

## Article

# Analysis of the Tourism Demand for Iberian Ham Routes in Andalusia (Southern Spain): Tourist Profile

José Antonio Cava Jiménez <sup>1,\*</sup>, María Genoveva Millán Vázquez de la Torre <sup>2</sup>  
and Ricardo Hernández Rojas <sup>1</sup>

<sup>1</sup> Department Agricultural Economics, Sociology, and Policy, Faculty of Economics and Business Sciences, Universidad de Córdoba, Plaza de Puerta Nueva s/n, 14002 Cordoba, Spain

<sup>2</sup> Department of Quantitative Methods, Faculty of Economics and Business Sciences, Universidad Loyola Andalucía, Escritor Castilla Aguayo 4, 14004 Córdoba, Spain

\* Correspondence: jcava@uco.es; Tel.: +34-670597604

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**Abstract:** Iberian/serrano ham is a food product with a long tradition in the Spanish diet that is increasingly demanded by national and international consumers. Spain has 5 protected designations of origin (PDO) and two protected geographical indications (PGI) that support the quality of this product, which is manufactured only in the Iberian Peninsula. Since 2013, and based on the culinary product of ham, public entities and some businessmen have been trying to promote tourism related to ham, similar to wine-based tourism. In this study, we attempt to understand the profile of a ham tourist in the three existing routes in Andalusia, as well as ham tourism's potential demand through seasonal auto-regressive integrated moving average (SARIMA) models. The results show that the profile of a ham tourist is similar to that of other typologies such as a tourist of wine or oil, and the demand has slow growth due to the novelty of this new tourism offering. Thus, there is a need to design strategies that allow the development of ham tourism, which will lead to an increase of wealth via employment in the local community.

**Keywords:** Ham tourism; Andalusia; ARIMA; Protected tourist motivations; Protected Designation of Origin; gastronomic tourism

## 1. Introduction

In recent decades, there has been a collective awareness of the sustainability of any activity, especially those taking place in rural areas [1]. Environmental concerns, implications and benefits for the local community, and the negative effects that any economic activity can generate are increasingly analyzed prior to starting, and tourism would do no less [2–4].

In Spain, there is no single standard that regulates tourism in rural areas; however, there are regulations in most of the autonomous communities of the country, where this tourism segment is legislated, with varying degrees of tourism demand [5]. Article 13.17 of the Statute of Autonomy, in Andalusia, one of the 17 autonomous communities that form Spain, attributes to the autonomous community exclusive competence in the matter of promoting and coordinating tourism, which is regulated by DECREE 20/2002 of 29 January 2002, whose objective is to legislate with the aim of preserving the different habitats where tourism is developed, one of the most vulnerable being tourism developed in rural environments. Although tourism can drive development during unproductive agricultural or livestock years, complementing agricultural income and maintaining or increasing employment [6,7] also has detrimental consequences, as seen in the rising prices of typical

domestic products and especially impacts to the soil [8], in addition to the loss of cultural identity and destruction of the environment; however, if tourism is managed properly, damage can be minimized, and benefits can be maximized.

In certain rural areas of Spain, natural and historical circumstances have endowed the agricultural or livestock products with distinctive qualities that are recognized, making their prices in the national or international market higher than their competitors' prices. Although the phenomenon is universal, not all countries have been granted the same importance or the same protection.

The search for more environmentally friendly production methods by producers and consumers in the European Union (EU), together with the economic, environmental, and social problems of conventional agriculture, has resulted in a greater push to certify agricultural products, especially those obtained through organic farming and other products of distinctive quality, including protected designation of origin (PDO), protected geographical indication (PGI), and traditional specialties guaranteed (TSG) [9].

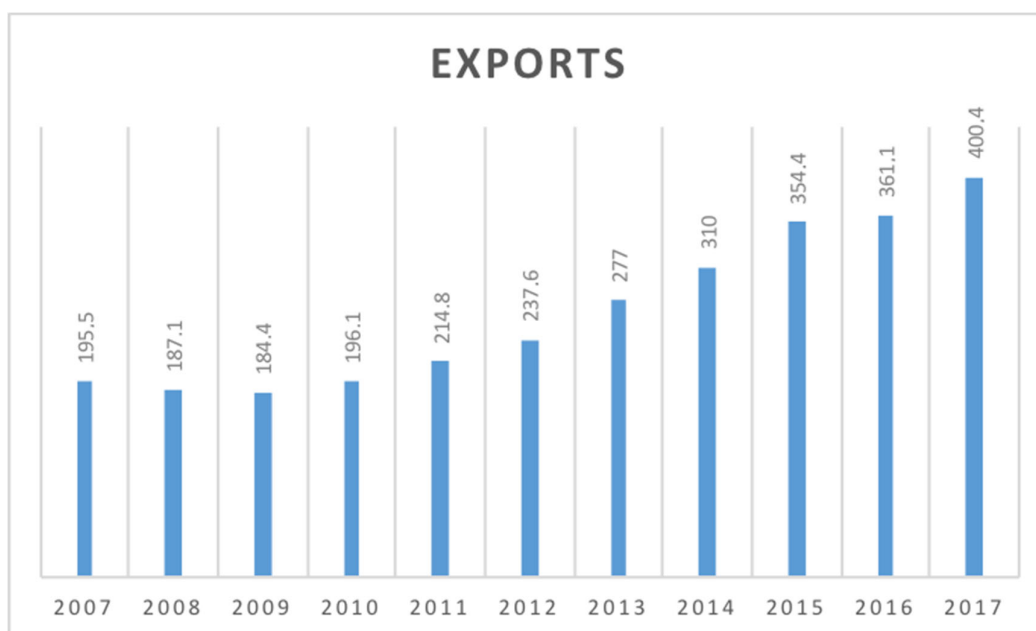
The rural crisis observed during recent decades in Europa prompted the European Union authorities to seek innovative solutions to improve the viability and competitiveness of rural areas. This promotion has led to a production diversification, the search for sustainable development processes (tourism), and the highlighting of strategies, based on quality, as potential sources of income in the rural environment.

A strategy to promote the development of the endogenous potential of rural spaces seeks to combine a process of regional identification with the creation of trademarks or identifications with which the region is promoted, both internally and externally. The strategy is usually based on specific products unique to the region, such as tourism, landscape, and agri-food products [10–13]. The rural development policy of the EU recognizes and supports food of distinction compared to conventional agricultural products [14]. In addition, regional products are conceived as a form of cultural capital that promotes achieving greater social and economic benefits in rural spaces [15].

Food has always been a key element in the culture of each society, and increasingly, visitors value gastronomy as an alternative to better understand the cultural traits of a particular place. There are many people who currently travel to experience flavors that are linked to the culinary offerings of restaurants, food fairs, or other events [16–18].

