

An ontological guide to make novel foods *familiar*

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Abstract: The goal of this paper is to develop strategies for novel food familiarization based on ontological modelling. I begin by offering an array of criticisms to standard definitions of novel food, focusing on the European Union (EU) approach as a case study, showing its difficulty in identifying and categorizing novel foods (§1). Next, I refine the EU approach by setting up a more robust ontological categorization suitable for assessing kinds and grades of food novelty (§2). Then, I add a further layer to this ontology outlining initial steps to incorporate novel food items within already known and accepted ontological categories (i.e., local food and symbolic food) (§3). I conclude by arguing that the decision-making process regarding novel food ontological categorization should include input from stakeholders (§4).

Keywords: novel food, food ontology, philosophy of food, food ethics, food stakeholders.

A growing scholarship on the impact of livestock farming insistently draws attention on its role as one of the main drivers of climate change and, more in general, environmental degradation. Just to provide a brief glimpse, livestock farming alone is responsible of 14.5% of worldwide greenhouse gas emissions and 64% of total ammonia production, a key element of water acidification (see, e.g., Aidoo *et al.* 2023; Espinosa-Marrón *et al.* 2022; Scanes 2018).

The production of alternatives to traditional meat, such as cultured meat, plant-based meat, or edible insects, would instead account for a far less environmental burden; for instance, a wide review by van Huis and Oonincx (2017) points out that the production of 1g of edible protein from mealworms requires about two to three times as less land and 50% less water in comparison to poultry production; depending on the context, poultry farming produces between 32% and 167% more greenhouse gas emission than mealworm farming. Additionally, in a recent review, Pingali *et al.* (2023) showcase that greenhouse gas emissions from beef are circa 13 times higher than plant-based

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meat, while pork and poultry production account for 3 to 2 times more greenhouse gas production than plant-based meat.

Thus, a more or less dramatic shift in dietary patterns, significantly diminishing global greenhouse emission, would mitigate some of the more severe effects of climate change (see, e.g., Smetana *et al.* 2023).

However, despite the availability of alternative options and although international health organizations guarantee the same safety and the similarity in nutritional profile (FAO 2021), Western national governments and individual consumers continue to harbor skepticism towards dietary shifts away from traditional meat.¹ Among the many drivers of such a food refusal, a common one regards the cultural import of those alternatives which fail to be recognized as proper meat by consumers (Hansen *et al.* 2021) and instead are suspected of having a disruptive impact² on the extant shared food ontology.

Before proceeding further, it is important to clarify this term, “food ontology”, which will play a fundamental role in the following argumentation. A food ontology, in a nutshell, is the systematic collection in meaningful categories of the most basic components of the food domain, i.e., those items, processes, habits, customs, perceptual states, and, broadly speaking, all possible objects, that belong to the food experience of an agent (e.g., the eater, the producer, the regulator, the community x living in the region y), according to a given criterium. For instance, the ontological category “traditional food” collects ingredients, preparation methods, flavors, and so on, associated with a certain gastronomic tradition, while “ethnic food” covers all those food-related items and behaviors associated with allogeneic traditions.³

Most alternatives to traditional and less sustainable foods are usually collected under the broader category of “novel foods”, in order to stress their character of novelty in respect to an extant culinary milieu. The European Union legal framework makes sense of this novelty by including under the label all those foods, substances, and production techniques, lacking a significant history of usage before May 1997:⁴

¹ See, for instance, the systematic review on food acceptance of insect products in Western countries by Kröger *et al.* (2022).

² Food refusal, technically called food neophobia, rests on a variety of factors that range from disgust to the perceived risk, to trust in the producers, to social positioning of the consumer, and so on. See, *inter alia*, Çınar *et al.* (2021); Siegrist and Hartmann (2020).

³ To delve into more details regarding what a food ontology is and how to characterize it vis-à-vis the contemporary debate falls outside the scope of the paper. For a detailed account, see Borghini *et al.* (2021), especially section 2.2.

