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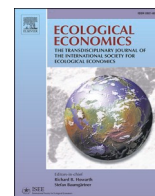


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Surveys

Tell me what you cook and I'll tell you who you are. A study of the influence of the representations and identities of aspiring chefs on their intentions to reduce meat in favour of plant-based dishes

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ABSTRACT

Faced with increasing recommendations for a more plant-based diet, the catering sector is particularly affected. This study investigates how future chefs' representations and identities (professional or otherwise) influence their intentions to offer less meat-based and more plant-based menus, either by reducing meat in dishes or replacing meat-based dishes with vegetarian options. Theories of representations and multiple identities were chosen to study how future chefs may or may not consider to reduce the amount of meat in their menus, in relation to the literature that shows links between representations, identities, and relationship with meat. Culinary students from two French schools ($n = 286$) were investigated. Participants' representations of the effectiveness of pro-environmental measures in restaurants were analysed using t -tests, while the association of identities on intentions to reduce meat was examined with bivariate and multivariate regressions. The results indicate that future chefs perceive meat reduction in favour of plant-based products in the offer (dishes, menu) less favourably than other measures (e.g., favouring local sourcing, limiting waste, etc.). Furthermore, environmental, food, and cultural identities are associated to future chefs' intentions to reduce meat in favour of plant-based products. Theoretical and managerial implications are suggested, as well as perspectives for future research.

1. Introduction

In light of the challenges posed by climate and environmental change, the IPCC (Intergovernmental Panel on Climate Change) has issued recommendations to adopt healthy, sustainable diets and to reduce the amount of land needed for food production (IPCC, 2019). A pertinent response to Western diets is to switch to more plant-based diets, which would entail a significant reduction in the consumption of meat in favour of plant-based foods (cereals, pulses, seeds and oilseeds, vegetables, etc.) (Godfray et al., 2018; Willett et al., 2019). This requisite alteration has ramifications for the entirety of the food system, including the restaurant industry. Around 1 in 5 meals is eaten away from home in France (Anses, 2017) and the restaurant sector will account for 30 % of French people's spending on food in 2023 (Xerfi, 2024). In 2023, traditional catering accounted for 48.8 % of the sector's total sales, up

11 % to €66.2 billion (Xerfi, 2024). The restaurant sector is therefore an interesting area in which to study changes to menus and dishes. Notable initiatives include the American food website Epicurious, which in 2021 announced that it would no longer publish new recipes containing beef on the site, to encourage the restaurant industry to offer more sustainable cuisine. Another potential method for influencing consumption patterns is to modify restaurant menus to include a greater proportion of sustainable cuisine. For example, reducing the quantity of meat served and increasing the quantity of vegetables can result in more sustainable consumption patterns without necessitating any changes in consumer behaviour or satisfaction (Reinders et al., 2020). This reduction of the amount of meat in dishes has a second positive effect in terms of environmental impact, as it also helps to reduce food waste. Moreover, a number of studies have investigated the influence of specific attributes of restaurant menus on diners' decisions regarding sustainability. For

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example, studies have demonstrated that providing information on the carbon impact of different dishes can lead to the consumption of more low-carbon meat (chicken) than beef (Brunner et al., 2018). Furthermore, the consumption of dishes labelled 'low emission' increases more when they carry a claim that they have a beneficial effect on the environment (Buratto and Lotti, 2024). Finally, a number of studies have demonstrated that identifying dishes as either vegan or vegetarian can result in a reduction in their consumption compared to dishes that are not identified in this way (Buratto and Lotti, 2024; Krpan and Houtsma, 2020). Reducing the environmental impact of meat dishes can therefore be achieved both by reducing the amount of meat in dishes and by substituting vegetarian dishes for meat dishes on menus. Chefs are in a unique position to effect change in the restaurant industry, particularly in relation to sustainability. They occupy a pivotal role not only as decision-makers within their restaurants but also as opinion leaders on matters relating to food (Batat, 2020; Leggett et al., 2021; Pereira et al., 2019). As a symbol of refinement, French gastronomy has shone throughout the world since the 17th century (Parkhurst Ferguson, 2006). While today we are witnessing the reclamation of societies' gastronomic heritages, the traditional French gastronomic savoir-faire taught in culinary schools remains a perennial trend.

Recent studies have examined the ways in which chefs approach sustainability issues. For example, the work of Huang and Hall (2023), Lamy et al. (2023), and Vu et al. (2023) indicates that chefs place significant value on sourcing choices, such as local products and organic products, and on limiting food waste. Although it is a significant issue, the reduction of meat consumption in favour of plant-based products does not appear to be a priority for chefs to make restaurants more sustainable. To date, no study has specifically examined the importance that chefs attach to reducing meat consumption in favour of plant-based products, in comparison with other measures already identified in the literature (e.g., sourcing local produce). Moreover, recent studies have demonstrated a connection between environmental concerns and the various facets of chefs' identities, which they express through their cuisine (Nascimento, 2023; Santamarina, 2023; Lamy, 2024). It thus appears pertinent to examine the potential influence of chefs' identities on their intention to offer a less meaty and more plant-based menu. Furthermore, Bertoldo et al. (2021) and Şahin and Gök Demir (2023) emphasise the importance of focusing on students of gastronomy and culinary arts, as they have the potential to influence societal attitudes towards sustainability, thereby assisting in the formulation of strategies to advance towards a more sustainable cuisine.

In this context, it is crucial to gain deeper insight into how future chefs approach the issue of sustainability and the subject of reducing the amount of meat on offer (in quantity in the dish or by substituting vegetarian dishes for meat dishes), as this is a product with significant symbolic meanings. Two conceptual approaches, that of professional representations (Piasek and Bataille, 2010) and that of multiple identities (Oyserman, 2009; Reed et al., 2012), are therefore helpful in exploring the relationship between chefs and these themes. The objective of this study is to assess the influence of the representations and identities of aspiring chefs on their intentions to reduce the number of meat dishes on offer in favour of plant-based dishes on the menu of their future restaurants. This research is part of an exploratory quantitative approach, using variables mainly derived from theories on consumer behaviour and adapted to the profile of chefs, whose behaviour has been little studied in the literature.

First, we present the theoretical framework based on professional representations and multiple identities, along with the hypotheses derived from it. Then we outline the methodology employed in the quantitative study, the results, a discussion of these results, and the implications that arise from them.

2. Theoretical framework and hypotheses

The theoretical framework is based on two complementary concepts:

representations and identities.

2.1. From social representations to professional representations

Social representations are socially constructed cognitive products (e.g., opinions, beliefs, knowledge) relating to an object. They enable a social group to regulate and appropriate its environment based on symbolic elements specific to the group (Abric, 2001). This mutual understanding contributes to the construction of a shared reality within the social group and helps to define the group's identity (Moliner et al., 2002). Social representations guide and regulate the actions of the social group, generating social norms to justify or legitimise actions (Moliner et al., 2002). Social representations are not static cognitive structures, but evolve over time as the social environment changes. New representations emerge with the appearance of a new object that is important to the social group, but old consensual representations of an object can evolve and incorporate new opinions. The process of integrating new meanings into representations can lead to some frictions, as they have to be established within an old consensus that sometimes consists of contradictory elements (Moliner et al., 2002). Professional representations are specific social representations that are cognitive products of professional action and interaction. They form the basis of professional identities and relate to objects that are salient for the profession (e.g., the notion of support for midwives) (Fregonese and Ratinaud, 2020; Piasek and Bataille, 2010). They serve similar functions to social representations, namely in understanding and sharing a common reality, in guiding actions in situations of uncertainty, and in justifying positions and behaviour. Although restaurant meals represent a minority of food consumption, it is interesting to study the professional representations of chefs because they prescribe the actions of chefs in restaurants and influence other social groups, such as consumers, by setting social norms in the field of food. In this research, we use professional representations to elucidate the relationship between future chefs and a subject of recent interest to the profession: sustainable cooking. The exploratory qualitative research conducted by Lamy et al. (2023) to investigate chefs' representations of sustainable cuisine indicates potential avenues for further investigation. In particular, the research highlights that chefs perceive little or no reduction of meat as an effective measure of sustainable cuisine. The objective of this study is to verify and compare the approach proposed by Lamy et al. (2023) with another approach by inviting chefs to estimate the perceived effectiveness of different measures that relate to sustainable cuisine. In light of this, the following hypothesis is put forth:

H1. Future chefs believe that the measure of cooking less meat and more plant-based foods contributes the least to environmental sustainability, compared with the other measures studied (e.g., using local supplies, combating losses and waste).

