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Consumer trust in organic food and organic certifications in four European countries

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1 Title: Consumer trust in organic food and organic certifications in four
2 European countries.

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17 **Highlights:**

- 18 • *Consumer trust and preferences in organic food differs significantly between*
19 *the four countries.*
20 • *Recognition is vital in consumer trust of organic certification.*
21 • *Countries differ on their preference of national and EU-level certification.*

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32 Abstract:

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34 As the European organic market accelerates its growth, consumers are increasingly
35 looking for produce that can be trusted, sustainably produced and environmentally
36 friendly. Over the last decade, organic research has shifted to faster growing markets
37 in Asia, despite fraudulent organic food still being an issue in Europe. This study
38 addresses this gap by investigating the differences in consumers trust in organic meat
39 and vegetables across 4 European Countries (Germany, Italy, Poland and the UK). In
40 this study an online cross-sectional survey utilising validated tools was designed and
41 data collected from 2071 respondents, approximately representative in terms of
42 gender, age and region per country. Results identified between country differences in
43 trust and beliefs in the 'organicness' of the produce. Overall, consumers had a high
44 levels of trust in certified organic food chain and produce, and strong beliefs in the
45 benefits of certification bodies; however this differed between countries. Italy and
46 Poland respondents reported higher overall trust and preferred EU certification; whilst
47 the UK and Germany reported lower trust and preferred their national certification
48 bodies. Similarly, there were interesting differences between the products and national
49 preferences. The findings highlight opportunities especially in Germany and the UK,
50 for private industry, national and world-level bodies to improve the sustainability and
51 growth of the organic food market.

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67 Introduction

68 In the current “fake news” world, it is important that consumers trust that the organic
69 food they buy is both safe to eat and authentically organic. There are increasing
70 financial motivations for fraudulent organic food due to several consumer-led factors,
71 including increasing consumer investment in reducing their environmental impact,
72 improving sustainability and desiring higher animal welfare standards (Rana & Paul,
73 2017). For example, in 2019, the European Commission and Operation OPSON VIII
74 seized/downgraded 186 tonnes of produce fraudulently masquerading as organic
75 (European Union Food Fraud Network, 2020). Organic fraud can be difficult to detect
76 as “Organicness” is undetectable by consumers at purchase, requiring consumers to
77 place their trust in the food chain actors responsible for certifying the products.
78 Despite this, due to the greater controls and certification involved, organic produce is
79 still regarded as less vulnerable than conventional produce to authenticity and fraud
80 concerns (Van Ruth & De Pagter-De Witte, 2020).

81 Reviews have consistently found that consumers who purchase organic produce are
82 skewed in certain demographics, with age (usually older but mixed findings), sex
83 (female), income (higher), education (higher education) and marital status (married)
84 more likely to purchase organic food (Gumber & Rana, 2019; Rana & Paul, 2017).
85 Similarly, consumer’s regional and national identities have been shown to affect
86 consumer’s beliefs for purchasing organic produce (Rana & Paul, 2017). For example,
87 while perceived healthiness was a common rationale for buying organic food in most
88 countries, ethical commitment in Italy (Pino et al., 2012) and higher perceived
89 knowledge in the UK have been identified as national priorities influencing purchase
90 of organic food (Gad Mohsen & Dacko, 2013). Other factors, such as the increase in
91 disposable income, have contributed to a growth of organic food purchasing in
92 countries like Germany (Kriwy & Mecking, 2012). As organic produce increases in
93 popularity, greater efforts have been made in Europe to ensure organic food is
94 authentically organic. This places a greater reliance on the level of trust in the organic
95 certification systems. Previous studies have shown that trust in organic certification
96 logos play a large role in influencing consumer to purchase organic produce (Zanoli
97 et al., 2015).

98 Research on the level of trust in organic food in EU countries has mainly been
99 conducted prior to the setting up of the EU organic produce certification labelling (EC
100 889/2008) legislation in 2010 (Aertsens et al., 2009; Hemmerling et al., 2015), or has
101 focused on non-EU countries (Rana & Paul, 2017). To address this knowledge gap, this
102 study investigated the current level of trust in organic food and organic certification
103 bodies in four European countries (Germany, Italy, Poland and the UK). To provide an
104 overview of the overall EU market, the four countries were chosen based on their
105 organic food backgrounds: ranging from the well-established organic food market in
106 Italy, the skepticism of the well-developed German and UK markets to the rapidly
107 developing market in Poland.

108 The UK and Germany have historically well-developed organic food markets, which
109 have experienced multiple (non-organic) food safety issues in the recent past;

110 including Bovine Spongiform Encephalopathy (BSE) outbreaks in the 1990's (UK) and
111 early 2000's (Germany)(Buschmann et al., 2007; Smith et al., 2007) and the "horsemeat"
112 scandal in the UK (Elliott, 2014; Tse et al., 2016). These events can affect consumer
113 confidence and trust in the safety and authenticity of their food (Dolgopolova et al.,
114 2015; Poppe & Kjærnes, 2003). Previous trust research identified the UK and Germany
115 as countries with low levels of overall trust and trust in food (Murphy et al., 2020).
116 However, organic food is an industry more tightly regulated and involves higher levels
117 of certification by multiple organisations (Van Ruth & De Pagter-De Witte, 2020). In
118 addition, due to the UK leaving the EU (Brexit), the role of the national certification
119 body (The Soil Association) is expected to increase substantially over the next decade
120 (Askew, 2020).