⁴ In what follows I will focus on the legal framework and the food ontologies of those countries adhering to the European Union, for the sake of brevity and precision. However, I’m confident that the same argument can be applied to other countries adopting slightly different legal frameworks,

any food that was not consumed “significantly” prior to May 1997 is considered to be a novel food. The category covers new foods, food from new sources, new substances used in food as well as new ways and technologies for producing food. [...] Traditional food is a subset of novel food and refers to food that is traditionally consumed anywhere outside Europe.⁵

This categorization, that clusters all novel foods using a temporal criterion, provides a simple and handy way for individuating those in need to be assessed whether they comply with the fundamental principles endorsed by the EU regarding food sale and distribution. These are usually summarized in the following form:

- (i) being safe for the consumer;
- (ii) being properly labeled to avoid misleading consumers;
- (iii) being nutritionally equivalent to any food it is intended to replace.

As an example, the European Union (EU) includes the following items in the novel food category:

new sources of vitamin K (menaquinone) or extracts from existing food (Antarctic Krill oil rich in phospholipids from *Euphausia superba*), agricultural products from third countries (chia seeds, noni fruit juice), or food derived from new production processes (UV-treated food (milk, bread, mushrooms and yeast)).⁶

For sure, not all novel food represents a more sustainable alternative to traditional foods, nevertheless at least some can play a role in the fight against climate change and environmental degradation (Mazac *et al.* 2023), replacing more traditional and less sustainable ones, e.g., pork, poultry, and beef meat.

This paper will take seriously the hypothesis – already explored in the literature (e.g., Tan *et al.* 2016; Gumussoy *et al.* 2021) – that making novel foods more familiar in respect to a food ontology shared by a group of eaters can help attempts to shift their diets to a more sustainable one. One of the ways for achieving this process of familiarization could be to highlight the closeness of novel food to already known and accepted foods.⁷

e.g., the USA or South Korea, see, e.g., Vapnek *et al.* (2021).

⁵ See the European Food Safety Authority website: <<https://www.efsa.europa.eu/en/topics/topic/novel-food>>.

⁶ See the page dedicated to novel food on the official website of the European Commission: <https://food.ec.europa.eu/safety/novel-food_en>.

⁷ On the role of familiarity for alleviating so-called food neophobia, see, e.g., Mattavelli and Riz-

However, we still lack two basic tools required to accomplish this task. First, a tool for assessing how and to what extent novel foods are either novel or familiar in respect to an extant food ontology. In fact, the time constraint adopted by the EU definition fails to accomplish such a task as it only indicates whether a food is novel, without specifying in what way or to what degree a food is novel. Second, we lack a tool for mitigating the novelty of those foods making them more familiar to the eaters.

The goal of this paper is to develop such tools by means of ontological modelling to be used in strategies of novel food familiarization by other scholars, practitioners, and policy makers. I adopt a method in tune with current debates on the ontology and metaphysics of food within the analytic tradition which have already systematically ameliorated, re-engineered, and revised other food concepts, such as wild food (Borghini *et al.* 2020), local food (Borghini *et al.* 2022), healthy eating policies (Piras 2024), in order to serve selected epistemic and political goals.

In what follows, I begin by offering an array of criticisms to the EU definition of novel food showing its difficulty in identifying and categorizing novel foods (§1). Next, I refine the EU approach by setting up a more robust ontological categorization suitable for assessing kinds and grades of food novelty (§2). Then, I add a further layer to this ontology outlining initial steps to incorporate novel food items within already known and accepted ontological categories (i.e., local food and symbolic food) (§3). I conclude by arguing that the decision-making process regarding novel food ontological categorization should include input from stakeholders (§4).

1. *A Critical Assessment of EU Food Ontology for Novel Food*

According to the EU definition, what characterizes a food as novel (or a part thereof, or the production technique) is whether it has or not a significant history of consumption before May 1997. This definition might be useful for cashing out criteria for deciding which foods deserve tailored tests of healthiness and safety as they lack a previous history of consumption that can be verified for their culinary reliability.⁸ Yet resting only on the debut in the market of a food might be not sufficient, and sometimes not even necessary, for establishing whether it is novel in respect to an existing food ontology shared by a group of eaters. It is reported, for instance, that the more a food is *perceived* or *considered* as novel, the higher the likelihood of it being rejected by consumers (e.g., Siddiqui *et al.*

zoli (2022); Raudenbush and Frank (1999).

⁸ See note 6.

