Between the Species

Fishy Reasoning and the Ethics of Eating

ABSTRACT

Ethical vegetarians believe that it is morally wrong to eat meat. Yet, many self-ascribed "ethical vegetarians" continue to eat fish. The question I explore here is this: Can one coherently maintain that it is morally wrong to eat meat, but morally permissible to eat fish? I argue that it is morally inconsistent for ethical vegetarians to eat fish, not on the obvious yet superficial ground that fish flesh is meat, but on the morally substantive ground that fish are sentient intelligent beings capable of experiencing morally significant pain and thus deserve moral consideration equal to that owed birds and mammals.

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> Answer me, machinist, has nature arranged all the means of feeling in this animal, so that it may not feel? has it nerves in order to be impassible? Do not suppose this impertinent contradiction in nature. ~~Voltaire

Ethical vegetarians abstain from eating meat on moral grounds. They believe that it is *morally wrong* to eat meat. Yet, many self-ascribed "ethical vegetarians" continue to eat fish. Indeed, many philosophers and ethicists who regard themselves as "ethical vegetarians" continue to eat fish. The question I wish to explore here is this: Can one coherently maintain that it is morally wrong to eat meat, but morally permissible to eat fish? In what follows, I argue that it is morally inconsistent for ethical vegetarians to eat fish, not on the obvious yet superficial ground that fish flesh is meat, but on the morally substantive ground that fish deserve moral consideration equal to that owed birds and mammals. In particular, I argue that the very reasons that convince ethical vegetarians that it is wrong to eat birds and mammals also entail that it is wrong to eat fish.

My argument proceeds in three steps: In § I, I present a simple, straightforward argument for the immorality of eating meat, based on commonsense moral principles we all share. An argument like the one I present serves as the basis for most ethical vegetarians' belief that eating meat is wrong. In §§ II&III, I argue that the very same argument extends to fish. In short, I show that our shared moral principles entail that it is wrong to eat mammals, birds, *and fish*. Finally, in §IV, I consider a well-intentioned attempt to justify eating fish and show why it fails.

Two caveats are in order. First, my principal reason for presenting the § I argument for the immorality of eating meat is to highlight the sorts of reasons that convince ethical vegetarians that eating meat is wrong. I only provide a cursory defense of that argument here, because I have already defended it at length elsewhere (Engel 2000, 2001, 2012, 2016a, and 2016b) and because my primary target—fish-eating ethical vegetarians—already accept it. My aim is to show that anyone who accepts the § I argument for the immorality of eating meat is committed to the immorality of eating fish, on pain of inconsistency.

Second, ethical arguments are often context-dependent in that they presuppose a specific audience in a certain set of circumstances. Recognizing what that intended audience and context is, and what it is not, can prevent confusions about the scope of the ethical claim being made. My argument is context-dependent in precisely this way. It is not aimed at those relatively few indigenous peoples who, because of the paucity of edible vegetable matter available, must eat fish to survive. Rather, it is directed at people, like us, who live in agriculturally bountiful societies in which a wealth of healthful, nutritionally adequate, plant-based alternatives to fish are readily available. I intend to show that the very same widely-held moral principles that convince ethical vegetarians that eating meat is wrong (when plant-based foods are available) entail that eating fish is wrong (when plant-based foods are available).

I. The Moral Case for Vegetarianism

A. Common Ground

One of the simplest, most straightforward arguments for the immorality of eating meat is based on several widely-accepted commonsense moral principles, principles which you no doubt accept. These commonsense principles are so central to our conception of morality that any moral theory that conflicted with them would be rejected as unsatisfactory on reflective equilibrium grounds. Since any adequate moral view must cohere with these principles, we can appeal to these principles directly when making moral evaluations. The principles are these:

> (P1) It is wrong to harm *sentient*[1] animals *for no good reason*.

> (P2) It is wrong to cause sentient animals to suffer *for no good reason*.

> (P3) It is wrong to kill sentient animals *for no good reason*.[2]

As a convenient shorthand, I use the expression "HASK practice" to refer to any practice that involves **<u>HA</u>**rming or inflicting **<u>S</u>**uffering on or **<u>K</u>**illing sentient animals *for no good reason*. Given this terminology, we can condense (P1) – (P3) into the following single principle:

> (P4) It is wrong to engage in HASK practices.

And finally, just as it is wrong to pay a hitman to kill an annoying neighbor on one's behalf,

> (P5) It is wrong to pay others to engage in HASK practices on one's behalf.

These principles are not in dispute.[3] Even the staunchest defenders of animal use embrace these commonsense principles. For example, Carl Cohen (2001, 46) explicitly endorses (P2) and (P3): "If animals feel pain (and certainly mammals do, though we cannot be sure about insects and worms), *we hu-*

mans surely ought cause no pain to them that cannot be justified. Nor ought we kill them without reason."[4] Elsewhere (2001, 226), Cohen reiterates his commitment to (P2) and (P3): "Our obligations to animals arise not from their rights, I believe, but from the fact that they can feel pain and from the fact that *we*, *as moral agents*, *have a general obligation to avoid imposing needless pain or death*."[5] Similarly, Peter Carruthers acknowledges that sentient animals deserve direct moral consideration when he explicitly endorses (P2):

> Most people hold that it is wrong to cause animals unnecessary suffering. Opinions will differ as to what counts as necessary... But *all will agree that gratuitous suffering—suffering caused for no good reason—is wrong*. (Carruthers 1992, 8)

Thus, even these prominent animal use advocates are on record acknowledging that we owe sentient animals a non-negligible amount of direct moral consideration. How much consideration? At least this much: We cannot harm animals or pay others to harm them, *for no good reason*. We cannot cause them to suffer or pay others to cause them to suffer, *for no good reason*. And we cannot kill them or pay others to kill them, *for no good reason*. If we engage in HASK practices or pay others to engage in HASK practices on our behalf, we are doing something morally wrong. We are failing to accord the animals affected the moral consideration that they are due.

It is important to be clear at the outset about what counts as a *good reason*, in the present context. A *good reason* must be a reason morally weighty enough to justify the behavior in question; it must be morally weighty enough to override the most significant interests of the animal in question. Suppose

I enjoy *the smell* of live kittens being burned to death. That is *a reason* to pour gasoline on a litter of living kittens, light it, and burn the kittens to death, but it is *not* a *good reason*. My relatively trivial interest in experiencing a particular olfactory sensation does not outweigh the kittens' most significant interests in avoiding such suffering and premature death. Burning a kitten to death to enjoy the smell is a HASK practice, and it is clearly wrong for that very reason.

B. The Anti-HASK Argument for Ethical Vegetarianism

Given principles (P1) – (P5), the case for ethical vegetarianism is really quite simple. All one need do is show that meat-producing animal agriculture is inherently a HASK practice. That demonstration can be accomplished in two steps. **Step 1:** Show that meat-producing animal agriculture, by its very nature, inflicts harm, suffering, and death on the animals it converts to meat. **Step 2:** Show that there is no good reason to treat animals in these ways when equally nutritious plant-based food is readily available (which, in modern societies, it almost always is). Formally, the argument runs as follows:

1. All forms of meat-producing animal agriculture are inherently HASK practices.

2. It is wrong both to engage in, and to pay others to engage in, HASK practices (i.e., it is wrong both to engage in, and to pay others to engage in, practices that **HA**rm, inflict **S**uffering on, or **K**ill sentient animals *for no good reason*). [(P1) – (P5)]

3. When one purchases and consumes meat, one is paying others to engage in HASK practices on one's behalf.

Therefore,

4. It is wrong to purchase and consume meat.[6, 7]

Premise 2 is just the conjunction of principles (P1) – (P5), commonsense moral principles we all accept. Premise 3 is also clearly true. When one purchases and consumes meat, one is paying the people who produce meat to engage in the HASK practices required to produce it. Since the anti-HASK argument is valid, the soundness of the argument rests on its *major premise*, premise 1. I now turn to a brief two-step defense of that premise.

