

SENTIENCE IN DECAPOD CRUSTACEANS

SCIENTIFIC ASPECTS AND ETHICAL IMPLICATIONS



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PART I

DESCRIPTION OF THE FACTS

1. DEFINING KEY TERMS

1.1. What are the key terms

The objective of this work is to investigate what scientific evidence exists for sentience in decapod crustaceans and to point out the implications of this for the moral consideration of these beings. Therefore, before we begin, it is important to define what we mean when we use the terms *moral consideration* and *sentience*, and also to explain why sentience is relevant to moral consideration. This is what we will do in the following sections.

1.2. Defining *moral consideration*

To give *moral consideration* to someone is to try to avoid harming them and to seek their benefit¹. Moral consideration can be direct or indirect. It is direct when the reasons for preventing harm and/or providing benefits have as their ultimate goal concern for the affected being itself. It is indirect when its ultimate goal is concern for other beings affected indirectly. Throughout this work, the term *moral consideration* will be used as shorthand for *direct moral consideration*.

1.3. Defining *sentience*

The word *sentience* is used with at least three distinct meanings:

1. As a synonym for consciousness in its broadest and most basic sense, that is, in reference to the capacity to have experiences. In this sense, to say that a being is sentient is to say that *someone* is inhabiting that body, that there is something it is like to be that being, that there is an internal, subjective point of view, and so on.²
2. As a synonym for the capacity not only to have experiences, but to value these experiences, that is, to experience them as positive or negative.³
3. As a synonym for the capacity to have experiences from stimuli external to the organism (which would be captured by the sense organs). In this use of the term, if a being is capable of having experiences only from internal stimuli (such as thoughts or dreams, for example), she would be conscious, but not sentient, even if she can value these experiences.⁴

1.4. Why sentience is important for moral consideration

Which of the meanings of the term *sentience* listed above is important for questions of moral consideration? The first meaning refers to the situation where someone is "inhabiting" a body. This is

¹ On the concept of moral consideration, see Jaworska & Tannenbaum (2021 [2013]), and Gruen & Monsó (2024 [2003]).

² On this subject, see Nagel (1974).

³ For a definition of valence, see Frijda (1986, p. 207).

⁴ For this definition, see Animal Ethics (2015).

relevant to questions of moral consideration because, for there to be the possibility of harm or benefit, there must be someone who could be harmed or benefited.

There is a debate about whether this first condition is sufficient for there to be harm/benefit and, consequently, about whether the second meaning of the term is important or not for questions of moral consideration. On one hand, it could be argued that being capable of having experiences is not sufficient for someone to be subject to being harmed/benefited: it is necessary to value these experiences (that is, to experience them as negative/positive).⁵ On the other hand, it could be argued that the very act of having experiences is already something valuable, even if these experiences are perceived as neutral (and, therefore, someone would be harmed if prevented from having them).⁶

As for the third meaning, it seems that it is irrelevant to questions of moral consideration because, if someone is incapacitated from having experiences from external stimuli, but is still capable of having them from internal stimuli (for example, thoughts or dreams), indeed they could still be harmed or benefited (for example, their thoughts or dreams could be pleasant or unpleasant).

Thus, the first meaning is relevant to moral consideration; the relevance of the second meaning remains open; and the third meaning is irrelevant. However, in the real world, as far as we know, it seems that every being capable of having experiences is also capable of experiencing them as either positive or negative. That is, there are not beings capable of only neutral experiences. Furthermore, in the vast majority of cases, beings are usually capable of experiencing both external and internal stimuli.

In this way, in what follows, when we speak about evidence of sentience in certain animals, we will generally be referring to these three things together.

⁵ This seems to be the position implicitly assumed traditionally by proponents of the sentience criterion, such as Bentham (2008 [1789]) and Singer (2011 [1979]).

⁶ An example of a view that shares this idea is *tranquillism*. On tranquillism, see Gloor (2017). Another example is Jamieson's position (1983, p. 145), which maintains that the mere fact of being conscious is positive in itself.

2. EVIDENCE OF SENTIENCE IN DECAPODS

2.1. A report on evidence of sentience in decapod crustaceans

An **official report by the United Kingdom government**, prepared by a team of expert scientists and published in November 2021, reviewed more than 300 studies, concluding that cephalopods and decapod crustaceans are very likely sentient.

The report defines sentience as the capacity to have experiences, including positive and negative experiences⁷ (which is in accordance with definitions 1 and 2 listed in the previous chapter). What follows is a summary of the methodology used in the report and the main evidence that supports its conclusion.⁸

2.2. Methodology used in the report

Birch et al (2021) used eight criteria to evaluate evidence of sentience:

1. Possession of nociceptors;
2. Possession of integrative brain regions;
3. Connections between nociceptors and integrative brain regions;
4. Responses affected by potential anesthetics or local analgesics;
5. Motivational trade-offs (balance between threat and opportunity for reward);
6. Flexible self-protective behaviors in response to injury and threats;
7. Associative learning that goes beyond habituation and sensitization;
8. Behavior demonstrating that the animal values anesthetics or local analgesics when injured.

The authors emphasize that no single criterion provides conclusive evidence of sentience. This is especially true for criterion 1, as it could be satisfied by a non-sentient animal. This is so because nociception is the detection by a nervous system of noxious or potentially noxious stimuli. Many responses to these stimuli indeed occur because of the presence of pain (for example, touching one's hand to fire will activate nociceptors and the experience of pain will pull the hand away). However, other responses to these stimuli do not necessarily require sentience (they can occur due to mere reflex). It is also possible to have pain experiences that are not the result of nociceptor activation. However, the criteria together are relevant for the general case.

After analyzing more than 300 studies, the researchers classified the level of confidence that the animals in question *satisfy or do not satisfy* each criterion as follows:

- *Very high*: when there is a large amount of reliable and high-quality evidence, eliminating any room for reasonable doubt.

⁷ Birch et al. (2021, p. 12).

⁸ For the report, see Birch et al. (2021). On sentience in decapod crustaceans in general, see also Crump et al. (2022); Souza Valente (2025).

- *High*: when they are convinced, even though there is still room for reasonable doubt.
- *Medium*: when doubts about the reliability of the evidence prevent them from having high confidence.
- *Low*: when there is little available evidence.
- *Very low*: when the evidence is severely inadequate or non-existent.

The following table summarizes the researchers' conclusions:

Very high = **A+** High = **A** Medium = **M** Low = **B** Very low = **B-**

Taxon	Criterion 1	Criterion 2	Criterion 3	Criterion 4	Criterion 5	Criterion	Criterion	Criterion 8
Cephalopods								
<i>Octopoda</i>	A+	A+	A	A	M	A+	A+	A
<i>Sepiida</i>	A	A+	A	B	M	M	A+	B
<i>Other coleoids</i>	A	A+	A	B	M	B	A	B
<i>Nautilidae</i>	A	B	B	B	B	B	M	B-
Crabs								
<i>Brachyura</i>	A	A+	B	A+	B	A+	A	B-
<i>Anomura</i>	A	A+	B	B	M	A	B	B-
Lobsters, crayfish								
<i>Astacidea</i>	A	A+	B	A+	B	B	M	B-
<i>Achelata</i>	A	A+	B	B	B	B	M	B-
Shrimp								
<i>Caridea</i>	A	A+	B	M	B	M	B	B-
<i>Penaidae</i>	A	B	B	M	B	B	B	B-

To present a general conclusion for each taxon, taking the eight criteria together, the researchers used the following parameter:

- Satisfies seven or more criteria = Very strong evidence of sentience
Satisfied by: *Octopoda*
- Satisfies five or more criteria = Strong evidence of sentience
Satisfied by: *Brachyura*
- Satisfies three or more criteria = Substantial evidence of sentience
Satisfied by: *Sepiida*, *other coleoids*, *Anomura* e *Astacidea*

So why does the report recommend that all cephalopods and all decapod crustaceans be considered sentient? For the following reason: the report emphasizes that when researchers state they have little confidence that a taxon satisfies a criterion, this does not mean that sentience in the animal in question is unlikely or that it has been refuted; rather, it means that the evidence is scarce, of low quality, or both. The report also emphasizes that there are no cases where researchers have very high or high confidence that a taxon does not meet a criterion.

The report explains that the amount of evidence of sentience for a given biological taxon is limited by the amount of scientific attention that the question of sentience in that taxon has received. For example, *Octopoda* and *Brachyura* have received increasing scientific attention, while *Nautilidae* and *Penaidae* have barely been studied.

For this reason, the central recommendation of the report is not to restrict the scope of protection to only some cephalopods or some decapods. The same already occurs in relation to vertebrates, as existing legislation makes generalizations based on evidence in intensively studied species (such as mice) to other related species.⁹

2.3. Detailing the evidence

Several of the data below mention research that involved causing harm to animals. We at Animal Ethics strongly oppose research of this type. However, once the data is available, it is not harmful to animals to cite it.

2.3.1. Reaction to harmful situations

The fact that harmful situations trigger a stress response in decapods, together with the observation that they change their long-term behavior in response, suggests that the change in their behavior is not a mere reflex without any experience, but instead that they are experiencing negative events.¹⁰

For example, when shrimps suffer eye mutilation, they not only thrash their tail, but also display unusual, relatively long-lasting behaviors: they avoid shelter¹¹ and swim in a disoriented manner¹² for at least half an hour. Additionally, shrimps exhibit a response that suggests nociception when they encounter a predator¹³ or when subjected to stings or electric shocks.¹⁴ Physiological responses to negative stimuli have also been documented in shrimps (for example, when faced with extreme temperature changes¹⁵ or injections of harmful heavy metals).¹⁶

2.3.2. Wound tending behavior

Decapod crustaceans rub, hold, and clean an injured area, in addition to limping and reducing the use of such areas.¹⁷ They also demonstrate awareness of the location of pain.¹⁸ For example, it has been documented that after eyestalk ablation (the stalk that supports the eyes), shrimps rub the affected

⁹ Birch et al. (2021, pp. 7-9).

¹⁰ Elwood & Adams (2015), Braithwaite (2010)..

¹¹ Diarte-Plata et al. (2012)..

¹² Taylor et al. (2004).

¹³ Arnott et al. (1998), Weineck et al. (2018).

¹⁴ Weineck et al. (2018).

¹⁵ Kuo et al. (1999), Davies (1980).

¹⁶ Lorenzon et al. (2004).

¹⁷ Elwood et al. (2009), Dyuizen et al. (2012), Elwood (2019). Especially on this behavior in shrimps, see Barr et. al. (2008).

¹⁸ Barr et al. (2008), Souza Valente (2022b), Elwood et al. (2009), Gherardi (2009).

area¹⁹ and that they rub and clean their antennae when these are pricked or exposed to an irritating substance.²⁰

2.3.3. Trading off important resources

The fact that an animal gives up a valuable resource to avoid a specific situation suggests that such a situation would cause negative experiences and, therefore, that the animal in question is sentient. Several studies have confirmed this type of behavior in decapods.²¹

For example, since crabs are nocturnal prey, a dark shelter is a very important resource. However, they prefer to stay in a well-lit and unprotected area if they perceive that the shelter may cause them an electric shock.²² Similarly, hermit crabs prefer lower-quality shells if they perceive that the better-quality shell causes them a shock.²³

2.3.4. Response to analgesics

Shrimps exhibit different behaviors after the same injury, depending on whether they receive analgesics²⁴ or anesthetics²⁵, indicating that they are capable of feeling pain.

For example, when white-leg shrimps are subjected to eyestalk ablation, the local anesthetic lidocaine reduces behaviors potentially indicative of stress, such as changes in feeding levels and swimming unusually.²⁶ It has also been proven that local anesthetics inhibit shrimps' responses of tail-flicking and rubbing to irritating substances that have been applied to the antennae.²⁷

2.3.5. Learning and memory formation

Memory formation can help differentiate between mere reflexes and a real painful experience, as long-term behavioral change protects against injury.²⁸ Decapod crustaceans avoid pain through learning and remembering a previous negative experience.²⁹ For example, they remember to avoid a specific cause of pain for at least 24 hours³⁰ and remember others of their species for up to 4 days.³¹ Crabs needed

¹⁹ Diarte-Plata et al. (2012)...

²⁰ Barr et al. (2008)..

²¹ See, for example, Appel & Elwood (2009b), Magee & Elwood (2016a, 2016b), Elwood (2019).

²² Magee & Elwood (2016).

²³ Appel & Elwood (2009b).

²⁴ Barr et al. (2008); Souza Valente (2022a), Diarte-Plata et al. (2012), Maldonado & Miralto (1982).

²⁵ Souza Valente (2022a, 2025), Sneddon et al. (2014).

²⁶ Taylor et al. (2004), Diarte-Plata et al. (2012).

²⁷ Barr et al. (2008).

²⁸ Elwood (2019).

²⁹ Davies et al. (2019), Souza Valente (2022a, 2025).

³⁰ Fernandez-Duque et al. (1992)

³¹ Gherardi & Atema (2005).

only two attempts to learn to avoid the same harmful situation³² and remember to avoid the same harmful stimulus after a full day.³³

The presence of brain areas associated with learning and memory has been identified in white-leg shrimps. It has also been argued that inhabiting water may require special neural networks that allow negotiating space in three dimensions.³⁴

2.3.6. Stress and anxiety

Pain is a negative experience frequently associated with a stress response.³⁵ Feeling pain makes individuals more risk-averse, which helps protect them against injury and prolongs their survival. In the scientific context, *anxiety* is the name given to the process of avoiding risks arising from pain.³⁶ Therefore, evidence of stress and anxiety can indicate that an animal is sentient.

Before receiving an anxiolytic medication, crayfishes actively avoided the stressor, but after the drug was administered, the behavioral signs of anxiety disappeared.³⁷ In another study, crayfishes changed their behavior as a result of exposure to antidepressants (like humans, their brains use the hormone serotonin).³⁸ Additionally, lactate is an indicator of stress,³⁹ and several studies are confirming increased lactate levels in decapods after having specific experiences.⁴⁰

2.4. Conclusion

The evidence listed above provides support for the conclusion that decapod crustaceans are sentient. As we have seen, there is not the same degree of confidence regarding all taxa in relation to meeting each criterion used. However, as highlighted by the report, this does not mean that the animals of the taxa in question do not meet such criteria; rather, it means that more detailed studies are lacking. Thus, the central recommendation of the report is to consider all cephalopods and decapod crustaceans as sentient, as there is sufficient evidence to make generalizations for species related to those already more studied, just as is done in the case of vertebrate sentience.

³² Elwood (2019), Magee & Elwood (2013, 2016b).

³³ Appel & Elwood (2009a).

³⁴ Strausfeld et al. (2020), Albalat et al. (2022).

³⁵ Broom & Johnson (2019).

³⁶ Elwood (2019).

³⁷ Fossat et al. (2014).

³⁸ Reisinger et al. (2021).

³⁹ Albert & Ellington (1985).

⁴⁰ Patterson et al. (2007), Aparicio-Simón et al. (2010).

3. HOW DECAPOD CRUSTACEANS ARE HARMED WHEN THEY ARE EXPLOITED

3.1. Introduction

Decapod crustaceans are among the animals most heavily exploited by humans. To give an idea of the scale involved, considering shrimps alone, it is estimated that around 25 trillion are killed every year for human consumption.⁴¹ The main methods used in the exploitation of these animals are outlined below.

3.2. Capture and storage

Decapod crustaceans exploited by the food industry are obtained both through fishing and aquaculture. Capture methods vary depending on the species and the number of animals targeted, but all of them cause serious harm. These harms include sudden pressure changes, injuries, physical trauma, crushing, exhaustion, and death.⁴²

Decapods captured directly at sea undergo a series of stressful post-capture experiences. For example, on boat decks they are exposed to air, light, temperature fluctuations, intense noise, constant handling, and confinement in overcrowded spaces, which restricts their movement and increases conflict among captured animals. They are often kept under these conditions for several days after capture. Common outcomes include injuries leading to infections, mutilations, and death by asphyxiation.⁴³

Despite their rigid shells, these animals are highly vulnerable. Their limbs, for example, can easily be injured or even torn off when they are pulled from nets or removed from the pots in which they are kept. In addition, the rapid transfer from sea to boat causes abrupt changes in pressure and temperature, which results in significant suffering.⁴⁴

Once removed from the sea, they are exposed to air, which poses a serious problem since they breathe underwater through gills. Outside water, they struggle to obtain oxygen, which can cause stress, make them more susceptible to disease, and, in many cases, lead to death by asphyxiation. During storage on boats, they typically remain out of the water for extended periods.⁴⁵

3.3. Mutilations

The term *mutilations* refers to practices that destroy, remove, or cause damage to limbs or other parts of the body. The mutilations discussed below are standard procedures in the crab, lobster, and shrimp exploitation industry, and the common practice is to perform them without the use of anesthesia or any type of analgesic.⁴⁶

⁴¹ Waldhorn & Autric (2023).

⁴² Crustacean Compassion (2023).

⁴³ Basti et al. (2010).

⁴⁴ Ibid..

⁴⁵ Crustacean Compassion (2024a).

⁴⁶ Crustacean Compassion (2024b).

3.4. Eye mutilation (eyestalk ablation)

Eyestalk ablation is a procedure that involves the removal or destruction of one or both stalks that support the eyes of shrimp. This practice is applied to breeding females with the aim of increasing egg production and inducing more females to participate in the reproductive process, since the eyestalk contains glands that regulate ovarian function. This type of mutilation is routinely adopted in nearly all marine shrimp breeding or maturation facilities worldwide, both in research centers and in commercial enterprises.⁴⁷

The procedure for ablation involves tearing off or crushing the eyestalk, cutting it with a blade, squeezing out its contents, and then cauterizing or tying off the stalk.

The techniques may vary. One consists of crushing the eyestalk, generally between halfway and two-thirds below the eye, as shown in the following image.



Image credit: Kannan et al. (2015).

In another technique, a cut is made in the eye with a blade or scissors, and then the eyestalk is crushed with the thumb and forefinger until the contents of the eye are completely removed, as illustrated in the following image.

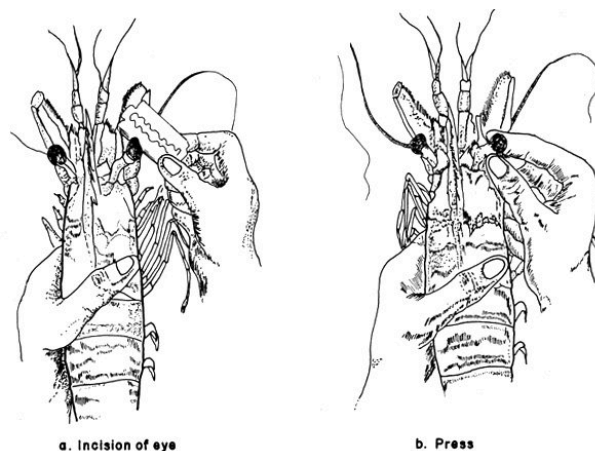


Image credit: Kungvankij et al. (1985)..

⁴⁷ Uawisetwathana et al. (2011).

Tools commonly used for cauterization include an electrocautery device, a heated wire, and forceps. Ligation consists of tying the eyestalk with surgical thread, tightening it firmly.⁴⁸

All of these procedures are almost always carried out without the use of anesthesia.⁴⁹ Research shows that shrimps display behaviors typically associated with pain during and after eyestalk ablation, such as tail flicking, rubbing the affected area, and curling up. Other studies indicate that these behaviors decrease when an anesthetic cream is applied to the affected region, which provides additional evidence that the procedure causes pain.⁵⁰

In addition to causing intense pain and obvious damage to the eyes, resulting in loss of vision, several studies show that the practice impairs multiple systems in shrimp, including physiological, metabolic, hormonal, and immune systems.⁵¹ It also harms their sensory perception⁵² and their ability to swim and move.⁵³ As a consequence, mortality rates among animals subjected to this procedure increase considerably.⁵⁴

Rowe (2018) mentions eyestalk ablation as an example of a practice that, if performed on vertebrates, would be regarded as a violation of the most fundamental standards of animal welfare. However, this practice is routinely carried out on invertebrates.⁵⁵

3.5. Claw removal (declawing)

Declawing is the manual amputation of one or both claws of a decapod crustacean. This practice is most commonly performed on crabs, both those farmed and those captured in the wild. The amputation impairs the animal's ability to feed and reduces its chances of survival.⁵⁶

Because crabs have the capacity for autotomy, that is, to amputate their own claws in situations of stress or danger, a common myth is that declawing does not cause pain. However, this is mistaken, as studies show that crabs whose claws were removed by humans exhibit a greater stress response and higher mortality rates compared to those who underwent autotomy.⁵⁷

Crabs who have had their claws removed by declawing display behaviors suggesting that they are aware of the pain caused by the injuries—for example, they exhibit trembling and use their remaining legs to touch or protect the wounded areas. These behaviors are not observed when claw loss occurs through

⁴⁸ On all these procedures, see Asmat-Ullah (2023).

⁴⁹ Animals Australia (2017), Cronin & Marshall (2011)..

⁵⁰ Taylor et al. (2004), Diarte-Plata et al. (2012).