2023). And, in fact, only some novel foods are strongly rejected by consumers, while others are instead easily accepted and adopted, even if they all equally meet the novelty requirements nailed down by the EU (e.g., see Rosenfeld *et al.* 2023 on the case of meat alternatives). A method for assessing such novelty is still missed, and yet it can be crucial if the introduction of a novel food is key for the achievement of a specific goal, for instance, the replacement of slaughtered meat with bloodless or more sustainable alternatives.

Unfortunately, the EU definition fails to explain where the difference lies as it is not able to capture the grade of novelty, familiarity, or even indifference, of novel foods in respect to extant food ontologies exactly because it does not take into account perception, conceptions, consideration, and beliefs of European eaters. This lack of reference to cultural contexts might lead to include under the label of novel food those food which are not novel, while excluding food which instead should be considered as novel. Here, to support this criticism, I provide three brief counterexamples, each focusing on a specific component of the definition which, if not related to an extant food ontology as context-reference, ultimately, make the definition unsuitable to deliver sufficient or necessary conditions to categorize novel foods.

A first component of the definition states that a food is novel if it was introduced in the EU market after May 1997. Even if it seems reasonable to label something as novel when its history in a context corresponds to less than a certain fixed time, this condition fails to be sufficient in the case of food as the novelty of a food seems to be determined by the perception and reaction of eaters. To illustrate, consider the use of monomethoxy polyethylene glycol (a synthetic polymer) as a chewing gum base, whose use for consumption has been authorized by the EU from January 1, 2022. While it lacks a history of consumption in the EU before May 1997, it hardly might be conceived as a novel food in respect of the European cultural context as European eaters are usually insensitive to the changes in chemical components of chewing gums. At most, such chemical components might be regarded as novel at the lowest level in a scale which, however, is missed in the EU definition. Furthermore, this role of perception of eaters involves the possibility that foods with longer history of consumption might still be deemed as novel due to, say, their exotism, undermining also the necessity of the condition (see Chen *et al.* 2023 on the case of avocado in China).

A second component of the definition unpacks what must be included under the category of novel food, that is, either products (“new foods, food from new sources, new substances used in food”) or “new ways and technologies for producing food”. However, as explained above, not all new products deserve the label of novel food and such a “novelty” can be less relevant for an eater

than the alteration or recombination of already used ingredients to make a brand-new food – even without resorting to new technology – which instead might deserve the label of “novel food”. For instance, imagine a liquid, produced following only accepted protocols, using only accustomed technology, and containing only already used chemicals, that provides nutrients suitable to replace a whole meal. Technically, it would not count as a novel food, while it might be deemed as novel by consumers who find it in a supermarket shelf and are unaccustomed to such a kind of food. Other examples of modifications that do not involve the introduction of a new substance but that might be considered novel in respect to an existing food ontology might regard the shape or consistency of a traditional food modified for a specific reason. For instance, all those foods whose texture is softened to make them more palatable to elderly people (see Aguilera and Park 2016 for a review of various methods, most of which do not require the use of new technology).⁹

Two other counterexamples might be raised against the spatio-temporal range of the definition. In fact, the definition cover indiscriminately all the European Union *de facto* running the risk of overlooking peculiarities of specific sub-regions. Consider the introduction of snails as food in European regions with no tradition of consuming them, such as those in the Northern part of the continent. As snails are staple foods in many Mediterranean regions belonging to the EU, they are not classified as novel foods in any European region, even though they might be considered so by those eaters in Northern Europe – even if the definition, not taking into account the different regional contexts of consumption in the EU, fails to acknowledge their specific local novelty.

Moreover, the strict time constraint of the definition is unable to discriminate between those food totally lacking a history of consumption in Europe and those whose history of consumption has been forgotten and then remerged in recent years. Think about the recent rise of edible insects in the European food market. Despite their consumption being widespread across Europe for centuries (Svanberg and Berggren 2021), they are nevertheless regarded as novel food by institutions and many consumers.

The examples below highlight serious shortcomings of the current EU framework, thus, calling for a more nuanced categorization of novel food including different conditions rather than only abstractly considering debut on the market of new substances and technology.

⁹ Other examples can be found in the realm of so-called high cuisine, where traditional foods are modified for pursuing aesthetic or artistic ends. For instance, the renowned dish *Five ages of Parmigiano Reggiano, in different textures and temperatures* by chef Massimo Bottura, who modifies the consistency and shape of the traditional Italian cheese Parmigiano for gastronomic reasons (Passera 2021).