Step 1: The Ugly Reality

The process of converting living, breathing, conscious, sentient animals into meat is not a pretty one, and yet, that is precisely the process that all meat-producing farms—from the largest factory farms to the smallest family farms—are engaged in. The process begins by forcibly impregnating female cows, pigs, chickens, turkeys, ducks, emus, and sheep—usually by artificial insemination, but sometimes by tethering and immobilizing the females in open-ended stalls or crates and introducing a "breeder" male who copulates with them repeatedly at will. After the birthing process, the mother is promptly separated from her young, which causes both her and her young a great deal of distress. After being removed from their mothers, the offspring are typically housed intensively in unnatural, inhospitable warehouses or sheds for the duration of their lives. Those animals judged to be growing too slowly are inhumanely killed on site either by neck-wringing (in the case of chickens and turkeys) or by "thumping" (i.e., grabbing piglets by their hind legs, slamming their heads on the concrete floor, and tossing them onto a discard pile). Thumping is not a reliable method of killing piglets, and as a result, "thumped" piglets are often still alive when they are tossed onto the discard pile, where they are left to die slow painful deaths. No attempt is made to stun these unwanted animals before they are killed.

Since the animals cannot move about freely in these overcrowded confinement facilities, they are forced to stand in their own feces and urine. The noxious ammonia fumes from the urine cause painful lung and eye irritation. In these cramped, unsanitary conditions, virtually all of the animals' basic instinctual urges (e.g., to nurse, stretch, move around, root, groom, build nests, rut, establish social orders, select mates, copulate, procreate, and rear offspring) are frustrated, causing boredom and stress in the animals. The inhumane, stressful conditions, in turn, increase aggression and cause other unnatural behaviors including cannibalism. To prevent losses from cannibalism and aggression, the animals are subjected to preemptive mutilations. For example, to prevent chickens and turkeys from pecking each other to death, the birds are "debeaked" using a scalding hot blade that slices through the highly sensitive horn of the beak, leaving painful blisters in the mouth.[8] Other routine mutilations include: dubbing (removal of the combs and wattles of male chickens and turkeys), toe clipping, tail docking, branding, dehorning, ear tagging, ear clipping, teeth pulling, and castration. In the interest of cost efficiency, *all* of these excruciating procedures are performed *without* anesthesia. *Unanesthetized* branding, dehorning, ear tagging, ear clipping, and castration are standard procedures on family farms, as well.[9]

Lives filled with frustration and torment finally culminate, as the animals are inhumanely loaded onto trucks and shipped long distances to slaughterhouses without food or water and without adequate protection from the elements. Once at the slaughterhouse, the animals are hung upside down [Pigs, cattle, and sheep are suspended by one hind leg which often breaks.] and are brought via conveyor to the slaughterer who slits their throats. In many cases (and all kosher cases), the animals are fully conscious throughout the entire throat-slitting ordeal. Undercover video footage documenting all of the above abuses can be found in the following short documentary videos: "Glass Walls" (available at: https://www.youtube.com/watch?v=sTifP6idBPs); "From Farm to Fridge" (available at: https://www.youtube.com/watch?v=fb2Z4RO5xCE); and "What Cody Saw" (available at: http://www.whatcodysaw.com).

The ugly reality is this: There is no practicable way to raise animals for human consumption without harming and killing those animals. Animal agriculture, by its very nature, involves harming animals, causing them to suffer, and killing them.[10]

Step 2: Why There Is No Good Reason to Kill and Eat Animals

I have documented the health benefits of plant-based diets elsewhere (Engel 2000 and 2016a), reporting the results of several well-designed, carefully-controlled studies examining the relationship between diet and disease.[11] I won't reiterate the details of those studies here. Instead, I'll simply report the positions of four highly-respected disseminators of nutritional information. The USDA's *Nutritional Guidelines for Americans* states unequivocally: "Vegetarian diets are consistent with the Dietary Guidelines for Americans and can meet Recommended Dietary Allowances for nutrients" (USDA 1995, 6). The Physicians Committee for Responsible Medicine, a group of over 3000 physicians committed to preventive medicine, recommends centering our diets on the *new* four food groups--whole grains, vegetables, fruits, and legumes--and recommends completely eliminating meat and dairy products, the two principal sources of saturated fat and cholesterol in the American diet (Barnard 1993, 144-147). The Academy of Nutrition and Dietetics [AND]—the national professional organization for Registered Dietitians in the U.S.—is one of the most reputable nutritional organizations in North America. The AND's position statement on vegetarian diets leaves no doubt about the health benefits of plant-based diets:

> It is the position of the Academy of Nutrition and Dietetics that appropriately planned vegetarian, including vegan, diets are healthful, nutritionally adequate, and may provide health benefits for the prevention and treatment of certain diseases. These diets are appropriate for all stages of the life cycle, including pregnancy, lactation, infancy, childhood, adolescence, older adulthood, and for athletes... Vegetarians and vegans are at reduced risk of certain health conditions, including ischemic heart disease, type 2 diabetes, hypertension, certain types of cancer, and obesity. Low intake of saturated fat and high intakes of vegetables, fruits, whole grains, legumes, soy products, nuts, and seeds (all rich in fiber and phytochemicals) are characteristics of vegetarian and vegan diets that produce lower total and low-density lipoprotein cholesterol levels and better serum glucose control. These factors contribute to reduction of chronic disease. (Melina, Craig, and Levin 2016, 1970)[12]

The USDA and U.S. Department of Health and Human Services concur:

> In prospective studies of adults, compared to non-vegetarian eating patterns, vegetarian-style eating patterns have been associated with improved health outcomes—lower levels of obesity, a reduced risk of cardiovascular disease, and lower total mortality. Several clinical trials have documented that vegetarian eating patterns lower blood pressure. (2010, 45)

The evidence is unequivocal: Eating meat is not necessary for human survival or human flourishing. On the contrary, meat consumption promotes a number of chronic degenerative diseases and is *detrimental* to human health and well-being.[13] Consequently, all of the harm, suffering, and death inflicted on farmed animals is *unnecessary*. It serves no significant human interest. Since we can meet all of our nutritional needs with plant-based foods, there is *no good reason* to raise and kill animals for their flesh.[14]

Taken together, steps 1 and 2 show that all forms of meat-producing animal agriculture are HASK practices—they are practices that harm animals, cause them to suffer, and kill them *for no good reason*.[15] Consequently, anyone who accepts (P1) – (P5) is committed to the immorality of eating meat, on pain of inconsistency. When I presented the anti-HASK argument elsewhere (Engel 2000, 2001, 2012, and 2016a), I did so in order to show you that *you* are rationally committed to the immorality of eating meat, given your other beliefs. And while the argument still demonstrates your rational commitment to the immorality of eating meat (since, like the rest of us, you accept (P1) – (P5)), my primary reason for presenting the anti-

HASK argument here is to establish the following **important dialectical point:**

> Self-ascribed *ethical vegetarians* accept the anti-HASK argument presented here; they believe that eating meat is morally wrong because doing so supports practices that inflict harm, suffering, and death on farmed animals *for no good reason*.

II. Extending the Anti-HASK Argument to Fish

I shall now argue that anyone who accepts the anti-HASK argument for ethical vegetarianism is equally committed to the immorality of eating fish. The formal argument exactly parallels the original anti-HASK argument:

1’. All forms of fish production and harvesting are inherently HASK practices.

2. It is wrong both to engage in, and to pay others to engage in, HASK practices (i.e., it is wrong both to engage in, and to pay others to engage in, practices that **HA**rm, inflict **S**uffering on, or **K**ill sentient animals *for no good reason*). [(P1) – (P5)]

3’. When one purchases and consumes fish, one is paying others to engage in HASK practices on one’s behalf.