⁵¹ Bae et al. (2013), Sainz-Hernandez et al. (2008), Perazzolo et al. (2002), Zacarias et al. (2021).

⁵² Bae et al. (2013); Sainz-Hernandez et al. (2008), Perazzolo et al. (2002).

⁵³ Taylor et al. (2004).

⁵⁴ Bae et al. (2013), Sainz-Hernandez et al. (2008).

⁵⁵ Rowe (2018). There are already initiatives underway to gradually eliminate eyestalk ablation and to use other methods to increase female fertility, such as increasing the sex ratio between females and males in the tank and providing nutritious, high-quality feed during the pre-maturation phase. On this, see Zacarias et al. (2019, 2021)..

⁵⁶ Crustacean Compassion (2024b).

⁵⁷ Patterson et al. (2007, 2009).

autotomy, which indicates that crabs experience pain as a result of claw removal.⁵⁸

3.6. Returning declawed crabs to the sea

The practice of removing a crab's claws and then returning it to the sea is considered a sustainable form of production because, in this process, one claw is removed to be sold, and the crab is released back into the water, with the expectation that another claw will grow in its place to be removed when the crab is captured again, and so on.⁵⁹

In addition to the painful wounds caused by declawing,⁶⁰ this practice severely harms the quality of life the crab will have after being returned to the sea. The loss of the claw reduces its ability to feed and to access food sources, which also interferes with the growth of the new claw. Furthermore, it decreases its ability to defend itself against predators and to compete for important resources, such as territory, shelter, and mating partners.⁶¹ As a result, the practice also reduces survival rates.⁶²

3.7. Claw cutting

The stressful and overcrowded conditions in which these animals are kept increase the likelihood of conflicts and even cannibalism among them.⁶³ Removing the functionality of the claws helps reduce the risk of harm that the animals cause to one another and to the workers who handle them. The claw-cutting procedure, known as *claw nickling*, involves fracturing the apodemes⁶⁴ and cutting the tendons in the dactyls⁶⁵ of the claws, with the aim of preventing them from functioning. This procedure is performed on animals such as crabs and lobsters, generally at the time they are prepared for transport.

The procedure is extremely harmful to the animals. As parts of the claws are fractured and cut, this creates open wounds. In addition to causing pain, the wounds and damage to internal tissues result in blood loss and increase the risk of infection.⁶⁶ Crabs whose claws were cut showed high mortality rates.⁶⁷ For example, the mortality rate of crabs whose claws were cut was 83%, whereas that of crabs who did not undergo this procedure was 16.7%.⁶⁸ Furthermore, since claws are essential for the movement of these animals,⁶⁹ the procedure also reduces their ability to feed, groom themselves, move, and defend themselves.⁷⁰

⁵⁸ McCambridge et al. (2016)..

⁵⁹ Crustacean Compassion (2024b)..

⁶⁰ Duermit et al. (2015).

⁶¹ Davis et al. (1978).

⁶² Patterson et al. (2007), Duermit et al. (2015).

⁶³ Fotadar & Evans (2011), Jacklin & Combes (2007), Coppola et al. (2019), Welsh et al. (2013).

⁶⁴ Apodeme is the name given to the internal projections of the exoskeleton of most arthropods.

⁶⁵ The dactyl is the region at the tip of the leg of some crustaceans and of the tentacle of cephalopods.

⁶⁶ Welsh et al. (2013), Barrento et al. (2010)..

⁶⁷ Barrento et al. (2008), Johnson et al. (2016), Chartois et al. (1994).

⁶⁸ Johnson et al. (2016).

⁶⁹ Carder (2017), Esposito et al. (2018).

⁷⁰ Crustacean Compassion (2024b).

3.8. Claw banding

Another common procedure during storage is claw banding. This process significantly restricts the animals' natural behavior and movements. When maintained for a long period, it is associated with muscle atrophy, difficulty feeding, and increased stress. Moreover, as with the claw-cutting procedure, it also reduces the animal's ability to feed, care for itself, move, and defend itself.⁷¹

3.9. Tail notching

Tail notching (known as V-notching) is intended to identify pregnant lobsters so that they can be returned to the sea and continue reproducing. This notch allows quick and easy identification if the lobsters are accidentally captured again.

The notch is made by removing a small triangular section from the end of the tail. In addition to being a painful procedure in itself, it causes further harm to lobsters due to handling, blood loss, and the risk of infection. In the long term, it also affects the lobster's locomotion and reduces its ability to detect the presence of predators.⁷²

3.10. Retention and storage

At some point in their lives, decapod crustaceans used in the food industry, both those farmed and those captured directly from the sea, are kept in storage for a period of time. This may occur before, during, or after transport; before they are killed; or while they are displayed in places such as retail outlets, restaurants, or markets.⁷³

Regardless of the duration, which, depending on the case, may extend for several months, storage causes various negative impacts on the animals. Among the main harmful factors are poor water quality, temperature fluctuations or inadequacies, restriction of typical behaviors, overcrowding, handling, and mutilations.⁷⁴ The way they are stored varies according to the species and the storage period: some are kept in tanks with or without water recirculation, others are exposed to air with varying levels of humidity, and some are placed directly on ice.⁷⁵

3.11. Transport

The transport of these animals may last for several days, during which they are subjected to adverse conditions such as poor water quality, inadequate temperatures, lack of shelter, very close contact with other animals, handling, as well as vibration and noise from vehicles.⁷⁶ These factors not only cause

⁷¹ Ibid.

⁷² Ibid.

⁷³ Crustacean Compassion (2024a).

⁷⁴ Crustacean Compassion (2023).

⁷⁵ Crustacean Compassion (2024a).

⁷⁶ Crustacean Compassion (2023).

suffering but also lead to extremely high mortality rates, both during the journey⁷⁷ and after arrival at their destination.⁷⁸

As aquatic animals, transport outside water and exposure to air, light, and other environmental conditions cause significant harm to them. Even when transport is carried out in tanks with water, it is difficult to ensure good water quality and maintain adequate temperature during long journeys. In addition, animals at the bottom of the tanks are at greater risk of losing limbs or even being crushed to death due to the weight of those above them.

It is common for these animals to go for long periods without being fed during transport, since withholding food helps reduce the amount of waste accumulated during the trip. They are also frequently kept in very confined spaces, together with a large number of other animals (sometimes even of different species) with very little space between them. As crustaceans are solitary and territorial animals, this proximity is highly stressful. The combination of hunger, dehydration, and overcrowding promotes aggressive behavior and also the occurrence of cannibalism.⁷⁹

3.12. The objection that this does not occur because it would result in loss of production

It could be objected that exploiters would not allow such things to occur, not because they care about the animals' suffering, but because it would result in loss of production, as it increases mortality rates before the animals are sold.

However, the system of animal exploitation already incorporates these losses as part of the business model, since it may be cheaper to accept a certain level of reduced productivity than to invest in improvements to the welfare of exploited animals. For example, it may be more profitable to operate with an extremely high stocking density than to reduce density in order to prevent disease, because the profit obtained from exploiting the survivors compensates for the losses.

3.13. Stunning

Stunning is the procedure that, in theory, serves to render the animal completely insensitive to pain before being killed.⁸⁰ Currently, the only method proven to be effective in this regard is electrical stunning, which can completely interrupt central nervous system activity and eliminate any response to sensory stimuli.⁸¹ However, the industry still uses other methods, such as chilling, the use of chemical substances, and exposure to carbon dioxide gas, which cause extreme agony to the animals.⁸² Even in the case of electrical stunning, the equipment must be species-specific and each species' specifications must be strictly followed to ensure that loss of consciousness occurs in less than one second.⁸³

⁷⁷ Barrento et al. (2010, 2012), Lu et al. (2015).

⁷⁸ Barrento et al. (2008, 2010), Uglow et al. (1986).

⁷⁹ Crustacean Compassion (2024a).

⁸⁰ Crustacean Compassion (2024c).

⁸¹ Roth & Øines (2010) Roth & Grimsbø (2016), Fregin & Bickmeyer (2016), Weineck et al. (2018).

⁸² Crustacean Compassion (2024c).

⁸³ Roth & Øines (2010), Roth & Grimsbø (2016), Fregin & Bickmeyer (2016), Weineck et al. (2018).

3.14. The way they are killed

Decapod crustaceans farmed or captured for consumption are killed in various ways. The most common is to place them alive in boiling water, or alternatively to heat the water gradually until it begins to boil.⁸⁴ This method causes intense and prolonged suffering, which can be observed in the animals' reactions, they struggle frantically, fight desperately, and attempt to escape from the pot, clear signs of intense agony before death.⁸⁵

Other methods used include tearing off the animals' limbs, chilling them to death, placing them in high-salinity solutions, using carbon dioxide (CO₂), or submerging marine animals in fresh water, all of these procedures cause great suffering and prolonged agony before death.

Death by mechanical methods, such as piercing or splitting the animal in half, also carries a high risk of causing intense suffering. This is because, in these animals, the ganglia that centralize the nervous system are distributed throughout the body, and it would be necessary to destroy all of them at the same time in order to prevent them from feeling pain. In practice, this is very difficult to do, even for a specialist.⁸⁶

3.15. Online sales of decapod crustaceans

Crabs and lobsters are also sold online and delivered alive to consumers, so that they can be stored and killed at home. During transport, which may last hours or even days, the animals are confined in boxes, generally piled on top of one another in groups, which increases the risk of injury, asphyxiation, and even death. Fractures and other fatal injuries are also common, since their bodies are fragile. As aquatic animals, they cannot obtain sufficient oxygen from the air. Therefore, when kept out of water, they may suffer a slow and agonizing death by asphyxiation.

After delivery, crabs and lobsters may be kept, handled, and killed in any way the consumer chooses. However, it is very difficult to create an adequate environment to meet these animals' health and welfare needs, since this requires control of water quality, temperature, salinity, and light. Many consumers store the animals in the refrigerator or freezer before killing them, which causes them great suffering. The most common methods of killing them include cutting them into pieces or boiling them alive, both while they are still conscious.⁸⁷ As seen in the previous section, it is already extremely difficult for a trained professional to kill these animals without causing intense suffering and agony; therefore, it is not possible for an untrained consumer to do so in a way that does not cause extreme suffering.

⁸⁴ Crustacean Compassion (2024d).

⁸⁵ Conte et al. (2021), Adams et al. (2019).

⁸⁶ Crustacean Compassion (2024d).

⁸⁷ Crustacean Compassion (2024e).

PART II

ETHICAL IMPLICATIONS

4. SENTIENCE AS A CRITERION OF MORAL CONSIDERATION

4.1. Introduction

In the previous section, various pieces of evidence were presented indicating that decapods are sentient. In the present section, we will discuss the ethical implications of this finding.

In this subsection, we will present an argument defending that one such implication is that we must grant these animals direct moral consideration. That is, we must avoid harming them and seek to benefit them out of concern for their own good.⁸⁸ In what follows, the term *moral consideration* will be used as shorthand for *direct moral consideration*. The central argument for defending that, if a being is sentient, we must consider it morally is the argument from relevance,⁸⁹ explained below.

If the aim of moral consideration is to avoid harming and to seek to benefit, then, for an entity to be morally considerable, it is necessary and sufficient that it be capable of being harmed and/or benefited. For an entity to be capable of being harmed and/or benefited, it is necessary and sufficient: (a) to be someone and (b) to experience certain states as positive and/or others as negative. Sentience is what makes an entity: (a) someone and (b) capable of experiencing certain states as positive and/or others as negative. Thus, since sentience is what makes someone capable of being harmed and benefited, for an entity to be morally considerable, it is necessary and sufficient that it be sentient. Since decapods are sentient, we must grant them moral consideration.

In the following subsections, we will discuss several objections to this argument.

4.2. Objections that question whether decapods are (sufficiently) sentient

4.2.1. The claim that there is no way to be certain whether they are sentient

One possible objection is to argue that we cannot be certain that decapods are sentient for the simple reason that any one person can only have certainty in their own sentience, their own sentience the only one that can be directly experienced. This is known as the problem of other minds.⁹⁰

One possible response is to argue that, even so, we have reasons to believe that other individuals are sentient. For example, if I know that it's the processing in the brain that creates the conditions for consciousness to manifest, then other beings who possess a similar physical apparatus to perform this type of processing are likely sentient as well.

However, the skeptic will say that this is a hasty generalization from a single case.⁹¹ That is, they will argue it's not valid to deduce, from the fact that one brain generates sentience, that all brains do. Thus, the skeptic concludes, we have no reason to think there are any other minds besides our own..

⁸⁸ On the distinction between direct and indirect moral consideration, see Wilson (2002).

⁸⁹ Defenses of the argument from relevance can be found in Horta (2018) and Cunha (2021, pp. 57-61).

⁹⁰ On this problem, see Avramides (2001) and Maslin (2001, ch. 8).

⁹¹ See, for example, Law (2003, pp. 102-103).

At this point, it could be questioned, in epistemic terms, who bears the burden of proof. However, in ethical terms, there is good reason to think that the burden of proof certainly lies with the skeptic. This can be grounded in the following principle.

The principle of the benefit of the doubt⁹² (also known as the precautionary principle) prescribes that, when there is reasonable doubt about whether a being is sentient, we should treat it on the assumption that it is sentient, since this minimizes the probability of harm. That is, if the being in question is sentient and we treat it as if it were not, the harm we will cause will be greater than the harm that would occur if we treat it as if it were sentient and it turns out not to be.

Thus, pointing out that we cannot have absolute certainty about the sentience of any other individual, except ourselves, is not a good reason to deny decapods moral consideration.

4.2.2. The claim that the degree of confidence in their sentience is lower

There is a position that holds that the degree of moral consideration we should grant someone ought to depend on the degree of confidence we have regarding whether the being in question is sentient.⁹³ For this reason, according to this position, we should invest far more resources in protecting humans or vertebrates in general than in protecting decapods or other invertebrates.

There are at least four responses to this objection, which will be presented below.

The first response is to reject assigning differentiated degrees of moral consideration based on our degree of confidence. For example, it could be argued that, in relation to beings for whom there is evidence that they are sentient, all such beings should count as one, regardless of our degree of confidence in that evidence. As we saw in the previous section, the low confidence we have regarding the sentience of certain types of animals exists due to the lack of research on their sentience, and not because those animals fail to meet the criteria for sentience. Thus, it could be argued that we should establish protections against our lack of information, rather than use it as a criterion.

The second way to respond would be to argue that the evidence in favor of decapod sentience is sufficiently strong and that, therefore, it doesn't make sense to say that they count as much less than one even if we accept the confidence-based criterion.

The third response points out that, even if such animals counted as less than one, an additional argument would need to be addressed to justify that it is permissible to exploit them, since this is not a necessary implication. For example, the probability that they are sentient may be sufficiently high that we should protect them against exploitation.

The fourth way to respond observes that, even if each decapod counted as much less than 1, the number of them harmed through exploitation is so enormous that we should still invest substantial resources to protect them. No matter how much smaller the weight assigned to each decapod, there

⁹² For a detailed formulation and a defense of this principle, see Birch (2017). For a defense of the view that uncertainty about whether other individuals are sentient does not threaten sentience as a criterion of moral consideration, see Dung (2022). For an example of the application of the benefit of the doubt to lobsters, see Jones (2014).

⁹³ For examples of positional defenses, see Chan (2011), Shriver (2020) and Sebo (2018).

would always be a number of decapod victims above which the balance would tip in favor of prioritizing them.

The only way to avoid this conclusion would be to establish a trump-like barrier⁹⁴ that would prohibit prioritizing decapods regardless of how many more of them were harmed.⁹⁵ However, an additional argument would need to be addressed to ground such a trump, since it does not follow from the claim that an individual's moral weight should be multiplied by our degree of confidence in their sentience. In subsection 4 we will see some reasons to reject the attribution of trumps.

Given these four responses, we have reason to conclude that the argument appealing to the degree-of-confidence criterion does not succeed in justifying the exploitation of decapods.

4.3. The claim that being sentient is insufficient to receive moral consideration

4.3.1. The criteria of species and cognitive capacities

In the previous subsection, objections to granting moral consideration to decapods were addressed that were grounded in doubts about their sentience. In the present subsection, we will discuss objections that recognize decapods as sentient, but argue that being sentient is insufficient for one to deserve moral consideration.

Each objection in this group provides a different reason for denying them moral consideration. The most common are the following:

- Because they do not belong to the human species⁹⁶
- Because they do not possess certain cognitive capacities⁹⁷
- Because they do not stand in certain relationships with us⁹⁸

The main argument for responding to these objections is, as we saw in [item 4.1](#), the argument from relevance, which will now be explained in greater detail.

4.3.2. Detailing the argument from relevance

The argument from relevance⁹⁹ holds that what is relevant to a decision is what is at stake in that decision. For example, what is at stake when choosing a criterion for priority in emergency care at a

⁹⁴ Here, 'trump' refers to a consideration that overrides all aggregative calculations, no matter how many individuals are affected. The term comes from the philosophical concept of rights as trumps, developed by Ronald Dworkin, which describes considerations that take precedence over calculations based on numbers or utility.

⁹⁵ For an example of a position in which the number of victims does not count, see Taurek (1977, pp. 300-303). For a defense of the view that the number of victims does count, see Parfit (1978, pp. 285-301).

⁹⁶ See, for example, the positions of Diamond (1991), Gaita (2003), and Posner (2004)...

⁹⁷ See, for example, the positions defended by Francis & Norman (1978), McCloskey (1979), Frey (1980), Leahy (1991), Carruthers (1992) and Ferry (1995 [1992])..

⁹⁸ See, for example, positions defended by Narveson (1977, 1987), Becker (1983), Midgley (1983), Callicott (1989), Næss (1989), Mosterín (1998), Petrinovich (1999) and Goldman (2001).

⁹⁹ For a detailed version of this argument, see Horta (2018) and Cunha (2021, pp. 57-61).

hospital is the possibility of being more or less efficient in attending to the individuals who most need assistance. That is why, for this issue, knowing who is more severely injured and who is at risk of death are relevant factors, whereas knowing how many letters each person has in their name is not.

What is at stake in matters of moral consideration is the possibility that, through our decisions, we may harm or benefit those affected by them. If this possibility did not exist, it would make no sense to ask which beings should receive moral consideration. If that is so, then having the capacity to be harmed or benefited by our decisions is a necessary and sufficient condition for someone to receive moral consideration.

Sentience is what determines that someone is capable of being harmed and benefited because, first, it is what makes there be someone in that body (and not merely a living but “empty” body), and second, because experiences can be positive or negative for the one who has them.

Thus, according to the argument from relevance, we must grant moral consideration to all sentient beings. Since belonging to the human species, possessing certain cognitive capacities, or having certain relationships with us does not determine whether someone is capable of being harmed or benefited, these are all inadequate criteria for determining who should receive moral consideration.

4.3.3. What is relevant for considering and what is relevant for being considered

It could be objected that having certain cognitive capacities is important for receiving moral consideration because it is what enables someone to understand ethical issues and recognize duties,¹⁰⁰ to have a sense of justice,¹⁰¹ to claim their rights, and to respect the rights of others.¹⁰² That is, according to this objection, in order to receive moral consideration, someone must also be capable of acting morally.

The response to this objection is already contained in the argument from relevance itself. Knowing whether someone is capable of acting morally may be relevant for determining whether we should hold them responsible, but not for determining whether they should be morally considered. To think otherwise is a confusion analogous to thinking that, in order for someone to receive medical care, they must also be a doctor. That is, for someone to be entitled to be the beneficiary of an activity, it is not necessary that they also be capable of performing it. We will now see an example of this in the human case itself.

4.3.4. The relationship between lower cognitive capacities and greater vulnerability

There are many humans who also lack the cognitive capacities typically cited to deny moral consideration to nonhuman animals. Examples include babies, children up to a certain age, and even adults who are victims of certain illnesses or accidents that prevent them from having such capacities. For this reason, it does not make sense to hold them responsible for what they do. However, this does not justify disregarding them. It does not even justify treating them worse than humans who possess such capacities. Therefore, the lack of these capacities in nonhuman animals (including decapods)

¹⁰⁰ See, for example, Kant (1991 [1785]). For criticism, see Korsgaard (2005) and Franklin (2005).

¹⁰¹ See, for example, Rawls (1999 [1971], pp. 15, 441, 442, 448). For criticism, see Rowlands (1998).

¹⁰² See, for example, Ross (1930, p. 50). For criticism, see Francione (2000).

cannot be a reason to treat them worse than humans in general, much less to cause them suffering and death.¹⁰³

Moreover, the lack of such capacities in humans is normally regarded as a reason to grant them even greater protection, since it contributes to increasing their vulnerability. In the same way, the fact that decapods possess lower cognitive capacities is a reason to grant them even greater protection, not to consider them to a lesser degree, much less to justify exploiting them.

The response to this criticism consists in pointing out that the argument from relevance does not begin by assuming that beings capable of being harmed and benefited must be considered, and then postulate that what is relevant for receiving moral consideration is being capable of being harmed and benefited. In fact, in the argument from relevance the exact opposite occurs: the first steps of the argument investigate what is relevant for determining who should receive moral consideration and arrive at the conclusion that what is relevant is knowing who is capable of being harmed and benefited (and not the other way around). For this reason, those first steps of the argument would never result in the conclusion that what is relevant for receiving moral consideration is belonging to the human species, possessing a certain level of intelligence, or any other such criterion.

