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VALUATION CHALLENGES AND STRATEGIES FOR CARANTANTA DE POPAYÁN, FROM THE LOCAL AGRI-FOOD SYSTEMS (LAFS) APPROACH

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ABSTRACT

Corn has generated a special interest in studies about the diet in Latin America, due to its importance in the conformation of Pre-Hispanic societies and its structural role in traditional cuisines. This study is focused on *carantanta*, a product derived from corn, which is gastronomic heritage of the Department of Cauca, Colombia. The objective is to analyze its traditional production in the territorial context of the village of Cajete, to identify challenges and strategies for adding value that could contribute to its protection. For the methodology, six tools from the Local Agri-Food Systems (LAFS) approach were applied, within the framework of mixed research, predominantly qualitative. As a result, the origin characteristics of the product were identified, as well as the traditions and innovations in its elaboration, the factors that give it identity, which, together with the physicochemical characteristics, are part of the scoring process, the conditions of association between producers, and the characterization of its productive chain with an emphasis on the transformation and commercialization links. Although traditional production has been maintained, the conclusion is that it faces challenges such as the lack of generational replacement, the tension between modernization and preservation of characteristics of identity, and the undervaluation of the product in the local market. In addition, it is not possible to attain a certification of Designation of Origin (DO), because the raw material does not comply with the regulations of origin criteria. The option remains to negotiate other distinctions, such as patrimonial certifications or collective brands, although first it is necessary to repair the social links between producers, marked by mistrust.

Keywords: gastronomic heritage, territory, traditional foods.

INTRODUCTION

Market pressures under growing globalization and its industrialized practices have led to a transformation of productive processes. These changes overlook the traditions and know-how that are part of the specific gastronomic heritage of a territory. In this context, as Jolivet (2015) describes, traditional foods are in danger of losing their specific traits of origin by subscribing to the economic logic and forms of production, which go against cultural knowledge and territorial elements that are strictly patrimonial. This is the case of *carantanta*,

an integral element of traditional cuisines in the Department of Cauca, Colombia, which is prepared with the crust that adheres to the pans where corn is cooked.

Together with products such as *pipián*, the *amasijos* and corn byproducts, such as *carantanta*, have given Popayán, capital of the Department of Cauca, the recognition from UNESCO as City of Gastronomy in the Creative Cities Network of the Global Alliance, granted in 2005. A good part of this recognition is directed at the village of Cajete, in the southeast of Popayán, which is the producing enclave of the most prestigious local byproducts of corn (Illera, 2019). Despite the importance of *carantanta* in the gastronomic repository of the city, the only academic study that has approached this traditional product is the one by Illera (2019), about the parent cuisines of Popayán. However, it is focused on the reconstruction of its cultural history. Up until now, there are also no official figures about production, or an integral tracking of what it could mean from the perspective of local development. The absence of specialized literature about *carantanta* is an example of what the Ministry of Culture from Colombia (2014) warns about in its diagnosis about traditional culinary systems of the country: 1) there is lack of awareness of our culinary heritage, 2) the intergenerational transmission of traditional culinary know-how is under risk, and 3) there are no incentives, monetary and non-monetary, or policies that promote their safeguard. Thus, it is important to document, promote and rescue the national and regional gastronomic heritage (Ministerio de Cultura, 2014); and particularly, to contribute to the study of gastronomic traditions around *carantanta* and the product's connection with its territorial context.

Under this guideline, the objective of the study was to analyze the traditional production of *carantanta*, making the product's connections with its territorial context in the village of Cajete explicit, and to identify tensions, challenges, and possible strategies to add value for the protection of this gastronomic heritage.

THEORETICAL FRAMEWORK

The notion of Local Agri-Food Systems (LAFS) emerged in France, as a response to the emerging challenges of rural development. As concept, it was proposed by José Muchnik and his research team, who defined it initially as agglomerations of production, transformation, commercialization and service companies, around a product with territorial characteristics (Torres, 2017). This notion of LAFS has evolved over the years, informed by several disciplines that have contributed to its development. From being an instrument for the characterization of rural productive systems in the 1990s, LAFS became an approach equipped with methodological tools that serve both to characterize the products from agri-food systems and to design added value strategies, through the activation of territorial resources. The LAFS approach includes two

phases: a research phase, which begins with the selection of methodological support instruments and ends with the proposal of strategies for the activation of territorial resources; and an implementation phase that consists in the activation of LAFS with the application of the strategies proposed (Grass, 2018).

Studies about the LAFS approach can be classified into three groups: i) theoretical developments about the notion of LAFS, as reported by studies such as Torres (2018), ii) case studies where a specific LAFS is characterized or strategies are designed to activate associated resources, such as the study by Tolentino (2014) about rice from Morelos, in Mexico, and iii) methodological contributions directed at the design of strategies and the activation of resources, such as the study by Grass *et al*. (2024) about coconut snacks from the Pacific Coast in Cauca, Colombia. In some cases, the studies converge in several groups: the theory is tested in the case studies that require effective methodological designs, and the methodological applications, in turn, allow refining the theory. Although the methodology has covered many studies of different types of products, in several studies it has been used to analyze the traditional production of foods considered to be the heritage of a region. This is the case, for example, of *tenate* cheeses in Mexico by Grass *et al*. (2018); *cachaça* production in the municipality of Morretes in Paraná, presented by De Oliveira *et al.* (2020); the study by Velarde (2022), about appraisal processes of wine in the Berisso Coast, cheeses from Tandil, and artisanal sierra cheese in Rio Grande do Sul, Brazil (Ceolin *et al*., 2020). In all of them, the studies were conducted in Latin America and no literature was found regarding the studies on patrimonial products outside the continent.

