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## **FROM AFFLUENCE TO PROCESSED FOOD: EVOLUTION OF MEAT CONSUMPTION IN SPAIN SINCE THE SECOND HALF OF THE 20TH CENTURY**

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**From Affluence to Processed Food: Evolution of Meat Consumption in Spain  
since the Second Half of the 20th Century**

**Del exceso a la comida procesada: evolución del consumo de carne en España  
desde la segunda mitad del siglo XX**

**Abstract:** We use Spain as a study case in order to analyse the evolution of meat consumption from the second half of the twentieth century until today. To do this, we built a database of meat consumption using all possible sources: FAO, Ministry Food Balance, Household Budget Surveys and Food Consumption Panel. There are two main contributions. First, we disagree with the idea that the consumption of meat in Spain has been growing steadily since the fifties, as some economic historians have previously reported. Second, we observe two different food consumption models. One characterized by the increase in standardized meat consumption and the other featured by the decrease in meat consumption as well as the rise in the consumption of processed and elaborated meat.

**Keywords:** nutritional transition, meat, Spain, consumption

**JEL:** N34, N54, O13

**Resumen:** En este trabajo utilizamos a España como caso de estudio para analizar la evolución del consumo de carne desde la segunda mitad del siglo XX hasta nuestros días. Para ello, hemos construido una base de datos utilizando todas las fuentes existentes: la FAO, los balances del ministerio, las encuestas de presupuestos familiares y el panel de consumo alimentario. Hay dos contribuciones principales. En primer lugar, ponemos en duda el hecho de que el consumo de carne en España ha estado creciendo ininterrumpidamente desde los años 50, tal y como algunos trabajos han afirmado. En segundo lugar, observamos dos modelos de consumo alimentario. El primero está caracterizado por el incremento en el consumo de carne estandarizada. El segundo se caracteriza tanto por la caída en el consumo de carne como por el incremento en el consumo de carne procesada y más elaborada.

**Palabras clave:** transición nutricional, carne, España, consumo

**JEL:** N34, N54, O13

## 1. Introduction

Meat consumption is a popular but controversial topic nowadays. There is a social and scientific consensus about the excessive meat consumption in both affluent societies and emerging economies. This overconsumption entails health, environmental and even ethical issues. However, the trends on meat consumption in high-income and emerging economies are not the same. While in the former there is an upward trend in meat intake (Delgado, 2003), in the latter the trend has been downwards during the last years, even if the consumption drop is not accentuated enough in order to achieve sustainable diets (Stewart et al., 2021). From a historical and nutritional point of view, meat consumption is linked to two related processes. On the one hand, the increase in meat consumption joined with the consumption of other animal products is one of the main characteristics of the modern nutritional transition and the westernization of the diets (Popkin, 1993). That is to say, the convergence to an animal-based diet around the world, even if this westernization has not been equal for all countries (Kearney, 2010; Langthaler, 2018). On the other hand, meat consumption is also embedded within two different food consumption models, one characterised by the increase of food consumption based on standardized agro-industrial products (Collantes, 2019), and another based on the intake of processed and elaborate food products and the drop in calories intake (Germán, 2009).

In this context, we use Spain as a study case in order to analyse the evolution of meat consumption from the second half of the twentieth century until the present. Spain is a highly interesting case given the dramatic social and economic changes it underwent during that time. Due to the Civil War (1936-1939) and a long post-war period, Spanish citizens developed the nutritional transition later than expected (Marrodan et al., 2012). However, after a few years, Spain left behind the Mediterranean diet and shifted to a westernized diet. Nowadays, according to the Spanish Minister of Consumption (based

on data provided by the FAO), the Spanish population is the largest meat-consumer in the European Union so that the Minister is claiming for a reduction of meat intake.

We shed some light on the meat consumption debate from an historical perspective. We present, for the first time, a comprehensive data base of meat consumption in Spain from all possible sources covering the years 1952-2019. This allows us, on the one hand, to put forward a methodological critique of the use of indirect sources of meat consumption. Based on this, we debate with the literature about the main trends in the meat intake in Spain during the last 70 years. We cast doubt on the fact that meat consumption has been steadily growing from the sixties to the present day, as some works have maintained. On the other hand, the disaggregation of meat consumption both from the animal origin and the meat elaboration enables us to see the two different models of consumption before and after the eighties, where processed meat (especially from pork) is gaining more and more importance in the Spanish diet. For policy purposes, the latter is important as processed meat less healthy than fresh meat. Therefore, in order to design a policy to reduce meat consumption, it is necessary to consider accurate meat consumption data to know the historical trend and what is the type of meat most popular.

The work contains five parts. After the introduction, we display our data base in detail as well as a critique about the use of indirect sources of meat consumption. In section three we analyse both the theoretical framework and the state of the art on meat consumption in Spain from the second half of the twentieth century. In the next section we present the main series of aggregate meat consumption and an international perspective. In section four we present the main trends of meat intake from a disaggregate point of view. Last, we draw concluding remarks and the future investigation.

## **1. Data base and methodology**

In order to obtain comprehensive, reliable, and systematic series of meat consumption in Spain from the second half of the twentieth century to the present, we have collected data from four different sources. Two of them are obtained by indirect methods: Food and Agriculture Organization (FAO) and Ministry Food Balance (MFB), while the rest from direct methods: Household Budget Surveys (HBS) and Food Consumption Panel (FCP). The direct methods aim to provide real consumption at a household level through surveys and shopping records, while the indirect methods offer residual results (see below). Therefore, data based on direct methods are more reliable than data from indirect methods (Collantes, 2012, p. 4; Rodríguez-Artalejo, 1996, p. 367). The last benchmark year we are taking into account is 2019 due to the data distortion caused by the COVID-19 crisis from 2020. That is to say, we consider that the magnitude of the effects of the pandemic on meat intake would need to be carried out in a different study.

Household Budget Surveys (HBS) are probably the most reliable source. Although not annually, it provides data on direct consumption from 1958 to 2018. There are three kinds of Household Budget Surveys<sup>1</sup>. Basic Household Budget Surveys (BHBS) collect data from 1958, 1964/65, 1973/74<sup>2</sup>, 1980/81 and 1990/91 (Instituto Nacional de Estadística, 2012, p. 5). The BHBS sample-size ranges from 24.000 to 28.000 households, which is a respectable and representative size.<sup>3</sup> The more recent BHBS is the more disaggregated the data. Nonetheless, all BHBS data has been fairly disaggregated since 1964. For example, the 1964 Basic Household Budget Survey provides 19 kinds of meat consumed (purchased) and the 1990/91 one offers 32 types of meat. Permanent Surveys of Consumption (PSC) contain a smaller sample size (around 2,000 households) and the data

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<sup>1</sup> This paragraph is highly based on Collantes, (2012a), p. 5 and Maluquer de Motes, (2005), p. 1271-72.

<sup>2</sup> We are not taking into account the 1973/74 BHBS due to it not including the intake of physical quantities, just the household spending.

<sup>3</sup> The 1958 Basic Household Budget Survey contains a less simple-size (around 4.000 households).

is far less disaggregated than that provided by BHBS (just four kinds of meats), but they provide quarterly data of consumption from 1977 to 1985. Permanent Surveys of Consumption were replaced in 1985 by Continuous Household Budget Surveys (CHBS), which offer a sample size around 3.200 households. Finally, from 1997, CHBS improved with a higher sample size (around 8.200 household) as well as a more disaggregated data (eight kinds of meat) continuing until today. The 1958, 1964/65, 1980/81 and 1990/91 Household Budget Surveys are both the most reliable (because of the size sample) and disaggregated sources, but putting together all the House Budget Surveys allow us to present a systematic and consistent series of consumption of meat in Spain from 1958 to 2019.

Food Consumption Panel (FCP) is another reliable and direct-based source of food consumption in Spain. It provides annual series of meat consumption in a highly disaggregated form (between 44 and 100 types of meat). The benchmark years are from 1987 to the present and the sample size is around 12.000 households (Martín Cerdeño, 2016, p. 76). From 1987 to 2005, data is published in a book called “Food in Spain”, while from 1999 until today data are published online<sup>4</sup>. Food Consumption Panel also provides data on extra domestic consumption disaggregated by products in some years. Therefore, consumption in public institutions such as nursing homes or the consumption in restaurants has been obtained from 1987 to 2007 and from 2016 to 2019.

