

1 **What is gastronomic identity? Exploring its definition and perception through sensory stimuli and**
2 **projective mapping**

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14 **KEYWORDS:** Culture, food, chefs, ingredients, qualitative research

15 **ABSTRACT**

16 The present study investigated how sensory stimuli, particularly olfactory stimuli from various aromas of
17 herbs, spices, and ingredients, as well as visual stimuli including recipes photos, could contribute to the
18 definition and identification of distinct gastronomic identities. Focus groups were conducted with gastronomes
19 and chefs of diverse nationalities and with international professional experience. Sessions were structured into
20 three parts: first, the concept of gastronomic identity was defined and discussed; then, participants identified
21 specific gastronomic identities and listed the sensory stimuli that could be used to characterize them; and,
22 finally, two Projective Mappings were conducted, one using olfactory stimuli (coded and blinded tubes
23 containing different ingredients) and the other one using visual stimuli (photos of recipes from five different
24 countries, but with no original information given). Data was analyzed through qualitative content analysis and
25 Multiple Factor Analysis. The findings indicated that the concept of gastronomic identity could be described
26 across five categories: sensory, environmental/territorial, sociocultural, emotional, and temporal. Gastronomic
27 identity definition encompassed sensory elements and ingredients, culinary traditions, regions, and abstract
28 concepts that allowed differentiating one cuisine from another. Projective Mapping results revealed that the
29 aromas of the samples were associated with specific regions, social dimensions, and culturally meaningful
30 festive events, while photos of recipes allowed an easy identification of specific gastronomic cultures such as
31 the Italian one.

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35 1. INTRODUCTION

36 The definition of gastronomy varies widely across scientific disciplines. This lack of conceptual unity reflects
37 its position at the intersection of various fields, including sensory science, psychology, tourism, nutrition, etc.,
38 which integrate and understand culinary activities into their own unique theoretical frameworks (Koerich &
39 Müller, 2022; Kuzu & Kosembay, 2023). Gastronomy is not only the set of actions surrounding food and
40 nutrition, but it also strongly relates to culture. The elements that link gastronomy to culture include culinary
41 methods, ingredients, and ways of preparing food; however, food perception, the pleasure of consumption, and
42 the recognition of sensory characteristics are also culture-dependent (de Miguel Molina et al., 2016; Del Pozo
43 Arana & Miranda Zúñiga, 2022; Eringa & Paredes, 2022; Kuzu & Kosembay, 2023; Rojas-Rivas et al., 2021).
44 Gastronomic culture, and by extension, gastronomic *identity*, is constructed and preserved at the intersection
45 of physical experience (eating) and symbolic meaning (perceiving). While food ingredients are processed
46 through physiological channels, their *identity* is established by the economic, social, and cultural values
47 individuals attribute to culinary elements, being a construct of their *perception*.

48 The literature identifies gastronomic identity manifested at three levels: first, the product level, encompassing
49 the use of local ingredients, regional culinary techniques and utensils; second, the service level, which includes
50 culturally specific rituals and linguistic protocols; and third, the spatial level, defined by architectural design,
51 ambient music, and the integration of ethnic symbolism within the interior environment (Del Pozo Arana &
52 Miranda Zúñiga, 2022; Hegarty & O'Mahony, 2001; Lytvynenko, 2025). Despite its interdisciplinary
53 relevance and close impact on shaping familiarity -and, therefore, food perception and choice (Tuorila &
54 Hartmann, 2020)- the study of gastronomic identity has remained largely confined to the social and tourism
55 disciplines leaving its meaning for food science and sensory perception overlooked. Because gastronomic
56 identities can evolve due to globalization and current consumer demands on new experiences (de Miguel
57 Molina et al., 2016), there is a need to increase research in gastronomic identity by examining the specific role
58 that sensory stimuli may play in its formation and perception. Determining the sensory profile and perception
59 of regional gastronomies can facilitate the study of their evolution and the preservation of their unique culinary
60 identity.