The LAFS approach is based on the application of six methodological tools, as established in Grass *et al*. (2016): oral history, genealogical method, technological trajectory, management of scoring and certification processes, network analysis, and agro-industrial chain analysis. Although studies with this approach depend on methodological tools close to others, such as cluster analysis or chain analysis, the LAFS approach is more comprehensive since it implies a systemic and territorial vision (Camacho, 2017). Another aspect that sustains the thesis of greater comprehensiveness of the LAFS approach is "its capacity to identify in the territory those resources (intrinsic and extrinsic) which are adequate to be activated through collective action processes" (Grass, 2016), through differentiation strategies for products and the development of external aspects that drive the local agri-food system.

In the theoretical evolution of the LAFS, the concept has changed from referring to organizations without conflict to a space in dispute over the distribution of income and the preservation of knowledge. As stated by Torres (2017), the LAFS has gone from being "a territorial theory to reach

the local agri-food system as territorialization, that is, as appropriation of the territory through collective action and the construction of means and practices that configure knowledge about cultivating, transforming and consuming". From this stems the importance of approaching concepts such as territory, community understandings, and identities. Within the LAFS approach, the territory is an intrinsic category that allows understanding the relationships between producers, stakeholders and institutions, from a spatial and temporal perspective (Boucher *et al.*, 2016). In this sense, it is a multidimensional concept that connects the appropriation and the identification beyond the physical space, because it also considers the daily social, political and symbolic constructions (Castaño *et al.*, 2021).

Regarding community understandings, according to Torres (2017), the LAFS "study foods as a social and cultural fact". That is, as shared knowledge, product of experiences accumulated by the peoples. Thus, there is a relationship with the category of community knowledge, understood as those elements shared and transmitted through observation, practice and reproduction of stories, habitually associated to orality (Lugo, 2018). Therefore, regarding the identities, conceptually there are three versions of identity in cultural terms (Vergara *et al*., 2015): the essentialist, the historicist, and the discursive. The first conceives identity as something that belongs to a human group, which is immutable in time and space; the historicist, in turn, conceives the change from human work as something that belongs to identity; meanwhile, the discursive thinks of identity as a primarily narrative construct. Within the Latin American context, the historicist version has developed with exponents such as Larraín (2014), who defines cultural identity as a set of social categories that determine the individuals and those that establish an 'us'.

METHODOLOGY

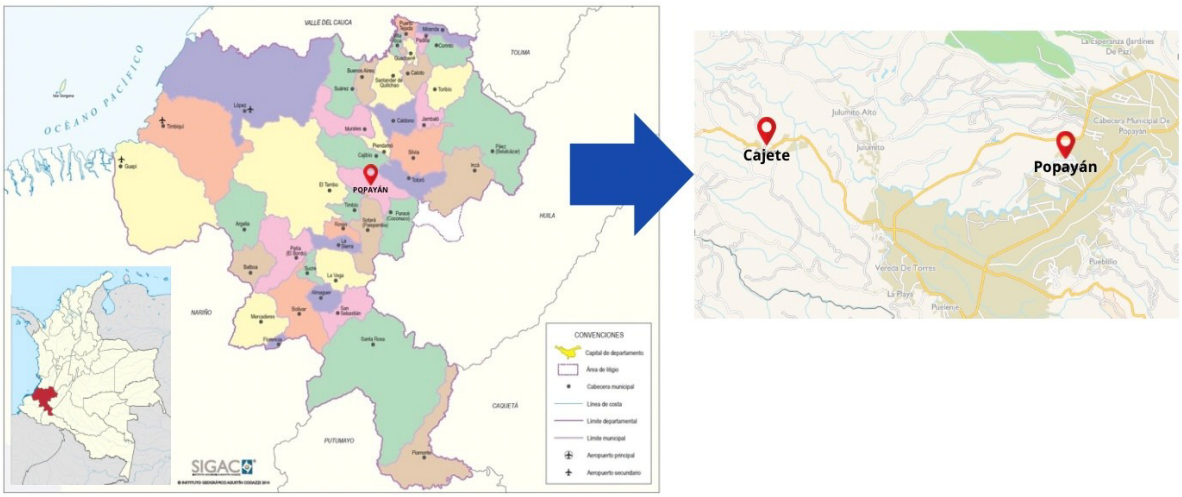
For the development of the study, the Local Agri-Food Systems (LAFS) approach and its six tools were used, with the purpose of gathering detailed information about the production conditions of *carantanta* in Cajete, and to identify challenges and strategies of added value, for the preservation of this local gastronomic heritage.

