoc.org/publications/geochemicalnews/gn141oct09/highestph>). For these reasons we expect potassium hydroxide has been approved by the NOP for other uses (aforementioned production of aquatic plant extracts and humic acid products, plus lye peeling of fruit per 21 CFR § 205.605(b))

Potassium Hydroxide has been exhaustively researched by federal agencies. Please see 21 CFR § 184.1631

Potassium hydroxide is the preferred embodiment for production of fish emulsion through alkaline hydrolysis as it is cheap and readily available, it is already commonly used in agriculture, fertilizer and

food products; and it does not introduce any chemicals that may be harmful to agriculture. Other hydroxide chemicals that could possibly be used are as follows (all are synthetic substances):

Alkali Metal Hydroxides:

Potassium Hydroxide: Inexpensive, potent, safe for plants

Sodium Hydroxide: Inexpensive, potent, harmful to plants (due to sodium content)

Lithium Hydroxide: More expensive, less potent, harmful to the environment (due to toxicity of lithium)

Rubidium Hydroxide: Very rare and expensive, unknown if safe to use

Cesium Hydroxide: Very rare and expensive, unknown if safe to use, may be radioactive

Francium Hydroxide: Very rare and expensive, extremely hazardous (radioactive)

Alkaline Earth Metal Hydroxides:

These include Beryllium, Magnesium, Calcium, and Strontium hydroxides. Some of these substances might be useful in alkaline hydrolysis of fish but are more expensive than potassium hydroxide, potentially more difficult to handle, and add chemicals or nutrients that are used by plants in much lower amounts than potassium (so a much higher chance of toxicity to plants due to overnutrition).

Metal Hydroxides:

These include Aluminum, Cobalt, Copper, Curio, Gold, Iron, Mercury, Nickel, Tin, Uranyl and Zinc hydroxides. We don't expect these substances to be useful in alkaline hydrolysis of fish as again they are more expensive and more difficult to handle, and they will in some cases add large amounts of nutrients that plants only require in very small amounts (therefore be toxic to plants at level necessary).

13. Petition Justification Statement Provide a "Petition Justification Statement," which provides justification for any of the following actions requested in the petition:

A. Inclusion of a Synthetic on the National List (7 C.F.R. §§ 205.601, 205.603, 205.605(b))

• **Explain why the synthetic substance is necessary for the production or handling of an organic product.**

See (1) below

• **Describe any nonsynthetic substances, synthetic substances on the National List, or alternative cultural method that could be used in place of the petitioned synthetic substance.**

See (2) below

• **Describe the beneficial effects to the environment, human health, or farm ecosystem from use of the synthetic substance that support its use instead of the use of a nonsynthetic substance or alternative cultural method.**

See (3) below

(1) A synthetic substance is necessary for production of fish emulsion by means of alkaline hydrolysis as there are no other more natural options available. While potassium hydroxide could be produced from the leaching of wood ashes such a source does not meet FDA's food grade specifications, is not readily available, and is still an artificial process Potassium hydroxide is the preferred embodiment for production of fish emulsion through alkaline hydrolysis as it is cheap and readily available, it is

already commonly used in agriculture, fertilizer and food products; and the chemical does not introduce any chemicals that may be harmful to agriculture.

- (2) There are no other “naturally available” chemicals known to us with a high enough pH to support alkaline hydrolysis that are not extremely rare and therefore prohibitively expensive or impossible to obtain. This is because such a high pH substance is highly reactive and will quickly reduce and not persist in the environment (or in a plant or animal). Potassium Hydroxide is a synthetic substance on the National List, however it is not specifically indicated as a processing aid for liquid fish products (fish emulsions),
- (3) As described there is no non-synthetic substance available to produce fish emulsion (liquid fish products) by way of alkaline hydrolysis. By approving this method for production of organic liquid fish fertilizer many environmental benefits are achieved. Most importantly it will help in our endeavor to expand production of fertilizer derived from invasive carp species (as most fish fertilizer is used in organic farming rather than conventional farming). This means we can better support the removal of the invasive fish from US waterways, which is major program at the Illinois Department of Natural Resources as well as in other states. Also, it will provide a source of organic fish fertilizer located in the midwestern United States much closer to farms than fish fertilizer produced near the ocean, which means lower transportation costs (and associated carbon emissions) for farmers. This will help promote organic farming in the area which is beneficial for the health of the environment, the health of humans, and food security.