This becomes evident if the argument from relevance is set out step by step. One way of setting it out is as follows:

4.3.5. The charge of circularity

A possible criticism of the argument from relevance is to accuse it of circularity. The accusation might claim something like this: “the proponents of the argument from relevance first decide that they want to consider beings capable of being harmed and benefited, and then postulate that what is relevant for determining who should receive moral consideration is knowing who is capable of being harmed and benefited.” According to this accusation, any other criterion could do the same. For example, someone could decide in advance that they want to consider all (and only) humans, and then postulate that what is relevant for receiving moral consideration is belonging to the human species. According to this criticism, whatever criterion we choose would have an equally circular grounding and, therefore, any criterion would be equally arbitrary.

The response to this criticism consists in pointing out that the argument from relevance does not begin by assuming that beings capable of being harmed and benefited must be considered, and then postulate that what is relevant for receiving moral consideration is being capable of being harmed and benefited. In fact, in the argument from relevance the exact opposite occurs: the first steps of the argument investigate what is relevant for determining who should receive moral consideration and arrive at the conclusion that what is relevant is knowing who is capable of being harmed and benefited (and not the other way around). For this reason, those first steps of the argument would never result in the conclusion that what is relevant for receiving moral consideration is belonging to the human species, possessing a certain level of intelligence, or any other such criterion.

This becomes evident if the argument from relevance is set out step by step. One way of setting it out is as follows:

¹⁰³ For a detailed development of this argument, see Ehnert (2002) and Horta (2014).

1. What is relevant for answering a question is that which makes the question meaningful.
2. The question “who is morally considerable?” only makes sense because, through our decisions, it is possible to harm/benefit those affected by them.
3. Therefore, what is relevant for determining who is morally considerable is knowing who is capable of being harmed/benefited by our decisions.
4. Sentience is what makes someone capable of being harmed/benefited by our decisions.
5. Therefore, what is relevant for determining who is morally considerable is knowing who is sentient.

Each new step of the argument adds new information, which is derived from the previous steps but is not already contained within them. Therefore, the argument from relevance is not circular.

4.4. The claim that they should receive moral consideration to a lesser degree

4.4.1. Should beings with lower cognitive capacities count less?

Certain positions acknowledge that we must grant moral consideration to all sentient beings but argue that we should construct hierarchies of moral status. Positions of this kind use different criteria to assign differentiated degrees of moral status. Some grant greater consideration to members of the human species.¹⁰⁴ According to others, the degree of moral consideration should be directly proportional to the degree of cognitive capacities, regardless of species.¹⁰⁵

What all positions of this kind have in common is the claim that, when faced with harms of equal magnitude, we should prioritize those who possess a higher status. According to some more extreme variants of these positions, we should prioritize those who possess higher moral status even when the harm to them is smaller.

Hierarchies of moral status based on race or gender are increasingly recognized as unjust. Are moral hierarchies based on species and degree of cognitive capacities also unjust? Below we will examine two principles that show that they are.

4.4.2. The principle of equal consideration

At the core of the principle of equal consideration¹⁰⁶ is the idea that, if what gives us reasons to avoid harms is the harms’ intrinsic negative character, and if what gives us reasons to seek benefits is the benefits’ intrinsic positive character, then the strength of those reasons depends on the magnitude of the harms and benefits in question. That is, equivalent harms and benefits must receive equal weight, and greater harms and benefits must receive greater weight, regardless of factors such as the species, race, gender, or degree of cognitive capacities of the one receiving those harms or benefits.

¹⁰⁴ See, for example, Benson (1978, p. 537), Diamond (1991, p. 59), Mosterín (1998, p. 24) and Næss (2005, p. 171).

¹⁰⁵ See, for example, the position of McMahan (2002, pp. 242-245, 265).

¹⁰⁶ For a more detailed explanation of this principle, see Singer (2011 [1979], ch. 3) and Cunha (2021, pp. 61-66).

It could be objected that we should not always prioritize avoiding the greater harm. This would be the case if, for some reason, someone had done something to deserve the harm they suffer. However, even if that factor is relevant, it could not justify giving less weight to nonhuman animals and/or to beings with lower cognitive capacities, since such characteristics are the result of the natural lottery, and not of merit or demerit.

There are two basic ways in which the principle of equal consideration is violated. The first is when equivalent harms/benefits are given different weight. For example, if a certain harmful practice toward decapods would be considered unjustifiable if it were carried out against humans, causing them equivalent harms, then the principle is being violated.

The second, more extreme, is when greater harms/benefits are given less weight than smaller harms/benefits. An example is the consumption of animals itself.¹⁰⁷ For instance, if humans consume a meal involving decapods, the benefit they gain is a few minutes of pleasure (which, incidentally, could be obtained in another way, through plant-based food). This implies death (and probably also suffering) for at least one decapod (and, in the vast majority of cases, for many decapods). On the other hand, if humans stop consuming animals, if they were to suffer any harm from doing so, it would be a much smaller harm in comparison to what the animals have to endure in order for humans to obtain that small benefit. Thus, the consumption of animals in general, including the consumption of decapods, is an extreme violation of the principle of equal consideration.

4.4.3. The principle of impartiality

Hierarchies of moral status can also be rejected on the basis of the principle of impartiality.¹⁰⁸ At the core of this principle is the idea that, for a decision to be just, it must be impartial (that is, not biased), and it is impartial only if it would be approved under conditions in which we did not know which position we would occupy among those affected.

If we did not know our species, we would certainly regard it as arbitrary to grant superior status to humans. If we did not know whether we would be born as beings who would one day develop complex cognitive capacities, we would certainly regard it as arbitrary to grant superior status to beings who possess such capacities.

This shows that superior moral status for humans or for beings with complex cognitive capacities is defended only because its defenders know that they belong to the privileged group. If that is so, then such positions violate the principle of impartiality.

4.4.4. The appeal to the group

According to what we will call the appeal to the group, nonhuman animals should receive lesser consideration because they do not possess sophisticated cognitive capacities. However, the same view maintains that humans who, for some reason (such as accident, illness, or congenital condition), do not possess such capacities (and not even the potential to develop them), should nevertheless receive equal consideration. The reason for this, according to the appeal to the group, is that individuals should

¹⁰⁷ For a comparison of the harm to nonhuman animals and humans on this issue, see Horta (2022 [2017]).

¹⁰⁸ For a detailed exposition of this argument, see Rowlands (2009 [1998], pp. 118-175).

be treated not according to their own characteristics, but according to the typical characteristics of the group to which they belong.¹⁰⁹

Thus, according to this view, humans who lack sophisticated cognitive capacities should receive the same degree of consideration that any other human should receive, because they belong to a group (namely, the human species) whose normal members possess these capacities. Nonhuman animals, according to this view, should receive lesser consideration because the normal members of their group (namely, the species to which they belong) do not possess such capacities.

A similar line of reasoning is the appeal to the average. According to this view, the reason why racism and sexism are unjust is that we cannot deduce, from someone's skin color or gender, that their cognitive capacities are greater or lesser. This is because, even though there is wide variation in the individual levels of such capacities, the group averages are similar. With respect to nonhuman animals, however, according to the same view, we are justified in granting them lesser consideration because we can deduce, from the fact that someone is a nonhuman animal, that their cognitive capacities truly do not exceed a certain level.

There are several possible criticisms of both views. We will examine the main ones below.

The first criticism points out that it would need to be explained why the level of cognitive capacities (whether of the individual or of the group) is important for the degree of moral consideration someone should receive. In the objection, this is simply assumed, without being explained. Moreover, it can be argued that it is not relevant. For example, it could be pointed out that, if the reason someone requires moral consideration is because they are capable of being harmed and benefited, then the degree of that consideration must depend on the magnitude of the harms and benefits, and not on cognitive capacities. In this sense, the degree of cognitive capacities would only be relevant to the degree of consideration if there were necessarily a correlation between having greater cognitive capacities and being capable of being harmed and benefited to a greater extent. However, as discussed in subsections 4.3.4 and 4.5, there is no such correlation (indeed, as we have seen, the opposite is generally the case).

The second criticism points out that the objection is circular. The objection is introduced in order to explain why knowing the species to which someone belongs is important for determining the degree of consideration owed to them. The explanation offered is that it reveals the typical level of cognitive capacities of the group to which the individual belongs. However, the objection already divides groups on the basis of species. Thus, one could ask: "why divide groups on the basis of species rather than on the basis of cognitive capacities themselves, and therefore construct a hierarchy based on levels of intelligence, regardless of species?" In short, the objection is introduced to explain the relevance of species, but it already assumes that species is relevant by using it as the criterion for dividing groups.

The third criticism, in turn, is directed at the idea that individuals should be treated according to the characteristics of the group to which they belong, rather than according to the characteristics they actually possess. This idea is at least controversial and would need to be justified. However, the objection does not provide such justification. If the idea is introduced merely because it would justify granting greater consideration to humans, then it is not independently plausible. Finally, it is also

¹⁰⁹ For examples, see Scruton (1996, p. 54-55); Campbell (2001, p. 164) and Machan (2002, p. 11). For criticism, see Clark (1977, p. 135), Singer (1991, p. 61-62) and Rollin (1998, p. 418).

possible to offer examples suggesting that it is unjust not to treat individuals according to their own characteristics. This is what we will see in the following criticism.

The fourth criticism accuses the objection of arbitrariness. It first claims that what justifies granting lesser consideration to nonhuman animals is the fact that they lack certain capacities. However, if there were a nonhuman animal who possessed such capacities, the objection would maintain that it would nevertheless be justified to grant that animal lesser consideration because most other members of its species do not possess those capacities. In short, the objection can be accused of arbitrariness for excluding from equal consideration nonhuman animals who might meet the criterion it adopts, while including in equal consideration humans who fail to meet the same criterion. One way of attempting to avoid this criticism is to maintain that, for someone to receive equal consideration, it is sufficient to meet one of the following two conditions: either to possess certain cognitive capacities, or to belong to the human species—thus, if some nonhuman animal possessed the capacities in question, it should receive equal consideration. However, this variation can also be accused of arbitrariness, since it requires nonhuman animals to possess certain capacities in order to receive equal consideration, but does not require the same of humans (for them, belonging to the human species is sufficient).

4.4.5. And if decapods counted less? What are the implications?

The idea of differentiated degrees of moral status is often brought up in an attempt to justify animal exploitation.¹¹⁰ However, what would have to be shown in order to justify their exploitation is not that such animals should count less, but rather that their vital interests, such as in not suffering and in not dying, should count very little.

And even if such animals counted very little, given their numbers, we would still have to invest a large amount of resources in protecting them. Approximately 25 trillion decapods are killed annually for human consumption.¹¹¹ In 2023, the number of human deaths was around 61 million.¹¹² For us to invest more resources in helping humans, each human would have to matter more than 409,836 times each decapod. And even if the number of human deaths were the total human population (8 billion), for us to invest more resources in helping humans, each human would have to matter more than 3,125 times each decapod. As we have seen, given the principles of equal consideration and impartiality, there seems to be no justification for even assigning greater weight to humans, much less for assigning a weight that is 3,125 or 409,836 times greater.

One way to reject this implication is to argue that the number of individuals does not matter.¹¹³ However, this position would imply that, if we had to choose either to save all individuals in the universe except one, or to save one and let all the other individuals in the universe die, we would have no reason to prefer the first option. Moreover, the principle of equal consideration itself already provides an explanation of why the number of individuals matters: if each counts as one, then two count as two, and so on.¹¹⁴

¹¹⁰ See, for example, Machan (2002).

¹¹¹ See Waldhorn & Altric (2023).

¹¹² Ritchie and Mathieu (2023).

¹¹³ For an example, see Taurek (1977, pp. 300-303).

¹¹⁴ This argument is developed in detail in Parfit (1978, pp. 285-301).

Another way to attempt to reject the above implication accepts that numbers matter, but argues that the numbers must be multiplied by the harm each individual would suffer from suffering and/or death and that, by doing so, the balance would tilt toward investing more resources in helping humans. The claim that decapods are only slightly harmed by suffering will be discussed in subsection [item 4.5](#), and the claim that they are only slightly harmed by death will be discussed throughout [chapter 5](#). Regardless, even if these claims were correct, this would only imply that we should invest fewer resources (and not that we should not invest resources at all) in preventing harms to decapods. Moreover, as already mentioned, it would also not imply that exploiting them is justified.

4.5. The objection that they suffer less due to the lack of certain cognitive capacities

It is sometimes argued that animals with poorly developed cognitive capacities are less capable of suffering.¹¹⁵ This view could be used to defend the claim that nothing very serious happens to decapods when they are exploited. Below we will examine three arguments that question this claim.

1. There are cases in which an individual suffers more precisely because of a lack of understanding of what is at stake.¹¹⁶ For example, someone may be trying to help an animal and, because the animal does not understand that the person wants to help it, it may panic. This is one of the reasons why animals often become desperate when they are captured to be medicated. It is for the same reason that, in the case of humans, it is more difficult to administer medication to children than to adults.

2. It is true that sometimes greater cognitive capacities imply greater suffering. For example, only those who can imagine the future suffer in anticipation, and only those who have long-term memory suffer by recalling negative events that happened long ago. However, such beings may also have their present suffering alleviated by anticipation or recollection of positive events. On the other hand, beings who do not possess such capacities, or who possess them in a very limited way, if they are suffering in the present, are wholly in suffering.¹¹⁷

3. For evolutionary reasons, it is quite possible that the intensity of suffering is not reduced by lower cognitive capacities. The capacity to experience suffering and pleasure is a trait that prevailed in evolutionary history probably because it is directly connected to motivation for behavior.¹¹⁸ That is, sentient beings avoid stimuli that cause them suffering and seek those that give them pleasure. This behavior, by increasing their chances of survival, also increases their chances of reproducing and passing this trait on. The greater the cognitive capacities, the greater the diversity of motivations for behavior and learning. Thus, it is possible that beings with greater cognitive capacities can survive and pass on their genes even if they do not have very intense experiences of suffering and pleasure. On the other hand, the lower an animal's cognitive capacities, the more its motivation to act and to learn will be tied exclusively to the intensity of pain and pleasure. This means that, in relation to animals with lower cognitive capacities, it is quite possible that they suffer even more intensely,¹¹⁹ since if that were not the case, those species would very likely not have succeeded in passing on their genes and would no longer exist.

¹¹⁵ See, for example, the positions of Groff & Ng (2019, p. 7) and Browning & Veit (2023, p. 13)..

¹¹⁶ On this, see Singer (2009 [1975], ch. 1).

¹¹⁷ In this, see Rollin (1989, p. 144).

¹¹⁸ On this (and more specifically in the case of decapods), see Gherardi (2009).

¹¹⁹ Ryder (2002, p. 64).

This seems especially true in the case of animals who do not receive parental care, since they must navigate the environment and attempt to survive as soon as they hatch from eggs.¹²⁰ Moreover, clutches in these species are normally enormous (thousands or even millions), while in periods of approximate population stability, the average number of survivors is only two per clutch.¹²¹ Even with such enormous clutches, the survival rate is extremely low. This suggests that, if these animals did not have a sharp capacity to feel at these stages, those species would very likely no longer exist. Thus, the fact that these species still exist is an indication that their members probably possess a quite acute capacity to feel.

4.6. Conclusion

If the above arguments are sound, then the following conclusions follow:

1. Decapods, like any other sentient being, must receive not only direct moral consideration, but equal consideration.
2. Even if there were justification for assigning decapods a lesser weight in our moral deliberations, given their numbers, we would still have to invest a large amount of resources in protecting them.
3. Their lower cognitive capacity does not therefore make them less capable of suffering.

¹²⁰ About this, see European Food Safety Authority (2005), and Doody & Paull (2013).

¹²¹ See Horta (2010), Animal Ethics (2015), Animal Ethics (2021, pp. 55-59), and Cunha (2022, pp. 28-34).

5. DISCUSSING THE HARM OF DEATH

5.1. The claim that it is acceptable to kill them, provided they do not suffer

We will now discuss the view that maintains that, provided exploitation of decapods is modified so that they do not suffer during use, no harm is caused to these animals, even if they are killed, since they would allegedly not be harmed by death.

Proponents of this view have offered different reasons to defend the claim that these animals are not harmed by death. Two of the most common are the claims that they do not understand what death is,¹²² and that they are not capable of having future-oriented desires that would be frustrated by death.¹²³ There is, however, an argument that explains what the harm of death consists in, and this explanation implies that, for someone to be harmed by death, it is not necessary either to understand what death is or to be capable of having future-oriented desires.

5.2. The harm of death as a deprivation harm

The harm of death is a different kind of harm from the harm of suffering. Suffering is a harm due to the presence of what is negative. Death, by contrast, is a harm due to the absence of what would be positive.¹²⁴

Thus, in order to assess whether an individual would be harmed by death, what we must do is compare two possible futures (one in which the individual dies now, and another in which they continue to live) and determine which of them would be better for the individual in question, in terms of the balance between positive and negative events. If, given the individual's likely future, continuing to live would be better for them than dying, then they are harmed by death (otherwise, they are not).

In short, what this argument says is that someone is harmed by death whenever continuing to live would be better than dying, and that this must be evaluated based on the quantity of positive and negative events the individual would experience in each scenario.

Note that, according to this argument, in order for someone to be harmed by death it is not necessary to understand what death is, nor to be capable of having future-oriented desires. If this is correct, then every sentient being with the possibility of having a minimally worthwhile life ahead is harmed by death, regardless of the species to which they belong and the degree of their cognitive capacities. Therefore, the exploitation of decapods already harms them by causing their deaths, even if they do not suffer during exploitation.

¹²² See, for example, the position of Cigman (1981). For criticism of this position, see Sapontzis (1987, pp. 161-173).

¹²³ This position was defended by Singer (2011 [1993]).

¹²⁴ See, for example, the positions of Nagel (1980, pp. 1-10) and Feldman (1991).

5.3. The objection that consuming them ends negative lives

A possible objection to the above conclusion would be to agree that the harm of death consists in preventing what is positive, but to argue that consuming decapods in fact benefits them, since it puts an end to lives that are largely negative.

According to this objection, this would apply both to animals bred for this purpose (since, as we saw in the first section, they are raised in conditions highly adverse to their welfare) and to those caught in the wild (since the vast majority of those born have predominantly negative experiences).

In nature, this occurs mainly because these animals have an enormous number of offspring per clutch. For example, the shrimp *Penaeus vannamei* lays between 100,000 and 250,000 eggs per spawning,¹²⁵ and *Litopenaeus setiferus* lays between 500,000 and 1 million.¹²⁶ In populations that remain stable over several generations, we can infer that, on average, only one descendant per progenitor survives to adulthood (that is, two per clutch, and fewer than that if there are progenitors who reproduce more than once in their lifetime).¹²⁷ All the rest are generally born only to die of starvation or be eaten by other animals, often without having had any positive experience.¹²⁸ For these reasons, according to this objection, consuming them benefits them precisely by causing their death.

Let us begin by analyzing the case of decapods bred for consumption. The fact is this: if we have reasons to end their lives because they are filled with suffering, then this gives us even stronger reasons to prevent them from being born in such contexts in the first place. By consuming them, we incentivize such production, which causes new animals to be born into such contexts. Thus, the fact that the death of someone who lives a life filled with suffering frees them from such suffering does not imply that breeding animals for consumption is justified (quite the opposite).

In response, it could be objected that, in the case of animals in the wild, we are not in a position to choose to prevent them from being born and that, therefore, the best we can do is to kill them (and fishing would contribute to this). However, it is false that we are not in a position to try to prevent them from being born. For example, programs could be conducted to reduce the number of births (for instance, through the use of contraceptives).¹²⁹

An objection to this would be to claim that, with respect to those who have already been born, fishing benefits them because it kills them, freeing them from lives filled with suffering. However, there are two problems here, as we will see below.

The first is that it could be studied how to modify the environment so that their lives become positive. That is, pointing out that their lives are negative does not automatically justify killing them, since death is only a benefit if there is no other way to improve the life in question.

¹²⁵ Briggs (2009).

¹²⁶ NOAA Fisheries (2025)..

¹²⁷ For an analysis of how population dynamics affect animal suffering, see Horta (2010). For an analysis of the ethical implications of this, see Cunha (2022).

¹²⁸ About this, see Horta (2010).

¹²⁹ For an analysis of contraceptive administration programs aimed at reducing wild animal populations in Europe, see Massei (2023).

The second problem is that the main reason why suffering predominates in the lives of animals in the wild is the fact that they die very prematurely. If they manage to live longer, the possibilities for positive experiences normally increase. This is so because the factors that cause them suffering also usually cause their deaths. Thus, by eliminating sources of suffering for them we are both increasing the probability that they will have positive experiences and increasing their lifespan.¹³⁰

In summary, if there are other options to try to make the lives of these animals positive (with respect to those already born) and to prevent them from being born into lives filled with suffering, then the claim that consuming them benefits them by ending lives filled with suffering is probably not the real reason why their consumption is defended. That is, a concern for the animals themselves is alleged as a way of concealing that the real concern is to place human interests above the lives and welfare of animals.

