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Regional efficiency and price fluctuation in the «grupos de consumo» 2020-2023

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Yo Carlos García RUZO, con DNI

DECLARO

que el TFG titulado eficiencia regional y fluctuación de precios en los grupos de consumo 2020-2023, es una obra original y que he citado debidamente todas las fuentes utilizadas.

12 de mayo del 2024

TÍTULO EN ESPAÑOL: Eficiencia regional y fluctuación de precios en los grupos de consumo 2020-2023

RESUMEN EN ESPAÑOL: En este estudio analizamos la distribución territorial de los grupos de consumo en la región de Asturias, así como la evolución de los precios en dichos grupos en comparación con los precios obtenidos en el Panel de Consumo Alimentario (PCA). Consideramos que la fluctuación en los precios es menor en los grupos de consumo que en el resto de minoristas. Por otra parte, comparamos las teorías de distribución espacial de Christaller con las distintas localizaciones de los grupos de consumo a lo largo de la geografía asturiana. Si bien la teoría de los lugares centrales de Christaller presenta muchas limitaciones, consideramos que podría tener cabida una clasificación de bienes de primer y segundo orden en el caso de la distribución geográfica de los grupos de consumo en Asturias.

TÍTULO EN INGLÉS: Regional efficiency and price fluctuation in the «grupos de consumo» 2020-2023

RESUMEN EN INGLÉS: In this work we study the territorial distribution of the consumption groups in the region of Asturias, we analyse as well the evolution of prices in these groups in comparison with the prices obtained in the Food Consumption Panel (Panel de Consumo Alimentario). We consider that the fluctuation in prices is lower in the consumption groups than in the rest of retailers. Thus, we compare Christaller's spatial distribution theories with the different locations of the consumption groups throughout the Asturian geography. Although Christaller's theory of central places has many limitations, we consider that the ordination of first and second order goods could be interesting to establish some patterns in the emergence of these groups in the region of Asturias.

Regional efficiency and price fluctuation in the «grupos de consumo» 2021-2023

INTRODUCTION

The COVID-19 pandemic led to an economic turmoil in global economies, including those in western countries. In the European Union (EU), most states experienced difficulties in their economies with low Gross Domestic Product (GDP) rates, high unemployment figures and rising inflation, especially in the years following the quarantine (that is from 2021 to 2023). During most of those years, European countries have suffered what is known in economy as stagflation, meaning a recession period with high levels of inflation. This concept, which has been rarely used until recent years, has resonated within the heads of numerous economists. Hence these causes and consequences, have been studied recently[1] in order to shed some light on possible ways of avoiding similar situations in the future.

Following this concern, we are interested in analyse the possible reasons of the high rates of inflation experienced last years on Spain, concretely in the region of Asturias. To perform this task, we have at our disposal several tools. Our goal is to analyse one of the possible causes of this high inflation rates: intermediated prices.

Hence, we have chosen to perform a comparative study of the gradual evolution of the prices among the retailers and one social and economic figures «grupos de consumo»[2]. These groups are framed in a wider concept that covers most of these groups throughout the globe: Alternative Food Networks (AFN).

We have chosen AFN as comparison figure due to the absence of intermediaries between producers (farmers) and consumers (group members). The proliferation of intermediaries could be one reason for the price increases. In an inflationary environment if the retailers and intermediaries keep the margins in nominal figures (15% for instance) the prices will raise rapidly. This issue is not happening on the AFN, as they ─normally─ lack of intermediaries.

The intermediaries price formation is not the goal of our work, as there are numerous papers ─for instance Bliss, C. (1988)─ that study deeply this issue. Therefore, we will focus our work in observing the retailer's prices and their stability in the recent years. Then we could observe if they have had some influence in skyrocketing the cost of the shopping basket of the regular consumer.

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[1] There are many studies interested in the post-pandemic inflation: Bernanke, B; Blanchard, O. (2023). "What Caused the U.S. Pandemic-Era Inflation?" Hutchins Center Working Paper n 86, June 2023. . Cascaldi-Garcia, D. Orak, Musa, Saijid, Zina (2023) "Drivers of Post-pandemic Inflation in Selected Advanced Economies and Implications for the Outlook" *Federal Reserve Notes*, January 13, 2023. Martin Harding ; Jesper Lindé ; Mathias Trabandt (2023) "Understanding Post-COVID Inflation Dynamics", *IMF Working* papers, January 20th , 2023. Cascaldi-Garcia, D. Orak, Musa, Saijid, Zina (2023) "Drivers of Post-pandemic Inflation in Selected Advanced Economies and Implications for the Outlook" *Federal Reserve Notes*, January 13, 2023.

[2] There are diferent names for the Spanish «Grupos de Consumo», «grupos de consumo agroecológico», «grupos de ecoconsumo», «grupos de consumo responsable» o «grupos de consumo». If these groups are self-managed, we talk about «Redes de Consumo Autogestionadas». A detailed explanation about these groups can be found in Ministerio de Transición ecológica y reto demográfico (2015).Ministerio para la Transición Ecológica y el Reto Demográfico, 2015, January. https://www.miteco.gob.es/es/ceneam/carpeta-informativa-del-ceneam/novedades/encanto-grupos-ecoconsumo.html

In order to confirm this fact, we will compare the data from the «Panel de Consumo Alimentario»[3] (PCA) with those on the consumption groups, contrasting their evolution on the years after the pandemic. We will focus our efforts on setting up an evolution of the food prices, especially those which are consumed on these groups, which are basically ecological and local products.

Despite the importance of this issue in the public debate, there is almost no empirical studies about this topic. This reality added to the fact that most of these groups appear spontaneously without any strict rules, makes the gathering of homogenous information a herculean task that requires the qualitative and quantitative analysis of several aspects of these groups. In this regard, we will be required to analyse the number of groups in Asturias. Nonetheless, we must study as well how they work, where are they located and, specially, the prices and their evolution on the years studied.

Taking advantage from the empirical work needed to establish a pattern on prices we will locate and distribute every consumption group in Asturias on a map. This inventory will serve as database to analyse if we can establish a pattern in their emergence. Following this line of work, we will try to establish an association on the appearances of the consumption groups and the central places theory stated by Christaller in the 1960's

This final degree project will help to shed some light on the status of the consumption groups in the region of Asturias, as well as the way they work. It will help us to locate them on the map and to compare the evolution of their prices with those on the retailers. Once we have established these concepts we will make generic assumptions about the regional efficiency on their locations from the point of view of the regional economy.

In any case, these issues are not only necessary because of the scarce information we have on these groups, but also because it sets up the pillars for further research on the matter. Thus, this process will help us on getting information about how the prices are formed in these associations and their location on the region.

Summing up, we will focus our work on two goals. First of all, we will locate in the region these groups, listing them on the map and pointing out differences and similarities among them. We will analyse if there is any pattern on their origin or they just appear randomly without any reason. Here we will use basic concepts of regional economy, concretely we will use the Christaller's theory of central places. We are aware of the several limitations of this theory, as stated in Parr J. (2017), but using this theory will allow us to reach some conclusions about them, especially on terms of number of settlements and their distance among them.

Secondly, with the limitations of the collected data, we will contrast the prices from the PCA in Asturias and Spain with those obtained in the consumption groups. As we will see, there are numerous limitations regarding this comparison but it would help us to get some insights on the behaviour of these groups. Normally, as studied by Sánchez Hernández, J. L. (2009), prices are lower in this groups (due to the lack of profit margins, therefore prices should be more stable that in the retailer prices.

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[3] The data in the «Panel de Consumo Alimentario» reflects the expenses on food products. "Series de datos del consumo alimentario por hogares hasta noviembre del 2023", Dirección General de la Industria Alimentaria, https://www.mapa.gob.es/es/alimentacion/temas/consumo-tendencias/panel-de-consumo-alimentario/series-anuales/default.aspx

1.- HISTORICAL BACKGROUND AND CONSUMPTION GROUPS NOTION

The notion of «grupos de consumo» stands out for its heterogeneity, reflecting different realities depending on the country and even within a given country. Nonetheless, numerous authors point its origin on the social movements from different countries in response to «The green revolution». This name responds to the intensive agriculture capitalization during the 1940's and subsequent years. Indeed, a common feature of all these movements were a refusal of the model promoted by the intensive and capitalist agriculture system that was being implemented by then.

It is important to take into account that these organizations tend to define themselves as non-profitable organizations which help producers to reach consumers. In this sense, these groups possess a feature that makes them peculiar in our western capitalist economies: their implication with the concept of moral economies. Following this concept, the purchasing decisions are not only based on prices, the decisions are based as well in other aspects such as fair income, rural environment protection, ecologic issues and sustainability.

In this sense, the pioneers were supposed to be the Japanese[4] on the 1960's-1970's with the *Tikei* movement. *Tikei* -meaning partnership in Japanese- started as "…urban housewives, organized themselves into collective groups that reached out to producers…" (Kondo, C ,2019: 104).

In the Community Supported Agriculture (CSA's) ─in the United States─ the goal was "…divide the costs of the farm or garden among shareholders before the growing season begins…." (Paul, M ,2019: 164). These CSA's rejected an agriculture based on a capitalist economy or subsidized by the government. The CSA's number grew rapidly after the implementation of the two first groups at the end of the 1980's, reaching the number of 6200 by 2014.

The *Association pour le Maintien d'une Agriculture Paysanne* (AMAPs)[5] are the equivalent to the CSA's in France. They started right after the CSA'S and *Tikei* movements in Japan as is pointed out in Olivier, V.;Coquart, D. (2010). At their start the commitment with the farmer was for six months with a regular payment for the daily products. The goal with this organization was to establish new networks of consumption among producers and consumers.

In Spain, due to the late development in agriculture, this movement emerged later than in most of western countries. The development in intensive agriculture in our country started during the 1980's-90's, growing rapidly after the economic integration in the European and Economic Community (EEC). Therefore, the «grupos de consumo» ─ as stated in Couceiro Arroyo, A. (2016)─ proliferated later than in other countries reaching their boiling point after the 15-M movements. The goals of these groups, as in other countries, are related with environmental issues and fair incomes for the farmers.

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[4] Some sources assess that the emerging of these organisations were first noticed in Germany, Switzerland and Japan. Nonetheless most authors state that the pioneers on the movement were the japanes with their *teikei* movement. https://www.tri-articulation.info/actualite/theme/economie/l-histoire-des-csa-et-son-lien-avec-les-amap

[5] For further information on the AMAPS, we recommend visiting the we page: *Qu'est-ce qu'une AMAP?* https://amap-idf.org/les-amap/quezako

Hence we can state that every *CSA, AMAP, Tikei*, etc are born to establish different relationships among producers and consumers. This is not a trivial issue as it confronts the basic principles of the capitalism and promotes a different way of consumption. In this sense, these entities turn up spontaneously with distinct common features among them.

This fact makes difficult to state a concept that comprehends each and every of the different kind of association existing nowadays. Moreover, because of these groups idiosyncrasy, they are continuously changing, fact that makes even more difficult to track them. We have to take into account that even within each «grupos de consumo» there are established different kinds of relationships among producers and consumers.

