CODEX ALIMENTARIUS COMMISSION

Food and Agriculture Organization of the United Nations

World Health Organization

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Agenda Item 6.1 **PR56/CRD40**

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CODEX COMMITTEE ON PESTICIDE RESIDUES

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Comments submitted by the National Health Federation

The National Health Federation (NHF) respectfully submits the following comments noted below for this Committee's consideration in establishing the Maximum Levels for the specified pesticide residues in food and feed.

Agenda Item 6.1 **CX/PR 25/56/5**

Introductory Statement

Everything in the natural world is connected. All life, together, forms one cohesive ecosystem. What happens to one piece of that whole, therefore, must affect ***all life***, positively or negatively. When one part of the ecosystem is disrupted, it can lead to a cascade of effects that destabilize the entire system. The extinction of a single species, for example, can lead to a loss of biodiversity, which causes the breakdown of food chains and impacts other species that rely upon them for survival. Such disruptions can go on to alter natural processes, such as pollination and nutrient cycling, ultimately impacting human societies that depend on these natural processes.

All pesticides leave varying amounts of residue. These residues are consistently found in surface water, groundwater, and even ocean waters, causing degradation of one of the most essential ingredients for all life on Earth. Pesticide residues are also pervasive in the air we breathe and in the soil from which life grows. The foods we eat contain residues from pesticides sprayed on and around our food.

This widespread contamination leads to the concentration and bioaccumulation of these residues in water, soil and, most concerningly, in the fatty tissues of almost all animals, including human beings.

Pesticides, collectively, are associated with a range of adverse health effects. These include nerve damage, endocrine disruption, reproductive disorders, neurotoxicity, kidney and liver damage, autoimmune conditions, and cancer. They cause interference in metabolic pathways of mammals and disruption of natural processes like photosynthesis or the shikimate pathway in plants and microbes.

The long-term, toxic effects on the World's population and our environment as a whole – consumers, farmers, adults, children, animals, plants, insects, birds, aquatics, and microbes – must be considered when creating Codex standards and national regulations for the use of any and all pesticides.

A living organism will always attempt to adapt to its environment in order to survive. This adaptation can lead to resistance. To illustrate, the Arctic fox has developed thicker, denser fur to resist the increasingly harsher, colder climate in which it lives. But this adaptation is not always a natural evolution, nor is it always beneficial. Antimicrobial resistance, including drug resistant bacteria, fungi, parasites, and viruses, has become increasingly common, in large part due to the overuse and pervasiveness of both pesticides and antibiotics. For example, most conventionally raised livestock are chronically ill due to their living conditions, non-species-appropriate diet, and constant exposure to toxins such as the chemical cocktail of fungicides, insecticides, herbicides, desiccants, and other genetically

engineered environmental inhibitors found in and on the GMO grain and alfalfa they often consume. Because they are ill, they are then given frequent antibiotics, which contributes to antibiotic resistance, which causes more and more pesticide use on crops. It is a vicious, toxic cycle that must be stopped. The only way to do this is to address the root cause of this growing problem.

Globally, there is a widespread and interconnected health crisis affecting almost all forms of life. As humans, we are currently experiencing a chronic health epidemic. Bird and insect populations are declining alarmingly, while aquatic species are exhibiting significant dysfunction, with many showing signs of reproductive and developmental abnormalities.

Systemic effects must also be taken into consideration. In particular, the pervasive presence of pesticides, which are absorbed by plants and kill or otherwise impact the organisms that rely on them for food. This creates a ripple effect throughout ecosystems overall. If we stopped to consider that the insects are dying from feeding off plants that pesticides were applied to, and the birds are dying from eating the insects that were contaminated by the plants, would it not be reasonable for us to question whether there are any safe MRLs for human food or animal feed?

As long as we hold on to the idea that pesticide use is safe until proven harmful and wait for "scientific research studies" to prove that it is causing harmful health issues, we will be waiting forever. There are too many variables, too many combined effects, and too much interconnectedness of life itself to pinpoint any one thing as the cause of the worldwide problems we are seeing. There is no feasible way to fund and execute unbiased research on the combination of the hundreds of thousands of chemicals, genetically modified organisms, and synthetic biology used in agriculture and other food systems, along with the chemical reactions and long-term changes that happen at the metabolic level in living organisms when exposure to these toxins occurs. Remember, if you take away the interference, all life on Earth will have the ability to heal and thrive.

PESTICIDE USE and MRLs

There has been a sharp rise in pesticide use worldwide since 1945, which correlates with a rise in chronic disease rates. **In 1960, there were 196 million pounds of pesticides applied in agriculture, while in 2022, statistics show that number to be a staggering 8,157 million pounds applied.** During this same period, chronic illnesses, including autoimmune diseases, have increased at a similarly alarming rate. In fact, estimates of the yearly increases in the overall worldwide incidence and prevalence of autoimmune diseases are 19.1% and 12.5%, respectively. Many studies suggest that long-term exposure to pesticides may contribute to these health issues by disrupting endocrine function and causing oxidative stress. This alarming trend highlights the need for increased caution and safer alternatives to pesticide use. It also underscores the need for more research into pesticide exposure's potential health impacts.

There are at least 336 scientific articles on *PubMed* alone showing a correlation between exposure to endocrine active pesticides (endocrine disruptors) and illnesses and conditions mediated by pesticide-residue-induced inflammation: congenital anomalies, developmental and cognitive/neurodegenerative disorders, DNA and genetic damage, oxidative stress, carcinogenic effects, reproductive disorders in both man, bees, aquatic, and terrestrial species, soil, and much more. Additionally, the risk of miscarriage, low birth weight, hypospadias, cryptorchidism, and micropenis were significantly greater in areas with higher use of pesticides in relation to those with lower use. It is well established that pesticide residues constitute a significant source of contamination of our air, water, and soil, thereby creating a continuous threat to the healthy co-existence of plant and animal communities in the ecosystem, let alone the knock-on effects upon human health.

A study by Pimentel (1995) showed that only a small percentage (0.3%) of applied pesticides go into the target pest while 99.7% go into the environment. With losses due to pests leading to one-third of the World’s agricultural production being lost annually juxtaposed against the degradation of entire global ecosystems by 99.7% with those pesticide residues, many of which remain in the soils for many years after the initial exposure, entering the environment, it is clear that this is neither wise nor sustainable, particularly when building soils would strengthen plants so they wouldn’t require the synthetic chemicals or at least not at the current usage rates.