5.4. The claim that they are benefited by being consumed, since this causes them to be born

If bringing someone into a negative life harms them, bringing someone into a positive life benefits them.¹³¹ Based on this, it could be argued that, if the system of producing animals for consumption were modified so that they had positive lives, then consuming them would be acceptable because it would benefit them by bringing them into existence. According to this position, the harm caused to the individual who is killed would be offset by the creation of a new individual who would take their place. This position is known as the replacement defense.¹³²

However, this thesis is far from obvious. In fact, it is widely regarded as unacceptable when humans are affected. For example, we do not say that it is acceptable for a couple to kill their children as long as they give birth to others to replace them. Another additional problem with this position is that the alleged reason for producing new births (namely, that this would benefit the animals if their lives are positive) simultaneously offers a reason against killing them once they already exist (since death would, in that case, deprive them of positive lives).

With regard to this latter point, it could be objected that refraining from killing them would benefit them, but it would also have the effect of reducing the number of individuals being born and, therefore, there would be fewer individuals with positive lives over time. There are at least three possible responses to this objection, which will be presented below.

The first points out that, if the goal of maximizing the number of individuals with positive lives over time justified replacement, then proponents of such a position would have to prefer killing humans and replacing them with small animals (such as decapods or insects), since a much larger number of the latter can exist in the same space. In short, the position in question, even if it were correct, would not justify humans consuming decapods.

The second response maintains that killing a sentient being who already exists is worse than failing to create a new sentient being. In the case of already existing sentient beings, there is someone who is harmed by death. By contrast, in the case of refraining from producing new beings, there are countless possibilities of future individuals. For example, if a couple decides to conceive a child this month, it does

¹³⁰ For a detailed analysis of this point, see Cunha (2022, pp. 259-261).

¹³¹ For a development of this line of reasoning, see Singer (2002 [1993], p. 132).

¹³² For examples of positions of this kind, see Crisp (1988) and Hare (1999, pp. 238-239).

not seem to make sense to say that they harmed the individual who could have been born from a different egg if they had waited until next month (and vice versa if they decide to wait until next month), since in that case what there are are countless future possibilities of individuals (and not actual individuals). By contrast, if they decide to kill a child who has already been born, it makes sense to say that they harmed them, since in that case there is already an individual, and not merely a future possibility of an individual.

It could be objected: why, then, does it make sense to say that we harm someone if we cause them to be born into a negative life and benefit them if we cause them to be born into a positive life, given that before that they were merely a future possibility of an individual? The difference, in these cases, is that through such actions we cause possibilities to become real individuals (who move from the state of nonexistence to the state of negative or positive existence), something that does not occur if the possibility remains a possibility without becoming a sentient being.

Finally, the third response criticizes the thesis that the harm done to one individual is compensated by the benefit done to another individual.¹³³ Indeed, even when a benefit is later given to the same individual, that by itself is insufficient to justify harming them. One thing is to say that, if we accidentally harm someone, we must compensate them by later conferring a benefit. Another thing is to say that, because we are going to confer a benefit later, we are now authorized to deliberately harm them. Thus, if a later benefit to the same individual is already insufficient to justify harming them, it is even more difficult to justify harming them if the later benefit is directed at another individual. It would be at least strange to say that we do nothing wrong if we cause harm to A as long as we later confer a benefit on B (and even more so if the harm to A is death and B is not yet an individual, but a future possibility of an individual).

In the [previous subsections](#) we discussed the argument that consuming decapods is justified because it causes the death of beings who have miserable lives. In this subsection we discussed the opposite argument: that consuming decapods would be justified if they had positive lives. We can summarize the problems with both views as follows. If the lives of such animals are predominantly negative to the point that death is a benefit, then there are strong reasons to prevent them from being born into such situations. However, if their lives are predominantly positive, then they are harmed by death, and that harm does not seem to be offset by the creation of another being who would have a positive life. That is, neither type of situation (negative lives or positive lives) can serve to justify exploiting them.

5.5. Attempts to ground the claim that they are only slightly harmed by death

Other attempts to justify the consumption of certain types of animals acknowledge that they are harmed by death, but argue that they are harmed only to a small degree by it. In the following subsections, we will discuss the main attempts in this regard.

5.6. The appeal to intellectual pleasures

It is sometimes argued that the more cognitively sophisticated experiences are, the more valuable they are, and that, therefore, someone is harmed to a greater extent if they are unable to experience them.¹³⁴

¹³³ For a development of this, see Horta (2007, pp. 688–690).

¹³⁴ Examples of this view include the positions of Mill (1969 [1861], pp. 209–217) and Singer (2002 [1993], pp. 83–86). Criticism of this view can be found in Cavalieri (2001) and Sapontzis (2014).

This view could be used to defend the claim that, since animals in general (and decapods in particular) are not capable of the intellectual pleasures that humans are, death would not deprive them of something very valuable and, therefore, they would not be greatly harmed by it.

A first way to question this argument is to challenge the claim that intellectual pleasures are necessarily more valuable. For example, it could be said that a non-arbitrary way of assessing the value of a pleasure is in terms of its intensity and duration, rather than assuming in advance that certain types of pleasures are more valuable than others, independently of their intensity and duration.

In this sense, being close to someone we love (a non-intellectual experience) and playing a game of chess (an intellectual experience) can be equally valuable experiences, provided that they produce the same amount of satisfaction. On the other hand, according to the conception that says intellectual experiences are more valuable, playing chess has more value than being close to someone we love, even if it produces less satisfaction, and this seems completely arbitrary.

Proponents of the view that intellectual pleasures are more valuable might object that there is a test that proves they are correct. For example, Singer suggests that we imagine what it would be like to live the life of a horse and that of a normal adult human, and then imagine a third state in which we would be neither one nor the other, but would remember what each of the lives was like.¹³⁵ He maintains that, if we carry out this exercise, we would choose the more intellectual life, and that this would prove that such a life is more valuable.¹³⁶

Cavalieri makes two criticisms of this method. The first is that we do not have access to a neutral state from which we could non-arbitrarily compare which of the lives is better. Everything we maintain is from a human perspective, which is a reason to suspect the preference for a typical human life. Moreover, even what we prefer in our typical human life depends on the circumstances. For example, if we are thirsty or hungry, at that moment we do not prefer intellectual pleasures (even though we know both types of pleasures). This suggests that it is false that, knowing both types of pleasures, we would prefer intellectual pleasures in every circumstance whatsoever. Cavalieri's second criticism is that, since the method in question appeals to what we would choose (and not to what we ought to choose), it does not show that someone would be wrong if, after imagining both types of life, they chose the less intellectual life.¹³⁷

All this shows that the thesis that intellectual pleasures are more valuable is questionable. However, even if they were, this would not ground the conclusion that animals incapable of having them are only slightly harmed by death, since this would not show that non-intellectual pleasures are not valuable, or that they are of little value.

Showing that A is more valuable than B is not showing that B is not valuable; it does not even show that B is of little value (it may, in fact, be extremely valuable, only slightly less valuable than A). For example, the non-intellectual experiences of these animals may be, as in the human case, extremely rewarding for them and, for that reason, death would harm them to a high degree by preventing them from enjoying them.

¹³⁵ Singer (2002 [1993], p. 116).

¹³⁶ Another proponent of a similar position is Mill (1969 [1861], p. 212).

¹³⁷ Cavalieri (2001, pp. 105, 110-111).

5.7. The appeal to psychological connectedness

According to a certain position, for someone to be greatly harmed by death, they must maintain a strong psychological connection with their future.¹³⁸ By psychological connection, we mean the degree to which memories, character traits, beliefs, desires, intentions, and so on are preserved.

Based on this, it could be claimed that decapods, because they possess lower cognitive complexity, have a weak psychological connection and that, therefore, they are hardly harmed by death, even when it prevents them from enjoying quite positive lives: “it is almost as if the future they lose upon dying were the future of someone else.”¹³⁹

Below we will examine two criticisms of this argument. The first argues that lower cognitive complexity does not imply a weak psychological connection. The second questions the idea that psychological connection is relevant to the magnitude of the harm of death.

5.8. Questioning the claim that they have little psychological connection

One way to deny that lower cognitive complexity implies weak psychological connection is to argue that, precisely because of lower cognitive complexity, the contents that make up the psychological connection of such beings will tend to vary less and, thus, the proportion of mental contents preserved over time will be greater. Thus, in fact, lower cognitive complexity would imply greater, not lesser, psychological connection over time.¹⁴⁰

It could be objected that, even if the proportion of shared mental contents is greater in the case of beings with lower cognitive complexity, the quantity of shared mental contents will probably be greater in the case of beings with higher cognitive complexity (even if, in their case, the proportion of shared contents is smaller).

This objection can be answered by pointing out that, if what the concept of psychological connection aims to express is how psychologically similar someone is between one moment and another, then the appropriate way to measure it is in terms of the proportion of shared mental contents, and not their quantity.

5.9. Why would psychological connection be relevant to the harm of death?

It is also possible to ask: “why, in order for someone to be greatly harmed by death, would they need to have a strong psychological connection with their future?” In subsections 5.10 and 5.11 we will discuss the two main attempts at explanation.

¹³⁸ See, for example, the position of McMahan (2002, pp. 165-174).

¹³⁹ This claim is made by McMahan (2002, p. 170) to defend the view that very young children are hardly harmed by death, but he applies the same thesis to the death of many nonhuman animals.

¹⁴⁰ For a defense of this position, see Horta (2007, p. 752) and Faria (2023, p. 28).

5.10. Does psychological connection determine identity?

The identity-centered explanation claims that what makes someone the same individual over time is their psychological connection.¹⁴¹ Based on this, it is argued that beings who do not possess a temporal sense of self (that is, who do not possess memories nor can imagine themselves in the future) are replaceable.¹⁴² The reason for this, according to this position, would be that, if there is not the same individual in that body over time (but rather several individuals arising and disappearing at each moment), then it makes no difference whether that body is kept alive or killed and another is brought into existence: in any case, the individual who exists now is annihilated (the difference would only be whether the new individual is born in that same body or in another).

A first important point to note regarding this position is that it could only be used to defend the replacement of beings who possess no psychological connection at all. But this is not the case with decapods (since, as we saw in subsection 2.3.5, they form memories).

Moreover, it is possible to question the idea that what makes someone the same individual over time is their psychological connection. For example, it could be pointed out that, although someone who has lost their memories “is no longer the same” in the sense of being very psychologically different from what they were before (that is, they are no longer the same qualitatively), this does not imply that it is another individual (numerically) occupying that body and that the previous individual has been annihilated.¹⁴³ The fact that they do not remember what they experienced up to that point does not imply that it is another consciousness (numerically) experiencing the world.

That is, the position in question assumes that, for someone to be the same individual (numerically) over time, they must know that they are the same individual (numerically) over time. But if someone were no longer the same individual over time, there would be no way for them to know this. Thus, it is not the fact that someone knows they are the same individual over time that makes them the same individual over time. If that is so, then psychological connection does not determine the (numerical) identity of an individual.

5.11. The appeal to intuitions

Another way of attempting to explain the relevance of psychological connection to the magnitude of the harm of death is to argue that, if it is measured solely in terms of how much an individual would be deprived of positive events, we will arrive at absurd conclusions, and that we avoid these by postulating that psychological connection is relevant to the magnitude of the harm of death.¹⁴⁴

Among these allegedly absurd conclusions would be: (1) that certain nonhuman animals would be more harmed by death than certain humans (for example, if the animal in question had enjoyed less up to that

¹⁴¹ This view is normally attributed to Locke (2008 [1694]), but it was also defended by several philosophers in the twentieth century. For a list of these authors, see Olson (2019 [2002]).

¹⁴² Defenses of replacement can be found in Singer (2002 [1993], pp. 128-143), Ferré (1986, p. 399), Scruton (1996, p. 100), and Hare (1999, pp. 238-239).

¹⁴³ On this distinction, see Noonan & Curtis (2018 [2004]).

¹⁴⁴ See, for example, the positions of Cigman (1981), McMahan (2002, p. 165; 2019), Belshaw (2016), and Dossena (2024a, p. 128; 2024b).

point and had more ahead to enjoy); (2) that, normally, children are more harmed by death than adults (because they have enjoyed less so far and would have more ahead to enjoy); (3) that the worst moment to die is the first moment at which the fetus becomes sentient (since in that case it has not yet enjoyed anything and would have everything ahead to enjoy) and that, therefore, normally already-sentient fetuses are more harmed by death than individuals who have already been born.

According to this position, we avoid these implications if we measure the magnitude of the harm of death by multiplying the value of what the individual would be deprived of by the psychological connection they would maintain with their future.¹⁴⁵ According to this view, animals who have little psychological connection are not greatly harmed by death, even if it deprives them of quite satisfying experiences (since these would be multiplied by a very low value).

A clear problem with this position is that it does not take into account the possibility that the intuition that those conclusions are absurd may be mistaken. Proponents of this position argue that this intuition is correct if the degree of psychological connection is relevant to the magnitude of the harm of death. But in response, we may ask: “and why would the degree of psychological connection be relevant to the magnitude of the harm of death?” And the answer offered by proponents of the position in question is: “because it grounds that intuition”.¹⁴⁶ If that is so, then the reasoning is clearly circular.¹⁴⁷

5.12. Magnitude of the harm of death and the length of the lifespan

5.12.1. The claim that it is not wrong to kill those who have little time ahead

A position sometimes defended is that animals who would have little time left to live are only slightly harmed by death. Having little time left to live is something that could occur either when the lifespan of the species in question is short, or when it is long but the animal is near the end of that lifespan.

There are at least three ways to question this position. The first points out that it would not apply to the case of many decapods normally exploited, since they would have much time left to live. The second is to question the thesis that, if someone has little time left to live, they are only slightly harmed by death. Finally, the third argues that someone being only slightly harmed by death is insufficient to justify killing them. We will examine each of these challenges in the following subsections.

5.12.2. The objection would not apply to the case of many decapods

Below is a table with the characteristic¹⁴⁸ lifespan of the decapod species whose members are most commercially exploited, as well as the approximate age at which they are killed¹⁴⁹ and how much time they would have left to live if they were not killed:

¹⁴⁵ This view is defended by McMahan (2002, pp. 43, 66-69, 75-80).

¹⁴⁶ McMahan (2002, pp. 78, 165-171, 232-233).

¹⁴⁷ McMahan himself acknowledges this circularity (2002, p. 78).

¹⁴⁸ For these data, see Dugassa & Gaetan (2018) and Vogt (2012, 2018, 2019).

¹⁴⁹ For these data, see Horn (2012), Maxwell et al. (2013), Fortuna (2023) and Krisandini (2024).

Species	Lifespan (in years)	Approximate age at which they are killed (in years)	How much time would remain to live (in years)
<i>Penaeus vannamei</i>	1,5	0.6	0.9
<i>Litopenaeus stylirostris</i>	1,7	0.6	1.1
<i>Macrobrachium rosenbergii</i>	3	0.58	2.42
<i>Eriocheir sinensis</i>	5	2	3
<i>Astacus leptodactylus</i>	7	3.5	3.5
<i>Cardisoma guanhumi</i>	20	Between 3 and 4	Between 16 and 17
<i>Panulirus argus</i>	30	Between 2 and 2.5	Between 27.5 and 28
<i>Homarus gammarus</i>	72	Between 4 and 8	Between 64 and 68

Thus, the objection in question would certainly not apply to the last three species. In fact, it is questionable whether it would apply in any case, since, for example, when a human still has 3.5 years of life ahead, we do not say that they have little time left to live (nor even if they have only 0.9 years of life ahead). Nevertheless, even if it is insisted that the objection applies to the first five cases, it is still possible to question the thesis that such animals are only slightly harmed by death. This is what we will examine in the next subsection.

5.12.3. Various ways of calculating the magnitude of the harm of death

To assess the claim that having little time left to live makes death a trivial harm, it is important to note that there are several ways of measuring how serious the harm of death is, taking into account the moment at which it occurs. Some are presented below.

The first two take into account either only the future or only the past:

A. Future only. The greater the amount of time remaining, the greater the harm of death.

B. Past only. The less someone has lived up to now, the greater the harm of death.

There are other ways that take into account both the future and the past. However, there are many ways of establishing the relationship between these two factors. Two examples are given below:

C. Percentage. The smaller the proportion of life lived so far relative to life expectancy, the greater the harm of death. For example, suppose an animal has a typical lifespan of one year and dies at one month of age. It has lived 8.3% of what it could have lived. According to this formula, the magnitude of the harm of its death is 91.7% (with 100% being the maximum harm, which occurs when someone dies as soon as they begin to exist as a sentient being).

D. Priority. This measures the magnitude of the harm of death on the assumption that the less someone has enjoyed up to now, the more valuable an additional moment of enjoyment is. Suppose that A and B would each have 40 years of enjoyment ahead, but that A has enjoyed 20 years so far and B only 10 years. According to this way of measuring, although A and B have the same amount of enjoyment ahead, that time would be more valuable for B because B has enjoyed less up to now. This method will yield different results from the percentage-based one. For example, suppose that A has a lifespan of 20 years and has already lived 10 years, and that B has a lifespan of 10 years and has already lived 5 years.

According to the Percentage formula, the magnitude of the harm of death for both is equal, since both have lived 50% of their total lifespan. According to the Priority formula, however, it would take into account both that A has more time remaining and that B has lived less up to now.

A formula for calculating the magnitude of the harm of death according to this conception is the following:¹⁵⁰ $g(T) - g(P)$, where T is the total well-being of the individual's life if they were to live the maximum of their life expectancy, P is the well-being the individual has experienced up to the present, and g is a strictly increasing and strictly concave function. It is strictly increasing because the more well-being an individual has had, the greater the total well-being. It is concave to represent the idea that the less well-being someone has had up to now, the greater the harm of not having an additional unit of well-being.

We will now see how each of these measurement methods would have to assess the magnitude of the harm of death.

5.12.4. Assessing the magnitude of the harm of death according to four formulas

A. According to the Future-only formula, those who have less time left to live are less harmed by death (than those who have more time left), whether they are individuals whose lifespan is short or individuals whose lifespan is long but who are near its end. For example, suppose that an animal has a lifespan of one year and has lived one month so far, and that a human (whose average life expectancy is 73 years) has lived 72 years and one month so far. According to this method of measurement, the magnitude of the harm of death for both is the same, since both have 11 months remaining.

This formula does not necessarily imply that individuals who have less time left are only slightly harmed by death. It implies only that they are less harmed than individuals who have more time remaining. For example, suppose that a human is born with a disease that will cause them to live only a few years (but that until then their life will be satisfactory). This human does not seem to be only slightly harmed by a premature death simply because their life expectancy is short. On the contrary, it seems that they are greatly harmed if they are unable to experience the little time that still remains.

B. According to the Past-only formula, how much time someone has ahead does not matter: all that matters is how much someone has lived up to now. According to this formula, all nonhuman animals (regardless of the length of their lifespans and how much time remains ahead for them to live) are as harmed by death as humans would be if they died at the same age.

C. According to the Percentage formula, the size of the lifespan and the amount of time remaining to be enjoyed do not directly matter: what matters directly is how much the time lived so far represents as a percentage of total life expectancy. For example, according to this formula, a nonhuman animal who is killed at 15% of its lifespan is as harmed by death as a human killed at 15% of their lifespan, regardless of the typical lifespan of each species.

D. According to the Priority formula, the time remaining to be lived must be weighed in relation to the time lived up to now. For example, let us again compare an animal with a life expectancy of one year

¹⁵⁰ This formula for the harm of death was developed by Ribeiro (2024) based on a formula suggested by Adler & Holtug (2019) for comparisons of harms in general (and not only the harm of death).

who has lived one month so far with a human (whose average life expectancy is 73 years) who has lived 72 years and one month so far. According to the Priority formula, in this case the nonhuman animal would be more harmed by death than the human, since although both have the same time left to live, the nonhuman animal has enjoyed much less so far. Of course, according to this formula the magnitude of the harm of death would vary greatly depending on how much the remaining time and the time already lived vary for the individuals being compared. However, according to this formula, in most cases the harm of death for nonhuman animals is greater than according to the Future-only formula.

5.12.5. The magnitude of the harm of death and the moment at which it occurs

Of all four formulas we have examined, the one that takes into account only future time is the least favorable to recognizing that death greatly harms animals who have little time left to live. Nevertheless, even this formula would have to recognize that they are as harmed by death as humans would be who had the same time left to live. We have also seen that there are at least three other formulas, and all of them generally imply recognizing a greater harm of death than the formula that takes into account only the future.

5.12.6. What if the passage of time is different for animals of different species?

It is possible that members of different species have different perceptions of the passage of time. According to a certain theory, smaller animals would have brains that process information more rapidly, making their “internal clock” of time perception faster, such that what for us seems like a week would be experienced by such an animal as the equivalent of months or years.¹⁵¹

Let us call this theory the Different Time Theory (DTT). In contrast, let us call the theory that holds that subjective time perception is the same regardless of species the Equal Time Theory (ETT). Our analysis in the previous subsection presupposed the ETT. We will now examine how each of the four formulas above would have to assess the magnitude of the harm of death if the DTT were correct.

