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► To cite this version:

Arnaud Lamy, Sandrine Costa, Lucie Sirieix, Maxime Michaud. Less red meat to be greener? An exploratory study of the representations of sustainable cuisine among French chefs. *International Journal of Gastronomy and Food Science*, 2022, 31, pp.100627. 10.1016/j.ijgfs.2022.100627 . hal-03882689

HAL Id: hal-03882689

<https://hal.inrae.fr/hal-03882689>

Submitted on 2 Dec 2022

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1 **LESS RED MEAT TO BE GREENER? AN EXPLORATORY STUDY OF THE REPRESENTATIONS OF**
2 **SUSTAINABLE CUISINE AMONG FRENCH CHEFS**

3 Arnaud Lamy, Sandrine Costa, Lucie Sirieix, Maxime Michaud

4

5 **Abstract:**

6 The main objective of this research is to examine the representations that French chefs have of
7 sustainable cuisine, and to determine whether this includes considerations for a reduction in
8 meat consumption. Global sustainability questions have led to specific issues for the
9 restaurant sector. Among these issues, the recommendation of a reduction in meat
10 consumption is a polarizing topic in France, as meat is deeply rooted in the French culinary
11 tradition. The study of chefs' representations offers a better understanding of the meaning of
12 their actions, what is at stake for them, their obstacles and limitations in the implementation of
13 more sustainable practices in their kitchens. A qualitative methodology based on 29 semi-
14 directive interviews was chosen to explore the chefs' representations. A sub-sample of 15
15 French chefs was selected to carry out an initial preliminary thematic analysis and to provide
16 some initial insights. The first results of this study show the plurality of perceptions behind
17 the concept of sustainable cuisine. The chefs who have a concrete vision of the concept
18 mainly mention actions related to food supply and culinary preparation. The subject of
19 reducing meat consumption is not prominent in the chefs' representations of sustainable
20 cuisine; however, the chefs do mention various actions to use animal products in a more
21 sustainable way: sourcing from local food systems, favoring farms that respect animal
22 welfare, respecting the seasonality of products or adopting a zero waste strategy in the
23 preparation of meat-based dishes. These results have implications for the restaurant sector, as
24 they provide initial insights into the relationship between chefs and sustainable cuisine, and
25 pave the way for a more in-depth study of chefs' representations.

26 Keywords: chefs' attitudes; restaurants; meat consumption; professional representations;
27 qualitative survey; green practices

28 **1. Introduction and theoretical framework**

29 While in 2020 and 2021 the restaurant industry was heavily affected by the Covid-19
30 pandemic, this crisis may have accelerated the industry's thinking about its social and
31 environmental responsibilities. Several initiatives in the high-end gastronomy segment are now
32 positioning themselves in favor of changes. In 2020, the Michelin Guide awarded a star to the
33 French chef Claire Vallée for her exclusively vegan menu. That same year, the Guide created a
34 new distinction, the Green Star, to promote the restaurants most committed to sustainable
35 dining. In 2021, chefs from Eleven Madison Park (New York, three Michelin stars, ranked 1st
36 in the 50 Best in 2017) and Geranium (Copenhagen, three Michelin stars, ranked 2nd in the 50
37 Best in 2021) made their menu completely vegan. Gomez and Bouty (2011) have described in
38 detail the emergence of vegetable-based cuisine in the gourmet kitchen of pioneering chef Alain
39 Passard. Outside of fine dining, the outlook in other segments of the commercial catering
40 industry is ambiguous.

41 The interest in meat, its consumption and its limitation is growing, in step with the global
42 environmental and climate issues which are challenging our agricultural and food systems
43 (Searchinger et al., 2019; Tilman and Clark, 2014). Current scientific recommendations for
44 Western countries converge on the need to reduce our consumption of animal products,
45 particularly meat, and increase our consumption of plant-based foods (such as grains and
46 legumes) (Godfray et al., 2018; Willett et al., 2019). An adaptation of meat consumption is also
47 recommended to improve health and animal welfare impacts (Bonnet et al., 2020). However,
48 there are several challenges to reducing meat consumption.