Therefore,

4. It is wrong to purchase and consume fish.

Once again, the argument turns on its *major premise*, in this case premise 1’. As before, that premise can be defended in two steps. **Step 1':** Show that fish production and harvesting inherently inflicts morally significant harm, suffering, and death on the animals it converts to meat. **Step 2'**: Show that there is no good reason to treat fish in these ways. I will begin with Step 2'.

Step 2': Why There Is No Good Reason to Kill and Eat Fish

As noted above, the Academy of Nutrition and Dietetics's position statement on vegetarian diets clearly notes that well-planned vegan diets "are appropriate for all stages of the life cycle, including during pregnancy, lactation, infancy, childhood, and adolescence" and also notes that "vegans are at reduced risk of certain health conditions, including ischemic heart disease, type 2 diabetes, hypertension, certain types of cancer, and obesity" (Melina, Craig, and Levin 2016, 1970). In short, well-planned vegan diets, totally devoid of all fish and seafood, are heart-healthy, cancer-protective diets that meet all of our nutritional needs. As such, there simply isn't any dietary need to eat fish.

But don't we need to eat fish rich in omega-3 fatty acids for their heart protective benefits?[16] Not according to Dr. William Castelli, Director of the Framingham Heart Study from 1965-1995. He maintains: "The vegetarian societies of the world have the best diet. Within our own country, they outlive the rest of us by at least seven years, and have only 10 or 15 percent of our heart attack rate" (Stapley 1996, 15). Based on his research, Castelli maintains that the most heart healthy diet is a vegan diet. (Stapley 1996, 15)

Myths die hard. So, a bit more about omega-3s. Alpha-linolenic acid (ALA), a short-chain n-3 polyunsaturated fatty acid, is the only *essential* omega-3 fatty acid. ALA is found primarily in plant-based foods, including dark green leafy vegetables, beans, nuts, seeds, and fruits. Walnuts, wheat germ and ground flaxseed are especially good sources. The long-chain omega-3 fatty acids [eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA)] found in fish are not considered essential nutrients because they can be synthesized from ALA (Drake and Higdon, 2012). Simply put, fish consumption is not necessary to ensure adequate intake of omega-3 fatty acids.

Not only that, there are a number of reasons to think that plant-based sources of omega-3s are preferable to fish-based sources. First, both fish and shellfish are high in cholesterol. For example, a three-ounce serving of bass contains 80 mg of cholesterol, the same amount of cholesterol as a three-ounce steak, and the 166 mg of cholesterol in three ounces of shrimp is more than double that found in the steak (PCRM 2009, 2). No plant-based sources of omega-3s contain any cholesterol whatsoever. Second, much of the fat in fish is saturated fat, the kind of fat known to clog our arteries. For example, Chinook salmon derives 52% of its calories from fat, roughly 25% of which is saturated fat (PCRM 2009, 2). Finally, fish consumption is one of the leading sources of heavy metals and other toxins in our diet. Traces of mercury are found in nearly all fish. The Physicians Committee for Responsible Medicine [PCRM] notes that mercury consumption "has been associated with increased blood pressure, irregular and increased heart rate, and increased rates of death from cardiovascular disease in at least 12 scientific studies" (2009, 1). The PCRM also notes that several other pollutants bioaccumulate in fish and shellfish, including polychlorinated biphenyls (PCBs), dioxin, chlordane, DDT, and organochlorine pesticides (2009, 1) and highlights some of the known health risks of these highly toxic substances:

- According to the EPA, PCBs are known carcinogens in some species and probable carcinogens in humans. PCBs also have been shown to disrupt immune function, cause learning disabilities, and disrupt neurological development; they may have endocrine effects as well.

- Dioxins, too, are known carcinogens and have also been shown to cause liver damage, weight loss, skin rashes, and reductions in immune function. They are especially dangerous during fetal development and early childhood.

- Chlordane and DDT, an organochlorine, are pesticides that have been banned from use in the United States. Nonetheless, appreciable levels of these highly toxic chemicals remain in waterways and bioaccumulate in fish. (PCRM 2009, 1)

After carefully weighing the benefits and risks of eating fish, the PCRM concludes:

> Given the clear evidence that fish are commonly contaminated with toxins that have well-known and irreversible damaging effects on children and adults, the consumption of fish should not be encouraged. . . . It is best to avoid the consumption of fish and shellfish. Other, more healthful foods from plant sources offer the full range of essential nutrients without the toxins and other health risks in fish. (2009, 2)

The four-year (2002-2006) Adventist Health Study-2 [AHS-2], involving over 60,000 men and women, is the only comprehensive longitudinal study to systematically compare the health benefits of vegan diets with those of pescetarian diets. AHS-2 found that vegans had a 50% reduced risk of developing type 2 diabetes (compared to non-vegetarians), whereas pescetarians (fish-eating vegetarians) only had a 30% reduced risk of developing type 2 diabetes (compared to non-vegetarians). Only 2.9% of vegans developed diabetes, while 4.8% of pescetarians developed diabetes. (Tonstad, Butler, et al., 2009, 791) The study also found that vegans were leaner and had lower Body Mass Indices [BMIs] than pescetarians. The normal range for BMIs is 18.5-25.0. Those with BMIs of 25.1-30.0 are considered overweight. Those with BMIs over 30 are considered obese. The mean BMI for vegans in the study was 23.6 (normal weight), while the mean BMI for pescetarians was 26.3 (overweight). (Tonstad, Butler, et al. 2009, 791) In addition, the study found that, compared with non-vegetarians, vegans were 75% less likely to be treated for hypertension, whereas pescetarians were only 38% less likely to be treated for hypertension. (Marsh, Zeuschner, et al., 2012) Vegan diets were also found to confer a significantly lower risk for overall cancer incidence in both genders and for female-specific cancers than other dietary patterns. (Tantamango-Bartley, Jaceldo-Siegl, et al., 2012, 286)

In sum, there are compelling reasons to think that 100% plant-based vegan diets are *nutritionally superior* to fish- and seafood-supplemented plant-based diets. That is the conclusion that Dr. Castelli has arrived at after directing the Framingham Heart Study for thirty years. It is also the conclusion that the PCRM has arrived at. And it's the conclusion strongly supported by the findings of the Adventist Health Study-2. But that conclusion is a stronger conclusion than Step 2' requires. All that is required to successfully complete Step 2' is showing that fish consumption is *nutritionally unnecessary*, and to show *that*, all one needs to show is that vegan diets are as nutritionally adequate, heart-healthy, and cancer-protective as fish-supplemented plant-based diets, about which there is no dispute. The Academy of Nutrition and Dietetics, the Dietitians of Canada [See note 12.], the Physicians Committee for Responsible Medicine, Dr. Castelli of the Framingham Heart Study, the USDA, and the U.S. Department of Health and Human Services, all agree that well-planned vegan diets are as nutritionally adequate, heart-healthy, and cancer-protective, as nonvegetarian diets, including pescetarian diets. The evidence is unequivocal: Fish consumption is not an essential part of an optimal diet. There is no nutritional need to eat fish. Since we can easily meet all of our nutritional needs with a plant-based diet totally devoid of fish, nutrition does not give us a good reason to eat fish.

What about taste? Enjoying the taste of fish is *a reason* to catch and kill a fish, but it is *<u>not</u> a good reason*. Just as my trivial interest in experiencing a particular olfactory sensation (the aroma of live kittens burning to death) does not outweigh the kittens' most significant interests in avoiding such suffering and premature death, my equally trivial interest in experiencing a particular gustatory sensation (the taste of fried trout) does not outweigh the trout's most significant interests in avoiding a painful premature death and, thus, does not justify catching and killing the trout. There is no *good* reason to eat fish.

Step 1': But can fish feel?

If fish aren't conscious sentient beings, then they can't feel pain, they can't suffer, they can't be harmed in morally significant ways, and their deaths are no more morally significant than the deaths of plants. So, to show that fish production and harvesting inflicts morally significant harm, suffering, and death on the animals it converts to meat, the first thing that one must do is show that fish are conscious sentient beings. That is the burden of § III. The second thing one must do is show that the process of fish production and harvesting, by its very nature, inflicts harm, suffering, and death on the fish it converts to meat. That is the task of § IV.