2. *A Relational Ontology for Novel Food*

An alternative approach to identifying and understanding why certain foods might be deemed as novel can employ methods and models developed in the flourishing literature on the metaphysics of food (e.g., Amoretti and Frixione 2020; Borghini and Piras 2022; Engisch 2023).

Starting from the criticism raised in the previous section, such attempt to categorize novel food should be based not only on the composition of the food, the technology employed in its production, and when its consumption began. As already suggested, a more nuanced approach should rest on the types of relations that a food enjoys with the cultural context of consumption and its eaters. In fact, an investigation on the cultural context can reveal which characteristics are accepted by the eaters and customary in that context and, thus, where to draw the line between traditional and novel foods. Such an investigation can involve the physical characteristics of foods (e.g., biochemical, microbiological, gustatory, and so on) to assess differences between new and old products; the social role of food in that context, for instance, what is the meaning assigned to local and traditional food (e.g., the criteria for defining a local food might require that all ingredients are produced in a given region, or that those ingredients are only processed there);¹⁰ what is the range of functions assigned to specific kinds of food (e.g., foods rich in carbohydrate assigned to fulfill the function of lunch dishes, foods rich in protein assigned to fulfill the role of food for athletes, and so on) in order to find out what and how a novel food can replace an old one in the accomplishment of the same task and which new functions can be brought out by novel foods.

Such an ontological categorization of novel food would deliver categories based on the various ways a product interacts with its context, taking into account the customs and beliefs of eaters regarding what they consider as *their* food and what, instead, they regard as a novelty. This approach can help to tease out, by contrast, what a novel food is, i.e., a food that does not fit within the categories set out following accepted criteria among European eaters.

To set up these ontological categories, more attuned to the context of production and consumption, we can still deal with the core assumptions of the EU definition, trying to lay down a more robust structure useful for practical actions and strategies. Particularly, the ontological categorization should pro-

¹⁰ For instance, Champagne wine product specification requires that all its ingredients are produced in the North-East region of France, while Modica Chocolate product specification requires that only the transformation process of the ingredients is implemented in Sicily, while cocoa beans can originate from South America (see Borghini *et al.* 2022).

vide robust way for implementing the core aspects of the definition for cataloging purposes, i.e., the food composition, the spatio-temporal range of food production, the function that a food is supposed to fulfill.

The first category stores food on the basis of its physical composition (*Physically Novel Food*). This categorization rests on the physical relations of similarity and difference that a novel food entertains with those other food which already belong to the ontology at stake. The underlying idea of this category somehow revisits and delves deeper into the fundamental thesis of the EU novel food definition, i.e., that a food to be considered novel must be physically different from those currently in circulation (resorting to the words used in the EU definition “new foods, food from new sources, new substances used in food”).

A second category rests on the locations where the novel foods originated, deepening and enhancing the EU thesis that the reference point for defining a novel food should be whether it already belongs or not to the European context (*Spatial-temporal Novel Food*). This category relies upon the spatial-temporal relations that a food has, or might have, with the place where the food ontology under consideration is at stake.

The third category relies on the role that the foods are supposed to play in the European context of consumption, collecting novel foods based either on their capacity of replacing extant foods in their role, or on their capacity to establish new roles (*Functionally Novel Food*).

These three categories take into account different aspects under which a food might be novel in respect to a given food ontology. This does not exclude the possibility that a same food might fall in more than one category, e.g., a food might be novel both because it comes from a foreign location as well as because it plays a new role. Likewise, it does not exclude that a same food is novel in only one respect, e.g., because it plays a new role, but not under another one, e.g., it is made of an already known substance.

Now, I characterize the three categories by outlining their building blocks and internal articulation in order to provide a useful map for those involved (e.g., stakeholders, policymakers, and practitioners) in order to navigate and categorize the novel food domain and its basic components.

Physically Novel Food: This category encompasses all foods whose physical components are at least partially different from those already included in the relevant food ontology. This can be divided into two distinct sub-categories:

- *Existentially novel food*, i.e., all items (or parts thereof) not classified as foods within an existing food ontology. It encompasses what the EU standardly defines as novel food—substances that were not considered food before a specific date, and generally, all newly introduced foods within a

food ontology. For example, monomethoxy polyethylene glycol could be considered as an existentially novel food.

