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RESEARCH ARTICLE

Making alternative proteins edible: market devices and the qualification of plant-based substitutes

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The aim of this paper is to empirically explore and conceptualise how marketing and markets shape the formation of edibility in the context of alternative proteins. While meat and dairy substitutes have attracted commercial and scholarly attention, promoting alternative proteins more widely has often proved to be difficult. Alternative proteins often challenge consumers' understandings of what is safe, appropriate and enjoyable food to consume. Disgust, distrust and even opposition are common consumer reactions. Taking a constructivist market studies approach and drawing on an ethnographic study of the marketing and consumption of plant-based substitutes, we explore the work performed by marketing to overcome these problems and make plant-based substitutes edible. Making use of the concepts of market device and qualification, the analysis shows that plant-based substitutes are constructed as edible in two ways. First, through *productising* and the related practices of packaging, disclosing, aestheticising and branding, plant-based substitutes are qualified as safe, enjoyable and appropriate for consumption. Second, through *animating* plant-based substitutes are linked to established food traditions, social eating and the performance of family, thereby creating a meaningful context for this food. It is through this dual move that plant-based substitutes become edible. Our analysis shows that edibility formation went beyond merely making plant-based substitutes tasty or acceptable. The market devices studied worked to construct plant-based substitutes as a much-needed resource for everyday (plant-based) food practices.

Key words alternative proteins • edibility • marketing • plant-based • qualification

Key messages

- This paper explores the role of marketing in making alternative proteins edible.
- Marketing makes plant-based substitutes edible by qualifying them with a host of desirable qualities and linking them to a set of established food practices.
- Through marketing, plant-based products are constructed as key cultural and material resources for the performance of meaningful food practices.

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Introduction

The consumption of meat and dairy products is often linked to climate change, animal welfare concerns and an increasing number of health issues (see also Sexton et al, 2019). The problems associated with conventional big-business agriculture are multiple. Against this backdrop, there has been considerable interest in finding alternatives to conventional animal-sourced foods (Mouat and Prince, 2018), often under the label of alternative proteins. Meat and dairy substitutes like 'Oatly' or 'Beyond Meat', insect foods like mealworms and 'bug burgers', and algae and lab meat have attracted both media and commercial attention.

Promoting alternative proteins more widely has however proved to be difficult. A common problem for alternative proteins is that they are often considered inedible by consumers. As a type of novel foods, they often challenge consumers' understandings of what counts as safe, suitable and enjoyable food to consume (House, 2016; Sexton, 2018). Disgust, fear, distrust and even opposition are common consumer reactions when confronted with alternative proteins (for example, Tan et al, 2015; Verneau et al, 2016). An important question for both the commercial actors behind these endeavours and the scholars analysing this phenomenon is therefore: what is involved in making alternative proteins edible?

To date, there have been two main ways of addressing this question. First, and by far the most widely taken approach, has been to do research on consumer acceptance to understand how alternative proteins can be promoted. Taking a psychological or sensory approach, research in this field seeks to determine the food and consumer traits and circumstances that favour the acceptance of alternative proteins. Edibility is here only indirectly addressed. These studies explore consumers' disgust sensitivity or, more generally, their attitudes to and preferences for novel foods such as insects (House, 2016) or soya-based meat substitutes (Wansink et al, 2005). A focus on the individual consumer and the issue of food choice has dominated this work. While this research offers valuable insights into the palette of consumer reactions and attitudes to alternative proteins, the survey, experiment and sensory test methods used delimit the scope and transferability of results to real-life consumption practices. Moreover, focusing on the individual, this research ignores the social, cultural and practical dimensions of food consumption.

Second, and in contrast to consumer acceptance research, social and cultural studies of the consumption of alternative proteins see edibility as constructed and therefore varied across contexts. The main question here is not necessarily under what conditions do consumers accept alternative proteins, but rather how is this (new) type of food *made* edible in a specific context. Sexton (2018), for example, explores and discusses the edibility formation of alternative proteins by showing how these novel foods are positioned, through both discursive and material means, as not only the same as but also better, safer and more ethical than conventional animal-based food. Consumers are urged to be ethical and choose alternative proteins over conventional products. Following in this vein but taking instead a practice theory approach, House (2019) examines the introduction of insects as foods. He argues that to understand why efforts to introduce novel foods succeed or fail, we need to take into account the bundles of food practices which these foods are to form part of. He shows that insects as food have had difficulties in becoming widely consumed not merely because of sensory qualities or neophobia, but also because they lack anchoring in contemporary European food practices. Novel foods need to be made part of a set of desirable and

feasible food practices (House, 2019). From this follows that to successfully introduce alternative proteins, one needs also to promote a bundle of appropriate food practices that make this food edible. This can be done either by inventing or re-locating a set of food practices – as in the case of sushi consumption (House, 2019) – or by making the foodstuff fit into existing bundles of practices – as is the case with meat and dairy substitutes (see, for example, Fuentes and Fuentes, 2017).

Following in this vein, we want in this paper to contribute to the understanding of how alternative proteins can be made part of consumers' everyday diets by examining the role that marketing has in the process of constructing plant-based substitutes as edible. While it is commonly acknowledged that marketing and markets are intricately involved in determining what alternative proteins become consumed (see, for example, Sexton, 2018; House, 2019), how exactly this is accomplished has received less attention. In the rare cases that the marketing of alternative proteins is explored, this is done mainly discursively through interviews with industry representatives or by drawing on promotional material (see, for example, Sexton et al, 2019). In these analyses consumers are discussed but seldom studied.