Therefore, we have chosen to use a broad concept, which will allow us to gather as much information on these groups as possible. This will be make us easier harmonizing and comparing the data collected, allowing us to map and analyse the networks and relations among them. Consequently, we will be able to determine their geographical position, as well as analyse their influence and their proportion in the regional economy.

We will define these entities as groups of people which gather several features:

1. The most important issue is always the group. The people decide to gather to consume local and organic goods, mainly seasonal food. They build human relations, then the group welfare and its prosperity is more important than individualism.

2. They refuse to participate in the main distribution channels and they consume these goods, straight from the producer, without any intermediaries.

3. Their main purpose is social and it is not related with economic aspects, for instance: achieving efficiency in the distribution. Then, on the contrary of what orthodox economy states, here the individuals will make decisions taking into consideration other issues: fair incomes, environmental welfare, mutual support and the sustenance of the local economy.

4. Their decision making process is democratic. The agreements are normally decided with the participation of the most part of the members, normally by consensus and by majority, when the unanimity is not reached.

5. They create a solidarity economy as an alternative to formal economies. In this sense, the main characteristics of these gatherings are typical from moral economies[6].

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[6] For the study of moral economies there are numerous studies that analyse the issue. Numerous researches have shown interest in this issue in recent year for instance: Hann C. (2016). "The Moral Dimension of Economy: work, workfare, and fairness in provincial Hungary", Max Planck Institute for *Social Anthropology Working Papers, Working* Paper No. 174, pp 1-20; Homs Ramírez de la Piscina, P. ., & Martínez Álvarez, B. . (2021). "Dignidad y precio justo: Las economías morales de la agricultura y la ganadería en la era de la agro-industria. Disparidades", Revista De Antropología, 76(1), e006. https://doi.org/10.3989/dra.2021.006

With this concept we consider most organizations of this kind in our region[7]. In plus, we take into account the most important feature of the *AFNs*, that is, their starring role as an alternative to capitalist economy, which is the prominent and current economic system and also to the and globalization experienced in the latest decades. Thus, we maintain the essence of the pioneer movements in this issue, the *Tikeis, CSA's*, etc…

We could also use the concept Alternative Food Networks, as every of the figures studied are contained in this concept. But this concept is wider and it comprehends *"…systems or channels of food production, distribution and consumption which are built upon the re-connection or close communication between producer and consumer, allowing for the development of new forms of relationship and governance of the actors' network and also enhancing a re-distribution of value for primary producers…"* (Sánchez Hernández, J. L. 2009: 376). Focusing on a specific concept will allow us to be more detailed in our analysis.

We have to take into account that we are not considering other existing options, for instance, «cestas de consumo» which are offers made by the farmers, where they gather different seasonal groceries and deliver them to the consumers. In these figures, there are normally a commitment of periodic orders and a recurrent payment depending on the delivery. In this case, the decisions are individualistic, each home decides what to buy –straight from the farmer- but there is not any deliberation or gathering in relation with this choice made.

Once we have stated a notion of «grupos de consumo», we will analyse the number of groups established in our region, summarizing their main features, way of working, principles and locating them on our region. We will then elaborate a map in which we will compare the main goals of the regional economy and how they apply to these spontaneous groups. This will require an extensive field work, mainly qualitative. This will be carried out with interviews (producers, consumers and organizations), phone calls, physical inspections of the facilities where they gather, etc…

To study this issue, we will use Christaller's central place theory (CTP). Although the assumptions made by Christaller's on its model are quite limiting[8] and it was designed to look for relationships between the size, the number, and the geographic distribution of cities; it gives an accurate description of the economic landscape and will allow to give us further knowledge on these groups.

Therefore, we consider useful to apply this theory to our analysis, as we can study their distribution on the map. There are numerous current studies that update this model, but as it overcomes the extent of our work we will only consider simplified Christaller's seminal theory.

Secondly, as a quantitative goal we will compare the evolution in the good prices from these associations with their equivalents in the retailers. We have chosen to compare the prices in the last three years as it is there where we have experienced high inflation rates in comparison with the years pre-covid (before 2020).

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[7] Due to the features of these groups we will use only the Spanish concept to refer to them. We are going to refer to them all along the work as «grupos de consumo» or their word to word translation: consumption groups. The terms CSA's, Tikeis, AMAP are not interchangeable and we will be referring to different concepts in different countries.

[8] a) a homogeneous terrain with a un rural population; b) the consumer assumes the cost of transport; c) same demand for every consumer d) There is not legal restrictions to enter the market. Pp569 Parr, J. B., & Denike, K. G. (1970). "Theoretical Problems in Central Place Analysis", *Economic Geography*, *46*(4), 568–586. https://doi.org/10.2307/142941

2.- REGIONAL LOCATION OF «GRUPOS DE CONSUMO» IN ASTURIAS

In order to locate the different «grupos de consumo» in the region, we have used basically qualitative information. Through different ways, especially through other «grupos de consumo», bibliography and farmers that provide products to the different groups we have been able to gather enough information about these groups.

Mainly we have focused our attention on the following issues:

   a. Name
   b. Establishment date
   c. Number of members
   d. Self-managed or association managed
   e. Order periodicity
   f. Goals
   g. Basic principles and values
   h. Regional influence
   i. Gathering city
   j. Prices

This information was collected contacting different groups and their members. Most interviews were made in the association locals, in the cases were they did not have local we visited the place where they receive and deliver the items. We have tried, as far as possible, to be there at least in the distribution of the products watching the group operating. Whenever this was not possible we have contacted the groups by phone or email collecting the abovementioned information.

We have also used other sources of information: specially we have searched on the internet for these groups. The information obtained had to be filtered, given their idiosyncrasy and volatility. In this sense, we have used several webpages such as grupagrupo[9] and naturve[10] where we have obtained different groups and their location on the map. We have also compared the information with bibliography, concretely in Arce María, González Í., Martínez E., Tarancón M. (2011), and as well with the different groups we have interviewed. In that respect, we have been able to get the most updated data possible, an important detail in this kind of researches where the groups are difficult to locate.

In order to maintain the privacy of the groups, as well to get the figures that we need, we will aggregate the empirical results getting descriptive information from their most important features We have chosen to analyse the establishment dates, the order periodicity and also the mean number of members.

On one hand, this information will allow us to get conclusions on the impact and potential growth of the groups. We would make generic assumptions about the importance of the groups in our region comparing them to other regions and countries, in numbers and way of working

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[9] https://www.grupoagrupo.net/
[10] https://naturve.wordpress.com/grupos-de-consumo/

summing this information in a table we can use to make assumptions on their existence and possible outcome for the following years

On the other hand, the geographic location of the groups will allow us to make assumptions about their presence on the region and if they are efficiently located on the map. Specially we will be able to determine if there are any recurrent pattern on their appearance or they appear randomly not following any efficient design. Therefore, our assumption, as stated on the introduction, was that they should follow the Christaller's central place theory, which tried to give an explanation about the spatial distribution of cities across the landscape.

2.1.- GROUPS MAIN FEATURES

Following these procedures, we have been able to gather information from sixteen groups[11]. Most of these groups are self-managed and their products are being delivered weekly. They stablish relations with the local producers being fair prices to the farmer and environmental issues their main principles.

Number of groups studied	Most predominant establishment date	Mean number of members	Number of self-managed groups	Number of association-managed groups	Most common order periodicity
16	2012-2017	19	7	6	Weekly

Table 2.1.1. Groups features summarized (own elaboration)

Groups features are summed up in the table 2.1.1. where we present their most prominent traits. This will allow us to present descriptive statistical data from the groups, specially number of groups located, members and foundation dates; this will have led us to get an in-depth-analysis of the status of these associations in Asturias.

The most predominant creation date for these figures is around 2010-2015. We have represented in a histogram this information. In the graph 2.1.1. we can see that seven groups were established during the years 2012-2017 whilst five emerged during the years 2006-2011. Recently, three groups were created on the last five years, where the evolution of the prices were studied.

As we assessed before, the proliferation of these groups came especially after the "indignados" movement, which happened after the economic and financial crisis experienced after 2008. This movement was dated from 15th May of 2011 to 2015.

Undoubtedly, the late emergence of these groups in our country is related with the late development of the agriculture in the country. In our region, the circumstances are different. Asturias has been a predominantly rural region until recent decades. In this case, the linkages among farmers and consumers have been steadier than in most of the country. This has deep implications, because there are situations where there have been rural transactions and also

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[11] Additional information on the groups interviewed and their details has been attached in the annexes

self-consumption until recently. These facts reduce the amount of groceries bought in the supermarkets and also in the consumption groups, reducing them in number when compare with other regions.

Most predominant establishment dates
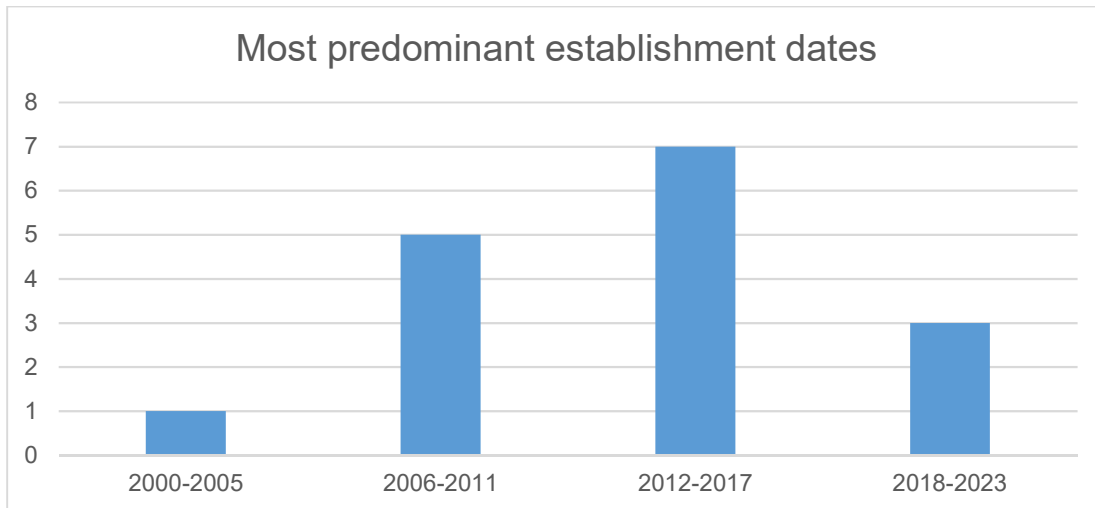
Graph 2.1.1. Groups most predominant establishment dates (own elaboration from qualitative research)

The mean of members is nineteen people. Therefore, extrapolating this result to the sixteen groups studied we have three hundred and twenty people participating in these groups. This fact reflects that their existence is not relevant in the Asturian economy, as their participation in the overall asturian population.

Some of these groups are self-managed (seven of them) and their most common order periodicity is weekly. This fact indicates that most associations buy perishable goods. There is an important amount of these groups which buy as well daily products in a weekly basis but most of them are managed by associations.