The village of Cajete is an administrative division in the rural area of the municipality of Popayán, in the Department of Cauca, Colombia. It is located in the southwestern part of Popayán, 10 kilometers away from the historical center. Cajete has an altitude of 1,737 masl and an annual mean temperature between 15 and 20 degrees centigrade. The small town is divided into three trails: Las Chozas, Santa Ana and Cajete, with a population of 819 inhabitants (Departamento Administrativo Nacional de Estadística-DANE, 2018). The study was developed specifically in the trail of Cajete.

The study was focused on this village, because it is the main local producer of *carantanta* and because it is part of the Route of Corn, a community initiative that promotes ecotourism in the region, at the same time that it highlights the traditional trade of corn processing. The zone of Cajete supplies Popayán, in addition to *carantanta*, with *arepas* or mature corn tortillas, *envueltos de colada*, *envueltos de mote*, and dough for empanadas and tamales (Figure 1).

The LAFS methodological approach was preferred for several reasons; on the one hand, for its comprehensiveness, since other methodologies focus solely on the economic sphere and they underestimate important aspects, such as the reconstruction of the know-how and its changes, etc. And, on the other hand, because tools such as oral history are fundamental for strategies to attain distinctive quality seals, something that has been approached by institutional initiatives.

The study was developed in the framework of the mixed research methodology, predominantly of qualitative type. The gathering of information was obtained through a mixed instrument (interview/survey) of 64 questions, which was divided into two sections: 1) tradition, which groups the tools of oral history, genealogical method, and technological trajectory, and 2) chain and network analyses. In addition, a collection of samples of the product was carried out for the scoring phase. The information was obtained from eleven *carantanta* producers: eight traditional ones, two more that give added value to the traditional product (in both cases, from the village of Cajete), and one recognized industrial producer from Popayán. The sample was selected under criteria such as broad knowledge of the theme, seniority in the trade, family



Source: prepared by the authors based on Gobernación del Cauca (2019) and IGAC (2024).
Figure 1. Location of the village of Cajete on the political map of Cauca.

links of the pioneer producers in the zone, and recognition in the community as bearers of tradition.

The information was gathered between the second semester of 2019 and the second semester of 2021, with an interruption during 2020, due to the Covid-19 pandemic. The data that were analyzed were those collected after the pandemic, although the previous information was used as a guide for the possible behavior of the future production. Information analysis was conducted during 2022.

To verify the tradition, 20 of the 64 questions from the instrument were practiced through in-depth interviews, which were complemented with field observations. The objective of the interviews was to reconstruct the origin and the tradition of know-how, production methods, genealogical line of learning, modifications of the tradition in time, and changes in the characteristics of the product. To systematize the information, responses from each producer were organized, to identify common and different elements, and then, the information was compared with secondary sources (academics, government actors, contacts in the territory, etc.), to confirm data and to identify novel findings. The answers related to the genealogical method were also selected, which were systematized and triangulated in a shared electronic board, to ease the elaboration of a genealogical diagram and the identification of knowledge transmission.

The remaining 44 questions were used for the chain and network analyses; they were in survey format, directed at identifying the stakeholders that make up the production chain links of *carantanta* and their networking (producers, suppliers, traders and clients), the type of product (if it is traditional or industrialized), and the volume and production system. For the study, the links of transformation and commercialization were prioritized. Results from the chain analysis were compared with the theory of production chains, while the network analysis data were processed through the UCINET software and its Netdraw module.

When it comes to the scoring phase of the product, samples of 500 g were collected for each producer, throughout a month of production (June, 2021), with the objective of determining their physicochemical characteristics. For this purpose, a proximal analysis was conducted by triplicate, in the Biotechnology Laboratory of Universidad del Cauca, from which the Nitrogen-Free Extract (NFE) was also obtained, made up mainly of digestible carbohydrates, vitamins and other non-nitrogenous organic compounds.

RESULTS

The results are presented in order based on what was exposed in the methodology; in the first place, regarding tradition –that is, oral history, the

genealogical method and the technological trajectory–; then, the network and chain analyses; and, finally, relating to the scoring of the product.

Oral history and genealogical method

The origin of *carantanta* is linked to that of other traditional corn dough dishes in the Department of Cauca. According to Tascón (1961 cited in Illera (2019)), the term *carantanta* comes from the Quechua *zaratanta* (face, crust; *tanta*, tortilla) and means crust that is left adhered to the corn dough pan when it is cooked. This accounts for the indigenous origin of the dough. In the zone of Cajete, white corn was cultivated at a small scale, so the production process for *carantanta* began with the harvest and drying of the corn. When the grain was obtained, it was emptied into clay pots, where it was left soaking for four or five days for it to age. Then, the corn was washed and ground several times, until clean strained content was obtained, which was cooked. In this stage, firewood stoves made of raw clay were used and copper pans where the mixture was shaken with the help of a *cagüinga*. When the ideal dough was obtained for the *amasijos* (mainly tortillas and *envueltos*), they were shaped manually. In particular, tortillas stand out, whose shape is like a volcano. From the residue left in the pan, a thin layer was obtained, known as *carantanta*, which was extracted carefully to dry in the open air, and then packed in linen wraps, as presented in Figure 2.