Against this background, our aim is to explore and conceptualise how marketing and markets shape the formation of edibility in the context of alternative proteins. Theoretically, we take a constructivist market studies (CMS) approach (Kjellberg and Helgesson, 2007). We make use of the concepts of market device and qualification, to go beyond the discursive and analyse the material-semiotic marketing work that goes into making alternative proteins edible. Empirically, our focus is on the Swedish market for plant-based substitute products. We are interested in the marketing work done to construct plant-based substitutes as edible and how this work shapes vegan consumers' everyday food practices. Drawing on an ethnographic study of the marketing and consumption of plant-based substitutes, we explore the socio-material work performed by three sets of market devices – social media sites and websites, stores, and packaging – to promote plant-based substitutes to vegan consumers.

We begin in the next section by describing our theoretical approach in more detail, outlining our CMS approach and how we conceptualise edibility formation.

Making food edible through markets

Drawing on both the fields of socio-cultural edibility research and CMS (Kjellberg and Helgesson, 2006; 2007; Araujo, 2007), we outline a theoretical framework that allows us to explore the processes by which market devices and their qualification work shape the formation of edibility. This, in turn, builds on two interlinked arguments: that edibility is socially and materially constructed; and that marketing and markets are key for this socio-material construction.

Edibility as socially and materially constructed

First, drawing on previous socio-cultural edibility research, we argue that edibility is socially and materially constructed. In recent years, a growing number of scholars within social and cultural food studies have taken an interest in 'edibility' and the way people's notion of what is suitable and safe to eat is formed (Stephens, 2022). The concept has been used to discuss and explore various food types and contexts; from meat consumption and the way animal bodies are made edible as meat (Vialles, 1994;

Roe, 2006; Stewart and Cole, 2009; Evans and Miele, 2012) to the way alternative proteins previously foreign to consumers are made acceptable and edible (House, 2018; 2019; Sexton, 2018; Sexton et al, 2019). There are also studies on how foods move from edible to inedible in the process of becoming waste (Blichfeldt et al, 2015; Whitelaw, 2016; Moreno et al, 2020). Recently, studies of 'freshness' and the making of fresh food has also attended to the notion of edibility (Jackson et al, 2020; Evans et al, 2022). The emerging literature share an interest in uncovering the way 'things become food' (see Roe, 2006) and explore edibility, not as an innate quality of food, but instead an outcome of continuous performative processes involving several actors.

Evans and Miele (2012), for example, explore how consumer understandings of animals move from the position of sentient beings to the position of edible meat. Adopting an 'embodied approach to consumption practice' (Evans and Miele, 2012), the authors show that there is a close connection between making sense of, that is, understanding food, and sensing, that is, experiencing and tasting food. They underline that our knowledge and experience of food is not just cognitive but also to a large extent embodied and performed. Thus, edibility must be understood as a category or a quality performed on a practical, sensual or aesthetic level, rather than an outcome of reflective or cognitive processes. Evans and Miele show that edibility is accomplished through a process of disconnection where the animal origin is materially and semiotically 'removed' from meat. The disconnection takes place through the material presentation of food, the use of food vocabularies and the timing of shopping practices (Evans and Miele, 2012).

Another interesting example is Sexton's (2018) work on the way alternative proteins that are new and unfamiliar to consumers are materially and discursively constructed as edible. Drawing on Roe's (2006) conceptualisation of the way 'things become food', Sexton shows how producers of alternative protein construct their products as edible by 'simulating' normative notions of meat, dairy and eggs, emphasising molecular, physical, visceral and discursive similarities between alternative protein and their conventional equivalents. Like Evans and Miele (2012), Sexton (2018) emphasises the performative and the material-semiotic aspects of edibility, here adding that consumers' understanding of what foods are edible is shaped by their exposure to certain materials (Sexton, 2018). Consumers' understandings of what is edible 'is reinforced through the appearance and sensory aspects of an end-product, the textual and visual language used to describe it, the performance of the retail/eating environment, and the cultural associations it draws on and reinforces' (Sexton, 2018: 590).

Drawing on the research reviewed here, we define edibility formation as socio-materially constructed. Edibility is for the purposes of our analysis seen as a temporary effect formed through continuous arrangements of material and discursive recourses. Edibility is thus not an essential physical quality of food, nor is it a purely discursive or symbolic construction. Instead, edibility is formed through the shaping of material and discursive arrangements that constitute the foods. To be more specific, this means that foodstuff is in a continuous process ascribed a set of properties that grant it the status of being edible, that is, food suitable for consumption (Roe, 2006). Edibility is therefore not a fixed category but something that has to be actively and continuously worked at.

Edibility is furthermore a network effect, co-produced by multiple actors, typically with different roles, interest and agency (House, 2018). Edibility also varies between

individuals or groups of individuals and can and often is contested. What is edible food for one individual/group is not necessarily edible for another. Edibility does therefore not entail general acceptance; it is situated and contingent (House, 2018). This also means that edibility varies over time. As more historically informed analyses have so clearly shown, what counts as edible changes over time (for example, House, 2019). This is also shown in studies of food waste where edible food can turn inedible and then back again (Evans, 2012).

From this vantage point edibility is not solely a binary category of food/non-food but can also exist on a continuum. That is to say, food is not only edible or inedible but can also be more or less edible. For example, while plant-based substitutes are recognised as food by meat eaters and would under specific circumstances be consumed (for example, if invited to dinner at a vegan household), they are normally avoided, not seen as a viable option for everyday meals (Fuentes and Fuentes, 2021). The reasons for this are typically multiple. Not only taste but also issues such as conventions surrounding a 'proper' meal, health aspects and even aesthetics play a role in determining how edible a foodstuff is (for a similar argument, see House, 2019).

