

1 **Determinants of the intention to purchase an autochthonous local lamb breed:**
2 **Spanish case study**

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13
14 **Abstract**

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16 The aim of the paper is to study consumers' acceptability for a lamb meat from a
17 local autochthonous breed. An intention to purchase model was developed based on the
18 Theory of Planned Behavior (TPB) and estimated using data from a survey conducted in
19 Spain. Results indicated that consumers were willing to buy this lamb meat because 86% of
20 respondents said that they probably/definitely would buy it, although only 23% would if the
21 meat is not available in their usual meat store. Then, the lack of availability in the market is
22 an aspect limiting its consumption. The most important factors explaining the intention to
23 purchase for consumers who would purchase this meat if it were not available in their usual
24 store are the importance attached to the animal breed and their social embeddedness with
25 the local area. An appropriate food policy would be to inform consumers about the
26 importance of the animal breed in the quality of the meat and the local origin.

27
28 **Keywords:** attitudes, consumer, ordered probit, Spain, Theory of Planned Behavior

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38 This research is part of the project entitled "La diversificación de producciones como alternativa de
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40 [aragon.es/index.php/mod.proyectos/mem.detalle/idproyecto.317/relecategoria.1073/chk.0be673c1efcd27ea2d0](http://www.cita-aragon.es/index.php/mod.proyectos/mem.detalle/idproyecto.317/relecategoria.1073/chk.0be673c1efcd27ea2d0ce47fa4784c83.html)
41 [ce47fa4784c83.html](http://www.cita-aragon.es/index.php/mod.proyectos/mem.detalle/idproyecto.317/relecategoria.1073/chk.0be673c1efcd27ea2d0ce47fa4784c83.html) funded by INIA (Spanish Government).

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46 **1. Introduction**

47

48 An increasing interest in indigenous animal genetic resources of the regions exists
49 worldwide because of the benefits they bring to sustainable economic development and
50 food security (FAO, 2007). Although indigenous breeds generally offer lower production
51 yields, these breeds represent unique combinations of genetic resources and present a
52 higher ability to adapt to local conditions, including feed and water availability, climate
53 change and diseases (Hoffmann, 2010, 2011).

54

55 Many local breeds deliver a wide range of ecosystem services and products that
56 supports the livelihoods of their keepers as integral components of agricultural ecosystems,
57 economies and cultures. Those diverse products and services are not usually accounted for
58 but their value can exceed that of market products in many production systems (Hoffmann,
59 2011). Therefore, the production of food products together with the maintenance of the
60 agricultural biodiversity and the ecosystem services is one of the most important challenges
61 for the international community (Millennium Ecosystem Assessment, 2005).

62

63 As Hoffmann (2011) stated, animal biodiversity conservation by using
64 autochthonous breeds has to go hand in hand with the production of food products with
65 high added-value in order to improve the producers' standards of living and effectively
66 ensure the biodiversity conservation. However, in order for the production system based on
67 local autochthonous breeds to be successful, these high-value products must be accepted by
68 consumers and they must be willing to buy them and to pay a price that could exceed the
69 higher cost of producing this meat from the local autochthonous breed (Ottesen, 2006).

70

71 Then, the aim of the paper is to study consumers' acceptance of lamb meat from an
72 autochthonous local breed. In particular, the consumers' intention to purchase lamb meat
73 from a local autochthonous breed (Ojinegra) from Teruel, a province in the northeast of
Spain (Aragón), is analyzed. In the region of Aragón, there are two local lamb promotion
breeds: "Rasa Aragonesa" and "Ojinegra from Teruel"¹. The first one is the most important
in terms of the number of animals (around 2 million heads) while the second one only holds

¹ Although several endangered lamb breeds also exists (i.e. Ansotana, Churra Tensina, Maellana, etc.)

74 around 29,000 heads but is more important in terms of rural development because it is bred
75 in a small and less favored area in the southern Aragon. This breed (Ojinegra from Teruel)
76 is native from the counties of Bajo Aragon, Andorra and Maestrazgo (Teruel province)
77 characterized by a harsh geography (mountainous) and an extreme continental climate
78 (large temperature fluctuations, low rainfalls). This breed has been produced for a long time
79 in this area because other breeds cannot be adapted due to this difficult climatic and
80 geographic environment. This breed has a high capacity to run on top of mountains in semi-
81 extensive farms, maximizing the use of the natural resources of the area. In this area, there
82 are around 50 “Ojinegra from Teruel” small and medium sized farms with semi-extensive
83 farming systems. In 1999, these farms created an association to maintain the breed called
84 AGROJI (Association of Ojinegra farmers) in collaboration with the regional Government.
85 These farms directly sell “Ojinegra from Teruel” sheep animals to the largest cooperative in
86 Zaragoza and to other slaughterhouses located in Aragón. In both cases, they sell live
87 animals to the slaughterhouses that sell the final lamb meat as an undifferentiated product,
88 without any indication that the meat comes from this particular breed.. The province where
89 this autochthonous local breed meat is produced (Teruel) is considered a less favored area
90 because it is mountainous and sparsely and low density populated (PDR, 2009). Therefore,
91 this breed plays an important economic, social and environmental role (Ripoll *et al.*, 2010)
92 supporting the local economy in the Teruel province in terms of jobs and income but also it
93 is an important animal genetic resource. Moreover, this breed provides lighter animals than
94 the other local breeds, what would be more appreciated by consumers. Ripoll-Bosch et al.
95 (2012) analyses the carcass and meat quality of suckling lambs from the Ojinegra from
96 Teruel breed. Findings indicated that the carcass and quality of the suckling lamb meat
97 from Ojinegra are similar to the meat of the other breeds.