2.2. Multiple identities

This research is also based on the framework of multiple identities. The work of Oyserman (2009) and Reed et al. (2012) on identity is part of an integrative approach to different scientific currents dealing with identity. In social psychology, this includes Social Identity Theory (Abrams and Hogg, 2006; Tajfel and Turner, 1979), while in sociology it encompasses Identity Theory (Stryker and Burke, 2000). In their review, Reed et al. (2012) summarize the existing research on identity in consumer behaviour sciences. They propose an inclusive definition of identity: a label that an individual associates with, either by choice or by assignment, and which resides in the self-concept. The label designates a representation that an individual has of what the bearer of this label looks like, thinks, and feels. This is consistent with the theoretical framework of representations. The self-concept is an individual's general feeling about their past, present, and future selves. The self-concept is a multifaceted entity, comprising a multitude of identities. The process

of identity formation is gradual, occurring over time as individuals adopt and integrate various aspects of their identity. These identities may be classified according to some criteria, including their variability, stability, breadth, inclusivity, subjectivity, transience, and so forth. Identities are found to be determinants of individual attitudes and behaviours (Reed et al., 2012). The relationship between identities and attitudes/behaviours is determined by two key factors: salience (the accessibility of the identity in the self-concept) and relevance (the coherence of the identity with the situation) (Kettle, 2019; Reed et al., 2012). It can be concluded that multiple identities represent an optimal framework for determining the positive or negative impact of future chefs' identities on their intentions to offer a less meaty and more plant-based cuisine.

2.3. The identities of chefs

In the professional chef context, it is pertinent to consider the diverse identities that inform chefs' approaches to meat-related practices. Lamy's work (2024) demonstrates that chefs rely on a range of identities, including dietary, familial, and health-related identities, to justify their culinary practices around meat and meatless foods. In their study of the influence of multiple identities on consumer attitudes towards red meat consumption, Randers and Thøgersen (2023) identified a set of relevant identities, including gender, gourmet, and healthy eater identities. Based on the aforementioned research, several identities have been identified as being likely to influence the intentions of chefs to offer a less meaty and more plant-based cuisine.

The initial identity to be considered is that of the professional chef. This social identity has been identified in the literature as exhibiting a number of defining characteristics, including a sense of community belonging (family functioning, devotion to the group, solidarity, peer recognition, etc.), an acceptance of challenging working conditions (long working hours, competition, bullying, sexism, etc.) and a shared language of cooking (system of shared values and symbols, etc.) (Balazs, 2001; Bonnet and Villavicencio, 2016; Cooper et al., 2017). The preparation of meat is a significant indicator of the professional socialisation of chefs through training, which is associated with prestigious positions within kitchen brigades, which is the system of hierarchy found in restaurants employing extensive staff (Harris and Giuffre, 2010; Lamy, 2024). The work of Lamy (2024) indicates that meat cuisine is perceived favourably by French chefs and is considered an essential and constitutive element of traditional French cuisine.

This study's second hypothesis aims to elucidate whether the subject of cooking with meat constitutes a central element in the professional representation of chefs' professional identity. This hypothesis is based on the work of Abric (2001) on the structural approach to representations. Abric's approach posits that an element can be considered central (in this study, the cooking of meat) only if it is inextricably linked to the object of representation (the professional identity of the chef) and shared by the majority of the group (the chefs).

H2. Meat cuisine is a central element in the professional identity of chefs.

The professional identity of a chef is an identity that is in construction by aspiring chefs. This implies the integration of a system of shared values, of which meat-cooking is historically a part. As a specific technique, cooking with meat ensures that the requisite standards of performance are maintained within the brigade. We hypothesise that the professional identity of aspiring chefs has a negative impact on their intentions to offer a cuisine that is less meaty and more plant-based (H3). Consequently, we hypothesise that the centrality of meat cuisine in the professional identity of aspiring chefs moderates their intentions to offer less meaty and more plant-based cuisine (H3bis).

H3. The professional identity of aspiring chefs has a negative influence on their intentions to offer a cuisine that is less meaty and more plant-

based.

H3bis. The effect of professional identity on the intentions of future chefs to offer a less meaty and more plant-based cuisine is moderated by the centrality of meat cuisine within the professional identity of chefs.

The structuring relationship between meat and gender is also evident. Men are more attached to meat than women (Graça et al., 2015). On a symbolic level, meat is associated with masculinity or virility, via the symbol of strength (Fiddes, 1991; Rozin et al., 2012; Ruby and Heine, 2011). Furthermore, within brigades, meat can also structure gender relations. Harris and Giuffre (2010) have demonstrated that within professional kitchens, women may have been allocated less prestigious roles (such as those associated with vegetable cooking) while men occupied the more prestigious positions linked to meat cooking. Given the symbolic association of meat with masculinity and the distinction achieved through meat cooking within the brigades, it can be proposed that gender identity, particularly among male chefs, directs them towards meat cooking. Gender identity is therefore the second identity considered in this study.

H4. Gender identity has a negative influence on the intentions of male future chefs to offer a cuisine that is less meaty and more plant-based.

In France, meat continues to play a prominent role in the country's culinary tradition, particularly in the composition of dishes and in traditional French cuisine (Cazes-Valette, 2012; Lamy, 2024; Melendrez-Ruiz et al., 2019) and consumption of traditional dishes with meat is part of French national identity. Meat consumption is also very important in a lot of other countries' national identities such as in the USA, Australia, Great Britain (Nguyen and Platow, 2021), Denmark (Randers and Thøgersen, 2023) and China (Du et al., 2024). In this study, aspiring chefs study in France in two French management and gastronomy schools. We may then assume that most of them either have a French national identity or feel close to the French national identity at least regarding its traditional cooking.

The third identity studied is national identity. It is postulated that this identity is negatively associated with the intention to offer cuisine that is less meaty and more plant-based.

H5. The national identity of aspiring chefs has a negative influence on their intentions to offer a cuisine that is less meaty and more plant-based.

The fourth identity of interest is the pro-environmental identity. The work of van der Werff et al. (2013) indicates that an individual with a robust environmental identity is more likely to perceive themselves as a person who acts respectfully towards the environment. Such individuals are more likely to engage in pro-environmental behaviours, including recycling and purchasing fair trade products. We hypothesise that a pro-environmental identity among future chefs should positively influence their intention to offer a cuisine that is less meaty and more plant-based.

H6. A pro-environmental identity has a positive influence on the intentions of future chefs to offer a cuisine that is less meaty and more plant-based.

However, the impact of this identity may be moderated by future chefs' professional representations of sustainable cuisine, contingent on whether they consider less meaty and more plant-based cuisine to be a component of sustainable cuisine.

H6bis. The impact of a pro-environmental identity on the intentions of future chefs to offer a cuisine that is less meaty and more plant-based is contingent upon their perception of the efficacy of this initiative in enhancing environmental sustainability.

The final identity considered in this study is that of an individual who has adopted a diet specifically aimed at reducing meat consumption. This may be veganism, vegetarianism, or flexitarianism. Lamy (2024) indicates that the personal dietary choices of certain chefs (vegetarian or

vegan) influence the meat- or vegetarian-focused cuisine they offer. Graça et al. (2015) demonstrate that omnivores are more attached to meat than those involved in reducing their own meat consumption.

H7. Engagement with a meat reduction diet (flexitarianism, veganism) is associated with more positive intentions among future chefs to offer a less meaty and more plant-based cuisine.

In their study on the influence of identities on meat consumption intentions, Randers and Thøgersen (2023) demonstrate that the flexitarian food identity has a significant effect on meat consumption intentions.

H7bis. The dietary identity (i.e., the importance attached to one’s diet) of future chefs who are involved in a meat reduction approach (flexitarianism, veg*ism) has a positive influence on their intentions to offer a less meaty and more plant-based cuisine.