In this regard, we observe that groups which order mainly non-perishable goods are usually self-managed and, on the contrary, when groups order in a weekly basis they are normally association managed. We can point out here a logical pattern, as the organizations increase in size and periodicity they tend to be organized by an association. On the contrary, when the order periodicity is longer the organizations are normally self-managed. As the organizational costs increase they are organized by the associations in order to reduce the transaction costs.

We have to take into account that there are figures, as we noted before, that do not fix the concept that we stated of these groups. In this case, groceries sold straight from the farmer to the consumer (in the way of baskets of products or groceries being sold individually) are not being studied and as we felt from the talks we had from some farmers, these are significant in number.

There are also baskets provided through the «grupos de consumo» but these were considered in the study as they are included in the comprehensive concept that we have defined previously. Nevertheless, these kind of baskets are not included on the prices fluctuation analysis that we do in the second part of our work. The reason is the high difficulty in comparing them with similar products in the retailers.

2.2.- GROUPS LOCATION AND REGIONAL ECONOMY

As we stated before, one of the main goals of this work is to locate the groups on the map and consider if there is any pattern in their emergence. This will allow to get conclusions about their distribution according to regional economy.

Therefore, following Christaller's central place theory, under certain circumstances we can affirm that the distribution of the different settlements will be made according to three principles: market principle, transportation principle and administrative principle.

Consequently, with these principles, Christaller established a hierarchy of products. First order products would be those who are needed in a daily basis. These kind of products are the one that are closest to population areas as they are needed daily. The second order products will be further from the rural areas, as they will be needed on a longer basis. On the other hand, the third order products are those which are consumed in an even longer basis and are further located than those of second order. In this sense, the cost of transportation is higher than the rest and the use of these products will be occurring more occasionally in time.
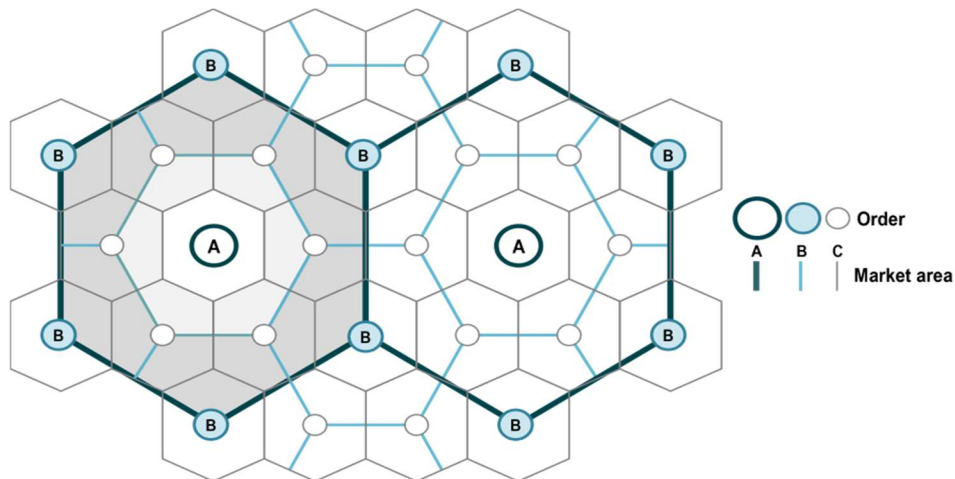
Graph 2.2. Christaller's central place hierarchy (geography of transport systems)[12]

According to Christaller's theory the rural areas should have consumption groups with weekly periodicity. Weekly consumption groups which usually distribute perishable goods, as they are items that are consumed in a daily basis they should be nearer to the consumer than the goods bought in a longer basis. These first order products should be then in rural areas.

In this regard, we have found six groups in rural areas with weekly periodicity (Llanes, Cabranes, Pruvia, El Entrego, Nava y Navia). These groups are located far from the metropolitan area where the 80% of the asturian population are located. Three are not far from this area (around 30-35 minutes by car), but the rest are further from this area. Nonetheless, one of them (Cabranes) have different order periodicity, as they allow monthly orders.

On the other hand, we have found in the metropolitan area more variety. In this sense, we have all the order periodicities in the metropolitan area. This fact, reinforces the idea of

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[12] The graph has been obtained form the web: https://transportgeography.org/contents/chapter2/transport-and-spatial-organization/central-places-theory-market-principle/

Christaller's theory. Orders made annual, by semester are located in this area. As well weekly orders are concentrated in this area.

Therefore, higher hierarchy products are located in an area where there is more population. This is consistent with Christaller's theory as it is more expensive for the consumer in terms of time to move from the rural areas to the metropolitan area to buy these products.

2.3.- CONSUMPTION GROUPS LOCATION

To withdraw conclusions from the groups distribution we have decided to numerate every «grupo de consumo» and put it on a map of the region. Then we can see if we can infer any conclusion from their location in the map related with Christaller's principles.
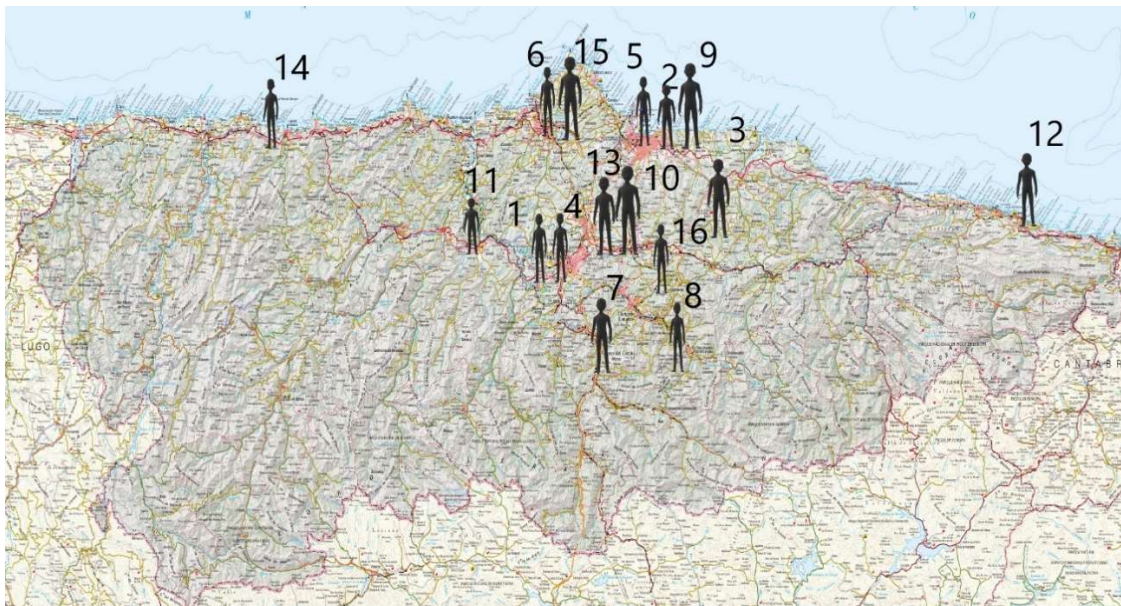
Map 2.3 Consumption groups distribution (Own elaboration)

According to the ordination of the groups depending on the products (first order, second order and third order) we observe different geographic distributions for those groups that have daily products from those that have non-perishable products. As we can see from the groups observed the following groups: 1 and 11 follow a pattern of annual or biannual orders. The groups numbered 2, 3 and 14 have a mixed order periodicity. The rest of them have a weekly order basis, mainly based on daily products.

Following Christaller's theory the groups with daily basis will be more centred in the region, as they are first order products. Therefore we should observe the first group of associations in the centred regions, where the most population is located [13]. In this case, most of the groups are located in this area, only two groups (EcoNavia and La Comuña) are far from the centre of the region. These groups distribute daily products in a weekly basis.

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[13] 70% of the asturian population are established in four districts (Gijon, Oviedo, Aviles, and Siero) as it can be seen in this article IDEPA,Demografía y población (Actualizado febrero 2023) https://www.idepa.es/conocimiento/asturias-en-cifras/demografia

Then this distribution would correspond to the classification established by Christaller. Which stated that second order products, which are bought in a longer basis, are further from the centre than those from first order. In this sense, most of the non-perishable products are bought in groups located among Oviedo, Gijon, Aviles and Siero, as we can see from the figure map 2.3.

Nonetheless, we cannot forget that almost 80% of the population is concentred among Oviedo, Gijon, Aviles and Siero. We have to take into account that the Principality of Asturias is composed of 78 municipalities. Most economic activity and a large part of the population are located in the central municipalities of Asturias.

In this regard, we cannot asseverate that only the Christaller's theory applies, as the concentration of groups in the region centre could be related to the high population density in this zone. In plus, considering the rural distribution of the region, we know that the municipalities with low population are the ones where the self-consumption −in the way of farming their own products− is really important in Asturias. Hence the «grupos de consumo» distribution could be related with the particularities of Asturias instead of the Christaller's principles.

Summing up, due to the concentration of the population in the centre of Asturias centre and a rural environment scattered around the region −with a broad variety of self-consumption and private vegetable gardens − we cannot asseverate that the emergence of these groups follows Christaller's theory. Nonetheless, we can state that there is a pattern in their appearance: they are grouped together in the centre of the region. Issue that it is a predictable fact, due to the region features aforementioned: high density population in the centre, self-managed gardens and rural environment.
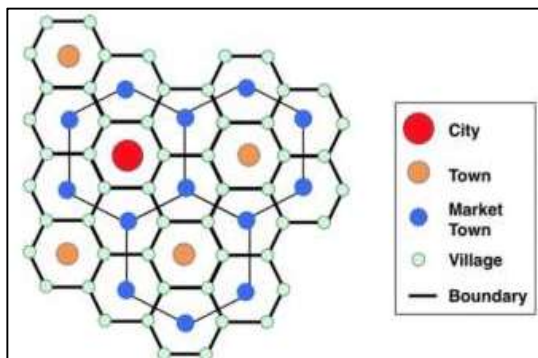
Graph 2.3 Central place theory [14]

3.- PRICE FLUCTUATION ON CONSUMPTION GROUPS AND RETAILERS

3.1.- METHODOLOGY

We have observed in the last section that according to Christaller's central place theory the consumption groups located in rural areas normally place their orders in a shorter basis that those ones in urban areas. This fact has allowed us to stablish a pattern in their appearance. Nevertheless, another point needs to be studied, are the prices in these groups lower –due to the lack of intermediaries– than retailer prices?

In this sense, we will analyse the retail price fluctuation –following post COVID19 economic crisis– on the consumption goods, specifically ecologic food prices, comparing them with the price changes on the groups investigated.

Our hypothesis here is that –as long as most of these groups are self-managed– the prices are more stable than the ones observed and the inflation rates are lower than the observed in the retailers. This assumption is related to the fact that these figures buy straight from the producers and are normally self-managed, not having any margin on their prices that could make the prices skyrocket as it happens with the retails margins.