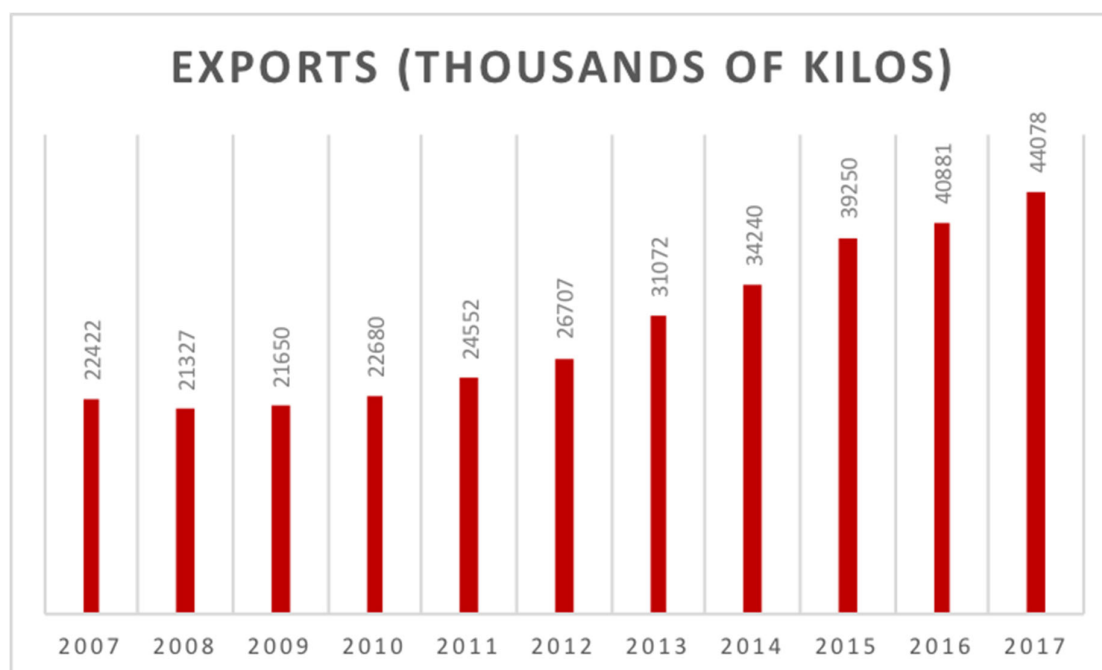
Among the tourist activities that can be developed in rural areas are agro-tourism, sports tourism, gastronomic tourism, and religious tourism [19,20]. In recent years, gastronomy has become more important in tourism, especially in inland areas, where culinary culture and ways of preparing culinary dishes constitute an intangible heritage [21] that passes from parents to children. However, for a dish to be well prepared, it needs high-quality raw materials, and Spain distinguishes itself by having more than 200 PDOs and PGIs that endorse the quality of agri-food products. Spain also belongs to the set of countries along with Croatia, Cyprus, Greece, Portugal, and Morocco, whose *Mediterranean diet* has been inscribed since 2013 in the Intangible Cultural Heritage of Humanity, since the Mediterranean diet comprises a set of knowledge, practical skills, rituals, traditions, and symbols related to crops and harvests in agriculture, fishing, and animal husbandry, and with the way of conserving, transforming, cooking, sharing, and consuming food.

Among the quality foods of Spain is Iberian ham, a food product native to the Iberian Peninsula (Spain and Portugal). This ham is derived from pigs raised in the Iberian *dehesas* (pastures of open woodlands of oak) fed mainly with acorns, thus lending its meat its typical flavor and grain, which is a delight for the palate and is increasingly demanded in international markets. The value of Iberian ham exports has doubled in 10 years (195.5 million euros in 2007 to 400.4 million euros in 2017) (Figure 1), as well as the number of kilos, from 22,422 thousand in 2007 to 44,078 thousand in 2017. This higher sales volume is due to the increase in the number of countries buying ham (Figure 2).



**Figure 1.** Evolution of ham exports, in million euros (years 2007–2017). Source: Own elaboration from MAGRAMA [22].

However, ham is not only a food product to consume; it is also important to consider ways to prepare the ham, as well as the breeding of the animal, which makes the final consumer more interested in learning about the product, such as wine [23], or olive oil [24], thus generating a scarcely exploited tourism product (ham tourism) that may have great potential in Spain.



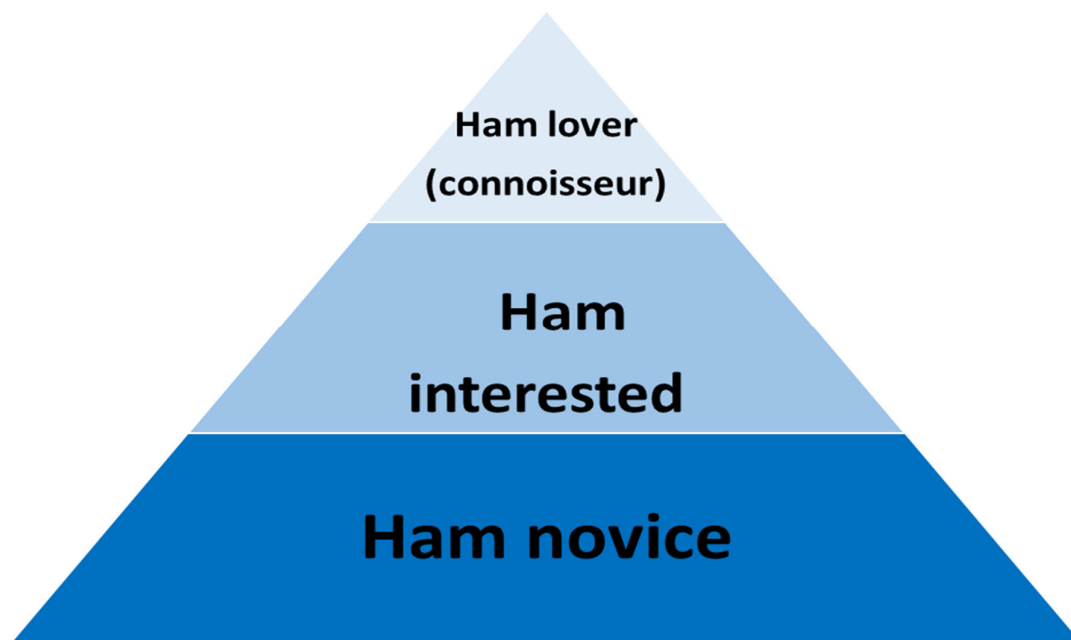
**Figure 2.** Evolution of ham exports, in thousands of kilos (years 2007–2017). Source: Own elaboration from MAGRAMA [18].

Iberian ham, as a quality product, can attract a significant segment of gastronomic tourists, establishing a ham tourism profile similar to that of wine [25,26].

On the lowest scale of the ham tourism profile would be the *ham novice* (curious about the ham), which includes people without prior education in the world of ham. These individuals are not very knowledgeable about ham, and although their motivation to visit the *dehesa* or the *secadero de jamón* (drying area) is not very strong, they are interested in participating in a guided tour of these areas and in ham tasting.

On an intermediate scale, *ham interested* describes individuals interested in ham, including those people who already know about ham before visiting a drying area or *dehesa* but who do not have prior education about the world of ham.

Finally, at the top of the pyramid would be the *ham lover*, lovers of ham formed by tourists who have a deep knowledge of ham. Thus, the gastronomy of the geographical area and the need to increase knowledge of ham, their typologies, are the key elements that motivate tourists of varying profiles to visit the drying area or *dehesa*. Within this group, there is a subgroup that is knowledgeable about ham (the *connoisseur*) that seeks above all to intimately know how ham is made and how ham production techniques are executed (Figure 3).



**Figure 3.** Types of ham tourists. Source: Own elaboration.

Not all ham tourists will have the same needs, as this will vary according to their profiles; therefore, it is necessary to understand what they wish to offer a quality tourist product.

This study will analyze the profile of the ham tourist in Andalusia (Southern Spain) as well as the demand of this tourism segment using auto-regressive integrated moving average (ARIMA) models.

## 2. Materials and Methods

### 2.1. Ham Tourism in Spain

The European policy on quality (European Commission, 2006) recognizes and protects the names of certain specific products that are unique to a region or a production method. This recognition translates into quality logos that allow for the identification of products of distinctive quality in the EU and that through specific controls, also guarantee their authenticity. Two have

geographical connotations (PDO and PGI), and the third is related to traditional production methods (TSG).

The regulation of the EU (European Union, 2006), on protection of geographical indications and designations of the origin for agricultural products and foodstuffs, establishes the definitions of PDO and PGI, differing in that a product with a PDO label is produced, transformed, and processed from the same geographical area. Examples of this category would be: Priego de Córdoba olive oil, Jerez wine, or La Alcarria honey; however, in a PGI product, it is not necessary that all the processes are performed in the same geographical area (examples of this other category would be Manchego lamb and Pan de Cea (bread)).