49 First, meat is at the heart of the culinary and food traditions of several cultures, such as
50 French gastronomy or, more broadly, Western gastronomy (Holm and Møhl, 2000; Melendrez-
51 Ruiz et al., 2019). On the consumer side, meat is symbolically placed at the top of the hierarchy
52 of food products (Dagevos and Voordouw, 2013). Meat is often considered as a festive food
53 and as an archetype of virility, providing strength and vitality (Fiddes, 1991; Ruby and Heine,
54 2011). Second, home and out-of-home eating practices differ regarding meat consumption:
55 recent findings in Germany (Biermann et Rau, 2020) and the United Kingdom (Horgan et al.,
56 2019) suggest that in restaurants, the likelihood of consuming meat and the amount consumed
57 are greater than in other contexts (such as home or work). Third, several studies show that
58 consumers misunderstand and/or minimize the environmental impacts of meat consumption
59 (Hartmann and Siegrist, 2017; Macdiarmid et al., 2016).

60 Recent works (Batat, 2020; Jallinoja et al., 2016) have emphasized the importance of
61 capturing the perceptions of chefs and restaurateurs toward sustainable food behaviors, as they
62 are responsible for designing their food offering. However, chef's practices as regards meat
63 have not been specifically investigated.

64 The general objective of this research is therefore to explore whether, and if so how,
65 chefs' representations of sustainability are manifested vis-à-vis the idea of reducing red meat
66 consumption in restaurant settings.

67 The theoretical framework chosen to study the perceptions of chefs is that of social
68 representation theory, formulated by Moscovici in 1976. Abric (2001) defines representation as
69 "*an organized and structured set of information, beliefs, opinions, and attitudes*" about an
70 object, which constitutes a particular socio-cognitive system. Gallen (2005) completes this
71 definition by specifying that representation encodes the meaning of the stimuli from the
72 environment while keeping this information in memory. Representation is social because it is
73 built and shared within a determined socio-cultural group (Lo Monaco and Lheureux, 2007).
74 Lo Monaco and Lheureux (2007) attribute four main functions to representations: to explain
75 reality through shared beliefs; to define a group's identity and membership; to guide actions
76 based on anticipations of behaviors *a priori*; and to justify stances and behaviors *a posteriori*.
77 Through the prism of the theory of representations, chefs' behaviors can be studied via their
78 perceptions and anticipations and the justification of their choices.

79 Professional training can modify the perception of certain social representations,
80 particularly those concerning objects that are salient to the profession. These specific social
81 representations are referred to as professional representations (Fregonese and Ratinaud, 2020;
82 Zouhri and Rateau, 2015).

83 Chefs have their own professional representations that differ from those of consumers on
84 certain objects. Rojas-Rivas et al. (2020) worked on Mexican chefs' representations of the
85 concept of gastronomy, which are firstly linked to culture, identity and tradition, and secondly
86 to culinary methods and techniques. Lee et al. (2022) have explored how Italian chefs see
87 themselves in a traditional and then in a modern restaurant. While previous surveys have
88 provided elements on the representations of chefs on healthy food or localized food products
89 (Condrasky et al., 2007; Obbagy et al., 2011; Salvador et al., 2017), their relationship to meat
90 has not been investigated (Frick, 2018).

91 **2. Methods**

92 The report on this qualitative research is based on the guidelines of the COREQ checklist
93 (Tong et al., 2007). A qualitative methodology based on semi-directive interviews was
94 conducted between January 2022 and June 2022 with 29 chefs working in restaurant SMEs in
95 France. This work is a pre-analysis conducted on a subset of the first 15 chefs interviewed (see
96 Appendix A for sample characteristics). The participants were recruited through purposeful
97 sampling strategies, i.e., theoretical and snowball sampling. Three of the participants were
98 approached directly, and the other 12 self-sampled through social media platforms. The
99 announcement stated that the interview was about sustainability issues in the restaurant
100 industry, without giving further details.

101 The objective of the interviews was to provide information on several themes: the chefs’
102 background, and their representations of traditional French cuisine, sustainable cuisine, meat
103 and meatless cuisine. We collected the data using an interview guide based on these themes. In
104 the present report, we focus on the parts of the interviews related to the sustainable cuisine
105 theme. The opening question on this theme was “If I say ‘*sustainable cuisine*’ (‘*cuisine durable*’
106 in French), what words and adjectives come to mind? What images, what sensations does it
107 evoke for you?”. The follow-up question asked them to link the ideas or concepts mentioned
108 with sustainable cuisine: “How do you relate ‘*this*’ to sustainable cuisine?”