- *Qualitatively novel food*, i.e., these foods whose at least one property has been modified without introducing a new substance or food in an ontology. For example, nutrient supplementation, such as milk with modified iron content to meet specific dietary needs, or texture modification, such as the high-pressure processing used to soften food while maintaining its flavor intact to facilitate chewing for elderly people or those with bone or muscle problems (see Barba *et al.* 2015).

Spatial-temporal Novel Food: This category encompasses foods deemed novel due to their provenance, that is, they originate from other food ontologies and are subsequently introduced into the ontology under consideration. This classification is based on the spatial-temporal relations that foods entertain with the existing food ontology.

- *Locally novel food*, i.e., all those foods that come from a different location in respect to the area where it is adopted the food ontology at stake. For instance, chia seeds whose consumption was already spread in South America, before becoming food in Europe (2009). This category can be made more precise by exactly specifying the area of interest, e.g., North Europe.
- *Temporally novel food*, i.e., all those foods that originate from a different era compared to the timeframe of the food ontology in question. This category includes all so-called forgotten foods, i.e., those foods whose consumption was widespread in the past but no longer belong to the food ontology at stake.¹¹

Functionally Novel Food, i.e., those whose novelty is related to the function that they can play in the ontology at stake.

- *Replacement novel food*, i.e., all those foods that might replace an old food while performing the role of the former within the food ontology. This category necessarily intersects with the others as it refers to how novel food can fulfill older ones. For instance, an *existentially novel food* such as a hamburger made of cultured meat can replace hamburger made of slaughtered meat or a *locally novel food*, such as cricket flour can replace flour made of raw grains.
- *Emergently novel food*, i.e., all those foods that establish a new function within a food ontology (e.g., capsule food supplement made of spirulina taken at a specific moment of the day traditionally not associated with a meal).

¹¹ On forgotten foods, see the manifesto written under the auspices of FAO and EU, published by The Global Forum for Agricultural Research and Innovation (GFAR) (2021).

As already anticipated, these three categories are not mutually exclusive and, furthermore, a food might be novel in some respects, falling in a given category, whereas not novel under others. For instance, cultured meat might be considered existentially novel and replacement novel, while it is not locally novel (as it might not come from a different setting). Whereas, insects can be considered existentially novel, as well as either locally novel (in those parts of Europe that lack a history of entomophagy) or temporally novel (in those parts of Europe where there is an ancient history of entomophagy). Moreover, high-pressure processed food for elderly people can be considered qualitatively novel, and a spirulina capsule existentially and emergently novel (see table 1 for an illustration of the ontological model).

This approach provides a more nuanced and precise categorization than the traditional EU strategy, while, still, being in tune with the original definition. It, in fact, is able to showcase under what respect a food is novel, whereas the original definition collected all novel food under one and a same category. The original definition was also unable to assess the grade of food novelty. Now, arguably, the categorization outlined here can help in accomplishing this crucial task: the more categories a novel food falls under, the more novel it is. Yet it is not always the case. For instance, one might argue that cultured meat is more novel than snails in Northern Europe, even though the former falls under two categories (existentially and replacement novel) and the latter, say, under three (existentially, locally, and temporally novel). The categorization alone cannot still provide the grade of food novelty in respect to a standard. Thus, each category must be equipped with a metric to measure the distance to a given threshold based on, say, consumer perception or traditional dietary patterns. A fully-fledged development of such metrics falls beyond the scope of the paper but, to illustrate, one can imagine that, for instance, the existential novelty of a food might be measured in terms of the relative importance of the new substance in the light of consumers' attention. Hence, monomethoxy polyethylene glycol might have a relatively low grade of novelty in comparison with cultured meat. Furthermore, the novelty of a replacement novel food might be measured in terms of differences in preparation in respect to its traditional counterpart.

	<i>Physically Novel Food</i>		<i>Spatial-temporal Novel Food</i>		<i>Functionally Novel Food</i>	
	Existentially	Qualitatively	Locally	Temporally	Replacement	Emergently
Cultured meat	x				x	

Insects	x		x	x		
High-pressure processed food		x			x	
Spirulina capsule	x					x

Table 1. Illustration of the ontological categories.