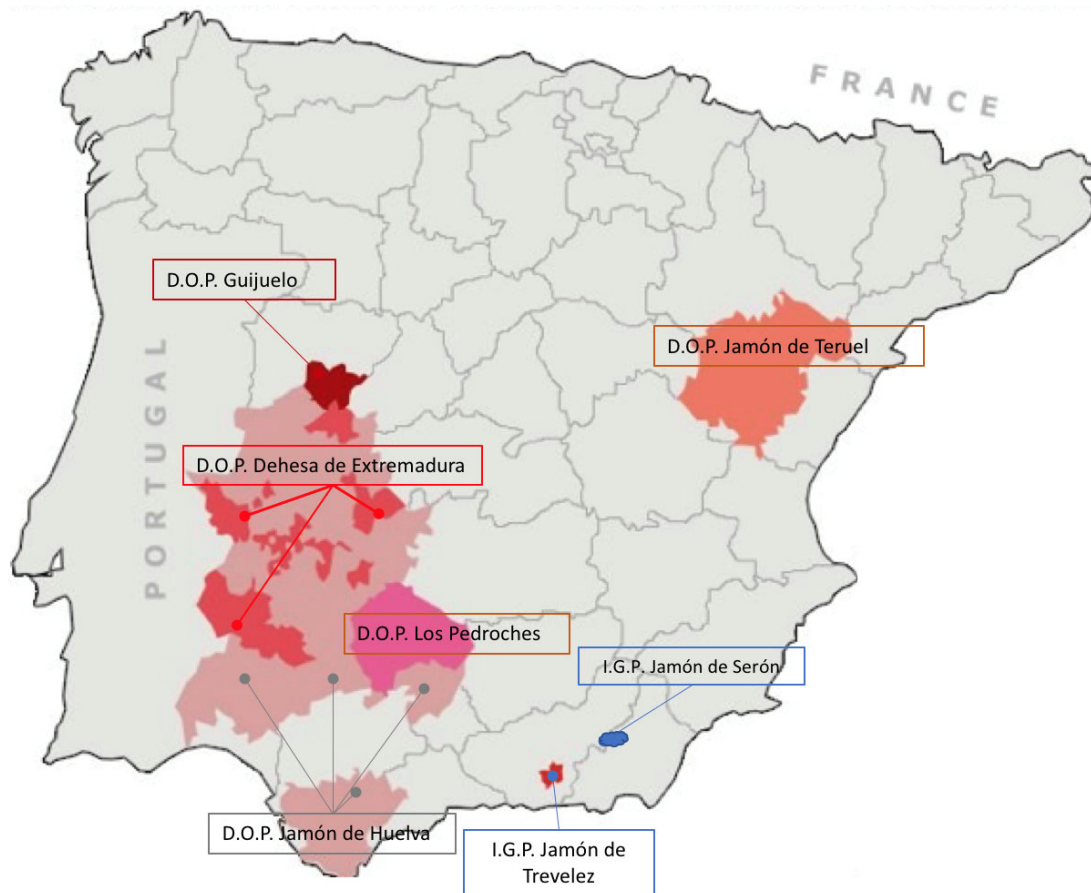
The TSG corresponds to products that have specific traits that are different from other foods of the same category. In addition, they must be produced from traditional raw materials or have a traditional or artisanal composition, mode of production or transformation. In Spain, there are only four products classified as TSGs: *jamón serrano* (serrano ham) with a number of specific characteristics, certified farm milk, *torta de aceite* (olive oil biscuit), or *panellets* (dessert) [22].

The EU also distinguishes products from organic production with a quality logo. This includes products whose production method preserves the structure and fertility of the soil, promotes a high degree of animal welfare and avoids synthetic chemicals such as fertilizers, pesticides, and antibiotics. Farmers use techniques that help maintain ecosystems and reduce pollution, and in the transformation of food, only a limited and very small number of additives and processing technologies can be used.

If an agri-food product is covered under a PDO, PGI, or TSG, it is synonymous with quality and will be in greater demand by the final consumer who seeks quality over quantity (agri-food consumer) or a unique tourism experience based on a quality raw material (tourist consumer) [27].

In 2019, Spain has 192 PDOs, with the product par excellence being wine with 90 PDOs, and 132 PGIs (42 of wine), while for ham there are 5 PDOs (Figure 4), of which 4 are for Iberian ham:

- *Jamón de Jabugo*: prepared in the mountains of Huelva, in the towns of Aracena, Cortegana, Cumbres Mayores, Jabugo, etc.;
- *Los Pedroches*: includes the forested *dehesas* of 32 municipalities of the region of Los Pedroches to the north of the province of Córdoba;
- *Jamón de Guijuelo*: reared in the foothills of the mountains of Gredos and Béjar;
- *Dehesa de Extremadura*: located in the cork oak and holm oak *dehesas* and in Cáceres and Badajoz; one PDO for serrano ham;
- *Jamón de Teruel*: all the regions of the province of Teruel are protected for the production of pigs and the preparation of hams with PDO; and two PGIs for serrano ham:
  - *Jamón de Trevélez*: The production scope of the pigs protected by this specified PGI covers the geographical area of Andalusia. The production and maturation of hams and front legs or shoulders are limited to nine municipalities in the region of Alpujarra Alta in the province of Granada.
  - *Jamón de Serón*: The production zone covers the Valle de Almanzara and Serón in the province of Almeria, with a mild climate, cold and dry winters and summers of moderate temperature that favour the curing of ham.



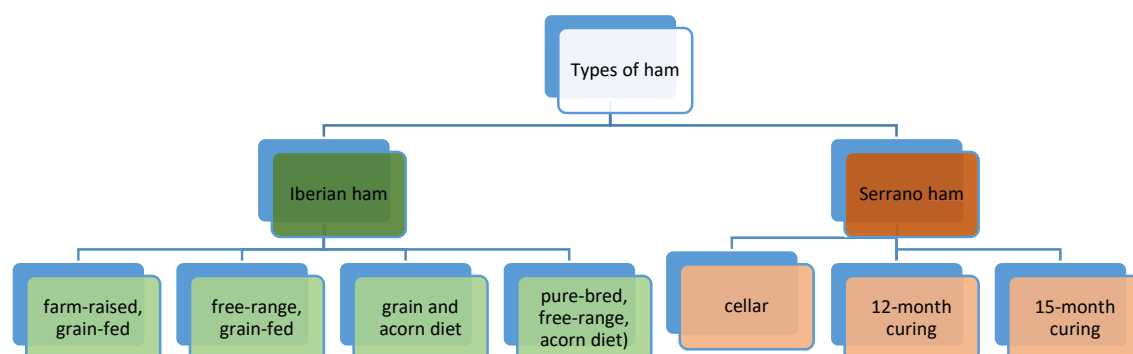
**Figure 4.** Geographic distribution of the denomination of origin status of ham in Spain. Source: Own elaboration from MAGRAMA [22].

A pig is an animal that is used in Spain, both in the fresh meat and prepared meat industries. Within the latter, products such as *salchichón* (type of sausage), *lomo* (loin), and *chorizo* (type of sausage) stand out, with ham as the flagship product, of which some varieties can be identified. The best known are Iberian ham and serrano ham.

To classify hams as Iberian ham (Figure 5), they must come from the Iberian pig, which must be raised in the *dehesa*, a singular ecosystem in which the fundamental components of the feeding of these animals are the acorns, herbs, and stubble that create the characteristic marbled fat of Iberian ham products. This fat infiltrates the animals' muscles, giving their meat a particular texture, flavor, and smoothness unique to Iberian acorn-fed ham.