98 One important factor that could benefit the future maintenance of this breed is the
99 decision of the Spanish National Government to consider this breed one of the
100 autochthonous promotion breeds (“raza autoctona de fomento”) under the National
101 Regulation (R.D 2129/2008, December 26th) on conservation, improvement and promotion
102 of animal breeds. This regulation opens the possibility for producers and/or producers’
103 associations to apply for two types of subsidies (national and regional) for the maintenance

104 of the herd book and the programme for genetic improvement². Subsidies for these
105 autochthonous sheep breeds would help the maintenance of the breed in comparison to
106 other breeds without this promotion recognition. Then, this institutional aid will be an
107 important tool for the maintenance and extension of the breed but it would also be
108 necessary that the final lamb meat produced will be demanded by, at least, a segment of
109 consumers. Using a model of the intention to purchase derived from the Theory of Planned
110 Behavior (TPB) by Azjen (1991), this paper analyzed the intention to purchase the lamb
111 meat from the autochthonous local breed (Ojinegra) and determine the factors explaining
112 this intention. Then, it will be possible to determine the profile of the segment of consumers
113 who are willing to buy this lamb meat from the autochthonous local breed. To do that, data
114 from a survey administered to a representative sample of consumers in one Spanish region³
115 (medium-sized town within 150 kilometers from the producing area) during 2009 was used.
116 The lamb carcass analyzed in the present study belongs to the light carcass classification
117 system (Mediterranean scheme) and in particular, corresponds to categories A (i.e.,
118 “Suckling” lamb) and B and C (named “Recental” in Spain but commonly known by
119 consumers in Aragón as “Ternasco”). Then, respondents received information on the type
120 of commercial type under analysis, “Ternasco” and “Suckling”⁴ before they have to
121 respond to the particular questions about this sheep breed.

122 The paper is structured as follows. The next section develops the theoretical
123 framework and section 3 describes the methodology. Section 4 presents the estimation
124 results, and finally, section 5 presents a summary of conclusions, discussion of implications
125 and further research.

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² R.D. 1625/2011, 14th November for subsidies for the promotion of Spanish autochthonous breeds (BOE) and O. 2nd March for subsidies for the producers’ associations that promote autochthonous breeds

³ In Aragón, the lamb consumption in 2009 was 6.31 kilos per capita and the average price 10.13€/kg (MAGRAMA, 2015). It is worthwhile to mention that in the following years until 2014, the per capita consumption decreased at an average rate of 7% reaching a consumption of 4.14 kilos per capita in 2014. Moreover, the per capita expenditure also decreased at a similar rate in this period and accounted for 40€/per capita in 2014. This decrease might be due to the economic crisis.

⁴ We did not include the feeder lamb category because it consists of animals weighting more than 13 kg, which represents only 12% of the slaughtered animals in Aragón and they are not consumed in the region.

130 **2. Theoretical framework**

131
132 The Theory of Planned Behavior (TPB) by Ajzen (1985, 1991) is an extension of
133 the Theory of Reasoned Action (TRA) developed by Ajzen and Fishbein (1980). According
134 to the Theory of Reasoned Action, a behavioral intention (e.g. purchase intention) is
135 determined by a consumer attitude towards engaging in the behavior and the degree of
136 social pressure felt by the person with regard to the behavior (i.e. subjective norm). Attitude
137 refers to the individual's evaluation of a given behavior as favorable or unfavorable and
138 formed on the basis of the individual's beliefs about the outcomes of behavior and their
139 evaluations of those outcomes (Ajzen, 1991). Subjective norm refers to perceived social
140 pressure to perform (or not perform) the behavior. Subjective norm is formed as a result of
141 the individual's beliefs about the extent to which important others would approve or
142 disapprove of their performance of the behavior mediated by the individual's motivation to
143 comply with others' views. However, the TRA has been criticized because it can be applied
144 only to behaviors that are totally under volitional control. To account for this concern,
145 Ajzen (1985) introduced in the TRA a third predictor of behavior, the perceived behavioral
146 control, to include behaviors that are not completely under an individual's control.
147 Perceived behavioral control refers to the consumer's perceptions of personal control over
148 what to buy and eat, which he or she believes to influence the judgment of risks and
149 benefits of products in a purchase situation. Perceived difficulty implies a consumer's
150 skills and abilities which are believed to influence the degree of personal control over the
151 behavior in question (Bredahl *et al.*, 1998).

152 The TPB has proved to be a successful analysis tool for a range of behaviors and
153 this model and modified versions have been used in many empirical studies. In particular,
154 this model has been used to explain consumer food choices applied to different food
155 products such as fresh produce (Verbeke and Vackier, 2005; Stefani *et al.*, 2008; Tuu *et al.*,
156 2008; Menozzi and Mora, 2012), GMO products (Bredahl *et al.*, 1998; Bredahl, 2001;
157 Cook *et al.*, 2002; Verdurme and Viaene, 2003; Lobb *et al.*, 2007; Chen, 2008), ready to eat
158 food (Mahon *et al.*, 2006; Dunn *et al.*, 2011) and organic produce (Chen, 2007; Gracia and
159 De Magistris, 2007; Arvola *et al.*, 2008; Vermeir and Verbeke, 2008; Guido *et al.*, 2010;
160 Ruiz de Maya *et al.*, 2011). Those previous studies conclude that the most important factor
161 explaining the intention to purchase is the attitude towards the purchase followed by the

162 perceived behavioral control. However, the influence of the social norms on the intention to
163 purchase was found to be positive, negative or not significant, depending on the study.