61 Recipes and their components have been previously researched in relation to gastronomic identities. Caprioli
62 et al. (2025) considered a set of over 40000 recipes from 23 cuisines to propose a data-driven approach that

63 provided a new way to compare cultures, characterize culinary traditions, and understand how cuisines might
64 adapt or evolve. The presence of spices and seasoning that shape flavor has been suggested to define the
65 distinctive sensory profiles of different countries gastronomies (Boronat et al., 2023; Restaurant Business Staff,
66 2006; Vázquez-Araújo et al., 2013). In addition, visual stimuli could also be influential in gastronomic identity,
67 as the first perception is through sight and visual cues shape expectations (Velasco et al., 2014). Cooks and
68 chefs not only combine ingredients but use aesthetic principles to create visually and sensorially stimulating
69 experiences (Ertaş & Taner, 2025). Mora et al. (2025) investigated how plating recipes from different cultures
70 could influence consumer implicit and explicit responses, confirming previous research that reported that the
71 presentation of a dish influenced liking (Zellner et al., 2014). However, to date, no research focusing on
72 individual sensory stimuli has been conducted to determine whether key odorants or the visual appearance of
73 specific ingredient combinations (e.g., recipes) could induce consumers to “identify” specific gastronomies.
74 The present study aims to evaluate the influence of olfactory (aromas of herbs, spices, and ingredients) and
75 visual stimuli (recipe photography) on the definition and recognition of distinct gastronomic identities. The
76 smell of some ingredients such as herbs and spices could evoke memories of home-cooked meals or festive
77 celebrations, fostering preference toward particular cuisines, and influencing their choice and acceptance (Al-
78 Khalili et al., 2025); for this reason, olfactory stimuli were chosen. Plating and some visual aspects such as the
79 presence of recognizable foods or specific colors have been suggested to affect expected liking and the
80 perception of ethnic authenticity of meals (Danhauser, 2023; Mora et al., 2025; Zampollo et al., 2012);
81 therefore, the visual sensory dimension was also considered in the present research. Because of the complexity
82 of the research matter, experts in gastronomy were chosen to participate in discussion sessions in which data
83 was collected using Projective Mapping, a rapid sensory method considered versatile and suitable for assessing
84 a wide number of samples (Moss & McSweeney, 2022). Although Project Mapping was mainly designed to
85 discriminate and describe foods based on sensory attributes (Varela & Ares, 2014), some new applications
86 have been proposed in recent years. Arellano-Covarrubias et al. (2024) used Projective Mapping to explore
87 cross-cultural ideas for food and beverage pairings. Coelho et al. (2025) proposed a variation of this method
88 to collect expected feelings elicited by food pictures. Results of these studies showed the feasibility of the
89 approach to discriminate and visualize differences among samples and collect a holistic understanding of
90 participants’ perceptions on different topics.

91 2. MATERIAL AND METHODS

92 2.1. Materials

93 The visual and olfactory stimuli for this research were selected based on two primary criteria: previous findings
94 by Boronat et al. (2023) regarding ingredient usage in different Mediterranean cuisines, and a consultative
95 session with a panel of six international chefs, each possessing over six years of professional experience. While
96 both olfactory and visual stimuli samples were coded and Mediterranean cuisine was never explicitly
97 mentioned, it was expected that participants would still intuitively associate certain ingredients with specific
98 regional gastronomies.

99 A set of 25 samples of commercial herbs, spices, and ingredients Hela-Guthaus (La Casa de los Sabores[®],
100 Berriozar, Spain; Jesús Navarro, S.S., Novelda, Spain) were used as olfactory stimuli: Dill; Rosemary; Thyme;
101 Bay Leaf; Oregano; Cardamom; Cinnamon; Ginger; Fennel; Cumin; Mustard; Turmeric; Onion; Garlic; White
102 pepper; Black pepper; Paprika; Clove; Nutmeg; Codium algae; Lemon grass; Saffron; Jalapeño pepper; Mint;
103 Coffee.

104 A set of 24 photos (A5 size, approximately 14.8 x 21 cm) of recipes from five different gastronomies of the
105 Mediterranean basin (Lebanon, Egypt, Italy, Spain, and Portugal) were selected from the book *Simply
106 Delicious* (BCC Innovation, 2025) and used as visual stimuli (included as Supplementary material). The list
107 of the recipes was Stuffed Eggplants; Peas with Serrano Ham; Polenta with Tomato Sauce; Lentils Stewed
108 with Vegetables; Chicken and Pea Risotto; Lasagna with Ragú; Pasta with Pesto and Burrata; Chicken and
109 Vegetable Paella; Cod à Brás; Octopus à Lagareiro; Roman style Fried Squid with Salad; Fideuá; Beef
110 Meatballs with Fennel Salad; Fried horse Mackerel with Tartare Sauce; Namoura Cake; Mulukhiya with Rice;
111 Shakshouka; Sayadieh; Spinach Stew; Falafel; Bulgur Chickpea Salad; Grilled Lamb Kabobs; Fattoush Salad;
112 Caprese Salad. All these recipes were cooked and plated by a chef with wide experience in international
113 cuisines, and photos were taken by the same professional photographer with few contextual elements and
114 common backgrounds.