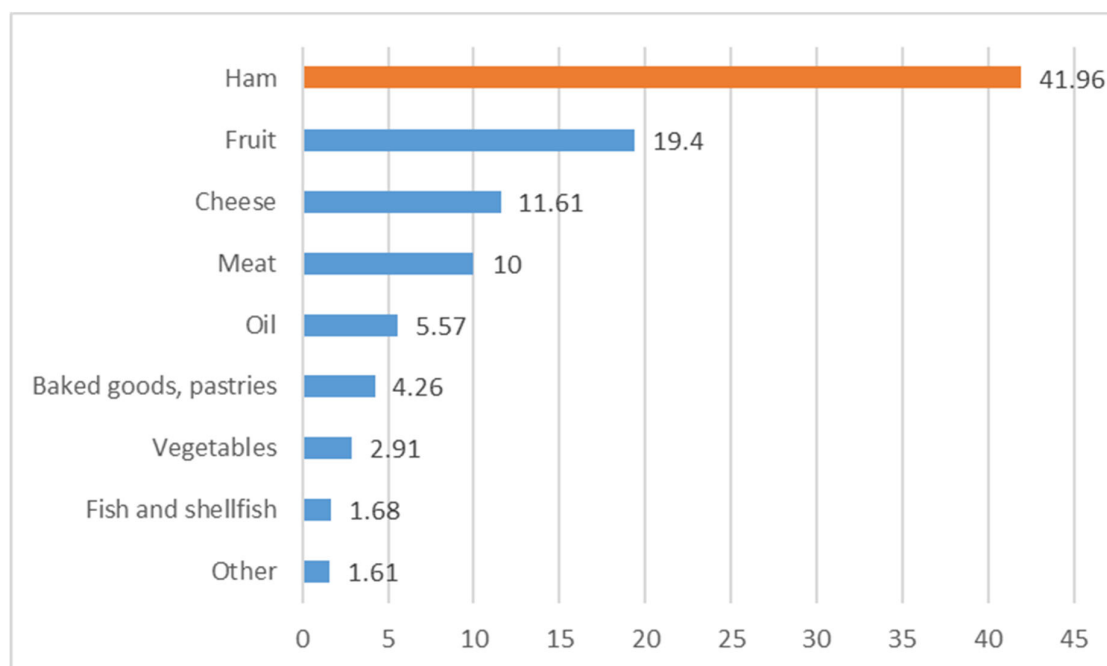
Within the Iberian ham variety, we distinguish *jamón ibérico de cebo* (farm-raised, grain-fed), *jamón ibérico de cebo de campo* (free-range, grain-fed), *jamón ibérico de recebo* (grain and acorn diet), and *jamón ibérico de bellota* (pure-bred, free-range, acorn diet).

In contrast, the serrano ham (also known as white ham), which comes from a breed of white pigs, is usually “sweeter” than the Iberian ham due to the low degree of salting required for the drying and maturing process. This difference is largely due to the ham being cured in a cold and dry mountain climate (northerly winds coming from the high peaks of the Sierra Nevada or blowing in the province of Teruel). The quality of serrano ham can be distinguished by its curing process: *jamón de bodega* (cellar), *jamón de reserva* (12-month curing), and *jamón gran reserva* (15-month curing).



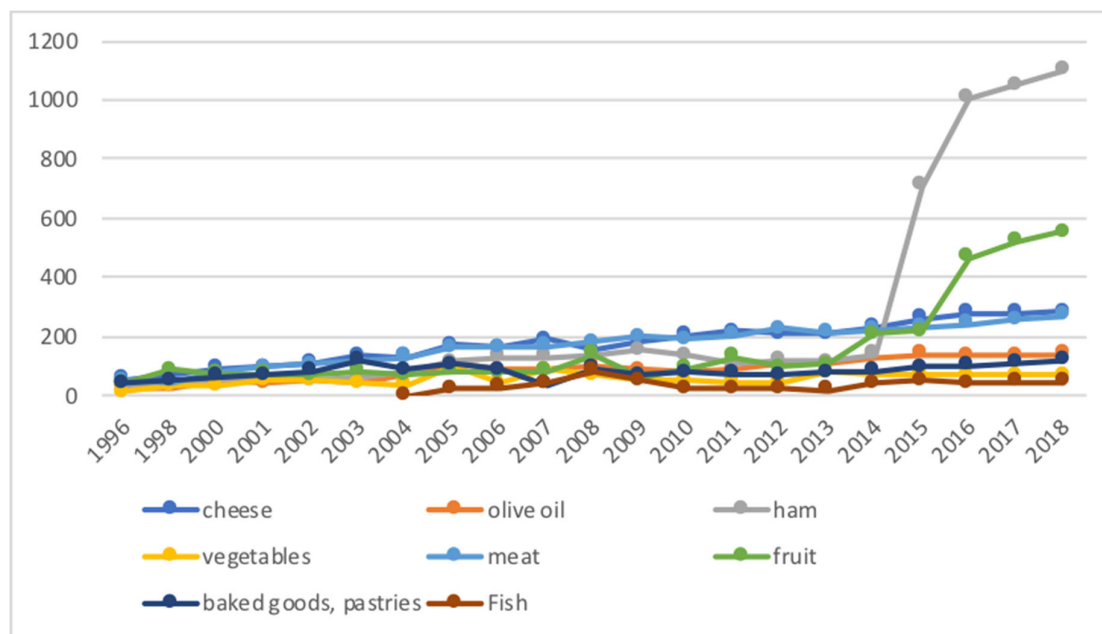
**Figure 5.** Types of ham. Source: Own elaboration.

From the economic point of view and focusing on marketing data of quality products, except wine, in the year 2018 (Figure 6), 41.96% of the market value of agricultural products and livestock protected under a PDO or PGI was for ham, followed by almost half of the remaining percentage representing fruits (19.4%) and cheeses (11.61%), and in fifth is olive oil with 5.57%, which indicates the importance of ham for its demand, being a product highly appreciated for its quality, both in the national and international market.



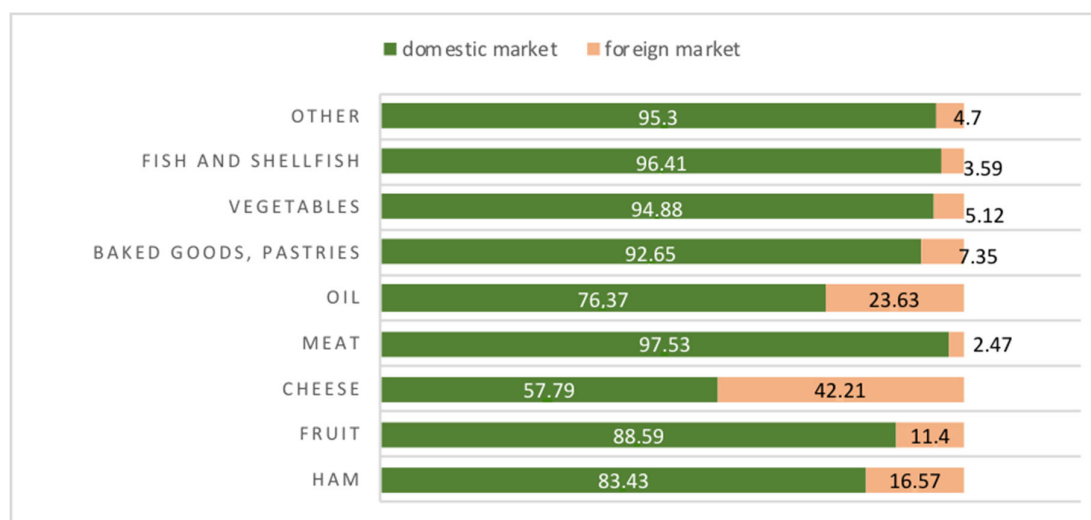
**Figure 6.** Products protected by protected designations of origin (PDOs), protected geographical indications (PGIs) and guaranteed traditional specialty (ETGs) distributed by economic value per producer (%) in 2018. Source: Own elaboration.

Analyzing the evolution of the main food products covered by PDOs and PGIs, the rapid growth of ham sales stood out; in 1996, only 34 million euros worth of ham was sold, while in little more than 20 years (2018), the sales rose to 1006.94 million euros, increasing by more than 288%. These findings indicate that the product is of high quality and is in great demand by the end consumers, and these are potential ham tourists because they are interested in the processes of its preparation (Figure 7).



**Figure 7.** Evolution of sales of products protected by protected designations of origin (PDOs) and protected geographical indications (PGIs) from 1996–2018 (million euros). Source: Own elaboration.

The destination for most of these products (Figure 8) is the national market with more than 90% used for domestic market consumption, except for cheeses where 42.21% of the revenue comes from exports, followed by oil with 23.63%. Ham occupies the fifth place with respect to exports and domestic consumption with 16.57%, with the foreign market being a potential route that should be strengthened.