121 Italy has a reputation as having a strong organic market with enthusiastic consumers
122 of both organic and nationally-sourced produce, and high levels of awareness of
123 organic certification (Annunziata & Vecchio, 2016; Janssen & Hamm, 2012b).
124 Therefore, it is expected to provide the highest levels of trust and beliefs in organic
125 produce. Poland is, on the other hand, a rapidly developing new consumer market for
126 organic food, with the value of the organic market increasing from €1.5m in 2004 to
127 over €235m in 2017 (Pawlewicz et al., 2020). This market has been supported by newly
128 available European grants and funding for organic food and better farming
129 infrastructure (Łuczka & Kalinowski, 2020). Poland has also experienced less high-
130 profile food fraud/safety scandals in the recent past than the other included countries.
131 Poland provides the perspective of an EU 2004 expansion country in this study; who
132 have minimal organic food trust research since accession and have been identified as
133 a key area of growth for trust research; as well as organic food consumption and
134 production (Łuczka & Kalinowski, 2020). Thus, this study aims to identify and
135 understand the differences in levels of organic food trust across the four European
136 countries.

137 Trust is a diffuse and complex concept, which is measured and conceptualised
138 differently across disciplines. We defined trust as "the willingness of a party to be
139 vulnerable to the actions of another party based on the expectation that the other will
140 perform a particular action important to the trustor, irrespective of the ability to
141 monitor or control that other party" (Mayer et al., 1995). More specifically in consumer
142 trust, it can be disaggregated into 1) *general trust* - how trusting an individual is of
143 others, 2) *food chain trust* - trust in food chain actors, 3) *organisational trust* - trust
144 related to food organisations and 4) *product trust* - trust in specific food products,
145 trust constructs (Benson et al., 2020; Macready et al., 2020). In this study, we utilised
146 the validated Trust Toolkit (Benson et al., 2020) to explore the differences in these trust
147 constructs across the four countries in relation to organic food.

148 The study will test the following hypotheses:

149 Based on previous findings we expect levels of trust to differ between countries.

150 *Hypothesis 1: Consumer levels of trust (general trust, organisational trust, food chain*
151 *trust and product trust) relating to organic food will significantly differ across the four*
152 *EU countries.*

153 Further, we envisage that consumer trust in the product (organic meat and vegetables)
154 will be correlated with the other trust constructs. Previous research has shown that
155 trust in EU beef burgers was strongly correlated to individuals levels of trust in the
156 chain, organisations and general levels of trust (Murphy et al., 2020).

157 *Hypothesis 2: The consumer trust in organic food products will be significantly*
158 *correlated with their level of general trust, their level of organisational trust and their*
159 *level of trust in the involved food chain actors.*

160 Fruit and vegetables are the most routinely purchased organic produce, while organic
161 meat produce are less routinely purchased (Vukasovič, 2016). However, how trust
162 impacts the consumer's beliefs on the "organicness" of vegetable and meat products
163 is not clear. In non-organic/conventional vegetable and meat products, national level
164 differences have been shown in both beef and vegetables. When asked about the
165 safety of their European conventional beef, UK consumers reported the highest level
166 of trust, whilst Germany and Italy had the two lowest trust levels (Poppe & Kjærnes,
167 2003). Germany and Italy also reported the lowest trust levels of fresh vegetables (and
168 fruit) (Poppe & Kjærnes, 2003). In previous organic research, organic beef trust
169 (vegetables not reported) was substantially higher in organic compared to
170 conventional beef in West Germany, East Germany and Italy (20%, 16% & 17% to 31%,
171 33% & 28% respectively) (Poppe & Kjærnes, 2003). However, trust differences in
172 different organic products have not been investigated. Therefore, we anticipate
173 difference in product trust between meat and vegetable respondents.

174 *Hypothesis 3: The level of trust in organic meat would be significantly different to the*
175 *level of trust in organic vegetables.*

176 The "organicness" of food is primarily communicated through the use of organic and
177 eco-labelling (Yokessa & Murette, 2019). These eco-labels "attempt to provide
178 relevant, accurate, and meaningful information to allow purchasers to incorporate
179 healthiness and environmental considerations as part of the routine purchasing
180 decision" (Case, 2004). More specifically in organic, these labels are to convince the
181 consumers to trust the product they are buying have faithfully followed the procedures
182 to be certified organic (Janssen & Hamm, 2012a). Within the EU, this is shown by the
183 "EU leaf" label. Therefore, having trust in organic certification and labelling is a
184 fundamental component in purchase intention and the profitability of organic produce
185 (Karstens & Belz, 2006). This research focused on the role of trust in this certification
186 as a main mediator of trust.

187 Since 2010, the EU leaf has been the mandatory organic label across the union, which
188 certifies organic produce; grown/bred within or outside the EU. This is under the
189 jurisdiction of the European Commission who certifies the product is at least 95%
190 organic and the remaining 5% is closely controlled. The 5% must not be from a
191 prohibited list or from genetically-modified sources (EC 889/2008). At the time of data

192 collection (October 2019), all included countries were part of the EU for organic food
193 legislation.