2.4. Behavioural antecedents to the adoption of sustainable practices

The work of Raab et al. (2018) examines the behavioural antecedents to the adoption of sustainable practices among restaurant owners, with a particular focus on subjective norms. Subjective norms represent perceptions of expectations and social pressures that inform and influence human behaviour in specific contexts (see Ajzen, 1991). The findings of their study suggest that subjective norms have a significant impact on restaurant owners’ intentions to engage in sustainable practices. On the basis of these elements, it is possible to assume that the social norms of chefs in relation to the practices of their colleagues and peers may be linked to their intentions to reduce meat in favour of plant-based products in restaurants. Two types of subjective norms are considered: descriptive norms (perception of what colleagues do) and injunctive norms (perception of what colleagues expect of the individual) (Randers and Thøgersen, 2023). The introduction of norms serves to control for their effect.

3. Methodology

3.1. Participants

A questionnaire was sent online (Qualtrics) between April and June 2023 to 594 students enrolled in a Bachelor’s or Master’s degree in Culinary Arts at two French hospitality schools (Institut Paul Bocuse now called the Institut Lyfe, and FERRANDI Paris¹). These two schools train students in the culinary arts (in positions of chefs, chefs de partie, sous chefs, etc.). As future key players in the gastronomic world, their main role will be to design and develop the culinary offerings of restaurants, while promoting French savoir-faire in culinary and hospitality industries in France and abroad. The questionnaire was provided in French or English, depending on the preference of the participants. Prior to data collection, the questionnaire was pre-tested with approximately twenty respondents, which resulted in minor changes to some questions.

From the 594 students registered in the culinary arts programme, we received 383 responses (response rate of 64 %), and we obtained 286 complete answers (92 partial answers and 5 inconsistent answers). Table 1 presents the socio-demographic profile of the sample. The mean

¹ The Institut LYFE, based in Ecully (France), welcomes more than 1200 students from 75 nationalities, with courses from Bachelor’s to Master’s Degree & MSc level in management of culinary arts, hospitality and food service. 76 % of the students in Culinary Arts become either chef, executive chef, ‘chef de partie’, restaurant owner or restaurant manager (based on an internal study conducted at the beginning of 2024). - FERRANDI Paris has over 2500 students, from vocational qualifications to post-master’s degrees, including 300 international students from over 30 countries. Backed by their internationally recognized brand identities, these two state-certified schools rapidly train graduates for positions of responsibility in gastronomic restaurants.

Table 1
Socio-demographic profile of respondents (n = 286).

	Sample size	Frequency (%)
Gender		
Men	157	54.9
Women	113	39.5
Other/don’t wish to reply	16	5.6
Which country’s culture do you identify with?		
French	219	76.6
Other culture	67	23.4
Declared diet		
Omnivore	194	67.8
Flexitarian	87	30.4
Pescetarian	3	1
Vegetarian	2	0.7
Frequency of meat consumption declared		
At least once a day	96	33.6
At least once a week	157	54.9
At least once a month	28	9.8
Not applicable	5	1.7
School		
Institut Paul Bocuse	211	73.8
Ferrandi Paris	75	26.2

age of the participants was 20.5 years (minimum age = 17, maximum age = 33, standard deviation = 2.59).

3.2. Questionnaire and measures

This research is based on an original questionnaire comprising six main sections: the first section is devoted to professional representations of sustainable cooking, the second to the place of meat within the professional identity of chefs, the third to the measurement of different identities. The fourth is devoted to social norms, the fifth to the measurement of the intentions of future chefs, and final section to socio-demographic data (Tables 1 and 2, Appendix A). The measurement scales of the questionnaire are partly based on existing scales. All the items in the English-language questionnaire are presented in Appendix A, and Tables 2 and 3.

Table 2
Mean, standard deviation and T-Test between item 12 (REP12) and the other items.

In your opinion, what effect do these different practices have on the environmental sustainability of restaurants? (-5/+5)	Mean	Standard deviation	p a
Use food from organic or sustainable agriculture	3.51	1.64	<0.001
Use locally grown food/ingredients	4.21	1.19	<0.001
Use fresh food/ingredients	3.88	1.62	<0.001
Use seasonal food/ingredients	4.41	1.13	<0.001
Save energy and water resources	3.90	1.83	<0.001
Use renewable energy	3.51	2.11	<0.001
Minimise and reuse waste	4.18	1.45	<0.001
Participate in recycling and/or composting initiatives	3.89	1.72	<0.001
Use eco-responsible cleaning products	3.45	1.89	<0.001
Respect know-how and traditions	2.29	2.47	0.066
Participate in an eco-labelling programme	2.76	2.02	<0.001
Reduce the proportion of meat on offer in favour of plant-based products	1.76	2.93	

Note. Wilcoxon rank sum test. H_a μREP X - REP 12 ≠ 0.

Table 3

Comparison of the distribution frequencies of the representation elements on the importance of cooking meat within the chef's identity versus a random distribution frequency.

One-sample t-test					
In your opinion, can a person be said to be a chef if ...	No	Yes	Frequency of « no »	Wilcoxon's W	p
CHEF1 They don't like to cook meat	57	229	19.9 %	8180	< 0.001
CHEF2 They don't know the different types of meat	209	77	73.1 %	29,992	< 0.001
CHEF3 They don't know the different cuts of meat	183	103	64.0 %	26,261	< 0.001
CHEF4 They don't know the techniques for preparing and cooking meat	207	79	72.4 %	29,705	< 0.001
CHEF5 They don't have the ability to propose meat dishes	144	142	50.3 %	20,664	0.906

Note. $H_a \mu > 0.5$.

The first section is devoted to measuring professional representations of sustainable cooking. The professional representations of sustainable cuisine were measured using Likert-type items on the perceived effectiveness of twelve restaurant environmental sustainability measures (See Table 2, i.e. Use food from organic or sustainable agriculture). These items were adapted from the measurement scale of Kwok and Huang (2019) and the work of Lamy et al. (2023). The twelve items were measured on an eleven-point Osgood differential scale, ranging from -5 (indicating a very negative response) to $+5$ (indicating a very positive response) so that a diversity of opinions on the effects of the practices (both positive and negative) can be expressed, and thus avoid neutral responses. These items will be analysed individually, to study chefs' representations on each of these practices.

The second section of the questionnaire is dedicated to measuring the centrality of meat in the chef's professional identity. The professional representation of the importance of cooking meat as an element of the chef's professional identity was measured using an Osgood differential scale, ranging from -2 (indicating a negative response) to $+2$ (indicating an affirmative response), and consisted of five items (See Table 3, e.g. 'They don't know the different types of meat'). The items relate to the respondents' attitudes towards cooking meat, their knowledge of the relevant techniques and products, and their ability to cook meat. The objective of these items is to determine whether cooking meat constitutes a central element of a chef's professional identity. The centrality of the items was evaluated using the "mise en cause" technique (Moliner et al., 2002). This involved presenting the items in their negative form (e.g., 'They don't know the different cuts of meat') then determining whether the item was considered central based on the frequency of negative responses to the questioning (can we say that a person is a chef if ...). If the frequency of negative responses was greater than the frequency of a random distribution (50 %), the item was considered central.

The next three sections aimed to measure latent variables (identities, social norms, intentions) using Likert scale. A Likert scale is made up of several statements to which participants must indicate their degree of agreement, and which are indicators of the latent variable being measured (for example, gender identity). The correlation between indicators must be strong for the latent variable to be measured correctly.

Furthermore, when several latent variables are measured, the correlation between indicators of each latent variable must be stronger than the one with the indicators of the other latent variables. A principal component analysis and a confirmatory factor analysis are performed to check that the measures used for all latent variables have the good reliability and validity properties. The latent variable is then measured by the sum, average or weighted average of the responses to each of the items (Likert, 1932; Joshi et al., 2015).

The measurement here was conducted on a seven-point Likert scale, with participants asked to indicate the degree of correspondence between the statements and their opinions on a scale from 1 (strongly disagree) to 7 (strongly agree) (see all the items in Appendix A). The number of 7 response options for a Likert scale corresponds to the recommendations of Cox III (1980) to have a minimum of 5 response options (to allow for variability) and a maximum of 9 responses (in view of the limited cognitive abilities of the respondents).

The third section of the questionnaire measures different identities (professional, gender, national, pro-environmental and food). The measure of professional identity is adapted and translated from Wang et al. (2020). The scale comprises nine items, three of which are inverted (e.g. 'It's important for me to become a chef.'). The gender, cultural, and pro-environmental identities were translated and adapted from the Randers and Thøgersen measurement scales (2023); each scale comprising three items. The construct of food identity is measured using the scale adapted and translated by Rosenfeld and Burrow (2018), comprising six items (e.g. 'My eating habits define an important aspect of my personality'). The items measuring identities were randomised.