- The **Future-only** formula would have to maintain that the harm of death for these animals would be greater than if time perception were equal, since they would then have more time of enjoyment ahead (how much greater would depend on how much faster their internal clock of time perception is).
- According to the **Past-only** formula, the harm of death for these animals would be smaller than if subjective time were equal, but this would not imply that it would necessarily be small.
- According to the **Percentage** formula, there would be no change at all in the magnitude of the harm of death, since what matters for this formula is how much the moment of death represents as a proportion of total lifespan, and not the size of the lifespan.
- According to the **Priority** formula, while the fact that they had experienced more subjective time up to that point would contribute to reducing the magnitude of the harm of death, the fact that they had a greater amount of subjective time ahead would contribute to increasing the harm of death.

¹⁵¹ For a discussion of this, see Tomasik (2019 [2016]).

In summary, whether the DTT or the ETT is correct, there is no basis for claiming that death only slightly harms sentient beings who have little time left to live.

5.12.7. If someone has little time left to live, does that justify killing them?

In the previous subsections it was argued that someone having little time left to live does not imply that they are only slightly harmed by death. Nevertheless, suppose that, under such conditions, an individual would be only slightly harmed by death. This does not seem sufficient to justify killing them. For example, even if a human has only a few months, or only a few days (or even a single day) of positive life ahead, it is normally considered unacceptable to kill them, even while recognizing that, in this case, their death would be a much smaller harm than if they had years of life ahead. If this view is correct, then a nonhuman animal having little time left to live is also not a justification for killing them.

5.13. Conclusion

Given what we have discussed in this chapter and in the previous one, there appears to be no way to justify the exploitation of sentient animals, including decapods, regardless of whether exploitation causes them suffering and death or only death. If that is so, then we should aim to abolish this exploitation. In the next section, we will discuss some strategies in this regard.

PART III

WHAT SHOULD BE DONE TO CHANGE
THE SITUATION OF DECAPODS?

6. ASSESSING DIFFERENT STRATEGIES TO CHANGE THE SITUATION OF DECAPODS

In the first section of this work, evidence was presented that decapod crustaceans are sentient, along with a description of how these animals are harmed when they are exploited. In the second section, the ethical implications of the facts described in the first section were analyzed. The main conclusion of the second section was that there is no justification for such exploitation and that, therefore, the goal should be to abolish it. The present section analyzes different strategies that could be used to change the situation of decapods.

In the following chapters, five strategies in this regard will be discussed.

The topics will be divided as follows:

Chapter 7 discusses the strategy of combating consumption.

Chapter 8 discusses the strategy of investing in products that are alternatives to those of animal origin.

Chapter 9 discusses the strategy of promoting moral consideration for animals.

Chapter 10 discusses the strategy of attempting to secure legal rights for animals.

Chapter 11 discusses the strategy of attempting reforms in exploitation.

Chapter 12 suggests some possibilities for further developments in terms of more precise comparisons between the different strategies.

7. TWO STRATEGIES FOCUSED ON REDUCING CONSUMPTION

7.1. Introduction

One way to combat the exploitation of decapods is to combat their consumption. In this chapter, the advantages and disadvantages of two strategies of this kind will be compared: promoting veganism and promoting reduced consumption.¹⁵²

7.2. Arguments in favor of focusing on promoting reduced consumption

The main arguments in favor of focusing on asking people to reduce their consumption are the following:

1. Asking people to reduce is less demanding than veganism. In addition, it does not carry the same stigma associated with veganism. Therefore, more people would probably adopt reduction than veganism.
2. It may be that many more people doing much less has a greater impact than many fewer people doing much more.
3. For people to demand the abolition of animal exploitation, it may be sufficient that they make only a minimal change in their consumption. Thus, focusing on reduction may generate broader public support for the cause that aims to end animal exploitation.¹⁵³
4. A focus on reduction provides an opportunity to explain that different animal products have different impacts on suffering and on the number of animal deaths. For example, it provides an opportunity to explain that consuming shrimp and insects causes far more deaths than consuming other animal-based products.¹⁵⁴
5. Even if the goal is to get people to become vegan, advocating reduced consumption can be a good “foot-in-the-door” strategy,¹⁵⁵ in which one begins by proposing something less demanding in order to try to make the ultimate goal more easily accepted later, step by step. For example, if Person A asks for five dollars and Person B agrees to donate once, this increases the likelihood that B will agree to donate another five dollars later, more than if A had initially asked for ten dollars..

7.3. Arguments in favor of focusing on promoting veganism

The main arguments in favor of focusing on the promotion of veganism are the following:

¹⁵² For more details on this debate, see Anthis (2020 [2017b]).

¹⁵³ Kateman (2015).

¹⁵⁴ Cunha (2024).

¹⁵⁵ On this strategy, see Freedman & Fraser (1966).

1. It more strongly emphasizes that consideration for animals is a serious matter.
2. Each person who adopts veganism causes a greater reduction in the number of animals born to suffer and in total deaths.
3. It is possible that a smaller number of vegans may have a greater impact than a larger number of people who merely reduce consumption. For example, adopting veganism increases the likelihood that someone will become an activist.
4. There is research suggesting that, on average, higher goals produce greater changes than more moderate goals.¹⁵⁶
5. Popularizing veganism now and reducing the stigma associated with it¹⁵⁷ is important if the goal is large-scale adoption of veganism in the future.
6. A focus on reduction may give the public the impression that there is nothing wrong with animal exploitation (since, when a practice is unjust, one advocates abolishing it). Thus, it is doubtful that focusing on reduction will lead people to defend the abolition of exploitation.
7. Asking people to reduce consumption may, paradoxically, increase the number of animals exploited. This would happen if people misunderstand the message and, instead of consuming no animal products on some days of the week, avoid beef and instead consume crustaceans, fish, poultry, milk, or eggs. However, this can be avoided if the message in favor of reduction is clear (for example, by explaining that the public should prioritize avoiding the consumption of crustaceans and insects, because the small size of such animals implies more deaths to produce the equivalent amount of meat). Even so, there remains the risk that the public will not pay attention to these important details of the message.
8. Veganism necessarily focuses on consideration for animals.¹⁵⁸ By contrast, reduced consumption can be adopted for environmentalist and anthropocentric reasons (although it can also be adopted out of consideration for animals). There is a consensus among researchers that focusing on animals is not only more effective¹⁵⁹ for benefiting animals, but also that using environmentalist and anthropocentric arguments is likely to be counterproductive.¹⁶⁰
9. Even if one's aim is to advocate reduced consumption, promoting veganism may be a good "door-in-the-face" strategy.¹⁶¹ That is, one first proposes something more demanding, with the aim that the ultimate goal will be more easily accepted afterward. For example, if Person A asks for fifty dollars and Person B refuses, and then A asks for five dollars, the probability that B will agree to donate is greater than if A had started by asking for five dollars, which is what A actually intends to obtain.

¹⁵⁶ See Pearson (2012).

¹⁵⁷ On this stigma, see Cole & Morgan (2011).

¹⁵⁸ Cunha (2023).

¹⁵⁹ See Anthis (2017a).

¹⁶⁰ See Greig (2017).

¹⁶¹ On this strategy, see Cialdini et al. (1975).

7.4. Conclusion and some additional questions

The above discussion suggests that the outcome of each strategy will depend on: (1) how much greater or smaller the number of people reached by each strategy will be, and (2) how much benefit for animals each of those people would bring about. Additional questions include the following: (1) Is it better to focus on a single strategy or on both, but to different degrees? (2) Should everyone focus on the same strategies? (3) Should an individual's focus (on one or both strategies) remain constant, or should it vary over time? For reasons of space, we will not address these questions here, but it is important to keep them in mind. In addition, it is important to note that everything discussed here concerns changes in individual attitudes. Another parallel and important discussion is whether we should focus on changes in individual attitudes or on institutional changes.¹⁶²

¹⁶² For a summary of the discussion on this topic, see Anthi (2020 [2017b]).

8. DEVELOPING ALTERNATIVES TO ANIMAL-DERIVED FOODS

8.1. Introduction

In this chapter, we will discuss another possible strategy to change the situation of decapods (and of exploited animals in general): focusing on the development of alternatives to animal-derived foods. Unlike the strategies discussed in the previous chapter, whose focus is to try to get the public not to consume (or to consume less) products of animal exploitation, here the focus is simply to invest in the development, cost reduction, and deployment of foods that substitute for the use of animals. The idea underlying this type of strategy is that, if alternatives to animal-based diets are available and affordable, that alone may bring about a reduction in animal exploitation.

Below we will compare four alternatives to animal-derived products in terms of their possibilities in the market:

- Plant-based products.
- Cultivated meat.
- Alternative proteins based on fermentation and algae.
- Direct consumption of plant foods.

Section 8.2 lists the main segments of the first three alternatives, as well as comparing their respective market sizes in 2024 and their projected growth through 2034. **Section 8.3** compares each of these three alternatives with products from animal exploitation, again in terms of their respective market sizes in 2024 and projected growth through 2034. **Section 8.4** presents the same type of analysis, but with respect to the direct consumption of plant foods. **Section 8.5** provides a summary of the debate surrounding cultivated-meat technology. **Section 8.6** compares the strategy of focusing on food technology with other possible strategic focuses for changing the situation of animals. Finally, **Section 8.7** presents the conclusions regarding the strategy focused on food technology.

Note that the alternatives listed are not necessarily alternatives specifically to the consumption of decapods (although some of their products may imitate equivalents of decapod exploitation). Nevertheless, they are all listed as alternatives because: (1) they can reduce animal exploitation in general; and (2) they can indirectly reduce the consumption of decapods by offering non-animal products on the market.

8.2. Comparing the impact of three alternatives

In this section, we will address specifically the products that aim to offer substitutes for equivalent animal-derived products:

- Plant-based products.
- Cultivated meat.
- Alternative proteins based on fermentation and algae.

Therefore, in this section we will not yet address the other segments of plant-based diets in general, such as directly consuming fruits, cereals, legumes, grains, vegetables, and so on. The direct consumption of plant foods will be addressed in **Section 8.4**.

8.2.1. Plant-based products

Main segments

- Plant-based meats: include burgers, sausages, hot dogs, and nuggets made from plant proteins.
- Plant-based dairy: plant-based milks, cheeses, and yogurts, such as soy, almond, and oat.
- Other products: ice creams, mayonnaise, and egg alternatives.

Market size in 2024

The global plant-based food market was valued at approximately US\$ 28.6 billion in 2024, with expectations of significant growth in the coming years.¹⁶³ 59% of households in the United States purchased plant-based products in 2024, representing 1.1% of total retail food and beverage sales.¹⁶⁴ There was a 5% growth in global plant-based food sales in 2024, despite economic challenges.¹⁶⁵

Growth projection through 2034

There is a prospect of continued growth, with an estimate of reaching between US\$ 50–60 billion in terms of global market value by 2034.¹⁶⁶

8.2.2. Cultivated meat

Cultivated meat is produced through the culture of animal cells, resulting in a final product with the same appearance, taste, and texture as conventional meat.¹⁶⁷

Main segments

So far, cultivated-meat production has mainly focused on producing the equivalent of beef,¹⁶⁸ but there is already work on producing poultry,¹⁶⁹ pig meat,¹⁷⁰ fishes,¹⁷¹ decapod crustaceans such as shrimps and lobsters,¹⁷² and even on producing dairy products.¹⁷³

Market size in 2024

The global cellular meat market was valued at US\$ 568.83 million in 2024.¹⁷⁴

¹⁶³ Hajjar (2025).

¹⁶⁴ Kirchner, J. et al. (2025).

¹⁶⁵ Mridul (2025).

¹⁶⁶ Precedence Research (2025b).

¹⁶⁷ Letti et al. (2021), Warner (2019), Zhang et al. (2020), Jairath et al. (2021), Huntley & McLaren (2024, p. 3).

¹⁶⁸ Chodkowska et al. (2022)

¹⁶⁹ Aleccia & Ungar (2023).

¹⁷⁰ Morrison (2023).

¹⁷¹ Tsuruwaka & Shimada (2022), Tsui (2023).

¹⁷² Chandimali et al. (2024), Wired Brand Lab (2022), BLUU Seafoods (2023), Nature Communications (2023).

¹⁷³ Remilk (2024).

¹⁷⁴ Pandey (2025).

Growth projection through 2034

There is a projected growth to US\$ 36.57 billion by 2034, representing a compound annual growth rate (CAGR) of 51.64%.¹⁷⁵ Large conventional meat companies, such as Cargill and Tyson, have been investing heavily in cultivated meat.¹⁷⁶

8.2.3. Alternative proteins: Fermentation and algae**8.2.3.1. Fermented proteins***Main segments*

- Precision fermentation: uses genetically modified microorganisms to produce specific proteins, such as albumin or casein.
- Traditional fermentation: applied in the production of fermented foods such as tempeh and miso, which are rich in protein and widely consumed.

Applications

- Egg and dairy substitutes.
- Ingredients for plant-based meats.
- Dietary supplements and functional products.

Market size in 2024

Market size in 2024 was approximately US\$ 472.91 million.

Growth projection through 2034

The projection for 2034 is to reach US\$ 1,768.38 million, with a CAGR of 14.2% from 2025 to 2034.¹⁷⁷

8.2.3.2. Algae proteins*Main sources*

- Spirulina and chlorella: unicellular microorganisms rich in protein and essential amino acids.
- Seaweeds (such as nori, kombu, and wakame): used in various Asian cuisines, rich in protein, fiber, vitamins, and minerals.

Market size in 2024

Market size in 2024 was approximately US\$ 933 million.

¹⁷⁵ Pandey (2025).

¹⁷⁶ Starostinetskaya (2021), Huntley & McLaren (2024, p. 6).

¹⁷⁷ InsightAce Analytic (2025).

Growth projection through 2034

The projection for 2034 is to reach US\$ 1.54 billion, with a CAGR of 5.1% from 2025 to 2034.¹⁷⁸

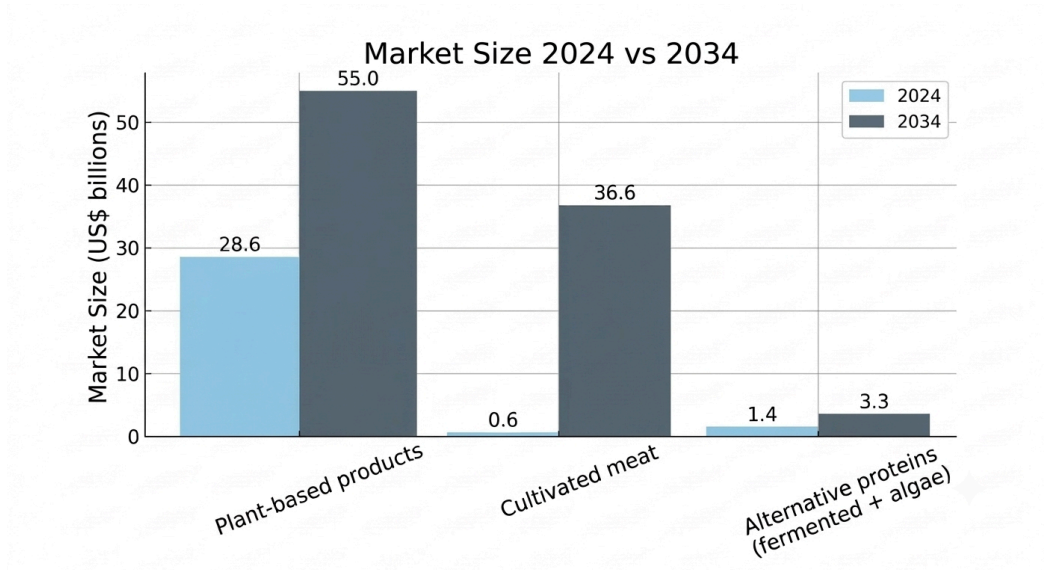
8.2.4. Comparative tables and charts

Category	Market Size in 2024	Projection for 2034	CAGR (2025–2034)
Plant-based products	US\$ 28.6 billion	~US\$ 50–60 billion	5–6% (approx.)
Cellular (cultivated) meat	US\$ 568.8 million	US\$ 36.57 billion	51.6%
Alternative proteins (fermented + algae)	US\$ 1.405 billion	US\$ 3.308 billion	9.7% weighted average*
Fermented	472,91 millones	US\$ 1.768 billion	14.2%
Algae	933 million	1.54 billion	5.1%

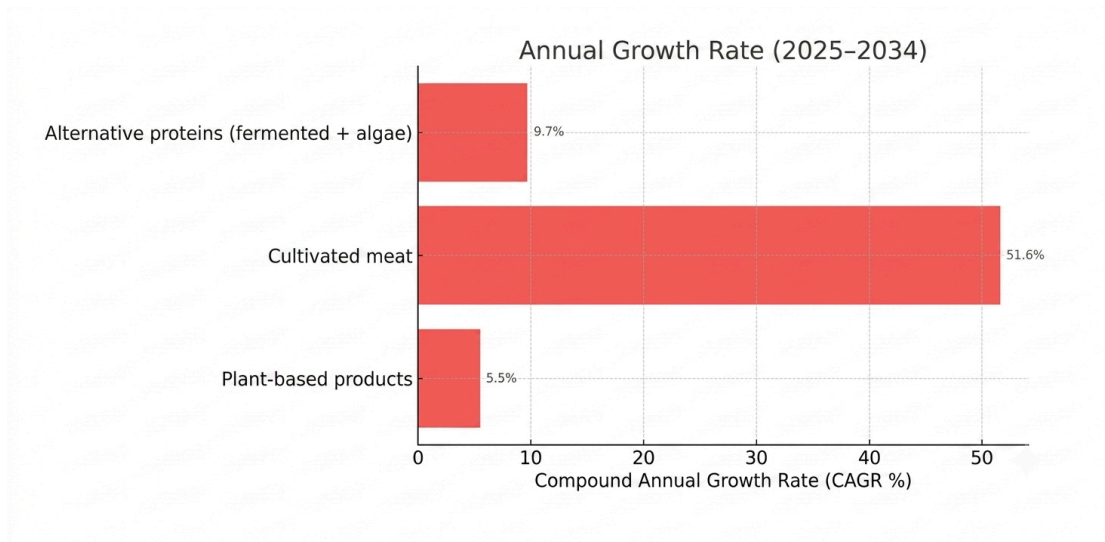
* Weighted CAGR calculation (considering relative market size):

$$\text{Weighted CAGR} = \frac{472,91 \times 14,2 + 933 \times 5,1}{472,91 + 933} \approx 9,7\%$$

The data in this table are illustrated in the two graphs below.



¹⁷⁸ Good Global Market Insights (2025).



8.3. Comparing with the animal exploitation market

Now let us compare the data from the previous section with the data on products derived from animal exploitation. Regarding the latter, the data vary considerably depending on the source. Below is a table with various sources referring to the market for products from the exploitation of: (1) aquatic animals (vertebrates and invertebrates); (2) terrestrial vertebrates; and (3) terrestrial invertebrates (in this case, insects).

The data below, on the market for the exploitation of aquatic animals, include the exploitation of decapod crustaceans, fishes, mollusks, etc.

Exploitation of aquatic animals			
Source	Market in 2024	Projection for 2034	CAGR
Precedence Research ¹⁷⁹	USD 239.33 billion	USD 370.54 billion	~ 4.47 %
Globe Newswire ¹⁸⁰	USD 310.66 billion	USD 513.31 billion	~ 5.15 %
PR Newswire ¹⁸¹	USD 311.1 billion	USD 573.7 billion	~ 5.2 %

¹⁷⁹ Precedence Research (2026a).

¹⁸⁰ Precedence Research (2025a).

¹⁸¹ Allied Market Research (2024).

The following data, on the market for the exploitation of terrestrial vertebrates, include beef, pig, and poultry meat, egg production, dairy products, processed goods, and value-added products.

Exploitation of terrestrial vertebrates			
Source	Market in 2024	Projection for 2035	CAGR
Market Research Future ¹⁸²	USD 1.5 trillion	USD 1.8 trillion	~ 1.45 %
WiseGuy Reports ¹⁸³	USD 1.6 trillion	USD 2.5 trillion	~ 4.2 %

¹⁸² More (2026).

¹⁸³ WiseGuyReports (2025).