According to reports by producers and informants interviewed, the origin of *carantanta* and other corn dough products in the village of Cajete is related to

Source: photographs from the field work.
Figure 2. Traditional *carantanta* from the village of Cajete.

the arrival of Mrs. Matilde Mauna Vidal, around 1900. Due to the violence that was experienced in many regions of Colombia at the end of the 19th century and the beginning of the 20th century, Doña Matilde –who was only 14 years old then– had to leave her native town, the village of Santa Bárbara, east of Popayán. Once established in Cajete, she transmitted the techniques for the elaboration of *amasijos* (dough products) to the women of the zone, who learned to process corn to make tortillas, *envueltos* and *carantanta*. Because it was a residue, *carantanta* was destined for consumption by the families, to feed animals, and as commission to maintain commercial dealings. Then, there was a change from a process of incorporating the food and its elaboration, to one of commercialization. This has made production increase, and the market grow.

The structure of the genealogical tree was based on the family of Doña Matilde, taking into consideration that there isn't clarity about which individuals in the zone she transmitted her knowledge to initially. Doña Matilde was mother to five children: Marcelino, Juan Bautista and Manuela, whose last name was their mother's because the identity of the father was unknown; and Fermín Tovar Mauna and Santiago Mera Mauna, fruit of two other unions, one with Ricardo Tovar and another with Vicente Mera. Although they all learned the trade of corn from an early age thanks to Doña Matilde, only Manuela devoted her adult life to it, and passed it on to her direct relatives.

In addition to her children, Doña Matilde taught how to prepare the corn byproducts to her grandchildren, the mothers-in-law of her children, sisters-in-law and other relatives, among whom her daughter-in-law, Aurora Feliciana Ledezma López, is considered one of the most recognized women in the tradition of *amasijos* from Cajete. In this same lineage, there is Aura Ledezma, Doña Aurora's sister, who learned the techniques from her mother, Irene López, apprentice of Doña Matilde. Continuing with the tradition, Doña Aurora taught her children, among them Antonio Ledezma, related to the production of *carantanta* as snack.

Within the learning chain, another of the oldest producers in Cajete stands out: Doña Flor de María Sánchez. She also learned the trade from Doña Matilde and has continued its dissemination until today, through projects for conservation of the tradition. One of the most relevant is the one from the Ministry of Culture and the Escuela Taller in Popayán, which seeks to protect the artisanal techniques of the know-how. In this strategy, Doña Flor led the dissemination of her knowledge about corn *amasijos* to a group of women from the zone.

A key trait of the transmission of the know-how is that the women met to work on the *amasijos* at a ranch that Doña Matilde adapted in her home for that purpose, and they were accompanied by their small children. That is, the learning chain began from childhood, through the observation or the delegation of some of the activities by parents and grandparents. With the

passage of time, each woman became independent and established her own productive unit. Some of these units were inherited by current producers, who have implemented modifications based on the norms of the territorial health agencies.

Technological trajectory

Most of the changes in the traditional production of *carantanta*, tortillas and *envueltos* have been adopted for the benefit of the producing community, and they have to do mainly with hygienic-sanitary requirements, health conditions of the producers, increase in production volume, efficiency of the process, and availability of materials, equipment and working tools in the zone. These changes have been introduced both in the facilities and in the productive process.

Regarding the facilities, changes have been led by the guidelines that the Health Ministry has given during supervision, such as changes in the kitchen materials. When it comes to the productive process, there are several modifications: reduction of soaking time and corn ageing; changes in its origin (makers of *amasijos* in Cajete went from producing their own corn to buying it mostly from a single supplier who, in turn, went from purchasing domestic corn, produced in the municipalities of El Bordo and Mercaderes, to corn from a hybrid seed from the DuPont company cultivated in the Department of Valle del Cauca); substitution of manual grinding, which made the process more efficient and reduced the physical effort, the work days, and the labor costs; and replacement of the working tool materials, according to the hygiene norms of the Health Ministry.

Another important modification came with the emergence of variants of the traditional product: on the one hand, *carantanta resacada*, and on the other, *carantanta* in snack presentation. The first implies a specific process where all the corn is destined exclusively to its production, putting aside the elaboration of *arepas* and *envueltos*. In this process, the *colada* is cooked until a crust forms, the excess dough is removed, and the sheet that is formed is detached. The remaining dough is mixed with fresh dough, sometimes keeping the bran, which brings variations in the sensorial properties of the product (the *resacada* crust tends to be whiter, thinner and simpler).