194 However, across Europe (and the world), there is a proliferation of logos (both organic
195 and other “eco-labels”), which can be confusing for consumers (Kuchler et al., 2020).
196 These organic and eco-organizations at national, international and industry levels
197 range from organisations which; do not fully conform to EU certification (e.g. Neuland
198 in Germany (Neuland, 2021), which still allows chemical fertilisers and plant protection
199 products), match/slightly exceed EU certification (Soil Association in the UK; (Soil
200 Association, 2021) and those who go further beyond in certain respects (Demeter;
201 (BDA Certification, 2021) less additives amongst other standards). This proliferation of
202 organisations and labels can make it difficult for the consumer to identify and
203 recognise the role of the logo/organisation (Aarset et al., 2004; Kuchler et al., 2020).
204 For example, in 2013 (2 years after the introduction of the new EU-leaf), only 15% of
205 German consumers were aware of the EU-leaf, while 75% were familiar with the
206 German national ‘Biosiegel’ (Meyer-Höfer & Spiller, 2013). However, organic
207 certification and recognition have increased greatly since these studies. Therefore, we
208 investigated the relationship between consumer’s recognition and trust both between
209 and within countries, of organic certification, and to identify differences in national
210 and European certification preferences.

211 *Hypothesis 4: Consumers’ recognition of national/industry certification bodies and the*
212 *EU Commission certification body (EU Leaf) relating to organic food will be*
213 *significantly different between and within the four EU countries.*

214 Overall, this study aims to update the literature on European organic food trust,
215 establish the main correlates on what is important in developing food trust, identify
216 potential differences in trust in organic meat and vegetables, and distinguish
217 consumer beliefs on national and European certification bodies.

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228 Materials and Methods

229 Procedure and Participants

230 A survey was conducted with respondents recruited by an external research agency
231 (Dynata) from their online panel of consumers in Germany, Italy, Poland and the UK in
232 October 2019. Quota sampling was used to ensure sufficient variance in the dependent
233 and independent variables. The sample fitted the following criteria (a) each respondent
234 had some responsibility for purchasing groceries in their household (b) at least 60%
235 of the respondents purchased organic food at least "several times a month" and (c)
236 there was roughly the same percentage of respondents from higher- and lower-social
237 class households. The participants were randomly split into 2 groups, where half of
238 respondents answered questions related to organic meat, and the other half answered
239 questions related to organic vegetables. To reduce bias, anyone aged under 18 or
240 working in (or living in a household with anyone working in) food safety, food
241 processing or manufacturing as well as farming, growing, wholesale or retail of food
242 or drinks were excluded. Demographic details and characteristics of the respondents
243 are detailed in Table 1. Ethical approval was granted by the Queen's University Belfast
244 School of Biological Sciences Research Ethics Committee (Approval N.09/19/MurphyB;
245 September 2019).

246 Measures

247 The survey composed of 3 sections: beliefs of organic certification and bodies,
248 components of the Trust Toolkit (Benson et al., 2020) and socio-demographic
249 characteristics.

250 Respondents were assessed on their trust and beliefs in organic certification bodies;
251 specifically the European Commission's EU-leaf (EC 889/2008), which covers all EU
252 organic produce, and a National organic certification body in each of the 4 countries:
253 Germany (Bundesverband der Öko-Kontrollstellen, BVK), Italy (Ministero delle politiche
254 agricole alimentari e forestali, MIPAAF), Poland (Ekoland) and the UK (Soil Association);
255 hereby referred to as "national organic certification bodies".

256 Within the UK, the charity organisation, the Soil Association, is the biggest and most
257 recognisable certifier of organic food, albeit with low overall recognition (Gerrard et
258 al., 2013); while in Germany, the "Bundesverband der Öko-Kontrollstellen" (BVK), is a
259 voluntary organic organisation which indicates organic production and processing in
260 Germany. It uses the 'Biosiegel' logo. Both have been used in previous organic research
261 (Zander et al., 2015). Previous research has shown German respondents preferred their
262 national bodies rather than EU bodies (Janssen & Hamm, 2014). Italy and Poland
263 however lack singular nationally recognised organic certification bodies (Zander et al.,
264 2015), and EU organic labelling (EC 889/2008) is the most prominent (Janssen &
265 Hamm, 2012a; Kowalska, 2018). Therefore, in Italy, the Ministero delle politiche
266 agricole alimentari e forestali (MIPAAF), a governmental body involved in organic
267 certification was chosen as it would have a higher recognition rate than the
268 certifications from a multitude of minor industry stakeholders in Italy (under
269 advisement from organic food experts in Italy). While in Poland, the industry brand

270 “Ekoland” was chosen as the comparator due to its high level of recognition and its
271 use in previous organic research (Zander et al., 2015; Zuba-Ciszewska et al., 2019).

272 Respondents were asked on 7-point semantic-differential scales whether the product
273 was; to be trusted, proven (organic), traceable, good/bad and their recognition of the
274 logo shown. Scales were scored to indicate higher levels of trust from higher scores.
275 These items were adapted from Spence et al., (2018)

276 Trust in organic meat and vegetables, as well as the trust in relevant actors were
277 measured using four constructs; adapted from the Trust Toolkit. Each item (39 items)
278 was rated on a 7-point semantic-differential scales ranging from ‘strongly disagree’ (1)
279 to ‘strongly agree’ (7). Scales were scored such that higher scores indicated higher
280 levels of trust. The four constructs included:

- 281 • *General trust. Trust at the individual level. How trusting an individual is in*
282 *general as a person. Which contained 5 items, such as ‘Most people are basically*
283 *honest’.*
- 284 • *Organisational trust. How much an individual trusts an organisation in terms of*
285 *a specific area or to perform a specific task. Which contained 7 items, such as*
286 *‘Farmers are honest about the safety of food’.*
- 287 • *Food chain trust. How much an individual trusts the actors or organisations*
288 *involved in food production. Which contained 17 items, such as ‘(National*
289 *organic certification body) has practices that favour the consumer’s best*
290 *interests’.*
- 291 • *Product trust. How much an individual trusts a specific product (organic meat*
292 *and vegetables). Which contained 10 items, such as ‘I trust that organic*
293 *meat/vegetables are authentic’.*

294 Socio-demographic data collected included sex, age, educational attainment, marital
295 status, number of children under 16, employment status and frequency of organic
296 meat/vegetable purchase.