FAO provides annual, online and homogenized series of meat consumption from 1961 to 2018<sup>5</sup>. Similarly, Ministry Food Balance offers annual series of meat consumption from

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<sup>4</sup><https://www.mapa.gob.es/es/alimentacion/temas/consumo-tendencias/panel-de-consumo-alimentario/series-anales/default.aspx>

<sup>5</sup> In fact, FAO provides data from a few years before 1961 but they are not published online. We obtained data from physical volumes since 1952. The predecessor of FAO was the International Institute of Agriculture (IIA). It offers consumption data from some European Countries since the early twentieth century. However, as underlined by the IIA, the data is not too reliable.

1952 to 1980. In fact, both series present highly similar results and are obtained from indirect estimations. This similarity is due to FAO basing their own series on official data provided by the Spanish Government. Roughly speaking, FAO series sums the total quantity of food produced in a country plus the imported quantity and subtracts the amount exported. Moreover, it tries to take into account the storage and transportation losses during the food chain as well as considering variations in stock between years.<sup>6</sup> For that reason, consumption per capita offered by FAO is actually “food availability”.

However, data offered by FAO is not always accurate in order to study the dietary changes in the societies. This is explained by the fact that the “real” consumption is not necessarily the same as “food availability”. For example, in the case of dairy products consumption in Spain, data FAO is quite overrated with respect to real consumption (Collantes, 2014, see figure 1). While most of the authors are aware of the limitations embedded in FAO data, they sometimes justify themselves arguing that the trends are correct. Thus FAO would provide data accurate enough in order to compare consumption trends in different countries or regions around the world. However, this does not have to be the case either. For instance, FAO data of olive oil and vegetables consumption in Spain is inaccurate both in quantity and trend (Garrabou Segura & Cussó, 2009, p. 54). Macronutrients comparison using Household Budget Surveys and Food Balance Sheets (FAO) in Spain between 1958 and 1988 also show different trends (Rodríguez-Artalejo, 1996). In the case of meat intake, we can tentatively say that FAO series are neither correct in quantity nor trend for an important number of countries.

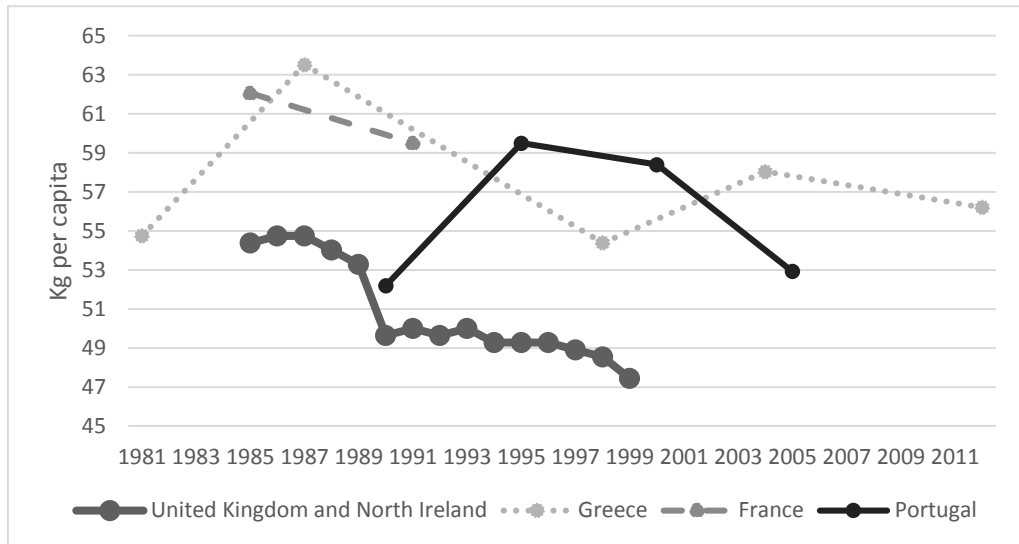
In order to test this hypothesis, Figure 1 and 2 show the evolution of meat intake for the same countries and years with data obtained from DAFNE-ANEMOS (direct method)

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<sup>6</sup> <http://www.fao.org/faostat/en/#data/FBS>, see metadata section.

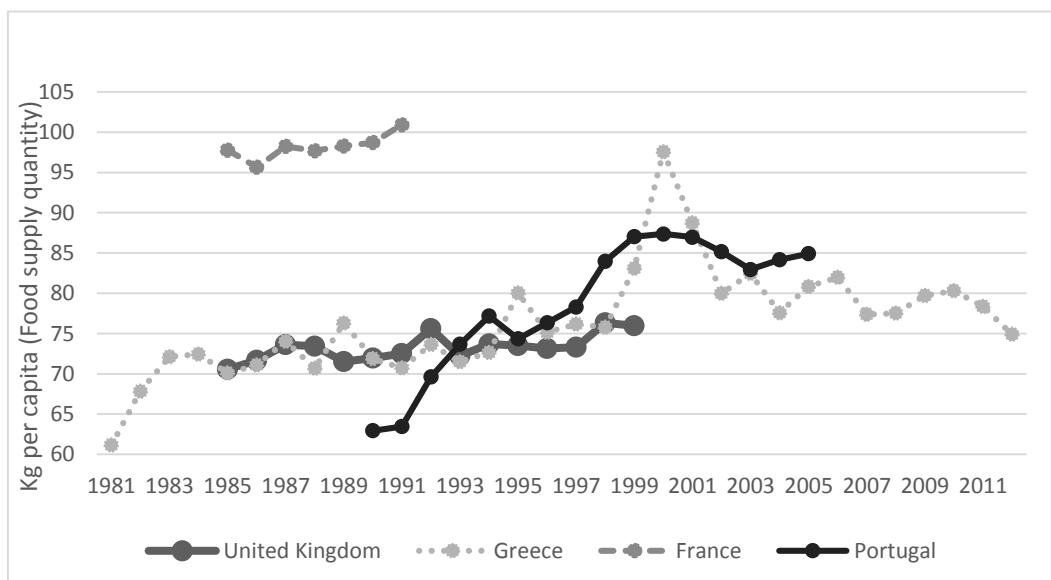
and FAO (indirect method). DAFNE-ANEMOS encompasses Household Budget Surveys from 28 European countries<sup>7</sup>. Note that while FAO offers data annually, DAFNE just provides data in specific years. Therefore, comparison should be done carefully.

**Figure 1: Meat consumption in different countries: DAFNE-ANEMOS data**



Source: author's elaboration from DAFNE-ANEMOS.

**Figure 2: Meat consumption in different countries: FAO data**



Source: author's elaboration from FAOSTAT.

<sup>7</sup> <http://dafne-anemos.hhf-greece.gr/>



There are three important differences between both figures. The first discrepancy is related to quantity. FAO series are systematically overrated. The minimum consumption of meat per capita computed by FAO (61 kilos) is equal to the maximum computed by DAFNE-ANEMOS (63 kilos). The second difference is about the comparability rate. That is, taking the years encompassing 1988-99, we can see important differences between countries. For example, according to FAO, Portugal is the least meat-consuming country during these benchmark years. However, FAO displays the United Kingdom as the least meat consuming country. Moreover, while DAFNE-ANEMOS illustrates big differences between the United Kingdom and Greece, FAO shows that both countries consumed the same quantity of meat. The third and more important difference is related to the trends. DAFNE-ANEMOS illustrates a slight downward trend in every country from the sample (excluding Portugal, which illustrates a U-inverted shape), but FAO displays a slight upwards trend during the same time. The opposite direction in trends is especially remarkable in the United Kingdom and France. Thus, we can conclude that data provided by FAO is not accurate in order to understand the real consumption of meat. Despite this evident problem, several studies analysing meat consumption still continue to use data from FAO (Alexandratos, 2006; Kanerva, 2013; Vranken et al., 2014; P.Sans and Combris, 2015 p. 107; Milford et al., 2019; Hansen, 2018; Garcia-Closas et al., 2006)).

Once we have collected data from all possible sources, we have based it on two criteria in order to analyse the evolution of meat consumption in Spain during the last 70 years. Apart from the total meat intake, we aggregate the data according to the animal origin and the type of elaboration. From the point of view of the animal origin, we consider five different categories: beef, lamb, poultry, pork and other meat. Within “pig meat” category, we have included some products which are not explicitly considered as coming

from pigs. Specifically, cold meats (dry, soft and smoked), cold cuts, salted meat, meat cured products, etc. have been incorporated in the “pork” category. The reason is that most of these kinds of meats consumed in Spain come from pigs (ham, chorizo, sausages, mortadella, blood sausage, etc.). Roughly speaking, during most of the period the main product within “other meats” are: rabbit meat, other fresh meat, and remains. Lastly, given that the 1958 HBS only offers three kind of meats (“meats”, “ham and cold meats” and “poultry”) we have classified “ham and cold meats” as a pork and we have divided “meats” into beef and sheep meat categories (50 percent each).