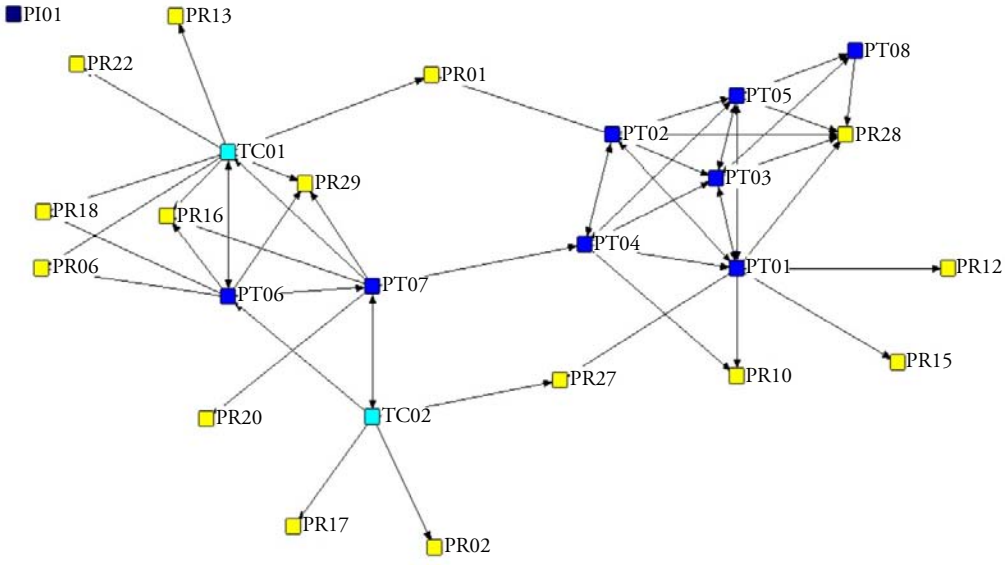
The snack presentation, for its part, is an industrialized product, to which a frying process is added, and which was introduced more than 25 years ago. For this case, the ancestral production practices changed significantly, with the inclusion of new stages and equipment. Regarding the stages, the following were included: lamination, dehydration and frying, which have reduced part of the manual labor and have maximized production. Among the new equipment, soaking tanks, mechanical mixers, industrial grinders

were implemented, as well as a kneading machine, lamination machines with electrical rolling pins assisted by transporter belts, drying rooms, dehydrators, ovens (baking and revolving), industrial fryers, and smoke extraction hoods. However, the packaging activity continues to be manual.

Network analysis

Based on the surveys applied among the eleven producers, three types of networks were built: social, commercial, and technical. In all of them, the groups of stakeholders that establish links between them, and the level of connection were identified. The positions of each stakeholder in relation to associativity were also tracked. All these elements allowed identifying strategies to strengthen the network.

To build the social producers' network, there were consultations made among them about who they talked with about themes related to *carantanta*. Four groups of stakeholders were identified: traditional producers, those who purchase the product and add the fried patty –which were called *carantanta* transformers–, the industrial ones, and the producers referred who were connected by them. The graph diagram in Figure 3 shows that there is no social link between the only industrial producer –Álvaro Paredes (PI01)– and artisanal producers. One of the reasons is that his factory is in the urban area of Popayán and the artisanal producers are in the village of Cajete. The diagram also shows the scarce connection between artisanal producers.



Source: prepared by the authors.

Figure 3. Graph diagram of the social network of *carantanta* producers.

The average of social relationships per stakeholder is 3.54, which can be considered low if the size of the network is considered, and the geographic proximity between most of the producers. This is explained, in part, by the mistrust there is between them, due to negative experiences in previous processes.

The commercial network was structured by asking producers who their clients and suppliers are. In this network, three groups of stakeholders were identified: producers (traditional, transformers and industrial), clients, and suppliers. It is a larger network, compared to the social network, with 80 nodes and 139 links. Each group of producers has consolidated its market in a differentiated manner, since the only links shared are those of the supply of electricity and drinking water. The industrial producer of *carantanta*, Álvaro Paredes, is the one who dominates the market in chain stores, while the artisanal and traditional producers monopolize the trade in market plazas. Although the reasons for this dynamic are not clear, there are some factors that could explain it: on the one hand, because Álvaro Paredes is the only producer registered with the National Institute for Food and Drug Vigilance (*Instituto Nacional de Vigilancia de Medicamentos y Alimentos*, INVIMA), an essential requirement to sell in chain stores; also, because artisanal producers do not have sufficient production volume to supply a demand as the one of large surfaces; on the other hand, because market plazas are the traditional trading points and because taking on commercialization in chain stores entails a very demanding transformation process (new spaces would have to be adapted, and processes would have to be added such as frying, standardizing processes, developing new packaging, etc.), especially taking into account that *carantanta* is not the main product for most of the artisanal producers.

A weakness in the network is also identified when it comes to organizational processes. Outside of the factory sale point, each producer contacts his suppliers. However, if they were unionized, they could make collective purchases of inputs, at better prices. The same happens with the sale of snacks; although they sell part of their production to the factory itself, most of it must be transported to where the client is located, which brings cost overrun from the transport service. This, in addition to the varying price of the snacks, shows that the commercial process is inefficient.

To establish the technical network, questions were asked about who intervenes in the transmission of elaboration processes and in the technical assistance to produce *carantanta*. Two groups were identified: one made up of producers who have disseminated their knowledge, and another by institutions that have intervened with some type of technical assistance. The network has 54 nodes and 70 relationships; it is also larger than the social network, although smaller than the commercial one.

As was identified through the oral history and the genealogical method, there is a weakness in the network, in terms of generational replacement. In contrast, there are institutional experiences that are beneficial for the transmission of know-how, which suggest alternatives. For example, within the framework of the project led by the Ministry of Culture and the Escuela Taller in Popayán; together with the artisanal producer Flor de María Sánchez, some women were trained in the elaboration of traditional corn snacks. In exchange, Doña Flor managed to improve the rental conditions of her factory.