The consumption groups features studied on the previous chapter, specially the principles related to the kind of products consumed –that is ecological[15] products–, allows us to narrow down the PCA prices to those stated as ecological[16] .

This gives us a list of twenty categories in the PCA to compare them with the prices in the «grupos de consumo». We have analysed the groups prices at our disposal and we have adapted them to the prices included in the PCA[17]. In this regard, we have tried to include as many categories as possible, so the prices could give us information from which we could extract some conclusions.

We have chosen eight categories from the ecologic products on the PCA and an additional three non-ecologic. The latter corresponded with other categories that are not specified in the PCA and are not comparable as they do not exist separately on the ecological products list: avocados, mangos and coffee.

The reasons why we have included these products are different. In the case of coffee we cannot compare it with the ecological coffee as the PCA does not distinguish between coffee and herbal teas. In the case of avocados and mangos we have chosen to include them as a way to include some specific daily products. The prices of the products are not equivalent, but as long as we are examining the prices fluctuation it should not pose a problem.

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[15] For a further explanation of what can be considered as an ecological product we have checked the information contained in Eco mark certificate. https://www.ecomark.com.tr/en/eco/ekolojik-urun-nedir

[16] Methodology for the ecologic products is summarized on Metodología del Panel de consumo alimentario en los hogares en España, Ministerio de Agricultura, Pesca, y Alimentación, Dirección General de la Industria Alimentaria, https://www.mapa.gob.es/es/alimentacion/temas/consumo-tendencias/panel-de-consumo-alimentario/metodologia/

[17] We have encountered many difficulties to adapt the prices in the consumption groups to those in the PCA. Prices and products description considered in the work are related in the annexes, pages 28-34

We have decided not to include daily products, the reason is that the PCA uses aggregated categories[18] and this fact makes it difficult to get accurate figures for the considered products. Using these products will unbalance the results giving us biased information that will not be of use. In this sense, when we have encountered different prices or we had to aggregate some categories (for instance: peas and lentils in the legumes category) we have calculated the mean of the product prices involved.

Regarding the information collected from the groups, we have been able to obtain information about the prices of three groups. We have aggregated them following the classification given by the PCA and getting the mean for all the prices. The prices do not vary significantly among them as they usually share providers and even join orders to save transport costs and avoid transporting the goods several times being more environmental friendly. The table with the prices can be found in the annexes.

3.2.- PRICES EVOLUTION

In order to get conclusions from the data collected we have decided to present three tables with the different prices evolution in the years considered. Therefore, we will have one table with the prices imported from the PCA for Spain, the PCA prices for the Principality of Asturias and as well the prices for the consumption groups. Regarding the PCA prices on April 2024 only the prices for November 2023 were available. We have decided to use these prices.

We have chosen to eliminate, in order to get a full comparison, the detected extreme values. Otherwise, it would be very difficult to get conclusions from the tables. Therefore we present the tables with the data on the annexes[19] and here we will present the filtered data which will give us a better insight on the prices fluctuation. This concept is called trimming[20] and consists in erase those extreme values that alter

Concretely, we have eliminated the categories «queso ecologico» and «carne transformada eco». The problem with the first category, ecological cheese, was that from the PCA they did not have any information until 2023. Using this category will change dramatically the mean results obtained, making the charts and the figures not comparable.

In the case of the «carne transformada eco», we have decided to exclude it because it is very difficult –due to the products variety included in the category- to get a mean of them. Therefore, we have chosen to take representative values and obtain a mean price. Unfortunately, this mean obtained was not representative and made difficult the analysis. So we decided to eliminate it.

These changes do not have any influence on our conclusions, as we can observe from the raw charts included in the annexes. The only difference it is a higher fluctuation because of the volatility and the reduced comparability of these two categories. But as long as our focus is going to be on the mean price fluctuation, these changes do not alter our conclusions.

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[18] Following the classification made by the PCA force us to keep the categories in Spanish.

[19] Annexes in pages 35 to 40.

[20] "…Trimmed Mean is a statistical measure that aims to provide a more accurate dataset representation by removing extreme values or outliers…" https://www.5paisa.com/finschool/finance-dictionary/trimmed-mean/

Then, with these adjustments we have three comparable tables, with their correspondent charts, where we can extract some conclusions. First of all, we will take into account the prices in Spain, in this case considering the categories aforementioned we can extract many conclusions from the data presented on the table.
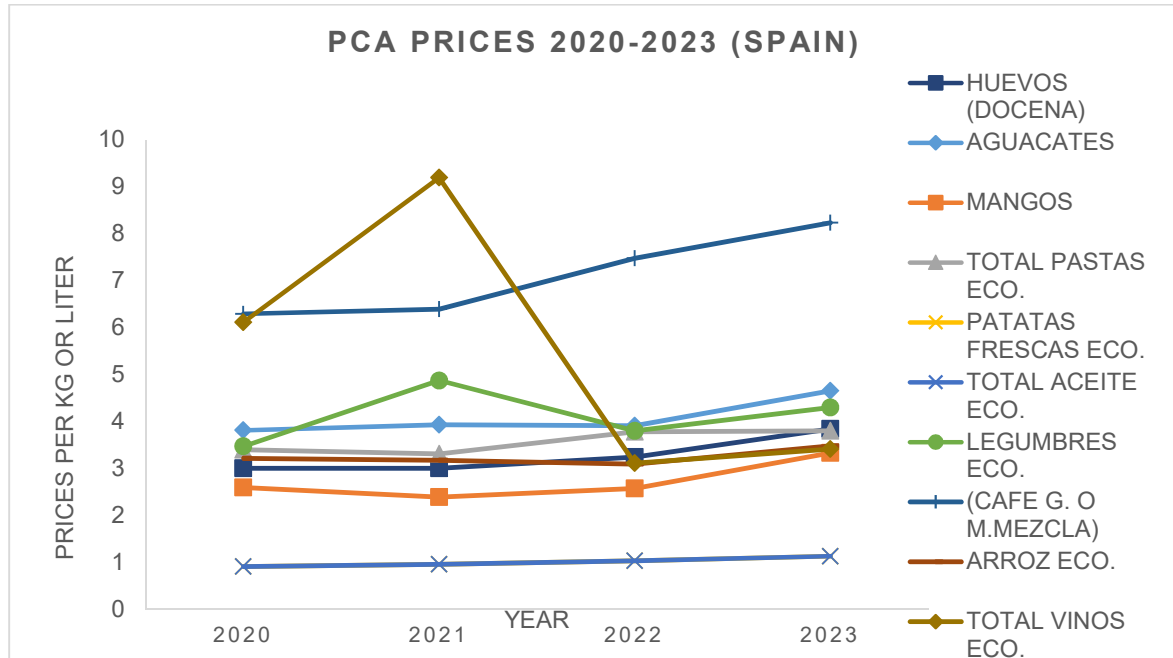
Chart 3.2.1 PCA prices 2020-2023 (own elaboration from «Panel de Consumo Alimentario»)

The prices in Spain represent the highest fluctuation. The PCA prices in Spain are a mean of the prices in the regions that conform the Spanish state. As they include more quantity of prices the mean should be more stable than the one considered in the case of the region of Asturias. Surprisingly, the prices in the Principality of Asturias are more stable than the ones in Spain.

PCA prices fluctuation Spain			
PCA concepts	2020-2021	2021-2022	2022-2023
Huevos docena	0%	8%	19%
Aguacates	3%	-1%	19%
Mangos	-8%	8%	30%
Total pastas eco.	-3%	14%	1%
Patatas frescas eco.	5%	7%	10%
Total aceite eco.	-43%	6%	19%
Legumbres eco.	40%	-22%	13%
(Cafe g. o m.mezcla)	2%	17%	10%
Arroz eco.	-1%	-3%	13%
Total vinos eco.	50%	-66%	10%
Mean increase	4%	-3%	11%

Table 3.2.1 PCA prices fluctuation in Spain (own elaboration from «panel de consumo alimentario»)

In this table 3.2.1, we can observe that the prices of commodities such as olive oil and wine —which production is concentrated in specific zones of the country and are quite sensitive to the climate changes— experience the highest fluctuation in the PCA prices in Spain. This issue can be observed as well in the PCA prices in Asturias, in the table 3.2.2.
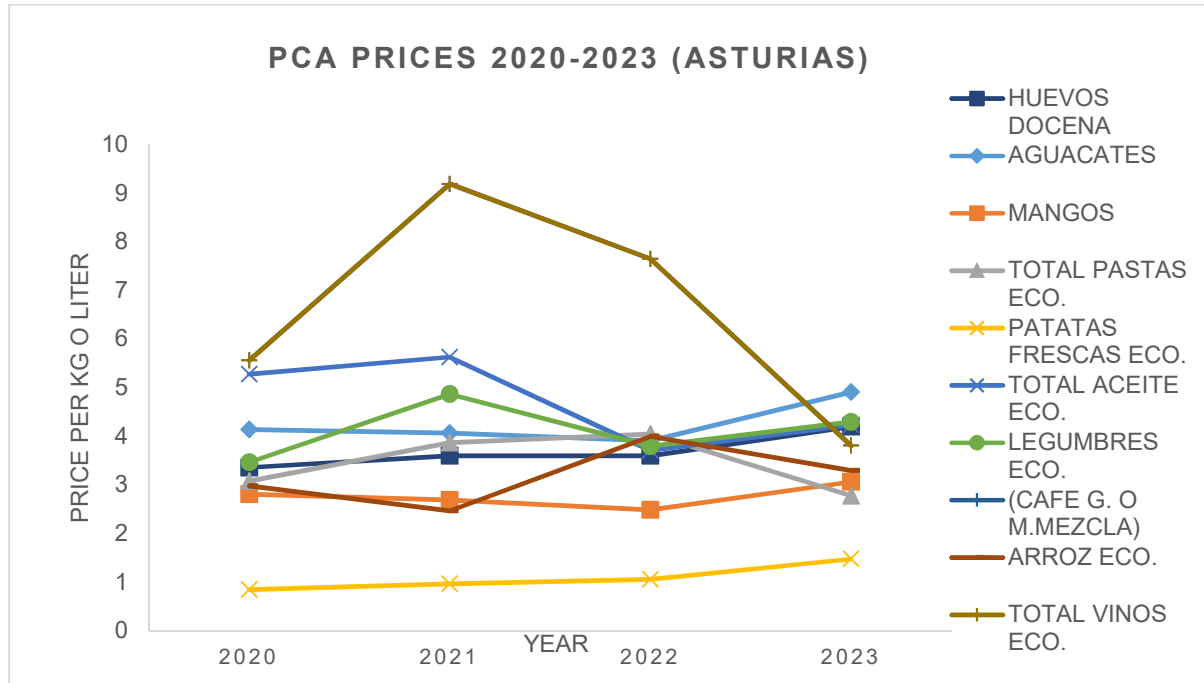
Chart 3.2.2 Asturias's PCA prices 2020-2023 (own elaboration from «panel de consumo alimentario»)

We do not observe this issue in the groups prices, where the prices are more stable that in the PCA prices. We can observe here a price increase on the year 2023, when the average inflation of Spain reached the 3,56%[21]. The rising prices are observed as well in the PCA prices, in Asturias and Spain but with more moderate increases than the ones observed in the consumption groups.