297 Data analysis was conducted using IBM SPSS Statistics v25. As forced response options
298 were used in the survey, no data was missing. Descriptive statistics were used to
299 explore the data. Groups were compared using T-tests and Chi² tests. Between- and
300 within-country differences were assessed using Analysis of Variance (ANOVAs) with
301 Bonferroni post-hoc tests. All analysis was considered significant at a level of 0.05 or
302 Bonferroni equivalent ($p < 0.0125$). Pearson’s correlations were used to assess
303 relationships between the trust constructs.

304 A statistical power analysis was performed for sample size estimation, comparing trust
305 profiles between countries; which was able to detect small effect sizes (0.20: (Cohen,
306 1988). With an alpha = 0.05 and power = 0.85, the projected sample size needed with
307 this effect size (Faul et al., 2007) was n=450 per group. Therefore, the sample size of
308 2071 was suitably powered for the analysis conducted.

309 Results

310 In total, 2071 individuals participated in the survey: approximately nationally
311 representative in terms of gender, age and region. The 2071 respondents were split
312 equally across the 4 countries (UK = 508; Germany = 510; Italy = 514, Poland = 539),
313 had a mean age of 46.82 years (SD= 16.35, range= 18 to 85) and were majority female
314 (52.8%), Table 1. In total, 1036 respondents answered questions on organic meat and
315 1035 respondents answering questions on organic vegetables. The results relating to
316 meat and vegetables are reported separately, although the overall findings are similar.
317 The majority of respondents in the study tended to be: well educated, no children
318 under 16 in their home, married and worked full-time or had retired. Due to the topic
319 of interest (organic food), this was as expected.

320 *TABLE 1*

321 There were significant differences between countries on all four trust constructs as
322 determined by ANOVA [General (F(3,2067)=7.523, $p<0.001$), [Chain (F(3,2067)=8.221,
323 $p<0.001$), [Product (F(3,2067)=20.615, $p<0.001$), [Organisational (F(3,2067)=30.823,
324 $p<0.001$)], Figure 1 and Supplementary Table 1. For organic meat, the UK participants
325 had the highest levels of general trust, while Germany consistently had the lowest trust
326 in all four constructs. Italy had the highest levels of trust in the food chain, trust in
327 organisation and trust in the product for organic meat. For organic vegetables, the
328 results were mixed, with the UK reporting the highest level of food chain trust, Italy
329 reporting the highest levels of organisational trust and product trust, Figure 1.
330 Therefore, hypothesis 1 - *Consumer levels of trust (general trust, organisational trust,*
331 *food chain actor trust and product trust) relating to organic food differed across the*
332 *four EU countries* - was supported.

333 *FIGURE 1*

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335 As expected, chain, organisation and general trusts were significantly correlated with
336 product trust ($r=0.594$, $p<0.001$; $r=0.698$, $p<0.001$; $r=0.550$, $p<0.001$ respectively),
337 Table 2. Those who trusted organic meat and vegetables also trusted the national
338 certification bodies, farmers, and other individuals (general trust) *Therefore,*
339 *hypothesis 2 - consumer trust in organic food products will be significantly correlated*
340 *with their level of general trust, their organisational trust and their level of trust in the*
341 *involved food chain actors* - was supported.

342 *TABLE 2*

343

344 There were no statistically significant differences in general, organisational or chain
345 trust between meat and vegetables in all countries (Figure 1). However, there was a
346 significant difference in product trust, with organic vegetables being trusted more
347 than organic meat, as determined by ANOVA ($F(3,2067)=20.615$, $p=0.012$). However,
348 at a country-specific level, only German participants trusted organic vegetables
349 significantly more than organic meat, as determined by an independent t-test
350 ($t(508)=-3.509$, $p<0.001$). The other three countries showed no significant differences
351 in product trust between organic meat and organic vegetables. Therefore, hypothesis
352 *3-The level of trust in organic meat would be significantly different to the level of trust*
353 *in organic vegetables* – was partially supported.

354 Overall, both national and EU organic certification were seen as traceable
355 (National=5.08; EU=4.99), trustworthy (National=5.20; EU=5.04), proven
356 (National=5.20; EU=5.06), good (National=5.27; EU=5.15) and was recognised
357 (National=5.15; EU=5.99) by participants, Table 3. However, there were significant
358 differences between countries on consumer perceptions (traceable, trustworthy,
359 proven and good) and recognisability. For both national and EU certification, Italy
360 recorded the highest scores on traceability, trustworthiness and proven (to be organic).
361 Germany recorded the lowest scores on trust (for national certification) and traceability
362 (national and EU certification). The UK recorded the lowest scores for all EU
363 certification values (except traceability where UK and Germany were both low).
364 Furthermore, within each country there were significant differences between scores for
365 the national and EU certification values, Table 3. There was a clear split between
366 countries, while Germany and the UK preferred their national certification, Italy and
367 Poland preferred EU certification. *Therefore, hypothesis 4 - Consumers' recognition of*
368 *national/industry certification bodies and the EU Commission certification body (EU*
369 *Leaf) relating to organic food will be significantly different between and within the*
370 *four EU countries* - was supported.