In 2010, Monsanto was granted a patent for glyphosate as an antimicrobial or antibiotic. Glyphosate targets the shikimate pathway in plants. Humans do not have this metabolic pathway, the basis for many of the safety claims that

have been made. However, bacteria do, which means glyphosate harms the necessary, beneficial bacteria in the human gut, thus harming immune system function. As of May 2025, Bayer/Monsanto has reached settlement agreements in nearly 100,000 Roundup lawsuits, paying out approximately $11 billion because glyphosate in Roundup has been proven in countless instances in a court of law to be toxic to humans and the environment. The company has agreed to remove glyphosate from residential Roundup, but its replacement consists of a combination of four highly toxic chemicals, diquat dibromide, Fluarzifop-P butyl, triclopr, and imazapic and the big Ag industry continues to use enormous amounts of glyphosate on human food products as well as Agrifeed.

A 2015 study titled "Assessment of three approaches for regulatory decision making on pesticides with endocrine disrupting properties," noted that no specific science-based approach for the assessment of substances with endocrine disrupting properties had been agreed upon./1 It doesn't appear that since that time, a decision has been reached either.

Moreover, antifungals are applied to prevent agricultural plants from rotting. Some scientists cite evidence that rampant use of fungicides on crops is contributing to the surge in drug-resistant fungi infecting humans./2 "It's an enormous problem," said Matthew Fisher, a professor of fungal epidemiology at Imperial College London, who was a co-author of a recent scientific review on the rise of resistant fungi. "We depend on being able to treat those patients with antifungals."

In fact, Dr. Lynn Sosa, Connecticut's deputy state epidemiologist states that the urgent threat of fungal infection C. auris is "the top" threat among resistant infections and that "it's pretty much unbeatable and difficult to identify." Like antibiotic resistance, resistance to antifungal drugs and other such products is now becoming prevalent and antifungal-product overuse in farming is being blamed.

SPECIFIC SUBSTANCES

None of the following toxic chemicals should be advanced in the 8-Step process for the reasons set forth in this CRD:

ACETAMIPRID (246)

High potential for bioaccumulation and is highly toxic to birds, which not only affects the bird populations but the food chain as well. Heath risks: Steatosis, neurodevelopment, immune system, and CNS impair; and male reproductive system damage. Moreover, evidence indicates acetamiprid may influence hormone levels—it has been linked to reduced testosterone in humans, and to abnormalities in rodents' reproductive development and brain structure. PAN Europe

Continuous exposure to acetamiprid, even at nanogram levels, triggers changes in protein expression across worker bees and queens, possibly affecting reproduction, growth, and immune responses. PubMed Combined with other insecticides, the result will be exactly what we are witnessing currently: a great decline in bee populations and colony collapse! There have been NO studies on the cumulative and synergistic effects of all of these insecticides, so none of these MRLs should be advanced.

See also Hazard Statements at:

https://pubchem.ncbi.nlm.nih.gov/compound/Acetamiprid#section=Hazard-Classes-and-Categories

ACIBENZOLAR-S-METHYL (228) or ASM

According to the UK Pesticide Properties Database, ASM shows moderate toxicity toward: Aquatic life (fish, daphnia); Birds; and Earthworms. Although ASM generally degrades in soil and water, it can exhibit moderate persistence, especially under anaerobic conditions. This indicates meaningful ecological risks even when labeled use is followed.

The European Food Safety Authority (EFSA) noted that current data are **insufficient to fully assess ASM's potential as an endocrine disruptor**. This unresolved status has led to regulatory concern. EFSA JournalEuropean Food Safety Authority Consequently, the **European Commission withdrew its approval** of ASM in mid-2024, citing the

manufacturer's inability to provide adequate data and a **self-classification of the substance as toxic for reproduction**. Usage authorizations are being phased out. Classified as a fungicide, antimicrobial, and an endocrine disruptor

ACYNONAPYR (333)

Extremely toxic to aquatic life, both immediately and over the long term, posing a high ecological threat to fish, algae, crustaceans, and other aquatic organisms. Even minimal amounts entering water bodies can have devastating effects. Long-term animal studies found increased rates of **tumors and lymphomas**, including hemangiomas in lymph nodes and malignant lymphomas in male rodents. fsc.go.jp Moreover, studies report **reduced fertility indicators**, including fewer implantations, lower conception rates, and reduced offspring weights. In rabbits, **abortion and low fetal body weight** occurred at higher doses. fsc.go.jp

There's limited information regarding its environmental fate and persistence, meaning potential long-term ecological consequences are unclear. It also has a high partition coefficient (log $K_{ov} \approx 6.65$), suggesting **potential for bioaccumulation and mobility** in ecosystems. assets.lgcstan

While Acynonapyr may be effective as an acaricide (mite insecticide), the combination of environmental and health hazards – especially its extreme aquatic toxicity, carcinogenic and reproductive concerns, chronic organ toxicity, and fire/explosion risks – raises serious red flags. Without more evidence of safe use, environmental containment, or safer alternatives, its continued use poses unnecessary harm to humans, ecosystems, and communities.

BUPROFEZIN (173)

Despite its past use as an insect growth regulator for controlling pests like whitefly and mealybugs, **Buprofezin raises serious ecological, health, and environmental concerns**. It is **highly toxic to aquatic organisms**, including fish embryos and larvae –studies report dramatically reduced hatch rates (e.g., only 25% hatching at 25 mg/L and near 0% at 100 mg/L) and low LC_{50} values in Daphnia, signifying substantial environmental risk sitem.herts.ac.ukPMC.

Moreover, Buprofezin poses **threats to beneficial insects**: it negatively affects the life history traits and reproductive success of Encarsia formosa, a parasitoid wasp that helps control whitefly populations, by reducing emergence rates and parasitism performance Aseestant. In terms of environmental fate, the chemical is **moderately to very persistent in soils and aquatic systems**; its low volatility and solubility combined with soil persistence increase the risk of long-term ecological impact sitem.herts.ac.uk.