3. *An Ontology of Familiar Food*

One of the main challenges facing policymakers, activists, and other practitioners is convincing consumers to switch to more sustainable diets by integrating novel foods. A significant barrier to this change is neophobia, the fear of unfamiliar foods compared to usual consumers' dietary patterns. Many studies in recent years have reported the emergence of neophobia among eaters in respect to edible insects, plant-based meat, and cultured meat, *de facto* preventing the gradual and partial replacement of slaughtered meat with more sustainable alternatives (see, *inter alia*, the essays collected by Meiselman and Lorenzo 2023, especially parts 3 and 5).

Since switching diets is recognized as key for advancing mitigation actions against climate change, recently, a whole range of strategies has been developed for alleviating food neophobia (for a review, Siddiqui *et al.* 2023), focusing either on specific class of agents, e.g., children (e.g., Lafraire *et al.* 2016), or on specific foods, e.g., cultured meat (see, Hamlin *et al.* 2022). Some of those strategies address one of the main drivers of food neophobia, i.e., the so-called food unfamiliarity (see, *inter alia*, Monaco *et al.* 2024; Fidder and Graça 2023; Aldridge *et al.* 2009). Food familiarity might be defined as the “knowledge of a product [...] developed from multiple and accumulated product-related experiences, including past experiences and information or knowledge about the specific product” (Xu and Zeng 2022).

In this section, I outline a strategy for addressing food neophobia based on the hypothesis that making novel food more familiar (see, e.g., Tan *et al.* 2016; Gumussoy *et al.* 2021) can be a useful way for alleviating neophobia. I pursue this strategy by adding a further layer to the ontological model, whose first step has been developed in §2. This second part of the model introduces two more ontological categories (local food and symbolic food) suitable to collect novel food items by using criteria that are already familiar to the eaters. Thus, it might reinforce and boost a kind of comparative thinking among eaters suit-

able to assess the closeness of novel foods with those more familiar ones (on the strategy of comparative thinking for familiarizing with novel food, see Matavelli and Rizzoli 2022). In particular, the local food category collects novel food focusing on their links with a familiar place, while symbolic food category emphasizes the symbolic role of novel foods within existing familiar symbolic and cultural frameworks.

This strategy is currently theoretical and should be understood as a preliminary step toward more practical interventions, which should be tested in controlled empirical settings by psychologists and other scholars collaborating with stakeholders. The reader might ask whether this strategy runs the risk of exploiting the epistemic authority of those stakeholders who should decide when and whether a food is familiar to them. I will take care of this issue in the last section. For the sake of explanation in what follows, I will use edible insects as an example, which, I submit, can be replaced with other kinds of novel foods.

3.1 *Local (Novel) Food Category*

A recent emerging trend in contemporary gastronomy, which traces its roots all the way back to the early '70 in California, is represented by so-called locavorism, the ideology that local food is healthier, more socially and environmentally sustainable than processed and foreign food (on a critical history of the locavolist movement see McWilliams 2010; for a philosophical analysis of its political tenets, see Werkheiser and Noll 2014). While whether relying on local food diet is a feasible recipe for adjusting the food system is still questioned (e.g., Desrochers and Shimizu 2012), several studies report that when a food is explicitly associated with a specific region its level of familiarity increases among the eaters (e.g., Perito *et al.* 2019; Skallerud and Wien 2019), regardless of whether these eaters entertain any social connection to that region at all (Xu and Zeng 2022).

How can a novel food be turned into a local one in order to make it more familiar to the eaters? The relation between a region and a food is complex and it might assume at least three different forms, as some recent works have highlighted (Borghini *et al.* 2022). Each of these forms require a tailored strategy of novel food categorization in order to make it local. In what follows, I will outline some initial caveats, while a second step, which will be briefly touched upon in the last section of the paper, will be to involve local eaters and other food experts in assessing the cultural and political validity of such a categorization. A last and third step, which I leave for another occasion, will be to implement this strategy in practical interventions.

First, a food can be local when its consumption happens at less than some fixed distance (usually calculated in terms of food miles) from its production place. For instance, if I live in Nottingham (UK) a tomato produced in a greenhouse located on the outskirts of the city counts as local, while a tomato coming from Spain does not. Edible insects can thus be categorized as local food by focusing on their place of production. For instance, if mealworms are produced nearby Nottingham, they can fall into the category of local food as long as they are consumed by eaters in Nottingham. This can be useful for emphasizing the role of insect production in the local economy and their low carbon footprint in respect to, say, beef from Argentina. Furthermore, depending on the adopted criteria – specifically, how stringent they are regarding the geographical location of food components – the same category can also include all those insects whose production occurs far away (e.g., Argentina), but whose processing (e.g., drying, smoking, fermentation) is located close to the consumption place (see note 10 above).