The projections of both studies were made through 2035. By interpolating the data in order to adjust them to 2034 and taking the CAGR into account, we obtain the following:

Exploitation of terrestrial vertebrates			
Source	Market in 2024	Projection for 2034	CAGR
Market Research Future	USD 1.5 trillion	USD 1.8 trillion	~ 1.45 %
WiseGuy Reports	USD 1.6 trillion	USD 2.4 trillion	~ 4.2 %

The following data relate to the market for the exploitation of insects:

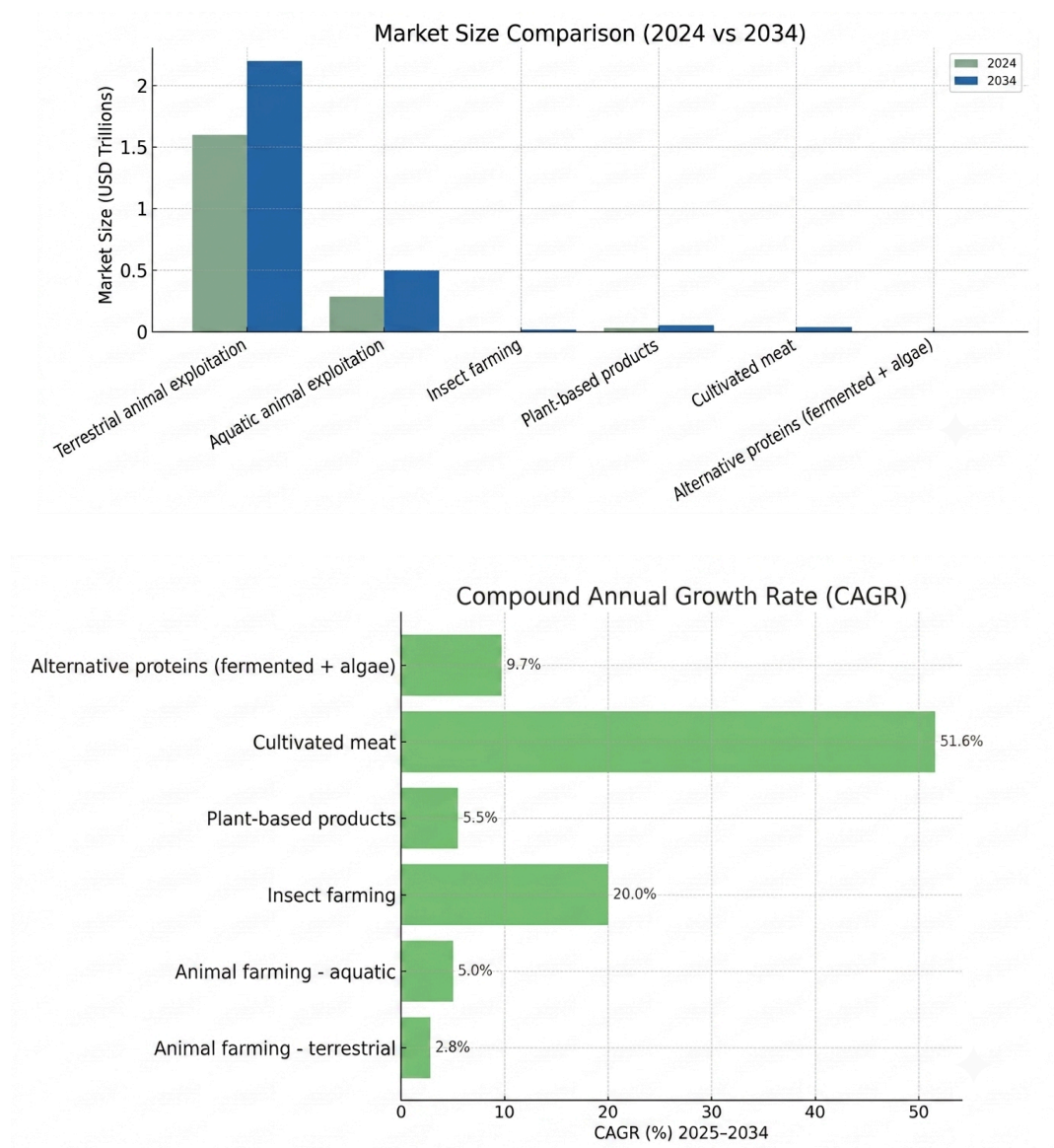
Exploitation of terrestrial invertebrates (insects)			
Source	Market in 2024	Projection for 2034	CAGR
Precedence Research ¹⁸⁴	1.48 billion	9.14 billion	~19.97 %

¹⁸⁴ Precedence Research (2026b).

The following table compares all segments of animal exploitation with the data from the three alternatives to animal-derived products discussed in the previous section:

Category	Market size in 2024	Projection for 2034	CAGR (2025–2034)
Products from the exploitation of terrestrial vertebrates	~US\$ 1.5-1.6 trillion	~US\$ 2.1-2.4 trillion	1.4 - 4.2 % (approx.)
Products from the exploitation of aquatic animals	~US\$ 239-311 billion	~US\$ 370-573 billion	4.5 - 5.2 % (approx.)
Products from the exploitation of insects	1.48 billion	9.14 billion	19.97 %
Plant-based products	US\$ 28.6 billion	~US\$ 50–60 billion	5–6% (approx.)
Cultivated meat	US\$ 568.8 million	US\$ 36.57 billion	51.6%
Alternative proteins (fermented + algae)	US\$ 1.405 billion	US\$ 3.308 billion	9.7%

The data in this table are illustrated in the two graphs below.



Note that the CAGR of the animal market is relatively modest compared, for example, to the explosive scaling projected for cultivated meat. These data reflect expectations of disruption (that is, an innovation that profoundly changes the structure of a sector) or aggressive adoption (given the expected speed of acceptance) of cultivated meat. However, it is important to note that these expectations are subject to many technical, regulatory, and other risks. Moreover, comparing emerging markets (such as those for alternatives to products from animal exploitation) with consolidated markets (such as animal exploitation) requires caution, since the animal market is much larger in scale, has established channels, consumption habits, global reach, etc., which creates a high “barrier to entry” for alternatives.

Also note that the animal-exploitation figures we saw in this section refer to market size, which does not necessarily coincide with the number of animals exploited. For example, the market share occupied by products from the exploitation of terrestrial vertebrates is much larger than that occupied by products

from the exploitation of aquatic animals and insects. However, the number of aquatic animals and insects exploited is much larger than that of terrestrial vertebrates. This happens because, since these animals are generally smaller (shrimps and insects, for example), it is necessary to kill a much larger number of them to produce the equivalent in kilograms of meat, for example.

The following table presents comparative data on the number of animals killed in each sector of animal exploitation for consumption:

Type of exploitation for consumption	Animals killed globally per year
Mammals and birds	Around 80 billion ¹⁸⁵
Fishes farmed in factories	Between 51 and 167 billion ¹⁸⁶
Fishes caught directly in the sea	Between 787 billion and 2.3 trillion ¹⁸⁷
Aquatic animals used as feed for farmed fishes for consumption	Between 462 billion and 1.1 trillion ¹⁸⁸
Farmed decapod crustaceans	Between 255 and 604 billion ¹⁸⁹
Silkworms for silk production	Between 420 billion and 1 trillion ¹⁹⁰
Insects killed for consumption	Between 2 and 3.2 trillion ¹⁹¹
Cochineals in the production of carmine dye	Between 4.6 and 21 trillion ¹⁹²
Shrimps caught directly in the sea	Around 25 trillion ¹⁹³

¹⁸⁵ Our World in Data (2025), Sanders (2018).

¹⁸⁶ fishcount.org.uk (2019).

¹⁸⁷ Ibid.

¹⁸⁸ Ibid.

¹⁸⁹ Ibid.

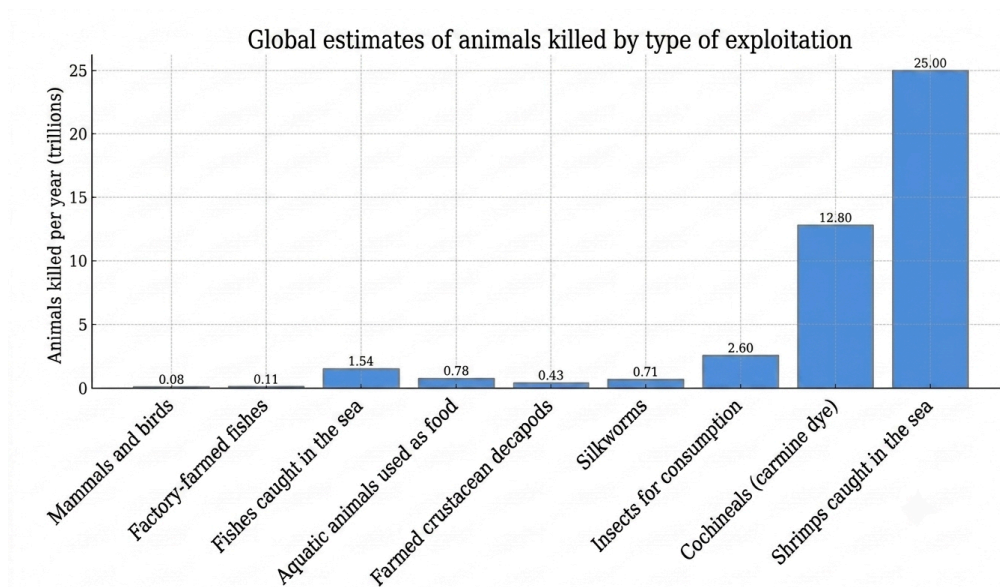
¹⁹⁰ Rowe (2021).

¹⁹¹ Rowe (2020b).

¹⁹² Rowe (2020a).

¹⁹³ Waldhorn & Autric (2023).

The data in this table are illustrated in the following graph:



8.4. The market for vegetables consumed directly

Vegetables consumed directly were included as an alternative to animal-derived products because, although they do not represent alternatives to specific equivalent animal products, an increase in the habit of consuming vegetables (and vegetable-based prepared dishes) may represent a decrease in the consumption of animal-derived products.

The calculation of the global market for vegetables consumed directly was made by summing the data from the fresh produce market and from grains and cereals, explained below.

Fresh produce

The term “fresh produce” refers to the set of fresh plant-based agricultural products intended for direct consumption, without undergoing significant industrial processing.¹⁹⁴

The concept excludes:

- Animal-derived products (meat, milk, eggs, etc.).
- Processed plant products (canned, frozen, dried, powdered, fermented).
- Industrialized plant-based products (such as plant-based meats or milks).
- Dry grains and cereals (such as rice, wheat, corn, soy), as they are classified in other markets.
- Dry legumes (beans, lentils, chickpeas, dry soybeans).

In summary:

Fresh produce = fruits + vegetables + leafy greens + tubers + greens + fresh herbs consumed in natura or minimally prepared (washed, cut, packaged).

Grains and cereals

To cover the remainder of direct plant-based food consumption, it is necessary to add grains, cereals, and legumes, which represent a very significant share of global plant consumption.

The data for these two categories, as well as their sum, are presented in the following table:

Category	Market size in 2024	Projection for 2034	CAGR (2025–2034)
Fresh Produce ¹⁹⁵	USD 3.5 trillion	USD 5.6 trillion	4.8 %
Grains and cereals ¹⁹⁶	USD 374 billion	USD 496 billion	5.9 %
Estimated total	USD 3.8 trillion	USD 6.1 trillion	5.3%

¹⁹⁵ Allied Market Research (2025).

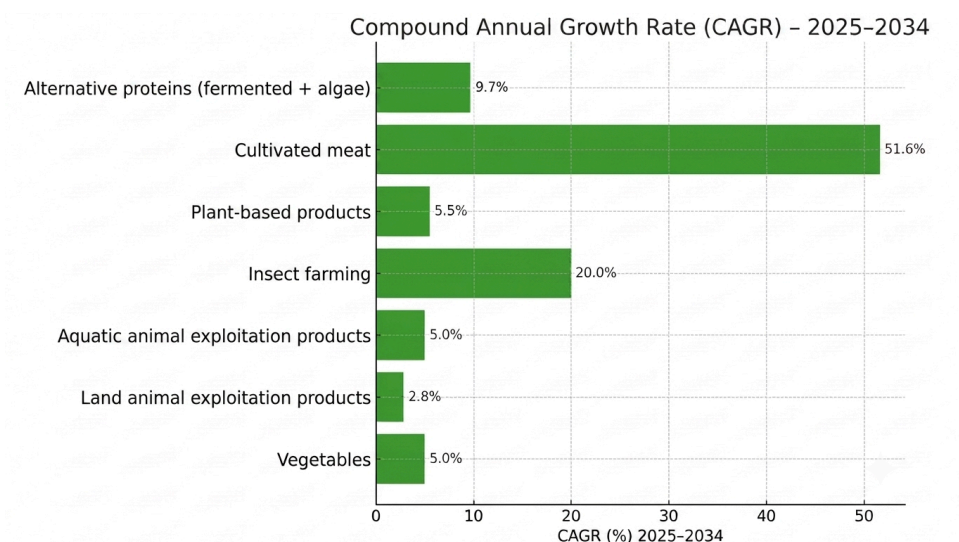
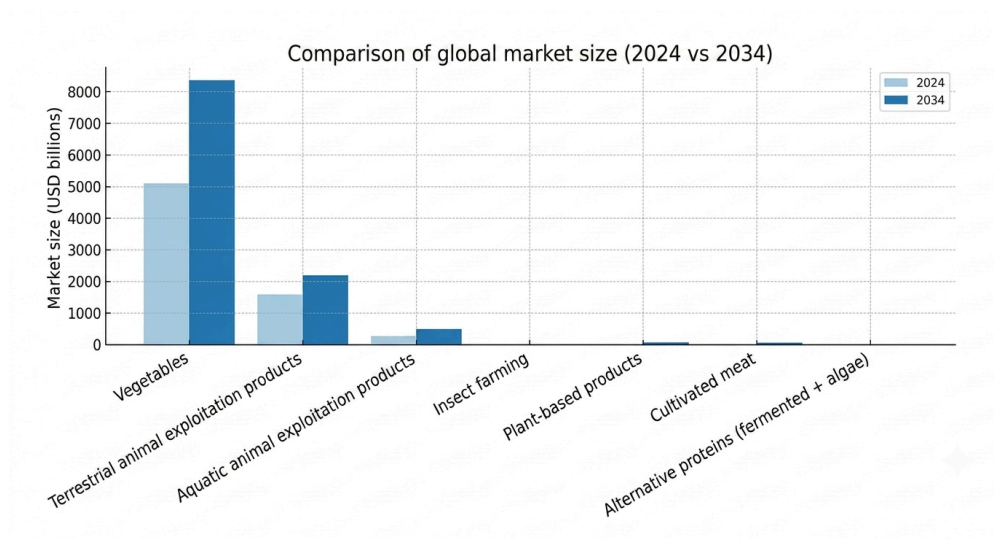
¹⁹⁶ The Business Research Company (2026).

The next table compares these figures with the figures we saw in the previous sections, referring both to animal-derived products and to alternatives:

¹⁹⁴ Allied Market Research (2025)

Category	Market size in 2024	Projection for 2034	CAGR (2025–2034)
Vegetables	USD 3.8 trillion	USD 6.1trillion	5.3%
Products from the exploitation of terrestrial animals	~US\$ 1.5-1.6 trillion	~US\$ 2.1-2.4 trillion	1.4 - 4.2 % (approx.)
Products from the exploitation of aquatic animals	~US\$ 239-311 billion	~US\$ 370-573 billion	4.5 - 5.2 % (approx.)
Exploitation of insects	1.48 billion	9.14 billion	19.97 %
Plant-based products	US\$ 28.6 billion	~US\$ 50–60 billion	5–6% (approx.)
Cultivated meat	US\$ 568.8 billion	US\$ 36.57 billion	51.6%
Alternative proteins (fermented + algae)	US\$ 1405 billion	US\$ 3.308 billion	9.7%

The data in this table are illustrated in the two graphs below:



8.5. The debate on cultivated meat

8.5.1. Introduction

One strategy to combat the exploitation of decapods would be to encourage the development and implementation of cultivated meat. Below we will examine two debates about this strategy. The first concerns the moral objections raised against cultivated meat. The second concerns its potential as a strategy to combat animal exploitation.

8.5.2. The objection that cultivated meat still harms animals

The main objection from animal advocates to cultivated meat is that it still causes harm to animals. For example, in some cases fetal bovine serum (FBS) is used for cell cultivation, produced from blood taken from a dead cow fetus. And even when this is not done, at least at the present time it still requires extracting cells from animals and, therefore, some animals would have to be kept as a source of cells. In addition, it is not clear what happens to animals during the cell extraction procedure nor what happens to the animal after the biopsy. Some authors claim that, presumably, they are also killed.¹⁹⁷

In response to these objections, it could be said, for example, that the cultivated meat industry is shifting from FBS to plant-based serums,¹⁹⁸ and that there are companies claiming that the animals they use as a source of cells are not killed.¹⁹⁹ It could also be replied that, even if cultivated meat caused all these harms, it would still radically reduce the number of animals who suffer and die in animal agriculture.²⁰⁰

To this, opponents of cultivated meat might respond that we should reject both conventional meat and cultivated meat because both use animals as resources. However, although at present it is necessary to use animals to obtain cells, perhaps in the future some procedure will allow cells to be obtained indefinitely, such as the use of immortalized cell lines or cloning, for example.²⁰¹ Moreover, there is no realistic possibility of convincing animal exploiters to switch to producing plant-based foods (since the demand for meat would continue), but there is a realistic possibility that, if cultivated meat technology becomes more profitable for them than conventional meat, they will switch to cultivated meat.

Support from animal advocates might help accelerate the development, cost reduction, and implementation of cultivated meat. On the other hand, if animal advocates oppose cultivated meat, and if they succeed, what they would achieve is to prevent animal exploiters from using (or from using as many) resources for cultivated meat. However, exploiters would probably not use those resources to create vegan products, but rather to exploit animals to produce conventional meat. Thus, the problem with the argument that we should reject cultivated meat because it would still cause some harm to animals is that, in its absence, the results would probably be much worse for animals.

¹⁹⁷ Chriki et al. (2022), Huntley & McLaren (2024, p. 6).

¹⁹⁸ Swartz (2021), Eat Just (2023), Huntley & McLaren (2024, p. 3).

¹⁹⁹ See, for example, Ferrari (2025).

²⁰⁰ Milburn (2019), Chriki et al. (2022), Huntley & McLaren (2024, p. 6).

²⁰¹ Letti et al. (2021), Ng & Kurisawa (2021)..

8.5.3. The objection that cultivated meat contains symbolic violence

Another objection raised against cultivated meat accuses it of containing symbolic violence. Wrenn (2024, p. 8) compares it to encouraging white supremacists to amuse themselves with AI-generated simulations of slavery, and to encouraging teenagers to play school-shooting video games as an alternative to real violence. She argues that, just as these acts can have negative consequences for humans, cultivated meat may reinforce speciesism. According to the author, cultivated meat will be “happy meat,” in which producers will employ tactics similar to those they currently use to block public knowledge about how animals are harmed in production. She argues that, by contrast, plant products that imitate animal meat do not run the same risk, since in that case consumers know that these analogues are plant-based.

There are at least two ways to question this objection. The first is to question the thesis that cultivated meat would reinforce speciesism. In this regard, Bryant (2024, p. 9) argues that cultivated meat could help reduce speciesism, since defenses of speciesism are often motivated by the desire to continue eating meat. Thus, if people stop eating animals, it may become easier for them to accept rejecting speciesism.

The second response points out that, even if cultivated meat reinforces speciesism, this is insufficient for us to reject it, because it is necessary to compare the likely harms and benefits resulting from a scenario in which resources are invested in cultivated meat with others in which they are invested in something else (in addition to trying to imagine where such resources would likely be invested if they were not invested in cultivated meat). It may be that, if the same resources were invested in anti-speciesist education, the results for animals would be better (although this is also highly uncertain). However, even if vegan investors would have some probability of investing in anti-speciesist education if they did not invest in cultivated meat, the probability that animal exploiters who invest in cultivated meat would do so is extremely low, perhaps null. This suggests that we should encourage at least animal exploiters to invest in cultivated meat because, otherwise, they would invest those resources in exploiting animals. The harms and benefits that would likely result need to be estimated taking into account the current state of the world. For example, since human slavery and school shootings are not currently the norm, virtual simulations of these practices may cause more harm than benefit. But if such practices were the everyday norm, and if creating virtual simulations of them were to considerably reduce their real occurrence, doing so would have a positive balance, even if it also had the potential to cause harm.

8.6. Advantages and disadvantages of focusing on changes in food technology

The debate about focusing on cultivated meat is an example of a more general debate about strategies focused on technological change versus strategies focused on social change.²⁰² Thus, several of the topics discussed here in the specific case of cultivated meat also apply to other technologies. Below are some points to consider when evaluating how much to invest in the strategy of encouraging the development and implementation of cultivated meat:

1. The greater the consumption of cultivated meat compared to conventional meat, the more animals are spared from suffering and being killed.

²⁰² See Anthis (2020 [2017b]).

2. Cultivated meat has the potential to produce behavioral changes in agents who are indifferent to the fate of animals. That is, cultivated meat may lead even people who do not care about animals to stop consuming them.
3. If cultivated meat becomes more profitable for exploiters, they themselves will want to abandon the use of animals.
4. For cultivated meat to actually replace the use of animals on a large scale, it is not enough that it offers advantages to exploiters: it must also offer advantages to the public. The public will not necessarily be receptive to cultivated meat. For example, some people may raise the banner “this is not natural!”, or may say that they are concerned about health risks. However, if the public sees advantages in cultivated meat (for example, if it becomes cheaper and tastier than conventional meat), the probability of acceptance is much higher. We can draw a parallel with the gradual replacement of animal traction with the emergence of the automobile. One of the key factors in this substitution was that the automobile offered many advantages to the public compared to carriages (speed, comfort, protection, etc.).