Marketing and markets shape edibility formation

Second, we note that the marketing and discursive arrangements shaping edibility are often commercial. This claim also finds support in previous edibility research. Previous studies demonstrate how edibility formation is linked to the way food is distributed and exchanged. Studies of alternative protein (for example, Sexton, 2018), meat (for example, Evans and Miele, 2012) and freshness (for example, Jackson et al, 2020) show how consumers' understandings of foods are intrinsically linked to how it is processed, packaged, marketed and sold. Edibility formation, these studies show, is intrinsically linked to the doings of market actors and practices of market exchange. This research thus suggests that to understand edibility formation one needs to take market processes seriously.

Here is where CMS come into play. CMS is a scholarly tradition that understand markets as constituted in and through practices (Helgesson et al, 2004) and where market actors as well as the goods exchanged are seen as socio-materially made. The CMS tradition thus underlines that goods, that is, items that are exchangeable via markets, are not naturally occurring entities. Goods have to be made. Contrasting the concepts 'product' and 'good', Callon et al (2002) describes 'products' as continuously formed and re-formed as they move through the chains and networks of producers, designers and marketers, while 'goods' are 'moments' in this never-ending process of product formation where the qualities the good are momentarily stabilised (Callon et al, 2002).

Central to the making of goods is the work performed by market devices; socio-material arrangements that support consumers' evaluative and calculative capacities (Callon et al, 2002). Market devices – examples include packaging (Hawkins, 2011), supermarket displays (Cochoy, 2010), brands (Onyas and Ryan, 2015) or shops (Dubuisson-Quellier, 2007) – are material-semiotic arrangements that 'qualify' goods, that is, attribute goods with qualities that make them understandable and comparable to other products. To become comparable, goods must be 'objectified'; they must be qualified in a manner that defines them and gives them properties considered to be objectively describable (Callon and Muniesa, 2005). To become understandable,

however, they must be 'singularised', that is, the goods must also be qualified in a manner that gives them properties that makes them fit with consumers' understandings and uses of the good (Callon and Muniesa, 2005). Objectification and singularisation happens simultaneously. While one can make an analytical distinction between these processes, it is difficult to empirically separate them.

Drawing on CMS we propose that edibility formation is closely linked to the making of exchangeable food goods. Like other products, plant-based substitutes turn into exchangeable goods through the work of market devices which objectify and singularise them, making them comparable to conventional meat and dairy foods, but at the same time different enough to offer specific value (see also Fuentes and Fuentes, 2017; Volden, 2023).

Productising and animating

Making use of the theoretical framework outlined previously we identify two modes of marketing that qualify plant-based substitutes so as to construct them as edible – productising and animating.

First, we will show that through *productising* plant-based substitutes are qualified and turned into exchangeable goods comparable to other goods as they are packaged, declared, aestheticised and labelled, making them safe, tasty, nutritious and thereby valuable resources for food practices. Productisation, as we use the concept in our analysis, is thus a specific mode of marketing that works to qualify a foodstuff so as to make it more product-like, with characteristics considered to be objectively desirable.

Second, through the processes of *animating* the plant-based substitutes are linked to a set of already established and desirable food practices – for example, family dinner, holiday dinners and barbecues. Hence, animating is here used to denote a specific marketing mode that qualifies the food products so as to make them fit into consumers' worlds.

Productising and animating are thus the ways that singularisation and objectification play out in this specific context. By developing these concepts, we illustrate the specific marketing modes and associated qualification processes that are at play here. While we would suggest that these two modes of marketing are also visible in other contexts, it is beyond the scope of this paper to show this. In addition, we are reluctant to equate productisation with objectification and animating with singularisation. While one could argue that productising mainly involves objectification and animating is more concerned with singularisation, it is, as the analysis will illustrate, not always possible to separate these two processes when analysing the work of market devices.

Studying the marketing of plant-based substitutes

To understand the role that marketing has in the process of constructing plant-based substitutes as edible we draw on material originally collected for a study of plant-based substitute packaging and their role in vegan consumers' everyday food practices. This was an ethnographically inspired study involving various empirical sites conducted by the first author and a post-doc[1] over a period of eight months, between 27 April and 27 December 2020. The material collected consists of ethnographic interviews with vegan consumers, observations of retail outlets selling substitute products, collected plant-based substitute packaging, and digital observations of the way plant-based

substitute products were marketed online. Drawing on this material we analyse how marketing works to qualify plant-based substitutes as edible and how this aligns with and shapes vegan consumers' food practices.

The analysis draws mainly on materials collected though in-store observations, food packaging and web marketing, but we also used the ethnographic interviews conducted with vegan consumers to get insights into the way consumers understand and eat plant-based substitutes.