When it comes to mammalian and human health, Buprofezin has been linked to **liver, heart, and thyroid damage in chronic rodent studies**, with observations of renal and cardiac lesions, although not definitively carcinogenic, these findings raise red flags inchem.orgFederal Register. Regulatory bodies, including the U.S. EPA, recognize **potential aneugenic effects** – chromosomal mis-segregation – although in vivo mutagenicity was not confirmed, giving it a "very low" carcinogenic risk rating Federal Register.

Furthermore, **bioaccumulation is a concern**: Buprofezin's log $K_{o}w$ exceeds 3, suggesting potential to concentrate in organisms and pose risks through the food web. This includes elevated risks of secondary poisoning for animals that feed on contaminated prey, especially in greenhouse settings PMC.

In summary, **Buprofezin's use is problematic** due to its high toxicity to fish and beneficial insects, its environmental persistence and bioaccumulation potential, and its documented harmful effects on mammalian organs and endocrine systems. Together, these concerns suggest that its use should be restricted or avoided, particularly in sensitive ecosystems or near water sources.

See also: https://pubchem.ncbi.nlm.nih.gov/compound/Buprofezin#section=GHS-Classification

CARFENTRAZONE-ETHYL (338)

There is insufficient information on this chemical, as admitted by Australia and Canada, and therefore the MRLs for C-E should NOT be advanced.

https://www.pesticideinfo.org/chemical/PRI1902

CHLORPYRIFOS (17) or CPF

Particularly nasty, it is one of the most commonly used pesticides worldwide. However, keeping in view its toxic effects such as genotoxicity, immunotoxicity, cytotoxicity, oxidative stress, neurotoxicity, and mutagenicity, CPF has been banned in various countries. **The residues have been detected in almost all living organisms.**

https://pmc.ncbi.nlm.nih.gov/articles/PMC9566616/

https://pmc.ncbi.nlm.nih.gov/articles/PMC1253789/

https://www.sciencedirect.com/science/article/abs/pii/S0048969720361787

CHLORMEQUAT (015)

Toxicological studies suggest that exposure to Chlormequat can reduce fertility and harm the developing fetus at doses lower than those used by regulatory agencies to set allowable daily intake levels. CHLORMEQUAT is an endocrine disruptor, affecting reproductive and developmental health.

https://www.sciencedirect.com/science/article/abs/pii/S0378427419303480

CYCLOBUTRIFLURAM (339)

NHF disagrees with Australia and Canada that this chemical should be advanced to Step 5/8 for the following reasons:

Cyclobutrifluram is a a synthetic SDHI (succinate dehydrogenase inhibitor) used as a nematicide and fungicide, and there are multiple, significant concerns that argue against its use.

First and foremost, it belongs to the PFAS class – chemicals known for their extreme persistence and environmental hazards. As a PFAS pesticide, Cyclobutrifluram presents long-lasting environmental contamination risks; once applied, it can persist in soil and water for months to years. This includes conversion into trifluoroacetic acid (TFA), a breakdown product **with a ~200-year half-life**, known for its links to cancer and reproductive harms The New Lede.

Multiple studies have shown toxic impacts of cyclobutrifluram on animals. Exposures in lab studies have triggered thyroid disruptions, liver effects, and body weight changes in rodents, yet EPA's classification of it as "not likely to be carcinogenic" has been criticized for relying on under-dosed carcinogenicity tests that may have underestimated cancer risk The New LedeCenter for Food Safety.

Inadequate safety assessments also cast further doubt. Human health risk evaluations have been labeled vague and weak, especially regarding thyroid effects, spray-drift protections, and carcinogenic thresholds. Some statements in the EPA risk assessments have been called "unsupported" or unenforceable by expert reviewers Environmental Protection NetworkRegulations.gov.

Ecologically, although EPA's preliminary evaluation suggests low risks to many species, uncertainties remain regarding long-term effects. The active ingredient is persistent in soil (with half-lives from 100 days up to nearly 3 years), moderately mobile – posing risks of leaching into groundwater – and may generate toxic metabolites. Labeling changes (e.g., reduced application rates, pollinator protections) may mitigate some risks, but do not fully discount broader environmental exposure pathways through runoff and drift.

Regulations.govPublicNow DocsThe New Lede.

Finally, several reviewers argue that the environmental and public health review was rushed, with key knowledge gaps left unaddressed. Given the availability of alternative practices and the irreversible nature of PFAS contamination, many argue that registration approval would be premature and potentially irresponsible Beyond PesticidesThe New Lede.

In summary, the MRLs for Cyclobutrifluram should not be advanced because of:

- **Persistent PFAS contamination**: long-lasting environmental presence, including toxic degradates like TFA.
- **Potential health risks**: thyroid, liver, weight effects in animals; cancer risk possibly underestimated.
- **Weak human health risk assessment**: vague conclusions, under-supported mitigation measures.
- **Environmental exposure threats**: soil persistence, mobility, and insufficient data on metabolites.
- **Regulatory and scientific criticism**: reviewers highlight rushed approval, insufficient data, and unaddressed hazards.

Given these substantial concerns – especially around longevity, ecological spread, and health effects – Cyclobutrifluram should not be used until and unless these risks are fully addressed through transparent, complete assessment and proven safe alternatives are available.

CYPROCONAZOLE (239)

Cyproconazole, a commonly used triazole fungicide, poses significant environmental, health, and regulatory concerns. It is **persistent in soil and water** and has a high risk of leaching into groundwater, making it both environmentally pervasive and long-lasting WikipediaAERUefsa.onlinelibrary.wiley.com. Notably, it is classified by the European Union as **toxic for reproduction (Category 1B)**, harmful if swallowed, damaging to the liver, and **very toxic to aquatic life** with long-lasting effects, signaling both acute and chronic hazards to ecosystems European Parliament.

Ecotoxicity beyond aquatic organisms is also a concern. Cyproconazole is **highly toxic to birds** and **moderately toxic to mammals, earthworms, aquatic organisms, and honeybees**, raising serious concerns about its impact on biodiversity WikipediaAERU. Further, studies show that cyproconazole, especially in combination with other fungicides like azoxystrobin, can cause **deleterious effects to freshwater fish**, suggesting synergistic environmental risks ScienceDirect.