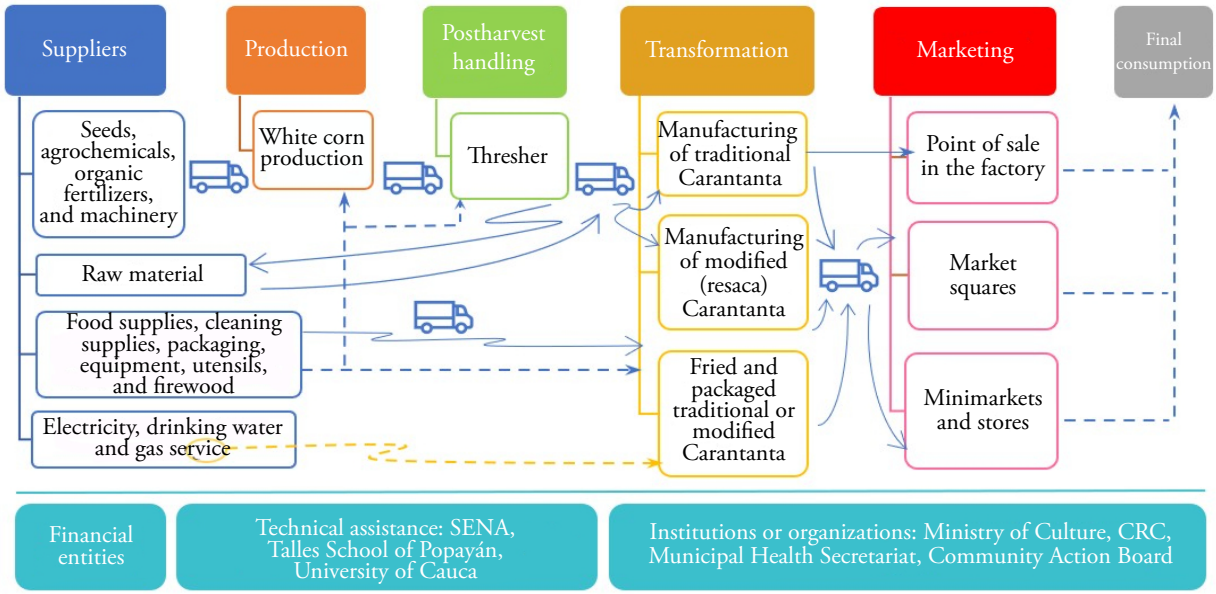
The network density was 2.45%, an indicator of low cohesion. Most of the producers relate the institutional support with the use of their knowledge, without retribution that guarantees an equitable link. An example is the experience of the corn agrotourism route, process that emerged in Cajete to show the traditional production of the snacks and to encourage their commercialization. However, the producers think that those who oversee its administration are the ones that know least about the corn trade, and at the same time, the ones who receive the highest economic benefits from the project. These experiences emphasize the lack of trust and enthusiasm over associativity initiatives.

Agroindustrial chain analysis

The production chain of artisanal *carantanta* is made up of six links that are presented in Figure 4. The producers are located mainly in Cajete, and they are of three types: producers of *carantanta* obtained with the elaboration of *envueltos* and *arepas*; producers who direct all the corn to make *carantanta*, which they call *resacada*; and those who buy it made, to add the fried patty and a new package.

The destination of *carantanta* varies according to the producer: in the case of those whose main sales are tortillas and *envueltos*, it is used as bonus to guarantee the continuity of the commercial deal; instead, others sell it in their factory or through the classic sale model in distribution points, such as market plazas. Intermediaries are part of the last two links in the production chain. The market is divided into local and national clients, with the local market being stronger. The main points of distribution and the clientele are found in Popayán, El Tambo and Cali. Only the industrial producer sells in national chain stores, and he is the only one that fulfills the requirements for exports set by the Invima.

The quality criteria of the product to trade are focused on its sensorial attributes. For the case of whole *carantanta*, the clients make a first qualitative valuation based on color, thickness, size, texture and aroma. Naturally, this does not take away from the importance of the flavor which can only be perceived when it is used in the different culinary preparations. In the case of fried *carantanta*,



Source: prepared by the authors.
Figure 4. Links in the artisanal production chain of *carantanta*.

it is the opposite: since it is ready for consumption, the initial parameters for judgement are the flavor and the crunchiness.

The sale prices also vary according to the presentation. When both chains are compared (artisanal and industrial), it is clear that the artisanal has weaknesses precisely in its commercialization. One of the reasons is the custom of giving away the product with the sale of tortillas and *envueltos*, although it is a dynamic that is difficult to quantify because it changes with each producer. The oldest producers give away all of the *carantanta*, in exchange for maintaining the commercial deal of their main production, which are tortillas; meanwhile, producers with young children have already seen the potential of *carantanta* as the main product, and they distribute the bonus and the commercialization in a 50/50 rate. The bonus, then, is given to maintain commercial deals with the oldest clients. For the case of this study, of the ten artisanal producers surveyed, seven traditional ones give away part or all their production, and only a single woman producer trades it in full.