Second, a food can be local if it owns its specific, unique, and often renowned, characteristics due to its production place features, regardless of where it is consumed. The relevant features of the place usually include all its physical qualities, such as soil composition, climate patterns, rainfalls, and so on, that contribute to the flavor of the product. Additionally, the knowledge rooted in the local heritage and the historical links with the product entertained by the local community are often claimed to partake to its culinary value. This is the case of so-called geographical indications, such as *Parmigiano Reggiano* (Italy), *Alheira* (Portugal), or *Kampot Pepper* (Cambodia), whose unique characters are supposed to be determined by their production place. Edible insects can be categorized as local delicacies if their production happens in a place particularly favorable to the development of specific gustatory profiles (e.g., worms grown in a terrain rich in minerals suitable to increase their balsamic or salty flavor). Furthermore, ancient traditions can be linked to the production of specific insects, recovering lost or forgotten memories, claiming the role of specific local knowledge and techniques used for their production.

These first two first kinds rely on the principle that local food should be understood in spatial or geographical terms. A third conception, instead, privileges the social aspects of local food, namely, that a food is local when its supply chain fosters direct social interaction between the producer, the retailer, and the consumer (see Ho 2020). For instance, the strong social and emotional relation between a consumer and the retailer, increasing the knowledge of the product and the trust on its, say, healthiness and taste, can make it local. In this last case, edible insects can be categorized as local food if sellers and producers are invited to familiarize with consumers in order to trump the level of trust in

their products as well as the knowledge of the farming process. This might create a direct link between all those involved in the food chain fostering common goals (e.g., reinforcing local economy, developing more sustainable dietary patterns, avoiding the consumption of big mammals).

3.2 *Symbolic (Novel) Food Category*

That a food can be the symbol of something else is not news, e.g., a food can represent a social tie, a status, a religious observance, a political idea, and so on (on this, see Telfer 1996: 36-40). And eating a specific food is often a way for reinforcing a social position and being acknowledged as a member of a certain community or supporter of some ethical, religious, or political principle. In the case of meat, the symbolization process has been studied by a wide range of scholars, starting from the cultural evolution of our species to its role in contemporary society, often as the symbol of the supremacy of white man over women and those other belonging to different racial groups (Adams 1990). Some foods thus might play an identity marker role, singling out its eaters as members of a certain community, belonging to a specific social and cultural milieu, carriers of a certain social position (see Montanari 2006: 91-141). A food whose symbolic role is acknowledged as key for one's own identity is more familiar to the eater, than a food whose role is totally unrecognized by them. Thus, how can edible insects become a symbol of something important for the eaters to be categorized as familiar foods? For the sake of explanation, we can bring out three symbolic roles, without any claim of exhaustivity, that edible insects might abstractly play to then be implemented in more specific contexts of agency and utterance.

Common history-symbol: as it is by now well known, edible insects have a history of consumption even in many European countries. For instance, Hunter (2021: 43) reports that:

In *Insects as Human Food: A Chapter of the Ecology of Man* (1951), the Israeli entomologist F. S. Bodenheimer described 'relics' of insect eating in the West, such as records from the 1700s and 1800s of various kinds of plant galls (abnormal growths caused by insect infestations) that were appreciated by peoples in Crete, France and the Levant. He also mentioned widespread eating of cockchafer beetles (*Melolontha* spp.) in Europe and noted a number of authors who recorded people in France and Russia consuming various species of grasshoppers into the 1900s.

Edible insects thus can fall into the category that collects all those foods that somehow represent a common and shared historical identity tracing back to

the origin of a given community, reinforcing their role as a key to access to a common past.

Political-symbol: Edible insects can fall into the category of food suitable to symbolize political ideals and values if those who consume that food attest or reinforce their political identity by eating that food. Those might be freegans against global food chains, or who retain to eat meat as a political choice, or environmental activists. We already have some first attempts of this symbolization of insects, as reported by Legendre and Baker (2022). One of the hypotheses tested and proved by the authors is that the consumption of edible insects increases when it is underpinned by purchase activism, i.e., “a motivational state to exercise their purchasing power for a cause one supports, leading to greater purchasing intentions”. Thus, categorizing edible insects as related to the support of a specific political ideal, might be pivotal in increasing their consumption by making them more familiar to those involved in such a political action.

