

New challenges to cultivated meat

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Abstract: Meat production raises a host of ethical problems that a move away from animal agriculture and towards cellular agriculture could, partially, resolve. Unsurprisingly, then, ethicists have offered a range of positive cases for cultivated meat, and ethics has been an important part of the broader conversation about the technology. However, academics continue to raise new ethical challenges to cultivated meat. In this paper, to bolster the positive ethical cases for cultivated meat offered elsewhere, we respond to three recent challenges to cultivated meat. These are Ben Bramble's argument that we should not want to be the kind of people who want to eat cultivated meat; Carlo Alvaro's suggestions that a virtuous individual would not eat cultivated meat and that cultivated meat will fail to eliminate animal agriculture; and Elan Abrell's claim that endorsing cultivated meat represents a missed opportunity. All three challenges, we contend, fail.

Keywords: Meat, cultivated meat, cellular agriculture, food ethics, animal ethics, animal activism, virtue ethics, philosophy of food, effective altruism

We find the arguments that animal agriculture is a moral disaster compelling. Annually, humans kill tens of billions of terrestrial vertebrate animals for food at a fraction of their natural lifespans. Many of these animals will have led lives of suffering, facing mutilation, close confinement, and the frustration of their natural inclinations. Humans kill many more aquatic animals and invertebrates, but numbers are hard to calculate. Animal agriculture creates serious environmental problems, through the release of greenhouse gases and water pollution, the former leading to climate change, and the latter contributing to ecosystem collapse. It uses huge areas of land, both for the animals themselves and (especially) to grow their food, contributing to deforestation. And it poses serious public health risks through, *inter alia*, the threat of zoonoses.

Advances in food technology offer the prospect of animal products without animal agriculture. Cultivated meat – also called *in vitro* meat, cultured meat, clean meat, and other names – is perhaps the most evocative. Beginning with animal cells, food technologists can grow meat in a bioreactor. At time of wri-

ting, such meat has very limited commercial availability, but dozens of companies aiming to produce this meat exist, supported by significant funding from governments, charities, and especially venture capital.

Ethicists have offered many defenses of cultivated meat against the background of the ethical problems with animal agriculture (see, e.g., Schaefer and Savulescu 2014; Hopkins and Dacey 2008; Robison-Greene 2024). Indeed, the debate is sufficiently advanced that it has broken into sub-debates (see, e.g., Chauvet 2018; Bacchini and Bossini 2023). Additionally, appraisals of the ethics of cultivated meat find a prominent place in non-philosophical explorations of the technology (see, e.g., Zhu et al. 2023; Baggini 2023).

Defenses of cultivated meat take many forms. For example, some (e.g., Robison-Greene 2023) frame cultivated meat as a “non-ideal” strategy for challenging animal agriculture. Such cases observe that arguments for veganism have achieved only limited success when faced with people’s desire for meat. But cultivated meat can overcome this challenge, allowing people to eat meat without supporting animal agriculture. The technology thus presents a promising route towards genuine change. Other defenses (e.g., Milburn 2023) position cultivated meat as part of an “ideal” society. Despite the problems of animal agriculture, says this approach, meat isn’t all bad. Better to keep meat if we can – and cultivated meat offers that opportunity.

Strikingly, cultivated meat has also faced significant criticism from some ethicists. In this paper, we focus on three recent challenges. Rather than offering a positive defense of cultivated meat – something done in the works cited in the previous paragraph – we take up the challenge posed by the technology’s critics.

We write as philosophers. Our focus is on moral challenges to cultivated meat. We acknowledge that there are (for example) important technological barriers to overcome before “cellular agriculturalists” can produce cultivated meat cheaply at scale. Engineers and other scientists are best placed to answer these questions. We also accept that advocates of cultivated meat have crucial legal, economic, and marketing questions to answer. But moral questions are important, too. Such questions ask whether cultivated meat is a technology that “we” should support – as individuals, as societies, as “movements” – and in what *sense* we should support it.

In this paper, we respond to recent ethical challenges to cultivated meat from Ben Bramble (2024), Carlo Alvaro (2022), and Elan Abrell (2023). Respectively, these challenges concern the idea that we should not want to be the sort of people who want to eat cultivated meat; that cultivated meat raises worries about both political strategy and vicious characters; and that support for cultivated meat represents a missed opportunity. We show that these challenges fail.

Our arguments complement the positive defenses of cultivated meat identified earlier. We assure those ambivalent about cultivated meat that these challenges are far from decisive; remind supporters of cultivated meat that, despite the wealth of moral argument on their side, some people remain unconvinced; and invite those skeptical about cultivated meat to recognize the technology's potential.

Ben Bramble and the people we should (want to) be

For Ben Bramble, the question, when it comes to cultivated meat, “is not what we should *do*,” but “what sort of people we should *be*” (2024, 122, emphasis Bramble’s). He believes that we should not be the sort of people who would want to eat cultivated meat.

Bramble holds that the thought of consuming another person’s body is repellent. This is not mere squeamishness, but the product of understanding “the role of our bodies in all the value and disvalue of our lives” (119). Cultivated human flesh is “*the same sort of stuff* that embodied selves come in,” and this means that it will feel equally “off” to a well-informed individual (120, emphasis Bramble’s). The bodies of sentient animals tie intimately to value and disvalue in animal lives, parallel to how humans’ bodies tie to human lives. Thus, a well-informed individual will feel repulsed at the thought of eating a sentient animal’s body. Cultivated meat comprises the same material as an animal’s body, and so it, too, will repulse a well-informed individual. Since we should want to be well-informed individuals, we should want to be people who find cultivated meat repulsive. And as we do not want to eat repulsive things, we should want to be people who do not want to eat cultivated meat.