Another weakness factor in the commercialization phase has to do with the variability in weight, shape and size of the *carantanta*, which may not compensate the production costs with its price; and also because the makers do not understand clearly how to determine them correctly; and, lastly, because the trade of traditional *carantanta* continues to be very local. Unanimously, producers recognize that *carantanta* has a competitive advantage in face of

similar products prepared with wheat flour. This is an opportunity factor to broaden the market, since it is a natural food made only with corn and water, with a mild and pleasing flavor. In the case of artisanal *carantanta*, its unique appearance also stands out, which arouses the curiosity among foreigners. However, the artisanal chain has not been able to take advantage of these differential factors to expand its market, in part because it does not have organizational processes to take on larger production volumes.

Product scoring

The results of the proximal analysis give different variables, evaluated for all the producers in their minimal, maximum, average and deviation values (Table 1).

Although the producers act independently from each other, the uniform behavior of the variables could indicate that the producers confer identity traits to the cooked product. In addition, data continue to be uniform, even for the industrialized product, except for moisture. In this sense, the territorial anchorage of *carantanta* would be associated to immaterial factors such as the practices of know-how. However, it is necessary to perform a more detailed and rigorous study to determine if there is a link between the specific traits of the product and the geographic medium where the production takes place.

Table 1. Descriptive statistics of results from the physicochemical analysis of *carantanta*.

Analysis	Maximum (%)	Minimum (%)	Cooked *carantanta*		Total *carantanta* (cooked and industrial snack)	
			Average	Deviation	Average	Deviation
Moisture	13.0675	*11.3234 **2.3088	11.871378	0.4966342	10.915120	3.0599885
Ashes	6.0124	3.3896	4.921744	0.8348599	5.021680	0.8481855
Ethereal extract	20.1929	*17.1414 **16.4122	18.576144	0.8662433	18.359750	1.0654895
Total protein	*6.1102 **6.2123	5.0312	5.408378	0.4126742	5.488770	0.4647654
Raw fiber	6.7132	3.1732	4.327067	1.2352030	4.427480	1.2070748
Nitrogen free extract (NFE)	68.4221	64.4615	66.766667	1.4787948	66.702320	1.4089916

*Value corresponding to the cooked *carantanta*.
**Value corresponding to *carantanta* in industrial snack.
The maximum and minimum values without an asterisk correspond to the cooked product and contain the range of maximum and minimum values of the product in industrial snack.
Source: prepared by the authors.

DISCUSSION

The search for secondary sources about *carantanta* gives an account of the inexistent academic repository about it, beyond the work by Illera (2019), who addresses part of its cultural history in relation to other gastronomic traditions in Popayán. Both exercises agree about the fundamental role that the village of Cajeta plays in the preservation of the tradition of *amasijos* and products derived from corn, as well as the importance of *carantanta* within the gastronomic heritage of Popayán. For the same reason, it is surprising that there is still not an adequate characterization of the zone in relation to this tradition; for example, understanding the economic impact of the production of these foods on local development, official production figures, consumption dynamics, etc.

In this line, the application of the LAFS approach, and its six methodological tools, is key for an early identification of factors that threaten food heritage. As it happens with the *tenate* cheese in Tlaxco, studied by Grass *et al*. (2018), the traditional production of *carantanta* has a limitation in the knowledge transmission chain to the next generation. In the case of the *tenate* cheese, this is because the oldest producers do not have children to make the generational replacement, while in the *carantanta* chain, it is because the traditional producers consider that theirs is not a task that brings quality of life to the new generations.

In this sense, the methodology ratifies the importance of collective action articulated with the institutional accompaniment. Projects such as the one led by the Ministry of Culture and the Escuela Taller in Popayán, together with one of the most important women producers, show that taking the tradition of know-how beyond the family scope can become a strategy to face the limitations of generational transmission. This agrees with the study by Velarde (2022) about the patrimonialization processes of wine on the Berisso Coast and cheeses from Tandil, which emphasizes that it is the collective nature of knowledge, not only among producers, but also among consumers and other stakeholders in the territory, which prevents it from being relocatable.

When it comes to the strengthening of collective capacities, work can be done in joint commercialization processes, such as Collective Brands and initiatives such as the Geographic Indications, which bring products to new commercial circuits, and therefore take pressure away from competition between producers of the same region. However, this type of initiative is insufficient if the general benefit of traditional producers is not considered. This is what De Oliveira Menezes *et al.* (2020) warn in their study about the experience of *cachaça* producers. In this case, the process of attaining the GI has accentuated the inequality between producers, instead of promoting Sustainable Territorial Development. In fact, the economist view of the LAFS approach and the requirements to gain access to the Geographic Indications

tend to overlook tensions between the systemic nature of territorial patrimony and the processes of patrimonial appropriation. This is seen in works such as the one on artisanal *serrano* cheese in Rio Grande del Sur, Brazil (Ceolin *et al*., 2020), which shows the difficulties that its productive chain faces to adapt to increasingly stricter legal frameworks. There is a clear tension, since the recognition of this market goes beyond legal issues and is based on emotional memory and the preservation of local history. For example, the processes of productive modernization of *carantanta* bring a dilemma between the economic benefit and the safeguard of tradition; to satisfy the growing demand for management of a collective brand, producers often must renounce ancestral practices, to adopt industrialized methods that, paradoxically, could distance them from a Geographic Indication. These contradictions are not only economic, but also legal, as exposed by Molina (2020), for the Argentine case; and political, such as the difficulties to comply with international free trade agreements (Vidaurreta, 2023).

