Geoforum xxx (xxxx) xxx–xxx

Contents lists available at ScienceDirect

Geoforum

journal homepage: www.elsevier.com/locate/geoforum

Insects as food in the Netherlands: Production networks and the geographies of edibility

Jonas House*

Department of Geography, University of Sheffield, Winter Street, Sheffield S10 2TN, UK
Sociology of Consumption and Households Group, Wageningen University, De Leeuwenborch (Building 201), 6706 KN Wageningen, Netherlands

ARTICLE INFO

Keywords:
Edibility
Edible insects
Entomophagy
Novel food
Consumer acceptance
Innovation

ABSTRACT

A nascent subfield within food geographies research investigates edibility, or how things 'become food'. In the context of efforts to create more sustainable foodways in Europe and the US (the 'West'), this question is pertinent. One proposed contribution to these efforts is the Western adoption of insects as human food. Related scientific and commercial activity in the Netherlands has been prominent in this area. This paper draws on research with people involved in the development of a Dutch edible insect network, and with the production, supply and consumption of a range of insect-based foods. It explains how this network arose out of the interaction between heterogeneous, mutually-influential actors, and acts to delimit the 'horizon of possibility' for insect-based foods. The paper then presents a case study of a range of insect-based foods, arguing that the food products themselves, and their edibility, can similarly be understood as a network effect. Agency in both the design of foods and the construction of edibility is conceptualised as distributed, multiple and contingent. The paper also discusses the disjuncture between edibility (in principle) and routine consumption (in practice): new foods may be successfully positioned as 'edible', but this does not mean that people will eat them. Implications for debates on the conceptualization of edibility are discussed.

1. Introduction

How do "things become food" (Roe, 2006a, p. 105)? Within the rich geographic literature around food, a nascent subfield has emerged which engages with this question in particular, investigating and elucidating the constitutive geographies of 'things becoming food' (e.g. Bennett, 2007; House, 2018a; Probyn, 2011; Roe, 2006b, 2006a; Sexton, 2016, 2018; Waitt, 2014). In this literature, which I term the *geographies of edibility*, the principal analytic focus is the concept of the in/edible: the "cultural categories of what can and cannot be eaten" (Long, 2004, p. 32).

The positioning of particular foods as in/edible is a relational process, which in broad terms is negotiated through mutually implicated practices of production and consumption. However, it involves a heterogeneous range of elements including – inter alia – discourse, technology, sites and modes of food production, provisioning and consumption, legislation, interpersonal relations, the taste and materiality of food, and its visceral, non-discursive or immaterial attributes (e.g. Evans and Miele, 2012; House, 2018b; Krzywoszynska, 2015; Longhurst et al., 2008; Probyn, 2011; Roe, 2006b, 2006a; Sexton, 2016, 2018; Smith, 2012; Vialles, 1994; Waitt, 2014; Waitt and Phillips, 2016). These points are reflected in accounts of the wax and wane of food which do not deal explicitly with the notion of edibility, such as in Houlihan's (2003) account of tripe in northern England. Houlihan demonstrates how the edibility of tripe was to a large extent temporally bound, and connected to contemporary industrial labour relations, food supply infrastructure, and family eating practices.

Historical examples from Europe and the US (the 'West') reflect the situated and constructed nature of changing edibility, and that it is liable to change over time (e.g. Mennell, 1996). Things may 'become food' for relatively long periods, such as sushi (House, 2018b), avocado (Charles, 2002), or sugar (Mintz, 1985), or for much shorter ones, such as organ meat (Wansink, 2002), tulip bulbs (Vorstenbosch et al., 2017), or dogs (van Es, 2000).

In the context of current debates around the sustainability of food, and efforts to make improvements in that direction, understanding how edibility may be deliberately constructed is a salient concern. Research in this area is still relatively limited, but has explored efforts to construct the edibility of new 'alternative proteins' including plant-based products (Sexton, 2016, 2018), genetically modified food (Roe, 2006b), and insects (House, 2018a; Sexton, 2018; Stock et al., 2016; Yates-Doerr, 2015). Prominent focuses within this work are the manifold

* Address: Sociology of Consumption and Households Group, Wageningen University, De Leeuwenborch (Building 201), 6706 KN Wageningen, Netherlands.
E-mail address: jonas.house@wur.nl.

https://doi.org/10.1016/j.geoforum.2018.05.011
Received 4 July 2017; Received in revised form 7 May 2018; Accepted 8 May 2018

strategies employed to construct edibility and the ways in which these may not, despite the best efforts of those involved, be successful.

The present paper seeks to extend and enrich these debates. It explains and analyses one such proposed solution to the unsustainability of current Western meat consumption: efforts in the Netherlands to encourage the use of insects as human food, and the production of insect-based foods in the same region. The context in which such foods were created is explained in terms of a network of actors, both human and more-than-human (Latour, 1996; Whatmore, 2006), which has shaped the 'horizon of possibility' for insect-based food – what insect-based foods *are*, or *can be*. This is argued to have implications for the production and consumption of insect-based foods, both in the Netherlands and beyond. The paper examines a case study of a range of insect-based foods, suggesting that the production of these foods, and of their edibility, can also be understood as resulting from interactions within a network of heterogeneous actors.