115 2.2. Participants

116 A total of 20 participants took part in the study. Recruitment criteria incorporated brief interviews to recruit a
117 full panel of chefs and gastronomists from different nationalities but with international expertise, including
118 participants with experience in different kinds of gastronomic business (e.g.: tourism, restaurants, etc.). Their

119 background or academic training was liked by gastronomy in different areas such as Gastronomic Sciences,
120 Gastronomy and Culinary Arts, Cuisine and Gastronomy, Chef-Pastry and Author Cuisine, Global Hospitality,
121 and Business Administration and Management. The aim was to ensure participation of experts with potential
122 knowledge and understanding of diverse gastronomies around the world. Participants' age ranged from 20 to
123 42 years, the gender ratio was balanced (50% female and 50% male) and their country of origin was varied,
124 including 12 different countries: Spain, France, India, Egypt, Greek, USA, Colombia, Brasil, Ecuador, Mexico,
125 Perú, and Israel. The number of participants was defined based on scientific literature considering the methods
126 chosen for the data collection; previous studies have suggested 3 to 6 focus groups, having group sizes of
127 approximately 6–10 participants, to capture main ideas from a relatively homogeneous sample (Hennink, 2007;
128 Hennink et al., 2019). Therefore, 3 focus groups were conducted in the present study (n = 6 and 7 participants).
129 Also, because Project Mapping was chosen to capture participant's understanding about the visual and
130 olfactory stimuli and its relationship with "gastronomic identities" a minimum of 20 participants was recruited;
131 this "n" has been considered sufficient to obtain robust and meaningful spatial configurations in Projective
132 Mapping (McSweeney, 2024).

133 2.3. Projective Mapping and Discussion Sessions

134 The present study methodology was included in the protocol approved by the ethic committee of Mondragon
135 University (IEB-20221115). All articles from the Declaration of Helsinki and the 2016/679 EU Regulation on
136 the protection of natural persons regarding the processing of personal data and on the free movement of such
137 data were met. The procedure was explained to participants prior to beginning the study and their consent
138 indicating voluntary participation was obtained. Three sessions were carried out, each lasting a maximum of
139 two hours, in which participants discussed about the concept "gastronomic identity" and conducted two
140 different Projective Mappings with the aforementioned samples.

141 The sessions were held at Basque Culinary Center (Donostia-San Sebastián, Spain) and were moderated by a
142 sensory analyst with wide experience in conducting Focus Groups. The structure of the session consisted of:
143 1) a discussion to collect opinions, and to define and contextualize the concept of "gastronomic identity"; 2)
144 an individual task to stimulate the identification of sensory stimuli in which participants were asked to
145 complete a table by listing all the "gastronomic identities" they could imagine, along with the elements that
146 made each one recognizable for them (flavors/aromas, ingredients, plating/utensils/visual aesthetics, and

147 textures) (“Task 1”), followed by a discussion; and 3) a final stage in which two Projective Mappings were
148 conducted, one of them using the olfactory stimuli and other one using the visual stimuli detailed in the
149 Materials paragraph.

150 For the first Projective Mapping, participants received a set of randomly ordered 2 mL black microcentrifuge
151 tubes containing a pinch of each ingredient, coded with 3-digit numbers, to ensure blind evaluation of the
152 ingredients. Participants were instructed to smell each vial and position it on an A3 mapping sheet based on
153 its perceived olfactory relationship with the other aromas considering cultural associations, links with
154 gastronomic identity, etc. Following placement, participants described the resulting aroma groupings using
155 different descriptive terms from their own personal ideas. In the second Projective Mapping, participants were
156 asked to arrange the 3-digits-coded images on an A3 mapping sheet based on their perceived similarities and
157 differences considering the aforementioned cultural associations, gastronomic identity links, etc.; then,
158 descriptors were also given to each group of photos. No information was provided on the name or origin of
159 the recipes from the photos, and each photo set was randomized per panelist.