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TABLE 3

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379 Discussion

380 The results show that consumers reported strong levels of trust in organic food in all
381 four countries: with Italy and Poland consistently reporting higher levels of trust on all
382 the trust constructs than the UK and German respondents. Consumer product trust
383 from all countries was significantly correlated with the other trust constructs (general,
384 organisation and chain trust). However, the nature of the produce (organic meat or
385 organic vegetables) had minimal significant effect on trust in the four countries.
386 However, in a within-country context, only in Germany a significant difference between
387 organic vegetables and organic meat trust was found. Finally, there was a clear
388 demonstration of a dichotomy of preference for national or EU certified produce
389 between the countries.

390 The nationality of the consumers played a large role in how much they trusted organic
391 food. There was a dichotomy between the "lower trust" countries (Germany and the
392 UK) and the "higher trust" countries (Italy and Poland). Previous research showed the
393 UK and Germany as "lower food trust" European countries (Janssen & Hamm, 2012b,
394 2014; Murphy et al., 2020). However, trust in organic meat and vegetables in Germany
395 and the UK was higher in this study than in conventional EU beef burgers in a
396 comparable study by Murphy et al. (2020). The countries where trust was higher, Italy
397 has a long history of organic and nationally-developed produce (Annunziata &
398 Vecchio, 2016), and Poland, a rising consumer market for organic food (Pawlewicz et
399 al., 2020), that may be more trusting. That the most historic and newest organic
400 countries were the most trusting indicates that there may be multiple ways of
401 marketing and developing consumer trust, which should be explored. This study
402 highlights the need for different marketing and trust-building interventions in
403 different countries. However, there is a need for further research using qualitative
404 methodologies, to disentangle this area and explore ways of increasing trust in
405 certified organic produce.

406 The study found that those who had high levels of trust in the organic farmers and the
407 National Organic Food organisations also had high levels of trust in organic food.
408 Previous research had shown trust in farmers as the most important predictor of
409 consumer confidence in the safety of food products (de Jonge et al., 2008). As safety
410 not being a salient issue in organic food (Van Ruth & De Pagter-De Witte, 2020), trust
411 may be transferred to certifying organisations. Trust in organic certification has been
412 shown as a fundamental part in consumers purchase intention and the general
413 profitability of organic produce (Karstens & Belz, 2006; Zanolli et al., 2015). Improving
414 awareness of the processes undertaken by organic farmers to grow/breed organic
415 produce, and the extensive procedures in place to regularly check farms and test
416 products to ensure the "organicness" of the produce (Padel, 2010), are key areas that
417 can improve product trust and organic sales. Interestingly, those with higher levels of
418 general trust (trust in other people) also trusted organic product more. This is different
419 to our previous research on non-organic EU beef burgers (Murphy et al., 2020),
420 suggesting organic produce trust is more personality-based than conventional food

421 trust. However, further investigation is needed in ascertaining the reasons for the
422 difference.

423 There were no differences in trust between organic meat and organic vegetables in
424 any country except Germany. The reason for the difference in Germany specifically is
425 unclear. However, trust in Germany is general low (Murphy et al., 2020). This is a novel
426 finding, as previous research has not looked specifically at differences between organic
427 meat and vegetables. Historical issues in fraudulent meat across Europe, such as
428 scandals involving BSE (Buschmann et al., 2007; Smith et al., 2007), horsemeat (Elliott,
429 2014; Tse et al., 2016), and Parma ham (Marks & Paravicini, 2017) would suggest a
430 lower level of trust in organic meat compared to organic vegetables. Research in
431 conventional food research has highlighted how belief and trust in the safety of the
432 produce is vital for sales. In 2003, Germany (and Italy) had the lowest trust levels in the
433 safety of their beef and vegetables in Europe (Poppe & Kjærnes, 2003). However,
434 organic produce may be more resistant to safety concerns, due to higher perceptions
435 of food safety (Poppe & Kjærnes, 2003) and perceptions of reduced fraud vulnerability
436 (Van Ruth & De Pagter-De Witte, 2020) than conventional produce. In light of this, our
437 research shows that organic certification is more closely linked to increasing consumer
438 trust in food safety than previously shown (Poppe & Kjærnes, 2003). However, as this
439 study did not measure trust in food safety explicitly, future research should investigate
440 this unexpected novel finding further.

441 While Italian and Polish consumers preferred EU-level certification, German and UK
442 consumers trusted their own certification bodies more. This highlights nationality as a
443 strong predictor of trust in organic food and therefore the need for more national
444 specific marketing strategies. The national differences observed could be argued to be
445 the selection of national bodies (governmental, charity or industry) affecting consumer
446 trust. However, both in Germany (BVK) and Italy (MIPAAF) state bodies, which were the
447 nearest approximation to national organic food regulators were selected. Whilst in the
448 UK, the Soil association, a charity and in Poland, Ekoland, a private organisation, both
449 which have higher standards for organic produce than EU regulations were selected.
450 Therefore, whether the certifying body is a state, charity or private organisation is
451 unlikely to fully explain the differences found in this study.