Regarding human and mammalian health, the EPA classifies Cyproconazole as **"**not likely to be carcinogenic to humans,**"** yet studies have documented **liver effects, thyroid follicular hyperplasia, and histopathological changes**, indicating potential chronic toxicity concerns at certain dose levels Federal RegisterRegulations.gov. Importantly, Cyproconazole also exhibits **endocrine-disrupting properties**, including binding to estrogen receptors, disrupting hormone production, and interfering with steroidogenesis pathways – effects demonstrated across multiple assay types .

PMCPubMedResearchGate.

Lastly, regulatory scrutiny further underscores its problematic nature: while the FDA and EPA have found dietary exposure risks to be within acceptable limits, the **fact that EU approval for Cyproconazole expired in 2021**, combined with its reproductive toxicity classification and environmental hazards, suggests a substantial regulatory pullback WikipediaEuropean Parliament.

In summary: **Cyproconazole's environmental persistence, threat to aquatic and terrestrial species, reproductive and endocrine-disrupting potential, and documented chronic organ toxicity strongly argue against its continued use**.

FENPROPIDIN (340)

Fenpropidin raises substantial concerns across environmental, ecological, and human health domains. It is **extremely toxic to aquatic life**, with both acute (H400) and chronic (H410) hazards documented, posing serious risks to fish and invertebrates even at low environmental concentrations LGC Standards. It is also **moderately toxic to birds, mammals, earthworms, and non-target arthropods**, indicating a broader ecological threat AERU. From a human-health standpoint, fenpropidin is classified as **harmful if swallowed, inhaled, or in contact with skin**, and can cause significant irritation, respiratory distress, allergic skin reactions, and even organ damage through prolonged exposure LGC StandardsAPVMA.

Chronic toxicity studies reveal alarming systemic effects: repeated exposure leads to neurological damage (demyelination and hindlimb paralysis), liver lesions, eye cataracts, and bladder epithelial changes in animal studies, raising serious concerns about long-term safety APVMA. Moreover, developmental and reproductive toxicity has been documented, including skeletal malformations, neurodevelopmental impairments in pups (reduced brain weight, cortical thickness), and reduced sperm counts—all in the absence of maternal toxicity – highlighting unacceptable risks to offspring health Federal Register.

Environmental persistence adds to the worry: fenpropidin is **highly volatile and water-soluble**, is moderately persistent in soils and water, and is prone to drift, increasing the likelihood of unintended contamination AERU. Finally, emerging studies on fish bioaccumulation demonstrate **enantioselective uptake and metabolism**, with certain metabolites showing **greater toxicity than the parent compound**—underscoring the need for continuous monitoring and revealing that environmental and health risk assessments may significantly understate its true hazards PubMedResearchGate.

In short: Fenpropidin's broad ecological toxicity, human health hazards, reproductive and developmental risks, environmental persistence and volatility, drift potential, and emergence of highly toxic metabolites collectively make a compelling case that its use should be **discontinued** or severely restricted until full, transparent safety assessments are completed.

FENPYROXIMATE (193)

Fenpyroximate raises numerous concerns across environmental, ecological, and human health domains, making its continued use highly questionable. This acaricide and insecticide is **extremely toxic to aquatic organisms**, including both acute and chronic effects on fish and invertebrates, as confirmed by EFSA hazard assessments efsa.onlinelibrary.wiley.comAERU. Moreover, it poses **chronic toxicity risks to birds and terrestrial invertebrates**, and may also impair reproductive and developmental processes in mammals AERU.

From a human health perspective, fenpyroximate exhibits **moderate oral and inhalation toxicity**, and is a **skin sensitizer** – capable of causing allergic reactions upon contact Government of Canada Publications. Repeated exposure in animal studies has resulted in symptoms such as diarrhea, torpor, emaciation, slight bradycardia, and decreased body weight, alongside **increased liver weights and hepatocellular necrosis** in female rats Regulations.govFederal Register. Inhalation exposure studies also identified respiratory distress, labored breathing, increased lung weights, and damage to nasal and olfactory tissues Regulations.govFederal Register.

From an environmental fate standpoint, Fenpyroximate has **low aqueous solubility** and is **not typically volatile**, but can be **persistent in soil depending on conditions**, with the potential for **particle-bound transport**, thus posing a risk to ecosystems AERU. While the compound does not readily leach into groundwater, its persistence and transport via soil particles could still lead to environmental contamination.

In **one single paragraph**, Fenpyroximate should be avoided due to its **acute and chronic toxicity to aquatic and terrestrial wildlife**, **moderate human toxicity and sensitizing potential**, **evidence of systemic harm in animals including liver and respiratory damage**, and **environmental persistence that risks soil and ecosystem health**. When safer and more environmentally benign alternatives are available, priority should be given to those rather than continuing use of Fenpyroximate.

FIPRONIL (202)

NHF agrees with Egypt that the MRLs for Fipronil should be lowered, for the following reasons and more:

1. Severe Toxicity to Non-Target Wildlife & Pollinators

- **Bees**: Fipronil is highly toxic to honeybees, with minute doses (LD_{50} ≈ 0.004 µg/bee) causing colony collapse, impaired navigation, and synergistic harm alongside bee pathogens. The EU banned its use on maize and sunflowers after EFSA identified "high acute risk to honeybees."Wikipedia+1

- **Terrestrial Invertebrates & Ecosystems**: In places like Madagascar, the pesticide caused drastic declines in termite populations – species vital for soil health and food chains – leading to downstream effects on insectivorous lizards and mammals. PubMed

2. Ecosystem Damage — Aquatic and Soil Organisms

- **Aquatic Toxicity**: Fipronil poses high mortality risk to fish and aquatic invertebrates, with its more toxic, persistent metabolites (sulfone, desulfinyl) compounding the danger. PubMedNational Pesticide Information CenterWikipedia
- **Soil & Sediment Impact**: It binds to sediments and can bioaccumulate in fish (bioconcentration factors up to 575), raising concerns for food chain contamination. PubMedNational Pesticide Information Center

3. Persistence and Environmental Hazards

- **Long Half-Lives & Toxic Metabolites**: Fipronil breaks down slowly (up to 7 months in soil), and its transformation products may be even more toxic and persistent.PubMedScienceDirect+1

Fipronil is an effective insecticide but its widespread environmental toxicity, persistence, and associated health risks far outweigh the benefits. It's especially harmful to key species like bees, aquatic life, and ecosystem processes. Pet treatments particularly introduce this toxicant into everyday environments, jeopardizing wildlife and human health.