160 2.4. Data analysis

161 To analyze the responses obtained during the sessions, as well as the information collected in the different
162 activities, all entries from the individual task related to “gastronomic identity” were compiled, classified, and
163 condensed following the principles of Qualitative Content Analysis in different categories considering their
164 meaning and contextual explanations (Bohm & Sundqvist, 2025). Entries that did not address the research
165 questions or did not provide relevant information were excluded from further analysis. Three different
166 researchers independently coded and checked the material to ensure reliability.

167 For the olfactory and visual stimuli used for Projective Mapping, the X and Y coordinates of each stimulus by
168 participant were determined by measuring each map and using the bottom-left corner as the origin of the
169 coordinate system. The dataset (X and Y variables) was analyzed using Multiple Factor Analysis (MFA),
170 which allows for the simultaneous integration of multiple data sets, weighing each group to prevent any single
171 variable set from dominating the global consensus map. The descriptors provided on each individual map for
172 each stimulus were also included in the MFA as an additional frequency data table to relate the semantic
173 information to the spatial configuration. Term filtering and grouping procedures were carried out based on the
174 criteria that the selected descriptors had to be relative and relevant to the objective of research. Descriptors

175 that were mentioned only once across all samples and by one participant were excluded from the analysis. An
176 MFA was conducted for each stimulus set; the MFA structure included columns corresponding to participants
177 (X and Y values) and descriptors, and rows corresponding to the assessed stimuli (olfactory or visual). All
178 statistical analyses were performed using XLSTAT (Version 2025.2.0, Addinsoft, Denver, CO, USA).

179 **3. RESULTS**

180 Gastronomic identity was defined and described using different concepts and ideas by participants through the
181 initial discussion. The ideas mentioned by participants were grouped into five categories: “sensory”,
182 “environmental/geographical”, “sociocultural”, “emotional” and “temporal” (Table 1). The sensory aspects
183 mainly referred to flavors associated with different recipes and foods linked to specific gastronomic cultures.
184 Utensils were also mentioned as elements contributing to specific cuisines and preparations. Within the
185 environmental/geographical category, participants mentioned concepts such as “seasonality,”
186 “climate/nature,” “local markets,” “proximity,” “regional community,” and “region,” linking the concept
187 gastronomic identity to territorial belonging. In the sociocultural category references to “politics”, “education”,
188 “economy”, “heritage”, “tradition”, “philosophy”, “roots”, and “legacy” were included. This category reflected
189 the intersection between cultural aspects and social structures that contribute to shaping gastronomic identity.
190 The emotional aspect was also present when participants defined gastronomic identity, recalling specific
191 moments with their family, social community and individuals’ emotion of “pride” and “personality”. Specific
192 emotions such as “nostalgia” and “memories” were also mentioned linked to sensory experiences and
193 highlighted as key drivers of this dimension. The last category, including concepts such as “diaspora” and
194 “evolution”, was considered a temporal dimension, emphasizing the dynamic nature of the concept
195 gastronomic identity.

196 Analysis of Task 1 responses, in which participants listed "gastronomic identities" and associated elements
197 (flavors, textures, etc.) revealed a wider array of ideas than previously expected. Main responses included
198 specific culinary traditions and regions (e.g., Italian, Spanish) (mention frequency = 73%) but also abstract
199 concepts (e.g., home, Christmas) (mention frequency = 27%). Therefore, the listed “gastronomic identities”
200 could be grouped into three different categories: (a) specific regions or countries (e.g.: Spanish) (73.3%), (b)
201 social/relational contexts (e.g.: family, grandmother) (17.3%), and (c) festive or culturally significant events
202 (e.g.: summer, Christmas) (9.3%). Also, participants identified various elements (flavors, visuals, and textures)

203 associated with these different gastronomic identities; during the discussion, participants considered the
204 interaction of these elements, rather than their isolation, what evoked an entire “gastronomic identity” and
205 made it different from another one.

206 Considering the “specific regions” category, broad territories such as Asia, the Middle East, East Africa, the
207 Amazonia, or Andes were mentioned, in addition, 19 countries and over 15 specific regions from different
208 countries were also mentioned (e.g.: Yucatecan, Asturian, Basque Country, Manabita, etc.). Considering the
209 mention frequency of regions/countries, Spain, Italy, Mexico, France, Colombia and Japan were the most
210 mentioned “gastronomic identities”. Table 2 shows a summary of the main ideas linked to these regional
211 gastronomies as listed in Task 1 and then discussed by participants after completing the Task.