Regarding the type of elaboration, we include three types of meats: refrigerated/fresh meat, frozen meat, and processed meat. Data offered by FAO do not allow to disaggregate in function of the type of elaboration so that we only rely on direct sources to analyse the evolution of this kind of meat. Why do we consider relevant to do those two kinds of disaggregation (type of elaboration and procedence of animal)? There are two reasons. First, we contemplate that while the first kind of disaggregation is from the producer’s point of view, the second one is also from the viewpoint of the consumer. Namely, when a consumer is deciding to purchase some type of processed meat such as sausages, they are not necessarily thinking of which animal that meat comes from. Second, prepared products (such as processed meat) were one of the main characteristics of food habits in high-income countries during the second half of the twentieth century (Germán, 2009, p. 11). Thus, if our work just relies on the traditional disaggregation (animal origin), which is the manner that FAO offers the data, it would hinder the analysis of meat consumption. Due to the sample size and the most intuitive form in disaggregating the data, in case of doubt, we contemplate Household Budget Surveys as the most reliable data.

### **3. Literature review: the “rupture” and the Spanish case**

Although from a different point of view, methodologies and disciplines (economic history, history, sociology, nutrition studies, etc.), several works differentiate two periods in the evolution of food consumption. Meat intake, as well as the intake of other animal products such as milk, play a decisive role in differentiating each period. The first period is characterised by an increase in meat intake while in the second period there is a downward trend in meat consumption. Thus, there is a “rupture” in the trend of food consumption signalling the beginning of a new food model.

Literature illustrates this “break” in several manners. In a seminal paper published in the nineties, nutritionist Barry Popkin considered that societies go through 5 different nutritional stages. Each stage is characterized by different demographic, economic, epidemiological, and diet patterns. Roughly speaking, the modern nutritional transition occurs in the four stages, namely when a society lowers the consumption of crop-based food and increases the intake of animal fat, sugar, and processed food (Popkin, 1993, 2003). In the same framework of Popkin but from a historical point of view, Grigg pointed out that income growth in Western Europe during the nineteenth and early-twentieth centuries led to consume a more varied diet as well as an increment of the consumption of animal products (Grigg, 1995). Similarly, but focusing on the demand side, Delgado L.C argued a few years later that income and urbanization rates growth drive the increase of meat and milk consumption in developing countries. Delgado called this process “the livestock revolution” (Delgado, 2003).

Nevertheless, in a last stage of the nutritional transition (five stage), Popkin considers that there is a behavioural change implying a greater awareness regarding eating habits. This behavioural change entails a rupture in the evolution of food consumption. That is,

societies lower the intake of meat, milk, sugar and so on. Empirically, some authors have shown that once an income level is reached, consumption of meat in high-income countries tends to decrease, giving way to this “rupture” (Cole & McCoskey, 2013).

Malassis frames dietary changes within different food consumption models (Collantes, 2016, p. 282) and underlines this “break” around the eighties. He points out that each food model is embedded by supply and demand capacity, changes in objective conditions of consumption such as urbanization, household equipment, female work and cultural changes (Malassis, 1997, p. 167). Thus, around 1980 rich societies achieved the maximum intake of calories at approximately 3500 per day and a 40 per cent of protein intake coming from animal products (Malassis, 1997, p. 220-24). At this point, consumers do not increase food consumption anymore but they prefer, on the one hand, to diversify food intake and, on the other hand, the intake of food quality rather than food quantity. In other words, after the Second World War, the rise of a Fordism consumption model came out, so that consumers tended to consume standardized agro-industrial food products (Clar, 2008; Collantes, 2019). A few decades later, the consumption of prepared, processed and elaborated food gained importance in the rich countries diets (Laajimi & Albisu, 1997; Langreo, 2008).

The mainstream opinion of nutritionism has also influenced the consumer preferences around meat consumption. During the nineteenth century, meat was considered in Europe as a key food in order to obtain protein, so global meat trade and consumption was encouraged (Scrinis, 2013, p. 115). Similarly, during the first third of the twentieth century, the international view of nutritionism was focused on the optimal diet, encouraging the intake of calories, macronutrients and vitamins (Barona, 2008, p. 91). Bilketoff, analysing this process in the USA, calls this paradigm “newer nutrition”, which lasted until the second half of the twentieth century. However, after the Second World

War, the nutritionists' opinion switched to "negative nutrition". Namely, they underlined the health effects due to meat excess (and other products such as milk), such as obesity and cardiovascular diseases (Biltekoff, 2012, pp.-6-7; Collantes, 2015, p. 252; Scrinis, 2013, p. 141; Variyam & Golan, 2002, p. 13). Thus, in Western Europe, the health concerns about food excess had penetrated in societies around the sixties (Gavrilova, 2005, p. 175). In the case of Spain, the concerns about food intake excess was developed belatedly with respect to other European countries, even if there were several initiatives at a municipal level years before (Bernabeu-Mestre et al., 2007, p. 2). Nevertheless, around the sixties, public Spanish nutritionists already recommended the intake of a moderate quantity of meat (around 100 g per day (Vivanco & Palacios, 1964, p. 196)). Today, Spanish nutritionists, as well as the World Health Organization, suggest the intake of an even lower quantity, ranging around 500g per week and trying to avoid red meat all together (Martínez et al., 2020, p. 53). Therefore changes in mainstream nutritional opinion could modify the consumer preferences by encouraging a rupture, which is, lowering the intake of meat consumption. In summary, borrowing the expression coined in (McNeill & Engelke, 2014) referred to the big economic and population expansion after 1945, we could differentiate the first food consumption model by a "great acceleration" on meat consumption and the second one by a decrease and diversification trend on meat intake.

As far as we know, there is no work analysing the consumption of meat in Spain since the second half of the twentieth century in a systematic manner. Nonetheless, the subject-matter has been studied secondarily, for example studying the livestock sector or the intake of other food products (Cussó Segura & Garrabou Segura, 2007; Domínguez Martín, 2001b)). Driven mainly by income growth, meat consumption in Spain increased during the interwar period (Langreo & Germán, 2018, p.171), even though around 1934,

the meat intake of the Spanish citizens was lower than the majority of European countries (Bernabeu-Mestre et al., 2007, p. 13). The Spanish civil war (1936-1939) as well as the post war period involved a severe deterioration in both the Spanish economy and the population diet, decreasing the food intake markedly (Cussó & Garrabou Segura, 2007, pp. 89-90). Consequently, food shortages implied an important reduction in the Spaniards living standard (Martínez-Carrión, 2016). Regarding meat intake, even in the 50s (10 years after the Civil War) Spanish residents were still consuming less meat than Turkey or Greece (Clar, 2010, p. 192, see note 1).

Nevertheless, in the sixties the scenario turned around completely. Following the European standards, the Spanish population left behind the Mediterranean diet and shifted to a westernized diet (Clar, 2008, p. 134; Moreno et al., 2002)). That is, before the sixties, meat was considered a product intended for special occasions (Marrodan et al., 2012, p. 59), but in a few years meat consumption in Spain started to grow notably along with other livestock products such as milk (Collantes, 2014). Thereby, the Spanish population reached the modern nutritional transition in a few decades (Cussó Segura & Garrabou Segura, 2007; Moreno et al., 2002) and meat became a mass consumer product. Nonetheless, not all types of meat participated equally in this process. In fact, while beef and lamb lost importance in the Spanish diet, poultry and especially pig meat became the main meat consumed by Spanish citizens (Domínguez Martín, 2001a, p.45). According to the literature, the average Spanish consumer decided to increase meat consumption based on the cheaper and standardized type of meat, which was accorded to more intensive and industrialized livestock sector: poultry and pork (Clar, 2005; Clar, 2008).