In the remainder of this section, we will do four things. First, we challenge Bramble’s reliance on anti-cannibalistic intuitions. Second, we interrogate his metaphysical account of the “stuff” that flesh is. Third, we propose an alternative vision of the need to respect the bodies of humans and animals grounded in the relationship between the body and conscious individual. Fourth, we challenge the importance that Bramble places in the need for us to become better people.

Anti-cannibalistic intuitions

Historically, many cultures have practiced cannibalism, including communities in North America, South America, Asia, Africa, and Australasia. (Attestations are contentious; colonialists used accusations of cannibalism to justify violence.) Naturally, cannibalistic practices vary. Among real-world customs

are cannibalistic practices included as part of respectful funerary rites. These kinds of activities were practiced into the 20th century by (e.g.) the Wari' in Brazil and the Fore in Papua New Guinea. We should be cautious about dismissing these practices as inherently disrespectful.

There are now few communities practicing cannibalism in the sense that (perhaps) Bramble imagines. But more innocuous cannibalism continues worldwide. The consumption of placenta remains moderately common, while Roman Catholics (18% of the world's humans) consume the literal body and blood of Christ during the Eucharist (or so a belief in transubstantiation suggests). And parts of our bodies end up inside other humans in many ways. Blood transfusions and organ transplants provide stark examples. Bramble doesn't say what he thinks about placental consumption, organ transplants, and the like – we return to them shortly – but he *does* say what he thinks about cannibalistic cultures like the Wari': "The people in these cultures were mistaken. They did not sufficiently understand the value and disvalue that is possible in human lives or the way in which our bodies are the special condition of this, our intimate companions throughout our lives" (120).

For Bramble, this is not just a claim of the superiority of the institutions of one culture over the institutions of another. Instead, Bramble holds, human aversion to cannibalism is natural. In a sense, we agree. It isn't hard to imagine that humans *evolved* an aversion to cannibalism (cf. Milburn 2016). Instincts discouraging interference with corpses are evolutionarily advantageous. But if we have an evolutionary explanation for a particular instinct, we should treat that instinct with caution in moral reasoning. After all, evolution offers tendencies likely to increase our chances of passing on our genes (in a given ecological context), and not necessarily good moral principles. Bramble acknowledges this but holds that there is "more to" our disgust than an evolved tendency – he "cannot prove" this, though (120).

Contra Bramble, we suggest that we should treat intuitions about the wrongness of cannibalism with caution. Many things intimately associated with cannibalism do raise ethical (aesthetic, health...) concerns, such as interhuman violence and interference with corpses. But cannibalism *itself* isn't as obviously ethically objectionable as Bramble takes it to be.

We must be careful about leaning too strongly on our "natural" intuitions when they may be culturally variable and amenable to evolutionary explanations, as they are – we suggest – when it comes to intuitions about cannibalism. We urge particular caution in this case, for two reasons.

First, Bramble uses "natural" intuitions to condemn practices that are not obviously bad for anyone. Cannibalism as part of a respectful funerary rite, for example, does not involve people hurting or killing anyone, nor does it involve

them doing to a person's body anything that the person would not want to happen. (Admittedly, cannibalism led to negative health outcomes for the Fore people. But such outcomes are not inevitable.) Similarly, there is no obvious victim when parents cook and consume a placenta, or Roman Catholics accept the Eucharist.

Second, Bramble explicitly uses the "natural" intuitions to criticize the practices of cultures very different from his own as "mistaken." This is something that we must do with caution. We (the authors) are not moral relativists, and thus accept that it is sometimes appropriate for people to morally condemn the practices of cultures of which they are not a part. But we do recognize that moral philosophers must explore such criticism with care. For example, we must interrogate whether, inadvertently or otherwise, critics apply different standards to the practices of other cultures than their own. (To use an apt example: many westerners are very ready to condemn those who eat dogs, even while they themselves continue to eat pigs.) Similarly, we must be careful not to allow our criticism to become motivated by non-moral considerations. For example, the practices of those in cultures quite unlike our own may seem strange, unpleasant, or unnecessary. But these are quite different things from them being *immoral*.

To be clear: alien practices that are not obviously harmful could, indeed, be morally suspect. But we suggest that, for methodological reasons, moral philosophers should be cautious of labelling them as such. This is because of the possibility of (inadvertently) motivated reasoning.

Metaphysics of stuff

But let's imagine Bramble is correct about cannibalism. Still, it might not follow that we should reject consuming cultivated meat. As noted, Bramble takes it that cultivated meat is the same "stuff" as flesh from a corpse. This is on the grounds that "physically speaking, it is identical" (121). This is an optimistic assessment of the current state of cultivated meat technology. It's also metaphysically suspect, taking for granted that only *material* questions are relevant to whether A and B comprise the same sort of stuff.

But this needn't be so. For example, there might be metaphysical significance to the stuff's *history*. To explain: perhaps part of the stuff's *stuffness* is how it came about, not just its material constituents. This means that two things that are *materially* similar might nonetheless comprise different stuff. For example, Robert Elliot (1982) famously argues that there is a difference between a forest that has occurred naturally and one that humans have "faked." Even if the "natural" forest and the "faked" forest are *materially* indistinguishable, their

different histories mean that there is a metaphysical difference between them. (And ethical differences can arise from these metaphysical differences.)