164 On the other hand, most of these papers proposed extensions of the TPB model.
165 Verdurme and Viaene (2003) and Chen (2008) integrated the TPB model with the Attitude
166 model (Fishbein, 1963) to analyze the intention to purchase GM foods. Stefani *et al.* (2008)
167 and Lobb *et al.* (2007) developed their models with the intention of purchasing GM foods
168 and chicken, extending the TPB model to take into account the impact of perceived risk and
169 two of its antecedents, trust and knowledge. Finally, Sparks and Shepherd (1992), Cook *et*
170 *al.* (2002) and Gracia (2013) extended the TPB model, introducing consumer self-identity
171 to account for predispositions that are expected to have an important influence on intention.
172 They analyzed the intention to purchase organic vegetables, GM food and animal welfare-
173 friendly meat products, respectively.

174 Following these last works, we developed a model of intention to purchase lamb
175 meat from the indigenous local breed (Ojinegra), introducing social embeddedness in the
176 TPB model. The rural sociology literature associates consumer choice of traditional local
177 foods with the notion of social embeddedness (Cranfield *et al.*, 2012), which refers to the
178 social relationships between the actors in the local food system and the surrounding
179 community based on reciprocity, trust and shared values (Hinrichs, 2000). Consumers
180 would choose traditional local foods not only for the intrinsic and extrinsic attributes but
181 also because people are seeking to engage with farmers, food producers and the rural
182 community; in other words, because of their social embeddedness with the local
183 community (Weatherell *et al.*, 2003). Although previous research for meat concludes that
184 animal breed is not one of the highest rated aspects by consumers (Bernués *et al.*, 2003;
185 Sepúlveda *et al.*, 2008), we included the importance consumers attached to the animal
186 breed when shopping for lamb meat to check whether this intrinsic attribute is indeed
187 related to the consumers' intention to purchase a specific breed. Last, socio-demographic
188 variables were also considered in the explanation of the intention to purchase lamb meat
189 from the indigenous local breed.

190 The model of intention to purchase lamb meat from the indigenous local breed
191 (Ojinegra) is presented in Figure 1.

193 INSERT FIGURE 1

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3. Methodology

3.1. Data collection and sample

200 Survey data were collected through personal face-to-face interviews using a
201 structured questionnaire in a Spanish medium-sized town during 2009. This town was
202 selected to be representative of Spain because its socio-demographics are similar to the
203 Spanish Census of Population (Table A in the Appendix). Moreover, the selected town is
204 one of the five largest towns in Spain and it is the closest to the area where the indigenous
205 breed (Ojinegra) animals are grown. In order to ensure that respondents had experience
206 with the lamb meat, the target population was the primary food buyers in the household and
207 households that consumed lamb meat at least occasionally.

208 The sample of participants was randomly selected and stratified on the basis of town
209 district and age. A number of stores and supermarkets were selected in each district, and
210 shoppers were randomly selected outside these food outlets. In order to take into account
211 the changes in shopper characteristics that occur between different times and days of the
212 week, interviews covered the full range of opening hours from Monday to Saturday at each
213 food outlet. Interviewers approached the randomly selected individuals, asking them two
214 screening questions: whether they were a main household food shopper⁵ and whether they
215 bought, at least occasionally, lamb meat. In the case that the consumer never bought food
216 and did not consume, at least occasionally, lamb meat, the interviewer selected at random
217 another consumer belonging to the same age group, and asked the screening questions until
218 a participant matching both requirements was found. A total of 399 consumers were
219 interviewed, which, for an infinite population and assuming a confidence level of 95.5%
220 ($k=2$) and $p=0.5$, the sampling error accounts for $\pm 5\%$.

221 The questionnaire included questions related to the following topics: *i*) attitudes
222 towards the lamb meat from the indigenous local breed (Ojinegra) and towards the
223 purchase of this meat, *ii*) subjective norms and perceived behavioral control, *iii*) intention
224 to purchase the lamb meat from the indigenous local breed (Ojinegra), *iv*) importance

⁵ We questioned whether interviewees always, almost always, occasionally, hardly ever or never buy the food for the household, and consumers who indicated never were not selected.

225 consumers attached to the animal breed when shopping, *v*) consumers' importance to the
226 regional origin of the meat when shopping and *vi*) consumer characteristics (gender, age,
227 household size, education and income). Prior to the final administration of the
228 questionnaire, it was validated using 20 consumers for understanding and interview length.
229 We were aware on whether the respondent knew the lamb meat from the indigenous local
230 breed, then, at the beginning of the questionnaire consumers were asked whether they have
231 heard about this sheep breed and only 12% of respondents stated to have heard about this
232 breed. Because, we expected this low consumers awareness about the breed, before
233 administrating the rest of questions, we informed respondents about the main characteristics
234 of the breed and the lamb obtained from this breed. We provided them with a neutral
235 description of all these characteristics.

236 Summary statistics for the socio-demographic and economic characteristics of the
237 sample are presented in Table 1 together with the population information for some
238 demographic profiles for comparison. Most individuals involved were female (76%), living
239 in households of 3.2 members on average. In addition, the average age was about 49 years
240 and nearly 20% received a lower income (less than 1,500 €/month) and about 23% of the
241 participants had finished university studies. The higher percentage of female compared with
242 the population is expected since women are still in Spain primarily taking care of the food
243 shopping of the household, and the target population was the primary food shoppers.