III. The Cumulative Case for Fish Sentience, Consciousness, and Intelligence[17]

A. Anatomical and Neurophysiological Evidence of Pain Perception in Fish

To determine whether fish possess the basic "hardware" needed to experience pain, Victoria Braithwaite and Mike Gentle looked at cross-sections of all three branches (i.e., the mandibular, maxillary, and ophthalmic branches) of the trigeminal facial nerve of trout[18] and found both myelinated A-delta fibres (responsible for acute *protective pain* in humans) and unmyelinated C fibres (responsible for *restorative pain* in humans), though trout have a significantly higher percentage of A-delta fibres than humans. (Braithwaite 2010, 52-55) Braithwaite and Gentle also identified 58 different receptors scattered over the face and snout of trout and demonstrated that 22 of these receptors were nociceptors. (Braithwaite 2010, 56-58) To isolate the receptors, Braithwaite and Gentle deeply anesthetized the trout involved in the experiment. Although the fish were unconscious, their nervous system was still functioning. Braithwaite and Gentle then carefully removed the skin and bone of the brain case from the head of the trout. The cerebellum and olfactory and optic lobes of the brain were removed to expose the trigeminal ganglion. They then applied a glass probe to various parts of the fish's face. When the probe touched a receptor, an electrical signal was detected in the ganglion. After detecting 58 receptors in this fashion, they tested the receptors with three kinds of noxious stimuli (touch, heat, and chemical) to see whether they were nociceptors. To measure sensitivity to touch, they applied von Frey filaments, fine hair-like metal strands with a controlled amount of force. They measured sensitivity to temperature by shining a narrowly focused quartz light that could be heated to specific temperatures. They investigated the receptors' sensitivity to a noxious chemical by applying drops of vinegar to the receptors. To ensure that the receptors weren't triggered by the mechanical action of dropping the vinegar on the receptors, they dropped similar sized drops of water on the receptors, as a control. In this manner, they identified 22 nociceptors, some of which responded to all three forms of noxious stimuli, others of which were more specialized, only responding to two of the forms of noxious stimuli. (Braithwaite 2010, 56-58)

Braithwaite's and Gentle's research clearly demonstrates that fish have the nociceptors and afferent nerves required for pain perception. To determine whether the pain signals from these nociceptors actually make their way to the fishes' brains, Rebecca Dunlap and Peter Laming conducted experiments in which they removed a small portion of the skulls of goldfish and trout so that recording electrodes could be implanted in different regions of these fishes' brains. They then applied a repetitive pin-prod stimulus to the skin just behind the gill cover to measure nociceptive responses. Recordings were taken from the spinal cord, cerebellum, tectum, and telencephalon (or forebrain). They describe their findings as follows:

> Neuronal responses were elicited in all these regions of the central nervous system in both species of fish

> during brush (mechanoceptive) and pin-prod (nociceptive) stimuli... Mechanoreceptive and nociceptive neuronal responses to various stimuli were elicited in all regions, and responses were detected as far as the telencephalon in both species... The accurate setting of timed prods allowed the latency of the response to be calculated in all regions. From these data, conduction velocities suggested that A delta and C fibers were activated;... This study has shown that there is neuronal activity in all brain areas including the telencephalon, suggesting a nociceptive pathway from the periphery to the higher central nervous system of fish. (Dunlap and Laming 2005, 561)

In mammals, the amygdala and hippocampus are critical areas of the limbic system. The former is linked with emotional states like fear; the latter is associated with learning and memory, determining the timing and sequence of events, and spatial learning. (Braithwaite 2010, 99) In fish brains, the amygdala and hippocampus are located in the telencephalon. When Cosme Salas and Fernando Rodruíguez, researchers at the University of Seville, surgically lesioned different portions of fish forebrains, they found that damage to the amygdala region of fish forebrains made it difficult for the fish to learn how to avoid something painful like an electric shock, while lesions to the hippocampus rendered the fish incapable of swimming through a maze that they could easily navigate before the surgery. According to Braithwaite, "The effects of the lesions were extremely specific; fish without a functioning hippocampus could still learn to avoid shocks, and fish with the amygdala lesioned could still solve maze tasks. So, the lesioning didn't impair learning by itself, but rather a specific form of learning" (2010, 101). On the basis of this research, Braithwaite concludes:

> So developmentally and functionally there is evidence of a limbic-like area in the fish forebrain. Allied with this area there is also evidence of dopaminergic connections within the fish forebrain. Dopaminergic systems play a crucial role in reward learning and in mammals they are associated with positive and negative states of mind that form the basis of emotions. (2010, 101)

These studies show that fish possess both the anatomy and the neurophysiology needed to perceive pain. In addition to this physiological evidence, there is ample behavioral evidence that fish feel pain.

B. Behavioral Evidence of Pain Perception in Fish

We know that, in humans, painful noxious stimuli inhibit hunger and cause increased respiration and heart rates. To determine whether noxious stimuli affect fish in the same way, Braithwaite and Gentle injected two groups of trout with a noxious stimulus. Trout in the first group had bee venom injected in the skin just under their mouths. Trout in the second group were injected with vinegar in the same place. There were also two control groups. Trout in the first control group were simply handled (which itself is stressful for fish); trout in the second control group were injected with a mild saline solution in the skin just under their mouths. All four groups of fish showed increased gill beat rates. The two control groups had an increased gill beat rate of 70 (compared to a normal gill beat rate of 50), but the fish that received the noxious stimuli were much more distressed and had gill beat rates of 90. Some of the trout injected with vinegar rubbed their snouts on the aquarium's glass walls or rocky bottom. Within 80 minutes, the gill beat rate of the trout in the two control groups returned to normal, and they began showing interest in food. The gill beat rate of the trout in the two noxious stimuli groups remained elevated above 70 beats per minute for 3.5 hours, after which it returned to normal and the fish in these two groups started to show interest in food again. (Braithwaite 2010, 58-64)

Braithwaite and Gentle have identified the following additional behavioral evidence of pain perception in trout. Trout are wary of new objects (neophobic) and show strong avoidance behavior when a new object is introduced into their tanks. When given a benign saline injection in their mouths, trout continued to manifest strong new-object-avoidance behavior. However, trout injected with vinegar stayed close to the newly introduced block tower, which suggested to Braithwaite that the fish were distracted by the pain from the vinegar injection. (Braithwaite 2010, 67-68) To test her pain-distraction hypothesis, Braithwaite repeated the entire experiment as before, only in addition to the vinegar and saline injections, all of the fish received small doses of morphine. As predicted, the vinegar-treated fish that had received morphine showed normal new-object-avoidance behavior. (Braithwaite 2010, 69)

Russian researchers Lilia Chervova and Dmitii Lapshin have found that nociceptors are widely distributed across the entire body surface (including fins) of trout, cod, carp, and sturgeon. (2004, 1420) To test the effects of analgesics on these four types of fish, Chervova and Lapshin semirigidly fixed the fish in a flow chamber and implanted a shock-administering electrode in the caudal fin blade (in a manner that excluded direct stimulation of muscle fibers). When painful bursts of electric current were administered to these fishes' caudal fins, the fish responded with a violent jerk of their tails. Chervova and Lapshin then administered various opioid and nonopioid analgesics to the fish to determine whether these substances would reduce the nociceptive response in the fish (based on measuring the degree of tail flicking). Among their findings:

- In cod: sydnophenum injected peritoneally decreased pain sensitivity by 15-89%; local subcutaneous injections of 2% solution of novocainum blocked the nociceptive reactions, and intranasal administration of 2.5-12.5 mg/kg of beta-casomorphine decreased pain sensitivity by 15-37% (depending on dose). (Chervova and Lapshin 2004, 1422)