As an alternative strategy to the mere search for a GI, De Oliveira Menezes *et al*. (2020) suggest in their work the consolidation of a basket of products. This could be a very pertinent path for the case of *carantanta*, considering that originally it is not the main product and, therefore, it is closely linked to others, such as *amasijos* and corn byproducts. In this sense, the basket of products belongs to a more integrating strategy, for it could connect producers broadly with initiatives of local tourism and other enterprises. A good example of this is the one presented by Mantino and Vanni (2018), about the basket of local products promoted in the Garfagnana area in the region of Tuscany, a project that, thanks to local institutions, has managed to include all the stakeholders of the zone, under the idea of improving the "rural identity".

However, first, it is necessary to reestablish the trust between members of the production/commercialization networks and techniques, as suggested in the network analysis. A sensitive theme, for example, is the integration of producers with initiatives of local tourism, such as agrotourism routes. The bad experience around the corn route is like other similar ones, such as those described by Grass (2024) on the valuation of coconut snacks from the Pacific Coast of Cauca, in Colombia, and by Thomé (2017) on the impact of oenological tourism in central Mexico. Beyond the certifications or promotion of baskets of products, it is necessary for agroecological routes around them to respond to real collective work, which benefits local producers. In the three cases, the approach of routes did not show opportunities of benefits for all its members, which accentuates the mistrust and lack of enthusiasm for belonging to similar initiatives. It is imperative to strengthen the capacities of leadership and communication of key stakeholders of the network, so they can foster the approach to the productive community through their example.

CONCLUSIONS

The methodological tools of the LAFS approach in the study of the production conditions of *carantanta* allowed reaching a diagnosis of the productive chain and the dynamics of relationships between its main stakeholders. In addition, a detailed description of the know-how associated with tradition was obtained. The oral history and the genealogical method were able to emphasize the familiar nature of the transmission of knowledge, perpetuated between generations of producers, and to account for the feelings of belonging and identity of the product, tied to the territory. These factors give the *amasijo*, of a particular aesthetic, special value as gastronomic heritage. The genealogical tree built allowed reaching the current producers, nearly 120 years after their origin. Although the physical effort of the trade and the market growth entailed a greater connection with the men, the women continue to have a principal role, both in the production and in the transmission of knowledge.

The technological trajectory and chain analysis were key to understand the change from self-consumption of *carantanta* to commercial exchange. With production at a larger scale, and the strengthening of know-how, family production units were consolidated around the tradition of the corn trade in the locality. The trade has managed to remain and contribute to the economic development of the zone, despite the technological advancements and the tendency of globalized markets. However, the production of *carantanta* faces some challenges, such as the lack of generational replacement and the undervaluation of the product in the local market.

One of the most interesting findings has to do with the contradictions around the industrialization of the process. On the one hand, it was identified that both presentations (traditional and modernized snack) have great reception in the local market, although among artisanal producers there is some rejection to the variations, for they consider that they risk tradition. This is paradoxical in two senses: on the one hand, because the physicochemical analysis showed that the properties between products are quite similar (except in moisture), although there is not a unified manufacture method or supervision of the processes; and, on the other hand, because the presentation in snack also promoted the traditional cooked sheet that is produced in Cajete, since the consumers identified that, in addition to soups, they could prepare it fried as snack.

The scoring process of the product, added to the technological trajectory, was key to recognizing that it is not possible to begin a certification process such as Designation of Origin (DO) with the Supervision of Industry and Commerce (*Superintendencia de Industria y Comercio*, SIC), because the raw material does not fulfill the obligatory conditions of origin. In this sense, it is necessary

to promote corn growing in Cajete with local materials, or to manage other emblems of social collectives, more ideal and which highlight the history, culture and tradition of the product. One option in this path is the certification of Protected Gastronomic Heritage, granted by the International Gastronomic Heritage Association (*Asociación Internacional para la Protección del Patrimonio Gastronómico*, APPG). To culminate the scoring processes and to determine the specific quality linked to the territory, trials with greater accuracy must be conducted, which could complement the proximal analysis. Among them, those directed at the consumer (sensorial) and the microbiological.

As strategy to add value, the suggestion is to strengthen the abilities of members of the producing families, to connect young people with the business, and to advance in formal organizational processes, such as associations or cooperatives that facilitate the management of heritage certificates and collective brands. The chain analysis of the links prioritized shows that there is strength in the high demand, not only of the different types of *carantanta*, but of the other corn byproducts. However, it is not possible to leverage the advantage without previously repairing the social links between producers, marked by mistrust. The institutional articulation and of the new generations of professionals are a window of opportunity to foster spaces for knowledge exchange. The transmission of traditional know-how can involve stakeholders outside the family environment, and, at the same time, the children and grandchildren of producers can, from their professions, strengthen the chain in issues of management and process unification. In sum, the objective is to achieve a balance between the organized action of producers, the formalization of the activity, and the respect for traditions that have managed to sustain the trade for such a long time.

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