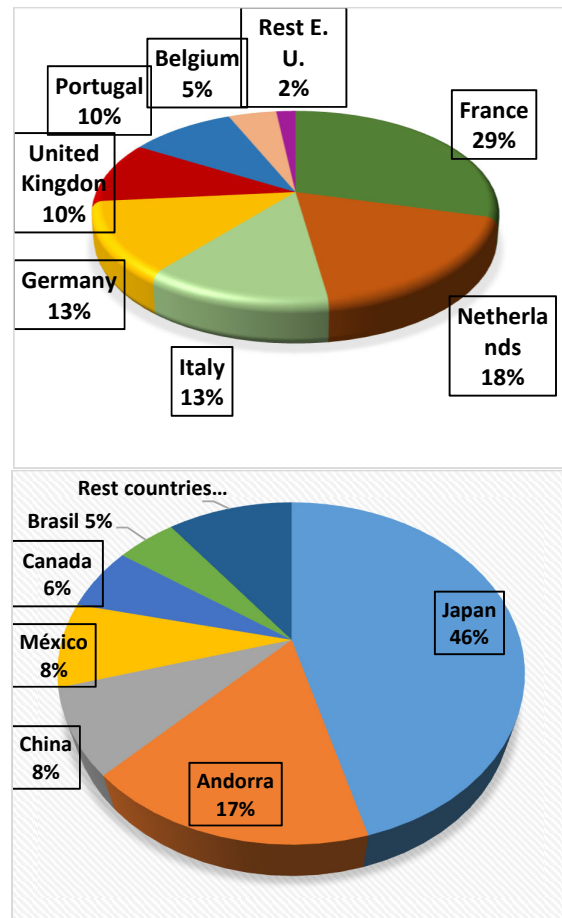


**Figure 8.** Economic value—Domestic and foreign market (%) in 2018. Source: Own elaboration.



Analyzing the foreign market of the 23,023 hams sold in 2018: 14,438 corresponded to countries of the EU (62.27%), and the other 37.73% corresponded to other countries of the world (8585 hams).

Within the EU, France stands out with a 29% share of the purchases of hams, followed by the Netherlands with 18% and Italy with 13% (Figure 9). With respect to the rest of the countries of the world, the main consumers are Japan (46%), Andorra (17%), and China and Mexico (each with 8%).



**Figure 9.** Foreign sales of hams in countries of the European Union and the rest of the world in 2018. Source: Own elaboration.

Therefore, Iberian ham is an increasingly desired product in international markets, with Spain being a country that could offer ham tourism within the gastronomic tourism sector, an initiative already launched by the Ministry of Agriculture, Food and Environment in 2013 with the project 'Rutas del Jamón Ibérico: Implantación del club de product (Iberian ham routes: Implementation of the product club)', with the aim to strengthen tourism and job creation in rural areas.

This initiative consists of a tourism experience for the populations with PDOs of Iberian ham (Guijuelo, Los Pedroches, Jamón de Huelva, and Dehesa de Extremadura) that demonstrate the production process of this product, its local landscape, and its context, in addition to recommended establishments for tasting.

The interregional project is developed in the 4 autonomous communities with ham PDOs, Castilla-León, Andalusia, Aragón, and Extremadura. The main objectives of the project, endowed with a subsidy of 320,000 euros from the ministry, were as follows: job creation, especially among the most disadvantaged groups in the rural world, that is, women and youth; avoiding the depopulation of these areas, as well as the conservation of biodiversity of habitats of community interest, such as the *dehesas* for livestock; and the development of tourism and the rural economy.

Like many initiatives, this project's effectiveness has not been measured; therefore, the outcome of the project remains unknown. Only the private initiative and effort of the PDOs provide some information on this subject. Hence, there is a need for studies such as the one proposed in this research.

## 2.2. Area of Study

The study area is the Autonomous Community of Andalusia, within which are 2 PDOs and 2 PGIs for Iberian/serrano ham, consisting of 2118 farms, which represent 39.23% of the total, with 59 drying areas representing 23.88% of the total existing in Spain and, in turn, accounts for 35.03% of the national sale of hams. Three routes have developed around these PDO and PGI hams from the tourism perspective (Figure 10).



Figure 10. Ham routes in Andalusia. Source: Own elaboration.

(1st) *Jamón de Jabugo Route*: Consists of 31 municipalities in the preparation and maturation zone of the PDO Jamón de Huelva in the regions of Sierra de Aracena, Picos de Aroche, and Cuencas Mineras. Much of the region is a natural park and world biosphere reserve. The Iberian pigs are bred here and used to make the world-renowned Jabugo hams. This route is made up of 28 businesses, of which more than half correspond to accommodation, highlighting more countryside houses than hotels, with 8 restaurants serving typical dishes where ham is an important element, in addition to having a farm or *dehesa* where the tourists can see how the pigs are raised and 4 drying areas where the ham is made (Table 1).

(2nd) *Jamón de Los Pedroches Route*: Encompasses the entire region of the PDO Los Pedroches. There are 31 municipalities distributed throughout the regions of the Valley of Los Pedroches, Alto Guadiato and the Sierra Morena Cordoba, as well as the municipality of Posadas, in the lower Guadalquivir. It is the largest and best preserved continuous *dehesa* of the Iberian Peninsula. Unlike the previous route, it has 3 museums, which can become an extra activity for the tourists, some of which can be used to prepare the slaughter and make the hams.

(3rd) *Trévelez and Serón Jamón Route*: This route is made up of towns belonging to two geographic indications, Trévelez in the province of Granada and Serón in the province of Almería, with 23 drying areas (not all of them are part of the respective PDOs), but there are no *dehesas* on this route.

**Table 1.** Ham routes in Andalusia and their compositions.

Route	Municipalities	Dehesas	Drying Areas	Hotels and Rural Houses	Restaurants	Specialized Stores	Museums	Business Activities
Jabugo	31	1	4	15	8	0		
Los Pedroches	31	3	4	12	4		3	3
Trevez and Serón	9	0	23	16	21	0	0	0

Source: Own elaboration.

### 2.3. Methodology

To analyze the demand of ham tourism in Andalusia, two techniques are applied in this study:

The first technique is quantitative, based on a random sampling obtained by using a questionnaire addressed to ham tourists in Andalusia. The technical data of the survey is provided in Table 2.

**Table 2.** Technical data of the survey.

<b>Population</b>	Male and female tourists 18 years old or older on a visit to the ham routes
<b>Sample size</b>	430 valid questionnaires
<b>Margin of error</b>	±4.3%
<b>Level of confidence</b>	95.4%; $p = q = 0.5$
<b>Sampling system</b>	Random simple
<b>Fieldwork dates</b>	May 2018 to December 2018

Source: Own elaboration.

The design of the questionnaire consisted of 25 questions with dichotomous answers, Likert scales, and open responses along the lines of the following five sections:

- Ham tourist socioeconomic profile: gender, age, educational level, family status, monthly income, etc.
- Itinerary characteristics: price, how one learned of it, where purchased, etc.
- Valuations and opinions of the itinerary: accommodations, restaurants, roads, signage, customer care, etc.
- Degree of satisfaction with the product: visit to the *dehesas*, ham drying areas, ham museums, etc.
- Knowledge of the world of ham: regular ham consumption, distinguishing between Iberian ham and serrano ham, etc.

The second technique attempts to determine a model of the ham tourist in Andalusia based on a sampling (84 data) collected from January 2012 to December 2018, based on the Box–Jenkins (BJ) methodology, using ARIMA models. According to Gujarati [28], the facilitating factor of this prediction method is in an analysis of the probabilistic, or stochastic, properties of the economic time series themselves (in this case, the number of ham tourists in Andalusia). In the time series models (BJ), the ham tourist variable can be explained over time by its past or lag values and by the stochastic error terms, giving ARIMA models an advantage of being less costly in data collection, requiring only historical observations of the data. In contrast, the main limitation of being a univariate analysis is that it does not recognize any causal relationship with the behaviour of other endogenous variables or information related to the behaviour of other explanatory variables.

Time series models have been widely used in forecasting tourism demand with a predominance of ARIMA models [29]. According to published studies by Song and Li [30], the different versions of the ARIMA models proposed by Box and Jenkins [31] to identify, estimate, and diagnose dynamic models of time series, have been applied in most post-2000 studies that used time series forecasting

techniques. In the case of seasonal time series analysis, these models are called SARIMA, and they are differentiated from stationary ARIMA models in that the latter consider the mean of the series constant over time, and the correlation function depends on the lag and not on the time in which it is calculated. However, the time series, in addition to random, cyclical, and seasonal variations, present a trend and seasonal components (the mean varies over time and by seasons), which makes the stationary processes unsuitable for modelling. For this reason, integrated models are introduced, thus eliminating the trend and seasonal component through these models.