However, in many cases, economic historians have not taken the “rupture” into account when analysing the main trends in meat consumption in Spain since the second half of the twentieth century. That is to say, most of the studies are focused on the nutritional

transition, but not on the second period when the intake of meat should decrease and diversify. Part of the literature deal with meat intake in Spain as if consumption would have increased steadily from the sixties uninterruptedly. We consider that there are two related reasons behind that fact. First, most of the studies base their conclusions on indirect estimations of meat intake. That is to say, the data used is the one provided by FAO or with a similar methodology. Second, the main goal of those works is not to analyse the “real” consumption of meat. In other words, they do not study deeply the diet changes in Spanish society over time. For example, in de Molina et al., (2017, p. 6), based on a methodology resembling that used by FAO, it states that meat consumption in Spain has increased four times from the sixties to the present. As the authors themselves confirm, their goal is not to study the real food consumption but the apparent consumption (see p. 2)<sup>8</sup>. However, using the same data or with data provided by FAO, “the great acceleration” in meat consumption in Spain during the second half of the 20<sup>th</sup> century has been used in several agro ecologic works (Carpintero Redondo, 2006, p. 40; Garrabou Segura & Cussó, 2009, p. 19 see table 19; González de Molina et al., 2017, p. 45; González de Molina et al., 2020; Infante-Amate et al., 2018, p. 500). Other papers, also based on FAO data, state that Spaniards consumed 21,5 kg per capita in 1961 and 123 kg per capita in 2001 (Clar, 2010, p. 177). In a book chapter, the argument of the “great acceleration” is clear, arguing that after the expansion in meat consumption in Spain until 1985, the expansion “*has not finished thereafter but it has continued, placing Spain in the second position, just after Austria, with a quantity nearly 95 kg in 2010, having reached even 107 kg per person and year around 2005*” (Clar, 2017 p. 414). Even other

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<sup>8</sup> It is fair to say that one of the author’s critics to the use of Household Budget Surveys is that they does not include the extra domestic consumption, which was, referencing the Annual report of food consumption in Spain, 32.3 per cent of the aggregate food intake in 2015 (*Informe Del Consumo de Alimentación En España*, 2016, p. 17). However, that number is the total food spending outside the home, not the physical food intake. In 2018, the physical food quantity consumed outside the home was 20% (calculations based on table 2 and 7 in Martin Cerdeño (2019)) and in the case of meat was around 13,5%.

international works also consider that meat consumption in Spain has grown steadily since the sixties (Kanerva, 2013, p. 9).

By presenting, for the first time, a systematic data base including all possible sources of meat consumption in Spain since 1952, we complement these works in two different manners. First, it allows us to cast doubt on the “great acceleration” argument in meat consumption in Spain. That is to say, our data base enables us to debate with the literature about the main trends in meat consumption in Spain during the last 70 years. Second, in addition to the traditional disaggregation (from the animal origin perspective), we can also shed some light in the evolution of meat consumption in function of type of elaboration of meat. The high disaggregation level of the data also allows us to differentiate two food consumption models, where the processed meat is gaining importance over time.

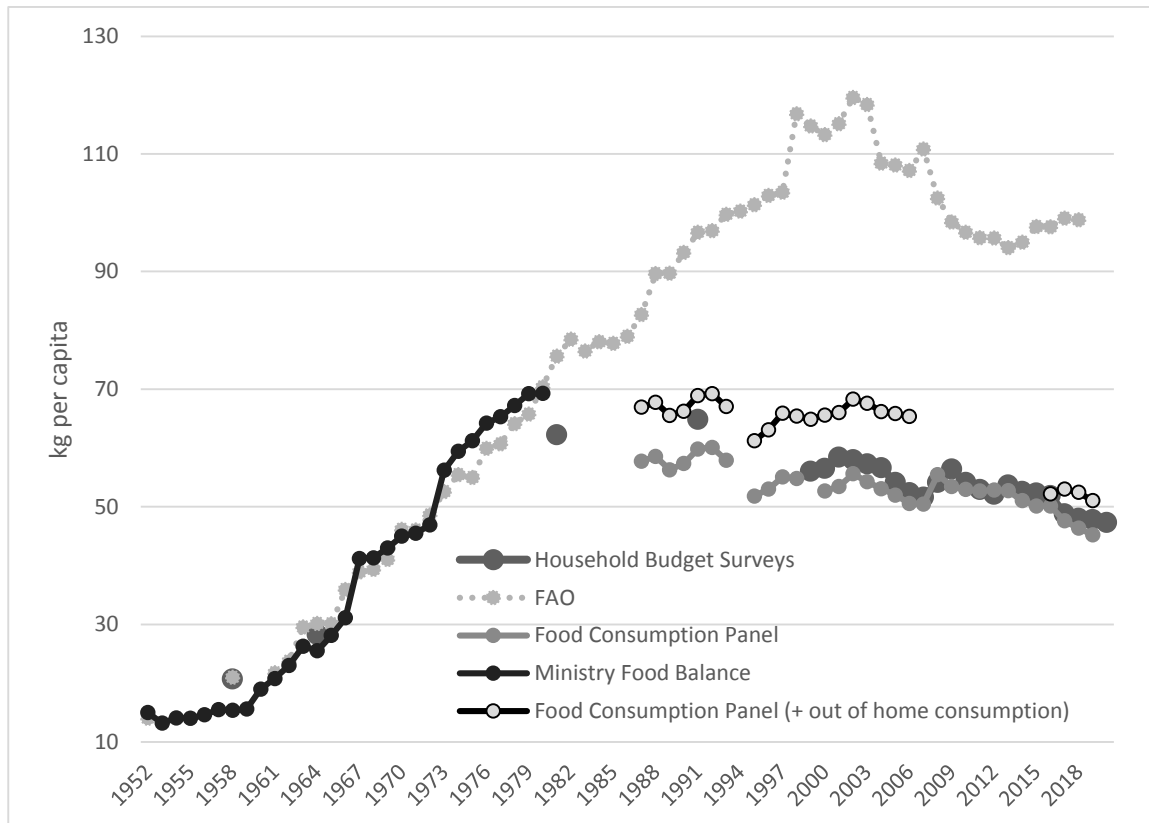
#### **4. Evolution of meat consumption in Spain: a comprehensive view**

Once the data has been compiled from all sources, (see part 2), figure 3 displays the meat consumption in Spain in kilos per capita annually from 1952 to 2019. At first glance, there are at least two remarkable aspects in the figure. First, since the eighties, there is a huge difference between data from FAO and data from the rest of the sources. More importantly, the difference is not only in quantity but also in the trend. While the data provided by FAO offers a picture of a big expansion of meat consumption in Spain until the early 21st century (and other expansion in the last ten years), the rest of series manifest a notable expansion until the early ‘80s and a downward trend thereafter. As explained in the methodology section, since FAO bases their series from indirect calculations of consumption (available food), it is fair to conclude that in the Spanish case data provided by FAO it does not represent the real meat consumption in Spain, neither in quantity nor



in the trend. Thus, we can state that, as well as other European countries (see figure 1 and 2), data FAO is not an accurate tool for analysing meat consumption.

**Figure 3: Meat consumption per capita in Spain (1950-2019)**



Source: see section 2.

The second remarkable trait of figure 3 is the two clear different patterns of meat consumption in Spain with a clear rupture around the eighties. Starting from a really low value in the '50s (around 10-15 kg per capita), the sixties implied a dramatic expansion of meat consumption lasting until the '80s. In that decade, consumption per capita was around 60 kg, which is a respectable quantity. In other words, consumption in Spain grew threefold in just twenty years. However, the picture from the '80s onwards is rather different. From that decade, the consumption of meat stagnated during ten years and started to decrease thereafter. The patterns of dairy products and meat consumption in Spain during the same time are remarkably similar (Collantes, 2014). As can be seen, the

rupture is a few years later if we are taking into account the meat consumption out of the home. However, there are two issues related with extra-domestic consumption that cast doubt on the reliability of the data. First, as stated in (Collantes, 2012, p. 6), extra-domestic consumption provided by Food Consumption Panel since 1987 is overrated. Second, meat consumed out of the home is partially compensated by the meat wasted in households. According to FAO, the meat wasted in Europe at the household level in 2010 is around 11 per cent (Gustavsson et al., 2011, see Annex 4). Therefore, we consider that household consumption of meat is fairly representative of the main trends of meat intake in Spain. So that in the next series we do not include out of the home consumption since it does not contribute to the general argument of this work.