212 Family, friends, and home were mentioned by participants within the “social/relational contexts” category.
213 Unlike regional identities, which showed some convergence of specific ingredients and aromas, the
214 social/relational context identity showed low consensus regarding specific ingredients or aromas, and
215 respondents focused instead on broad categories (e.g., meat, fish, vegetables) and sensory descriptors.
216 Responses including plateware and textural descriptors were highly variable, reflecting the individualized
217 nature of home-cooking.

218 The last category, “festive or culturally significant events”, included the identities “Christmas”, “countryside”,
219 and “summer”. The Christmas identity was characterized by sweet aromas, ingredients such as cinnamon and
220 clove, and specific elaboration such as panettone, and different types of meat (e.g.: turkey, chicken). Red and
221 green colors were mentioned when describing plating and visuals. Salty, smoky and barbecue aromas were
222 prevalent when describing the countryside gastronomic identity, with ingredients such as grilled vegetables
223 and meats. The summer gastronomic identity was mainly defined as “fresh” by participants, and fish was
224 mentioned as one of the common ingredients.

225 Figure 1 shows the results of the Project Mapping made with olfactory stimuli. The observation and variable
226 plots of the MFA for the olfactory samples showed how the aromas/spices positioned in a two-dimensional
227 space using data from all participants. The first two dimensions accounted for 30.70% of the total variance.
228 The terms used by respondents to label the groups on their maps included countries, global regions, and other
229 terms aligned with the three pre-existing categories established during the initial individual task (listing and
230 describing gastronomic identities) - regional/territorial (e.g.: Asia, Italy), social (e.g.: Family, Home), and

231 festive/culturally significant events (e.g.: Summer/Vacations)-. On the F1 axis, a territorial differentiation
232 could be observed: the left side grouping European and Latin American regions, and the right side including
233 some Asian countries. The F2 axis showed the differential descriptors of the upper zone, with terms associated
234 with festive situations (e.g.: Summer/Vacations) and a variety of different regions, and the lower zone
235 including descriptors related to social aspects and connected to terms such as “home”, “family”, and some
236 Mediterranean regions. Considering the resulting map, the aroma of lemongrass seemed to be linked with
237 Asian countries such as Japan and Thailand. Sweet aromatics from cumin and turmeric was associated with
238 India and North Africa while other herbal odors coming from oregano, thyme, or rosemary seemed to be linked
239 to Mediterranean countries such as Italy of France. Paprika and garlic odors were close to Spain, also in the
240 area in which other Mediterranean countries were allocated. Social and festive descriptors were in the center
241 of the map, probably linked to each participant’s personal experiences and self-cultural background.

242 Figure 2 shows the results of the second Project Mapping developed with visual stimuli (recipes photos). The
243 first two dimensions of the plot accounted for 31.83% of the total variance. The descriptors used to describe
244 gastronomic identities could also be classified into the three aforementioned main categories:
245 regional/territorial (e.g.: Latam, Lebanon), social (e.g.: Family, friends) and festive or culturally significant
246 events (e.g.: Summer/Vacations). Visual stimuli including photos of lasagna, risotto, caprese salad and pasta
247 al pesto were clearly linked with Italy by respondents, but other recipes seemed to be associated with specific
248 regions of a country (e.g.: octopus to Galicia, Fideuà to Catalonia). Middle east, North Africa, India, and some
249 countries from these regions (e.g.: Lebanon, Tunisia) were mentioned linked to recipes such as Falafel, Bulgur
250 chickpeas, Fattoush salad, Mukhiya. Again, although mentioned by participants, social and festive descriptors
251 were not strongly linked to any specific recipe, probably linked to each participant’s personal background.

252 During the general discussion after Project Mapping development, participants mentioned that different visual
253 elements could help them link recipes with specific regional gastronomies. Beyond ingredients present in the
254 photos —such as pasta that led them to mention Italy, or tomatoes linked to the Mediterranean region—
255 additional visual markers such as typical Asian cutlery (chopsticks) or traditional ceramics (e.g., Talavera or
256 earthenware) could serve as a regional symbol. Participants also noted that portion sizes and the practice of
257 mixing multiple preparations on a single plate could be culturally significant. Finally, they emphasized that
258 knowing or observing how food is consumed (e.g.: eating with your hands vs. eating with utensils) could

259 outweigh the visual presentation of the recipe, highlighting the importance of context to assign gastronomic
260 identity labels.