452 Alternatively it could be argued that the recognition of the organic logos was the key
453 to explain the country differences, as proposed in Janssen & Hamm (2012a). The UK
454 had the lowest mean recognition of the EU organic certification logo with 21.1% of UK
455 consumers not recognising the EU logo (10.2% did not recognise the Soil Association
456 logo). In comparison, an average of 5.2% and 5.4% of all the other countries'
457 respondents did not recognise the EU and their national certification logos
458 respectively. In previous research, organic logos with less recognition were deemed
459 less trustworthy by consumers (Janssen & Hamm, 2012b). In (Janssen & Hamm, 2012b),
460 the UK, respondents had low recognition and trust in the EU organic logo and a
461 preference for their national certification. Similarly, German respondents reported
462 lower trust in EU certification and preferred national and private (Demeter) certification
463 (Janssen & Hamm, 2012a). While Poland was not included in that study, Italian

464 respondents reported high levels of awareness and trust in EU certification (Janssen &
465 Hamm, 2012a). These findings support the results of the current study. However, since
466 the data collection of Janssen & Hamm (2012a), the EU leaf certification logo for
467 organic produce (EC 889/2008) has been implemented and there is a large growth
468 in the EU organic market (Rana & Paul, 2017). With new EU organic certification
469 regulations to be implemented in 2022, our study highlights the challenges faced in
470 promoting trust with organic certification. Future interventions should focus on
471 increasing certification recognition to improve trust.

472 Furthermore, Brexit has led to the UK transitioning out of the single market system
473 and many of the food safety and authenticity laws previously managed under the EU
474 jurisdiction, now managed by the UK (UK Department for Environment Food & Rural
475 Affairs, 2020). Organic food import, export (after 2022) and equivalency have been
476 highlighted as a significant challenge for post-Brexit Britain's future with organic food
477 (Askew, 2020).

478 One of the strengths of the study is that it was underpinned by a validated Trust Toolkit
479 (Benson et al., 2020), which has previously shown comparability across countries
480 (Murphy et al., 2020). In addition this study covers three of the four (the other is France)
481 largest organic food markets in the EU (at data collection) (Manson, 2020). However,
482 this study data was cross-sectional and as mentioned, organic food is an increasing
483 movement in the EU which is constantly changing. The data was collected post-Brexit
484 and pre-COVID-19. The effects of these major events worldwide highlights the need
485 for strong longitudinal studies and frequent updates of the literature to show the
486 impact of these periods of changes on the organic food market.

487 In conclusion, there is a strong trust in organic produce across Europe but the levels
488 of trust are country dependent. Consumers in Germany and the UK have lower trust in
489 organic produce than consumers in Italy and Poland. This study has shown that
490 consumer's trust in other people, organic farmers and national certification bodies are
491 key to understanding why consumer's trust organic food. Clear opportunities for
492 expanding the organic market are present, especially in Germany and the UK, through
493 collaboration between national, private industry and EU-level bodies to improve the
494 recognition of organic certification and increased trust in organic food.

495

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501 Conflict of Interests Statement

502 The author(s) declare that there are no potential conflicts of interest with respect to
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504 Data availability statement

505 The data that support the findings of this study are available from the corresponding
506 author, upon reasonable request.

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Table 1: Participant characteristics per country

Characteristic/country	Total n (%)	UK	Germany	Italy	Poland
	2071 (100%)	510 (100%)	510 (100%)	514 (100%)	539 (100%)
Gender					
<i>Male</i>	978 (47%)	247 (49%)	242 (48%)	242 (47%)	247 (46%)
<i>Female</i>	1093 (53%)	261 (51%)	268 (53%)	272 (53%)	292 (54%)
Age					
18-24	215 (10%)	59 (12%)	49 (10%)	44 (9%)	63 (12%)
25-34	351 (17%)	62 (12%)	72 (14%)	90 (18%)	127 (24%)
35-44	393 (19%)	95 (19%)	80 (16%)	114 (22%)	104 (19%)
45-54	365 (18%)	90 (18%)	98 (19%)	87 (17%)	90 (17%)
55-64	296 (14%)	90 (18%)	74 (15%)	62 (12%)	70 (13%)
65+	437 (21%)	112 (22%)	127 (25%)	116 (23%)	82 (15%)
<i>Prefer not to say</i>	14 (1%)	0	10 (2%)	1 (0.2%)	3 (1%)
Highest level of completed education					
<i>Primary school only or incomplete secondary education</i>	18 (1%)	9 (2%)	4 (1%)	4 (1%)	1 (0.2%)
<i>Completed secondary education (GCSE)</i>	254 (12%)	196 (19%)	105 (21%)	27 (5%)	26 (5%)
<i>A-Level or vocational qualification</i>	794 (38%)	110 (22%)	219 (43%)	206 (40%)	259 (5%)
<i>Undergraduate degree</i>	465 (23%)	169 (33%)	39 (8%)	199 (39%)	58 (48%)
<i>Postgraduate degree or doctorate</i>	535 (26%)	123 (24%)	140 (28%)	77 (15%)	195 (36%)
<i>Prefer not to answer</i>	5 (0.2%)	1 (0.2%)	3 (1%)	1 (0.2%)	0 (0%)
Marital status					
<i>Married or living with partner</i>	1543 (75%)	371 (73%)	363 (71%)	377 (73%)	432 (80%)
<i>Never married</i>	389 (19%)	98 (19%)	100 (20%)	112 (22%)	79 (15%)
<i>Separated/widowed/divorced</i>	131 (6%)	38 (8%)	46 (9%)	24 (5%)	23 (4%)
<i>Prefer not to answer</i>	8 (0.4%)	1 (0.2%)	1 (0.2%)	1 (0.2%)	5 (1%)
Number of children under 16 in household					