If, as with Elliot's forests, the nature of the stuff we call human flesh depends partially upon its history, we could hold that cultivated human flesh is *not* the same kind of stuff as flesh from human bodies. This is because the two agglomerations of stuff have different histories: some of the stuff arose in a human body, some arose outside of it. A difference like this could allow us to retain our commitment to, say, respect for corpses, without having to condemn cultivated meat. This is because some historical features of a given kind of stuff may be moral features, or at least morally *relevant* features, and these moral features may serve to distinguish that bit of stuff from another bit of stuff that is *materially* identical. So, if cultivated meat is a different sort of stuff from the flesh in a corpse, even if materially indistinguishable, we could owe respect to parts of a corpse (and, crucially, things made of the same stuff as parts of a corpse) without owing the same respect to cultivated meat.

If, on the other hand, history *isn't* metaphysically relevant when determining the nature of certain body-like stuff, we must question the ethical significance of shared stuffness. Human bodies mostly comprise oxygen, carbon, hydrogen, nitrogen, calcium, and phosphorus, with a little potassium, sulfur, sodium, chlorine, and magnesium. But we don't and shouldn't recognize other objects made of these elements as comprising the same "stuff" as our bodies. What matters about a body, we will shortly suggest, might be its relationship with a person, not its material.

It is worth acknowledging a final puzzle about the metaphysics of cultivated meat: is it a *part* or a *product* of a body? Bramble sometimes writes as if *any* use of bodies is off-limits. It's "disgusting to eat a dead person's body (or to use it in other ways, say, by extracting and selling their hair and teeth)" (119), he says. But this is implausible, as it condemns many clearly laudable practices. A person could donate her organs to humans in need of transplants, or her body to medical schools, saving human lives. The medics and researchers clearly use the body parts of this person. But that isn't disgusting (in the morally significant sense). Indeed, it might be the opposite. To echo Bramble's language, perhaps someone who fully understands the role that our bodies could play in saving lives would want their organs donated to the ill, or bodies donated to science. We should *want to be* the sort of person who requests that others use their body like this. Bramble might object that there's a difference between taking and using a body part with consent and taking and using a body part *without* consent. There surely is. But this is not the point. The point is that there are at least some cases in which the use of a part of another's body is *not* disgusting. And if that's so, Bramble owes us more explanation of why the

consumption of parts of an animal's body is necessarily disgusting.

Other times, Bramble distinguishes between parts of animals' bodies and things that, when removed, cease to be parts of it, like eggs (128). He is right that there is potentially a moral difference between using bodies and using bodies' *products*. But he does not argue that cultivated meat *is* a part of an animal's body. (His case, recall, depends on it being the same *stuff* as an animal's body, which we have challenged.) Indeed, we contend that – even if it's made of the same “stuff” as individuals' bodies – we could think of cultivated meat as the *product* of a body. After all, cellular agriculturalists grow cultivated meat outside of, and quite separately from, paradigmatic instances of animals' bodies, much as an egg (once out of an animal's body) exists completely independently of it. Cultivated meat does, based on current technology, require biological material from an animal at some point in its production process. (Even if we could create cultivated meat from immortal cell lines, that cell line needs to start somewhere.) But that starting point could be eggs, feathers, hair, umbilical cords – it needn't be an animals' body in the straightforward sense.

Self-body relations

Rather than starting with metaphysical questions about “stuff,” we can challenge Bramble's argument by beginning with the connection between self and body. Bramble's claim that living beings stand in special relationships to their own bodies is plausible. But we can ground this special relationship by recognizing a *relational* property – namely, the relation that obtains between conscious creatures and their bodies. (We understand consciousness by simply noting, echoing Thomas Nagel (1974), that there is something that it is like to be a conscious being. There is something that it is like to be one of us, you, or a bat. There isn't, panpsychism aside, something that it is like to be a cup.) On this framing, if we think that special moral considerations hold when it comes to the pairing of consciousness with body, it's *because they're paired*. When the relation between the two no longer obtains, the special moral considerations can disappear (or otherwise change) with it. (On this picture, incidentally, there's no reason to believe that the “stuff” a body comprises carries any moral or metaphysical significance.)

An analogy makes this argument clearer. Imagine that you hear music, seemingly produced on a trumpet played in a breathy, Chet Baker style. You have a variety of reactions – aesthetic, moral, and more. You might think the song moving and soulful, and the artist deep and evocative. You might have (implicit) attitudes about the artist's entitlements (to appreciation or pay, say). Imagine further, however, that you learn that a person didn't produce the music at all; the sound was simply the wind blowing through a bottle bank. The

relationship you thought existed between artist and instrument does not exist. It *never* existed. Now, your aesthetic and moral responses change. You may no longer be inclined to use “deep” as a descriptor, because you reserve judgments about depth for the behaviors of cognitive, emotive beings. You might conclude that there’s no reason to be concerned about appreciation or compensation for the “talents” of wind or glass, as it’s only when a relation exists between artist and instrument that these judgments are apt.

Similarly, when a conscious being stands in a relation to a body, it makes sense to have aesthetic and moral reactions to that embodied creature. We may now feel both aesthetic and moral disgust when someone treats the embodied being as a mere thing. But this does not apply to body-like things when they have never had a relationship of this sort with a conscious being. And even if a body has previously had such a relationship, when, for whatever reason, the relation no longer obtains between the conscious being and the body, the judgments ought to change as well. This could happen either when the being dies or when someone separates a part of the body (e.g., a scientist extracts their cells). This is just an instance of judgments changing as the facts of circumstances change. To say that we should continue to regard the flesh in the same way in which we viewed the relationship between flesh and consciousness is to claim that the physical stuff is still somehow haunted with properties that applied to the relation. To borrow Bramble’s language, perhaps a morally well-developed person will adjust beliefs and behavior in response to this kind of change.