261 **4. DISCUSSION**

262 The aim of the present research was to better understand the concept of gastronomic identity from a sensory
263 point of view, considering conceptual definitions from experts in the field, but also the association they would
264 make when exposed to olfactory (herbs/spices aromas) and visual (photos of recipes) stimuli. A sensory rapid
265 method, Project Mapping, was used to collect this associations data. The main results of the study revealed the
266 complexity of defining the concept of gastronomic identity, considering the multiple aspects mentioned by
267 participants while listing “identities” and describing them. In addition, results confirmed the importance of
268 sensory cues, first used as descriptors of the gastronomic identities listed by participants and, second, because
269 of being drivers to identify and connect specific gastronomic identities.

270 Five dimensions or categories were detected from the terms used to define a “gastronomic identity”:
271 products/ingredients/sensory, environmental/territorial, sociocultural, emotional, and temporal descriptors.
272 These categories have been somehow considered by literature and, although chefs and gastronomes could have
273 particular semantics and linguistics to describe food-related concepts (Giboreau, 2017), results had strong
274 congruence with the terms used by consumers to define “traditional foods”, who primarily referred to eating
275 habits, naturalness, heritage, taste, and locality (Verbeke et al., 2016). Sensory stimuli linked to flavors,
276 ingredients, textures, and recipes were mentioned in the present study, but discussed as a combination of
277 multiple sensory cues to characterize each gastronomic identity, independently talking about specific regions
278 or countries, social/relational contexts, or festive/culturally significant events. These results confirmed the idea
279 reported by Kapitány and Kapitány (2024), who indicated that regional cuisine identities tended to be described
280 with a combination of ingredients, tastes, and preparations. The environmental/territorial dimension
281 emphasized the use of local ingredients and the symbolic role of seasonality in national dishes, previously
282 indicated by Kapitány and Kapitány (2024) and De Miguel Molina et al. (2016). Gastronomic heritage includes
283 not only the ways of eating and drinking, but also the social and cultural values attached to gastronomy (de
284 Miguel Molina et al., 2016) and cultural heritage has been linked to identity, evolving over time, and having a
285 crucial role in defining and reinforcing regional identities (de Miguel Molina et al., 2016; Duda, 2024; Verbeke
286 et al., 2016). The emotional dimension was mentioned by participants because food has been previously shown

287 to serve as a powerful carrier of memory and a compound for social interactions, often linked to family, unity,
288 and personal experience (Daly, 2025; Ertaş & Taner, 2025). Finally, the temporal and dynamic dimension
289 observed the evolving nature of gastronomic identity (e.g.: taste of ingredient depends on time and place)
290 previously reported by Hermansen (2012) and Kapitány and Kapitány (2024). These dimensions confirmed
291 that gastronomic identity is a multifaceted concept in which sensory aspects are fundamental; the relative
292 importance of each category may shift depending on the specific identity under study, requiring a holistic
293 approach to its characterization and further investigation.

294 Identities within the “regional” and “festive/culturally significant events” categories were described by
295 participants using common patterns and terms (e.g.: Italy: “tomato, basil”; Christmas: “cinnamon”). On the
296 contrary, social/relational identities (e.g.: family, friends) seemed to be described more individualized and
297 personal-experience-centered; Kapitány and Kapitány (2024) indicated that social contexts carry deep
298 symbolic weight, defining the boundary between routine meals and festive dining.

299 While defining gastronomic identities involved sensory elements, the present study showed that exposing
300 participants to specific olfactory and visual stimuli during the Project Mapping exercises actively triggered
301 other associations, including not only regional, but also social, and contextual/festive. Olfactory stimuli
302 seemed to elicit a richer variety of descriptors than visual cues; these went beyond mere territorial labels (e.g.,
303 Italy, Africa) to include social and symbolic dimensions events (e.g.: travel, home, family, childhood). Results
304 from the Project Mappings suggested that while visual stimuli elicited stronger associations with geographical
305 identity, olfactory stimuli were more effective at evoking memories tied to non-regional identities. However,
306 overall results suggested that a gastronomic identity would not be linked to a single sensory dimension (visual
307 or olfactory), but rather to the integration of multiple sensory inputs (visual + olfactory + others). Although
308 not all images were directly linked to the origin of the recipes cooked to take the photos (e.g.: *falafel* was a
309 recipe from Egypt, and *octopus a Lagareira* was a recipe from Portugal), responses showed that the perceptual
310 linkage was culturally coherent and showed geographical/cultural proximity (Egypt – Lebanon; Galicia –
311 Portugal;), as previously reported by other authors (Boronat et al., 2023).