109 The interviews were audio-recorded, pseudonymized and fully transcribed. A thematic
110 analysis was performed on the corpus of our sub-sample of 15 chefs, based on their response to
111 our question on sustainable cuisine. This thematic analysis follows a deductive approach by
112 being guided by the analytical interest of a specific research question. Themes are identified at
113 a semantic level (Braun and Clarke, 2006). We used MAXQDA 2022 (VERBI Software, 2021)
114 for data analysis. We draw on Braun and Clarke's (2006) and Nowell et al.'s (2017) work to
115 clarify how the thematic analysis was conducted. They divide the process of thematic analysis
116 into six phases, each of which contains points requiring vigilance to conduct rigorous and
117 reliable research (table 1).

118 Table 1: Phases of the thematic analysis process (Braun and Clarke, 2006)

Phases	
1	Familiarization with the data
2	Generation of the initial codes
3	Research of the themes

4	Examination of the themes
5	Naming and definition of the themes
6	Production of the thematic analysis report

119 During the first phase of the thematic analysis, familiarization with the data, the
120 interviews were transcribed manually and in full and the initial reflective thoughts were kept.
121 The part of the corpus corresponding to “sustainable cuisine” was color coded on MAXQDA
122 to facilitate the work. The second phase consisted in the generation of the initial codes. The
123 coding framework was based on the structured interview guide as well as on a first global
124 reading of the corpus. The first keywords were identified. The lexical field of meat was
125 identified in the corpus by automatic searches on MAXQDA for the word "meat" or types of
126 meat such as “beef” or “lamb”, and completed by a manual search. The third phase consisted
127 of researching the themes. A second reading of the corpus resulted in a list of 9 themes to be
128 identified more precisely in the whole corpus. The fourth phase was the examination of the
129 themes. The framework was adjusted and validated by the members of the research team.
130 Themes and sub-themes were implemented in MAXQDA. The fifth phase was based on naming
131 and defining the themes. To facilitate the organization of the coding, each code specific to this
132 analysis was named with its own prefix ("sustainability_") and a specific color. A "memo" was
133 added to each code directly on MAXQDA to define the code. The sixth and final phase
134 consisted in the production of the thematic analysis report, which included a detailed analysis
135 of each theme and was verified by the members of the research team.

136 3. Results and discussion

137 The thematic analysis of the notion of sustainable cuisine led to the identification of
138 eight different themes identified thanks to the key words spontaneously uttered by the chefs
139 and through a global reading of the corpus.

140 According to the recurrences among the different chefs’ discourses, two main themes
141 appear: the use of short and local supply chains, and the management of waste and losses.
142 Three other themes are present to a lesser extent: the use of good practices and the know-how
143 of cooks, the modes of agricultural production and breeding, and the expenditure of resources.
144 Finally, three themes are present among only a few chefs’ discourses: the seasonality of
145 products, ecological cleaning products, and the use of self-production. As shown in Table 2
146 below, most of the themes mentioned by the chefs are related to the purchasing and supply
147 stages and to a lesser extent to the storage and culinary preparation stages.

Table 2: Links between themes and stages in the chefs' work process

(1) Purchasing practices and supply	(2) Storage and culinary preparations
Management of waste and losses	
Ecological cleaning products	
Modes of agricultural production and breeding	
Use of short and local supply chains	
Seasonality of products	
Use of self-production	
	Use of good practices and the know-how
	Expenditure of resources

150 Among the 9 themes of sustainable cuisine, 5 are related to actions on animal products:
 151 the seasonality of products, the use of short and local supply chains, the management of waste
 152 and losses, the modes of agricultural production and breeding, and the use of good practices
 153 and the know-how of cooks.

154 3.1. The use of short and/or local supply chains for animal products.

155 The chefs were critical of long-distance transportation of animal products (Herman:
 156 *"People are going to be forced into sustainability soon. I think about air travel. Sending an*
 157 *insane amount of seafood and meat parts."*). The use of shorter, local solutions is valued. This
 158 approach allows the customer to be aware of the origin of the product consumed (Gérard).
 159 However, this solution has its limits, particularly in terms of its lesser variety of products, or
 160 for chefs in charge of restaurants offering a large number of meals: Billy indicates that local
 161 producers cannot cater for the volumes he needs: *"With the volumes I have, too bad, I can't*
 162 *manage. When I call a small supplier of lamb in the mountains and I tell him that I will need*
 163 *80 racks of lamb per week, he sees 40 lambs at the slaughterhouse, so he tells me that it is not*
 164 *possible. I am obliged to go and look for things much further away in France, I won't look*
 165 *abroad and I am obliged to go to maybe 3 different suppliers to get my 80 racks of lamb"*.
 166 There is no consensus on the perimeter of what is local, with some chefs referring to a
 167 national scale (Gauthier: *"Local if we limit ourselves to France, normally it is good"*), others
 168 regional, while for others it is territorial.