The fourth section examines the measurement of social norms. To mitigate the potential for bias due to omitted variables, social norms were assessed, as they have the capacity to significantly influence participants' intentions to reduce meat consumption and enhance the plant-based options available at their future restaurant. Furthermore, social norms and identity variables share a similar degree of variance, which may introduce a degree of confounding. Four items measuring subjective norms were integrated, translated, and adapted from the work of Randers and Thøgersen (2023) (See Appendix A, e.g. 'My colleagues prefer me to cook less meat and more plant-based food').

The fifth section of the questionnaire measures the intentions of future chefs to offer a less meaty and more plant-based menu. The dependent variable of chefs' intention to offer less meat and more plant-based dishes was measured using an 8-item scale (items presented in appendix A). Four of these items measured the participants' intentions to reduce the proportion of meat in their future restaurant menus (e.g. 'I intend to reduce the overall number of meat dishes on the menu of my future restaurant'). The other four items measured their intention to increase the proportion of plant-based foods in their future restaurant menus (e.g. 'I intend to offer several vegetarian dishes on my future menu').

The latent variables of identities, social norms and intentions are measured by the average of responses to their items (retained after the PCA). Since their items range from 1 (strongly disagree) to 7 (strongly agree), the latent variables are between 1 and 7.

The last section of the questionnaire is devoted to socio-demographic and consumption data. Subsequently, respondents were required to complete their socio-demographic profile, which included information on gender, age, cultural background, and dietary habits.

3.3. Statistical analysis

The data extracted from Qualtrics were implemented on Jamovi software (version 2.3.21) in order to carry out different types of analysis.

Descriptive statistics (mean, standard deviation) were calculated and are presented in Appendix A. The range of scores obtained for each item is consistent with the minimum and maximum possible scores.

To determine whether the average of the "reduce meat in favour of plant-based products" representation (REP12) differed from those of the

other representations, *t*-tests were conducted to compare the average of REP12 with the others. In instances where the Shapiro-Wilk test indicated that the items did not follow a normal distribution, the Wilcoxon-Mann-Whitney test was employed for the subsequent analysis. In order to address the issue of multiple tests of significance on the same data set, the Bonferroni correction was applied. Sub-samples were established to address specific research hypotheses regarding the socio-demographic and dietary characteristics of the respondents, including gender, meat-eating habits, and the influence of French culture.

In evaluating the centrality of cooking with meat in the professional identity of the chef, items are considered central to the chef's identity when their questioning provokes a frequency of distribution of negative responses greater than a random distribution (50 %). To facilitate the subsequent analysis, each of the five items was transformed into a binary variable, with the value of 1 representing a negative response (i.e., "not at all," or "rather no") and the value of 0 representing a positive response (i.e., "yes," "yes absolutely," or "don't know"). *t*-tests were conducted to compare the distributions of each item with a random frequency (50 %). In instances where the Shapiro-Wilk test indicated that the items did not follow a normal distribution, *t*-tests were performed using the Wilcoxon-Mann-Whitney test. Following the application of multiple significance tests on the same data, the Bonferroni correction was applied.

In order to test the association of identities with chefs' intentions, we first sought to verify the validity of our constructs. The psychometric variables were subjected to an initial reliability assessment, employing Cronbach's alpha (see Appendix A). The items measuring intentions ($\alpha = 0.94$), national identity ($\alpha = 0.81$), pro-environmental identity ($\alpha = 0.85$), and dietary identity ($\alpha = 0.89$) demonstrated high internal consistency. Concerning gender identity ($\alpha = 0.69$), the removal of an inverted item (in terms of my identity, the fact of being a man or a woman does not matter) resulted in an improvement in the reliability of the variable measured ($\alpha = 0.80$). A Promax rotation Principal component analysis (PCA) was performed to synthesise the different items and to identify the structure of the relationships between the variables (see Appendix B). The Promax rotation is an effective method for elucidating the underlying dimensionality of a set of items, and is more effective than the Varimax rotation in identifying the presence of simple structures within the data (Finch, 2006). The PCA identified nine distinct components associated with the identity variables, social norms, centrality of meat cooking in the chefs' identity and intentions. The professional identity variable was divided into two sub-variables, which we renamed 'professional affirmation' (ID pro 1) and 'professional questioning' (ID pro 2).

A Confirmatory factor analysis (CFA) was conducted using the items that had been tested in the Principal component analysis (see Appendix C). The Average variance extracted (AVE) of the constructs was calculated from the loadings of the CFA to test the convergent and discriminant validities, which were both verified (Table 4).

A series of statistical analyses were conducted with the objective of elucidating the relationships between identities and intentions. First, as the data were not normally distributed, Spearman correlations were performed to test the association between the different variables

(identities, norm, chef) and intentions. Second, a linear regression model was constructed, with intentions as the dependent variable, based on all the variables identified in the Principal component analysis and the related factors (gender, diet) as predictors. Regression can produce robust results even if the data from Likert scales are not normal (Norman, 2010). The hypothesis of normality of the residuals can in fact be verified with a sufficiently large sample thanks to the central limit theorem.

4. Results

4.1. Perceived effectiveness of the measure to reduce meat consumption in favour of plant-based foods compared with other sustainable cooking practices

In terms of future chefs' perceptions of sustainable cooking, when respondents ranked effectiveness on a scale of -5 to 5, the measures they perceived as most effective and important are three: the use of seasonal produce [mean (*m*) = 4.41, standard deviation (SD) = 1.13], locally grown produce (*m* = 4.21, SD = 1.19), and waste minimisation and the fight against waste (*m* = 4.18, SD = 1.45). The measure concerning the reduction of the proportion of meat in favour of plant-based products (REP12) was evaluated as the least effective by the participants (*m* = 1.76, SD = 2.93), and significantly so ($p < .005$), compared with the other measures except one ("respecting know-how and traditions"), which was slightly higher but not significantly different from REP12 (Table 2).

Hypothesis 1 postulated that the measure of cooking with less meat and more plant-based food would be evaluated as the least effective for environmental sustainability. Hypothesis 1 is validated; this measure was identified by future chefs as having the weakest effect on the environment in sub-samples. The mean scores for item REP12 were lower among men, omnivores, and participants from a French cultural background, and higher among women, meat reducers (grouping together flexitarians, pescetarians and vegetarians), and participants from a cultural background other than French.

4.2. The centrality of meat cuisine in the professional identity of the chef profession

Table 3 illustrates that four out of the five items exhibit a distribution frequency that differs from 50 %.

The distribution frequencies of CHEF2, CHEF3, and CHEF4 items are significantly higher than 50 %, while that of CHEF1 is significantly lower than 50 %. This means that for future chefs, it is essential to be familiar with the different types (CHEF2) and cuts of meat (CHEF3) and to know the techniques for preparing and cooking meat (CHEF4). Being able to propose meat dishes is not a determining factor in becoming a chef (CHEF5). Similarly, a preference for cooking meat is not a prerequisite for becoming a chef (CHEF1). The results indicate that hypothesis 2 is partially validated.

CHEF2, CHEF3 and CHEF4 were aggregated into an average score for

Table 4
Construct validity: average variance extracted (AVE) and correlations between variables.

	AVE	CHEF	ID pro 1	ID pro 2	ID gender	ID national	ID env	ID diet	Norm	Int
CHEF	0.834	–								
ID pro 1	0.619	–0.020	–							
ID pro 2	0.658	–0.065	0.237***	–						
ID gender	0.809	–0.021	0.158**	–0.099	–					
ID national	0.708	–0.135*	0.261***	0.031	0.168**	–				
ID env	0.696	0.139*	0.162**	–0.152*	0.108	0.050	–			
ID diet	0.654	–0.022	0.235***	–0.193**	0.254***	0.175**	0.431***	–		
Norm	0.706	0.020	0.100	–0.068	–0.061	–0.006	0.187**	0.166**	–	
Intentions	0.728	0.221***	0.000	–0.105	–0.008	–0.200***	0.470***	0.298***	0.295***	–

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

the three elements (CHEF) from the three initial continuous measures, as these showed a high degree of internal consistency ($\alpha = 0.89$). The CHEF variable, which is used in the subsequent analyses, reflects the significance of knowledge about meat processing in the representation of the chef's role.