FLORPYRAUXIFEN-BENZYL (341)

F-B has risks to the environment and ecology:

1. **Toxicity to Non-Target Aquatic and Terrestrial Plants:** Florpyrauxifen-benzyl is harmful to non-target aquatic and terrestrial plants. Even minor spray drift can damage sensitive vegetation like soybeans, grapes, and tomatoes. mda.state.mn.usfiles.dnr.state.mn.us
2. **Acute Risk to Aquatic Organisms:** Freshwater fish and invertebrates show *slightly elevated acute toxicity* at exposure levels beyond recommended limits. mda.state.mn.us
3. **Disruption of Soil Microbial Communities:** Repeated application significantly alters the soil bacterial diversity and community structure, potentially impacting soil health and function. ScienceDirect
4. **Environmental Persistence of Degradates**: While the parent compound degrades relatively rapidly, the combined total of toxic residues – including longer-lasting degradates – can persist for extended periods in soil and sediment. outside.vermont.govPMC

There are also human & wildlife health considerations:

1. **Limited Human Toxicity Does Not Preclude Risk**: Although acute toxicity, carcinogenicity, genotoxicity, and reproductive effects appear low or negligible, the focus remains primarily on short-term studies; long-term or cumulative impacts may not be fully assessed. Mass.govfsc.go.jpoutside.vermont.gov
2. **Emerging Evidence of Genotoxicity and Hepatotoxicity in Aquatic Animals:** Studies on Nile tilapia have demonstrated liver toxicity, DNA damage, and oxidative stress in fish, suggesting possible broader environmental toxicity beyond what earlier assessments indicated. Beyond PesticidesBeyond Pesticides

Although florpyrauxifen-benzyl has relatively favorable acute toxicity profiles for humans and some wildlife, key risks remain:

- **Ecological harm to plants and aquatic organisms**
- **Disturbance of soil microbial ecosystems**
- **Potential persistent toxicity of degradates**
- **Emerging evidence of harmful effects in fish**

Given these concerns – especially in sensitive agricultural or aquatic environments – it would be prudent to reassess its use, consider buffer zones or drift reduction strategies, or explore safer alternatives.

FLUAZINAM (306)

Fluazinam is toxic and induces contact dermatitis in some individuals, with symptoms ranging from mildly itchy, papular rash to a painful, weeping, and blistering dermatitis. /12

Moreover, Fluazinam:

• **Is highly toxic to fish and aquatic invertebrates**
Fluazinam poses significant hazards to aquatic life, necessitating strict label restrictions: it must not be applied near water bodies, via aerial sprays, or through irrigation systems, and requires buffer zones of at least 25 feet to protect water sources. mda.state.mn.usUS EPA

• **Binds to sediment and bioconcentrates in fish**
It has a tendency to accumulate in sediments and then bioaccumulate in fish tissue. This raises concerns about food-chain contamination and ecological persistence.Regulations.gov

• **Poses chronic risk to sediment-dwelling and aquatic organisms**
Screening-level assessments indicate fluazinam can pose chronic ecological risks particularly in pore water and sediment environments.Regulations.gov

• **Is Toxic to zebrafish larvae**
Recent studies show that exposure to fluazinam disrupts mitochondrial function in zebrafish larvae, leading to reduced survival rates.ScienceDirect

Although fluazinam is valued as a broad-spectrum fungicide, its notable ecological and health hazards – especially to aquatic environments – and persistent nature make it problematic. Combined with uncertain impacts on plant and soil ecosystems, its continued use raises valid concerns across multiple risk dimensions.

FLUBENDIAMIDE (242)

Flubendiamide is a widely used diamide insecticide, which displays a concerning environmental and regulatory profile that strongly argues against its continued use. The U.S. Environmental Protection Agency (EPA) has formally determined that Flubendiamide causes **unreasonable adverse effects on the environment**, particularly harming **benthic invertebrates** – organisms crucial for aquatic food chains – prompting initiation of a **notice of intent to cancel all registrations** of the chemical. This action reflects the chemical's breakdown into **highly toxic and persistent metabolites** that remain in aquatic ecosystems long after application, amplifying its ecological threat.US EPA+1ACS PublicationsNational Agricultural Law Center

Further environmental fate studies underscore that Flubendiamide is **persistent and potentially mobile**, with a high potential to contaminate both surface and groundwater, raising concerns about its widescale contamination potential. Regulations.govAERU In laboratory studies, Flubendiamide has been shown to disrupt **protein metabolism in freshwater fish** and **enzyme activity in soil ecosystems**, underlining its broader ecological toxicity. PMC

For humans, chronic exposure to flubendiamide has been linked to **liver enlargement and fatty degeneration**, **thyroid alterations**, **kidney pathology**, and **adrenal and offspring developmental effects**, including eye enlargement and delayed sexual maturation in offspring, even when reproductive toxicity was not observed at certain levels. EPA NERL Although immediate human health risks were not the primary driver for regulatory action, these findings raise valid concerns about its long-term safety.

In summary, Flubendiamide's documented **ecotoxicity, especially to aquatic ecosystems**, its well-evidenced **environmental persistence and bioaccumulation**, and its potential for **systemic organ effects in mammals** combine to create a compelling case against its use. Regulatory decisions to cancel its registration further reinforce that it poses unacceptable risks – particularly when safer, more sustainable alternatives are available.

FLUPYRADIFURONE (285)

Flupyradifurone, marketed under the brand name Sivanto, is a systemic insecticide developed by Bayer. While it was introduced as a safer alternative to neonicotinoids, there are several compelling reasons to reconsider its use due to its environmental and ecological impacts.

Ecotoxicity and Environmental Persistence

Flupyradifurone is highly toxic to aquatic invertebrates and has been shown to have lethal effects on solitary bees and lady beetles. Studies have reported that exposure to Flupyradifurone can lead to reduced survival, impaired foraging, and abnormal behaviors in these non-target species. Additionally, its high water solubility and persistence in the environment raise concerns about contamination of water bodies and the potential for bioaccumulation. ScienceDirect+1

Regulatory Concerns

In 2020, French authorities raised concerns about the potential risks of Flupyradifurone to human health and the environment, prompting a review of its approval status. This action underscores the growing apprehension among regulatory bodies regarding the safety of this chemical. PMC

Conclusion

While Flupyradifurone was developed as a safer alternative to neonicotinoids, its significant ecological risks and regulatory scrutiny suggest that its use should be reconsidered. The potential harm to beneficial insect populations and the environment warrants a cautious approach and consideration of alternative pest management strategies.