The SARIMA models  $(p,d,q) \times (P,D,Q)_s$  are described by the following expression:

$$\phi(B)\Phi(B^s)Z_t = \theta(B)\Theta(B^s)a_t$$

$$Z_t = (1-B)^d(1-B^s)^D Y_t$$

where the operators introduced in the formulas are  $Y_t$  (series observed, in our case is the tourism demand of ham),  $\Lambda$  (represents the correction of the trend in variance of the series),  $Z_t$  (series de-seasonalized and without trend, that is, is stationary),  $B$  (lag operator),  $(1-B)$  (typical difference operator),  $B^s$  (seasonal lag operator),  $(1-B^s)$ : seasonal difference operator). The difference operators and seasonal difference operators, in general, eliminate trends and the seasonal components of the series, respectively.  $\phi(B)$  is the auto-regressive polynomial of order  $p$ , corresponding to the ordinary part of the series;  $\theta(B)$  is the polynomial of moving averages of order  $q$ , corresponding to the ordinary part of the series;  $\Phi(B^s)$  is the  $p$ -order auto-regressive polynomial, corresponding to the seasonal part of the series;  $\Theta(B^s)$  is the polynomial of moving averages of order  $Q$ , corresponding to the seasonal part of the series;  $a_t$  is the disturbance of the model; and  $D$  is the number of times the seasonal difference operators and typical difference are applied to the original series to make it stationary.

In the ARIMA and SARIMA models, the behavior of a time series is explained from the past observations of the series itself and from the past forecasting errors. Several studies have shown how ARIMA models and their different variants obtain good results in forecasting tourism demand and, in most cases, surpass other time series methods, such as the periodic auto-regression model [32,33], moving averages [34], smoothed exponential [35], non-causal basic structural model [36], and multivariate adaptive regression splines [37], based on these authors who support the use of ARIMA models for predicting tourism demand, has served as an argument in this study to use the models in predicting ham tourism demand. These ARIMA models have the limitation of only detecting linear relationships and assume a probabilistic distribution of the data [38]; they do comply with the validation tests such as the Dickey–Fuller test for unit roots and with the absence of conditioned heteroscedasticity through ARCH (auto-regressive conditional heteroscedastic) models. This explains why the temporal stability of the set of causal factors that operate on the dependent variable is the key element on which the predictions are articulated through time series [39].

### 3. Results

#### 3.1. Univariate Results

Table 3 shows that the socioeconomic profile of a ham tourist is male (51%), over 45 years of age (42%), with an income level between 1001 and 2000 € (51%), married (51.4%), and from Andalusia (48.9%). The majority of trips are through the Andalusian community and are not overnight trips; therefore, the trip they make to the ham route lasts less than 24 h (83% of the respondents). It might be assumed that the average cost would be lower because of not staying the night, but this is not the case; the average expenditure incurred by tourists in the community is actually higher, at 65.5 euros in the first quarter of 2019 [40], or other types of gastronomic tourism [41–43]. This is because many of the tourists buy products related to the pig when they visit the drying areas, i.e., loin, *chorizo*, and especially the serrano ham, which, depending on the weight of the ham and the type (if Iberian is more expensive), can exceed 150 euros per ham.

**Table 3.** Socioeconomic characteristics of ham tourists.

CHARACTERISTICS		PERCENTAGES	
PERSONAL	Sex	Female	49%
		Male	51%
	Age	<18 years	3%
		18–30 years	20%
		31–45 years	35%
		>45 years	42%
	Education	None	1%
		High school	73%
		Higher education	26%
	Marital status	Single	35%
		Married	44%
		Other	21%
	Place of origin	Andalusia	43%
		The rest of Spain	34%
		European Union	12%
		Rest of the world	11%
TRAVEL	Income	<1000 €	24%
		1001–1500 €	51%
		>1500 €	25%
	No. of days	<24 h	83%
		Between 2 and 3 days	10%
		>3 days	7%
	Average daily expenditure	<50 €	12%
		Between 50 and 75 €	40%
		>100 €	48%
	Type of trip	Organized	58%
		Private	42%

Source: Own elaboration.

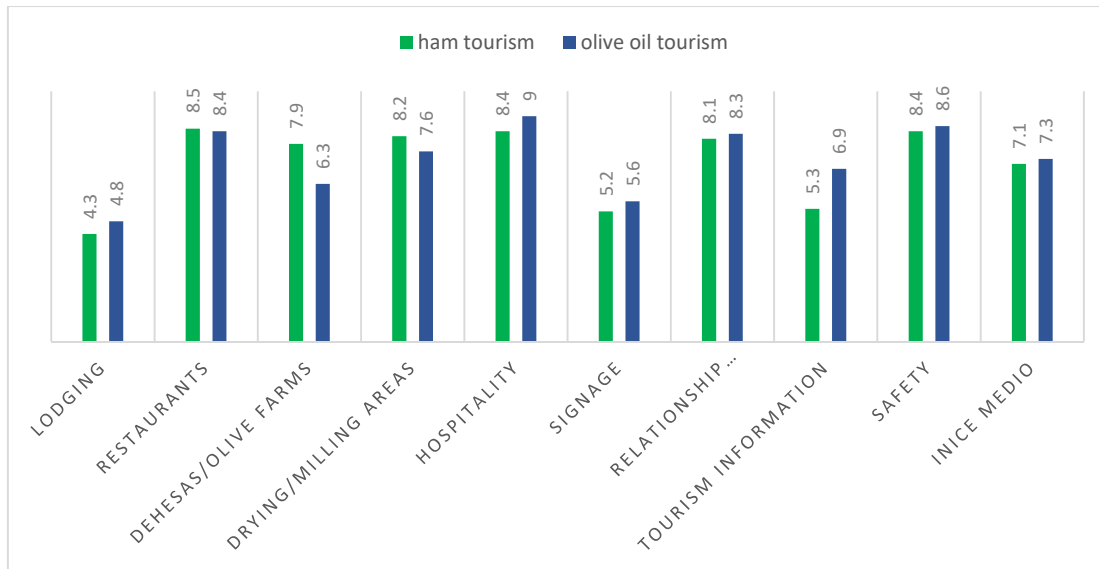
People who have done any of the three routes of ham analyzed herein indicated that gastronomy was their main motivation (75%), highlighting the high degree of satisfaction (82%) mainly for the hospitality shown and for the ham tasting, which translates into possibly repeating the trip; since more than 70% would repeat the experience, which shows that when customers know a product is of quality, they are loyal to the product [44]. Therefore, complementary activities related to the world of ham could be created, such as cooking workshops, ham cutting, interpretive museums of ham culture, and participation in a traditional pig slaughter. The main ham tourist attraction (94%) is visiting the drying areas where ham is produced and learning the different preparation techniques (salting and drying); in contrast, only 8% have visited ham museums because in some routes they do not exist, and the *dehesas* where the pigs are raised still tend to restrict visits from tourists (Table 4).

Since the majority of tourists are Spanish, the ham culture is deeply rooted in the Mediterranean diet; therefore, the tourists tend to be regular consumers of ham (56%), although only 6% of the respondents understood the varieties well, but the majority do appreciate the quality of ham coming from a PDO and PGI and would be willing to buy that product in their place of residence, making the ham tourist a potential ham customer, a perspective that is still poorly acknowledged by the owners of the drying areas or *dehesas* because they believe that the tourist provides little benefit, not realizing that it is a future customer of their product; in some businesses, especially cooperative ones, that mentality would have to change. Private businesses, however, are becoming aware of the tourism potential as an alternative source of income and modernizing their facilities to adapt to tourism.