<i>0</i>	1187 (57%)	330 (65%)	346 (68%)	265 (52%)	246 (46%)
<i>1</i>	418 (20%)	81 (16%)	62 (12%)	111 (22%)	164 (30%)
<i>2 or more</i>	401 (19%)	87 (17%)	77 (15%)	120 (23%)	117 (22%)
<i>Prefer not to say</i>	65 (3%)	10 (2%)	25 (5%)	18 (4%)	12 (2%)
Frequency of organic meat or vegetables purchase for household					
<i>At least several times per week</i>	814 (39%)	120 (24%)	166 (33%)	275 (54%)	253 (47%)
<i>Once per week</i>	878 (42%)	546 (42%)	251 (49%)	184 (36%)	230 (43%)
<i>More than once a week</i>	379 (18%)	175 (34%)	93 (18%)	55 (11%)	56 (10%)
Employment					
<i>Full-time (Paid)</i>	1201 (58%)	266 (52%)	278 (55%)	283 (55%)	374 (69%)
<i>Part-time (Paid)</i>	212 (10%)	71 (14%)	50 (10%)	54 (11%)	37 (7%)
<i>Homemaker</i>	66 (3%)	21 (4%)	14 (3%)	22 (4%)	9 (2%)
<i>Unemployed</i>	54 (3%)	25 (5%)	7 (1%)	14 (3%)	8 (2%)
<i>Student</i>	91 (4%)	9 (2%)	35 (7%)	32 (6%)	15 (3%)
<i>Retired</i>	435 (21%)	113 (22%)	135 (25%)	108 (21%)	89 (17%)
<i>Prefer not to say</i>	12 (1%)	3 (1%)	1 (0.2%)	1 (0.2%)	7 (1%)

* Percentages may not total 100% due to rounding

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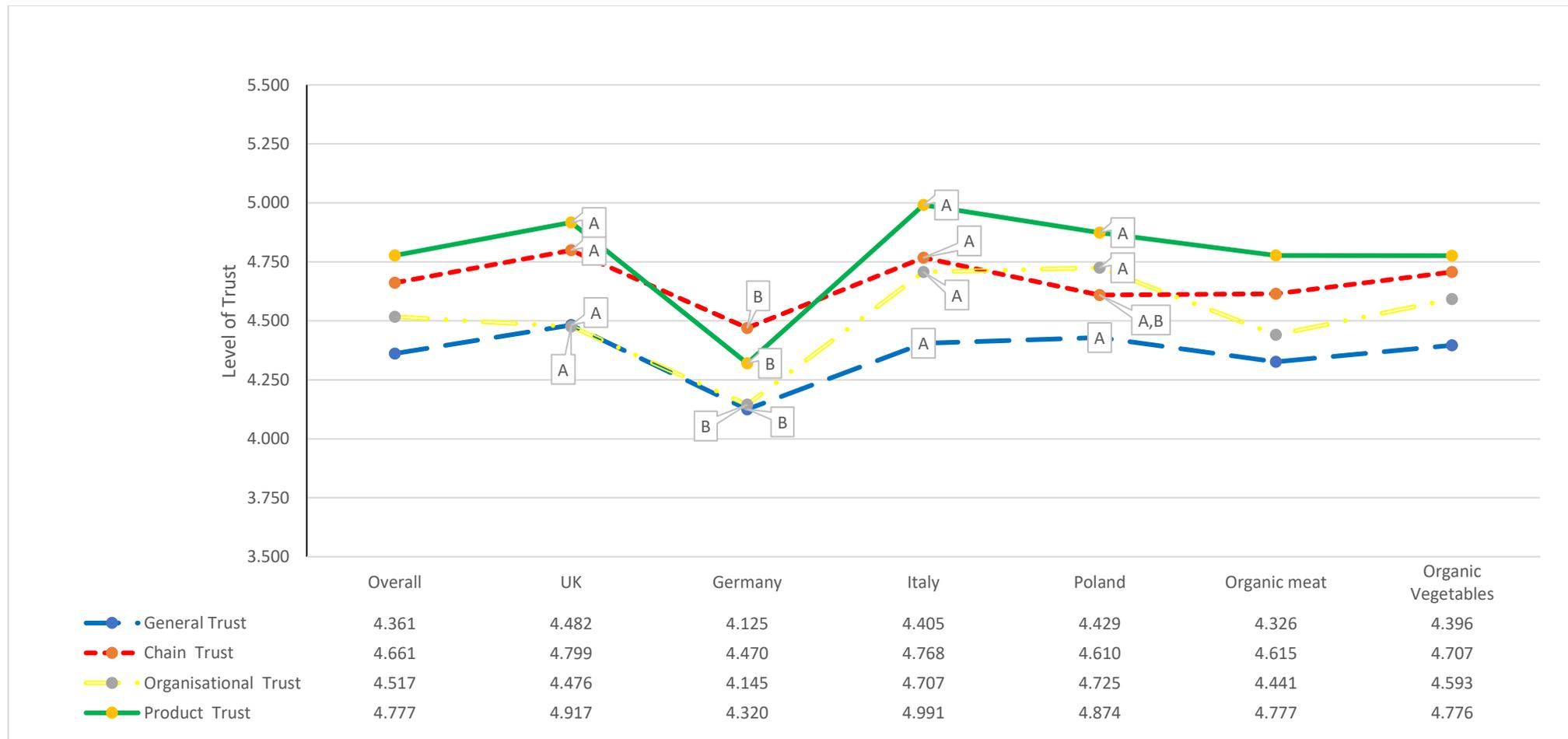
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696 **Figure 1: Differences in levels of trust by country (the UK, Germany, Italy and Poland) and by organic produce (Organic**
 697 **meat and Vegetables) using the Trust Toolkit (Benson et al., 2020).**