The paper has two central arguments. The first is that edibility is a *network effect* (Law, 1992). To conceptualise edibility in this way directs attention to the way in which its constituent elements – the kind of things listed in the discussion of literature above – are related to each other, are interdependent, and are mutually constitutive. That is to say, it is not that edibility simply represents the outcome of the successful arrangement of heterogeneous entities into a particular constellation (although in one sense, it certainly does). Rather, through their involvement in the construction of edibility, these entities affect and shape each other. This argument also entails a move away from seeing the construction of edibility as chiefly the responsibility of entrepreneurial strategy (e.g. Sexton, 2018; cf. House, 2018b), and towards a view of edibility as *co-produced* by a diverse range of actors. Edibility in this account is situated and contingent: it does not entail general acceptance of insects, although this may be the aim.

The second main argument is that edibility and consumption are *not the same thing*: it is possible for a food to be positioned as 'edible' without anyone actually eating it. The analysis illustrates a fundamental tension, in which socio-material arrangements and network connections necessary for the construction of edibility may in fact work against the routine consumption of the foods in question. Connections between edibility and routinisation are discussed towards the end of the paper.

2. Insects as food

The idea that insects should be adopted as a human food source in the West is not a new one (e.g. Holt, 1885; DeFoliart, 1992; Meyer-Rochow, 1975), but its recent prominence can be attributed to a report published in 2013 by the Food and Agriculture Organisation of the United Nations (FAO), entitled *Edible Insects: Future Prospects for Food and Feed Security* (van Huis et al., 2013). Synthesising global knowledge around insect consumption ('entomophagy'), the report argued for Western use of insects as a new, sustainable protein source in both human food and animal feed. The principal grounds for this were environmental and nutritional: in both senses, insects compare favourably with conventional meat animals. The global prevalence of entomophagy was cited as a strong indicator of insects' appropriateness as human food.

The report was downloaded 2.3 million times in 24 h. It sparked a wave of media interest (Smith and Pryor, 2014a, 2014b), academic research, and – perhaps unsurprisingly – significant commercial interest. A plethora of start-ups and small businesses have since appeared in Europe and the US, marketing whole insects or foods containing insects as a processed ingredient (for examples, see Engström, 2018).

However, the wave of new commercial endeavours following the report were established in the context of a pre-existing network of research, policy and business activity in the area. While defining an absolute origin of this network is likely to be rather difficult (cf. Latour, 1996) – one could, for example, identify the earlier pieces advocating Western consumption of insects as foundational – it evidently began to assume a more formalised character in around 2006.

I term this network the 'Dutch edible insect network'. Although its actors were – and are – primarily based in the Netherlands, it also involves Belgian universities, businesses and governmental agencies, and the FAO, a global NGO headquartered in Rome. It is also shaped by academic and less formalised knowledges about insects from all over the world. The decision to term this network 'Dutch' is thus a heuristic one. In addition to signifying the territorial location of primary actors, the designation follows a popular understanding of the Netherlands as playing a key role in the area (e.g. Anderson, 2015; Jansson and Berggren, 2015), self-identification of the Netherlands as a forerunner and advocate for sustainable protein sources including insects (e.g. Green Deal, 2018; Willemsen, 2015), and the substantial financial and institutional support provided by the Dutch government (addressed below). Although I will also explain, for example, how developments in Belgium act (and are acted upon) within the network, I continue to use the designation 'Dutch' for the sake of clarity. In what follows I also employ the term 'European edible insect network', to indicate the broader context in which the Dutch network is situated, and is a constituent and influential part.

This following analysis is divided into two sections. In the first section, I explain the development of the Dutch edible insect network. I conceptualise its development as the weaving together of heterogeneous elements in alignment towards a common project, the establishment of insect-based food in the Netherlands and across Europe.[1] The process by which these heterogeneous actors become recruited or 'enrolled' to the project can be understood one of *translation*, in which their diverse interests are translated in accordance with a unifying idea (Latour, 1996).

In the second analytic section, I apply these insights to a case study of a specific range of insect-based food in the Netherlands and Belgium. I explain how the Dutch edible insect network has shaped the horizon of possibility for these foods, and suggest the conceptual account of the network itself can be fruitfully extended to an analysis of the foods' development. This entails a view of food production as the achievement of a "hybrid collective" (Callon, 2004, p. 4) rather than an individual entrepreneur (Drakopoulou Dodd and Anderson, 2007), and of the development of foods (as with other innovations) as a distributed, negotiated process, rather than as involving the linear diffusion of a stable artefact (e.g. Akrich, 1992; Håkansson and Ford, 2002). Drawing on research with consumers of these foods, I analyse how the foods were successfully positioned as edible, and how their edibility was shaped by the complex and contingent processes of production, supply, and consumption. I then discuss how the achievement of edibility does not necessarily entail consumption of foods so positioned, drawing out implications for the edible insect sector and future research on the geographies of food.

3. Methodology

As part of a larger project investigating public acceptance of insects as food in the Netherlands,[2] this paper focuses on evidence from semi-structured interviews with six individuals involved in some way with the development of an edible insect sector in the Netherlands. Interviews were conducted during 2016 and 2017, and participants included a scientist at the Netherlands' Wageningen University and Research Centre; a scientist at a Dutch insect farm; the owner of a Dutch insect farm; a civil servant working for the Dutch food safety authority; a product development manager at Damhert, a Belgian manufacturer of insect-based foods; and a category manager at Jumbo, a Dutch

[1] The same argument applies to the related but distinct goal of facilitating and creating insect-based animal feed, discussion of which is beyond the scope of the present paper.

[2] Other aspects of the project are discussed elsewhere (House, 2016, 2018a, in press).