312 General results also showed that some gastronomic identities were more mentioned or easily
313 defined/recognized than others (e.g.: Italian). This could be explained by the culinary fingerprints or foods
314 from specific regions, such as Neapolitan pizza from Italy, which are reinforced by specific ingredient markers

315 (Ahn et al., 2011). A notable correlation between the most researched cuisines (Lin et al., 2021) and those
316 recognized by participants was observed, implying that academic and media exposure could have an impact
317 on identity definition. In addition, UNESCO has a list of “Intangible Cultural Heritage of Gastronomy” in
318 which different popular gastronomies are described. These include the Mediterranean diet, French gastronomy,
319 and Mexican and Italian cuisines. The gastronomies and the elements included by UNESCO in the Intangible
320 Cultural Heritage of Gastronomy list aligned with the results obtained in this study; both responses and
321 UNESCO definition include not only ingredients, but also techniques, cultivation, preparation, rituals,
322 celebrations, and symbolic meanings (UNESCO, 2025). It is important to note that, while a broad range of
323 ingredients from different origins were used during the olfactory stimuli phase, only Mediterranean recipes
324 were included in the visual stimuli exercise, limiting the potential of descriptors and connections elicited by the
325 samples. This was a significant limitation of the study that could be solved in future research by including
326 photos from different worldwide cuisines. Plating and photography styles were considered important variables
327 during the present research, and the selection of the visual stimuli was therefore narrowed to the
328 aforementioned Mediterranean gastronomies. Also, while the current sample size was justified for the present
329 exploratory phase, expanding the participant pool and profile in future studies would be valuable to increase
330 statistical power and validate the applicability of the findings.

331 The present study shows the significant potential for sensory research in gastronomic identity. The
332 methodology used for mapping regional identity profiles offers a scalable framework that could be applied in
333 future research. Culinary experts are essential for conceptualizing the main ideas of food and gastronomy
334 (Ertaş & Taner, 2025) and therefore were chosen for developing the exercises designed during the present
335 research. Expanding this research into a cross-cultural consumer study would be of significant interest to
336 establish how different sensory cues contribute to identifying, defining, and accepting distinct gastronomic
337 identities. While specific dimensions were identified in the present research, perceptions are shaped by sensory
338 appeal, health considerations, and cultural distance; therefore, new categories such as nutrition and/or safety
339 could appear in future research, as these are increasingly emerging as significant drivers of modern identity
340 (Pan et al., 2025). Nowadays, when unhealthy eating is the focus of much discussion due to its direct
341 relationship with chronic diseases, a proper understanding of the role of gastronomic identities recognition and
342 reaction may contribute to promote healthier habits. Guéguen and Jacob (2012) demonstrated the positive

343 effect of using affective labels that would trigger memories of family, tradition, and patriotism in restaurant
344 sales. Therefore, considering the different concepts and dimensions identified during the present research to
345 encourage consumers toward healthy choices could be a valuable research avenue.

346 Finally, future research should explore sensory strategies that align with the multidimensional nature of food
347 choice; a favorable alignment between expected and current sensory profiles can trigger nostalgia and enhance
348 consumer satisfaction (Pan et al., 2025). Within this framework, decoding the role of sensory stimuli in
349 gastronomic identity is essential for designing healthy menus and recipes that tailor regional flavor and visual
350 profiles, familiarity, and are easily linked to a specific identity by consumers.

351 **5. CONCLUSIONS**

352 Gastronomic identity was understood and described as a multidimensional construct that extended beyond
353 basic ingredients or standardized recipes. During the present study it was defined by concepts included in five
354 dimensions: (1) Sensory/product, involving the integration of flavors, recipes and ingredients; (2)
355 environmental-geographical, including terms of territorial provenance, climate, and seasonality; (3)
356 sociocultural, relating to heritage and social structures; (4) emotional, comprising psychological terms such as
357 nostalgia or caring; and (5) temporal, explaining the evolution and variability of culinary practices over time.

358 Gastronomic identities mentioned by participants fall into three main groups: regional/national (e.g., Italian or
359 Mexican cuisines), with higher consensus on specific ingredient markers; social/relational (e.g., "family"),
360 described with individualized descriptors, but more emotional terms; and, festive/cultural events (e.g.,
361 Christmas or Summer), linked to specific seasonal aromas and colors. Finally, although participants were able
362 to identify a particular gastronomy through isolated elements (e.g.: "Italy" by smelling basil aroma, or a seeing
363 caprese salad photo) their responses suggested that the interaction and integration of multiple sensory inputs
364 (aroma + visual + other, e.g.: eating methods) could easily evoke or outweigh single stimuli to clearly evoke a
365 complete gastronomic identity. Future research should transition from expert panels to cross-cultural consumer
366 studies to validate these dimensions across different populations and include a wider variety of global visual
367 stimuli.