Better actions vs. better people

A final concern for Bramble’s view is one that is common to virtue-theoretic approaches. In circumstances in which significant and preventable harms remain unaddressed, such approaches can seem like navel gazing. It is, of course, important for us to consider the kind of person we ought to (want to) be. It is even plausible that engaging in this kind of introspective activity is part of what it is to live well. That said, considerable attention to virtues of character can fail to promote good and prevent harm. We’ve already noted the harms of animal agriculture. We maintain that lessening these harms should be our priority, rather than the cultivation of good character. If we become better people through our efforts, all the better, but that shouldn’t be our primary focus.

The insidious nature of this problem is revealed when we see that sometimes aiming to become “better” people can lead us to actively oppose harm-reduction. Bramble seems to think that we should keep intensive animal agriculture because it offers us opportunity for moral development. Switching to cultivated meat would be, he accepts “a good thing in one way” (126). (He’s

talking about benefits to animals.) But, he says, a move away from factory farming “will make it much harder for us to have some kind of reckoning about our treatment of animals” – it makes self-deception “all too easy” (126).

We are uneasy about this argument. Imagine a parallel argument about refusing to rescue someone facing domestic abuse on the grounds that this would prevent their abuser being able to have a “reckoning.” We do not, and should not, find such an argument compelling. We hold that it is wholly reasonable to believe that animal agriculture’s harms are more morally weighty than maintaining an opportunity – that, so far, we’ve collectively ignored – for moral self-development.

Bramble, it seems, believes that we can achieve both aims at the same time: become better people *and* help animals. He may have a strategy in mind according to which everyone recognizes that experiencing disgust in response to flesh is what virtue requires. This approach would require that 1) We can change our aesthetic responses; 2) People care what virtue requires; and 3) People will quickly change these attitudes *en masse*. Absent a clearer sense of what this strategy entails, we worry about its feasibility. A strategy utilizing cultivated meat, we suggest, is more promising. It offers the opportunity to seriously reduce harm to animals, and, at the very least, wouldn’t *prevent* humans from having the kind of moral reckoning – or even change in aesthetic sensibilities – for which Bramble calls.

Carlo Alvaro and virtuous consumption

Carlo Alvaro (2022) challenges the efficacy of a strategy endorsing cultivated meat to combat the ills of currently available (or slaughter-based) meat, as well as the ethics of consuming cultivated meat. We address these challenges in turn.

Effective strategy

Championing cultivated meat, Alvaro says, is “fighting fire with fire,” which “often backfires” (788). Cultivated meat is still *meat*, so (he says) people can consume it healthfully only in moderation. He quotes Mark Post, the “father” of cultivated meat, for whom vegetarianism is a more environmentally friendly diet than a diet containing cultivated meat.

These observations are fair. We accept that we could healthfully consume cultivated meat only in moderation, and that a completely meat-free diet will typically be more environmentally friendly than a diet containing moderate amounts of cultivated meat.

Alvaro then argues that these observations create a problem for cultivated meat, because a “plausible consumer reaction to messaging that aligns [cultivated meat] with a sustainable food systems agenda may well be indulgence or overindulgence in meat” (788). Undeniably, food activists and manufacturers shouldn’t oversell the potential benefits of cultivated meat. But Alvaro seems to want to say more than this. Perhaps he holds that widespread availability of cultivated meat will lead to healthier or less sustainable diets than are prevalent at present – i.e., a move to cultivated meat will backfire. But, if so, he needs to offer more argument than he does.

We are not clear on what this further argument might be. Even if cultivated meat’s prevalence leads meat-eaters to eat more meat – it’s pure speculation that it would – a shift to cultivated meat could still lead to overall health and environmental benefits. For example, widespread adoption of cultivated meat would lead to a reduction of intensive animal farming, and thus a reduction in associated pandemic risk and antibiotic use. Meanwhile, assuming (only) modest environmental benefits of cultivated meat relative to slaughter-based meat, the increase in meat consumption would have to be considerable before the promotion of cultivated meat would “backfire” – even if a vegan diet would be more environmentally friendly than a diet high in cultivated meat.

Considering only the potential impact of cultivated meat on human health and the environment – and ignoring its impact on animals – we agree with Alvaro that promoting cultivated meat could, in principle, backfire. But we contend that he has not offered us reason to believe this likely.

Alvaro’s second objection is that there are “two possible routes” to “convince meat eaters to embrace” cultivated meat (788). One is an “anti-democratic” approach favoring “aggressive advertisement and lobbying” to encourage people to “buy [cultivated meat] against their desires” (788). The other is a legal route, “forc[ing] people to buy [cultivated meat] and reduce or discontinue traditional meat consumption” (788). This is a false dichotomy. For example, when Alvaro introduces his own preferred approach – shifts towards significantly lower meat production – he suggests that we should “educate people and make them realize the necessity of transitioning to more sustainable food systems” (788). But it is unclear why this “education” route is open to Alvaro but not to advocates of cultivated meat. Further, Alvaro’s advocate of cultivated meat feels like a straw man. For example, while there are advocates of cultivated meat who support banning (most) animal agriculture (e.g., Milburn 2023), this is quite different from requiring the consumption or purchase of cultivated meat – vegans, who buy and consume only plant-based foods, could continue to exist in the envisioned society. Indeed, to our knowledge, nobody supports *forcing* people to buy cultivated meat.