To understand how the marketing of plant-based meat and dairy substitutes shapes consumers' everyday practices, we conducted 13 ethnographic interviews with vegan food consumers (see Table 1 for details). The participants were recruited via personal networks, postings on social media, and an animal rights organisation that allowed us to send a recruiting message to its members. All the participants identified as vegan (and all except one reported eating an exclusively plant-based diet). There was variation in how long they had been vegan, ranging from 3 to 22 years. There was

Table 1: Research participants

Pseudonym	Age	Household	Number of years as vegan	Brands
Maria	37	Couple with children	3.5 years	Alpro, Anamma, Astrid & Aporna, Carlshamn, Hälsans kök, Kung Markatta, Oatly, Oddly good, Oupmh!, Peas of heaven, Quorn, Rydbergs, Vegme, Violife, Yipin
Tina	41	Single	10 years	Anamma, Astrid & Aporna, Hälsans kök, Oatly, Oupmh!, Peas of heaven, Planti
Robin	23	Co-housing	-	Anamma, Hälsans kök, Kung Markatta, Oatly, Quorn
Carin	31	Couple with children	5.5 years	Anamma, Hälsans kök, Kung Markatta, Oatly, Quorn, Rydbergs, Vegme, Yipin
Cecilia	52	Single with grown up children	10 years	Anamma, Astrid & Aporna, Oatly, Oddly good, Quorn
Anna	35	Single	3 years	Anamma, Astrid & Aporna, Hälsans kök, Oatly, Oupmh!, Peas of heaven, Planti
Eric	26	Couple	8 years	Alpro, Anamma, Astrid & Aporna, Carlshamn, Hälsans kök, Oatly, Quorn, Rydbergs, Vegme, Yipin
Veronica	37	Single with children	6 years	Alpro, Anamma, Astrid & Aporna, Carlshamn, Hälsans kök, Kung Markatta, Oatly, Oddly good, Oupmh!, Peas of heaven, Planti, Quorn, Rydbergs, Vegme, Violife, Yipin
Mia	36	Couple with children	17 years	Anamma, Hälsans kök, Kung Markatta, Oatly, Peas of heaven, Quorn, Violife, Yipin
Elisabeth	35	Couple with children	22 years	Alpro, Anamma, Astrid & Aporna, Hälsans kök, Oatly, Oddly good, Oupmh!, Peas of heaven
Rebecca	37	Couple with children	3 years	Anamma, Kung Markatta, Oatly, Oupmh!, Peas of heaven, Vegme
Louise	33	Couple with children	11 years	Alpro, Anamma, Astrid & Aporna, Carlshamn, Hälsans kök, Oatly, Planti, Quorn, Vegme, Yipin
Michael	30	Couple with children	9 years	Anamma, Astrid & Aporna, Carlshamn, Oatly, Planti, Violife

also variation in gender (ten women, two men and one non-binary), age (23–52), geographical location (different cities around Sweden) and household composition (both single and family households, with both small and grown-up children). Nonetheless, the informants and their households were in many respects similar too: Swedish, middle-class, university-educated, professional, living in urban areas. The ethnographic interviews were qualitative, contextual, informal in nature and semi-structured. They were conducted both face-to-face and digitally via Skype and Zoom, due to the COVID-19 situation. While not ideal for ethnographic interviews, the digitally enabled interviews were fruitful. Digital interviews also allowed us to sample more widely geographically speaking, since distance was not an issue in these cases. The interviews typically lasted between 60 and 90 minutes and were audio recorded and transcribed in full. They were guided by key 'grand tour' questions (Spradley, 1979) centred on: the participants' development as vegans; their food shopping, cooking and disposal practices; and their views on and use of plant-based substitute packaging. Seven of the 13 participants also kept photo diaries, sending us photographs documenting their everyday food practices and the role of plant-based substitute packaging in these practices. The approximately 70 photos taken by the participants depict plant-based substitute packaging in cupboards and fridges, alongside plant-based dishes. These photos were used both during the interviews and afterwards to better understand the practices talked about by the participants.

To understand how plant-based substitutes are marketed at retail outlets, and shopped for, 16 observations at supermarkets, smaller convenience stores and niche food stores were conducted in two Swedish cities. Observations were documented using photographs and field notes. The observations typically involved a scoping tour of a store to map out its layout and organisation followed by detailed observations of the way various plant-based products were marketed at the stores. Observations centred on promotional material like signs and marketing materials and how these were used and where they were located. Products were specifically documented using photographs of the packaging, shelves and displays. The observations generated more than 200 photos.

Finally, we also conducted extensive digital observations of a selection of plant-based substitute products. To secure a link between the marketing work observed and consumers' accounts of substitute consumption, we centred the observations on 16 substitute brands that were mentioned in at least four of the 13 interviews (see Table 2). Focusing on this selection, we made digital observations of these brands' websites, Facebook pages and Instagram accounts. The observations were documented using screenshots of all posts within a six-month period. A smaller number of digital observations were also made for other substitute brands mentioned in the interviews (29 brands), focusing on images of the packaging. These digital observations generated more than 1,000 screenshots.

The material was coded and analysed using NVivo (a qualitative analysis software) and the constant comparative method (Charmaz, 2006). The fieldnotes, the photos generated during the in-store observations, the screenshots resulting from the digital observations, as well as the interview transcripts, were all added to the NVivo database and coded. Our objective in the analysis was to capture the various ways in which market devices work to qualify plant-based substitutes to make them edible. In the following section we present, illustrate and discuss the result of our analysis.