- In rainbow trout: intranasal administration of 0.20-0.75 mg/kg of the mu opioid agent dermorphine caused a dose-dependent decrease in the pain sensitivity by 12-55%. The analgesic effect was usually observed within ten minutes after administration and lasted for at least one hour. (Chervova and Lapshin 2004, 1422)

- In carp: nociceptive thresholds significantly increased following the intramuscular injection of agonists of mu, delta, and kappa opioid receptors—tramadol 10-100 nmol/g, DADLE 10-50 nmol/g, and U-50488 30-80 nmol/g, respectively. Five to fifteen minutes after the administration of tramadol, changes in fish sensitivity to painful stimuli were observed. The analgetic effect was dose-dependent; the higher the dose, the more quickly it acted. The lack of responses to increasing pain could not be blamed on tramadol immobilizing the fish, because the same fish placed into an aquarium showed normal swimming and behavior. Tramadol had no analgetic effect if naloxone, an antagonist of opioid receptors, was administered before. (Chervova and Lapshin 2004, 1422)

- Sturgeon were found to experience nociception as well as bony fishes. They reacted to the painful electrical stimuli with the same behavior – a jerk of the tail. Their nociceptive thresholds were comparable to that of carp. Their pattern of response after administration of a 100 nmol/g tramadol solution was the same as that of carp. (Chervova and Lapshin 2004, 1423)

Chervova and Lapshin's research shows that trout, cod, carp, and sturgeon have both opioid and nonopioid antinociceptive systems—endogenous pain control mechanisms—that work similar to the ones found in humans. As Chervova and Lapshin put it:

> Our results indicate that, like higher vertebrates, fish also develop a prolonged analgesia in response to agonists of the opioid mu receptors. Hence, fish have an antinociceptive system consisting of the opioid receptors similar to those in terrestrial vertebrates. . . . The decrease in pain sensitivity under the action of nonopioid preparations analginum and sidnophenum as well as analgesy caused by stress, illustrates the presence in fishes of other endogenous analgesic systems in addition to the opioid system. (2004, 1424)

Here we can appropriately echo Voltaire: Has nature outfitted organisms incapable of experiencing pain with endogenous pain-control mechanisms? "Don't suppose this impertinent contradiction in nature" (Voltaire 1989, 21).

The cumulative anatomical, neurophysiological, and behavioral evidence for pain perception in fish leaves little doubt that fish are conscious sentient beings that can and do feel pain in response to a noxious stimulus or injury. Not only are they sentient, it also turns out, as we shall now see, that fish are far more intelligent than typically thought.

C. Reasoning Fish and Fish Cognition

1. Spatial Learning and Long-Term Memory

Frillfin gobies live in coastal areas. When the waters recede at low tide, these fish become "trapped" in discontiguous rock pools. When frillfin gobies are threatened by a hungry sea bird (or a crazed scientist prodding them with a stick), they will jump with remarkable accuracy to an adjacent pool (which, of course, they cannot see from the vantage point of their current rock pool). If the threat persists, they will jump from pool to pool until they reach open water. When Lester Aronson first observed this behavior in 1949, he theorized that: "these gobies swim over the tide pools at high tide and acquire an effective memory of the general features of the topography of a limited area around the home pool which they are able to utilize when locked in their pools at low tide" (1951, 22). To test his hypothesis, he transferred gobies to unfamiliar pools and threatened them with a stick. The transplanted gobies "never jumped even when prodded until they were so exhausted that they could be easily picked out of the water by hand" (Aronson 1951, 18). They didn't jump because they didn't know where to jump.

In a separate experiment, Aronson used a simulated tidal situation to determine how long it takes frillfin gobies to map the topography of a new environment. He found that these fish need as little as one experience at high tide to generate an accurate 3-D map of the local topography that provides them with the ability to plan safe escape routes. (Braithwaite 2010, 88-9) Other studies have shown that frillfin gobies are able to "return to their home pool even after being displaced by 30 m" (Brown 2015, 9) and that "even after being removed from their home pools for 40 days, the fish could still remember the location of the surrounding pools" (Brown 2015, 9).

2. Memory, Fish Recognition, and Transitive Inference

Logan Grosenick, Tricia Clement, and Russell Fernald have demonstrated that Siamese fighting fish (*Astatotilapia burtoni*) are able to recognize the winners and losers of fights they have witnessed and that they make transitive inferences when inferring dominance hierarchies among rival male fighting fish. For eleven days, they had eight bystander males (located in centrally placed aquaria) observe other male fighting fish fight each other in peripherally located aquaria. Each bystander fish saw staged fights between five size-matched males (A to E, where each letter stands for a different rival male). The fights were rigged so that every day the bystander males observed A beat B, B beat C, C beat D, and D beat E.[19] Grosenick then the put the bystander males in the middle of A and E (in effect forcing the bystanders to fight). The bystanders immediately swam toward E. That result could be explained as follows. In the rigged fights, A never lost and E never won. So, it is possible that the bystanders were just swimming toward the fish they tagged "loser". Perhaps, but that simple hypothesis can't explain their next result. When placed between B and D, the bystanders immediately engaged D, suggesting that they judged D to be the weaker fish. Since the bystanders had seen each of these two fish (i.e., B and D) win one fight and lose one fight (each day), they couldn't simply be tagging one of them "loser". The most plausible explanation for why these bystander males consistently judged D to be weaker than B is that they reasoned transitively *from* D is weaker than C and C is weaker than B *to* D is weaker than B. (Grosenick, Clement, et al. 2007) Grosenick's experiment provides compelling evidence that Siamese fighting fish have extended memory, reliable fish recognition capability, and the ability to make transitive inferences.

3. Temporal Awareness

Can fish tell time? Apparently. Culum Brown explains one way of measuring *time-place learning* in fish:

> A typical approach is to feed the fish at one end of an aquarium in the evening and the other end in the morning. Each day the location of the fish is recorded just prior to feeding. If the fish show anticipatory behavior by congregating at the feeding end, then they have learnt the task. Poeciliids and galaxiids can learn this task in around two weeks... By comparison, rats take about 19 days to learn this task. (2015, 8)

Phil Gee, a psychologist at the University of Plymouth in England, and his colleagues carried out an experiment that demonstrated operant temporal discrimination learning in goldfish. In stage 1, the goldfish (housed in separate aquaria) were taught to press a lever to release food, and the behavior was reinforced (i.e., food was released) every time the lever was pressed. In stage 2, the feeding time was gradually restricted to one hour per day [2:00 PM to 3:00 PM for some of the goldfish; and 2:00 AM to 3:00 AM for other goldfish]. During stage 1, the goldfish pressed the lever in their respective tanks at a fairly consistent rate of 3-5 presses per 15-minute interval throughout each 24-hour period. However, by the end of stage 2 when a stable pattern of responding had been reached, Gee and his colleagues report:

> a typical daily record showed a level of responding [lever-pressing] that was close to zero until between 4 and 6 hr before food became available. Once responding [lever-pressing] had begun, the rate accelerated almost linearly with time until it reached a level of approximately 40 responses per 15 min immediately prior to feeding. During the hour of food availability, the rate of response dropped to around 10 presses per minute [presumably because the goldfish were spending time eating], and then dropped back to zero within an hour of the end of the feeding period. (Gee, Stephenson, and Wright 1994, 5-6).

Without some ability to process time, it's unclear how the fish could have managed to reliably anticipate when to press the levers at the appropriate times.

4. Social Intelligence, Cooperation, and Reconciliation

Fish are capable of entering into complex cooperative relationships with fish of other species. One such example is that of cleaner wrasses and their "clients." Brown describes their cooperative relationship as follows:

> Cleaner wrasse occupy cleaning stations on coral outcrops and remove parasites and dead skin from the surface of client fish. They have a large number of regular

> customers, and they recognise them all individually. The clients present themselves and perform a "clean me" stance which signals to the cleaner that they require a good service. Of course there are many stations a client can potentially visit so it is very important that the cleaner does a good job to keep up its reputation. If the cleaner should accidentally bite the client, then the client will rapidly swim away. But the cleaner has a mode of reconciliation; they chase after the distraught client and give them a back rub, thus enticing them to come again. (2015, 11)

In this win-win cooperative arrangement, the wrasses get a meal, and the clients get exfoliated.