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371 **Table 1.** Concepts mentioned during the focus group discussion to define gastronomic identity classified in
 372 five dimensions.

Category	Concepts	Participants comments
Sensory	Recipes, food, flavors, and utensils	<p>“Smell, taste, memory, odors, something you have seen, smelled, experienced. Sensory attributes are the vehicle through which a gastronomy can be defined.”</p> <p>“The different sensory modalities are necessary and are related to each other to identify gastronomic identity, but some of them may be more important than others in specific cultures (e.g., Middle Eastern cultures: flavor; Basque Country: texture).”</p>
Environmental / Geographical	<p>Seasonality, climate, nature</p> <p>Local markets, local crops, proximity, terroir, ecosystem</p> <p>Community, nation, country, region</p>	<p>“The relationship/connection people have with food due to different climatic and environmental factors linked to a territory.”</p> <p>“Gastronomic identity is aligned with the eating habits and traditions of a group of people or a nation.”</p>
Sociocultural	<p>Politic, education, economy</p> <p>Heritage, roots, legacy, tradition, culture, history, ancestors</p> <p>Beliefs and Philosophy</p>	<p>“A system influenced by politics, culture, and resources; from this system, people create that identity.”</p>
Emotional	<p>Comradery, attachment, family, connection, belonging</p> <p>Experiences, celebrations, enjoyment</p> <p>Pride, identity-related, personality</p> <p>Memory, nostalgia, remembrance, something seen/experienced</p>	<p>“I would explain identity based on the experiences I have lived.”</p> <p>“Gastronomic identity is shaped by each individual’s priorities—how you define what is yours and how you build your gastronomic identity from that.”</p> <p>“Flavor and aroma are very important because of their relationship to memory and nostalgia.”</p>
Temporal	Diaspora, evolution, multidimensional	<p>“It is about the country, but it can travel with people and change.”</p>

373

374

375 **Table 2.** Descriptors of different gastronomic identities provided by participants.

Country	Ingredients, flavors, textures, visuals, customs
Spain	Meats, seafood, vegetables (onion, pepper, artichoke), olive oil, and spices (paprika, garlic). Techniques including grilling, frying, and stews. Aromas linked to cooking techniques and by spices such as paprika. Ceramic and glass plateware; deep plate for stews and legumes.
Italy	Tomato, cereals (pasta, pizza), cheese, and, occasionally, fish. Ingredient centered aroma and herbs such as basil and garlic; umami taste. Firm texture for the pasta; unctuous and mouth-coating. Colorful presentations.
Mexico	Corn, <i>tacos</i> , <i>tamales</i> , <i>tortillas</i> , grilled meats, vegetables, and spicy condiments. Flavors and aromas were described as fresh, citrus, and spicy. Textures: crunchy or fried. Food eaten with hands; colorful and mosaic-like plateware.
France	Dairy, meat, wine. Creamy and soft textures. A strong emphasis on visual presentation, including fine plateware and careful plating.
Colombia	Different kinds of meats, fish, <i>arepas</i> , and dairy products (fresh cheese, <i>dulce de leche</i>); including flavors from herbs and spices such as cilantro, parsley, <i>ají</i> , and lemon. Also, some smoky and citrus aromas, salty taste.
Japan	Umami, fishy, and sweet flavors. Presence of rice. Minimalist visual presentation, often featuring small plates. Textures were defined as varied and contrasting.

377 **Figure Captions**

378 Figure 1. Symmetric plot showing results of the multiple factor analysis of olfactory stimuli.

379 Figure 2. Symmetric plot showing results of the multiple factor analysis for the visual stimuli.

380

381 **Declaration of generative AI and AI-assisted technologies in the manuscript preparation process.**

382 During the preparation of this work the authors Olatz Urkiaga and Laura Vázquez-Araújo used Gemini to
383 refine the English grammar of specific sentences. This tool was used solely to correct potential language
384 inaccuracies. After using this tool/service, the authors reviewed and edited the content as needed and take full
385 responsibility for the content of the published article.

386

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