Table 2: Vegetarian and vegan brands studied

Brand	Brand description
Alpro	International brand of Belgian origin and with health profile specializing on soy-based dairy-substitute foods.
Anamma	Swedish brand with sustainability profile offering a broad range of frozen meat substitutes and ready-made vegan products.
Astrid & Aporna	Swedish brand offering a broad range of frozen and non-frozen vegan products for "the whole family" targeting vegans as well as non-vegan consumers.
Carlshamn	Swedish brand with quality profile offering a smaller range of margarine products.
Hälsans kök	Swedish brand with a sustainability and health profile offering a wide range of plant-based frozen foods.
Kung Markatta	Swedish brand with a sustainability and health profile offering a wide range of foods. Notably they are not marketed as plant-based or vegan.
Oatly	International brand of Swedish origin offering a range of oats-based dairy products.
Oddly good	International brand of Finnish origin offering oats-based dairy products.
Oupmh!	Swedish brand offering a range of frozen meat substitute products with a clear veggie and quality taste profile.
Peas of heaven	Swedish brand offering a smaller range of non-frozen meat and dairy substitutes.
Planti	Swedish brand offering dairy-substitute products made from oats, soy or beans.
Quorn	UK-based brand offering frozen a wide range of semi-processed meat-substitute products.
Rydbergs	Swedish brand offering a range of vegan options of their otherwise wide range of non-vegan sauces, cold salads and cured-meat products.
Vegme	Swedish brand offering a wide range of fresh meat substitutes, plant based ready-meals and sauces.
Violife	International brand of Greek origin offering a range of vegan cheese products.
Yipin	Swedish brand offering a range of tofu and tempeh products.

Marketing plant-based substitutes: the making of edible goods

As noted in the introduction, the market for plant-based substitutes has grown substantially over the last years. To reach as many potential customers as possible, the companies marketing plant-based substitutes target both consumers who follow a vegan/vegetarian diet and those merely interested in adding more plant-based foodstuffs to their diet. Today, plant-based substitutes are available for purchase in ordinary supermarkets and convenience stores. Typically, consumers can find plant-based substitutes for many meat and dairy product categories and several brands for each category. The establishment of the plant-based substitutes as edible is a prerequisite for this development.

In what follows we draw on both marketing material and interviews with vegan consumers to describe how market and edibility formation are intimately

intertwined and discuss how marketing actively takes part in shaping consumers' understanding of what is edible. As previously noted, market devices work to enable exchange. On the market for plant-based substitutes, working to enable exchange also involves working towards making plant-based substitutes edible. The work of making a market for plant-based substitutes involves transforming this foodstuff into edible goods.

The analysis we develop centres on the qualification of plant-based substitutes as performed by a set of market devices: company webpage, company use of social media, product displays in stores, and product packaging. Together, this collection of devices formed a set of market devices that not only promoted plant-based substitutes but also, in the process, worked to make them edible through two interrelated market processes: *productising* and *animating*.

Productising plant-based substitutes

Food producers designed and marketed the plant-based substitutes so as to make them into mobile and comparable goods that were also appealing to consumers. We will argue that this was accomplished through a specific mode of marketing – productising – that connected the plant-based substitutes with material and aesthetic qualities making these foods come across as safe, tasty and appropriate to consume. More specifically, we will contend that through packaging, disclosing, aestheticising and branding, plant-based substitutes were made to fit with existing logistic infrastructures, legislative frameworks and food ideals that shape contemporary food retail and consumption.

Packaging

Packaging, that is, producers' use of sealed plastic or paper containers to materially encapsulate the plant-based substitutes, was a central feature of edibility formation. Just like other food goods, the plant-based substitutes analysed here were all packaged. For producers (and retailers) packaging is a way to follow hygienic standards and avoid contamination during transport and sales. The analysis showed that the use of packaging qualified plant-based substitutes as hygienic, non-contaminated and appropriate for sale. In the interviews it became clear that the material containment offered by packages was important to consumers and their understanding of food as safe and appropriate for consumption.

> 'Of course, there have to be plant-based alternatives among the other stuff, also so that others can find out that these are good products. That they exist. It doesn't bother me at all actually. What would bother me is, of course, foods lying around in the open bunched together. I wouldn't like that, if it wasn't packaged, on some delicatessen counter. Nope, I wouldn't like that.' (Interview with Elizabeth)

As this illustrates, the materiality of the packaging offered a sense of security that the food stuff had not been contaminated by other non-vegan foodstuffs. The material containment of packaging qualified products as safe for consumption, thereby contributing to the food products' edibility.

In addition to offering safety packaging also qualified the food according to food categories. Different package types, like cardboard boxes, tetras or transparent plastic containers, signalled distinctive food categories. In line with previous work on substitutes, our analysis showed that packaging was used to position plant-based substitutes (Fuentes and Fuentes, 2017) and make them appear similar and appropriate substitutes for the original products (Wansink et al, 2005). The non-frozen meat substitutes included in our study were, for example, were packaged in the same manner as fresh meat, usually in a plastic or paper container with a see-through plastic film that enables the consumer to see the foodstuff. Other products like plant-based milk were packaged in the same kind of tetras used for cow's milk. By imitating the way conventional meat or dairy products are packaged, the plant-based substitutes are rendered as comparable to meat and dairy products, thereby supporting consumers in how to understand and use the product (see also Fuentes and Fuentes, 2017). Through this marketing work, plant-based products were qualified as part of the meat or dairy product category and thereby as appropriate and edible.

Disclosing

Also, central to making plant-based substitutes edible was the practice of disclosing, that is, using packaging, websites or social media to disclose and account for the composition and contents of the plant-based substitutes.

Food sale is highly regulated and producers are required to use food packaging to disclose certain information, for example, ingredients and energy content. In addition to disclosing ingredients and nutritional content on the packaging, most producers also used their websites to present more detailed information on contents, nutrition and other qualities of the plant-based substitutes. An illustrative example is offered by Alpro. On their company webpage all products were displayed and described in terms of area of use, taste, product size, ingredients and nutritional content (www.alpro.com, accessed on 11 November 2020). By disclosing this type of information on websites (and packaging) the marketing of Alpro's goods worked to make otherwise 'invisible' product qualities accessible to consumers (see also Cochoy, 2004). By doing so, the disclosing of product composition and content actively worked to construct plant-based substitutes as edible by making the material components and characteristics of the foodstuff known to consumers.