**Table 4.** Motivation of ham tourists.

<b>MOTIVATION</b>	Motivation	Gastronomic	75%
		Learn new things	10%
		Visit the region	6%
		Other	9%
	Satisfaction with the destination	Satisfied	82%
		Indifferent	12%
		Unsatisfied	6%
	Would repeat experience	YES	70%
		NO	30%
	Would recommend ham tourism	YES	82%
		NO	16%
	Would go to festivals or activities related to ham culture	YES	77%
		NO	33%
	Has visited other ham routes	YES	9%
		NO	91%
<b>GASTRONOMIC KNOWLEDGE</b>	Has visited ham drying areas	YES	94%
		NO	6%
	Has visited <i>dehesas</i>	YES	45%
		NO	54%
	He has visited ham museums	YES	8%
		NO	92%
	Are you a regular consumer of ham?	YES	56%
		NO	44%
	Do you know the different varieties of ham?	YES	6%
		NO	94%
	Do you use ham in the preparation of your culinary dishes?	YES	53%
		NO	47%
	Does it matter more if a ham is PDO?	YES	92%
		NO	8%

With regard to the score that tourists gave to the ham route referred to in Figure 11, a comparison can be observed with another type of gastronomic tourist, the olive oil tourist, in the same region of Andalusia [42], highlighting that the highest scores obtained are for hospitality (8.4 points), site restoration (8.5) and the ham drying areas (8.2), and the worst rated for both the ham and olive oil routes are accommodations (scarce and of few stars, although rural houses abound), signage and tourist information, which is disparate, and no coordinated routes. However, overall, the average score is above 7, which is fairly good considering the newness of the routes and lack of entrepreneurial awareness that tourism can complement their usual activities such as production and livestock.



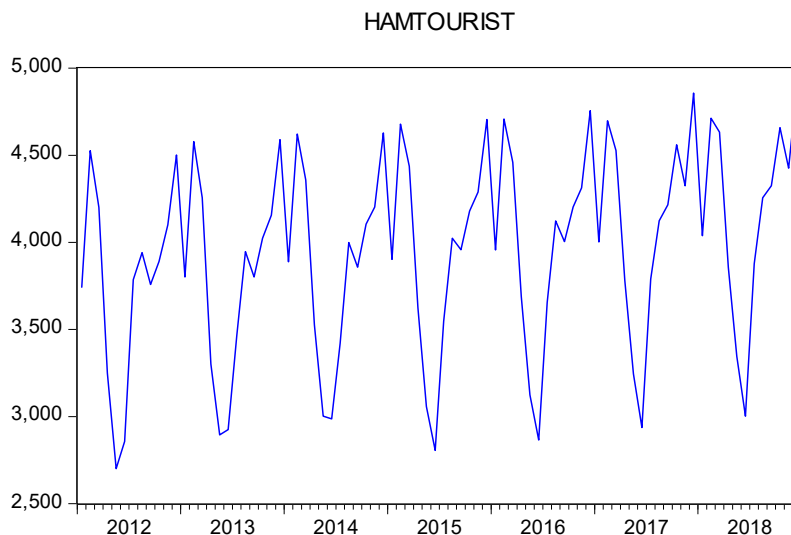
**Figure 11.** Evaluation of the ham itinerary compared to olive oil itinerary. Source: Own elaboration.

### 3.2. Results: Estimating the Ham Tourism Demand in ANDALUSIA for 2019.

Ham tourism is a tourism sector barely exploited for its novelty, but it has been growing slowly. To revitalize ham tourism, studies are needed to demonstrate its evolution, as well as to implement the necessary marketing tools to make it more dynamic and to turn it into an exclusive product of the Iberian Peninsula.

There are hardly any studies on the potential demand for ham tourism in Andalusia, although there are local areas [45] mainly due to the difficulty of obtaining data on tourists, since the statistics held by businesses dedicated to tourism are scarce. In this research, we have compiled the information of the tourists that visit the different ham routes in Andalusia, mainly the ham drying areas, where most of this type of tourist is concentrated using ARIMA models, which are widely used for predicting tourism demand [46–49]. Figure 11 shows a slight upward trend in these 7 years analyzed (January 2012 to December 2018).

Figure 12 shows that ham tourism demand is a variable with a variance trend, which has been corrected with the Box–Cox transformation  $\lambda = 0.3$  and the mean trend and with a cycle corrected with differentiation in mean and in cycle.



**Figure 12.** Evolution of the ham tourism demand in Andalusia (January 2012 to December 2018).

The estimated predictive model of monthly ham tourism demand is SARIMA (1,1,0) (0,1,1)<sup>12</sup> (Table 5)

$$(1 + 0.573505B) (1 - B)^1 (1 - B^{12})^1 \text{Hamtourist}^{0.4} = (1 + 0.880220 B^{12}) \text{ at}$$

$t\Phi_1 = 5.75^*$ ;  $t\theta_1 = 38.91^*$ ; \* Significant parameters  $\alpha = 0.05$ .

**Table 5.** Estimation of the demand of ham tourism in Andalusia SARIMA (1,1,0) (0,1,1)<sup>12</sup>SARIMA.

Dependent Variable: D(HAMTOURIST <sup>0.4</sup> ,1,12)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
AR(1)	−0.573505	0.099652	−5.755097	0
MA(12)	0.88022	0.022616	38.91983	0

Tables 6 and 7 show the different parameters of model validation, such as the ARCH test, which indicates an absence of auto-regressive conditional heteroscedasticity in the model since the statistical probability of 0.1974 is greater than the level of significance of 0.05.

**Table 6.** Heteroscedasticity Test: ARCH.

Heteroscedasticity Test: ARCH			
F-statistic	1.653181	Prob. F (1,67)	0.203
Obs * R-squared	1.661533	Prob. Chi-Square (1)	0.1974

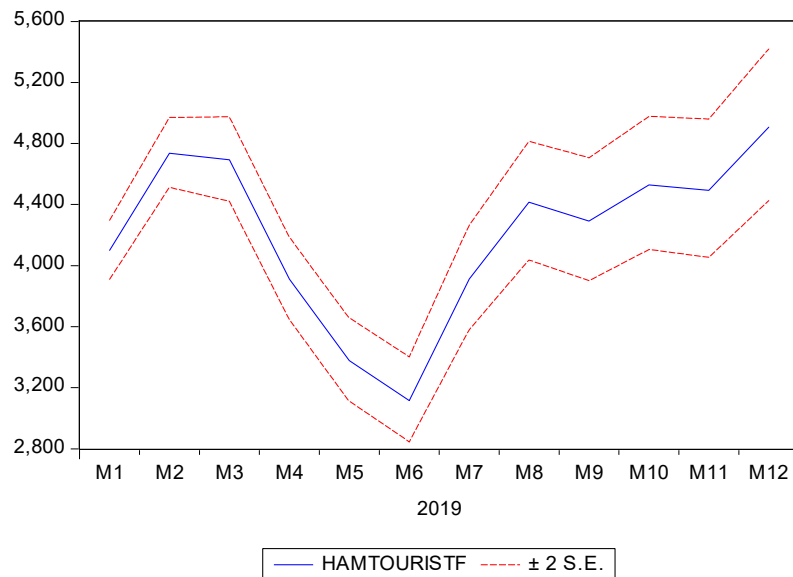
\* Absence of auto-regressive conditional heteroscedasticity.