**Table 1: Annual cumulative variation rate of meat consumption**

	1958-1964	1964-1980	1980-1990	1991-2000	2001-2010	2011-2019	1958-1980	1980-2019
<b>Household Budget Survey</b>	5,3	7,4	0,4	-1,5	-0,8	-1,3	17,6	-0,7
<b>FAO</b>	6,2	8,7	2,5	1,8	-1,9	0,4*	19	0,7**
<b>Food Consumption Panel</b>				-1,3	-0,1	-2,1		-0,8***
<b>Ministry Food Balance</b>	8,8	10,5						

Source: see section 2. \*2011-2018, \*\*1981-2018, \*\*\*1987-2019

Table 1 illustrates more clearly the two different patterns of meat consumption before and after the eighties. After a notable growth in 1958-1964 (5, 3 per cent annually), the big expansion comes in 1964-81 (7, 4 per cent). Apart from FAO series, the rest of sources show a negative growth rate thereafter. In fact, the decrease in meat consumption accelerated in the second decade of the XXI century. The last two columns display the different patterns before and after rupture. In the first part of the twentieth century, the annual accumulated growth was 17, 6 percent. In this time, the Spaniards achieved the nutritional transition. During the second part to the present day, the annual growth was

about -0,8 percent. So that during the second food consumption, the Spanish population reduced the intake of meat.

In summary, real meat consumption in Spain from the second half of the twentieth century is not characterized by a great acceleration. Therefore, “real” consumption and the “food available” in the case of meat do not follow the same trend since the eighties. This is the main discrepancy between the above-cited papers and the present work. After the rupture around the eighties, the Spanish diet was characterized by a decreasing trend in meat consumption. A trend that lasts to the present day. The “great acceleration” of meat consumption argument does not fit with reality. Even if we are consuming more meat than that recommended by the scientific consensus, we are not as carnivorous as the Spanish Consumption Minister pointed out (around 90 kg per capita and year in 2018 based on data FAO) and the trend is in the correct direction (even not accentuated enough) to reach a sustainable and healthy quantity of meat intake.

#### **4.1 An international perspective:**

As we have argued, FAO data is not a reliable source in order to analyse consumption of meat over time. For that reason, we use DAFNE-ANEMOS data base to obtain a comparative perspective of Spain and Europe. The main inconvenience is that DAFNE-ANEMOS does not provides data before the eighties, so we focused on the second consumption model (after the rupture).

**Table 2: Consumption of meat in different European countries (kg per capita):**

	1981-85	1986-90	1991-95	1996-2000	2001-2005	2006-2012
<b>Spain</b>	62.24 (1981)	57,74* (1987)	64.83 (1991)	54, 8* (FCP, 1998)	54,2** (2003)	52.1** (2012)
<b>Greece</b>	54,75 (1981)	63.51 (1987)		54.39 (1998)	58,04 (2004)	56,21 (2012)
<b>United Kingdom</b>	54,39 (1985)	54,02 (1988)		48,55 (1998)		
<b>France</b>	62,05 (1985)		59,5 (1991)			
<b>Finland</b>	51,1 (1985)	47,45 (1990)		54.39 (1998)		
<b>Estonia</b>					62.05 (2004)	
<b>Portugal</b>		52.2 (1990)	59.5 (1995)	58,4 (2000)	53 (2000)	

Source: Author's elaboration from DAFNE-AMENOS and Food Consumption Panel. \* Food Consumption Panel. \*\* Household Budget Surveys.

Table 2 illustrates the consumption of meat in a few European countries from 1980 to 2012. What was the relative position of Spain with respect these countries? In the first years of the eighties, Spain, along with France, was the most meat-consuming country from the sample. As we have seen, during those years Spain achieved peak consumption and culminated the modern nutritional transition. However, while France had started to lower the consumption in the nineties, Spain was still at its peak. What happened in the next years? On the eve of the twentieth century, all countries in the sample were consuming the same intake of meat (around 55-60 kg per capita), Portugal being the largest consumer of meat. In fact, during the first decade of the XXI century Spain became one of the least consumer of meat in our sample since Greece and Estonia consumed more meat than Spain. As illustrated by Figure 3, after 2010 the downward trend continued so Spaniards are consuming around 45 kg nowadays. It seems clear that not all countries suffered the “rupture” at the same time. For example, Chile increased dramatically the consumption of chicken meat and milk from the nineties (Llorca-Jaña et al., 2020) while countries like Spain or France had started to lower the consumption of animal products

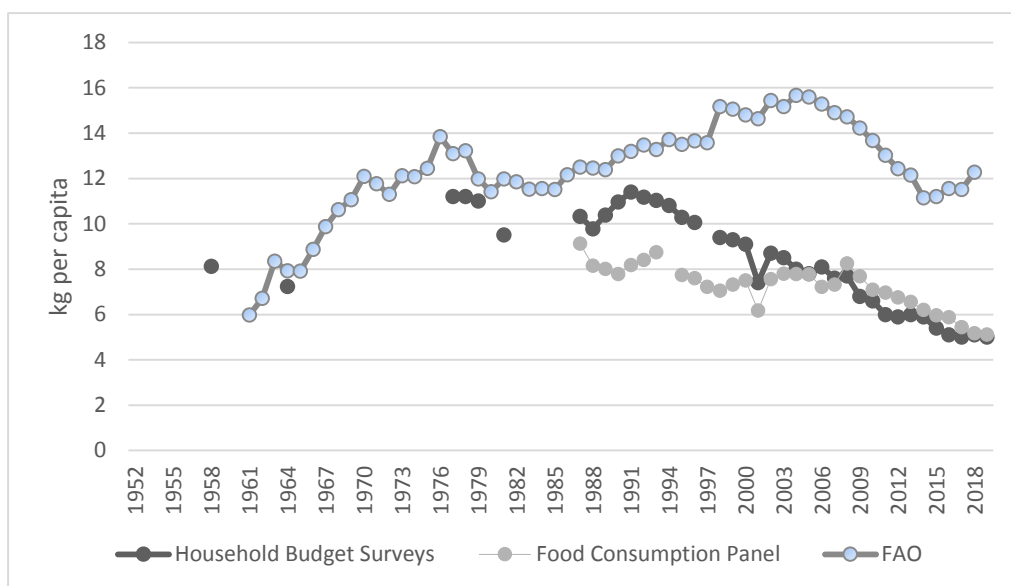
during that time. On the other hand, other countries such as the United Kingdom had been reducing the consumption of meat a few years before.

## **5. Consumption of meat: a disaggregated point of view**

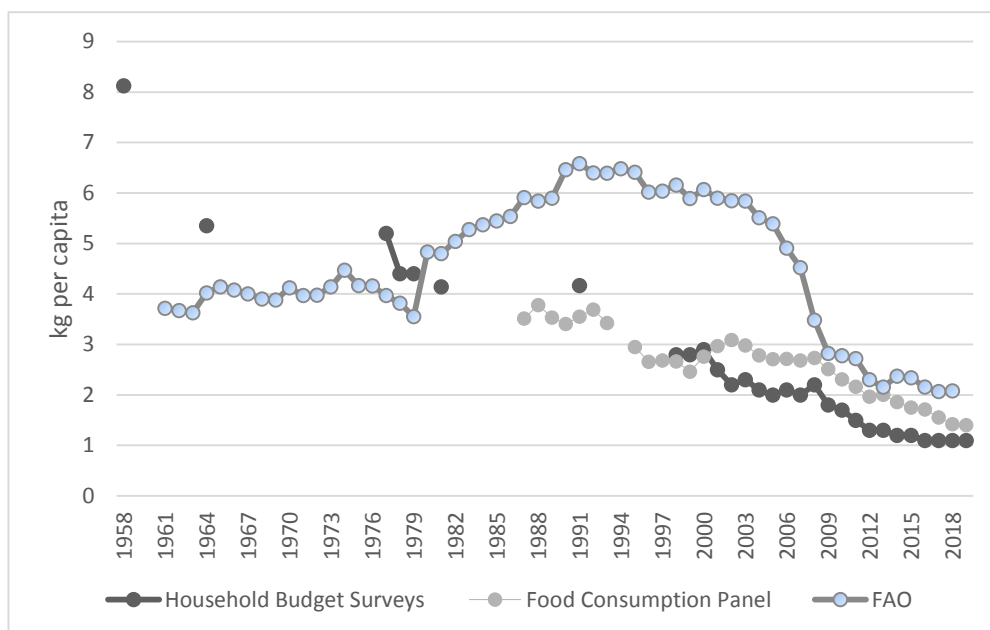
Once the aggregate consumption of meat in Spain from 1950 to 2019 has been analysed, in the second part of this work we try to obtain a disaggregated point of view. Was there a rupture in all types of meats? Is the FAO data inaccurate in all types of meat? Like the general trend in food consumption in high-income countries: ¿Has the elaborated and processed meat gained importance over time in detriment of standardized meat? In order to answer those questions, we use our data base to analyse the evolution of consumption depending on both the type of animal and the elaboration of the meat (see methodology part).