Nonetheless, the prices in the Principality are usually higher than those observed in Spain. We cannot extract any conclusions from this fact, but it is an important issue when compared with the «grupos de consumo» prices. If we infer that these higher prices come related to transportation costs, we could expect higher prices from the figures extracted from the consumption groups, but we do not observe this fact on the prices.

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[21] The average inflation of Spain in 2023 was 3.56 %, data obtained from the web https://www.inflation.eu/en/inflation-rates/spain/historic-inflation/cpi-inflation-spain-2023.aspx

PCA prices fluctuation in Asturias			
PCA concepts	2020-2021	2021-2022	2022-2023
Huevos docena	7%	0%	17%
Aguacates	-2%	-4%	26%
Mangos	-4%	-7%	23%
Total pastas eco.	26%	5%	-31%
Patatas frescas eco.	14%	9%	40%
Total aceite eco.	-56%	53%	175%
Legumbres eco.	7%	-34%	14%
(Cafe g. o m.mezcla)	0%	14%	8%
Arroz eco.	-17%	62%	-18%
Total vinos eco.	65%	-17%	-50%
Mean increase	3%	6%	16%

Table 3.2.3 PCA prices fluctuation in Asturias (own elaboration from «panel de consumo alimentario»)

Examining each category, we see an extreme value when talking about the oil olive in the PCA prices in Asturias. Examining the prices on the rest of the regions we can observe different prices among these regions. It is an issue that shocked us, for instance the prices of olive oil in the region of Catalonia and Valencia, where around nine euros, same that in Andalusia (where most of the Spanish olive oil is produced[22]). We cannot explain these fluctuations or the price gap among the oil olive in Asturias and in other regions which is around 20%-30%. Reasons that we consider that could explain these different prices are: the demand in each region, the retailers margin, transportation cost or even the variations in stock.

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[22] "Andalusia produced 1.15 million tons of olive oil last season. That accounted for 77.5 percent of Spain's and 34 percent of the world's olive oil production. " https://www.oliveoiltimes.com/business/andalusia-authorities-release-data-on-2021-2022-season/116623

CONSUMPTION GROUPS PRICES 2020-2023)

Legend:
- HUEVOS
- AGUACATES
- MANGOS
- TOTAL PASTAS ECO.
- PATATAS FRESCAS ECO.
- TOTAL ACEITE ECO.
- LEGUMBRES ECO.
- TOTAL VINOS ECO.
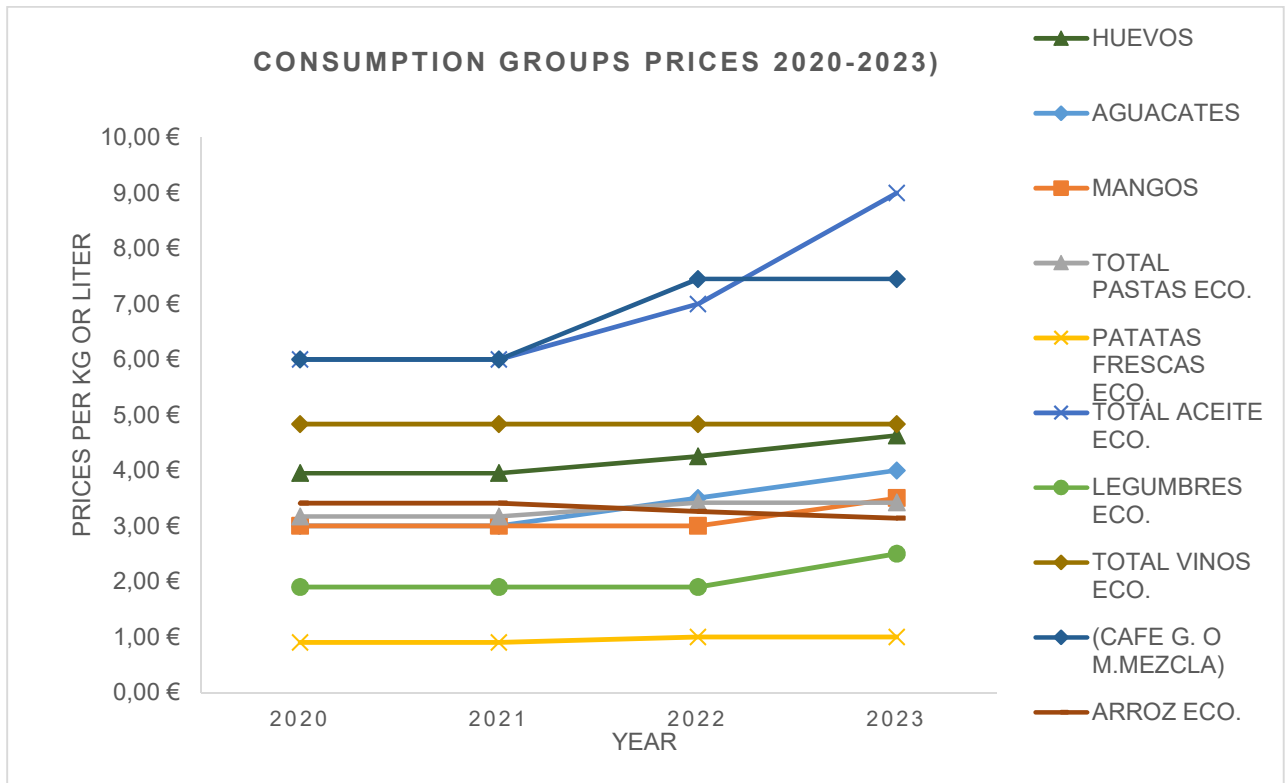- (CAFE G. O M.MEZCLA)
- ARROZ ECO.

Chart 3.2.3 Consumption groups prices 2020-2023 (own elaboration from «Panel de Consumo Alimentario»)

Studying the prices on the consumption groups we observe two prices —coffee and olive oil— that rise from the rest of the prices observed. In this case, one of the reasons of the surge on the olive oil prices was due to the scarce harvest in the year 2023 this was stated[23] due to the drought experienced in the south of Spain that affected the prices in the market. We can state that this increase is much higher than the oil prices obtained from the PCA prices in Spain but not in the prices in the rest of the regions where is still higher.

One plausible explanation for this issue is that normally the farmers that provide to the «grupos de consumo» are smaller producers. Then their stock —if any— is very limited. In this sense, during the 2023 the big olive oil producers[24] were reducing their stocks serving as a cushion to the retailer olive oil prices. This issue does not apply to the small producers, whose possibilities for accumulation are limited.

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[23] More information on the olive oil prices and the changes during the year 2023 are summarized in "Record Olive Oil Prices Drive Down Consumption in Spain, but Loyalty to Category Remains", By Daniel Dawson, Jan. 25, 2024 https://www.oliveoiltimes.com/business/record-olive-oil-prices-drive-down-consumption-in-spain-but-loyalty-to-category-remains/128073

[24] "…It is worth mentioning that from the 457,000 Tons, 204,000 Tons (46%) are stored in oil mills and available to the market, while industrial packers keep 245,000 Tons (54%) to support their existing food programs: making the actual number of liters available for trading even lower. At the same time last year, the oil mills and cooperatives held 66% of the remaining stock, while the industrial packers held just 34%...". https://www.certifiedorigins.com/olive-oil-monthly-market-report-july-2023/

Finally, when we study the prices in the consumption groups we observe more stability. It is true that there is a price increase, concretely in two items: olive oil and legumes, but not as remarkable as the ones observed on the retailers. Actually the prices increase seemed more stable than the country inflation. In this case whilst the inflation rate on Spain was 8,30% in 2022[25] and 3,4% in 2023, the mean price increase in these groups, as observed in Table 3.2.3, was a steady 7%.

Consumption groups prices fluctuation			
PCA concept	2020-2021	2021-2022	2022-2023
Huevos docena	0%	8%	9%
Aguacates	0%	17%	14%
Mangos	0%	0%	17%
Total pastas eco.	0%	8%	0%
Total aceite eco.	0%	17%	29%
Patatas frescas eco.	0%	11%	0%
Legumbres eco.	0%	0%	32%
Total vinos eco.	0%	0%	0%
(Cafe g. o m.mezcla)	0%	24%	0%
Arroz eco.	0%	-4%	-4%
Mean increases	0%	7%	7%

Table 3.2.3 Consumption groups prices fluctuation (own elaboration from «Panel de Consumo Alimentario»)

To be real aware of the prices increases in the «Indice Precios al Consumidor» (IPC) we have elaborated a table from the data obtained by the «Instituto Nacional de Estadistica» (INE) with the mean prices evolution for the years studied. In this case, as the INE lack of information about ecologic products, therefore we have considered similar categories but not ecologic.

In the table 3.2.4 we observe that the surge in alimentary products prices in Spain is almost the double of the observed in the prices studied in the consumption groups. This table reflects the evolution in non-ecologic prices. In this table we can see that prices are steadier than in the prices obtained in the ecologic products.

This fact has been studied by numerous researchers, for instance Vicente Molina, M.A. Izagirre; Olaizola, J.; Tamayo Orbegozo, Unai (2007). One plausible explanation is that, normally, the margins on the ecologic products are around 45%-55% higher than in the 'regular' products. This is one of the reasons —other causes could be the lower production, higher costs in production or more sensitivity to adverse climate effects— why the ecologic

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[25] The average inflation of Spain in 2022: 8.40 %: "The inflation chart and table below feature an overview of the Spanish inflation in 2022: CPI Spain 2022. The inflation rate is based upon the consumer price index (CPI). The CPI inflation rates in the table are presented both on a monthly basis (compared to the month before) as well as on a yearly basis (compared to the same month the year before)" Inflation Spain 2022 **(CPI)** https://www.inflation.eu/en/inflation-rates/spain/historic-inflation/cpi-inflation-spain-2022.aspx

products prices are normally higher and more volatile than in the conventional alimentary products.

In the case of the consumption groups they evolution is quite similar to the evolution on the non-ecologic products. This fact could be related to the higher margins charged by the retailers on ecologic products in comparison with the margins applied on the conventional products which are much lower, around 20%-25%.

Mean non-ecologic prices evolution in Spain			
	2020-2021	2021-2022	2022-2023
Arroz	0,4%	12,1%	19,3%
Pastas alimenticias y cuscús	2,8%	24,8%	4,5%
Queso	1,0%	12,0%	12,5%
Huevos	2,0%	20,6%	14,4%
Aceite de oliva	13,6%	26,1%	44,4%
Legumbres y hortalizas secas	0,6%	10,6%	12,5%
Café	0,4%	10,6%	7,2%
Vino de uva	-2,1%	6,4%	5,7%
Mean increase	2%	15%	15%

Table 3.2.4 Mean non-ecologic prices evolution in Spain (own elaboration from information obtained from INE)

3.3.- DIFFERENT EVOLUTION IN PCA AND CONSUMPTION GROUPS PRICES

Once we have taken into account all the collected data we can affirm that the price fluctuation is higher in the PCA prices, both Spain and Asturias, than the one observed on the consumption groups. Nonetheless we cannot asseverate that the prices are much higher in one case (retailer) than in the other. If we compare the prices we can see that even if the prices increases in the consumption groups are lower than the observed in the retailers, in the latter there are some products that have experiences a decrease in their prices. For instance: pasta, rice and wine.