Another example is that of the cooperative hunting relationship that exists between groupers and moray eels. When a grouper chases a prey fish into a coral reef crevice, the grouper can wait and hope that the fish comes out, but has no guarantee that the fish will come out the same way. What's a hungry grouper to do? Not wanting to wait, the grouper seeks out a moray eel for assistance. After finding an eel, the grouper signals the eel by vigorous headshaking and making a series of vertical movements. At this point, the eel can ignore the signal, but often the two fish swim off together with the grouper leading the way. The grouper takes the eel to the part of the coral reef where the prey fish was last seen, sometimes even "pointing" by standing on its head and putting its snout in the hole where it wants the eel to go in. Roughly half the time the eel gets the prey fish. The other half of the time, the fish emerges and the grouper quickly snatches its meal. Such cooperative hunting requires the ability to communicate and convey intentions. (Braithwaite 2010, 106-112)

Interim Conclusion

When it comes to birds and mammals, there is growing consensus that, because birds and mammals are conscious sentient intelligent beings, they deserve direct moral consideration. The research highlighted in the present section makes it equally clear that fish are conscious, sentient, cognitively sophisticated, intelligent beings, who, like birds and mammals, deserve direct moral consideration. As such, it is wrong to harm them, cause them to suffer, or kill them *without good reason*.

IV. Fishy Reasoning

I now turn from reasoning fish to the fishy reasoning some people use to justify killing and eating fish.

A. The StarKist Tuna Defense

Years ago, the StarKist Company ran a series of cartoon commercials featuring Charlie the Tuna. The commercials depicted Charlie as a Beatnik who wore a beret and coke bottle glasses and who had impeccably good taste (He played the harp, created paintings, hobnobbed with celebrity sharks, etc.). For some reason, Charlie wanted to be caught and killed by StarKist so that his flesh could be stuffed into cans for humans to eat. In an ironic twist, Charlie wasn't good enough for StarKist. The commercials would end with a despondent Charlie as he read the lowered sign "Sorry Charlie" and heard the voiceover "StarKist doesn't want tunas with good taste, it wants tunas that taste good." What the commercials somehow managed to convey is that StarKist would have been doing Charlie *a favor* by killing him and packing him in a can.

Some well-intentioned people attempt to justify the killing and eating of fish on similar grounds. They reason as follows: "Fish experience quicker, less painful deaths at our hands than they would otherwise experience in the wild. So, we're actually doing them *a favor* by killing and eating them!" I call this the "StarKist Tuna Defense." One famous proponent of this defense is Jeremy Bentham, who argued as follows:

> If the being eaten were all, there is very good reason why we should be suffered to eat such of them as we like to eat: we are the better for it, and they are never the worse…. The death they suffer in our hands commonly is, and always may be, a speedier, and by that means a less painful one, than that which would await them in the inevitable course of nature. (Bentham 1988, 311 [Sec. XVII, n. 1])

B. How We Catch and Kill Fish

The biggest and most devastating problem with the StarKist Tuna Defense is this: There's no good reason to think that fish die quicker, less painful, less traumatic deaths at our hands than they would typically die in the wild. Consider some of the ways we catch and kill fish.

1. Long-Line Fishing

Long-line fishing is used to catch tuna, swordfish, and mahi-mahi. Hundreds of lengths of fishing line ten meters long rigged with floats and hundreds of baited hooks are left for several hours at a specific depth. When fish take the bait, barbed hooks get imbedded in the highly sensitive nociceptor-lined tissue of their throats and mouths. Braithwaite describes the fate of hooked fish as follows: "Once hooked, depending on the number of lines set, the fish may have up to 10 hours to wait before the lines are collected. Many fish are exhausted from trying to escape, but they are still alive as they are hauled onto the deck of the fishing vessel and then left to suffocate in the air" (2010, 175). Hardly a quick painless death. The baited long lines are indiscriminate about what they catch and often end up catching non-target species, which the industry euphemistically refers to as "by-catch" – the fishing industry's own form of collateral damage. Braithwaite highlights a common example: "the squid-baited hooks also attract sea birds such as albatross who themselves then become caught on the hooks and drown. Hundreds of thousands of birds have died this way and four species of albatross are perilously close to extinction" (2010, 175).

2. Deep Long-Line Fishing

Deep-water long-line fishing uses a similar technique, only the lines are weighted to operate at the sea floor—sometimes hundreds of meters deep—and have many more hooks attached. As with shallow long-line fishing, hooked fish often must wait hours before being hauled to the surface to suffocate on the decks of the fishing vessels. In addition, turtles, dolphins, and whales get caught on the lines and drown. More by-catch. (Braithwaite 2010, 176)

3. Trawling

Large nets with a wide opening that funnels down to a closed end section are hauled through the water at different depths indiscriminately catching everything in their path. The fish swim to the point of exhaustion trying to out swim the nets. When the nets are finally hauled in and pulled out of the water, those fish at the bottom of the net are crushed to death by the weight of the fish above them. The rest of the fish are dumped on the deck of the vessel where they frantically flap about until they suffocate. When deep-water trawling nets are used, the fish also experience barometric trauma from the rapid decrease in pressure. Fish have swim bladders that allow them to maintain and control buoyancy. The rapid change in barometric pressure damages their swim bladders. Braithwaite describes the results: “Without time to adjust to the decreasing pressure, the gas-filled swim bladder typically becomes overinflated, causing huge distention inside the fish. Sometimes the pressure is so great that their stomach and intestines are pushed out of their mouth and anus. Eyes can also become distorted and bulge out” (Braithwaite, 2010, 177).

As with long-line fishing, non-targeted fish get caught in the trawling nets along with the desired fish. According to Jeffrey Masson, this unintended by-catch is:

> calculated to be one quarter of the global fish catch. Included are thousands of crabs, starfish, juvenile cod, sharks, and hundreds of other “unwanted” sea creatures, as well as many rare species. They are dumped back into the ocean, dead. The long lines also take and kill marine mammals, birds, and sea turtles. Purse seine nets catch dolphin, who die horribly of asphyxiation. . . . For every 3 tons of fish processed, 1 ton or more of other sea animals are killed. (Masson 2009, 114-5).

4. Aquaculture

Nearly half of all the fish consumed today are raised in land-based or net-enclosed ocean-based aquafarms, where the fish spend their entire lives in cramped, filthy enclosures and where many suffer from parasitic infections, diseases, and debilitating injuries. Drugs and genetic engineering are used to accelerate growth. Smaller fish, prevented from swimming away by the enclosure nets, are bullied and often killed by larger fish. To reduce such killing, the fish are sorted by being force to swim through a series of grates. The smaller fish slip through the smaller grates. This "grading" process is itself very stressful on the fish and causes them to get scraped and lose scales. Conditions are so abysmal that anywhere from 25-50 percent of the fish die before the aqua-farmer is ready to slaughter them.[20] There are no regulations that require the humane treatment of fish, and as a result, slaughter techniques vary. Common slaughter techniques include:

a. Head Bashing

Large fish, like Salmon, are sometimes bashed on the head with specialized bats called "priests." Since head-bashing isn't an exact science, many of the fish are seriously injured but not killed by the blow, and as a result, remain fully conscious, as their gills are slit with knives so that they can bleed out.

b. Suffocation

In the case of smaller fish, like trout, the ponds are often simply drained. The fish are then either left to suffocate or they are packed in ice while they are still conscious (ice-packing slows their metabolism and actually prolongs the time it takes for them to die).