Alvaro claims both that “consumers are quite happy about eating meat and are not interested in [cultivated meat]” (788), and that we should favor a transition towards veganism rather than a transition towards cultivated meat. These claims are in tension with one another. Alvaro takes consumers’ apparent satisfaction with slaughter-based meat to be an argument against the development of cultivated meat, but not against transitions towards veganism. It’s unclear why he does this.¹ But, in any case, he oversells his claims about consumers not wanting cultivated meat.

In the opening lines of his paper, Alvaro claims that “meat eaters are not interested in consuming [cultivated meat] on a regular basis, let alone replacing traditional meat with [cultivated meat]” (788). He cites Matti Wilks and Clive J.C. Phillips (2017). Wilks and Phillips’s study of 673 American adults (some, but not all, meat-eaters) found that 65.3% of respondents were definitely or probably willing to try cultivated meat, with a further 11.7% unsure. While fewer were open to incorporating large amounts of cultivated meat into their diet, the authors did find that 32.6% were definitely or probably willing to eat it regularly, while 31.5% were definitely or probably willing to replace slaughter-based with cultivated meat in their diet. (30.8% and 26.3%, respectively, were unsure.) And, in fact, these numbers are slightly lower than the percentage for meat-eaters in the sample, as – in-line with other studies – meat-eaters were *more* likely to be open to eating cultivated meat than veg(etari)ans in Wilks and Phillips’s study.

There are obvious problems with basing assumptions about what a large demographic will do based on a single study – especially one testing only participants’ self-expressed willingness to engage with a (hypothetical) product. But based on this study alone – the study Alvaro cited – it’s hard to conclude that meat eaters are “not interested” in regularly consuming cultivated meat.

There is a further problem. Alvaro’s argument that consumers don’t want to give up meat is a dangerous one for his position. If consumers don’t want to give up meat, that would be, it seems, a partial argument in favor of advocating cultivated meat *rather than* advocating veganism. (Recall the “non-ideal” case for cultivated meat we mentioned in the introduction.) One would expect consumers’ unwillingness to give up meat to mean it was *harder* to encourage them to shift to veganism than to shift to a *different kind* of meat. And this is, at least in part, supported by Wilks and Phillips (2017), who found that, among their respondents, 47.7% reported that they were more willing to eat cultiva-

¹ Incidentally, the claim about consumers’ satisfaction with “meat” depends upon the idea that cultivated meat is *not* meat, when his “fighting fire with fire” critique depended on the claim that cultivated meat *is* meat.

ted meat than soy-based meat substitutes, while only 20.1% reported that they were less willing. Cultivated meat – based solely on the study that Alvaro cited to illustrate its unattractiveness – sounds *more* attractive to consumers than vegan alternatives to meat. (Alvaro would presumably express skepticism about these “substitutes” as well as about cultivated meat, but the point stands.)

A full assessment of veganism vs. cultivated meat as “non-ideal” solution to problems with the food system is a complex exercise. It will involve assessing the ability of the respective strategies to right wrongs, the likelihood of their respective success (i.e., dietary uptake), and – crucially – their ability to bring us closer to the ideal. Of course, this also means that we need to have a clear sense of in what the “ideal” for which we’re aiming consists. We’re thus unable to offer a full case for cultivated meat as a non-ideal strategy here, and do not criticize Alvaro for failing to offer a full case for veganism as a non-ideal strategy, which would be beyond the scope of his paper. But we have, we believe, demonstrated that Alvaro’s critiques of strategies favoring cultivated meat leave much to be desired.

Virtuous consumption

For Alvaro, a virtuous person will be temperate, and thus have “a rational and harmonious approach to appetite and food pleasure” (789). In particular, she will not be “particularly attached to a certain food simply because it may taste good or because it generates pleasure” (789). For the virtuous individual, Alvaro says, “food pleasure is relatively important [but] the main purpose of eating food is to acquire energy for growth and for proper functioning and health” (789). The virtuous person, then, “may consider that optimal health does not require the consumption of any animal products” (789). The temperate (and just) individual will seek “satisfactory alternatives” to current systems of meat production. But, says Alvaro, we *already have* satisfactory alternatives: “plant-based, vegan diets, or forms of agriculture that may include very low amounts of meat” (789). On the other hand, encouraging the uptake of cultivated meat carries with it a “financial burden and strategies to convince people to abandon what they see as perfect and natural (factory farming) to embrace something unnatural made in the lab that they do not want” (789).

We have already challenged Alvaro’s worries about strategies for convincing people to eat cultivated meat, and his assessment of how people “do not want” cultivated meat. But we accept that the development of cultivated meat carries with it a financial burden. Might there be any reason for the virtuous person to champion the development of cultivated meat *even despite* the financial cost?

A first answer again stresses the *non-ideal* character of some arguments in fa-

vor of cultivated meat. Perhaps the temperate person will not call upon cellular agriculturalists to develop cultivated meat *for her sake*. But the virtuous person might call for it *for others*. The just and compassionate person will champion those strategies that could lead to a reduction in the harms of animal agriculture. The wise and patient individual will recognize that, often, we are unable to instantiate a perfectly just social order, so must favor a second- or third-best option. And the magnanimous individual will forgive those others whose temperance falls short, allowing that there should be some space for intemperance.²

A second response, however, argues that the eating of cultivated meat might sometimes be a virtuous activity, and thus that the virtuous individual might champion the production of cultivated meat for her own sake.