FOLPET (041)

Folpet (CAS No. 133-07-3) is a phthalimide-based fungicide used to control fungal diseases in various crops. Despite its efficacy, several concerns regarding its safety and environmental impact warrant reconsideration of its use.

Human Health Risks

Folpet has been associated with several health risks. In animal studies, it has caused hyperkeratosis and acanthosis of the skin, particularly in rats, and has been linked to duodenal adenomas and adenocarcinomas in mice. While it is not classified as a mutagen, some studies have shown cytotoxic effects on human bronchial epithelial cells. Additionally, folpet is a known skin sensitizer and irritant, which poses risks to individuals handling the chemical without adequate protective measures. Exposure can lead to allergic reactions, including eczema and photo allergy, especially among agricultural workers.

Environmental and Ecological Concerns

Folpet exhibits high toxicity to aquatic organisms. For instance, the 48-hour LC_{50} for Daphnia magna is 0.60 ppm, indicating significant risks to aquatic invertebrates. It is also toxic to fish, with reported 96-hour LC_{50} values of 185 ppb for rainbow trout and 675 ppb for bluegill sunfish. While it is relatively non-toxic to honeybees, its impact on other beneficial insects and soil organisms remains a concern. Folpet's persistence in the environment, particularly under alkaline conditions, increases the potential for long-term ecological effects.

Regulatory Actions

Folpet has been banned in several countries due to its health and environmental risks. In the European Union, folpet was not re-registered for use as a pesticide, reflecting concerns over its safety profile. Similarly, in the United States, the Environmental Protection Agency (EPA) has conducted risk assessments indicating potential health hazards associated with folpet exposure, leading to restrictions on its use in certain applications.

Conclusion

Given the significant human health risks, environmental toxicity, and regulatory restrictions associated with folpet, its use should be carefully reconsidered. Alternative fungicides with safer profiles and lower environmental impact are recommended to mitigate these concerns.

FOSETYL ALUMINIUM (302)

Fosetyl aluminum (also known as fosetyl-Al or Aliette) is a systemic fungicide used to control oomycete pathogens in various crops. While it is effective in disease management, there are several reasons why its use may be reconsidered.

Fosetyl aluminum is highly soluble in water and can leach into groundwater, especially when heavy rainfall follows application. Although it degrades rapidly in soil to non-toxic components, its potential to leach raises concerns about water contamination. US EPA

Ecotoxicological studies indicate that fosetyl aluminum has low-to-moderate toxicity to most terrestrial and aquatic species. However, it has been shown to have moderate chronic toxicity to birds and moderate acute toxicity to fish. These effects underscore the need for careful management to prevent environmental harm. AERU

In summary, while fosetyl aluminum is effective against certain plant diseases, its environmental persistence, potential for water contamination, ecotoxicity, and possible neurotoxic effects on humans warrant careful consideration of its use.

LAMBDA-CYHALOTHRIN (146)

The symptoms and signs of acute poisoning resulting from exposure to different pyrethroids are similar. Clinical analysis of 573 cases of acute pyrethroid poisoning due to occupational or accidental exposure revealed symptoms including burning, itching, and tingling sensations of the skin, which resolved after several hours. Washing was not an effective treatment. The systemic symptoms included dizziness, headache, nausea, anorexia, and fatigue; vomiting was most common in cases due to ingestion of pyrethroids. Although less frequently reported, tightness of the chest, paresthesia, palpitation, blurred vision, and increased sweating were observed in some cases. Coarse muscular fasciculations were observed in more serious cases. While not likely to be carcinogenic, convulsions and coma can also result from acute poisoning with pyrethroids. /19 More study of this compound is required. It should not be advanced in the 8-Step process.

PHOSMET (103)

Phosmet is an organophosphate insecticide with several significant concerns regarding its safety and environmental impact, leading to its ban in the European Union and increasing scrutiny in other regions.

Human Health Risks

Phosmet is a cholinesterase inhibitor, disrupting nerve function by interfering with acetylcholine breakdown. Acute exposure can lead to symptoms such as nausea, vomiting, abdominal cramps, dizziness, and, in severe cases, convulsions and respiratory failure. The compound has a reported oral LD_{50} of 113–160 mg/kg in rats, indicating moderate toxicity. While it is not classified as a carcinogen, Phosmet has been associated with reproductive toxicity and developmental effects in animal studies. Children are particularly vulnerable, with studies indicating that their health is threatened by current exposures from food, especially from fruits like peaches, apples, and blueberries. EarthjusticeEWG

Environmental and Ecological Concerns

Phosmet is highly toxic to aquatic organisms, including fish and invertebrates, even at low concentrations. It is also highly toxic to honeybees, posing significant risks to pollinator populations. The compound's use has led to concerns about its impact on biodiversity and ecosystem health. Canada.caUS EPA

Regulatory Actions

Due to its health and environmental risks, Phosmet has been banned in the European Union. In the United States, the Environmental Protection Agency (EPA) has identified Phosmet as a pesticide that presents significant risks to human health and has expedited its review to address these concerns. Environmental and Energy Law Program

Conclusion

Given its toxicity to humans and wildlife, persistence in the environment, and regulatory actions taken against its use, Phosmet presents significant risks that outweigh its benefits. Safer and more sustainable alternatives should be considered to protect both human health and the environment.

PROPICONAZOLE (160)

Propiconazole is a fungicide and an endocrine disruptor. It is listed as a possible human carcinogen displaying an increased incidence of benign and malignant liver cell tumors among male laboratory rats and mice. Additionally, it is a skin and gastric mucosa irritant and highly toxic to aquatic species. Propiconazole degrades into triazole compounds, which can then be toxic to terrestrial and avian organisms. /23 This highly toxic compound most definitely should not have any MRLs approved for it by Codex.