### **5.1. From the animal origin: the traditional perspective**

Most of the authors analysing the evolution of meat consumption in Spain during this time base their conclusion either on an aggregate point of view (total meat intake) or disaggregated by the animal origin. Again, the reason behind it is that they usually use data from FAO, which just provides disaggregated data in this manner. Figure 4, 5, 6 and 7 illustrate the evolution of meat consumption of beef, lamb, pork, poultry and other meat.

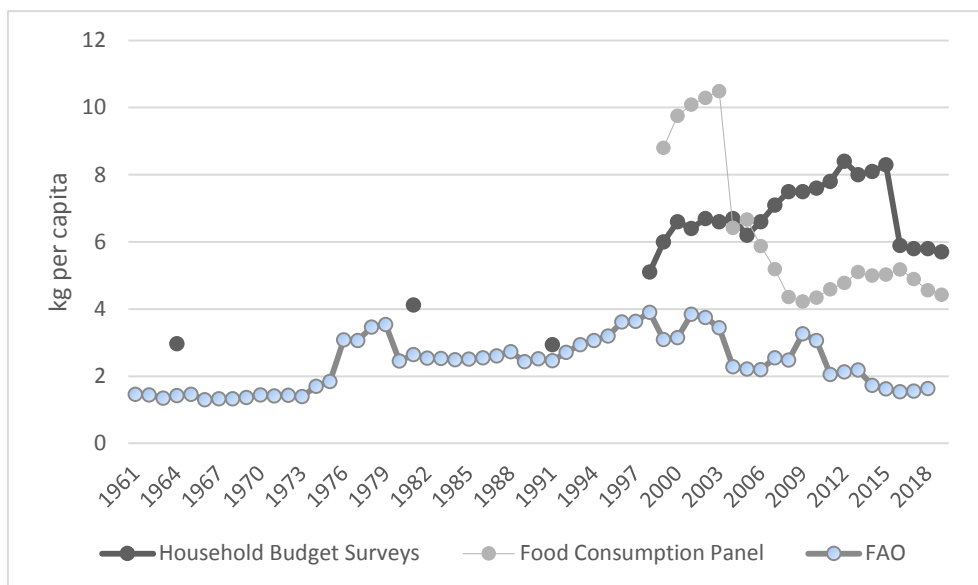
**Figure 4: Consumption of beef in Spain**

Source: see section 2.

**Figure 5: Consumption of lamb in Spain**

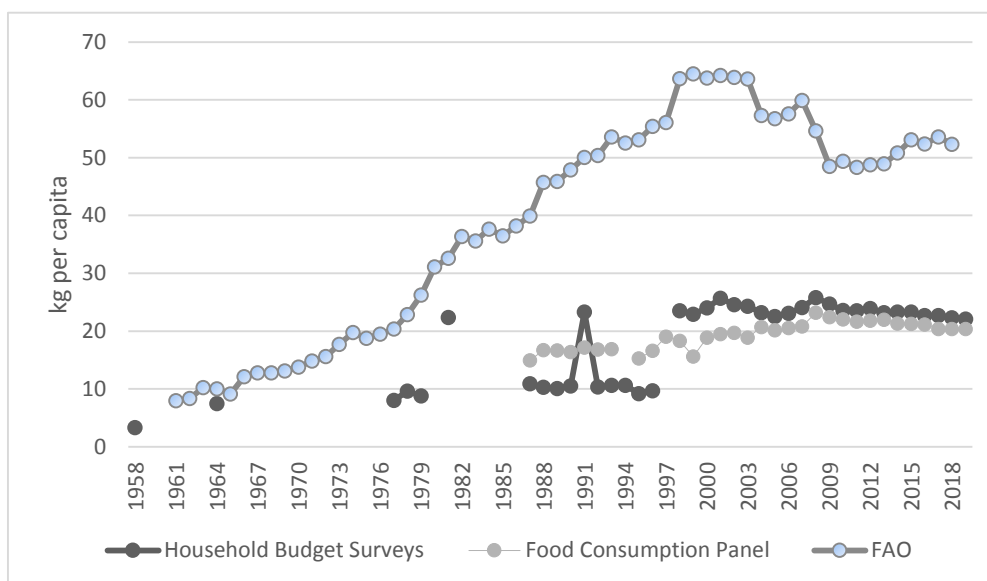
Source: see section 2.

**Figure 6: Consumption of other meat per capita in Spain**

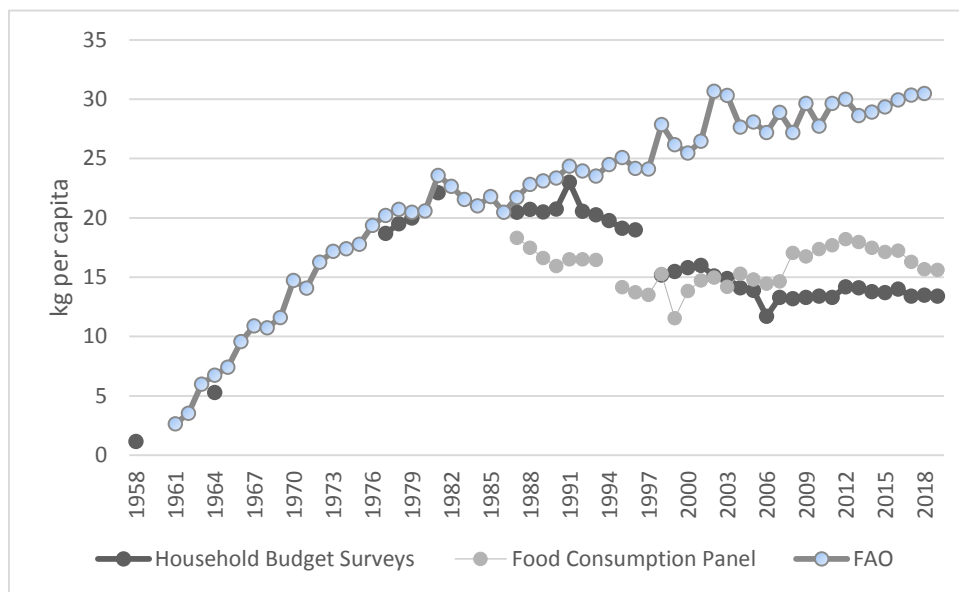


Source: see section 2.

**Figure 7: consumption of pork per capita in Spain**



Source: see section 2.

**Figure 8: Consumption of poultry per capita in Spain**

Source: see section 2.

From a general point of view, there are at least three remarkable traits in all figures. In the first place, as expected, data from FAO is remarkably different with respect to the rest of the sources, even if not during the entire period. In the second place, the absolute quantity consumed varies greatly among the different kinds of meats. Third, not all meats display the rupture at the same time. Besides, some of them show a break more accentuated than others. Based on kilos per capita consumed, we can clearly split off the five kinds of meat in two different blocks: on the one hand, lamb, beef and other meat (mainly rabbit meat, remains and other fresh meat). On the other hand, pork and poultry. While beef, lamb and other meats have a low importance in terms of quantity consumed nowadays, the intake of pork and poultry is rather higher in absolute terms.

The evolution of beef over time illustrates an inverted U-shape. Starting from around 6-8 kilos in 1958-1964, its consumption grew notably until the eighties, reaching 11 kilos during that decade. So, before the rupture, beef displayed a similar behaviour to aggregate consumption of meat. However, from the nineties, it shows an accentuated downward trend lasting until today, when the consumption per year is even lower than the sixties



(less than 6 kilos per capita). FAO displays a rather accurate data both in quantity and trend until the nineties. However, it continues to show an expansion of beef lasting until 2005. With respect to sheep meat, the picture is substantially different. From the starting point (1958), the trend was downwards lasting to the present day, when the consumption is almost non-existent (around 1 kilo per capita). FAO data of sheep meat is accurate until around 1980 and from 2007 until today. In the rest of the years, FAO data show an expansion, drifting away from the rest of the sources. Regarding other meat, there is no rupture either. In fact, the trend is upwards during all the benchmark periods. In the eighties and nineties, the most consumed product in this category was rabbit meat. However, from the XXI century, categories such as “other fresh meat”, or “remains” grew enough to expand the category “other meat” while rabbit meat lost importance in the Spanish citizen’s diet.