244

245 INSERT TABLE 1

246

247 3.2. Variables definition

248

249 The intention to purchase lamb meat from the indigenous local breed (Ojinegra) was
250 measured asking respondents two questions: i) whether they intend to buy this lamb meat
251 (IP1) and ii) whether they intend to buy this lamb meat if it is not available in the store they
252 used to buy the lamb meat and they have to look for a store which sells this lamb meat
253 (IP2) on a scale from one (definitely no) and five (definitely yes) following Cook *et al.*
254 (2002), Mahon *et al.* (2006) and Chen (2008) (Table 2). A small percentage of respondents
255 stated that they would probably or definitely not purchase this autochthonous local lamb

256 meat (Ojinegra) (1.2% and 2.5%, respectively). On the other hand, almost half of them
257 were likely to purchase (43.41%) and 32.6% would definitely purchase this meat. Then,
258 there is a small segment of consumers not willing to purchase (definitely no and no) the
259 meat from this breed (3.7%), a medium sized segment of consumers who did not know if
260 they would buy it (20.3%) and the majority of consumers that would buy it (probably yes
261 and definitely yes), named potential buyers segment (76% of respondents). However, a
262 higher percentage of respondents stated that they would probably or definitely not purchase
263 this meat if it was not available in the store where they usually buy the lamb meat (21.5%
264 and 25.8%, respectively). On the other hand, only 15.6% of respondents were likely to
265 purchase it and 7.8% would definitely purchase this meat. Then, if the availability of the
266 meat in the market is low, the majority of consumers would not purchase this lamb meat
267 (47.3%) and a smaller segment of consumers would do it (33.4%). In the latter case, the
268 segment of potential consumers has been reduced to half and the size of the non-buyers
269 segment has tremendously increased. We asked two intention to purchase questions
270 because we expected that respondents would be more willing to purchase this lamb meat if
271 they were asked a general question following Cook *et al.* (2002), Mahon *et al.* (2006) and
272 Chen (2008). However, we expected that the indigenous local lamb meat would be
273 available in only some meat stores but not in the majority of them. Then, respondents who
274 would need to change the commonly used store would be less willing to purchase this meat
275 because of the loss of the shopping convenience. Then, we were interested in investigating
276 the intention to purchase under a less convenient shopping scenario. Moreover, we
277 analyzed whether the factors affecting the intention to purchase differed depending on the
278 availability of this indigenous local lamb meat in the stores.

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INSERT TABLE 2

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282 Because measuring attributes or psychological aspects such as attitudes, subjective
283 norms and perceived behavioral control is challenging (Lobb *et al.*, 2007), the definition of
284 the scales related to these aspects was based on previous empirical papers. Respondents
285 were asked to indicate their agreement or disagreement with the statements provided using
286 a five point Likert scale where one indicates strong disagreement and five, strong

287 agreement. The scale items for the attitudes towards the meat, the subjective norms and the
288 perceived behavioral control and the empirical papers used to design them are shown in
289 Table 2.

290 We can see that the average ratings for the attitudes towards lamb meat from the
291 indigenous local breed (Ojinegra) are all less than three except for “this meat has a higher
292 quality than the meat from other breeds.” Following this, consumers also agreed more with
293 the fact that “this meat is more consistent because the animal claims on the top of the
294 mountains” and “it is safer” with an average rating of 2.9, respectively.

295 Before using this scale in further analysis, the reliability of the scale was tested
296 using the Cronbach alpha. The reliability of the scale was very high with a Cronbach alpha
297 of 0.9. Moreover, the correlations among the different attitudes towards these lamb meat
298 items were calculated obtaining a high and statistically significant correlation among them.
299 Therefore, we were not able to include all the attitudes’ statements as independent variables
300 to explain the intention to purchase. Then, we conducted a factor analysis to reduce the
301 original information for the attitudes to fewer uncorrelated factors. Results showed that
302 only one factor must be extracted using the eigenvalue criteria which explained the 63% of
303 the original data variance. Before the factor analysis, we calculated the Kaiser–Meyer–
304 Olkin measure of sampling adequacy (KMO) to check whether it was appropriate to apply a
305 factor analysis for the data. The sampling adequacy was meritorious with a KMO of 0.82.
306 Then, the scores for the rotated factor were calculated and used as explanatory variables of
307 the attitudes towards the lamb meat from the indigenous local breed (Ojinegra) in the
308 subsequent model (ATTITUDE).⁶

309 The consumers’ social embeddedness (SEMBEDDEDNESS) was measured, asking
310 respondents about the importance consumers attached to purchase lamb meat produce in the
311 region, measured in a scale from one (not important at all) to five (very much important)
312 following Gracia *et al.* (2012) (Table 2). Finally, we measured the consumers’ importance
313 attached to the breed when shopping for lamb meat in a scale from one (not important at
314 all) to five (very much important) (BREEDIMPORT) (Table 2).

315

316

⁶ We also used as an indicator of attitudes towards the lamb meat the sum of all the items divided by the number of the items as do Chen (2007), and the results were similar.

317 *3.3. Model specification*

318

319 The two endogenous variables of the intention to purchase model (IP1 and IP2) are
320 discrete variables. Then, the consumer intention to purchase the lamb meat from the
321 indigenous local breed (IP) is specified as follows:

$$IP_i^* = \beta X_i + u_i \quad (1)$$

322 where X_i is a vector of all exogenous variables (consumer socio-demographic
323 characteristics, attitude beliefs towards the product, purchase attitudes, subjective norms,
324 perceived behavioral control, social embeddedness and consumers' importance attached to
325 the animal breed when shopping for lamb meat), and u_i is the error term normally
326 distributed $N(0, \sigma_u^2)$. IP_i^* is unobserved but the intention to purchase stated by the
327 individual when shopping is observed. In particular, it was measured by five levels (see
328 definition in Table 2), as follows:

329

$$\begin{aligned} IP_i &= 1 & \text{if } IP_i^* \leq \tau_1 \\ IP_i &= 2 & \text{if } \tau_1 \leq IP_i^* \leq \tau_2 \\ IP_i &= 3 & \text{if } \tau_2 \leq IP_i^* \leq \tau_3 \\ IP_i &= 4 & \text{if } \tau_3 \leq IP_i^* \leq \tau_4 \\ IP_i &= 5 & \text{if } \tau_4 \leq IP_i^* \end{aligned} \quad (2)$$

330 where τ_i are the unknown threshold parameters to be estimated. The first threshold
331 parameter is normalized to zero ($\tau_1 = 0$).