Alvaro holds that, since the main function of eating food is to support good health, we should eat the most healthful diet that we can, eschewing foods, like meat, that are not consistent with that. But virtue theorists could reasonably take other approaches to temperance. Virtue theory is a matter of using one's reason to guide one's emotions and behavior to fall in line with the mean between two extremes. What Alvaro suggests seems extreme, rather than moderate.

This contrasts strongly with Aristotle's position. Aristotle does not say that humans ought to consume food purely to remain in good health. What he says is that the virtuous agent must do that which is "conducive" and "not detrimental" to health:

But such pleasures as conduce to health and fitness he will try to obtain in a moderate and right degree; as also other pleasures so far as they are not detrimental to health and fitness, and not ignoble, nor beyond his means. The man who exceeds these limits cares more for such pleasures than they are worth. Not so the temperate man; he only cares for them as right principle enjoins. (*NE*, 1119a)

There are many diets that match this description, including diets containing some moderate amount of meat (cf. Haile 2013, 91-2). Indeed, the virtuous agent *should* include pleasure among their motivations when it comes to what they eat. To abandon all gustatory pleasure to pursue some (perhaps illusory) picture of an ideally healthy diet is to be insensible³ – a vice of deficiency:

Men erring on the side of deficiency as regards pleasures, and taking less than a proper amount of enjoyment in them, scarcely occur; such insensibility is not human.

² Indeed, if intemperance was impossible, *temperance* would be impossible, too. Virtue does not exist in a vacuum. We must practice it.

³ Compare the critique of picky eating from Matthew J. Brown (2007).

Indeed, even the lower animals discriminate in food, and like some kinds and not others; and if there be a creature that finds nothing pleasant, and sees no difference between one thing and another, it must be very far removed from humanity. (*NE*, 1119a)

So, Aristotle thinks that pleasure is an important part of consumption *and* he has difficulty imagining any kind of animal pursuing a diet without it. He does not describe the ideal moral agent as engaged in a quest to determine what the ideally healthful diet would be. Indeed, he admits considerable variability when it comes to healthful diets.

Aristotle does argue that there are many ways that we can go wrong when it comes to pursuing pleasures:

But in regard to the pleasures peculiar to particular people, many men err, and err in many ways. For when people are said to be ‘very fond of’ so-and-so, it is either because they like things that it is not right to like, or like them more than most people do, or like them in a wrong manner; and the profligate exceed in all these ways. (*NE*, 1118b)

This passage provides us with three ways of thinking about temperance. None of these three entails Alvaro’s claim about the obligation of the temperate individual. Aristotle thinks that a person can go wrong in their pursuit of pleasure by delighting 1) In the wrong things; 2) More than most people do; and/or 3) In the right things in the wrong way. One way of reading Alvaro is that he is saying something like (1) – that delighting in less than ideally healthful food is intemperate. The problem with this, as we’ve already explored, is that it seemingly equates temperate behavior with extreme behavior.

We think that a more useful contemporary way of thinking about “delighting in the wrong things” has to do with the relevant moral features of those things. In this case, the relevant moral aspects are clear – one is delighting in the wrong things if those things cause avoidable harms, especially if those harms are severe. We think there is every reason to believe that the harms associated with industrial animal agriculture are severe. But we can’t see a virtue-based reason to think that it would be necessarily wrong to delight in the consumption of cultivated meat, which need not involve harms (severe or otherwise) to animals.

Alvaro has not provided us with good reason for thinking about temperance in the way in which he suggests rather than another plausible alternative. We have argued that the temperate person need not abandon a desire to experience the taste of meat. What they must do is consume the right kind of meat (i.e., meat not produced in harmful ways).

We also note that Alvaro places a lot of weight on temperance, without ex-

ploring what non-temperance virtues might say about meat consumption. Put simply, Alvaro seems to assume that an individual (who has the option of eating a vegan diet) who chooses to eat meat does so solely because they like the taste of meat. But there could be other, more virtuous reasons for eating meat.

Admittedly, vegetarian perspectives predominate in discussions about the virtues of meat-eating.⁴ But these cases against meat have often relied upon the violence to animals inherent in food production. Once we *remove* that violence – as cultivated meat can – we open the door to virtue-based arguments in favor of meat-eating. Christopher Bobier (2021) stresses how a virtuous individual might eat animal products rather than plant products when doing so is less harmful to animals. But once we allow that meat-eating can be harm-free, we could explore a wide range of cases for virtuous meat-eating. Could there be virtue in honoring the (meaty) traditions of our cultures? Could there be virtue in admiring the (culinary) creations of our friends? Could there be virtue in showing hospitableness to our (non-vegetarian) parents? We suspect so. Could these justify us in eating, or at least hoping for, harm-free meat, even if its consumption will not be fully temperate? Again, we suspect so.

We are sympathetic to the idea that the virtuous individual will abstain from slaughter-based meat, given the horrors of animal agriculture (Hursthouse 2006). But we don't think that this extends to cultivated meat, even for someone who agrees that temperance speaks against the eating of *any* meat. Surely, for example, the virtuous individual would not refuse a friend's hospitality, creating tension at the table, just because the harmless food they serve is a little lavish. And it seems that's what Alvaro is saying the person served cultivated meat must do.