Mean prices fluctuation (with trimming)			
	2020-2021	2021-2022	2022-2023
Mean increase consumption groups	0%	7%	7%
Mean increase asturias	3%	6%	16%
Mean increase Spain	4%	-3%	11%

Table 3.3.1. Mean prices increase with trimming (own elaboration from «Panel de Consumo Alimentario»)
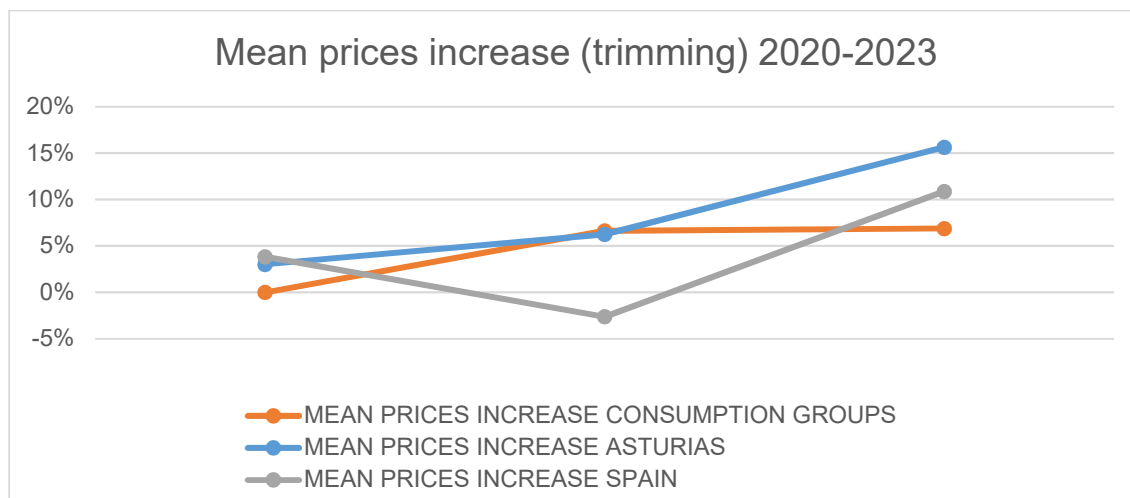
Chart 3.3.1. Mean prices increase (own elaboration from «Panel de Consumo Alimentario»))

In the chart 3.3.1 we have represented the mean price increase on the years considered. The escalating in Spain and Asturias are higher than in the consumption groups. Overall we observe more stable prices in the «grupos de consumo» prices and a steady increase in the PCA prices in Asturias. We can asseverate then that the prices fluctuation is higher in the prices obtained from the PCA.

We have to take into account that we have withdrawn from our analysis the two items aforementioned («queso ecologico» and «carne transformada eco») with these two categories the mean increase will. In this case, we could observe subtler differences in our conclusions, as we can observe from the chart 3.3.2.

Prices fluctuation (without trimming)			
	2020-2021	2021-2022	2022-2023
Mean increase consumption groups	0%	13%	12%
Mean increase asturias	5%	6%	17%
Mean increase spain	5%	-2%	11%

Table 3.3.2. Mean prices increase without trimming (own elaboration «Panel de Consumo Alimentario»)

Mean price increase (no trimming) 2020-2023
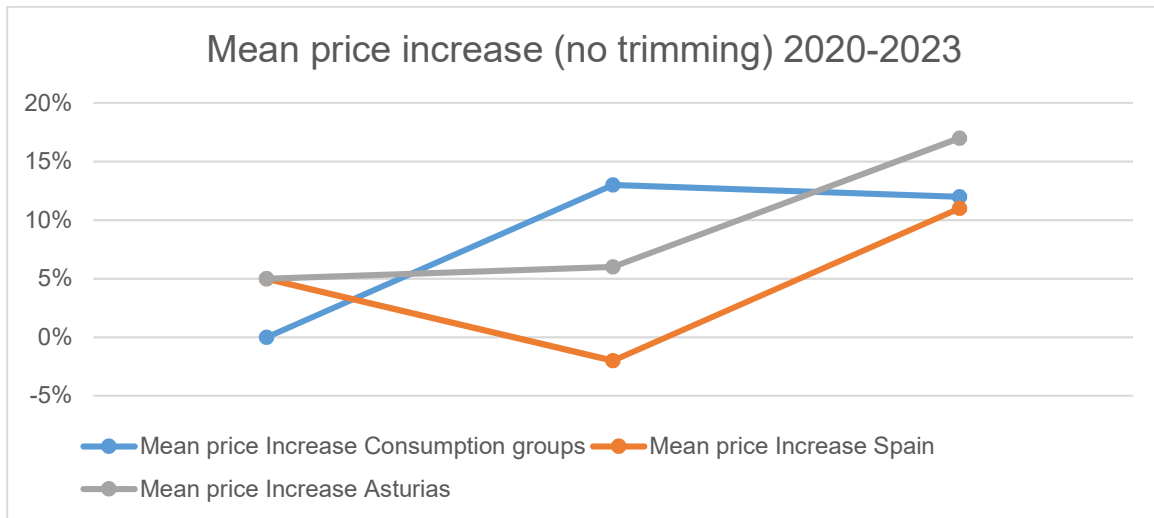
Chart 3.3. 2.. Mean prices increase without trimming (own elaboration from «Panel de Consumo Alimentario»)

With the trimming the differences in prices are not as significant as in the mean prices without trimming. This fact is expected as we withdraw extreme values that introduced distortion in our analysis. Then we can affirm that either way, with or without the trimming technique, our conclusions are the same: the price fluctuation is higher in the prices obtained from the PCA than the ones observed in the «grupos de consumo».

FINAL RESULTS AND CONCLUSIONS

«Grupos de consumo» are a heterogeneous figure which importance has grown recently. Nonetheless, their idiosyncrasy makes them difficult to locate and analyse. These limitations are not an obstacle to study them from different perspectives.

We have chosen to analyse them from two perspectives: first, to get some conclusions about their emergence, we have mapped them and gotten some generic features from their way of working. Secondly, we have compared their prices with those in the retailers, extracting conclusions on their evolution.

We have tried to see if there was any pattern in the appearance of the groups, comparing them with the central places theory. In this sense we have seen that most of these groups are located in the centre of the region.

Nonetheless, we cannot affirm that these facts respond to Christaller's theory. As concluded from Christaller in the 1960's low order products, those who are needed in a daily basis, would be near to the population, as the people need to move of the to get them. On the contrary, second order products, which are consumed in a longer basis, would be more centred in the region, nearer to the most populated places.

We have observed this pattern in our analysis, but we cannot asseverate that this is the only reason to the agglomeration of the groups around Oviedo, Gijon, Aviles and Siero. Therefore, the reason for the concentration of the groups could be more related with the higher demand of these products in this part of the region and not because of the demand for first and second order products.

Nevertheless, we have found that in rural areas the most predominant order periodicity is weekly. In the case of the urban areas there are more variety (Biannual, Monthly, Fortnightly and weekly). This is consistent with Christaller's theory, where high order products (in this case more variety in the order periodicity) are located in the most populated areas (cities) and the other products in less populated places (rural areas).

Subsequently, once the groups were mapped, we have analysed their prices with those obtained from the «panel de consumo alimentario». This information is obtained from the selling of these products from different retailers (supermarkets, hypermarkets, neighbourhood stores, discounts,…)[26].

In this case, with the collected data we have observed that the fluctuation of the prices is much lower in these consumption groups, than in the data extracted from the PCA and the INE. It was expected to be that way, as most of the groups are self-managed and they do not charge any margin on the prices. On the contrary, the PCA retailers do charge a margin on their products, specially they charge higher margins on ecologic products where the customer is more prone to pay higher prices by the alimentary goods. This issue is reflected, as expected, in the prices and their evolution.

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[26] The methodology for the Panel de Consumo Alimentario is summarized in the document obtained
https://www.mapa.gob.es/es/alimentacion/temas/consumo-tendencias/metodologia-panel-hogares-2021_tcm30-543228.pdf

Nevertheless, there are of course other issues that influence on these differences. We could point out for instance: existing stock, purchasing power, influence, economic power, etc. These are issues that have influence in the price formation.

These results have answered some questions, for instance, the possibility of controlling the inflationary effects taking into account the intermediate prices, one of the authors studying this is for instance Bikhchandani, Sushil (2020). The government promotion of these groups would be necessary due to their relevance in containing inflationary effects. Besides from making known to the public these kind of groups, other measures such as offering them locals where to meet, tools to organize them and subsidize their creation will make them appear and grow rapidly in number.

Hence, the proliferation of these groups would imply a better wealth distribution as the local farmers receive fairer incomes. This will also boost the local economies making us less dependent on energy imports making more resilient the local communities. It is also a great way of becoming more environmental sustainable (reducing the plastics, reducing the transportation costs, supporting local families and rural environment).

Finally, we would like to state, that we have chosen to carry out this work about the consumption groups for their social interest and as well for their unique features. These groups are quite interesting as they defy the maximum in orthodox economy: consumers only take decisions based on prices.

Actually, one of the main features of consumption groups (in any of their categories) is that they tend to create a social network among producers and consumers. This fact, does not usually occur in the market and it has been studied in recent economics works under a figure called moral economies.

This concept of moral economies has re-emerged with strength recently, reflecting a reality that did not have the appropriate response in the economics field, as stated in Palomera, J. & Vetta, Th (2016). In this sense, these alternatives are based in several principles that does not correspond with the orthodox economy. These points: moral economies, different ways of consumption and bottom-up[27] organizations are only few of the features that have been studied.

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ANNEXES

ANNEX I: DATA COLLECTED

We have contacted every group on the list, unfortunately we did not receive answer from every group. We have decided to highlight those from whom we receive response. In the cases where we did not have any reply we filled the data with the information found on the internet or through bibliography. We have interviewed, as well, five groups and three farmers to get a deep insight on the groups.