332

333 **4. Results and discussion**

334

335 The model defined by [1] was estimated for the two intention to purchase questions
336 (IP1 and IP2) using as explanatory variables the ones defined in Table 1 and Table 2 with
337 the STATA 10.0 statistical software package. The estimated parameters for the two
338 equations are presented in Table 3. We estimated the model with all explanatory variables
339 defined in Table 1 and Table 2 and even those variables which were individually and/or

340 jointly insignificant were maintained in the final estimations to compare results from both
341 intention to purchase definitions as some of the variables were not statistically significant in
342 one equation but they were in the other one.

343

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INSERT TABLE 3

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346 Related to the first intention to purchase equation (IP1), only one of the socio-
347 demographic consumers' characteristics was statistically different from zero at the 10%
348 significance level (UNIVERSITY). The positive estimated parameter for the
349 UNIVERSITY variable indicated that consumers with a higher education were more likely
350 to purchase the lamb meat from the indigenous local breed (Ojinegra). Second, as stated by
351 the theory of planned behavior, the intention to purchase lamb meat from the indigenous
352 local breed (Ojinegra) (IP1) was related to attitudes towards the product and towards its
353 purchase but contrary to expectations was not explained by subjective norms and perceived
354 behavioral control. In particular, the positive coefficient for the attitudes variable
355 (ATTITUDES) indicated that consumers' positive attitudes towards the lamb meat from the
356 indigenous local breed will increase the probability to purchase this meat. Moreover, there
357 was a significant relation between the intention to purchase lamb meat from the indigenous
358 local breed (Ojinegra) and the attitudes towards the purchase of this lamb meat (GOOD and
359 PLEASANT). Findings suggested that consumers who believed that buying lamb meat
360 from the indigenous local breed (Ojinegra) was good and pleasant were more likely to
361 purchase them. Similar findings for food products are reported in Bredahl (2001), Cook *et al.*
362 (2002), Mahon *et al.* (2006), Chen (2007, 2008), De Magistris and Gracia (2012),
363 López-Galán *et al.* (2013) and Gracia (2013).

364 The subjective norm variable (SNORM) was not statistically significant, indicating
365 that social pressure felt by the consumer had no influence on the intention to purchase those
366 products in the same way as results obtained by Ruiz de Maya *et al.* (2011) and López-
367 Galán *et al.* (2013) for organic produce, but contrary to Cook *et al.* (2002), Mahon *et al.*
368 (2006), Chen (2007, 2008) and Gracia (2013). In addition, there was no significant relation
369 between the intention to purchase lamb meat from the indigenous local breed (Ojinegra)
370 and the perceived behavior control (CONTROL and ABILITY), contrary to the Ajzen

371 (1991) theory and previous empirical papers (Bredahl, 2001; Chen, 2007, 2008; Lobb *et al.*,
372 2007; Gracia, 2013; López-Galán *et al.*, 2013). In other words, the consumers' perception
373 that it is easy (CONTROL) or difficult (ABILITY) to perform the decision did not explain
374 the intention to purchase this meat. This result indicates that no matters if consumers
375 perceive that they can easily or with difficulty to perform a behavior, because this
376 perception does not influence the intention to purchase the lamb meat from this breed. This
377 is an important result because indicated that either the social pressure made by other people
378 on the consumer or the consumers' confidence towards executing the behavior did not
379 determine the intention to purchase this lamb meat.

380 As we expected, social embeddedness (SEMBEDDEDNESS) had a positive and
381 statistically significant effect on the intention to purchase (IP1), indicating that consumers
382 engage more with farmers, food producers and the rural community; in other words,
383 consumers more socially embedded with the local community were more likely to purchase
384 lamb meat from the indigenous local breed (Ojinegra). On the other hand, the importance
385 that consumers attached to the animal breed when shopping (BREEDIMPOR) had no
386 influence on the intention to purchase this meat.

387 Similar results, with only few differences, were found for the intention to purchase
388 lamb meat from the indigenous local breed (Ojinegra) when it was not available in the store
389 they used to buy the lamb meat (IP2). First, two of the socio-demographic consumers'
390 characteristics were statistically different from zero at the 5% significance level (AGE and
391 HSIZE). The negative estimated parameter for the AGE variable indicated that older
392 consumers were less likely to purchase the lamb meat from the indigenous local breed
393 (Ojinegra). The positive estimated parameter for the HSIZE variable showed that
394 consumers living in larger households were more likely to buy this lamb meat. Second,
395 similar to the previous estimations, attitudes towards the product (ATTITUDES) and
396 towards its purchase (PLEASANT) had also a positive and statistically significant influence
397 on this intention to purchase, and subjective norms (SNORM) had no effect on this
398 intention. However, the results on the perceived behavioral control variables (ABILITY)
399 differed from the previous intention to purchase equation (IP1). Although the CONTROL
400 variable is still statistically not significant, the ABILITY variable is negative and
401 statistically significant at the 10% significant level. This last result indicated that when

402 consumers highly believed that their ability to purchase the lamb meat from the indigenous
403 local breed (Ojinegra) was low, they would be less likely to definitely purchase this meat.
404 This finding is similar to the ones obtained by Bredahl (2001); Chen (2007, 2008); Lobb *et*
405 *al.* (2007); Gracia (2013); López-Galán *et al.* (2013). Third, similar to the previous
406 intention to purchase scenario, social embeddedness (SEMBEDDEDNESS) had a positive
407 and statistically significant effect on the intention to purchase, indicating that consumers
408 engage more with farmer, food producers and the rural community; in other words,
409 consumers more socially embedded with the local community were more likely to purchase
410 lamb meat from the indigenous local breed (Ojinegra) when it was not available in the store
411 where they used to buy the lamb meat. However, in this case, consumers' importance
412 attached to the animal breed when shopping (BREEDIMPOR) had a positive and
413 statistically significant influence on the intention to purchase this meat.