4.3. Associations of identity with intentions to reduce meat and increase plant-based products on the menu

Firstly, Spearman's bivariate correlation tests were conducted between the different variables from the Principal component analysis (PCA) to examine the relationships between the variables (Table 4): professional identity (through the two dimensions of professional affirmation, ID pro 1 and professional questioning, ID pro 2), gender identity (ID gender), national identity (ID national), pro-environmental identity (ID env), social norms (Norm), centrality of cooking with meat in the professional identity of the chef (CHEF) and futures chefs' intentions to reduce meat in favour of plant-based food on the menu (Intentions).

The two dimensions of professional identity (ID pro 1 and ID pro 2) were not directly correlated with the intentions to reduce meat and increase plant-based foods. The correlation between gender identity and intentions was not statistically significant. However, in the male sub-sample ($n = 157$), there was a weak negative correlation between the two variables ($r(155) = -0.166, p = .037$). The remaining variables were correlated with intentions. In the case of the other sub-samples, the national identity of French participants was found to be negatively correlated with overall intentions (the intention to reduce meat and increase plant-based food) ($r(217) = -0.280, p < .01$), while the dietary identity of meat reducers was not correlated with overall intentions. However, it was found to be positively correlated only with intentions to reduce meat ($r(90) = 0.244, p = .019$).

A multivariate linear regression model was run in three stages, taking into account the confirmatory factor analysis (CFA) variables (model 1), then the factors (model 2), and finally the interaction between the CFA variables and the factors (model 3) (See Table 5). The "reduce meat in favour of plant-based products" representation variable (REP12) was recoded as a binary categorical variable, with value 0 assigned to measures of effectiveness equal to or less than 2 and value 1 assigned to

measures of effectiveness equal to or greater than 3. To reflect the fact that the higher the CHEF variable, the more aspiring chefs considered that being a chef meant knowing how to cook meat, the CHEF measure was inverted (CHEF-R).

The 3 models verify the normality of the residuals (checked with the Q-Q plot), the absence of multi-collinearity of the explanatory variables (VIF are less than 1.5), as well as the homoscedasticity (verified with the graphs of the residuals) and the absence of autocorrelation of the residuals (the Durbin-Watson are almost equal to 2).

Hypotheses 3 and 3bis postulated that professional identity had a negative influence on the intentions of future chefs to offer less meat and more plant-based cuisine. Furthermore, it was hypothesised that the effect of professional identity on the intentions of future chefs to offer less meat and more plant-based cuisine was moderated by the importance of meat-based cuisine within the professional identity of the chef. The results demonstrate that neither of the two components of professional identity (professional affirmation and questioning one's career) is associated with intentions to reduce meat and increase plant-based options. The centrality of meat cooking within the professional identity of chefs is negatively correlated with the intentions of future chefs (models 1 and 2), with no interaction with professional identity. Hypotheses 3 and 3bis are partially rejected.

The multivariate regression model revealed that male gender identity (in the identity part of the survey) is not associated with the intentions. However, the results indicated that being male (in the demographic data) had a negative association with their intentions. Hypothesis 4 postulated that the gender identity of men would have a negative influence on the intentions of future chefs to consider cooking with less meat and more plant-based. Hypothesis 4 is therefore rejected.

The multivariate regression model indicated that national identity had a negative association with intentions. However, this was not through interaction with the fact of being of French culture. This is likely due to the distribution of the sample between different cultures, with many people of French culture and a great diversity of cultures in the rest of the sample. Hypothesis 5 postulated that the national identity would have a negative influence on the intentions of future chefs to envisage a cuisine that is less meaty and more plant-based. Hypothesis 5 is therefore validated.

The pro-environmental identity is positively associated with the intentions of future chefs towards a cuisine that is less meaty and more plant-based. The representation of the perceived environmental effectiveness of the measure to reduce meat consumption in favour of plant-based products is also associated with the intentions in the multivariate model. Nevertheless, the interaction between the two variables is not associated with the intentions of future chefs. Hypotheses 6 and 6bis postulated that a pro-environmental identity would positively influence the intentions of future chefs to envisage a cuisine that is less meaty and more plant-based (H6), and that this influence would be moderated by the perceived effectiveness of the measure to reduce meat in favour of plant-based food (H6bis). The results validate Hypothesis 6, while Hypothesis 6bis is rejected.

The multivariate model revealed that dietary identity had a positive association with intentions. Furthermore, the fact of being in the process of reducing one's own meat consumption also had a positive association with intentions. Hypothesis 7 postulated that involvement in a meat reduction approach (flexitarianism, pescetarianism, veg*ism) would influence the intentions of future chefs. Hypothesis 7 was confirmed. Nevertheless, the interaction between food identity and involvement in a meat reduction process was not statistically significant. Hypothesis 7bis proposed that the food identity of future chefs engaged in a meat reduction process (flexitarianism, pescetarianism, veg*ism) would exert a positive influence on the intentions of future chefs to envisage a cuisine that is less meaty and more plant-based. Hypothesis 7bis is partially validated.

As anticipated, subjective norms were also associated with the intentions of future chefs to reduce meat consumption in favour of plant-

Table 5
Multivariate linear regression models.

Model fit measurements				General model test			
Model	R	R ²	Adjusted R ²	F	ddl1	ddl2	p
1	0.598	0.357	0.339	19.2	8	277	< 0.001
2	0.729	0.532	0.513	28.3	11	274	< 0.001
3	0.736	0.541	0.514	19.8	16	269	< 0.001

	Model 1	Model 2	Model 3
Intercept	3.0226***	2.08754***	2.4698*
ID pro 1	-0.0162	0.00210	0.0962
ID pro 2	0.0264	0.04005	-0.1820
ID gender	-0.0129	0.00877	0.0615
ID national	-0.2659***	-0.16200**	-0.1612**
ID env	0.3912***	0.26741***	0.2260**
ID diet	0.1784**	0.12729*	0.1266*
CHEF R	-0.1914**	-0.12739*	-0.2270
NORM	0.2542***	0.28505***	0.2782***
men: 1-0		-0.32881*	0.0699
REP12 1-0		0.87209***	0.4872
Meat reducer: 1-0		0.93942***	1.0204*
ID pro 1 * CHEF_R			-0.0276
ID pro 2 * CHEF_R			0.0594
ID gender * men			-0.0876
ID env * REP12			0.0790
ID diet * meat reducer			-0.0140

Note. * p < .05, ** p < .01, *** p < .001.

based products.

5. Discussion

The objectives of this study were to assess how the reduction of meat is perceived within the representations of future chefs towards sustainable cuisine (H1), to evaluate the centrality of meat-based cuisine in the professional identity of chefs (H2) and to evaluate the association of the identities of these future chefs on their intentions to reduce meat in favour of plant-based food in their future restaurants (H3, H4, H5, H6, H7).

The first result concerns the chefs' representations of sustainable cooking. Although there is a consensus on the significant environmental impact of meat production, the impact of meat reduction seems underestimated by the future chefs questioned. The results indicate that the chefs consider the measure of reducing meat production in favour of plant-based food to be less effective than several other measures, including the use of organic produce, fresh produce, seasonal produce, minimisation of waste, and so forth. Our measurement item concerned the reduction of meat in favour of vegetarian dishes, without specifying a particular action between reducing the quantity of meat in dishes or substituting meat dishes with vegetarian dishes on the menu. Chefs may perceive these two actions differently, which would be interesting to include in future research.

The study presents contrasting results concerning the associations of identities on the intentions of future chefs to reduce meat and increase plant-based foods. These intentions among future chefs are associated with the pro-environmental, cultural, and food identities. Neither professional nor gender identities were found to be associated with these intentions. These findings are consistent with those of [Randers and Thøgersen \(2023\)](#), who identified that national, pro-environmental, vegetarian, and flexitarian identities predict the intentions of Danish consumers to consume red meat, and found no effect concerning gender, religious, or gourmet identities.

[Randers and Thøgersen \(2023\)](#) distinguish between identities based on their level of abstraction from the behaviour in question. They posit that higher-order identities, such as gender or religious identity, are less relevant to the behaviour under study than behaviour-specific identities, such as flexitarian or vegetarian identity. These elements of relevance may potentially explain why gender identity in this study and that of [Randers and Thøgersen \(2023\)](#) is not associated with behavioural intentions. Another possible explanation is male dominance in the kitchen workspace. [Harris and Giuffre \(2010\)](#) describe situations in which women will incorporate masculine stereotypes in order to adapt to this work atmosphere and be integrated into the kitchen brigade.