However, just as the implementation of the automobile did not completely eliminate the use of animals for traction, although it helped reduce it, the same may occur with cultivated meat. This is because strategies focused on technologies, by themselves, do not combat speciesism, which is the cause of animal exploitation. This shows that, if the goal is to abolish the use of animals, strategies centered on technological change need to be combined with strategies aimed at increasing consideration for animals.

5. Since adherence to cultivated meat, by itself, does not change people’s mindset regarding speciesism, it does not prevent setbacks in relation to what is done to animals. For example, if people remain speciesist, and in the future some more profitable way of exploiting animals arises, they would likely return to exploiting animals. Thus, activism focused on technologies that substitute for the use of animals is not a substitute for anti-speciesist activism. In fact, it requires such activism so that there are no setbacks.
6. On the other hand, adherence to cultivated meat may help facilitate the rejection of speciesism.²⁰³ Many people defend speciesism not because they believe it is correct, but because they enjoy the taste of animal-derived products. Thus, if in the future people do not have to give up that taste because they are already consuming cultivated meat, it may become easier for them to reject speciesism. However, it is also possible that there are people who defend speciesism simply because they believe it is correct, and not as a disguise for their taste for specific flavors. Thus, adherence to cultivated meat may facilitate the rejection of speciesism for some people, but not for others.

8.7. Conclusion

Activism focused on technological change does not replace anti-speciesist educational activism, but, if combined with it, offers good opportunities for positive change without setbacks for animals.

²⁰³ Bryant (2024, p. 9).

9. THE STRATEGY OF INCREASING CONSIDERATION FOR ANIMALS

9.1. Introduction

In this chapter we will address strategies aimed at increasing consideration for animals in society.²⁰⁴ We will examine what these strategies consist of and list their advantages and disadvantages in relation to other strategies.

9.2. Two strategies with different objectives

There are at least two different strategies aimed at increasing consideration for animals, each with different objectives:

1. *Defending consideration.* To encourage more people to give direct moral consideration to animals, that is, to regard animals' well-being as important in itself, leaving open what the degree of that consideration should be.
2. *Defending equal consideration.* The second objective includes the previous one, but goes further: it aims to encourage more people to give equal consideration to animals (for example, to regard their well-being as as important as that of humans).

Below we will compare the advantages and disadvantages of these strategies.

9.3. Strategically, which level of consideration is better to defend?

The main argument in favor of only defending that nonhuman animals should be morally considered is that, because this strategy does not criticize the predominant view that humans should receive greater consideration, it would probably generate less resistance than defending equal consideration. Additionally, it could be argued that perhaps, if people give animals a minimal level of consideration, this is sufficient for them to position themselves against their exploitation.

However, the moral consideration that people would come to give to animals, if equal consideration is not defended, might not be sufficient for them to position themselves against their exploitation (and perhaps not even to reduce their consumption). Moreover, if someone accepts equal consideration, they will very likely make a much greater effort to try to change animals' situation than if they accept it to a lesser degree. Thus, even a smaller number of people accepting equal consideration may make a more positive difference for animals than a larger number of people who consider them to a lesser degree.

In light of this, one might think that, then, in order to assess which of the two strategies is more efficient, it is crucial to weigh how much smaller the number of people who would likely accept equal consideration would be, and how much more each of these people would do for animals, compared to people who would consider them to a lesser extent.

²⁰⁴ The term animals will be used here as an abbreviation for sentient animals, which includes decapod crustaceans.

However, the thesis that the potential acceptance of equal consideration is lower than accepting only some consideration is also questionable (for example, as we saw in [section 4.4](#), equal consideration has very strong arguments in its favor). Moreover, it could be pointed out that the behavior that both strategies aim to change in the public is the same: getting them to stop consuming animals and to take a stand against their exploitation. Thus, although defending equal consideration is more demanding in terms of changing beliefs, it is not very different in terms of what it requires in terms of behavioral changes.

Another possible strategy, which in fact combines the two, is to argue in favor of equal consideration, and additionally point out that even those who reject it would still have to reject the exploitation of animals (as we did in [subsection 4.4.5](#))

9.4. What the methods of these strategies would be

In practice, strategies centered on increasing consideration for animals would be any strategy that made it clear that nonhuman animals matter in themselves (whether in some degree, or in terms of equal consideration).

That being so, the following strategies are not strategies that increase consideration for animals: (1) pointing to the environmental impact of animal exploitation; (2) pointing to risks to human health from consuming animals; (3) pointing to negative impacts on humans of animal exploitation (for example, the use of plant resources that could be given directly to humans living in poverty).

However, there are various ways in which consideration for animals could be defended. One way would be to present the arguments that show that there is no justification for denying them equal consideration (an example is what we did in [section 4.4](#)). Another would be to present slogans, pamphlets, and describe (for example, with videos or photos) the situation of animals.

9.5. Comparing with other strategies not centered on consideration for animals

In this section we will compare strategies centered on publicizing consideration for animals with other strategies that do not refer to such consideration, such as encouraging cultivated meat or trying to get people to stop consuming animals or reduce their consumption based on arguments not centered on consideration for animals.

The main apparent disadvantages that could be pointed out with regard to strategies centered on publicizing consideration for animals are the following:

1. They may take longer to generate practical impacts for animals than other strategies.
2. Unlike what happens in other strategies, in this kind of strategy, for people to change their practice, it is necessary to change what they think about animals. Compare, for example, with encouraging cultivated meat: for it to reduce the number of animals exploited, it is only necessary that it provides advantages to exploiters and consumers. That is, in other strategies, even people who do not consider animals to any degree might come to reduce their negative impact on them. Strategies centered on spreading consideration for animals do not appeal to the public's self-interest (in fact, they aim to limit that self-interest), and self-interest can be an important force in terms of motivation for behavior.

However, in defense of strategies centered on publicizing consideration for animals, it could be said that these points are not necessarily disadvantages. Below we will see this in relation to each point above:

1. First, the claim that the strategy of publicizing consideration for animals takes longer to have practical effects than other strategies could be questioned. For example, it is not clear that someone who stops consuming animals for reasons of considering them takes longer to do so than someone who does so for anthropocentric or environmentalist reasons (perhaps it takes less time). Moreover, cultivated meat, for example, may take longer to become cheaper to produce than conventional meat. Likewise, regulations in animal exploitation sometimes take years to be approved and implemented. Second, more importantly, it could be replied that the fact that a strategy takes longer to have practical effects does not show that it is therefore less efficient than other strategies. What would have to be evaluated are the total effects of each strategy over time, and not the moment when each effect happens. We will comment more on this point below.

2. Regarding the second claim, it could be replied that the strategy of defending moral consideration for animals is the only one that attacks the cause of the problem, and not only its symptoms, and precisely for that reason it may have a better impact over time. The reason animals are exploited is that most people give them little moral consideration. For example, technology is used to maximize the efficiency of animal exploitation because there is this level of disregard. If there were a high level of consideration for animals in society, technology would be used to benefit them. In short, whether means will be used to increase or to decrease suffering is something that depends on the degree of moral consideration people give to those affected by their decisions. Thus, a great advantage of publicizing consideration for animals is that this strategy prevents setbacks, something that no other strategy does. For example, a law that benefits animals can later be repealed if society remains speciesist. People who stop consuming animals motivated by anthropocentric or environmentalist reasons may go back to consuming them if in the future forms of exploiting them arise that do not put humans at risk and are sustainable. Even if cultivated meat comes to be implemented on a large scale, without an increase in consideration for animals it is likely that both exploiters and the public would return to exploiting animals if in the future a way of exploiting them arose that gave them more advantages than cultivated meat. In short, the great advantage of strategies centered on increasing consideration for animals lies precisely in their being the only ones capable of making people change what they think about animals and, therefore, the only ones capable of attacking the cause of the problem, and not only its symptoms.

10. THE STRATEGY OF TRYING TO SECURE LEGAL RIGHTS FOR ANIMALS

10.1. The legal status of nonhuman animals

Legal systems around the world differ from one another in many respects. However, a common feature of the most widespread legal systems is the distinction between persons and objects.²⁰⁵

The term person here is not a synonym for a member of the human species. A person can be a natural person (such as, for example, a member of the human species) or a legal person (such as, for example, a company). What characterizes persons, in legal terms, is that they are the only entities that can have legal rights and, therefore, cannot be used as if they were mere objects. Legal rights are protections, in the form of laws, granted to their holders. For example, in the case of natural persons, some of their most important rights protect their physical integrity and their lives.

In contrast, the category of objects includes those entities that cannot have legal rights. Objects are items of property owned by persons, who also have the right to exploit their objects. Given the prevalence of speciesism, nonhuman animals in legal systems around the world normally have the status of objects, and this prevents them from having legal rights (this is why animal exploitation is legalized).²⁰⁶ For the same reason, animal welfare laws do not prevent them from being exploited.²⁰⁷

Thus, one possible strategy to change the situation of decapods (and other animals) would be to try to remove them from the category of objects, so that they come to have the status of persons and can have legal rights. This type of strategy is very different from trying to reform the system of animal exploitation because, if someone is a person, they have the right not to be exploited as an item of property (and then their exploitation would have to be abolished, not regulated).

10.2. The objection that animals are not exactly things under the law

A possible objection to the thesis that nonhuman animals have the status of objects points to the fact that the legislation of several countries explicitly recognizes animals as sentient beings, and that this means they cannot simply be equated with the status of objects. Below are some examples:

- *France*. In 2015, an amendment was made to the French Civil Code that changed the definition of animals from “things” to “living beings endowed with sentience”.²⁰⁸
- In addition to France, several European Union countries, such as Austria, Germany, Italy, Belgium, Luxembourg, the Netherlands, Spain, and Finland, also have legal provisions recognizing animal sentience.²⁰⁹

²⁰⁵ For a detailed explanation of these distinctions, see Herstein (2023)..

²⁰⁶ See Tannenbaum (1995), Francione (1995), McCartney-Smith (1998), Bryant (2008) and Maddux (2013).

²⁰⁷ For an analysis of this issue, see Francione (1995).

²⁰⁸ World Animal Protection (2015).

²⁰⁹ Eurogroup for Animals (2025).

- *European Union*. The Treaty on the Functioning of the European Union (Lisbon Treaty, Article 13) recognizes animals as sentient beings and states that member countries must take animal welfare into account in their policies.²¹⁰
- *United Kingdom*. The Animal Welfare (Sentience) Act was passed in 2022, recognizing animals as sentient beings for the purposes of public policy formulation.²¹¹
- *New Zealand*. Animal sentience was legally recognized in its Animal Welfare Act.²¹²
- *Colombia, Chile, and Peru*. They are mentioned in studies as countries with legislation that recognizes or presupposes animal sentience.²¹³
- *Canada*. The province of Quebec amended its Civil Code to state that animals are not things, but sentient beings with biological needs.²¹⁴

In addition, it could be mentioned that there have been several cases of habeas corpus granted to animals, which would not be possible for objects.²¹⁵ Certain practices have also been prohibited, which may be interpreted as a recognition of certain rights for animals. For example, the cutting of dogs' vocal cords has been prohibited in some cases, on the grounds that dogs have the right to bark. In the United States, the practice is prohibited in New York,²¹⁶ Massachusetts²¹⁷ and Maryland.²¹⁸ In Brazil, the practice is prohibited in the state of Rio de Janeiro²¹⁹ and also prohibited by the CFMV (Federal Council of Veterinary Medicine).²²⁰

This objection will be discussed in the following section.

10.3. The basic legal status: animals are still property

Even in countries that recognize animals as "sentient beings," they continue, in legal terms, to be items of property. What changes is only the way this property may be exercised, that is, there are limitations on use (for example, prohibiting unnecessary cruelty, mutilations, or imposing duties of care), but there is no change in the fundamental legal status. For this reason, their exploitation remains legalized.

In other words:

- The owner may still possess, buy, sell, donate, breed, and use the animal.
- Only certain forms of use are restricted.

²¹⁰ Kotzmann & Stonebridge. (2021).

²¹¹ Meredith & Hawkins (2026).

²¹² Auffret van der Kemp (2019).

²¹³ Carpendale (2022).

²¹⁴ Auffret van der Kemp (2019).

²¹⁵ De Paula (2006).

²¹⁶ The New York State Senate (2025).

²¹⁷ All-Creatures.org (2010).

²¹⁸ All-Creatures.org (2014).

²¹⁹ Rede Globo (2014).

²²⁰ Conselho Federal de Medicina Veterinária (2022 [2019]).

Recognition as a sentient being is symbolic or limited

This recognition is generally declaratory or rhetorical, without amounting to the attribution of legal personhood (that is, the status of person).

Examples:

- The European Union, in its Lisbon Treaty (Art. 13), recognizes that animals are “sentient beings,” but also reaffirms that Member States must respect “cultural customs and traditions” related to the use of animals, which includes livestock farming, hunting, fishing, and experimentation.²²¹
- In Spain, the Civil Code was amended in 2021 to recognize that animals “are living beings endowed with sentience,” but it maintains the property regime, only with restrictions on mistreatment and abusive use.²²²

Therefore, the fact that the law declares that animals are “sentient” does not imply that they have ceased to be legally objects.

Habeas corpus and isolated decisions

Cases of habeas corpus are isolated decisions, generally symbolic or exceptional, and do not alter the general legal regime. They are often interpretations by isolated courts, without broad binding force. In almost all countries, habeas corpus is not recognized for animals as a rule. These cases indicate a movement questioning property status, but not a consolidated change.

Is there incoherence in the legislation?

Yes, there is an apparent tension or incoherence, but not a formal contradiction. The incoherence lies at the moral and conceptual level, not at the strictly legal level. The law can recognize that a being is sentient and still treat it as an object of property rights, provided it imposes some ancillary obligations on the owner (such as guaranteeing minimum welfare). Therefore, there is no internal legal contradiction, although there is an evident ethical incongruity between recognizing sentience and maintaining exploitation.

10.4. Advantages and disadvantages of the strategy of trying to secure legal rights

The main advantages of this strategy are the following:

1. If it succeeds, the protection animals would receive would be very strong, since it would legally prohibit their exploitation.
2. If animals come to have legal rights, all agents would have the legal obligation not to exploit them, regardless of whether they give moral consideration to animals.

²²¹ Kotzmann & Stonebridge (2021).

²²² España (2021).

3. Even before succeeding, such a strategy emphasizes to society that animal exploitation is a very serious problem, and that animals should receive a great deal of consideration.

In turn, the main challenges for this strategy are the following:

1. Given the degree of speciesism prevailing in society, and how powerful the animal exploitation industry is, securing legal rights for animals is a very difficult task, which will probably take a long time to achieve. However, in defense of such a strategy, it could be replied that this is precisely a reason to begin as soon as possible to defend that animals should have legal rights, since this is a way for future generations to reap the fruits of what begins to be planted now.

2. It is a strategy that also runs the risk of achieving no gain at all (for example, investing many resources and time in a campaign, and the campaign not being approved in the end).

3. For a project of this kind to succeed, it is necessary to have a considerable increase in moral consideration for animals in society, since the success of such an undertaking depends on there being a large number of people demanding it. This shows that the demand for legal rights for animals depends on spreading moral consideration for them. However, if combined with this, the potential to create significant change increases greatly, especially when long-term effects are taken into account.

4. Even if legal rights for animals are eventually achieved (and the consequent prohibition of animal exploitation), for the law to be effectively enforced, and for there to be no setbacks in terms of placing them again in the category of items of property, it is necessary that consideration for animals in society be increasingly strengthened and expanded. Thus, the strategy of defending legal rights for animals must always be combined with the defense of their moral consideration, whether because this is necessary in order to achieve legal rights for animals, or because it is also necessary to ensure that such rights, once achieved, are in fact respected and that there are no setbacks.

10.5. The objection that legal rights would not guarantee strong protection

In the previous section, among the advantages of the strategy of trying to secure legal rights for animals, the following advantages were listed:

1. If it succeeds, the protection animals would receive would be very strong, since it would legally prohibit their exploitation.
2. If animals come to have legal rights, all agents would have the legal obligation not to exploit them, regardless of whether they give moral consideration to animals.

A possible objection to these claims is that this is not guaranteed, since in the past some slaves had certain legal rights (such as rights to obtain property), yet their exploitation continued to be permitted.

A possible response to this objection is to accuse it of confusing two distinct types of rights:

- Fundamental legal rights, which derive from legal personhood (such as the right not to be property, not to be exploited, not to be tortured, etc.);
- And restricted or conditional rights, granted within a regime of subordination (such as certain "rights" recognized for slaves or for animals).

When the strategy of trying to secure legal rights for animals was mentioned in the previous section, the reference was to the strategy of seeking to secure full rights derived from the status of person, and not limited rights within the status of property.

In the case of slaves, they could have certain functional “rights” (such as possessing a small amount of property, or protection against extreme abuse), but they were not holders of full legal personhood. Therefore, exploitation was legalized because their basic status was that of property.

Thus, the present objection does not invalidate the thesis that only the status of person guarantees that someone cannot be exploited as property. The historical examples of slaves with some rights confirm, rather than refute, this thesis.

11. THE DEBATE ON REGULATING ANIMAL EXPLOITATION

11.1. Introduction

In this chapter we will discuss several topics related to the strategy of pursuing reforms in animal exploitation.²²³ For each topic, the main arguments in favor of reforms and against reforms will be summarized.

11.2. Could reforms in exploitation gradually abolish it?

Pro reforms:

- Increasingly demanding reforms could make it increasingly difficult to exploit animals. This would lead to abolition, since exploiters would see that exploitation does not have a good cost/benefit ratio.
- Since reforms focus on animals' suffering, this could lead the public to care at least somewhat (or even to a great extent) about animals, and gradually come to support abolition.

Against reforms:

- As long as the majority in society continues to give little consideration to animals, there is no chance that increasingly demanding reforms will be enacted to the point that animal exploitation ceases to be profitable, since demand for products of animal exploitation would remain high. Therefore, a strategy centered on reforms would need to be combined with the strategy of trying to increase consideration for animals..
- Reforms may lead consumers to increase their consumption because they believe animals' welfare is now guaranteed.
- Focusing on reforms, rather than abolition, may reinforce the notion that animals are resources for us to use. Thus, there does not appear to be a necessary connection between having reforms and the public increasing its consideration for animals, much less coming to support abolition.

11.3. Do reforms increase the costs of exploitation?

Pro reforms:

- If reforms increased profits, the industry would adopt them without pressure from activists. If they increase costs, this weakens the industry and, consequently, reduces the consumption of animal-derived products, since their prices tend to rise.²²⁴

Against reforms:

- Although reforms may initially increase costs, it is also possible that over time they increase profits, due to the potential increase in consumption resulting from labels such as "happy meat" and similar claims.

²²³ For an overview of both sides of this debate, see Francione & Garner (2010).

²²⁴ See, for example, Miller (2012), Doward (2012), Mullally & Lusk (2018), and Lusk et. al. (2019).

11.4. Do reforms facilitate later changes?

Pro reforms:

- Reforms offer gradual steps toward abolition, since it will not be achieved overnight.
- The British anti-slavery movement first aimed to abolish the transatlantic slave trade, and when it succeeded, it focused on eliminating slavery in the West Indies, and so on.²²⁵
- In several countries in 2015 and 2016, reforms followed one another rapidly. For example, shortly after transitions to cage-free policies, commitments to end the practice of killing male chicks were accepted.²²⁶
- If the industry opposes reforms, the public may conclude that the only way to solve the problem is through abolition.²²⁷

Against reforms:

- Abolition will not be achieved overnight, but perhaps the best gradual steps are other strategies, not reforms (such as spreading anti-speciesism, promoting cultivated meat, veganism, reduction of consumption, etc.).
- In the movement against human slavery, it was emphasized that each action was a step toward abolition, and this does not occur in campaigns for reforms in animal exploitation.²²⁸
- The gradual steps in the abolition of human slavery were gradual abolitions (such as eliminating the slave trade in certain regions), not regulations of existing practices (for example, the number of lashes permitted).
- The public will only think reforms are insufficient if a significant portion of the public is seriously concerned about animals, which shows that reforms, by themselves, do not lead to abolition (for an abolition movement to exist, there must be an increase in consideration for animals in society).
- Companies may become more resistant to new reforms after having already implemented some, especially if those implemented have improved their public image and cost little.
- The animal exploitation industry may influence and neutralize animal advocacy organizations due to partnerships these organizations build with the industry, especially if there is financial investment from the industry in these organizations.²²⁹

11.5. Do reforms facilitate or hinder reduction in consumption?

Pro reforms

- When a reform occurs, people see that their culture includes some concern for animals, and this may influence them to incorporate that concern and feel outraged when they discover that animals still suffer tremendously, even with reforms.²³⁰

²²⁵ See Anthis & Anthis (2017).

²²⁶ See, for example, Anthis (2020 [2017b]).

²²⁷ Spence (2014, p. 230) and Hochschild (2006, p. 334).

²²⁸ Anthis & Anthis (2017).