Alvaro anticipates the possibility that meat is not as bad as he makes out. But if that's so, he says,

it would seem that the virtuously temperate person would have considered that intensive animal agriculture is bad for the environment and for animals, that [cultivated meat] is not supposed to replace traditional farming and that traditional farming is supposed to continue. (2022, 789)

Thus, he says, the temperate individual will favor the continuation of "ethical and responsible non-intensive animal farming" rather than the development of cultivated meat (789). We struggle to understand this argument. We are unclear who is "supposing" that cultivated meat will not replace ani-

⁴ In addition to Alvaro's own work (e.g., 2019), virtue-based cases against meat include Nobis 2002, Hursthouse 2006, and Shafer-Landau 1994. There are exceptions, though (e.g., Haile 2013).

mal agriculture; instead, we contend that virtuous individuals could champion systems in which slaughter-based meat is replaced by cultivated meat. This possible future is, we think, no more utopic (in the pejorative sense) than an envisioned vegan future.

On the other hand, Alvaro may be pointing to how the production of cultivated meat continues to require the keeping of animals – cultivated meat cannot entirely replace animal farming. But cultivated meat requires far *fewer* animals than slaughter-based meat – that is, it’s an animal-efficient method of producing meat. And the production of cultivated meat does not require the *killing* of animals; it might even allow new ways of living with animals (cf. Dutkiewicz and Abrell 2021; Weele and Driessen 2013). A virtuous individual wouldn’t favor killing animals for meat when she can have meat *without* killing animals.

Let us summarize. Alvaro argues that the temperate individual would favor a vegan diet over the production of cultivated meat. We argue that the virtuous individual could nonetheless champion the production of cultivated meat *for others*, or, conversely, could hold that temperance speaks (or non-temperance virtues speak) in favor of the consumption of cultivated meat at least occasionally. Meanwhile, Alvaro argues that if there *is* room for meat consumption, we should produce this meat in some unspecified “environmentally responsible” way “that enables the ethical treatment of farmed animals” (2022, 789). We reject this, holding instead that the virtuous consumer should favor cultivated meat over killing animals.

Elan Abrell and opportunities missed

Elan Abrell, a cultural anthropologist and former senior regulatory specialist at the Good Food Institute, worries that a focus on cultivated meat may represent an opportunity missed. Abrell doesn’t oppose cultivated meat as such. He believes “the overwhelming magnitude of the many harms caused by animal agriculture outweigh the potential harms of cultivated meat” – an idea echoed in our responses to Bramble and Alvaro – and expresses sympathy with the idea of “investing public funds in the advancement of meat-culturing technology so that it can at least help reduce the size of the conventional animal agriculture industry” (2023, 155). But he nonetheless worries about cultivated meat as a *primary* strategy to combat the ills of animal agriculture.

Abrell expresses doubts about whether the technology will be able to produce meat on a scale that would make replacing factory farmed meat realistic – even if the industry is able to overcome some of the technological barriers it currently faces. Perhaps it will eventually be possible for cultivated meat companies to produce enough meat to satisfy current demand, but

it's unlikely they'll do so in the necessary timeframe to combat the climatic impact of animal agriculture. Abrell points out that mega-facilities dedicated to producing cost-competitive cultivated meat by 2030 could produce roughly 22 million pounds of cultivated meat in a year. The largest cattle slaughterhouses produce that amount of slaughter-based meat in a week.

We should be wary, Abrell says, of the technology as an instance of "disaster capitalism." That is, we should be aware of the possibility that venture capitalists may be using our anxieties to make money quickly, without offering any realistic solution. He evokes the spirit of Audre Lorde's assessment of oppressive systems, claiming that "a capital-based activism strategy will never dismantle the capitalist system of animal exploitation that is rapidly destroying our planet" (156). Abrell argues that what we need is not change driven by capitalism, but, rather, a radical political and ethical shift in how we think about our relationships with animals. What we need to do is to end animal agriculture now.

Technological skepticism

We focus our response on Abrell's normative claim, but first we quickly note that we don't think that his pessimism about the state of the technology is the only reasonable way to understand the state of the cultivated meat industry. Indeed, we note that there have been major breakthroughs even since Abrell wrote his paper. We give just two examples.

One major technological hurdle acknowledged in the cellular agriculture world (and mentioned by Abrell) is the use of fetal bovine serum (FBS), a gruesome slaughter co-product, as a component of cell culture media. If the cell growth required to produce cultivated meat requires slaughter, it would hardly constitute progress. The fact is, though, cell growth *doesn't* require FBS. The cultivated meat company Mosa Meat has been producing its product without FBS since 2019. A paper outlining their method was recently published in *Nature Food* (Messmer et al. 2022). There's room for lingering concerns, of course. As Abrell points out, the cultivated meat industry as it presently exists relies on capitalism. Mosa Meat has obligations to funders and a profit motive. They've seemingly acted transparently by releasing their methodology, but they've also pursued a patent. This may have the implication that Mosa Meat can use the technology, but other tech companies can't. If this is the case (and assuming that other groups can't find their own way to a similar outcome) that limits cultivated meat's radical potential. That said, we now know that alternative production methods are not impossible.

There have also been new developments in distribution and authorization sin-

ce Abrell made his arguments. The United States Food and Drug Administration declared cultivated meat safe for human consumption in November 2022. In June 2023, California's Agriculture Department gave approval for two companies, Upside Foods and Good Meat, to sell cultivated chicken meat. Restaurants in both California and Washington D.C. plan to serve the product. Of course, this doesn't settle whether cultivated meat will eventually be scalable. But the technology is moving forward. Abrell claims that "[t]he promises of cultured meat have proven to be illusory" (2022, 157). While it's possible that the promises *may yet* prove illusory, we suggest that his conclusion is, at present, too hasty.