414 The marginal effects were calculated to assess the magnitude of the exogenous
415 variables' effect on the intention to purchase (IP1 and IP2). In this specific case, and for the
416 continuous exogenous variables, effects were calculated by means of the partial derivatives
417 of the probabilities with respect to a given exogenous variable. In the case of dummy
418 variables, the marginal effects were calculated taking the difference between the predicted
419 probabilities in the respective variables of interest, changing from 0 to 1 and holding the
420 rest constant. The change in predicted probabilities gave a more accurate description of the
421 marginal effect of a dummy variable on event probability, than by predicting the probability
422 at the mean level of the dummy variable. The marginal effects are shown in Table 4.

423

424

INSERT TABLE 4

425

426 Results in Table 4 show that the effects of the different factors on the intention to
427 purchase were higher in the general intention to purchase scenario (IP1) than in the
428 intention when this lamb meat was not available in the store they used scenario (IP2).
429 Moreover, the most important factors affecting both intentions to purchase were different.
430 While in the first intention to purchase scenario (IP1) the most important factor was the
431 attitude towards the purchase followed by the attitude towards the product and the
432 consumers' education level, in the second scenario (IP2) the most important factors were

433 the consumers' importance given to the animal breed, the social embeddedness and the
434 attitudes towards the product with similar magnitude effects.

435 As mentioned before, Table 4 also shows that the effects of consumers' socio-
436 demographic characteristics on the likelihood to purchase lamb meat from the indigenous
437 local breed differs between the two intentions to purchase scenarios. In the first scenario
438 (IP1), results indicated that people with university studies were more likely to purchase this
439 lamb meat and the magnitude of the effect was important. However, younger consumers
440 living in larger households were more likely to definitely buy the indigenous lamb meat
441 (Ojinegra) in the second scenario (this lamb meat is not available in the store they used) but
442 the effect was rather small. On the other hand, the effect of the attitudes (towards the
443 product and its purchase) and the social embeddedness in the intention to purchase were
444 statistically significant and with the same direction under both scenarios but the magnitude
445 of the effect differed between them. In particular, an increase in the consumers' attitudes
446 toward the lamb meat from the indigenous local breed (ATTITUDES) and its purchase
447 (GOOD and PLEASANT) increased the probability to purchase this meat in both scenarios
448 but the increase was higher in the first scenario. In addition, consumers more socially
449 embedded with the local community were more likely to purchase lamb meat from the
450 indigenous local breed under both scenarios, although the magnitude of the effect was
451 higher in the second scenario, being one of the most important factors.

452 However, the impact of the perceived behavioral control, measured as the ability to
453 purchase, was statistically significant only in the intention to purchase this lamb meat when
454 it was not available in the store they used together with the importance consumers attached
455 when shopping for the breed of the animal. In particular, consumers were less likely to
456 purchase this lamb meat if they highly perceived that their ability to purchase this meat was
457 low. Moreover, consumers who attached more importance to the breed of the animal when
458 shopping for lamb meat were more likely to purchase the lamb meat from the indigenous
459 breed (Ojinegra). This is the most important factor affecting this intention (IP2). Then, we
460 can conclude that the perceived ability to purchase the product affects the intention to
461 purchase only when its availability in the market is rather limited.

462
463

464 **5. Conclusions**

465
466 Results provided evidence on consumers' intention to purchase a lamb meat from an
467 indigenous breed (Ojinegra) because 86% of respondents indicated that they probably or
468 definitely would buy this lamb meat, although only around 25% would buy it if this meat
469 was not available in the store where they usually buy the lamb meat. Then, findings
470 suggested that there is a segment of consumers' willing to buy this lamb meat but the size
471 of the segment differs depending on the availability of the meat in the market. Then,
472 availability of the meat in the stores is an important factor to enhance the consumption of
473 this autochthonous local lamb meat.

474 In addition, to increase the size of the segment willing to buy this meat even in the
475 situation that they should go to another meat store, one appropriate food policy would be to
476 inform consumers about the importance of the animal breed in the quality of the final lamb
477 meat because results indicated that consumers will more probably purchase this indigenous
478 local lamb meat if they attach higher importance to the animal breed. The new regulation
479 (R.D 2129/2008, December 26th) on conservation, improvement and promotion of animal
480 breeds is a first step in this direction but it should be accompanied by an information
481 campaign on the benefits of the promoted breeds for the farmers and the agricultural
482 biodiversity and the impact of the breed in the final meat. Consumers in this segment were
483 characterized by a higher social embeddedness with the local area and more positive
484 attitudes towards the purchase of this meat and towards the meat. Then, producers could
485 take advantage of these results and to implement and promote this indigenous lamb meat
486 using the new voluntary label system regulated by the National Government R.D.
487 505/2013, 28th June on the use of the logo "100% autochthonous breed" for animal
488 products (100% raza autóctona, in Spanish). This regulation established the regulatory
489 framework for the voluntary use of an autochthonous breed logo which recognizes products
490 from pure indigenous native breeds in the labelling of the product and the places where this
491 meat can be bought. The promotion of this labelled meat should communicate the
492 specificities of the breed and the benefits to the environment. In order to make this meat
493 more visible in the market, the producers association (AGROJI) could develop several
494 agreements with different meat stores in the town as did with a high standing restaurant
495 located in the center of the town where the product is already available.