In the interviews, consumers described how they read declarations of content and nutrition, in order to know what the products the consumed were made of and their nutritional qualities. Consumers described declarations as central to identifying the qualities of a product. For example, disclosing allowed consumers to know if a plant-based product placed in a 'vegan' section really was vegan, if it contained enough nutrients or energy, or if it contained some ingredient that the consumer wanted to avoid. To summarise, producers' disclosure of ingredients and nutritional content on websites and packaging work to make plant-based substitutes edible by enabling consumers to assess if the foodstuff was safe and suitable to consume.

Aestheticising

Another important part of making plant-based goods edible was to bring aesthetic qualities of the food to the fore. By aestheticising plant-based substitutes, that is,

using marketing to qualify them according to contemporary food aesthetic ideals, the foodstuff was made to fit with cultural understandings of what is tasty and appropriate to eat. All products included in this analysis used images and text on packaging, webpages and social media to depict the food in an aestheticised manner, highlighting colours, textures, and the overall taste and look of the food.

Images were commonly staged to depict the plant-based substitutes as part of a cooking scene or a meal. Dishes, and sometimes uncooked samples of the food, were combined with props like wooden cutting boards, porcelain plates, linen or cotton towels, fresh spices, ground salt and pepper, vegetables and fruits. The marketing material of Oumph! offers an illustrative example. When visiting their official Instagram account (www.instagram/eat_oumph, accessed on 25 June 2020), we found several BBQ Oumph! images focused on communicating the tactile and visceral qualities of the plant-based substitutes. For example, in one picture several very meat-like but plant-based barbecued fillets lay on a wooden tray together with a small bowl of red salsa, grilled lemon, onion, peppers, and a fresh salad with white cheese. The image communicates specific aesthetic qualities, accentuating the meat-like qualities of the plant-based substitutes.

Not only the images but also the marketing texts that accompanied the products worked to aestheticise them. Plant-based goods were qualified using taste adjectives like 'creamy', 'crispy', 'rich' and 'filling'. Like the visualisations, the narrations conveyed texture and taste qualities and qualified products as meat or dairy-like. For example, Hälsans kök's 'Sensational sausage' was described as raw instead of pre-boiled, thereby making it possible to cook it in a familiar way. The marketing also promises the same 'chewiness' as a meat-based sausage.

In summary, the plant-based substitute products were marketed according to contemporary food aesthetics. Images were full of colourful, well-prepared foods and the foods were described as rich in taste and texture, thereby qualifying these substitute foods, both through images and texts, as fresh and tasty, two key dimensions of edibility (see also Evans et al, 2022).

Branding

Making plant-based substitutes edible through marketing also involved branding, that is, connecting the plant-based goods with a specific company name, logo and design. Branding is a central marketing activity and commonly used to bring certain qualities of goods to the fore (Holt, 2006). In marketing practice branding is seen as an activity where the branded items are attached with a set of values embodied by the brand that support consumers' understandings of products' semiotic and material qualities.

In our material we saw that brands were used to define and position plant-based products. Similarities could be found regarding the type of aestheticising images used; the way products were described as tasty, healthy, sustainable and innovative yet familiar. Many brands also used humour and a naïve style on fonts to market their products. In the interviews we could see that consumers had no difficulties differentiating between brands and that they actively used brands to navigate among and narrate plant-based substitutes.

> '[Responding to the question "What kind of minced soy do you buy?"] I buy the brand Anamma. I try to avoid certain brands. Partly because I am a bit

> political. But also because I like Anamma. I like that they produce as locally as possible. I try to buy Oatly. But I also like Aito. The Finnish brand, their barista milk. I'm so sad that it is rather difficult to come by. Because I think it is the best milk on the market. Aito are the ones that have the cooking crème. The green one made of oats and that is gluten free. They also have a number of oats drinks and the barista is also gluten free. And it is rather creamy. A little bit sweeter I think, compared to Ikaffe [Oatly]. But it is so tasty and creamy and really works well when cooking too. It's not just the cream. And I think it is super tasty in tea as well.' (Interview with Emma)

As illustrated in this quote, Emma used brands to navigate the political landscape of food production. She expressed preferences for locally produced goods and actively avoided brands that used crops grown in occupied areas. But she also used brands to navigate among product qualities and tastes. Like all other consumers in this study, Emma clearly expressed taste preferences for specific brands due to the way products tasted and how they fit with her cooking and eating practices. This illustrates the complexities involved in edibility formation. The plant-based substitute in this case has to be tasty but also in line politically with the consumer's views to be seen as edible food and a desirable good.

Like declarations of content, brands took part in edibility formation as they signalled and ascribed specific qualities to the plant-based products. Brands assigned the foods specific characteristics and taste qualities but also politics of food production. They supported consumers in navigating among various plant-based goods and deciding what is appropriate for consumption and what is not.