**Table 7.** Null Hypothesis.

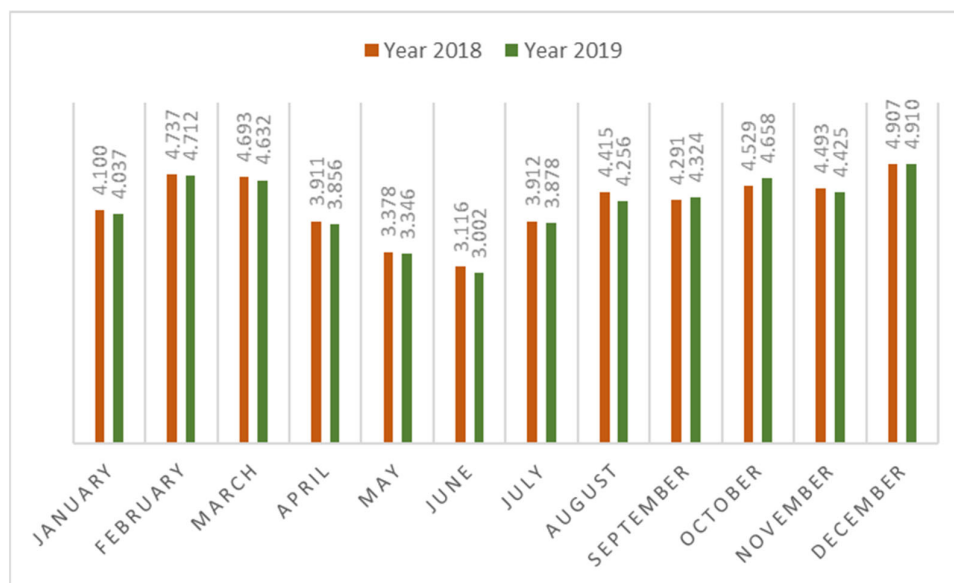
Null Hypothesis: HAMTOURIST Has a Unit Root			
Exogenous: Constant			
Lag Length: 11			
		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		1.387082	0.9988
Test critical values:	1% level	−3.524233	
	5% level	−2.902358	
	10% level	−2.588587	

Figure 13 shows the monthly prediction of ham tourism demand for the year 2019 in Andalusia, with June being the month with the lowest number of visitors. Based on these figures, a combination could be created between gastronomic routes in which for this month, which is very close to summer holidays, visits to the *dehesas* or the drying areas could be prioritized. If we compare with the year 2018 (Figure 14), we see that in almost every month there is a slight increase compared to the previous year, which indicates that this type of tourism, given that it is new, as is the case with all the products that are put on the market, is in the takeoff or market entry phase. This implies slow growth, which could be stimulated if there were more drying areas open to the public and the signage were improved, because when in rural areas, the tourist does not always want to travel many kilometers to see a single drying area, but would do so to see several, and if these are not offered, they look for another gastronomic product such as wine, which is better known and better adapted to the tourism sector, thus losing this potential ham tourism customer.





**Figure 13.** Evolution of the prediction for the year 2019 of the ham tourism demand in Andalusia.



**Figure 14.** Forecast of the ham tourism demand in Andalusia for 2019 compared with 2018 (number of tourists).

Based on the above results, it can be deduced that ham tourism has great potential for development in Andalusia, but it is necessary to carry out an analysis of the strategies that this segment of tourism can have on the community, analyzing what needs to be improved to make this livestock product, of which Spain is a world leader in terms of production and quality of its hams, become the benchmark for gastronomic tourism.

Promoting any tourism product undoubtedly requires knowledge of the peculiarities, circumstances, preferences, and needs of the market, both from the perspective of supply and of demand. A series of strategies and measures is suggested that will promote the area, increase wealth, and attract new investments that encourage and allow the ham routes of Andalusia to take off.

1. Strategy: Encourage the coordination of public and private institutions to promote ham tourism. To this end, coordination between the different municipalities should be fostered to cooperate in the joint dissemination of the activities of the various institutions: publications of a tourism

catalogue, a website, etc. Likewise, meetings between public and private entities should be strengthened to share the actions to be carried out to develop ham tourism in Andalusia.

2. Strategy: Enhance the development of tourism as an integrative activity of the different entrepreneurial activities in the Andalusian autonomous community in gastronomic tourism. Among the proposed actions:
  - Develop tourism cooperation with other activities to design an integrated supply aimed at reducing seasonality of demand.
  - Promote joint tourism promotion activities with other businesses involved in tourism.
3. Strategy: Promote a culture of cooperation among the inhabitants of the area that facilitates fair competition and banishing illegal activities, thus improving the social image of the area. Among the proposed actions:
  - Promote and support legal measures conducive to curbing the impact of the underground economy, such as illegal accommodation in rural areas.
  - Strengthen the adaptation to quality standards of products, services, facilities, and equipment of the businesses and institutions in the area.
  - Design and improve communication strategies that transfer to the market an image of quality of the region.
  - Adopt strategic planning systems in the municipalities so that they act in coordination with each other and seeking the development of the entire region.
4. Strategy: De-seasonalize the demand by promoting joint tourist packages. Some of the proposed actions are to:
  - Promote diversification and flexible specialization of tourism activities, taking special advantage of the different possibilities offered in each of the seasons.
  - Encourage the creation of complementary activities, such as cultural or gastronomic festivals related to ham.

The adoption of measures to improve the image of the area, encouraging participatory tourism in which visitors can integrate and participate in tasks and customs and the local ways of life, and rescuing traditional activities will distinguish the product and service offered in the zone from the rest of the competing destinations. Offering ham tourism, the symbiosis between commercial production and tourism unites the different agents involved such as farmers, restaurateurs, and hoteliers, the force that will give value to a new use for ham tourism.

#### 4. Discussion and Conclusions

Ham tourism is a tourism segment that is in its infancy as a tourist product, as there are still few tourists who experience ham tourism compared with other culinary products such as wine, due in part to a lack of coordination between public and private entities when marketing the ham routes.

This study analyzes the ham tourism characteristics and trend in Andalusia. It identifies the profile of ham tourists, their motivations, their itinerary characteristics, and their ham knowledge. It also analyzes the demand to offer a sustainable product, best suited to demand. With this aim, two techniques were applied in this study. Firstly, a random survey addressed to ham tourists during 2018 (May–December) in Andalusia was undertaken. Secondly, a seasonal ARIMA model was estimated and the ham tourism demand was forecast.

The results show that the socio-economic profile of a ham tourists is male, over 45 years, with medium level studies, with an income level between €1001 and €1500 per month, married, and mainly from Andalusia. Most ham tourists did not spend the night in the area, travelled with their family or with friends, and spent around €100 per day. The results also show that some aspects related to the ham tourism travel ought to be improved, mainly related to leisure and entertainment. In addition, information about itineraries and guides' explanations also requires improvement. Finally,

improving accommodation is also recommended. On the other hand, the results show that ham tourists are highly satisfied with the destination (82%).

To increase this demand, which is growing as seen by the estimations of the SARIMA model, and to eliminate its seasonality, it is necessary to create or promote activities related to the world of ham or gastronomic festivals that are highly valued by tourists, as suggested by Perez et al. [50], who claim that more than 77% of the tourists surveyed would be willing to attend. Another strategy is to coordinate routes of gastronomic products, such as ham and oil tourism and ham and wine tourism, because all of them are part of the Mediterranean diet and are highly valued by tourists, according to Akdag et al. [51]. Such combinations will increase the tourist's level of satisfaction with the route taken while increasing the average daily expenditure by incorporating lodging and restaurant services that generate employment, decreasing the high rate of unemployment in these areas of Andalusia.

The rural areas where Iberian ham is produced should be adapted through the diversification of tourist products (agritourism, gastronomic tourism, sports tourism, etc.), and specialize their supply to adjust to changes in consumer habits and to satisfy their needs, which is ultimately the most important for gaining loyalty and new tourist consumers [44]. Tourists are becoming more selective and have a clearer idea of what they want to know, or try in their leisure time, and gastronomy is an essential element in the choice of destination.

Andalusia has a quality gastronomic product endorsed by PDOs and PGIs, which is only produced in the Iberian Peninsula, the Iberian ham, which has no competition in other countries due to the uniqueness of the area where it is made, which could attract much international tourism if an adequate marketing campaign is carried out and the product and ham routes are sold in international fairs as is accomplished with the wine routes in Spain, but this would require first an awareness in the Andalusian businessman that tourism can generate money in addition to the production of ham. This tourism activity is a complementary activity to livestock and production that allows maintaining the identity and culinary traditions of the region and generates wealth in the inhabitants of the area by managing sustainable tourism, in line with the studies of Kristjánisdóttir et al. [52]. Second, to make the necessary investments in creating ham routes (signage, adapting the drying areas to tourism, etc.). It is not recommended to convert tourism into the main economic activity, but as a complementary activity to livestock and production that maintains the identity and culinary traditions of the region and generates wealth among the inhabitants of the area by managing sustainable tourism, favorable for all elements of the equation, entrepreneurs, residents, public entities, and tourists.

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