169 3.2. The management of waste and losses by the promotion of all meat cuts.

170 Meat is a product that is at the heart of the chefs' loss control issues. From the raw
 171 product, chefs have learned to extract the noblest part of the cuts and get rid of the trimmings.
 172 Today, the challenge is to promote the value of the whole product (Arsène: *"Now we are*

173 *taught more, and we learn to keep the whole raw product, to try to work with everything.*
174 *These are small things, but we will recover the meat trimmings to make a sauce base").* The
175 containers of products are also a focus, with the limitation of plastic and the encouragement to
176 recycle (Gauthier: *"And then, for example, with suppliers we imposed the use of transport*
177 *crates or we give them back each time. Rabbit is like that, for example"*). Live animals, in a
178 circularity approach, also contribute to the recovery of certain waste (Billy: *"We put geese*
179 *and hens in to recover waste and they lay eggs that end up on the hotel breakfast buffet";*
180 Gauthier: *"As soon as I have a few things left over, I have hens, and there are horses")*).

181 3.3. Modes of agricultural production and breeding with attention to the types of breeding and 182 animal welfare.

183 Within the question of the type of production, two issues emerge. First there is a critical
184 relationship with organic farming among some chefs as regards organic foods that are
185 imported, which thus lose their expected ecological properties, as Timothée mentions: *"We*
186 *were absolutely looking for organic prawns. There were some, but they came from*
187 *Madagascar. We said, wait, they come from Madagascar, ok they are organic there. But once*
188 *they leave Madagascar and travel halfway around the world, I don't think they are organic*
189 *anymore, because they have a huge carbon footprint"*. Second, intensive farming methods are
190 questioned by some chefs due to their impacts on the environment and on the treatment of
191 animals (Gérard: *"Everyone wants to eat smoked salmon today so we have over-intensified*
192 *salmon farming with all the consequences we know"; Ernest: "There are fish that I no longer*
193 *work with like cod, because it is fished too intensively [...] there is no way I would buy poultry*
194 *that never sees the light of day and lives in a small cage"; Lucien: "I would rather spend a*
195 *little more on a pig that was raised outdoors than a poor critter that has never seen the light*
196 *of day")*).

197 On the question of animal welfare, the conditions under which animals are treated are
198 criticized and influence purchase choices. (Lucien: *"I prefer to spend more and to work, for*
199 *example, with beautiful poultry that has been raised in the open air, that the producer has*
200 *taken care to raise in the best possible conditions for the animal, rather than buying poultry*
201 *that has been raised in a battery and has been mistreated"*). Some chefs remain more
202 ambiguous, welcoming the consideration of animal welfare while fearing the rise of a more
203 general meatless movement (Bruce: *"I'm very happy with animal welfare. But there is*

204 *another side to it, the extremist side, where they want to impose everything, too fast, right*
205 *away”).*

206 3.4. Seasonality of animal products.

207 Chefs advocate respecting nature and the seasonality of products. For some products
208 this involves the observance of reproduction periods (Gauthier: "*Avoid reproduction periods*
209 *for fish, for meat. And then, don't ask for more than what nature can offer*").

210 3.5. Use of good practices and the know-how with animal products.

211 The chefs rely on meat recipes or techniques to offer a know-how that respects the
212 products and therefore provides a sustainable cuisine (Lucien: "*Continue to do as we do now*
213 *or as we did 20 or 30 years ago, with dishes like a pot au feu*"). The example of sauce bases is
214 given several times by the chefs, who talk about the ability of cooks to make the most of the
215 trimmings and waste from meats (Timothée: *It's also about using the whole product. We use*
216 *the tails and the heads; Arsène: we will recover the meat trimmings to make a sauce base*).

217

218 The question of the quantity of meat consumed was raised by only one chef, who
219 acknowledged the need to reduce meat consumption, but without supplying any alternatives
220 (Ernest: "*Now we are talking more and more about paying attention to how we eat, instead of*
221 *eating meat every day, eat it only 2 or 3 times a week at most and eat good meat and enjoy it*
222 *more than eating meat every day*").