c. Carbon Dioxide Poisoning

Yet another method of killing farmed fish involves transferring the fish from their enclosures to tanks filled with CO_2-

saturated water. After being rendered motionless by the CO2 gas, the fish are removed from the tank, their gills are slit with a knife, and they are left to bleed out before they are taken to the processing tables. Once thought to be a humane method of fish slaughter, Braithwaite tells a different story:

> As the fish enter the CO2-saturated water, their environment suddenly becomes very acidic, which irritates softer tissues such as the gills. The stress of the rapid change in environment often causes the fish to become very agitated and to excrete ammonia, further affecting the quality of the water within the tank. The fish struggle for several minutes before they become immobile from exhaustion and lack of oxygen. There is actually no evidence that the fish are anaesthetized at this stage—so they are not unconscious when their gills are cut. The ice they are then packed into chills them, but because these animals are cold blooded, their metabolism simply slows, thus prolonging the time it takes them to die. (2010, 181)

d. Desiccation

Masson describes the standard method of killing farmed eels as follows:

> The primary method in industry is to bathe them in dry salt, which gradually penetrates and desiccates their bodies. It is very hard to kill an eel. So by the time they are ready to be "gutted," most of them are still alive. Even after they are actually gutted, "a significant proportion is still alive after 30 minutes," according to industry accounts. During that time they make strenuous efforts to escape. (2009, 118)

All of these methods of catching and killing fish cause them protracted, intense pain and suffering. The deaths they experience at our hands are horrific. There is no good reason to think that the deaths these fish would otherwise experience in the wild are worse than the slow, agonizing deaths they experience at our hands. There is no doubt that fish production and harvesting inflicts morally significant harm, suffering, and death on the fish it needlessly converts to meat.[21]

V. Conclusion

Fish are conscious, sentient, intelligent creatures that can feel pain and can suffer. They do not experience quick and painless deaths at our hands. Quite the contrary, they typically experience painful, protracted, horrific deaths at our hands. Since we can easily meet all of our nutritional needs without consuming fish, there is no good reason for us to harm fish, cause them to suffer, or kill them for food. Consequently, the anti-HASK argument entails that eating fish is morally wrong. So, those who accept the anti-HASK argument for the immorality of eating meat are equally committed to the immorality of eating fish. Since ethical vegetarians do think that it is wrong to engage in or support HASK practices (i.e., practices that inflict harm, suffering, and death on conscious sentient beings *for no good reason*), they are committed to the immorality of eating fish.

While the argument presented here has been directed primarily at fish-eating ethical vegetarians, it should be clear that it applies with equal force to anyone who accepts (P1) – (P5). Those who think that it's wrong to engage in, or pay others to engage in, practices that inflict harm, suffering, or death on conscious sentient beings *for no good reason* are committed to the immorality of eating cows, pigs, chickens, turkeys, ducks, emus, sheep, *and fish*, and should alter their diets accordingly.[22]

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Endnotes

1 A *sentient* being is any being capable of feeling pain and/or experiencing pleasure.

2 We also accept the following related principles:

> (P1*) It is wrong to harm sentient animals *unnecessarily.*
>
> (P2*) It is wrong to cause sentient animals to suffer *unnecessarily.*
>
> (P3*) It is wrong to kill sentient animals *unnecessarily.*
>
> (P4*) It is wrong to engage in practices that harm or inflict suffering on or kill sentient animals *unnecessarily.*
>
> (P5*) It is wrong to pay others to engage in practices that harm or inflict suffering on or kill sentient animals *unnecessarily.*

Strictly speaking, (P1*) – (P5*) are not equivalent to (P1) – (P5), respectively, because there might be a good reason to perform a certain action that strictly speaking isn't *necessary* for some significant human benefit. Suppose both *X* and *Y* are equally effective means to achieving some important end *E*. Then, strictly speaking, performing *X* is *not necessary* to bring about *E*, since we might perform *Y* instead. Still, if performing *X* costs considerably less than performing *Y*, we might have a *good reason* to perform *X* to bring about *E*. Conversely, the fact performing an action *A* is *necessary* for bringing about a certain valuable end *E* doesn't always give us a good reason to perform *A*. Suppose the only way I can save my son's life is to kill you and harvest your heart and lungs, e.g., suppose you are the only tissue match. In the scenario just imagined, killing you is *necessary* to save my son's life, but that doesn't give me a good reason to kill you. I still would not be justified in killing you. Even though *necessity* and *having good reasons* can pull apart in these ways, they typically go hand-in-hand. Typically, when performing an action is necessary for bringing about a significant human benefit that will give us a good reason to perform it; and more importantly for present purposes, typically, when there is no good reason to perform an action, performing that action will not be necessary for some significant human benefit. Accordingly, I will treat (P1*) – (P5*) as roughly equivalent to (P1) – (P5), respectively, because nothing in the present paper will turn on the subtle sorts of situations where *necessity* and *the having of good reasons* pull apart.

3 As I have already noted, these principles are central to our understanding of morality. Together they specify an important part of the underived conceptual role of the concept of *moral wrongness*. By way of illustration, consider the following much discussed example from Gilbert Harman: "If you round the corner and see a group of young hoodlums pour gasoline on a cat and ignite it, you do not need to *conclude* that what they are doing is wrong; you do not need to figure anything out; you can *see* that it is wrong" (Harman 1977, 4). Harman offered the example to show that some moral judgments are direct, as opposed to inferential. What is relevant about Harman's example for present purposes is this: No one seriously doubts that burning a cat to death for no good reason is wrong. Treating a cat in such a way causes the cat harm, suffering, and death for no good reason, and we all judge such conduct to be immoral. For a more recent non-fictional example, consider the public outrage that erupted when it was revealed that professional football player Michael Vick was guilty of sponsoring dog-fighting rings in which pit-bulls were forced to fight to the death. As

with Harman's cat, we are outraged that someone would cause these dogs such harm, suffering, and death for no good reason, and we view those people who would engage in, or pay others to engage in, such conduct as morally deficient and/or depraved. These examples illustrate that principles (P1) – (P5) are partially constitutive of the very concept of *moral wrongness*, and they confirm that no one seriously doubts (P1) – (P5).

4 To see Cohen's commitment to (P2) here, we need only recognize that justification proceeds in terms of reasons. We are justified in causing an animal pain if and only if we have a good reason for doing so. If there is no good reason to cause an animal pain, then causing that animal pain cannot be justified.

5 Here, strictly speaking, Cohen commits himself to (P2*) and (P3*). See endnote 2 for details.

6 Remember the context-sensitivity qualification I stressed in the introduction. I am only arguing that eating meat is wrong when equally nutritious plant-based food is readily available (which, in modern societies, it almost always is). The anti-HASK argument could be formulated cumbersomely to make this qualification explicit:

1. Meat-producing animal agriculture is inherently a HASK practice whenever equally nutritious plant-based food is readily available.

2. It is wrong to engage in, or pay others to engage in, HASK practices (i.e., it is wrong to engage in, or pay others to engage in, practices that inflict harm, suffering, or death on conscious sentient beings *for no good reason*). [(P1) – (P5)]

3. When one purchases and consumes meat when equally nutritious plant-based food is readily available,

> one is paying others to engage in HASK practices on one's behalf.

Therefore,

> 4. It is wrong to purchase and consume meat whenever plant-based food is readily available (which, in modern societies, it almost always is).

It is this context-restricted version of the anti-HASK argument that I am endorsing throughout the paper. That said, I will not repeatedly call attention to the qualification "whenever equally nutritious plant-based food is available" in the body of the paper.

7 I defend the anti-HASK argument for ethical vegetarianism in much more detail in Engel 2000, Engel 2001, Engel 2012, Engel 2016b, and in this journal in Engel 2016a. For related arguments, see Jordan Curnutt (1997) and Alastair Norcross (2004).