The results of this study indicate that national identity is negatively associated with future chefs' intentions to reduce meat and increase plant-based offerings. This is in line with previous research on the predominant place of meat in French food culture ([Cazes-Valette, 2012](#); [Melendrez-Ruiz et al., 2019](#)). In a similar manner, national identity has been shown to predict Danish consumers' intentions to consume meat ([Randers and Thøgersen, 2023](#)). These results diverge from those of [Michielsen et al. \(2024\)](#), who conducted their research in the Dutch context and found that the chefs they interviewed were particularly enthusiastic about embracing a more plant-based cuisine. Additionally, the work of [Dhont and Hodson \(2014\)](#) indicates that right-wing political ideologies are linked to meat consumption, driven by resistance to cultural change. This resistance is particularly evident in the perception that vegetarianism represents a threat to "traditional" food practices. A positive correlation was observed between the pro-environmental identity and the intentions of future chefs to reduce meat consumption and increase the availability of plant-based foods. This result differs from that of [Randers and Thøgersen \(2023\)](#), who found no correlation between pro-environmental identity and intentions to consume meat, controlling for flexitarian identity. The pro-environmental identity is associated with intentions to reduce meat consumption in favour of

plant-based food, without being related to considering it as an effective measure of sustainable cooking.

The results indicate that food identity is positively associated with the intentions of future chefs to reduce meat and increase plant-based products within the overall sample. However, this relationship is not observed when the chefs are involved in a meat reduction process (either flexitarianism or vegetarianism). This result differs from the findings of [Randers and Thøgersen \(2023\)](#), who observed that flexitarian identity predicted intentions to consume meat among consumers. It should be noted that the measures of dietary identity and flexitarian identity are different. The dietary identity measures used in this study, which were adapted from the work of [Rosenfeld and Burrow \(2018\)](#), do not specifically refer to meat behaviours, which may explain this result.

The construct of professional identity was operationalised using the scale developed by [Wang et al. \(2020\)](#). Two distinct dimensions were identified: professional assertion and career questioning. The multivariate regression model revealed that neither is associated with chefs' intentions to reduce meat consumption in favour of plant-based products. This result is particularly unexpected, given the findings concerning the role of meat cuisine in the representation of the chef's profession. These indicate that for aspiring chefs, a chef must possess a certain degree of expertise in meat cuisine, encompassing knowledge of various types of meat, cuts, preparation, and cooking techniques. Nevertheless, these findings suggest that a prospective chef is not inherently required to enjoy cooking meat to become a chef. In addition to knowledge and the enjoyment of cooking meat, future research could investigate whether, for future chefs, cooking meat represents a duty or a necessity. Following [Dubar \(1992\)](#), professional socialisation is defined as the process by which individuals construct their professional future and their recognition by institutions (the company, the corporation, etc.). This professional socialisation contributes to the construction of professional identity through two forms of "transaction": the biographical transaction, through which individuals project themselves into the future based on their past, and the relational transaction, through which individuals gain recognition from their peers in the professional field ([Dubar, 1992](#)). In this study, the measurement of professional identity is aligned with the biographical transaction, whereby how these future leaders project themselves into their future profession is evaluated. However, the recognition of these individuals by professionals (relational transaction) was not taken into account. The professional identity measured in this study is in its emerging stages and exhibits considerable instability, as the students have yet to gain substantial practical experience in the profession. This experience also contributes to the construction of the professional identity of a chef. This may be attributed to the fact that professional identity is not associated with the intentions of future chefs in this model. Social norms were controlled for in this study and the regression shows, as suggested in the literature, their positive association with intentions. The descriptive and injunctive social norms used are related to how future leaders perceive what do colleagues and peers in the profession and what are their expectations. It would be interesting in a future study to explore more precisely the link between these social norms and professional identity.

The findings of this research have the potential to inform theoretical discussions within the field of research on the role of chefs in sustainable cooking. The study demonstrates that, in addition to the professional identity of chefs, their food, pro-environmental, and cultural identities are associated with their professional practice intentions. It also indicates that future chefs will not a priori be proactive towards a less meat and more plant-based food transition, in line with their representations of the perceived environmental effectiveness of the measure.

This research has managerial implications. National identity has a negative influence on future chefs when it comes to reducing the meat they offer. To limit the impact of this identity and enable more sustainable cuisine in the future, several avenues can be explored. On the initiative of leading chefs, traditional dishes could be modernised to offer less meaty or more vegetarian dishes, or recipes could be

formulated to set a standard for vegetarian cuisine. Plant-based cuisine could be actively promoted through special training courses, cooking competitions, or special days. Some brands are proactive in helping chefs to cook more plant-based dishes, such as Bonduelle Food Service and its “Greenology” programme (recipes, tutorials, and personalised support). Finally, these results also have educational implications, both in terms of initial training (for the chefs of tomorrow) and continuing training (for practising chefs), to develop courses devoted to plant-based cooking and less meat-centred cuisine. In addition to training in environmental issues and more plant-based cuisine, chefs also need to be empowered, to make them aware of their role and influence in the ecological transition of restaurants and their impact on reducing meat consumption in favour of plant-based menus. This means giving chefs the ability to take action, encouraging them to express themselves and sharing the experiences of chefs who have implemented these measures in their restaurants.

We also advocate the creation of synergies between stakeholders to promote a cross-disciplinary approach to sustainability issues in schools, integrating meet-ups on best culinary practices around plant-based cooking but also enlightening scientific discourses on the ecological transition. Dewey’s cooking lab experience (Belliveau, 2007) demonstrates that practical cooking in a laboratory is an ideal learning environment for a broad range of subjects, from human sciences to mathematics. Sustainability can be one of these subjects, easily accessible through culinary learning.

6. Conclusion

This research examines the representations of future chefs about the perceived effectiveness of pro-environmental practices in the restaurant trade and examines the impact of different identities on intentions to offer a less meaty and more plant-based menu. The findings suggest that future chefs tend to underestimate the environmental effectiveness of reducing meat consumption in favour of plant-based alternatives, when compared to a series of other potential measures. The study also indicates that the diverse identities of future chefs, from the perspective of multiple identities, are associated with their intentions to propose a menu that is less meaty and more plant-based.

This research has several limitations related to the measures used in the survey. Regarding the use of Likert scales, Cox III (1980) recommends using between 5 and 9 response options in psychometric scales, the gain in information being low beyond 9 alternatives. It would therefore be appropriate to reduce the number of response options for measuring representations of pro-environmental practices. In addition, although all the Likert scales included a neutral response, none of them had a ‘don’t know’ response, which could lead to either a random response or a neutral response from people who didn’t know where they stood on the scale. Gavard-Perret et al. (2018) recommend including this response only when a significant number of respondents are likely to have no opinion as the absence of this response option does not lead to a decrease in measurement reliability (Churchill Jr and Peter, 1984). However, it would be preferable to include it systematically in future surveys in order to identify possible selection biases better and adapt econometric models if necessary.

This study shares limitations with similar cross-sectional studies that utilise a single set of data, self-administered by the participants. To mitigate the potential biases associated with this type of study, we randomised the order of the questions and identified any responses that appeared questionable. The sample is limited to cookery students in private higher education schools, which is not representative of cookery teaching in France. A further limitation concerns the measurement of the centrality of meat in the identity of chefs. This measurement concentrated on the aspects of liking, knowledge, and ability to cook meat. A further avenue for investigation is the question of whether chefs feel a sense of obligation to cook meat to fulfil their role.

This research opens up new avenues of investigation. It would be

useful to identify more precisely why the measure to reduce the meat on offer leads to a form of resistance on the part of future chefs. It would also be fruitful to identify how chefs perceive their customers’ expectations and behaviour about meat reduction, as chefs may want to avoid this measure for commercial reasons.