Pork and poultry, although are both the main kind of meat consumed nowadays, illustrate a different evolution over the time. Pig meat exhibits a long expansion trend. Like the aggregate meat, the growth from the fifties until the eighties was spectacular since in the fifties the consumption was minimal, so that there was an impressive growth until the eighties. From that point, even if the growth was less accentuated, the expansion continues until the first decade of XXI century. In the last years there has been a slight downward trend. So in the case of pork, unlike the aggregate meat, the rupture was a few years ago. FAO series, in addition to being clearly overrated, shows a constant growth during forty years (1961-2003). After that, there is a slight downward trend but during the last ten years, there is an upward trend again, which does not fit to the rest of the sources. Last, poultry, as well as the total meat consumption also illustrate a clear rupture. From the fifties, the intake per capita grew remarkably until the eighties. From that point, the evolution illustrates a downward trend, giving way to the inverted U-shape. However,

unlike the aggregate consumption of meat, from 2007 the consumption tends to flatten. FAO series are reliable until 1986, when the evolution drifts away from the rest of sources displaying an uninterrupted expansion until the present.

**Table 2: Weight of different meats with respect all meat consumed from Household Budget Survey (%)**

	1964	1981	1991	2000	2010	2018
<b>Beef %</b>	25,85	15,27	18,8	15,58	12,47	10.57
<b>Lamb %</b>	19,1	6,65	6,88	4,97	3,21	2.32
<b>Pork %</b>	26,56	35,9	31,5	41,09	44,61	46.72
<b>Poultry %</b>	18,85	35,13	37,47	27,05	25,33	28.32
<b>Other meat %</b>	9,64	7,02	5,34	11,03	14,37	12.05

Source: see part 2

Table 2 provides another perspective of the evolution of meat intake. Namely, it presents the relative amount consumed of each type of meat with respect to all meat consumed. In 1964, the diversification rate of meat consumed was quite high. That is to say, the Spanish population tended to consume a rather similar amount of each meat. In the eighties and nineties, beef and, especially lamb, lost importance in the Spaniards' diet while poultry and pork gained importance accounting approximately 70% of all meat intake. Therefore, while meat tended to become a "mass product", its consumption standardized around pork and poultry, since those livestock sectors were based on an industrial intensive production. However, after the rupture, poultry dropped its importance, so that in the last 20 years it represents about 27 percent of all meat consumed. The most impressive evolution is that of pork consumption. It has been gaining importance in the diet of the Spanish population since the fifties. In fact, it represents almost half of all meat consumed in Spain at the present. For this reason, we want to go further in the evolution of

consumption of this meat. Table 3 illustrates the evolution of pork disaggregated by cold meats and other pork (fresh and frozen mainly).

**Table 3: Percentage of fresh, frozen meat and sausages with respect all pig meat**

**(HBS):**

	1964	1981	1991	2000	2010	2018
<b>Fresh and frozen pork (%)</b>	27,15	45,23	40,30	33,75	34,75	35,87
<b>Cold meats (%)</b>	72,85	54,77	59,70	66,25	65,25	64,13

Source: see part 2.

Before the eighties, most of the pig meat was mainly consumed in the form of cold meats (especially chorizo). During the time of big expansion in meat intake (before rupture), fresh and frozen pork (other pork) gained weight achieving 45% of all pork intake. However, after rupture, the expansion of pork is mainly explained by cold meats again. In the 2000s, almost two thirds of all pork consumed was already in the cold meats form and this proportion remained until today. So that the distinctive character in the evolution of pork is the consumption of this meat in a processed manner.

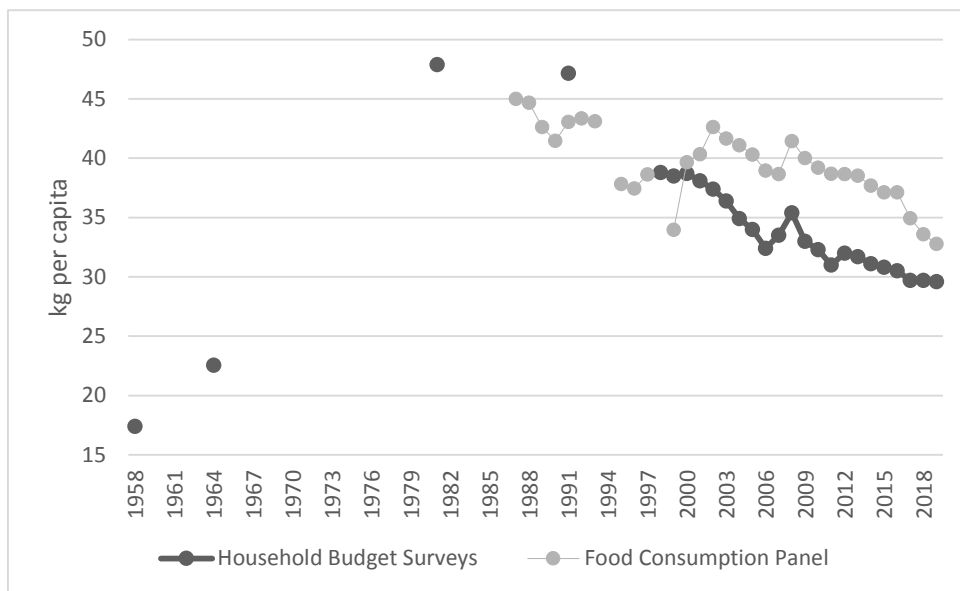
In summary, from the viewpoint of the origin of the animal, not all meats showed a rupture around the eighties and nineties such as the evolution of consumption of aggregate meat. In fact, only beef and poultry display a similar evolution of the aggregate meat, while pork shows a big wave expansion of consumption and lamb a long decline wave during the last 70 years. The long expansion of pork after rupture is explained by consumption of processed meat, which leads us to the last part of the work.

## **5.2. From the consumer point of view: a different perspective**

As explained, processed, prepared and elaborated food is one of the main features of food consumption in high-income societies during the last decades. For this reason, we try to determine if this pattern is also fulfilled in meat consumption in Spain. To do this, we

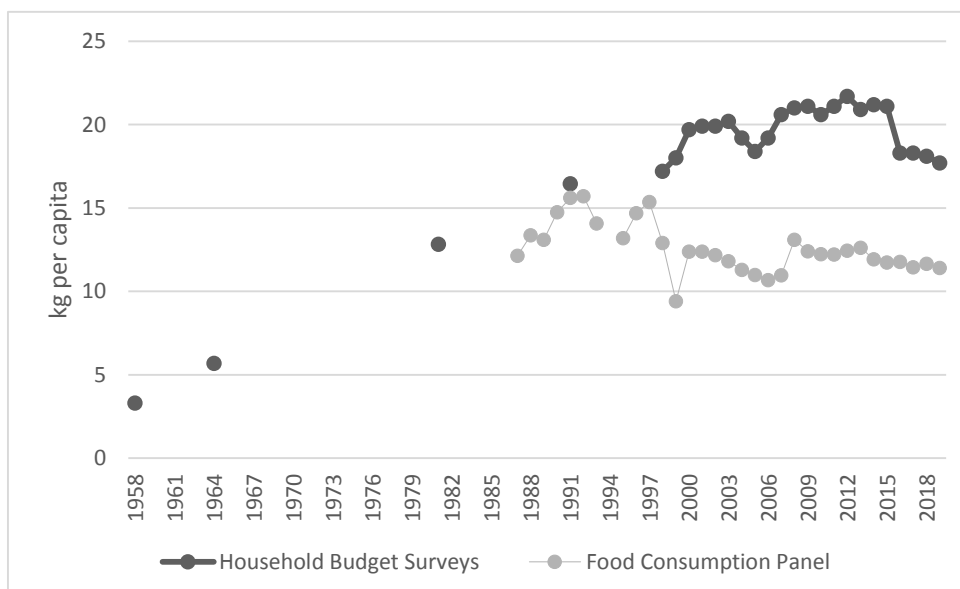
compare the evolution between fresh with processed meat<sup>9</sup>. In this case, we just employ the data based on direct methods since FAO does not offer the data in function of the degree of elaboration.

**Figure 9: Consumption of fresh and refrigerated meat per capita in Spain**



Source: see part 2

**Figure 10: Consumption of processed meat per capita in Spain**



Source: see part 2

<sup>9</sup> Since frozen meat has relatively low importance in the Spanish citizens diet, it has not been taking into account.