Animating plant-based substitutes

Plant-based substitutes were also made into edible goods through the work of animating. If productising consisted of the marketing activities involved in preparing the foodstuff to become an exchangeable good – in this case, packaging, disclosing, aestheticising and branding – animating involves qualifying plant-based goods so that they fit into consumers' worlds. More specifically, what we term animating involved in this case connecting plant-based substitutes, through visual imagery and narration, to a set of familiar and desirable food practices. It involved the marketing work done to connect plant-based substitutes to consumers' everyday practices – such as food shopping, cooking, baking, setting a table and eating – thereby connecting them to existing food traditions, conventions, identities and interests. It is a way to make these goods part of consumers' worlds, to bring them to life, so to speak.

Connecting plant-based substitutes to food traditions

One of the most common ways to depict plant-based substitutes in use was to communicate scenes of the cooking or eating of a meal. Most of these scenes centred on conventional meat- or dairy-based dishes familiar to Swedish consumers, such as meatballs, beef stew or pizza. Although the plant-based substitutes were novel to these meals, they were here depicted as suitable components of familiar meat- and dairy-based cooking and eating practices. The marketing of the plant-based substitutes

made these goods edible by connecting them to familiar food practices and the specific set of meanings associated with these.

An illustrative example is a screenshot from vegme.se featuring a cast iron pot with what looks like a conventional beef stew, with rich broth, pieces of carrot, onion, mushrooms, fresh herbs and what looks like meat stew pieces and the text 'fresh, plant-based, and cooked in Sweden'. The plant-based meat substitute is here depicted as an appropriate ingredient in a conventional dish and thereby connected to traditional and familiar cooking and eating practices. The image also depicts the plant-based stew pieces as identical to meat, suggesting a consumption experience similar to a conventional meat-based dish. Also, although many images depicted everyday meal situations, references were also commonly made to holidays like Christmas and Easter, adhering to traditional cuisines. For example, the webpage of Quorn featured a page with an image of a grey marble cutting board, with what looks like a partly sliced Christmas ham, a small bowl of mustard, kale, and hard bread with slices of ham and mustard on it. In connection to the image one can also read:

> For the Christmas dinner
>
> Our amazing vegetarian products makes it easy to cook a tasty Christmas dinner that everyone can eat. Serve our super tasty Holiday special instead of Christmas ham, and perhaps our lacto-ovo vegetarian meat balls? No one should have to celebrate Christmas without Christmas ham. (www.quorn.se, accessed on 27 December 2020)

By animating the plant-based 'ham' the marketing of Quorn contextualises the plant-based substitutes and makes it part of not only familiar cooking and eating practices but also the traditional Swedish Christmas holiday practices.

The marketing from vegme.se and Quorn are two of many examples of the ways plant-based substitutes were framed as both meat-like and appropriate for familiar and traditional meals. By portraying plant-based substitutes as part of established food practices, the marketing material of these and other companies qualified plant-based goods as meat-like and a means for maintaining already established cooking and eating practices. By doing so, the images and narrations performed the dual move of connecting plant-based goods to valuable food practices and supporting the consumer in how to understand and how to use products. Plant-based foods were in this way portrayed as appropriate and edible to all consumers interested in a plant-based diet.

Connecting plant-based substitutes to social eating

Animating also involved connected plant-based food substitutes with social eating. Plant-based food substitutes were commonly depicted as part of a prepared, often festive, meal shared by a company of two or more people. It could be images showing people sitting or standing around a table, or images centring the food but also depicting the hands of people helping themselves to the meal. In this way, plant-based substitutes were portrayed as suitable ingredients in not only everyday and familiar food practices, but also to support and promote social eating. The marketing

of Oumph!, for example, offers many illustrations of connecting plant-based food substitutes with social eating. When visiting Oumph's webpage (www.oumph.se, accessed on 19 November 2020), we could see countless images depicting groups of people sharing a meal well integrated into their marketing material. The images depicted what looked like dishes with colourful vegetables, rice noodles, and chicken or meat-like bits. The food was served on large frying pans and wooden tables. Groups of people were sitting together, helping themselves to the food on the pan or table using forks or eating sticks. The commensality was emphasised as the eaters had no individual plates but instead eat from a common surface.

By using these types of images, plant-based substitutes were connected to food practices like joint cooking or sharing a meal with friends. Hence, the visual imagery used by Oumph! and other companies connected plant-based substitutes with practices of commensality, thereby framing the products as appropriate parts of established and familiar food practices and social contexts. Through the emphasis on social eating, the companies took part in edibility formation by prescribing how to consume substitutes and presenting them as viable parts of social practice. Here it is evident that marketing not only works to make plant-based substitutes edible by emphasising certain qualities but also by connecting this foodstuff to a host of social eating practices (see also House, 2019).

Connecting plant-based substitutes to the performance of family

The marketing of plant-based substitutes did not only connect the food to social eating and food tradition, but also framed it as a means for performing family (for example, Brembeck, 2005). The marketing material included many references to making family and family dinner. Text and images often included families (children and adults) preparing or sharing a meal. For example, in a post on Instagram, Alpro market their Greek-style yoghurt using an image of two teenagers preparing food and the text 'Quick, while she's [the mother] not looking. You just couldn't resist a sneaky pre-pre-dinner dip. Good for you' (www.instagram.com/alpro, accessed on 11 November 2020). The image and text suggest that the products are suitable for families and joint family cooking.

Also, descriptions of the products as fit for the wants and needs of children were common. For example, both Oatly and Alpro described certain products as designed specifically for children. Promoting their oat drink, Oatly highlight the ease of use that comes with a small package and straw, as well as the extra calcium and vitamins added to the product. On their website Alpro market their plant-based mini-yoghurts, stating that 'little ones love a smooth bite' and that it is also a way to get children to eat extra calcium and vitamins. Hälsans kök provides another example, describing their plant-based balls as 'appreciated by big and little ones', meaning adults and children, and their soy nuggets as a 'great snack for hungry children'.