496 Last, this work poses some limitations that must be taken into account and will
497 constitute further research on the topic. The main methodological limitation of the analysis
498 is the possible hypothetical bias due to the use of a stated question for the intention to
499 purchase. In addition, although the intention to purchase is a good predictor of final
500 behavior, the analysis should be also extended to analyze not only the intention to purchase
501 these products but also their final purchase.

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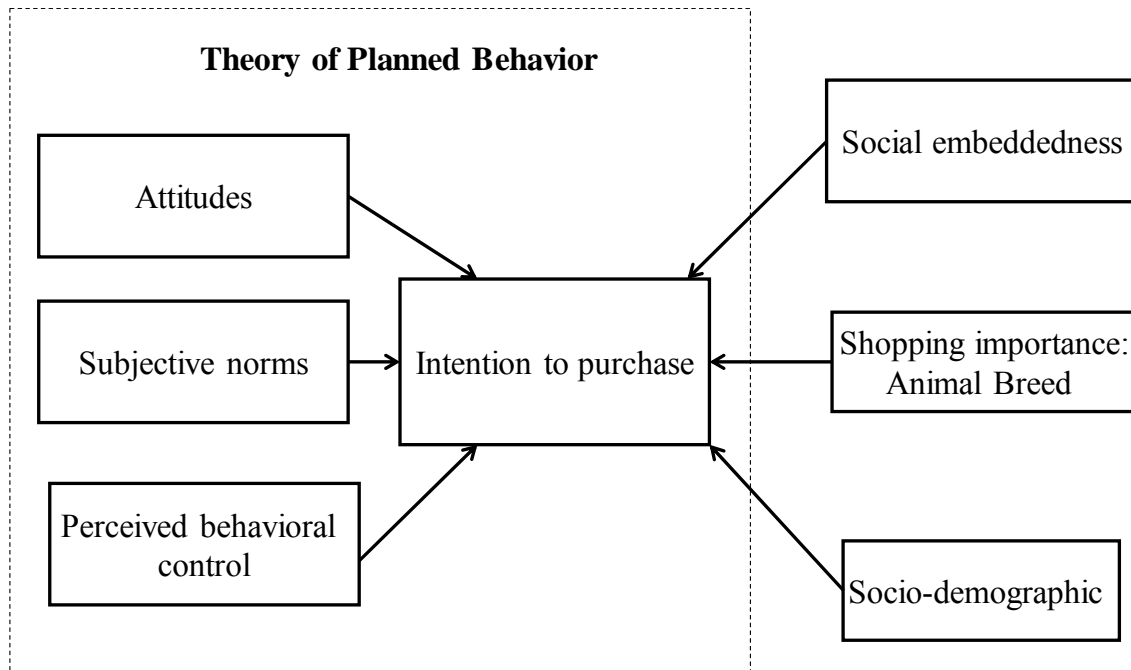
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Figure 1. Model on intention to purchase lamb meat from the indigenous local breed (Ojinegra)



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Table 1. Sample characteristics (% , unless stated)

Variable definition	Name (type)	Value	Population
Gender			
Male		24.3	49.9
Female	FEMALE(dummy)	75.7	50.1
Age (Average from total sample)	AGE (continuous)	48.8 (14.9)	49.9
Household Size (Average from total sample)	HSIZE (continuous)	3.2 (1.3)	Na
Education of respondent			
Elementary		41.3	34.1
Secondary		33.6	41.4
University	UNIVERSITY (dummy)	25.1	24.4
Average Household Net Income			
Households with net income lower than 1,500 €/month		19.8	Na
Households with net income between 1,500 and 2,500 €/month	LINCOME (dummy:1 if income less than 1,500 €)	35.1	Na
Households with net income between 2,500 and 3,500 €/month		31.3	Na
Households with net income more than 3,500 €/month		13.8	Na

721 Standard deviations are in parenthesis; Na: not available

722 Note: for education and income, university studies and income lower than 1,500 €/month are the reference levels

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Table 2. Variables definition: Extended Theory of Planned Behavior model

Variable definition	Sources	Name	Value
Endogenous variable: Intention to purchase lamb meat from the indigenous local breed (Ojinegra)			
<i>Would you purchase lamb meat from the indigenous local breed (Ojinegra)?</i>			
Definitely no	Cook <i>et al.</i> (2002)	IP1	2.5%
Probably no	Mahon <i>et al.</i> (2006)		1.2%
Indifferent	Chen (2008)		20.3%
Probably yes			43.4%
Definitely yes			32.6%
<i>Would you purchase lamb meat from the indigenous local breed (Ojinegra) if it is not available in the meat store you usually buy the lamb meat?</i>			
Definitely no	Cook <i>et al.</i> (2002)	IP2	25.8%
Probably no	Mahon <i>et al.</i> (2006)		21.5%
Indifferent	Chen (2008)		29.3%
Probably yes			15.6%
Definitely yes			7.8%
Exogenous variables			
<i>Attitudes towards lamb meat from the indigenous breed (Ojinegra)</i>			
It is more consistent because the animal claims on the top of the mountains		ATTITUDES	2.9 (1.25)
It is similar to the meat from other breeds			2.4 (1.03)
It has a higher quality than the meat from other breeds			3.1 (1.23)
It is safer			2.9 (1.29)
It enhances the economic development of the rural area			2.7 (1.15)
It contributes to the employment in the rural area			2.6 (1.15)
It is less expensive			2.3 (1.07)
<i>Attitudes towards the purchase of the lamb meat from the indigenous local breed</i>			
I believe that buying lamb meat from the indigenous breed (Ojinegra) is good	Bredahl (2001)	GOOD	3.5 (0.81)
I believe that buying lamb meat from the indigenous breed (Ojinegra) is pleasant	Chen (2007) Chen (2008)	PLEASANT	3.5 (0.77)
<i>Subjective norm</i>			
Most people who are important to me think that I should buy lamb meat from the indigenous breed (Ojinegra)	Bredahl (2001) Chen (2007) Chen (2008)	SNORM	2.8 (1.06)