Figures 9 and 10 display the evolution of fresh and refrigerated, frozen, and processed meat. Fresh and refrigerated meat (figure 9) is the most consumed meat over time. Moreover, its evolution clearly shows the rupture, such as the aggregate meat intake (figure 1). That is, a big expansion until the eighties and a decrease thereafter. The decreasing trend after the rupture is more accentuated than the aggregate meat (see figure 1) since it forms a clearer inverted U-shape. Spanish citizens are consuming about 30kg per year of this kind of meat nowadays, which implies a strong reduction from the eighties (around 50 kg). This pattern strengthens the argument above explaining the importance of standardized meat (fresh meat in this case) during the great acceleration in meat intake until the eighties. As seen, fresh meat was consumed mainly in chicken and pork form (even if the proportion of pork consumed in a cold meat form was high), the most industrialized livestock sectors. However, after the rupture, the standardized meat was losing more and more ground in the Spanish diet.

Processed meat shows a different pattern (figure 11). That is to say, the increase in consumption of processed meat lasted until the early 21st century at least. In fact, according to Household Budget Surveys, the expansion of this meat lasted until the second decade of XXI century. In the most conservative scenario, processed meat illustrates a stagnation from the 2000s. Namely, like the pork, the rupture in processed meat was a few years ago. Therefore, processed and fresh meat show an opposite pattern. Processed meat was residual in the sixties but it has been gaining importance over time. In other words, the drop in the aggregate meat consumption has not been accentuated enough due to the minor fall in processed meat intake.

**Table 4: Weight of different meats out of all meat consumed from Household Budget****Surveys (%)**

	1958	1964	1981	1991	2000	2010	2018
<b>Refrigerated/fresh meat % (HBS)</b>	84,06	79,73	74,51	72,75	63,86	58,60	59,83
<b>Refrigerated/fresh meat % (FCP)</b>					75.26	74.02	72.48
<b>Frozen meat % (HBS)</b>	n/d	0,14	2,47	1,87			
<b>Frozen meat % (FCP)</b>					1,19	2.89	2,38
<b>Processed meat % (HBS)</b>	15,94	20,12	23,00	25,37	36,13	41,4	40,16
<b>Processed meat % (FCP)</b>					23.55	23.08	25.22

Source: see part 2.

Table 3 exhibits the evolution of meat consumption weighing each kind of meat with respect the aggregate consumption of meat. Frozen meat has increased its weight out of all meats, however, even today consumption is too low (around two percent). The most interesting feature of table 3 is the comparison between refrigerated/ fresh meat and processed meat. Nevertheless, the weights are different depending on the source.

According to Household Budget Survey (HBS), in 1958 refrigerated and fresh meat accounted for 85 percent of total meat consumed while processed meat just 15 percent. In the eighties and nineties the picture was rather similar: fresh and refrigerated meat accounted for 73 per cent and processed meat around 23 per cent. From the early XX century, the picture is quite different since both kinds of meats have approached each other dramatically. Processed meat accounts for 40 per cent of total meat consumed and fresh and refrigerated meat around 60 percent. Therefore, this pattern depicts clearly how meat intake in Spain fits into the two models of consumption in developed countries, one characterized by the intake of standardized agro-industrial food products and the second one by the rise of importance in processed products.

However, even if the patterns are the same, the evolution in processed and fresh meat intake are different with the Food Consumption Panel source. That is to say, although processed meat is gaining importance over time, the trend is less accentuated. According to FCP, 25 per cent of the total meat intake was in processed form while according to HBS processed meat accounted for 40 per cent. Probably, the actual processed meat consumption lies between both points. Moreover, if we are taking into account not only the processed meat (that is, smoked, cured meat, or adding chemical preservatives) but meat elaborated or prepared, the trends are even more accentuated. For example, the growth of the certified meat consumption has been 25 percent from 2004 to 2019. The patterns of chicken consumption has also changed over time. In 2001, about fifty per cent of chicken consumption was “whole chicken”. In 2019, “whole chicken” accounted for 30 percent while chicken in pieces and fillets (that is, prepared chicken) accounts for 70 per cent. In other words, regardless of the source, elaborated, prepared and processed meat is more and more consumed over time while standardized meat is less and less important.

So if processed meat, being the most dynamic kind of meat over time, accounted by between 25 and 40 per cent of all meat consumed, which products were the most dynamics inside processed meat? Table 4 shows the evolution of the main components of processed meat both in absolute and relative quantities.

**Table 5: Consumption of the main processed meats**

Kg per capita	1964	1981	1991	2004	2010	2018
<b>Ham</b>	0,9	4,2	4,9	4,1	4,0	3,4
<b>Chorizo, fuet and salami</b>	2,1	3,0	3,7	2,4	2,2	2,0
<b>Sausages and blood sausage</b>	0	1,4	1,7	0,9	1,5	1,4
<b>Cold cuts and others</b>	2,7	3,2	4,2	2,7	3,1	3,3
% of total meat intake	1964	1981	1991	2004	2010	2018
<b>Ham</b>	3,2	6,7	7,6	7,7	7,6	7,3
<b>Chorizo, fuet and salami</b>	7,4	4,8	5,7	4,5	4,2	4,3
<b>Sausages and blood sausage</b>	0,0	2,2	2,6	1,7	2,8	3,0
<b>Cold cuts and others</b>	9,5	5,1	6,5	5,1	5,9	7,1

Source: see part 2.

Before the eighties, chorizo, fuet as well as salami, cold cuts and others were the most processed meat products consumed in Spain. However, ham was the fastest growing product and during the eighties and nineties became the preferred processed meat by the Spanish population. Even though ham has been less consumed in absolute terms during the last 10 years, it still accounts for 7, 3 percent out of all meat consumed. Chorizo, fuet and salami has tended to stagnate from the nineties while cold cuts and other have gained importance in the last years. Lastly, even if nowadays it just accounts for 3% of all meat intake, sausages and blood sausages have been gaining weight consistently since the sixties. As may be seen, the main processed meat products are coming from pork. That is to say, table 3 and 5 are two sides to the same coin. The long expansion of pork is explained by the cold meats intake, which in turn is processed meat.

In summary, as in other developed countries, we can differentiate two consumption models before and after rupture. Before the eighties, the expansion of meat consumption was based on standardized form (fresh and refrigerated meat). After the eighties, the drop in meat intake was accompanied by the increase in processed (and elaborated) meat. The



increase in the consumption of pork products such as ham, chorizo or cold cuts entailed a less accentuated drop in the total meat intake during the last years.

## **6. Conclusions and future research**

The culmination of the nutritional transition in Spain entailed a rapid shift to a westernized diet. That is, along with other socioeconomic changes, the Spanish population became one of the largest meat consumers in Europe in few years. During this process, standardized meat, that is, that based on intensive livestock sector such as chicken and pork was the most meat consumed. At the same time, beef and lamb, both based on extensive livestock lost ground on the diet. In other words, from 1950 to 1980/90 meat became a mass consumer product. However, during the following years the story was rather different and far less documented. The Spanish average consumer slowly tended to consume less and less meat. At the same time, processed and more sophisticated meat was gaining weight in the total meat intake, especially that coming pork. Moreover, fresh and refrigerated meat dropped in importance. Therefore, the trends in meat intake are in line with those of in developed countries. The use of all possible sources of food consumption has enabled us to explain this second part of the history as well as to criticize the indirect sources estimation of meat intake. As stated by both the Minister of Consumption in Spain and the literature, (Ekmekcioglu et al., 2018; Gerber et al., 2013), meat consumption is still far from being low. However, in the Spanish case, the trend seems to be adequate, so that should be taken into account to design a correct food policy. On the other hand, and as far as public health is concerned, an appropriate food policy should be focused on reducing the consumption of processed meat.

This result encourages the initiation of two different branches in future research. First, in this work we have made reference to the average intake of meat per capita. However, with

no doubt, income, territorial, and age differences were present during this process (Collantes, 2015b; Cussó Segura & Andreu, 2013). Second, we do not know the main drivers of both the expansion and the recession trends in meat consumption in Spain. There are many variables embedded in consumer decision of meat intake: income, meat prices, prices of other food products, culture, religion, moral, health and environmental issues, rates of urbanization, tastes, advertising, dominant nutritionism opinion, etc. Moreover all those variable are different in function of each kind of meat. Knowing all of this, would allow us to understand consumer preferences with respect to meat.

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