By visualising and narrating the use of plant-based food substitutes in ways that animate them, making them 'come to life' as part of valuable practices, these market devices construct plant-based substitutes as edible. Through 'animating' marketing works to connect plant-based goods with specific contexts and situations that qualify them as meaningful and valuable. It portrays the foodstuff as appropriate for cooking and eating practices where traditions, family and sociability is enacted.

Discussion and conclusion

Our aim in this paper has been to contribute to the understanding of how alternative proteins can be made part of consumers' everyday diets by examining the role that marketing and markets have in the process of constructing these foods as edible. Taking a constructivist market approach and drawing on an ethnographic study of the marketing and consumption of plant-based substitutes in Sweden, we argued that marketing constructs plant-based substitutes as edible food in two ways.

Through *productising* and the marketing practices of packaging, disclosing, aestheticising and branding, plant-based substitutes were qualified as safe, enjoyable and appropriate for consumption. More specifically, through this specific mode of qualification plant-based substitutes were constructed as exchangeable entities with specific sets of (supposedly) desirable qualities. Through *animating* plant-based substitutes were linked to an array of already established and desirable food practices. By linking plant-based substitutes to food traditions, social eating and the performance of family, these goods were made both safe and suitable for consumption and valuable as cultural resources for the performance of meaningful practices. It is, we contend, through this dual move that plant-based substitutes become edible. Thus, we show that edibility formation goes beyond merely making plant-based substitutes safe for consumption. Edibility formation also involves qualifying food as, for example, tasty, sustainable and/or acceptable to consume and it involves linking food products to sets of desirable food practices.

Furthermore, in this paper, we have proposed that edibility formation should be understood as a continuous process. It is not a static state that remains stable once achieved. Edibility must be worked on, performed, often by multiple actors. In our analysis, we have tried to show that even a fairly established food category such as meat and dairy substitutes (Hoogstraaten et al, 2023) have to continuously be performed as edible. This is evident in the way the marketing for plant-based food substitutes is designed. In the analysis developed in this paper, it was clear that the marketing material was set up to make this foodstuff edible continuously and repeatedly. We have also argued that edibility is not necessarily a binary category. In our analysis it was clear that plant-based substitutes were not just edible or inedible but could be more or less edible. The edibility of plant-based meat and dairy substitutes existed on a continuum. This was illustrated by the way consumers talked about these plant-based foodstuffs, referencing how these products were more or less suitable for consumption depending on various qualities, such as taste, symbolic properties or nutritional content. The analysis thus broadens the concept of edibility, by showing how edibility formation involves continuous, socio-material work to qualify foodstuffs with multiple qualities. But it also underscores the importance of examining the role of commercial actors in edibility formation, exploring how edibility is constructed through marketing and markets.

Our paper contributes to previous research in important ways. The analysis contributes to the discussion on edibility by showing that edibility is not an innate quality of food stuff but rather formed continuously through active socio-material work. The analysis corroborates previous work that demonstrates that edibility is actively formed, at least partly, by the way the food is packaged, marketed and sold (Evans and Miele, 2012; Sexton, 2018). Moreover, this analysis contributes to and extends previous work on edibility by empirically illustrating and conceptualising *how* markets and marketing shape edibility formation. Rather than merely noting that

edibility is shaped by commercial forces, the analysis demonstrates how specific modes of marketing make plant-based substitutes edible by giving them specific qualities and situating them in meaningful food practices (for a similar argument, see House, 2019). The analysis also highlights the need to understand edibility both through cultural or social lenses – centring discourse, meaning and social relationships – and through perspectives taking market actors and exchange practices into account. To understand edibility formation today, one needs to take seriously the marketing of goods and the actions of market actors.

We also contribute to the field of alternative proteins and efforts to reduce meat consumption by illustrating the market-based socio-material work involved in making the consumption of alternative proteins possible. Our analysis underscores that if alternative proteins are to be introduced into new settings, they must be both comparable to and different from established animal-based food products. They must be recognisable as pertaining to the same product category but simultaneously offer qualities that conventional meat and dairy products do not, for example, sustainable or cruelty-free products. In addition, alternative proteins, whether these are plant-based substitutes, algae-based food products or even insects as food, must also be anchored in consumers' food practices to become edible. Accomplishing this, we show, typically involves both developing a desirable product (that is, a product with suitable qualities) and linking this product to a set of new or established food practices, thereby connecting to consumers' worlds. While the relevant qualities and food practices may vary, the underlying market mechanisms for making alternative proteins edible to consumers will likely be similar. Introducing alternative proteins is not merely an issue of achieving 'consumer acceptance'. It is not, as much previous research would suggest, only or mainly about developing palatable food products (Tan et al, 2015), finding consumer segments susceptible to novel foods (Sogari et al, 2019) or changing the attitudes of consumers (Aizaki et al, 2011). It involves actively constructing foodstuffs as edible for a specific group(s) of consumers and in relation to their food practices (for a similar argument see Volden, 2023, in this issue). This is a transformative but also, in our contemporary market societies, highly commercialised process. Therefore, trying to understand the introduction of alternative proteins by only studying consumers and their preferences or products and their qualities is ill-advised. One needs to understand the process by which alternative proteins – such as plant-based substitutes, cultured meat, algae-based products and insects – become edible products through marketing and in connection to consumers' everyday food practices.

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Conflict of interest

The authors declare that there is no conflict of interest.

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