223 The results of this exploratory study seem to indicate that French chefs are more aware
224 than consumers of the environmental issues linked to meat (Hartmann and Siegrist, 2017;
225 Macdiarmid et al., 2016). However, their representations are not oriented toward reducing the
226 amount of meat in their dishes. Their representations of sustainable cuisine primarily relate to
227 food supply and preparation methods and have little to do with service. For the chefs, the
228 question is more one of improving the quality of the meat offered than limiting meat
229 consumption. This is in line with Horgan et al. (2019) and Biermann and Rau (2020), who show
230 the importance of meat consumption in restaurants, and with Melendrez-Ruiz et al. (2019), who
231 show how meat remains at the heart of food traditions in France.

232 The respondents of the study are all men, which may have an impact on the themes
233 detected. Indeed, the work of Ruby and Heine (2011) shows different attitudes in men and

234 women toward meat consumption; the work of Graça et al. (2019) indicates that women are
235 more inclined to change their diet or adopt a plant-based diet. However women are poorly
236 represented in French chefs (Stengel, 2018), so even if there are some differences, it impacts
237 the profession in a very limited manner.

238 Like in every qualitative study, the researcher always impacts the results to a certain
239 extent. We managed this issue in two main ways: 1-The first author, who conducted the
240 interviews and most of the thematic analysis, tried to keep a neutral position in the formulation
241 of the questions, in the exchanges and in the analysis and 2-The other authors validated the
242 interview guide and the different steps of the analysis and the constitution of the themes as the
243 research progressed.

244 In the next steps, an analysis on the whole corpus of 30 chefs, including 6 women, will
245 allow to strengthen the results and to investigate the gender issue, and a quantitative survey on
246 a larger sample would put these initial results into perspective.

247 **4. Conclusion**

248 This research explored how chefs' representations of sustainable cuisine relate to the
249 reduction of red meat consumption. The main result indicates that reducing meat consumption
250 is not a prominent idea among the chefs interviewed, even if they associate the use of meat with
251 other sustainable cuisine practices. Red meat and, by extension, other animal products (like
252 poultry or seafood) are directly or indirectly mobilized in several sustainable cuisine themes, in
253 supply practices (use of short and/or local supply chains for animal products, attention to
254 breeding methods and animal welfare, seasonality of products) and in culinary preparation
255 practices (management of waste and losses by the promotion of all meat cuts, use of good
256 practices and know-how with animal products). The topic of service and consumption is
257 relatively absent from the chefs' discourse on sustainable cuisine, which may explain why the
258 issue of reducing meat consumption is discussed very little. This first exploratory study of
259 chefs' representations of sustainable cuisine and the place of meat opens up new avenues for
260 research into chefs' representations.

261 **Ethical approval**

262 Ethical approval was received by an advisory statement from the University College of General
263 Medicine (CUMG) of University Lyon 1. (IRB: 2021-11-23-05).

264 **Funding**

265 This work was supported by the G&G Pélisson Foundation at Institut Paul Bocuse.

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367 Appendix A: Presentation of the sample

N°	Chef	Age	Restaurant sector	Location
1	Herman	31	Hospitality school	South-east, Lyon region, urban area
2	Fernand	58	Hospitality school	South-East, Lyon region, urban area
3	Damien	50	Gastronomic, Michelin-starred	South-East, Marseille region, rural area
4	G�rard	49	Brasserie cuisine (casual cuisine)	South-East, Lyon region, rural area
5	Billy	31	Brasserie cuisine	South-West, Carcassonne region, urban area
6	Ernest	43	Gastronomic, Michelin-starred	Southeast, Avignon region, rural area
7	Timothy	31	Upscale brasserie cuisine	South-West, Albi region, rural area
8	Ars�ne	53	Upscale brasserie cuisine	Northwest, Nantes area, urban area
9	Ivan	43	Gastronomic	North-East, Besancon region, rural area
10	Lucien	38	Brasserie cuisine	Switzerland, Neufch�tel region, urban area
11	C�lestin	31	Brasserie cuisine	Center, Clermont-Ferrand region, rural area
12	Edouard	47	Gastronomic, Michelin-starred	Center, Clermont-Ferrand region, urban area
13	Ronan	39	Hospitality school	South-East, Lyon region, urban area
14	Gauthier	31	Gastronomic	Northwest, Nantes, rural area
15	Bruce	42	Brasserie cuisine	South, Montpellier region, urban area

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