Name	Establishment date	Number of members	Self or association managed	Order periodicity
Ecocestu	2014	30	Self-managed	Weekly
L'ensame	2013	Unknown	Unknown	Monthly
El llokal	2021	Unknown	Unknown	Unknown
Al mercaú	2023	Unknown	Association managed	Weekly
Libélula huerta	2006	Unknown	Self-managed	Quarterly
EcoNavia	2006	11	Association managed	Weekly and periodically
NABIPI	2014	13 units	Self-managed	Weekly
La simiente			Association managed	Weekly
Proyecto Fresneda	2009	Unknown	Association managed	Weekly
La ponte	2013	15	Self-managed	Biannual
La Comuña	2016	Unknown	Unknown	Fortnighktly and Weekly
L'allegría lagüerta	2010	6	Association managed	Weekly
Grupo Ramas	2010	23 consumption units	Self-managed	Biannual
Grupo Picu Rabicu	2022	Around 10 units	Self-managed	Weekly and fortnightly
Cabranes	2015	30	Self-managed	Weekly, fortnightly, monthly
Grupo Cambalache	2004	30	Association managed	Weekly

ANNEX II: PRODUCTS UNDER STUDY

Nomenclatura/literal	Definición
T.HUEVOS KGS ECO.	Huevos medidos en kilogramos que sean ecológicos conceptuados por el productor (Siempre que lleve EAN) o por el hogar
T.HUEVOS UNDS.ECO.	Huevos medidos en unidades que sean ecológicos conceptuados por el productor (Siempre que lleve EAN) o por el hogar
T.HUEVOS GALLINA ECO	Huevos procedentes de gallina que sean ecológicos conceptuados por el productor (Siempre que lleve EAN) o por el hogar
TOTAL CARNE ECO.	Engloba la carne fresca, congelada y transformada que sea ecologica (conceptuada por el productor con el codigo EAN o por el hogar)
CARNE FRESCA ECO.	Incluye carne fresca de vacuno, pollo, conejo, ovino, etc tanto si se trata de animales enteros como en filetes, piezas, salchichas, carne picada, etc que sea ecologica - conceptuado por el productor mediante EAN o por el hogar.
CARNE CONGELADA ECO.	Incluye toda la carne sin preparar que esté congelada que sea ecologica - conceptuado por el productor con el EAN o por el hogar-. No se incluyen despojos ni la carne especial para animales.
CARNE TRANSFORM.ECO.	Engloba todos los productos transformados e industrializados del cerdo u otros animales (vacuno, pollo, pavo, etc) que sean ecologicos (conceptuados por el productor con el EAN o por el hogar)
T.LECHE LIQUIDA ECO.	Leche líquida ecologica de vaca, cabra u oveja (conceptuada por el productor con el EAN o por el hogar). NO incluye la Leche reconstituida ni las Bebidas Vegetales de soja, arroz, almendra, avena, etc
PAN FRESCO/CONG.ECO.	Incluye todo el pan fresco y congelado ecologico (conceptuado por el productor con el EAN o por el hogar)
BOLL/PAST.GALL. ECO.	Incluye Bollería (dulce y salada), Pastelería, Galletas y Cereales ecologicos (conceptuados por el productor con el EAN o por el hogar)
ARROZ ECO.	Incluye arroz natural, platos preparados base arroz en conserva, congelados y otros arroces topo basmati, bomba, thai, etc todo ello ecologico (conceptuado por el productor con el EAN o por el hogar)
TOTAL PASTAS ECO.	Incluye pastas alimenticias (seca y fresca) y laminadas para rellenar todas ellas ecologicas (conceptuadas por el productor con el EAN o por el hogar)

LEGUMBRES ECO.	Incluye legumbres tanto secas como cocidas (garbanzos, lentejas, alubias, etc) ecologicas (conceptuados por el productor con el EAN o por el hogar)
TOTAL ACEITE ECO.	Incluye todos los tipos de aceite vegetal ecologico (conceptuado por el productor con el EAN o por el hogar)
TOTAL VINOS ECO.	Incluye todos los Vinos que no son derivados, tanto de mesa, como DOP, IGP, etc y que sean ecologicos (conceptuados por el productor con el EAN o por el hogar)
TOTAL ZUMO/NECTAR ECO	Zumo de frutas y verduras (concentrado y exprimido, que se encuentran tanto en la sección de Ambiente como de Refrigerados) + Néctar (clásico y sin azúcar) + Horchatas + Smoothies + Mostos todos ellos ecologicos (conceptuados por el productos con el EAN o por el hogar)
PATATAS FRESCAS ECO.	Patatas frescas ecologicas (conceptuadas por el productor con el EAN o por el hogar)
T.HORTALIZAS FRE.ECO.	Incluye cualquier tipo de verdura y hortaliza fresca ecologica (conceptuada por el productor con el EAN o por el hogar), tanto a granel como envasada, excluyendo las patatas frescas
T.FRUTAS FRESCAS ECO.	incluye cualquier tipo de frutas frescas ecologicas (conceptuadas por el productor con el EAN o por el hogar)
FRUTOS SECOS ECO.	Engloba todos los frutos secos ecologicos (almendras, cacahuetes, nueces, avellanas, pistachos, etc)
T.FRUTA&HORTA.TR.ECO.	Engloba todas las frutas y hortalizas/verduras transformadas ecologicas (conceptuadas por el productor con el EAN o por el hogar)
PLATOS PREPARADOS ECO	Incluye todos aquellos platos preparados que se compran ya cocinados (listos para comer directamente) o precocinados (es necesario someterlos a un pequeño proceso de cocinado antes de consumirlos) tanto en conserva, como congelados o refrigerados y que sean ecologicos (conceptuados por el productor con el EAN o por el hogar)
CAFES/INFUSIONES ECO.	Incluye cafés, sucedáneos de café e infusiones, (conceptuadas por el productor con el EAN o por el hogar).
HARINAS Y SEMOLAS ECO	Incluye semola, féculas, harina, preparado panificable, gofio, etc ecologicos (conceptuados por el productor con el EAN o por el hogar)
BEBIDAS VEGETALES ECO	Bebidas vegetales, conceptuadas por el productor con el EAN o por el hogar.
AGUACATES	Aguacates frescos
MANGOS	Mangos
CAFE G. O M.NATURAL	Incluye cualquier tipo de café tanto en grano como molido NO sometido a ningún proceso de tueste

PCA products and concepts. (own elaboration from «panel de consumo alimentario»)
https://www.mapa.gob.es/es/alimentacion/temas/consumo-tendencias/panel-de-consumo-alimentario/metodologia/

ANNEX III: PCA PRICES

PCA Prices Spain					
PCA	Products	2020	2021	2022	2023
Huevos (docena)	Huevos docena	3	3	3,24	3,84
Aguacates	Aguacates (Kg) (no Eco)	3,81 €	3,93 €	3,91 €	4,65 €
Mangos	Mangos (Kg) (No eco)	2,59 €	2,39 €	2,57 €	3,33 €
Total pastas eco.	Pasta blanca (Kg)	3,40 €	3,31 €	3,78 €	3,80 €
Carne transform.eco.	Carne (Kg)	11,41 €	13,27 €	14,57 €	15,27 €
Patatas frescas eco.	Patatas (Kg)	0,91 €	0,96 €	1,03 €	1,13 €
Total aceite eco.	Aceite de Oliva (Litro)	6,77 €	3,85 €	4,07 €	4,83 €
Legumbres eco.	Lentejas (Kg)	3,47 €	4,87 €	3,80 €	4,30 €
Legumbres eco.	Garbanzo (Kg)	3,47 €	4,87 €	3,80 €	4,30 €
Total pastas eco.	Pasta Integral (Kg)	3,40 €	3,31 €	3,78 €	3,80 €
Total vinos eco.	Vino (Botella)	6,11 €	9,19 €	3,11 €	3,41 €
(Cafe g. o m.mezcla)	Café (Kg) No eco	6,29 €	6,39 €	7,47 €	8,23 €
Arroz eco.	Arroz (Kg)	3,21 €	3,17 €	3,09 €	3,48 €
Queso eco	Queso	sin datos	sin datos	sin datos	14,20 €

PCA prices in Spain (own elaboration from «panel de consumo alimentario»)

https://www.mapa.gob.es/es/alimentacion/temas/consumo-tendencias/panel-de-consumo-alimentario/series-anuales/

PCA Prices Asturias				
PCA	2020	2021	2022	2023
Huevos docena	3,36 €	3,6 €	3,6 €	4,2 €
Aguacates	4,14 €	4,07 €	3,91 €	4,91 €
Mangos	2,81 €	2,69 €	2,49 €	3,07 €
Total pastas eco.	3,08 €	3,87 €	4,05 €	2,78 €
Carne transform.eco.	9,56 €	11,92 €	11,23 €	12,86 €
Patatas frescas eco.	0,85 €	0,97 €	1,06 €	1,48 €
Total aceite eco.	6,79 €	2,98 €	4,57 €	12,58 €
Legumbres eco.	5,28 €	5,63 €	3,71 €	4,23 €
Total pastas eco.	3,08 €	3,87 €	4,05 €	2,78 €
Total vinos eco.	5,56 €	9,19 €	7,65 €	3,81 €
(Cafe g. o m.mezcla)	6,69 €	6,67 €	7,63 €	8,24 €
Arroz eco.	2,98 €	2,47 €	4,00 €	3,30 €
Queso eco	sin datos	sin datos	sin datos	17,25 €

PCA prices in Asturias (own elaboration from «panel de consumo alimentario»)
https://www.mapa.gob.es/es/alimentacion/temas/consumo-tendencias/panel-de-consumo-alimentario/series-anuales/

ANNEX IV: CONSUMPTION GROUPS PRICES

Consumption groups prices

| Products	2020	2021	2022	2023
Huevos docena	3,95 €	3,95 €	4,25 €	4,63 €
Aguacates (Kg)	3,00 €	3,00 €	3,50 €	4,00 €
Mangos (Kg)	3,00 €	3,00 €	3,00 €	3,50 €
Carne (Kg)	12,50 €	12,48 €	22,50 €	36,15 €
Patatas (Kg)	0,90 €	0,90 €	1,00 €	1,00 €
Aceite de Oliva (Litro)	6,00 €	6,00 €	7,00 €	9,00 €
Lentejas (Kg)	1,80 €	1,80 €	1,80 €	2,50 €
Garbanzo (Kg)	2,00 €	2,00 €	2,00 €	2,50 €
LEGUMBRES ECO.	1,90 €	1,90 €	1,90 €	2,50 €
Vino (Botella)	4,83 €	4,83 €	4,83 €	4,83 €
Pasta (kg)	3,17 €	3,17 €	3,42 €	3,42 €
Café (Kg)	6,00 €	6,00 €	7,45 €	7,45 €
Arroz (Kg)	3,41 €	3,41 €	3,26 €	3,14 €
Queso (Kg)	15,00 €	15,00 €	15,00 €	16,00 €

Consumption groups prices (own elaboration)