698 Mean scores with different letters are significantly different between the countries (Bonferroni's test, $p < 0.0125$).

699 **Table 2: Correlations between the trust measurement factors which contribute to Product Trust (Organic meat and**
 700 **vegetables). (Pearson's R).**

<i>Model</i>	<i>1</i>	<i>2</i>	<i>3</i>
Product Trust	-		
Chain Trust	.594**	-	
Org Trust	.698**	.620**	-
General Trust	.550**	.630**	.518**

701 *. Correlation is significant at the 0.05 Level (2-Tailed)

702 **. Correlation is significant at the 0.01 Level (2-Tailed)

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714 **Table 3: Consumer's beliefs on organic Certification: Per Country and Per organic produce (Organic meat and**
 715 **Vegetables)**

	Overall sample n=2071	Between Country differences		UK n=508	Germany n=510	Italy n=514	Poland n=539	Organic Meat n=1063	Organic Vegetables n=1035	P value
	Mean (SD)	F (df)	P value	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	P value
<i>What level you trust the product as a result of the label from your country?</i>										
<i>Scale: Not at all traceable (1)- Very traceable (7)</i>	5.08 (1.44)	9.787 (3, 2067)	<.001	5.086 (1.307) ^{a,b,c}	4.912 (1.522) ^{a,b}	5.360 (1.309) ^{a,c}	4.981 (1.552) ^{a,b}	5.095 (1.413)	5.073 (1.463)	0.738
<i>Scale: Not to be trusted (1)- Very trustworthy (7)</i>	5.20 (1.37)	4.232 (3, 2067)	.005	5.268 (1.316) ^{a,b}	5.020 (1.421) ^a	5.294 (1.280) ^a	5.215 (1.424) ^{a,b}	5.206 (1.335)	5.193 (1.396)	0.837
<i>Scale: Not at all proven (to be organic) (1)- Very proven(to be organic)(7)</i>	5.20 (1.42)	0.111 (3, 2067)	.954	5.199 (1.402) ^a	5.196 (1.470) ^a	5.233 (1.313) ^a	5.186 (1.498) ^a	5.204 (1.365)	5.203 (1.479)	0.990
<i>Scale: Bad (1)- Good (7)</i>	5.27 (1.4)	0.604 (3, 2067)	.612	5.244 (1.374) ^a	5.259 (1.403) ^a	5.233 (1.400) ^a	5.338 (1.498) ^a	5.240 (1.410)	5.299 (1.392)	0.345
<i>Scale: I do not recognise this logo (1)- I recognise this logo (7)</i>	5.15 (1.79)	49.189 (3, 2067)	<.001	4.772 (1.935) ^a	5.941 (1.409) ^b	5.000 (1.695) ^a	4.887 (1.828) ^a	5.148 (1.734)	5.144 (1.842)	0.962

<i>What level you trust the product as a result of the label from the EU?</i>										
<i>Scale: Not at all traceable (1)- Very traceable (7)</i>	4.99 (1.45)	36.750 (3, 2067)	<.001	4.677 (1.401) ^a	4.661 (1.519) ^a	5.403 (1.302) ^b	5.215 (1.419) ^b	5.015 (1.432)	4.971 (1.464)	0.485
<i>Scale: Not to be trusted (1)- Very trustworthy (7)</i>	5.04 (1.41)	32.201 (3, 2067)	<.001	4.685 (1.361) ^a	4.784 (1.439) ^a	5.339 (1.339) ^b	5.314 (1.372) ^b	5.015 (1.408)	5.056 (1.410)	0.502
<i>Scale: Not at all proven (to be organic) (1)- Very proven(to be organic)(7)</i>	5.06 (1.43)	29.760 (3, 2067)	<.001	4.659 (1.380) ^a	4.896 (1.483) ^a	5.342 (1.316) ^b	5.327 (1.408) ^b	5.040 (1.448)	5.082 (1.406)	0.498
<i>Scale: Bad (1)- Good (7)</i>	5.15 (1.39)	24.273 (3, 2067)	<.001	4.807 (1.361) ^a	4.980 (1.413) ^a	5.344 (1.354) ^b	5.430 (1.343) ^b	5.110 (1.417)	5.181 (1.362)	0.248
<i>Scale: I do not recognise this logo (1)- I recognise this logo (7)</i>	4.99 (1.90)	87.664 (3, 2067)	<.001	3.900 (2.030) ^a	5.102 (1.933) ^b	5.430 (1.506) ^{b,c}	5.494 (1.668) ^c	4.999 (1.873)	4.981 (1.934)	0.835

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717 Mean scores with different letters are significantly different between the countries (Bonferroni's test, $p < 0.0125$).