PYDIFLUMETOFEN (309)

Pydiflumetofen is a fungicide with moderate toxicity to mammals, 24 aquatic species, invertebrates, and plants, sediment dwelling organisms, and remains currently undetermined as an endocrine disruptor. Further study, however, is necessary.

SPINOSAD (203)

Spinosad is **very highly toxic to bees**, particularly if applied while they're active or before residues dry WikipediaWikipedia. Studies show **100% mortality** in **Africanized honeybee workers** at field-recommended doses, accompanied by severe behavioral and cellular damage. PubMed

Spinosad also exhibits significant toxicity to non-target aquatic insects. In exposure studies on the non-biting midge *Chironomus riparius*, even sub-lethal levels caused oxidative stress and developmental disruption, impeding growth and life cycle progression. PubMed

In rats, high doses caused widespread tissue degeneration – vacuolation, inflammation, and histological damage – in organs including the liver, thyroid, and lymphatic tissues InChemPubMed. Sub-chronic exposure in mice led to biochemical imbalances and neurodegeneration in liver, kidney, and cerebellum SciELO.

Even low doses triggered lysosomal dysfunction, oxidative stress, lipid dysregulation, and neurodegeneration in fruit flies, raising concerns about impacts on beneficial insects at environmental concentrations PMC.

Given these concerns, the use of Spinosad should be **reassessed**, particularly in contexts where beneficial insects, aquatic ecosystems, or human exposure are concerned.

TEBUCONAZOLE (189)

Tebuconazole is identified as an **endocrine disruptor**, with evidence showing **anti-estrogen effects** and interference with hormone biosynthesis, reproduction, and development in aquatic organisms such as zebrafish. It skews sex ratios, suppresses egg production, and alters steroid hormone levels. PubMedMDPIOekotoxzentrum.

A comprehensive review highlights tebuconazole's potential to cause:

- **Developmental toxicity**
- **Genotoxicity**

- **Reproductive toxicity**
- **Mutagenicity**
- **Hepatotoxicity, neurotoxicity, cardiotoxicity, and nephrotoxicity**
  These effects are mediated through mechanisms like oxidative stress, DNA damage, and disruption of gene expression. PubMed

It is **very toxic to aquatic organisms**, including fish, invertebrates, and algae, both in acute and chronic exposures. PAN Europe Moreover, Tebuconazole has **moderate mobility in soils** and is **highly persistent** in both water and sediment ecosystems, leading to prolonged environmental exposure and risk to benthic and aquatic organisms. MDPIRegulations.g

Prolonged or repeated use, especially in turf, tree nuts, and similar applications, poses **chronic risks to birds and small mammals**, even at labeled application rates. US E

The U.S. EPA classifies Tebuconazole as a **Group C possible human carcinogen**, based on increased liver tumors in mice at high doses. Regulations

Despite some regulatory approvals, mounting evidence of **endocrine disruption, ecological harm, environmental persistence, and health concerns** suggests tebuconazole's risks outweigh its benefits. Given safer alternatives exist, its continued use should be **re-evaluated or restricted**, especially in vulnerable ecosystems and human health contexts.

TEBUFENOZIDE (196)

Tebufenozide affects blood chemistry by increasing methemoglobin, which impairs oxygen transport and can lead to hemolytic anemia in mammals. This raises concerns for applicators and those with conditions like sickle-cell disease or thalassemia.US Forest Service Maine Moreover, although not classified as carcinogenic or a birth defect agent, tebufenozide has shown **adverse reproductive effects** in lab studies involving rats, rabbits, and dogs.US Forest And sensitive species such as Lepidoptera (butterflies) and certain earthworms show negative effects even at low application rates (as low as 0.03 lb/acre). US Forest Service.

Tebufenozide's targeted action and favorable mammalian toxicity profile have made it popular in integrated pest management (IPM). However, **human health risks** (especially for those with blood disorders), **harm to sensitive insects**, **low-level aquatic toxicity**, and **ecosystem disruptions** warrant a more precautionary approach. Alternative, truly benign options would better serve both agricultural and environmental sustainability.

TETRANILIPROLE (324)

Tetraniliprole is highly toxic to adult and larval honeybees, as well as adult bumblebees when exposed orally. Foliar and soil applications – especially on blooming crops – pose notable risks to individual bees. This raises serious concerns for pollinator health. mda.state.mn.us It also exhibits **very high toxicity to freshwater invertebrates**, including aquatic species like Daphnia, especially in the benthic (bottom-dwelling) ecosystem. mda.state.mn.us

Tetraniliprole is **moderately persistent**, with soil half-lives ranging from **69 to 144 days (aerobic)** and up to **177 days (anaerobic)**. Degradation in aquatic environments is variable but can be extremely slow, ranging up to **925 days** in some records. The compound is **moderately mobile**, meaning it could leach into groundwater or drift into water bodies.

Although Tetraniliprole is marketed as a lower-risk, selective insecticide, there are still significant concerns:

- **High toxicity to bees and aquatic invertebrates**
- **Persistence** that allows accumulation in soil and water
- **Risk of water contamination via runoff**, especially near sensitive ecosystems
- **Possible carcinogenic potential**

- **Health hazards with limited safety data**

Given these concerns and data gaps, its use should be **approached with extreme caution**, especially in proximity to water, pollinator habitats, or residential areas. Safer alternatives should be evaluated where feasible.

Environmental Inhibitors in Agrifood

Environmental Inhibitors are substances used in agriculture to address perceived imbalances and/or negative environmental impacts caused by conventional farming practices by reducing or halting specific processes, such as the production of greenhouse gases. Specifically, they are focused on mitigating greenhouse emissions and attempting to correct nutrient deficiencies in our depleted soil that have been caused by widespread pesticide use alongside synthetic ammonia- and urea-based and bio-sludge fertilizers.

There are three main categories of environmental inhibitors: Nitrification Inhibitor, Urease Inhibitors, and Methanogenesis Inhibitors, as well as biofertilizers. All three categories are synthetic or synthetic-biology compounds. Biofertilizer is also extremely dangerous, so the Committee should be attentive to it as well.

Nitrogen inhibitors are used to slow the conversion of ammonium to nitrate. These synthetic compounds delay the biological oxidation of ammonium to nitrite and then nitrite to nitrate by targeting soil bacteria. As with pesticides, these compounds disrupt the natural pathways and synthesis of bacteria in the soil microbiome, which can lead to antimicrobial resistance among other concerns. Some nitrogen inhibitors are also classified as pesticides.