It would also be beneficial to consider the influence of aspiring chefs’ food literacy on their intentions to reduce meat consumption in favour of plant-based products in their dishes. Food literacy is defined as an individual’s ability to obtain, interpret, and understand information about food and nutrition, as well as the competence and motivation to use it (Kolasa et al., 2001). By investigating its influence on the intentions of aspiring chefs, this research would be in line with the study presented here. Finally, this dataset could be expanded by extending the study to other French and international hotel schools. This would enable a comparison between the impact of cultural identities on the intention to reduce meat in favour of plant-based food in the dishes offered, and the place of meat cuisine within the professional identity in different cultures. As the two schools studied are elite French schools specialising in the culinary arts, it would be interesting to study other forms of culinary training, such as Hamburger University, where training is focused more on managerial aspects.

This work focuses on future chefs and considers them as the main actors in the selection of restaurant menus. However, in many restaurants, this responsibility may be shared or held by the restaurant owner or manager and may influence the composition of the restaurant, particularly in relation to financial criteria. This work therefore also opens up the prospect of qualitative work to explore the chefs’ ability to control the process of introducing new dishes or changes to the menu, through the circumstances that facilitate or hinder this process, by interviewing chefs and restaurant owners from different generations and backgrounds.

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CRediT authorship contribution statement

Arnaud Lamy: Writing – original draft, Project administration, Methodology, Formal analysis, Data curation, Conceptualization. **Sandrine Costa:** Writing – original draft, Supervision, Methodology, Conceptualization. **Lucie Sirieix:** Writing – original draft, Supervision, Conceptualization. **Ophélie Mugel:** Writing – original draft, Data curation, Conceptualization. **Maxime Michaud:** Supervision, Conceptualization.

Declaration of competing interest

The authors have no competing interests to declare.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.ecolecon.2025.108642>.

Data availability

Data will be made available on request.

References

- Abrams, D., Hogg, M.A., 2006. *Social Identifications: A Social Psychology of Intergroup Relations and Group Processes*. Routledge.
- Abric, J.-C., 2001. A structural approach to social representations. In: *Representations of the Social: Bridging Theoretical Traditions*. Blackwell Publishing, Malden, pp. 42–47.