²²⁹ See Anthis (2020 [2017b]).

²³⁰ See Anthis (2020 [2017b]).

- Countries that have had more reforms in exploitation tend to have higher rates of adherence to vegetarianism.²³¹
- Media coverage of reforms tends to focus more on the problems that still remain than to suggest that, after reforms, consumption is less problematic.²³²
- Studies have found that people who read about reforms were more likely to say they would reduce their consumption of animal-derived products than a control group that read about policy changes unrelated to animals.²³³

Against reforms

- Reforms may lead people to consume more animal-derived products and to defend animal exploitation, pointing out that “now animals live good lives”.
- Nothing guarantees that the public will become aware that animals still suffer tremendously, even with reforms. For example, in a 2017 survey, 75% of respondents in the U.S. said that the products they buy come from well-treated animals, even though more than 99% of animals exploited in the U.S. are raised on factory farms.²³⁴
- Greater adherence to vegetarianism in countries with more reforms does not show that reforms contribute to reducing consumption. It may very well be the opposite: in those countries there may be more reforms because there were already more people concerned about animals who did not consume them. Reduction in consumption may be influenced by other variables besides reforms.
- The fact that media coverage focuses more on the problems that remain does not necessarily influence a reduction in consumption: it may only influence the search for animal-derived products that claim to comply with reforms. For example, during the period of media coverage preceding the vote on a reform in California in 2008, there was no reduction in egg consumption, although consumption of eggs from cage-free hens increased and consumption of eggs from caged hens decreased.²³⁵
- Legislative campaigns in favor of reforms are easily detectable by the animal exploitation industry, which may attempt to neutralize these efforts by promoting consumption of animal-derived foods.

In response to the last point, defenders of reforms might reply that this would show that it is not worth investing in reforms only if the industry’s efforts to neutralize the campaigns are more efficient than the reformist campaigns themselves. However, it could be replied that this may very well be the case in the vast majority of instances (or even all), given the disparity in power between the animal exploitation industry and animal advocates.

Moreover, the industry may not only neutralize but co-opt the reformist message, converting it into pro-consumption marketing (“happy meat,” “cage-free”). Reform campaigns are particularly vulnerable to narrative capture. If this leads the public to increase consumption, the potential benefit of the reform is nullified.

Defenders of reforms might argue that, even if the industry co-opts a campaign, activists gain organizational experience and visibility, which helps in future struggles. However, it could be replied that,

²³¹ Caldwell (2016).

²³² Anderson & Lenton (2019).

²³³ Tomasik (2015) and Caldwell (2016).

²³⁴ Anthi (2017a).

²³⁵ Smith (2016).

although this is possible, the same learning could occur in non-reformist campaigns, without the risks of co-optation by the industry.

11.6. Do reforms reduce animals' suffering?

Pro reforms

- Unlike any of the other strategies, reforms are the only ones that have as one of their objectives reducing the suffering of animals who will be exploited anyway (all the others aim only to reduce the number of animals exploited).
- Reforms have the force of law. Since exploiters are legally obliged to follow them, this makes it likely that animals will benefit.
- Even if there may be difficulty in enforcement, the existence of a law allows a company to be sued for noncompliance.

Against reforms:

- Not all reforms have the force of law. Some are adopted as commitments between exploiters and pressure from animal advocates. These commitments are not necessarily fulfilled.²³⁶ And even when they have the force of law, this does not guarantee that animals will benefit, since, under the law, animals are items of property of their exploiters.²³⁷ Therefore, when there is a conflict between what the reform requires and the owner's interest, the law tends to favor the owner, since items of property cannot have rights (and owners have the right to exploit them).²³⁸
- It can be very difficult to monitor whether what the reform requires is being fulfilled. For example, in the case of mammals and birds, the law already requires stunning before killing the animal, but since lines in slaughterhouses move at high speed due to high demand, it is common for animals not to be fully stunned and then to be boiled or sliced while still fully conscious.²³⁹
- Pointing out that having a law allows a company to be sued, even if it is not possible to monitor compliance, is to recognize that there is no necessary relationship between a reform being approved and animals' suffering being reduced.

11.7. Difficulty of penalization in cases of noncompliance

Against reforms:

In laws regulating animal exploitation, terms such as "cruel treatment," "unnecessary suffering," and "inhumane treatment" are usually defined very differently from how they are used in ordinary language.²⁴⁰

For example, in these laws, for treatment to be considered cruel, it generally must be proven that the agent felt pleasure in causing suffering (since cruelty is a mental state). Thus, contrary to what the

²³⁶ On this, see Block (2022).

²³⁷ See Tannenbaum (1995), Francione (1995), McCartney-Smith (1998), Bryant (2008) and Maddux (2013).

²³⁸ For an analysis of this issue, see Francione (1995).

²³⁹ On this, see Warrick (2001) and Pitney (2016).

²⁴⁰ See Francione (1996, pp. 17-20, 115-116, 134-143, 231).

public usually thinks, in these laws “cruel” is not defined based on consequences for the victim, but on the agent’s mental state. However, animal exploiters can simply claim that they were not feeling pleasure in the practices that cause suffering, but rather that their objective was to maximize profit from their property. Since someone’s mental state is very difficult to prove, laws prohibiting cruelty rarely result, in practice, in any punishment.²⁴¹

Inhumane treatment is normally defined as any treatment that is not common practice among humans in that area. Therefore, any procedure that causes extreme pain will not be considered inhumane treatment as long as it is common practice among exploiters in that area. Thus, only very unusual cases of harm to animals are prohibited.²⁴²

Finally, the term unnecessary suffering is normally defined as suffering that is not necessary for the owner to achieve the end they seek. Thus, if the owner shows that the suffering caused by their practice was necessary to achieve their goal (for example, maximizing profits from their production), the law will consider it necessary suffering, even if it causes extreme suffering and even if the activity itself is not in any way necessary.²⁴³

Pro reforms:

In defense of reforms, it could be said that not all regulations of animal exploitation are based on concepts such as cruelty, inhumane treatment, and unnecessary suffering. For example, some explicitly require increasing space in cages for exploited animals, and others aim specifically to prohibit certain procedures (such as eyestalk ablation, for example).²⁴⁴

11.8. Difficulty of implementation and enforcement of regulations

As we saw in [Chapter 2](#), an official report from the United Kingdom government published in November 2021 recommended that all cephalopod mollusks and decapod crustaceans be recognized as sentient beings for legal purposes and, therefore, be protected by UK animal welfare laws.²⁴⁵

Two years after the publication of the report, Crustacean Compassion, an organization seeking to reduce the suffering of exploited crustaceans, conducted a survey to verify how the report’s recommendation was being implemented.²⁴⁶ The survey used as a benchmark the law The Welfare at Time of Killing (England) Regulations 2015 (known as WATOK), which states that an animal may not be killed in a way that causes it avoidable pain, distress, or suffering, and that any person who kills an animal must have the necessary knowledge and skills to do so.²⁴⁷

The survey was sent to departments responsible for animal use in all 32 London boroughs. However, 25 boroughs did not respond, and among those that did respond, several did not recognize that they had

²⁴¹ Ibid., pp. 134-139.

²⁴² Ibid., pp. 115-116, 137.

²⁴³ Ibid., pp. 17-20, 141-143, 183, 231.

²⁴⁴ On proposals to eliminate eyestalk ablation, see Zacarias et al. (2019).

²⁴⁵ Crustacean Compassion (2021).

²⁴⁶ Crustacean Compassion (2023).

²⁴⁷ United Kingdom (2015).

responsibility for enforcing this law. For example, the boroughs of Kensington and Chelsea claimed that decapods are not covered by animal welfare laws (which, as we saw, is not true). The only borough updated regarding the report, Hammersmith and Fulham, mentioned that it has only eight staff members on its Food Safety Team, and acknowledged that its Animal Welfare Charter “needs subsequent revision,” since it still did not include decapods. At the time of the survey, two years had already passed since the publication of the government report, and none of the London boroughs had begun to implement its recommendation.

Moreover, although WATOK prescribes that “any person who kills an animal must have the necessary knowledge and skills to do so,” the purchase of live decapod crustaceans to kill at home is still permitted throughout London. The Crustacean Compassion report notes that it is highly unlikely that the average consumer can kill these animals at home in a way that does not cause them suffering, especially given that it can take between 4 to 8 minutes for a lobster to die when boiled alive, which is the common method of killing them. As we saw in [Chapter 3](#), killing such animals without causing them suffering is a difficult task even for a specialist.

11.9. Are reforms inevitable?

Proponents of reforms might argue that activism based on public awareness can contribute to the implementation of reforms, even if this is not its intention, since politicians may use this interest in the issue to approve reforms that partially satisfy public concern, thus reducing pressure on the issue. Therefore, it would be naïve to suppose that it is possible to carry out awareness-based activism that does not lead to reforms.

This argument seems to assume that if any form of activism leads to reforms (as a side effect), then we should pursue reforms (as a goal). One way to respond to this argument is to point out that, even if reforms are a side effect of any form of activism, this does not imply that we should aim at reforms for their own sake. For example, if reforms are ineffective or counterproductive, then they would be an undesirable side effect of any form of activism. And, obviously, the fact that an action has undesirable side effects does not imply that we should aim at those side effects as a goal. On the contrary, it implies that we should try to minimize those undesirable side effects. For example, an undesirable side effect of agriculture is that part of the production deteriorates before it can be used, but this does not imply that we should aim at this loss (on the contrary, it implies that we should try to minimize it). In short, even if something is inevitable, that does not make it desirable.

Moreover, the thesis that every form of awareness activism leads to reforms could be questioned. For example, it could be argued that forms of awareness-based activism that point out problems with reforms as a strategy of activism will not create in the public a desire for reforms (and then, in that case, politicians cannot capitalize on increased interest in the animal issue to approve reforms, since reforms will not satisfy that type of public). That is, not every increase in awareness leads to reforms, especially if a critical discourse of reforms is part of the message itself.

Thus, even if reforms arise as “inevitable side effects,” what should be done is to design awareness activism in a way that minimizes its appropriation by politicians (for example, emphasizing that certain palliative changes do not solve the problem). A possible objection to this is to say that even if awareness activism does not intend to lead to reforms, the public may interpret the message in that way (“animals suffer, therefore, we need to try reforms”). This might be inevitable given the public’s current cognitive structure. A possible response to this objection is to say that campaigns can be planned with a discourse that minimizes such interpretations (for example, also citing arguments that suggest

reforms are ineffective).

11.10. Are reforms currently the only possible form of legislative activism?

Defenders of reforms might argue that in the societies in which we live, based (to a greater or lesser degree) on welfare policies for humans, all political practice regarding animals is directed toward obtaining reforms, making any other way of directing legislative action regarding animals difficult.

This argument could be answered by pointing out that it does not show that reforms are more effective strategies than other types of strategy. For example, it could be argued that, if the current mindset is speciesist, then we will probably obtain better results over time if we work now to combat speciesism (since this would remove the barrier that prevents progress for animals, whether in moral or legislative terms) than if we use the same resources (money, time, activists, etc.) on reforms. That is, perhaps we should invest in changing mindsets before investing in changing the law.

However, defenders of reforms might say that, even if reforms do not solve the problem, they improve lives now and are therefore morally preferable to waiting for an uncertain cultural transformation. In response to this objection, it could be said that this depends on evidence about whether the immediate benefit (if any) outweighs the risk of moral stagnation. For example, the results of anti-speciesist activism might take a long time to have significant effects, but it could be argued that what matters is the complete history, not whether positive effects occur sooner or later. That is, it could be argued that, if in order to achieve the best future history for animals it is better to wait, then it is a mistake to focus on reforms simply because their results would occur sooner (since those results may be less positive for animals than if we invested in other activist strategies that take longer to have an effect but produce more positive overall effects).

There is therefore a distinction between (1) political feasibility within current rules and (2) political feasibility in terms of transforming current rules. Reforms may be feasible within the first category, but ineffective in the second.

Additionally, it could also be said that, if the speciesist mindset really makes it difficult to direct legislative action in favor of animals in any way other than through reforms, and if reforms are ineffective or counterproductive, perhaps it would be appropriate to temporarily abandon attempts at legislative action for animals and redirect the resources that would be used in pursuing reforms to campaigns aimed at combating speciesism. Doing so would be the only way to ensure that, at some point in the future (quite a long time from now, probably), it becomes possible to make truly transformative legislative changes in the situation of animals. Prioritizing transformation of mindset is a precondition for lasting legislative change. Thus, temporarily abandoning the legislative arena may also be a strategy.

Moreover, the thesis that, because the speciesist mindset predominates, the only way to direct legislative action in favor of animals is through reforms could be questioned. For example, attempts could be made to abolish specific practices and to create legal precedents that would facilitate a later removal of animals from the category of items of property.

Defenders of reforms might also say that fighting for reforms and fighting to change the speciesist mindset are not mutually exclusive strategies. However, although conceptually compatible, in practice these strategies compete for scarce resources (time, funds, attention).

11.11. The possibility of biases on both sides

Proponents on both sides may be subject to biases²⁴⁸ that incline them to defend the position they support without impartially analyzing the impact of reforms. Below are some examples in this regard.

*Commitment bias.*²⁴⁹ Someone who has long supported reforms may see them as more positive than they really are. Similarly, someone who has invested heavily in a position against reforms may be reluctant to recognize that they can be effective.

*Bandwagon effect.*²⁵⁰ Proponents of reforms often cite that most researchers in the effective altruism movement agree that regulations hinder rather than facilitate animal exploitation.²⁵¹ Due to the bandwagon effect, this may incline other researchers to favor them without necessarily carefully evaluating their effectiveness. The same bias may influence those who oppose reforms. For example, if most animal rights activists are against reforms, someone may feel inclined to reject them without evaluating whether they are truly ineffective.

*Cognitive dissonance.*²⁵² It is the discomfort that arises from holding conflicting beliefs or attitudes that conflict with our beliefs. The desire to avoid this discomfort may influence both an anti-reform and a pro-reform position. For example, someone may feel compelled to assert that reforms are ineffective in order to avoid the discomfort of feeling complicit in animal exploitation by approving reforms. Likewise, someone may feel compelled to assert that reforms are effective in order to avoid the discomfort of thinking that actions taken with good intentions may be ineffective or counterproductive.

11.12. The efficiency of reforms under discussion

11.12.1. The criterion of efficiency

One might think that, if it were demonstrated that reforms really lead to abolition or really reduce the suffering of exploited animals, then animal advocates should invest in reforms. However, it could be argued that, even so, there might be other strategies more efficient than reforms.

At this point, a parenthesis is necessary. A defender of reforms might argue that, even if there may be other strategies more efficient in terms of reducing the number of animals exploited and in terms of leading to abolition, reforms are necessarily the most efficient strategies for reducing the suffering of animals who will inevitably be exploited, since they are the only ones with that goal.

However, it could be replied that, even if this is true, if we must decide where to allocate our resources, we would then have to consider the goal of reducing the suffering of animals who will inevitably be exploited versus the goals of reducing the number of animals exploited and abolishing animal exploitation. In this sense, it could be argued that it is better to focus on aiming at abolition because, if achieved, it would produce a world history with less total suffering even compared to the most efficient

²⁴⁸ On cognitive biases, see Kahneman (2011).

²⁴⁹ Pilat & Krastev (2025a).

²⁵⁰ Pilat & Krastev (2025b).

²⁵¹ Anthi (2017a).

²⁵² Pilat & Krastev (2025c).

possible strategy for reducing the suffering of exploited animals.

In turn, regarding this point, the defender of reforms might argue that, if different people work with different goals (some aiming to reduce the number of animals exploited and achieve abolition, and others aiming to reduce the suffering of animals who will be exploited), the total balance of suffering over time might be lower than if everyone aimed only at reducing the number of animals exploited and/or achieving abolition.

Having made this parenthesis, we will discuss below only whether other strategies could be more efficient in terms of reducing the number of animals exploited and/or leading to abolition.

11.12.2. The issue of cost/benefit ratio and risks

An argument against reforms holds that, given the relationship between the cost required to run a pro-reform campaign and the risks that such resources may result in no gain at all (for example, if the proposal is not approved), it is better, in cost-benefit terms, to invest in other types of strategy. For example, strategies aimed at reducing consumption also carry the risk of not achieving the planned success, but even when this occurs, they usually achieve the goal to a lesser degree (for example, the aim is to reduce consumption among a specific number of people, and only half that number is reached), but the risk of producing no gain at all is low.

On the other hand, in defense of reforms it could be said that, if the gains they could provide are sufficiently higher than the gains other strategies could provide, it is worth attempting them, even if the risk of achieving nothing is also high.

However, two ways of responding to this argument are: (1) to deny that reforms provide gains high enough to justify running such a great risk; (2) to point out that other strategies may provide gains as high as or even higher, but with lower risk. We will see below two examples in this regard.

11.12.3. Examples defending that other strategies would be more efficient

1. *In defense of investing in cultivated meat.* If cultivated meat technology becomes cheaper to produce than conventional meat, exploiters themselves will have an interest in migrating to cultivated meat (and therefore it would face less resistance from exploiters than reforms). Moreover, unlike reforms, investment in cultivated meat does not carry the risk of increasing conventional meat consumption and, consequently, does not carry the risk of increasing the number of animals exploited (in fact, it would considerably reduce that number).

2. *In defense of investing in consideration for animals.* It could be argued that spreading moral consideration for animals would strongly contribute to people stopping consuming them, and that this would reduce the number of animals exploited more quickly than investing the same resources in more regulations. It could also be argued that the educational strategy is more efficient because, unlike reforms²⁵³ and any other strategy, it attacks the cause of the problem, not merely its symptoms and, therefore, prevents the problem from re-emerging.

²⁵³ On the risk of reforms being overturned after being approved, see Torella (2023).

11.12.4. Lack of data and compensation for neglect

In defense of reforms, it could be objected that there are no very precise data on the efficiency of other strategies. Therefore, they do not necessarily have a better cost-benefit ratio than reforms. However, one of the reasons why there are no such data is that much less has been invested in other strategies compared to reforms (whether in terms of financial resources or number of activists). Thus, it could be argued that, given the uncertainty about the degree of efficiency of each strategy, it is important to compensate for neglect, since our impact will be greater if we focus on strategies that have been less attempted so far.

This is because, when a strategy is highly neglected, there are many easy and inexpensive opportunities to make significant progress, which are like fruit hanging on the lowest branches of a tree. The first activists to explore the strategy in question can identify and exploit these opportunities, thereby having a large impact. However, as more people begin to use the same strategy, the cheapest and most impactful opportunities tend to be taken first. What increasingly remains are tasks with lower impact per unit of effort. Thus, the impact of each new person working on a strategy tends to decrease over time.

For example, if the strategy of spreading moral consideration for all sentient beings has been much less attempted so far, the first activists who begin to explore this strategy may try to convince those people who are more open to the issue and/or who have more influence, resources, power, etc. As more activists invest in the same strategy, what remains are increasingly difficult opportunities, and therefore the impact per additional investment tends to decline.

The point is: since investment in reforms (in terms of resources and number of activists) is much greater than investment in other strategies, it could be argued that our marginal impact will be much greater if we focus on other strategies.

12. SUGGESTIONS FOR FURTHER DEVELOPMENTS

In the previous chapters, we addressed five types of strategies that could be used to try to change the situation of decapods (and, more broadly, of animals in general). Debates were presented regarding many issues related to each type of strategy. Thus, to some extent, they were also compared with one another according to various parameters.

One possible further development would be to create a comparative table of how well or poorly each type of strategy performs with respect to different parameters. Some evaluation parameters that permeated the entire discussion in the previous chapters, and that could be used in relation to each strategy, are the following:

- Whether the strategy attacks the cause of the problem or only its symptoms
- Potential to prevent the risk of setbacks
- How extensively or minimally has it already been attempted?
- Potential to reduce the number of animals exploited
- Potential to reduce the suffering of exploited animals
- Potential to offer gradual steps toward abolition
- Potential to facilitate subsequent changes
- Does it carry a risk of increasing the number of animals exploited?
- Cost/benefit ratio
- Magnitude of risk (does it risk producing low gains or even none at all?)
- Magnitude of the expected positive balance over time
- Potential for acceptance/rejection
- Ease/difficulty of implementation
- To succeed, does it depend on other strategies being implemented?

Some challenges for such a development would be the following:

1. It would need to be investigated whether all the parameters above should be included, and whether there are other important parameters not on the list above.
2. It would need to be investigated whether it is possible to offer an overall result, in terms of how much more or less promising one strategy is in relation to another, taking all parameters together, or whether such an assessment can only be made in relation to each parameter separately, without being able to commensurate them.
3. If the aim is to produce an overall comparison by commensurating the various parameters, it would need to be investigated whether all parameters should have the same weight, or whether some should weigh more than others (and, if so, what their relative weight should be).
4. To investigate the possibility of obtaining objective data regarding the score of each type of strategy in relation to each parameter.

The present study should therefore be understood merely as a starting point in terms of presenting the discussions conducted so far regarding the efficiency of different types of strategies. Nevertheless, we believe that this initial discussion provides a good starting point for more detailed future developments, such as the one suggested in this chapter.

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