Urease inhibitors block the activity of the urease enzyme, which converts urea (a common nitrogen fertilizer form) into ammonia. By inhibiting urease, these compounds aim to prevent the loss of nitrogen as gaseous ammonia through volatilization.

Methanogenesis or methane inhibitors are feed additives used to lower the amount of methane produced by cattle. Ruminants naturally break down the cellulose in grass, their primary diet, using a process called enteric fermentation, which is a biological process whereby beneficial bacteria help break down fibrous plant material. During this process, methane is produced as a byproduct. This natural part of the ruminant's digestive system is ultimately how the animal is able to absorb nutrients from their diet. We know that if the digestive system or microbiome of any living creature is compromised, ill health almost always ensues. And we cannot get healthy humans from unhealthy animals.

An example of a methane inhibitor is the product Rumin 8. This is presented as a natural solution “derived from red seaweed,” but at a commercial level, it is produced using synthetic biology or “GMO 2.0,” where engineered microorganisms can be programmed to use red seaweed hydrolysate as a feedstock to produce the wanted compounds. This substance targets methanotrophs, an important archaea in the microbiome of the cow. If the microbiome of an animal is tampered with, many dysfunctions can occur. The immune function can be altered, nutrient assimilation can decrease, and dysbiotic infections can follow, adding to the ill health of the animals, which in turn will cause a need for antibiotic use. It is not possible to alter the natural function of the body of any living creature without causing long-term ill-effects.

Additionally, in a healthy animal without the environmental inhibitor present, the beneficial microbes break down the cellulose in the plant matter into short-chain fatty acids; but they also play a key role in naturally fixing nitrogen in the soil – one of the issues being addressed by these synthetic substances. This natural process is crucial for soil and plant health and also enhances carbon sequestration. All of which are good for the environment. Pasture-raised, naturally healthy cows actually help capture carbon by stimulating the grass growth with nutrient-rich manure, grazing, and hooves that can aerate the soil.

Genetically Modified or Genetically Engineered Microbes for the soil / Biofertilizer (also biocontrol agents, enhanced fertilizer)

Conventional farming practices used over the last century have caused the once healthy, bountiful, balanced microbiome of the soil to all but disappear. Instead of turning to regenerative farming practices that work WITH nature and help rebuild a healthy microbiome, corporate agricultural interests have decided that copyrightable technology can do a better, more income-producing, job than nature and they have engineered soil microbes. A

glaringly obvious and valid scientific concern here is that the GE or GM microbes may become invasive or disruptive to the natural ecosystems they are introduced to. Their use involves potential risks that must be carefully evaluated and managed. They may be designed to have positive outcomes, but the unintended consequences, such as affecting the metabolic pathways of all life on the Planet, polluting our water, and our food, are of the utmost concern.

These substances are all new, man-made technologies with no long-term use or studies to provide proof of safety or give insight into the possible health implications on both livestock and humans consuming the end products. Widespread usage looks like a large-scale experiment with human, animal, and environmental health as the involuntary guinea pigs. In applying the precautionary principle, we can only presume this will lead to unintended, negative health consequences. Environmental inhibitors show strong evidence that they pose significant risks to human health and the environment by interfering with essential biological processes. While some inhibitors may occur in nature, the versions of these substances used commercially are synthetic compounds released into the environment for agricultural uses that they were never a part of in natural ecosystems. We must not fall prey to GE or synthetic biology solutions simply because they are labeled as "natural," and we must remember that not all things found in nature are healthy and safe for human consumption. The tag line for synthetic biology or biotechnology is "Redesigning Life." What could go wrong with that?

FINAL STATEMENT

In light of the damage from the prolific overuse, barely regulated, and irresponsible use of pesticides and other chemicals and synthetic compounds, the National Health Federation respectfully, but firmly, submits that this Codex Committee on Pesticide Residues (CCPR) has been lacking in solid science. When glyphosate, one of the most heavily accepted and widely applied pesticides on the Planet, is being banned by major retailers and by entire countries, when Bayer has lost one lawsuit after another regarding the carcinogenicity of glyphosate use, Codex must not continue to disregard the major health dangers posed by pesticide use and environmental inhibitors, as well as the clear and present danger of the synergistic effect of such compounds upon human and animal health.

Entire communities are banning not only glyphosate but all synthetic chemicals unless a waiver is obtained due to an "emergency need." 34 If CCPR continues to set maximum residue levels on pesticides that man, animals, and the environment will be exposed to, community leaders simply bypass CCPR's decisions and act responsibly for the Planet and all affected life, and discontinue using killer products. Codex will be proven as completely irrelevant when these actions occur. This is not an outcome that any of us should want, as Codex must remain strong and relevant in world health matters, because Codex performs many useful purposes.

Each of us should support the transition to regenerative farming and building healthy soil through proven, natural (not "natural" synthetic biology) means. Bowing to corporate sponsor demands at Codex is bringing about the destruction of the Earth's biome and the health of us all. Wouldn't it make sense to take a preventative approach, using the precautionary principle, and assume that there is a great chance that these toxic substances, all the "-cides," are a large contributor to the root cause of the global problems that have grown alongside their use? There is more than enough evidence to support this approach.

The Precautionary Principle states: "When an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically."

Committee members, as representatives of your countries, it is your job to represent the population of your country. Their health and well-being, as well as that of the entire Planet, lies in your hands. The National Health Federation retains the position we have stated in the past, that is, that the pesticide MRLs are too high, there have been no studies of cumulative and varied/synergistic pesticide, herbicide, and chemical exposures, and there are limited-to-no studies on the negative health impact of Environmental Inhibitors. Therefore, neither this Committee nor the Codex Alimentarius Commission can propose, with any degree of confidence, any safe level of exposure to pesticide residues. The studies listed in the References below show that any responsible and respectful approach to global health and safety would reject the advancement of the proposed MRLs under consideration at CCPR56.

The National Health Federation respectfully asks this Committee to consider the global nature of decisions made here and to stop acting solely in the interest of corporations and pesticide sponsors intent on just improving their financial bottom line. Instead, NHF asks that this Committee protect and preserve the Planet for the sake of humanity and all life that exists on it.

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