- Ajzen, I., 1991. The theory of planned behavior. In: *Organizational Behavior and Human Decision Processes, Theories of Cognitive Self-Regulation*, 50, pp. 179–211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T).
- Anses, 2017. Etude individuelle nationale des consommations alimentaires 3 (INCA 3) (Rapport d'expertise collective). Anses.
- Balazs, K., 2001. Some like it haute: leadership lessons from France's great chefs. *Organ. Dyn.* 30, 134–148. [https://doi.org/10.1016/S0090-2616\(01\)00048-1](https://doi.org/10.1016/S0090-2616(01)00048-1).
- Batat, W., 2020. Pillars of sustainable food experiences in the luxury gastronomy sector: a qualitative exploration of Michelin-starred chefs' motivations. *J. Retail. Consum. Serv.* 57, 102255. <https://doi.org/10.1016/j.jretconser.2020.102255>.
- Belliveau, C., 2007. A New Look at Dewey's Cooking Lab: A Pedagogical Model for Interdisciplinary Learning in Contemporary Higher Education. Graduate College Dissertations and Theses, p. 20. <https://scholarworks.uvm.edu/graddis/20>.
- Bertoldo, J., Hsu, R., Reid, T., Righter, A., Wolfson, J.A., 2021. Attitudes and beliefs about how chefs can promote nutrition and sustainable food systems among students at a US culinary school. *Public Health Nutr.* 1–13. <https://doi.org/10.1017/S1368980021003578>.
- Bonnet, E., Villavicencio, D., 2016. Sources et ressources des chefs. Les ingrédients de la créativité en gastronomie. *Nouvelle Revue du travail*.
- Brunner, F., Kurz, V., Bryngelsson, D., Hedenus, F., 2018. Carbon label at a university restaurant – label implementation and evaluation. *Ecol. Econ.* 146, 658–667. <https://doi.org/10.1016/j.ecolecon.2017.12.012>.
- Buratto, A., Lotti, L., 2024. Encouraging sustainable food consumption through nudges: an experiment with menu labels. *Ecol. Econ.* 216, 108024. <https://doi.org/10.1016/j.ecolecon.2023.108024>.
- Cazes-Valette, G., 2012. Viande. In: Poulain, J.-P. (Ed.), *Dictionnaire Des Cultures Alimentaires*. PUF, Paris, pp. 1391–1402.
- Churchill Jr., G.A., Peter, J.P., 1984. Research design effects on the reliability of rating scales: a meta-analysis. *J. Mark. Res.* 21 (4), 360–375.
- Cooper, J., Giousmpasoglou, C., Marinakou, E., 2017. Occupational identity and culture: the case of Michelin-starred chefs. *Int. J. Contemp. Hosp. Manag.* 29, 1362–1379. <https://doi.org/10.1108/IJCHM-02-2016-0071>.
- Cox III, E.P., 1980. The optimal number of response alternatives for a scale: a review. *J. Mark. Res.* 17 (4), 407–422.
- Dhont, K., Hodson, G., 2014. Why do right-wing adherents engage in more animal exploitation and meat consumption? *Personal. Individ. Differ.* 64, 12–17. <https://doi.org/10.1016/j.paid.2014.02.002>.
- Du, J., Liu, J.C.E., Mix, T.L., 2024. China deserves its hamburger: the controversy over WildAid's Shu Shi campaign in China. *Environ. Sociol.* 1–12. <https://doi.org/10.1080/23251042.2024.2319370>.
- Dubar, C., 1992. Formes identitaires et socialisation professionnelle. *Rev. Fr. Sociol.* 33, 505–529. <https://doi.org/10.2307/3322224>.
- Fiddes, N., 1991. *Meat: A Natural Symbol*. Reprint. ed. Routledge, London.
- Finch, H., 2006. Comparison of the Performance of Varimax and Promax Rotations: Factor Structure Recovery for Dichotomous Items. *J. Educ. Meas.* 43 (1), 39–52.
- Fregonese, C., Ratinaud, P., 2020. Interrogation de la fonction de génération de signification du noyau central des représentations sociales à partir de l'étude longitudinale d'un système représentationnel de trois objets. *Les Cahiers Internationaux de Psychologie Sociale Numéro 125-128*, 19. <https://doi.org/10.3917/cips.125.0019>.
- Gavard-Perret, M.L., Gotteland, D., Haon, C., Jolibert, A., 2018. *Méthodologie de la recherche en sciences de gestion. Réussir son mémoire ou sa thèse*, 3rd edition. Pearson France, Paris, p. 344.
- Godfray, H.C.J., Aveyard, P., Garnett, T., Hall, J.W., Key, T.J., Lorimer, J., Pörtner, H.-O., Roberts, D.C., Zhai, P., Slade, R., Connors, S., van Diemen, R., Ferrat, M., Haughey, E., Luz, S., Neogi, S., Pathak, M., Petzold, J., Pereira, J., Portugal, Vyas, P., Huntley, E., Kissick, K., Belkacemi, M., Malley, J. (Eds.), *Climate Change and Land: An IPCC Special Report on Climate Change, Desertification, Land Degradation, Sustainable Land Management, Food Security, and Greenhouse Gas Fluxes in Terrestrial Ecosystems*, 2019. IPCC.
- Joshi, A., Kale, S., Chandel, S., Pal, D.K., 2015. Likert scale: explored and explained. *Br. J. Appl. Sci. Technol.* 7, 396–403. <https://doi.org/10.9734/BJAST/2015/14975>.
- Kettle, K.L., 2019. Identity salience: understanding when identity affects consumption. In: *Handbook of Research on Identity Theory in Marketing*, pp. 30–43.
- Kolasa, C.M., Peery, A.I., Shovelin, K., 2001. Food literacy partners program: a strategy to increase community food literacy. *Top. Clin. Nutr.* 16 (4), 1–10.
- Krpan, D., Houtsuma, N., 2020. To veg or not to veg? The impact of framing on vegetarian food choice. *J. Environ. Psychol.* 67, 101391. <https://doi.org/10.1016/j.jenvp.2020.101391>.
- Kwok, L., Huang, Y.-K., 2019. Green attributes of restaurants: do consumers, owners, and managers think alike? *Int. J. Hosp. Manag.* 83, 28–32. <https://doi.org/10.1016/j.ijhm.2019.03.011>.
- Lamy, A., 2024. Do chefs have a beef with meat? An exploration of the professional representations and identities of French chefs in relation to traditional French cuisine and meat-based and plant-based dishes. *Décis. Mark.* 115, 185–207.
- Lamy, A., Costa, S., Sirieix, L., Michaud, M., 2023. Less red meat to be greener? An exploratory study of the representations of sustainable cuisine among French chefs. *Int. J. Gastron. Food Sci.* 31, 100627. <https://doi.org/10.1016/j.ijgfs.2022.100627>.
- Leggett, K., McCann, R., Brunson, M., Miller, B.A., MacAdam, J., 2021. "From a chef's perspective or what I can sell on the menu?" Exploring culinary professionals' attitudes toward specialty beef production and barriers to adoption. *Agroecol. Sustain. Food Syst.* 0, 1–21. <https://doi.org/10.1080/21683565.2021.1888185>.
- Likert, R., 1932. A technique for the measurement of attitudes. *Arch. Psychol.* 22, 1–55.
- Melendrez-Ruiz, J., Chambaron, S., Buatois, Q., Monnery-Partris, S., Arvisenet, G., 2019. A central place for meat, but what about pulses? Studying French consumers' representations of main dish structure, using an indirect approach. *Food Res. Int.* 123, 790–800. <https://doi.org/10.1016/j.foodres.2019.06.004>.
- Michielsens, Y.J.E., van der Horst, H.M., van de Nobelen, R., 2024. Beef or Beet Wellington? Chefs, meat reduction, and hindering and supportive forms of craftsmanship. *Food, Cult. Soc.* 0, 1–24. <https://doi.org/10.1080/15528014.2024.2322792>.
- Moliner, P., Rateau, P., Cohen-Scali, V., 2002. *Les Représentations sociales: Pratique des études de terrain*. PU RENNES.
- Nascimento, M.A., 2023. Chapter seven - sustainable restaurants in Barcelona (Spain): identity and sustainability in local cuisine. In: Medina, F.X., Conde-caballero, D., Mariano-Juárez, L. (Eds.), *Food, Gastronomy, Sustainability, and Social and Cultural Development*. Academic Press, pp. 117–132. <https://doi.org/10.1016/B978-0-323-95993-3.00010-4>.
- Nguyen, A., Platow, M.J., 2021. "I'll eat meat because that's what we do": the role of national norms and national social identification on meat eating. *Appetite* 164, 105287. <https://doi.org/10.1016/j.appet.2021.105287>.
- Norman, G., 2010. Likert scales, levels of measurement and the "laws" of statistics. *Adv. Health Sci. Educ.* 15, 625–632.
- Oyserman, D., 2009. Identity-based motivation: implications for action-readiness, procedural-readiness, and consumer behavior. *J. Consum. Psychol.* 19, 250–260. <https://doi.org/10.1016/j.jcps.2009.05.008>.
- Parkhurst Ferguson, P., 2006. *Accounting for Taste: The Triumph of French Cuisine*. University of Chicago Press.
- Pereira, L.M., Calderón-Contreras, R., Norström, A.V., Espinosa, D., Willis, J., Guerrero Lara, L., Khan, Z., Rusch, L., Correa Palacios, E., Pérez Amaya, O., 2019. Chefs as change-makers from the kitchen: indigenous knowledge and traditional food as sustainability innovations. *Glob. Sustain.* 2, e16.
- Piäser, A., Bataille, M., 2010. Of contextualized use of "social" and "professional". In: Chaïb, M., Danermark, B., Selander, S. (Eds.), *Education, Professionalization and Social Representations*. Routledge, London, pp. 44–54.
- Raab, C., Baloglu, S., Chen, Y.-S., 2018. Restaurant managers' adoption of sustainable practices: an application of institutional theory and theory of planned behavior. *J. Foodserv. Bus. Res.* 21, 154–171. <https://doi.org/10.1080/15378020.2017.1364591>.
- Randers, L., Thøgersen, J., 2023. Meat, myself, and I: the role of multiple identities in meat consumption. *Appetite* 180, 106319. <https://doi.org/10.1016/j.appet.2022.106319>.
- Reed, A., Forehand, M.R., Puntoni, S., Warlop, L., 2012. Identity-based consumer behavior. *Int. J. Res. Mark.* 29, 310–321. <https://doi.org/10.1016/j.ijresmar.2012.08.002>. Special Issue on Consumer Identities.
- Reinders, M.J., van Lieshout, L., Pot, G.K., Neufingerl, N., van den Broek, E., Battjes-Fries, M., Heijnen, J., 2020. Portioning meat and vegetables in four different out of home settings: a win-win for guests, chefs and the planet. *Appetite* 147, 104539. <https://doi.org/10.1016/j.appet.2019.104539>.
- Rosenfeld, D.L., Burrow, A.L., 2018. Development and validation of the dietarian identity questionnaire: assessing self-perceptions of animal-product consumption. *Appetite* 127, 182–194. <https://doi.org/10.1016/j.appet.2018.05.003>.
- Rozin, P., Hormes, J.M., Faith, M.S., Wansink, B., 2012. Is meat male? A quantitative multimethod framework to establish metaphorical relationships. *J. Consum. Res.* 39, 629–643. <https://doi.org/10.1086/664970>.
- Ruby, M.B., Heine, S.J., 2011. Meat, morals, and masculinity. *Appetite* 56, 447–450. <https://doi.org/10.1016/j.appet.2011.01.018>.
- Şahin, E., Gök Demir, Z., 2023. Decision tree analysis of sustainable and ethical food preferences of undergraduate students of gastronomy and culinary arts. *Sustainability* 15, 3266. <https://doi.org/10.3390/su15043266>.
- Santamarina, A., 2023. The importance of identity in today's chefs: Mugaritz and popular culture. *Int. J. Gastron. Food Sci.* 33, 100756. <https://doi.org/10.1016/j.ijgfs.2023.100756>.
- Stryker, S., Burke, P.J., 2000. The past, present, and future of an identity theory. *Soc. Psychol. Q.* 63, 284–297. <https://doi.org/10.2307/2695840>.
- Tajfel, H., Turner, J.C., 1979. An integrative theory of intergroup conflict. In: Hatch, M. J., Schultz, M. (Eds.), *Organizational Identity: A Reader*. OUP Oxford, pp. 56–65.
- van der Werff, E., Steg, L., Keizer, K., 2013. The value of environmental self-identity: the relationship between biospheric values, environmental self-identity and environmental preferences, intentions and behaviour. *J. Environ. Psychol.* 34, 55–63. <https://doi.org/10.1016/j.jenvp.2012.12.006>.
- Vu, O.T.K., Duarte Alonzo, A., Bressan, A., Tran, L.N., Tran, T.D., Nicholson, G.J., 2023. Is the cooking profession still 'hot'? A qualitative cross-national study of chefs' career perceptions. *J. Hosp. Tour. Manag.* 54, 255–267. <https://doi.org/10.1016/j.jhtm.2022.12.021>.
- Wang, C., Xu, J., Zhang, T.C., Li, Q.M., 2020. Effects of professional identity on turnover intention in China's hotel employees: the mediating role of employee engagement

- and job satisfaction. *J. Hosp. Tour. Manag.* 45, 10–22. <https://doi.org/10.1016/j.jhtm.2020.07.002>.
- Willett, W., Rockström, J., Loken, B., Springmann, M., Lang, T., Vermeulen, S., Garnett, T., Tilman, D., DeClerck, F., Wood, A., Jonell, M., Clark, M., Gordon, L.J., Fanzo, J., Hawkes, C., Zurayk, R., Rivera, J.A., De Vries, W., Majele Sibanda, L., Afshin, A., Chaudhary, A., Herrero, M., Agustina, R., Branca, F., Lartey, A., Fan, S., Crona, B., Fox, E., Bignet, V., Troell, M., Lindahl, T., Singh, S., Cornell, S.E., Srinath Reddy, K., Narain, S., Nishtar, S., Murray, C.J.L., 2019. Food in the Anthropocene: the EAT–lancet commission on healthy diets from sustainable food systems. *Lancet* 393, 447–492. [https://doi.org/10.1016/S0140-6736\(18\)31788-4](https://doi.org/10.1016/S0140-6736(18)31788-4).
- Xerfi, 2024. La restauration traditionnelle et les cafétérias. In: *Conjoncture et prévisions 2024. Analyse de la concurrence et des nouveaux équilibres (No. 24SME01)*, Essential. Xerfi.