ANNEX V: GROSS CHARTS
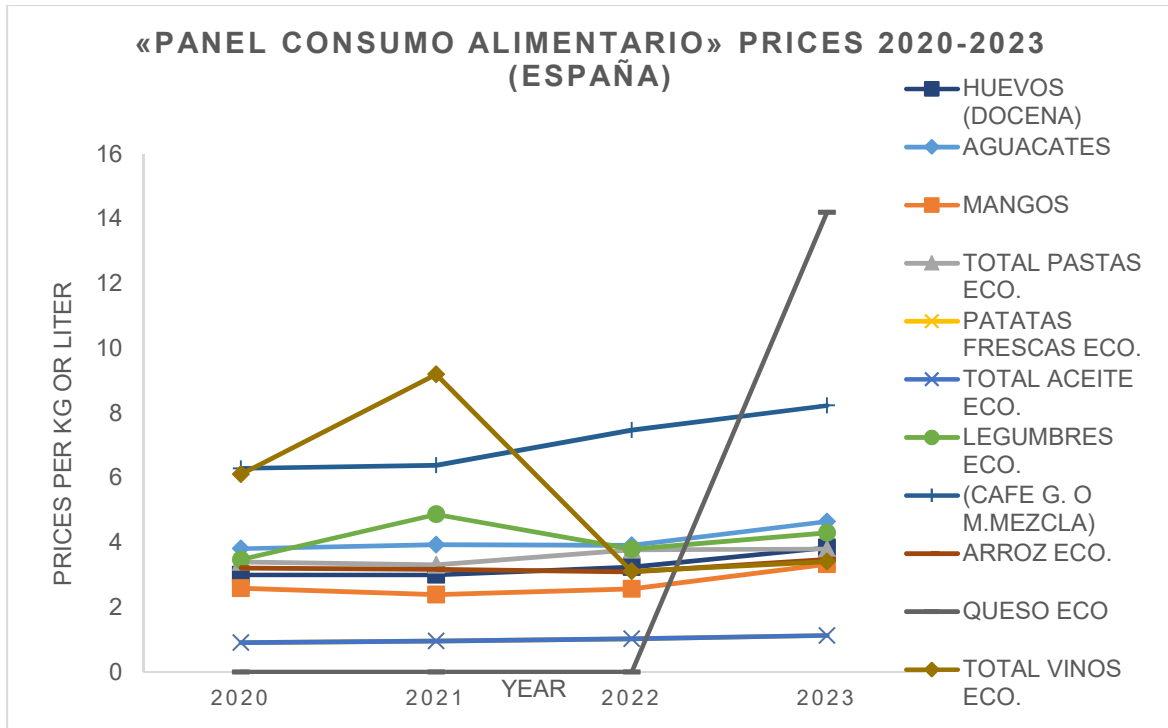
PCA prices in Spain 2020-2023 (own elaboration from «panel de consumo alimentario»)
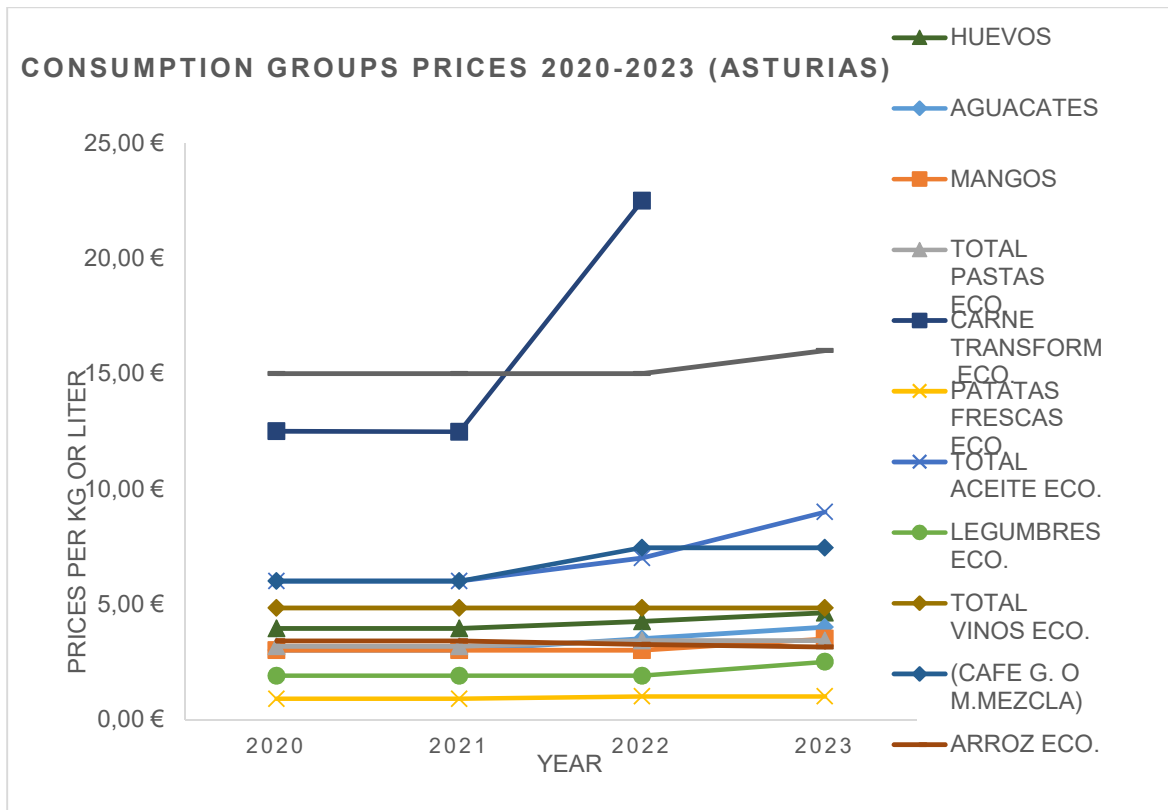
Consumption groups prices 2020-2023 (own elaboration from «panel de consumo alimentario»)

«PANEL CONSUMO ALIMENTARIO» PRICES 2020-2023 (ASTURIAS)

Legend:
- HUEVOS DOCENA
- AGUACATES
- MANGOS
- TOTAL PASTAS ECO.
- PATATAS FRESCAS ECO.
- TOTAL ACEITE ECO.
- LEGUMBRES ECO.
- (CAFE G. O M.MEZCLA)
- ARROZ ECO.
- QUESO ECO
- TOTAL VINOS ECO.
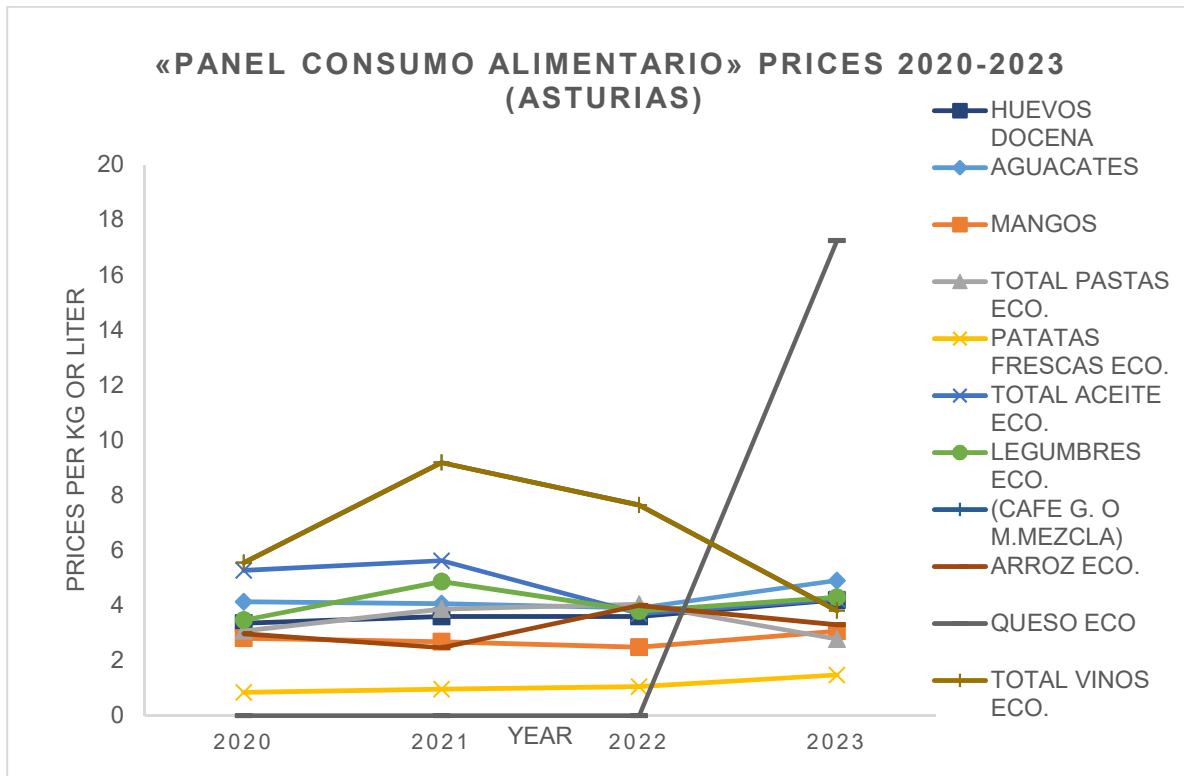
PCA prices in Asturias 2020-2023 (own elaboration from «panel de consumo alimentario»)

ANNEX VI: GROSS TABLES

PCA prices fluctuation Asturias

PCA CONCEPT	2020-2021	2021-2022	2022-2023
Huevos docena	7%	0%	17%
Aguacates	-2%	-4%	26%
Mangos	-4%	-7%	23%
Total pastas eco.	26%	5%	-31%
Carne transform.eco.	25%	-6%	15%
Patatas frescas eco.	14%	9%	40%
Total aceite eco.	-56%	53%	175%
Legumbres eco.	7%	-34%	14%
Total vinos eco.	65%	-17%	-50%
(Cafe g. o m.mezcla)	0%	14%	8%
Arroz eco.	-17%	62%	-18%
Queso eco	-	-	100%
Mean increase	5%	6%	17%

Prices Fluctuation in Asturias (own elaboration)

PCA prices fluctuation Spain

PCA	2020-2021	2021-2022	2022-2023
Huevos docena	0%	8%	19%
Aguacates	3%	-1%	19%
Mangos	-8%	8%	30%
Carne transform.eco.	16%	10%	5%
Patatas frescas eco.	5%	7%	10%
Total aceite eco.	-43%	6%	19%
Legumbres eco.	40%	-22%	13%
Total vinos eco.	50%	-66%	10%
Total pastas eco.	-3%	14%	1%
(Cafe g. o m.mezcla)	2%	17%	10%
Arroz eco.	-1%	-3%	13%
Queso eco	-	-	100%
Mean increase	5%	-2%	11%

Prices Fluctuation in Spain (own elaboration)

Prices fluctuation consumption groups

PCA	2020-2021	2021-2022	2022-2023
Huevos docena	0%	8%	9%
Aguacates	0%	17%	14%
Mangos	0%	0%	17%
Carne transform.eco.	0%	80%	61%
Patatas frescas eco.	0%	11%	0%
Total aceite eco.	0%	17%	29%
Legumbres eco.	0%	0%	32%
Total vinos eco.	0%	0%	0%
Total pastas eco.	0%	8%	0%
(Cafe g. o m.mezcla)	0%	24%	0%
Arroz eco.	0%	-4%	-4%
Queso eco	0%	0%	7%
Mean increase	0%	13%	12%

Prices Fluctuation in consumption groups (own elaboration)