Natural-symbol: The question of what constitutes a natural food remains open (see Siipi 2013 for a taxonomy), as does whether food can ever truly be natural or is always a social object or artifact (Borghini & Piras 2020). However, some might believe that eating insects can be a way for approximating to the natural world or creating a stronger tie with the environment. For instance, following Siipi, if one believes that natural foods are those more authentic, i.e., those that have “a contrast to artificial or synthetic” (2013: 806), all edible insects that lack artificial or synthetic intervention (such as genetic modification or use of flavor additives), can be categorized as authentic and thus natural. And if eating naturally is a way of being closely linked to nature, eating edible insects can allow eaters to take steps toward the natural world.

4. *Food Stakeholders and Food Expertise*

In this paper so far, I critically discussed the extant EU definition of novel food, proposing an ontological model that provides a more nuanced and detailed categorization of those food items. I then add a further layer to that model introducing some more categories that should collect novel foods emphasizing their familiarity with the eaters. Beyond conceptual structure, both ontological moves require specific normative choices on what should fall into a specific category. To illustrate, consider whether edible insects should count as temporally novel in those areas with an ancient history of consumption. Contemporary eaters might or might not consider themselves as linked to that history, depending on when they locate the historical and cultural roots of their community. Likewise, one might or might not consider edible insects as a local

food depending on their own locality criteria: previous history of consumption in that area, relations with other traditions, origin of, say, the worms.

So: who should be in charge of taking such decisions? And what ground food expertise in the case of novel foods?

The camp of food expertise is vast and complex even when focusing only on novel food. Food experts to be taken into account include food historians, chemists, biologists, anthropologists, sociologists, and so on.

However, resorting only to these experts to determine whether a given food item should fall into one of the categories of novel food may fall short of providing a reliable answer from both an epistemic and political standpoint. In the footsteps of previous works on how to define and categorize specific food items (Borghini *et al.* 2023), I argue that the answer, in fact, should be provided in a joint effort involving food stakeholders. That is, as Borghini *et al.* (2023: 553) explain, “any agent who has a stake on the nature and functioning of a business or institution (customers, retailers, stockholders, employees, etc.) [...] an individual has stakeholder status in a food item if that item is a salient aspect of a practice that is part of the culture of a community to which the individual belongs”.

Consider, again, the case of edible insects and whether they should, first, be classified as temporally novel food, and second, whether they might be regarded as a local food, according to the perspective mentioned above – namely, that a local food derives its characteristics from the specific place where it is produced.

In region x , there was an ancient history of consumption of mealworms which has been dramatically interrupted five hundred years ago. A contemporary food historian, acknowledging that old heritage, suggests treating mealworms as temporally novel food, i.e., food originally coming from a different age but still linked to a common history. However, food stakeholders might reasonably contend that they do not feel linked to that distant past which is not even a part of their cultural heritage. Thus, terming mealworms as “temporally novel food”, as long as there is not a recognized connection between that past age and their extant daily life, would be misleading. In fact, self-recognition can be considered as a crucial part of being a part of a historical pattern which is not just the purely ascription of some genetic relations between subsequent groups of people. In this case, as it turns out, food expertise should be complemented with the self-recognition of the local community in a common history including both those anciently producing mealworms and themselves.

The very same argument can be used to argue that edible insects, as any other novel food, can fall into the category of “local food” only when the link with the place where they are farmed is recognized by the local community. Suppose that a microbiologist points out that some gustatory qualities of the

mealworms derive from the specific minerals of the soil of a land y . Nevertheless, the local community refuses to recognize those worms as local insofar as they fail to meet the parameters of the local diet, which, say, includes only those foods with a long history of consumption there. In this case, while the food expert can trustworthily put forward the microbiological link between a food and soil qualities, they cannot arrogate to themselves the right to grant the label of local food to that item as long as the community denies ascribing it to the mealworms. Any attempt to impose the label of local food to the community there, could be termed as a sort of conceptual domination (Shields 2021), as a concept which should belong to the local community (local food) is mastered and managed by external agents.

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