Perceived behavioral control

Whether I will eventually buy lamb meat from the indigenous local breed (Ojinegra) is entirely up to me	Bredahl (2001)	CONTROL	2.9 (1.27)
If this meat was available in the shops, I do not think I would ever be able to do so	Chen (2007) Chen (2008)	ABILITY	2.4 (1.03)

Consumers' importance attached to:

Regional origin of the lamb meat		SEMBEDDEDNESS	3.5 (1.16)
Breed of the lamb meat	Gracia <i>et al.</i> (2012)	BREEDIMPOR	2.3 (1.22)

743 Standard deviations are in parenthesis

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746 Table 3. Estimates of the PROBIT model: Intention to purchase lamb meat from the
747 indigenous local breed (Ojinegra) in Spain

Coefficients	IP1		IP2		
	Estimates	t-ratio	Estimates	t-ratio	
INTERCEPT	-1.70	-3.14 **	-2.1174	-4.28 **	
FEMALE	-0.0104	-0.07	-0.0828	-0.60	
AGE	0.0029	0.71	-0.0096	-2.45 **	**
HSIZE	-0.0760	-1.48	0.1051	2.17 **	**
LINCOME	0.0904	0.56	-0.1124	-0.73	
UNIVERSITY	0.2518	1.67 *	0.2058	1.48	
ATTITUDES	0.2752	3.88 **	0.1691	2.51 **	**
GOOD	0.3543	3.54 **	0.1273	1.37	
PLEASANT	0.6926	6.64 **	0.3018	3.18 **	**
SNORM	-0.0056	-0.09	-0.0697	-1.16	
CONTROL	-0.0601	-1.08	0.0173	0.34	
ABILITY	0.1027	1.55	-0.1110	-1.78	*
SEMBEDDEDNESS	0.2063	3.53 **	0.3052	5.38 **	**
BREEDIMPOR	-0.0475	-0.86	0.3602	6.83 **	**
N	399		399		
Log Likelihood	-379.99		-518.94		
Threshold parameter 2	1.95	3.64 **	2.8484	5.81 **	**
Threshold parameter 3	3.31	6.21 **	3.8692	7.59 **	**
Threshold parameter 4	4.87	8.74 **	4.8213	9.02 **	**

748 (**)(*) denotes statistical significance at 5% and 10% significance levels

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Table 4. Marginal effects on the ordered PROBIT equations IP1 and IP2

Variables	Prob IP1=1	Prob IP1=2	Prob IP1=3	Prob IP1=4	Prob IP1=5
FEMALE	0.0001	0.0001	0.0023	0.0009	-0.0035
AGE	-0.0000	-0.0000	-0.0007	-0.0003	0.0010
HSIZE	0.0011	0.0009	0.0169	0.0066	-0.0256
LINCOME	-0.0012	-0.0010	-0.0197	-0.0089	0.0309
UNIVERSITY	-0.0031	-0.0026	-0.0529*	-0.0292	0.0878*
ATTITUDES	-0.0040*	-0.0033*	-0.0613*	-0.0240*	0.0925*
GOOD	-0.0051*	-0.0042*	-0.0789*	-0.0309*	0.1191*
PLEASANT	-0.0099*	-0.0083*	-0.1543*	-0.0604*	0.2329*
SNORM	0.0001	0.0001	0.0013	0.0005	-0.0019
CONTROL	0.0009	0.0007	0.0134	0.0052	-0.0202
ABILITY	-0.0015	-0.0012	-0.0229	-0.0090	0.0345
SEMBEDDEDNESS	-0.0030*	-0.0025*	-0.0460*	-0.0180*	0.0694*
BREEDIMPOR	0.0007	0.0006	0.0106	0.0041	-0.0160
	Prob IP2=1	Prob IP2=2	Prob IP2=3	Prob IP2=4	Prob IP2=5
FEMALE	-0.0238	-0.0091	0.0117	0.1570	0.0055
AGE	0.0027*	0.0011*	-0.0013*	-0.0019*	-0.0007*
HSIZE	-0.0297*	-0.0120*	0.0143*	0.0202*	0.0073*
LINCOME	0.0326	0.1208	-0.0163	-0.0211	-0.0073
UNIVERSITY	-0.0554	-0.0256	0.0245*	0.0406	0.0158
ATTITUDES	-0.0478*	-0.0193*	0.0230*	0.0325*	0.0117*
GOOD	-0.0360	-0.0146	0.0173	0.2444	0.0088
PLEASANT	-0.0853*	-0.0345*	0.0410*	0.0580*	0.0208*
SNORM	0.0197	0.0080	-0.0095	-0.0134	-0.0048
CONTROL	-0.0049	-0.0020	0.0023	0.0033	0.0012
ABILITY	0.0313*	0.0127	-0.0157*	-0.0213*	-0.0077*
SEMBEDDEDNESS	-0.0862*	-0.0349*	0.0415*	0.0586*	0.0211*
BREEDIMPOR	-0.1018*	-0.0412*	0.0490*	0.0692*	0.0249*

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Appendix. Population in Spain and the town

799 Table A. Population by gender and age in Spain and the town (%)

	Total	Gender		Age				
		Female	Male	0-19	20-34	35-54	55-64	More than 64
Spain	46,148,605	50.99	49.01	19.88	20.80	31.10	11.05	17.14
Town	952,383	50.90	49.10	18.46	19.63	30.83	11.64	19.42

800 Source: INE (2012)
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