8 Debeaking is the surgical removal of the birds' beaks. When beaks are cut too short or heal improperly, the birds cannot eat and eventually starve to death in their cages/shed (Davis 1996, 48, 65-71; Mason and Singer 1990, 39-40; and Robbins 1987, 57).

9 Singer 2009, 145.

10 The premature killing of farmed animals at a fraction of their natural lifespans is itself a harm. For a defense of this claim, see Engel 2018, 189-191.

11 Including the Ornish study (Ornish et al. 1983, 54-59; Ornish et al. 1990, 129-133); the Cornell/Oxford/China study (Chen, Campbell et al. 1990; Campbell 1997, 24; Campbell et

al. 1994, 1153S-1161S); and the Loma Linda study (Phillips et al. 1978, S191-S198).

12 The Dietitians of Canada (the national professional organization for Registered Dietitians in Canada) concur with this AND position statement on vegetarian and vegan diets (Mangels, Messina, et al., 2003, 748). They go on to note:

> Vegetarian diets offer a number of nutritional benefits, including lower levels of saturated fat, cholesterol, and animal protein as well as higher levels of carbohydrates, fiber, magnesium, potassium, folate, and antioxidants such as vitamins C and E and phytochemicals. Vegetarians have been reported to have lower body mass indices than nonvegetarians, as well as lower rates of death from ischemic heart disease; vegetarians also show lower blood cholesterol levels; lower blood pressure; and lower rates of hypertension, type 2 diabetes, and prostate and colon cancer (Mangels, Messina, et al., 2003, 748).

13 The Cornell/Oxford/China Health Project is the largest epidemiological study ever conducted. It has systematically monitored the diet, lifestyle, and disease patterns of 6,500 families from 65 different counties in Mainland China and Taiwan. The information collected in this massive data set has led Dr. T. Colin Campbell, director of the study, and his associates to conclude that:

> A diet comprised of a variety of good quality plant-based foods is the healthiest. (1997, 24)

> There is no threshold of plant-food richness beyond which further health benefits are not achieved. (1997, 24)

> Even small intakes of foods of animal origin are associated with significant increases in plasma cholesterol concentrations, which are associated, in turn, with significant increases in chronic degenerative disease mortality rates. (1994, 1153S)

14 In Engel 2000 and Engel 2016a, I consider a number of other purported justifications for eating meat and argue that none of them provides a good reason for killing and eating animals when nutritionally adequate plant-based food is available. Given space constraints, I can't repeat those arguments here.

15 The anti-HASK argument also shows that it is wrong to eat commercially produced eggs and dairy products, since commercial egg and dairy production are also inherently HASK practices. See Engel 2000, 883-886 for details. For an anti-HASK argument that shows that pharmacological animal experimentation is wrong and ought to be abolished, see Engel 2011.

16 It's worth noting that only some types of fish, such as wild salmon, are rich in Omega-3s. Most farm-raised fish, including farmed salmon, are not good sources of Omega-3s, and the fish that most people eat increasingly comes from fish farms.

17 In this section of the paper [§III], I report the results of numerous scientific experiments conducted on fishes to establish whether or not fish are sentient, intelligent beings. Let me be perfectly clear upfront: I do not approve of such research. Quite the contrary, I think the kind of invasive and ultimately lethal research that was conducted on these fish subjects is profoundly unethical. Indeed, in Engel 2011, I argue animal experimentation is morally wrong and ought to be abolished. Since the research conducted on these fishes was itself unjust, some may question whether my appealing to such research is

also unjust. Rebecca Tuvel (2015) has argued that it is *pro tanto* wrong to use the knowledge gained from animal experiments because doing so disrespects the victims and serves to further entrench the practice of animal experimentation. She does, however, acknowledge one legitimate use of such knowledge, namely, when the knowledge gained from the experiments is used to benefit either the research subjects themselves or members of the research subjects' species. (Tuvel 2015, 238–241) I am reporting the results of these experiments to show that fish are conscious, sentient, intelligent beings who deserve direct moral consideration in their own right and who thus should not be exploited for their flesh. My aim in sharing the knowledge obtained from these unethical experiments is to benefit fish by persuading people to leave fish off of their dinner plates for good.

18 Braithwaite identifies three main reasons they chose to study trout: (1) Trout grow to a reasonable size, which makes the task of isolating receptors and nerves easier, (2) trout are a commercially important species, and (3) trout are closely related to salmon (globally the most popular species reared in aquaculture), and so, the findings for trout would likely apply to salmon, as well. (2010, 51)

19 Grosenick, et al., explain how they guaranteed the outcomes of the rigged fights as follows:

> Because *A. burtoni* individuals vigorously defend their territory against intruding rivals, moving one male into a unit defended by another male always resulted in the intruder losing. Thus, we could train each bystander on an artificial dominance hierarchy by using animals whose relative status we controlled. This ensured that there were no consistent differences in male abilities or physical characteristics—a potential confounding fac-

> tor in naturally formed dominance hierarchies. (2007, 429) . . . To control for stable physiological differences between fish chosen to be A–E rivals, rival positions were exchanged such that fish serving as the A rival for half of the bystanders served as the E rival for the other half. (2007, 431)

20 Clare Hesketh reports that an intestinal infection has killed 35% of juvenile yellowtail kingfish at CleanSeas Tuna's Eyre Peninsula facility. (Hesketh 2012) A 2008 HSUS report on the welfare of animals in the aquaculture industry concluded: "Increasing mortalities are a clear indication that serious welfare problems exist, often from environmental effects, poor water quality, and infections, with some systems maintaining mortality rates of nearly 30% throughout the life cycle" (HSUS 2008, 16). A Marine Institute report on the status of Irish Aquaculture tracked smolt mortality rates in Irish salmon farms. Mortality rates ranged from a low of 24.33% in 2002 to a high of 54.34% in 2005. According to S.B. Wheatley, et al., "Mortality rates of up to 48% have been experienced in Irish farmed Atlantic salmon during their first year of production at sea with disease outbreaks making a significant contribution to these mortalities" (Wheatley, et al. 1997, 195).

21 In this section [§IV], I have focused on the production, harvesting, and killing methods employed by commercial fishers since such fishing is responsible for the vast majority of fish caught and killed. Space considerations preclude me from being able to provide an in-depth discussion of non-commercial fishing, but it should be obvious that private anglers and recreational fishers are also engaged in HASK practices when they catch and kill fish. After all, they catch fish with the same barbed hooks used by commercial fishers. These hooks typically get imbedded in the highly sensitive nociceptor-lined

tissue of their throats and mouths, though sometimes fish get hooked on the face, in the eye, or in their gills. Once hooked, the fish struggles in vain to get away but eventually becomes exhausted and is slowly hauled in. The barbed hook is then removed with pliers causing even more pain and tissue damage to the fish, after which the fish is left to slowly suffocate in an ice-filled cooler. Like commercial fishing, angling harms fish, causes them to suffer, and kills them *for no good reason*. Since it's wrong to engage in HASK practices, it's as wrong to catch and kill fish yourself as it is to pay others to catch and kill them for you. When plant-based foods are available, there is no justification for treating fish so badly. Thus, all forms of fish harvesting are HASK practices, when plant-based foods are available, and are wrong for that very reason.

22 I have presented earlier versions of "Fishy Reasoning" at the Bled Ethics Conference, Davidson College, Eastern Illinois University, the Midsouth Philosophy Conference, the Minding Animals International Conference, North Carolina State University, the Rochester Area Vegan Society, the Rocky Mountain Ethics Congress, the Russell Philosophy Conference, the University of Arizona, the University of Wisconsin Colleges Annual Colloquium, Vanderbilt University, and Vegetarian Summerfest. I wish to thank those in attendance for their helpful comments and feedback. Special thanks to Ramona Ilea and the wonderful students in two of her Pacific University Animal Ethics classes for providing me detailed probing questions that helped improve the current article. I would also like to thank an anonymous referee for *Between the Species* for helpful suggestions on the penultimate draft.