Strategies for change

We turn now to Abrell's main normative claim: rather than relying on capitalist strategies to solve the problems that (Abrell claims) capitalism created, we ought to focus our resources on strategies that change the political structure that, Abrell contends, allows for the oppressive system of animal agriculture in the first place.

We offer several responses. The first is that Abrell presents a false dichotomy. Animal advocates can be strategic pluralists. We can champion cultivated meat *and* support political strategies to end animal agriculture (or capitalism). For example, again echoing comments from our introduction, we might see cultivated meat as part of an array of "non-ideal" strategies to move us towards a vegan world in the long term while limiting harm in the short term. Or we might envision a future in which animal agriculture as we know it is abolished, replaced by cultivated meat – and there's no reason this future couldn't be socialist (Dutkiewicz 2019). Venture capitalism has played a part in the technology's development, but there is no reason that cultivated meat couldn't be part of a food justice agenda (Broad 2019).

What's more, we probably *need to be* strategic pluralists. Though Abrell critiques cultivated meat strategies for being incapable of making a difference soon, he provides no reason for thinking that his strategy fares better. Even if we directed all the resources currently directed toward cultivated meat towards political change instead, it may still not be possible to bring about the change Abrell calls for.

Indeed, we worry that Abrell's characterization of "effective" animal advocates (i.e., animal advocates sympathetic to the philosophy of "effective altruism") calling for the movement to "channel all our resources" (2022, 151) into cultivated meat is a straw man. He envisages Animal Charity Evaluators (ACE) "channeling significant funding streams away from vegan outreach and other strategies" (152) towards cultivated meat, on the grounds that ACE con-

sistently recommends donations to the Good Food Institute (GFI), an organization that aims for food system change through support for cultivated and plant-based meat (and other plant-based/cultivated products). But he doesn't mention that ACE *also* consistently recommends donations to organizations focused on vegan outreach (plus other strategies and cause areas), as detailed in the next paragraph.

Abrell (153) quotes ACE's own estimates that it influenced donations to GFI of around \$3.2 million in 2020. The first thing to say is that the report Abrell quotes (ACE 2021) *also* detailed millions of dollars to *other* organizations, too, including over \$3.5 million to The Humane League, and hundreds of thousands of dollars to each of the Albert Schweitzer Foundation, Anima International, The Wild Animal Initiative, Compassion in World Farming USA, Faunalytics, Sinergia Animal, and Sociedade Vegetariana Brasileira, none of which focus on cultivated meat. Consequently, it'd be unfair to frame ACE as championing cultivated meat at the expense of other strategies and areas of concern – *even if* GFI focused exclusively on cultivated meat, which it doesn't.

But let's imagine that GFI is solely concerned with cultivated meat, *and* we ignore the money that ACE has raised for other causes. Let's also imagine that Abrell is right that ACE's actions lead to donors redirecting money from other areas of animal advocacy – a claim for which Abrell does not offer evidence – rather than generating new donations or redirecting donations away from non-animal causes. Even then, we think, he'd be wrong to frame ACE's activities as "channeling significant funding streams away" from other areas. Ultimately, \$3.2 million is a drop in the Ocean. Battersea Dogs & Cats Home in London (a paradigm less "effective" organization) had a 2022 income of £56.527 million (\$71.286 million), including donations/legacies of £53.41 million (\$67.37 million). Dogs Trust had an income of more than £124 million (\$156 million), with over £111 million (\$140 million) in donations/legacies. For Cats Protection, the numbers were £86 million (\$108 million) and £62 million (\$78 million).

In short, it's not clear that ACE supports investment in cultivated meat as "the main solution to the problem of animal agriculture" (Abrell 2023, 156), nor that – even if they do – their activities have led to a "channeling [of] significant funding streams away from vegan outreach and other strategies" (152).

What would we need to achieve the changes Abrell calls for? In addition to time, energy, and resources, we'd need a substantial political will. The best available inductive evidence suggests that this doesn't exist. Vegans have been arguing and demonstrating for political change for decades, but have made little progress.

Abrell wants political change. Most advocates of cultivated meat want that, too. This is no argument against cultivated meat; instead, it supports a nuanced

strategy that includes it. The more strategies we have at our disposal, the more likely we are to be able to bring about substantive change.

Conclusion

Many ethicists have made a positive case for cultivated meat. Nonetheless, new ethical challenges to the technology continue to arise. In this paper, we have closely examined three recent and high-profile challenges to cultivated meat, finding them all wanting. Only time will tell whether cultivated meat will live up to the promises of its most optimistic advocates. But, we contend, there's a moral case to hope that it will.

Two recurring puzzles arising from the analysis of this paper concern virtuous eating and political strategy. Future work on the ethics of cultivated meat, thus, could focus on these areas. Here, we responded to Alvaro and Bramble's specific virtue-based arguments, but stopped short of offering a full-fledged virtue-based case for cultivated meat. We would welcome further contributions to the literature that take up this line of enquiry. We would also welcome sustained analyses of the potential of cultivated meat to offer significant food system change (with an eye to impacts on animals, the environment, and/or public health); a puzzle that arose in our conversations with both Alvaro and Abrell. There is value in comparing political strategies championing cultivated meat to political strategies championing veganism. Crucially, however, anyone offering such a comparison should remember that this need not be an either/or. If we are right about the magnitude of the moral problem our current food system poses, perhaps it is only right that we collectively pursue a range of strategies to lessen animal agriculture.

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