Contemporary Readings in Law and Social Justice
ISSN: 1948-9137, e-ISSN: 2162-2752
Vol 16 (1), 2024
pp. 2068 - 2077

# Analysis Of The Technical, Economic And Commercial Viability Of The Dehydrated Cape Gooseberry From Boyacá For Export To The European Union.

**[1]Luis Alfonso Moreno Corredor, [2]Luis Carlos Nova Santos,[3]Carlos Andrés Chaparro Arias**

[1]Doctor en Relaciones Internacionales; Magíster en Relaciones Internacionales Iberoamericanas; Economista. Universidad Pedagógica y Tecnológica de Colombia. luisalfonso.moreno@uptc.edu.co. ORCID: https://orcid.org/0000-0001-8462-7940.

[2]Magíster en Marketing Digital y Comercio Electrónico, Magíster en Administración; Administrador de Empresas. Universidad Pedagógica y Tecnológica de Colombia.luis.nova01@uptc.edu.co.ORCID: https://orcid.org/0000-0002-0978-1320.

[3]Especialista en Estadística Aplicada; Licenciado en Matemáticas y Estadística. Universidad Pedagógica y Tecnológica de Colombia. carlos.chaparroarias@uptc.edu.co. ORCID: https://orcid.org/0009-0007-0778-7810.

**Abstract**

This study provides a comprehensive analysis of the viability of producing and exporting dehydrated cape gooseberry from the department of Boyacá, Colombia, to the European Union. The research posits that dehydrating the fruit is a superior value-added strategy compared to fresh export, as it significantly extends the product's shelf life, simplifies its transportation logistics, and reduces post-harvest losses. As Colombia's main producing region, with a share of around 38% of the national total and a consolidated supply from producers with over a decade of experience, Boyacá has a solid capacity to sustain the project. On the commercial front, a robust and growing demand is identified in key European markets such as the Netherlands and Germany. This demand is driven by the global trend of consuming healthy and functional products, with a projected annual growth of 4.1% in the European market for dehydrated fruits. From a technical standpoint, the study evaluated different drying methods and selected hot air drying as the most suitable due to its optimal cost-benefit ratio, operational efficiency, and its ability to preserve the cape gooseberry's nutritional and organoleptic properties. The viability of this method was validated through a successful pilot test. Finally, the financial analysis projects exceptional profitability, with an Internal Rate of Return (IRR) of 92% and a Net Present Value (NPV) of COP $198 million, which demonstrates its attractiveness for investment. It is concluded that the project is technically, commercially, and financially viable, representing a strategic opportunity to strengthen the cape gooseberry's agro-industrial chain, generate a positive socioeconomic impact in Boyacá, and position a higher-value product in the competitive international market.

**Keywords:** cape gooseberry, dehydration, export, European Union, supply, demand, viability.

**Received:** 02 Jan 2024 **Accepted:** 11 Feb 2024 **Published:** 19 Feb 2024

## INTRODUCTION

The global food market has undergone a significant transformation, driven by growing consumer awareness of health and wellness. This trend has catapulted the demand for exotic fruits and "superfoods", especially in developed markets such as the European Union (EU), where consumers are looking for nutritious, functional, and sustainably sourced products (Mordor Intelligence, 2023). In this context, cape gooseberry (Physalis peruviana), a fruit native to the Andes, has gained international

prominence due to its nutritional profile, rich in vitamins A and C, antioxidants and fiber, and its distinctive flavor.

Colombia has positioned itself as the undisputed leader in the world cape gooseberry market, contributing approximately 94% of the global supply (CCI, 2005). Within the country, the department of Boyacá is the main productive epicenter, with 175 registered farms that generate about 38% of national production (ICA, 2023; Ministry of Agriculture and Rural Development, 2018). Colombian exports of fresh gooseberry have shown robust growth, consolidating the EU, and in particular the Netherlands and Germany, as its main destinations (Analdex, 2023).

However, exporting the fruit in its fresh state presents considerable logistical and economic challenges, mainly its short shelf life and its sensitivity to transport, which increases costs and the risk of post-harvest losses. In response to this problem, dehydration emerges as a value-adding strategy that not only extends the shelf life of the product from months to years, but also facilitates its storage, reduces weight for transport, and aligns the product with the growing demand for healthy and convenient snacks (ECLAC, 2016).

Therefore, the main objective of this research is to determine the technical, economic and commercial viability of the production and export of dehydrated cape gooseberry from Boyacá to the European Union. The study seeks to validate whether the transformation of fresh gooseberry into a product with greater added value represents a profitable and sustainable business opportunity that can strengthen the competitiveness of the regional production chain in international markets.

## METHODOLOGY

This analysis was structured under a quantitative, descriptive and deductive approach to determine the integral feasibility (commercial, technical and productive) of the export of dehydrated cape gooseberry from Boyacá to the European Union. The methodological design was divided into the following phases:

### 1. Population and Study Area

The study focused on the department of Boyacá, Colombia, selected for its status as a national leader in the production of gooseberry. According to the Colombian Agricultural Institute (ICA, 2023), the department has 175 registered producer farms and an estimated annual production of 18,000 tons, which represents approximately 38% of the country's total.

### 2. Sample and Sampling Method

A simple random sampling was applied for finite populations, determining a sample size of 52 cape gooseberry producers from key municipalities such as Ramiriquí, Gámeza and Duitama. The calculation was carried out with a confidence level of 95% and a margin of error of 5%, guaranteeing the statistical representativeness of the data collected.

### 3. Data Collection

The collection of information was carried out through a dual approach:

- **Primary Data:** Structured face-to-face surveys were applied directly to the 52 producers in the sample. A validated questionnaire was used to collect quantitative variables on production volumes, agricultural practices, marketing channels, technification and possession of quality certifications.
- **Secondary Data:** A documentary review of official and specialized sources was carried out, including statistics from the Colombian Agricultural Institute (ICA), the National Association of Exporters (Analdex), the TradeMap database, reports from the Economic Commission for Latin America and the Caribbean (ECLAC) and yearbooks from the Ministry of Agriculture and Rural Development.

### 4. Technical Evaluation of the Dehydration Process

A comparative analysis of four dehydration techniques was carried out: freeze-drying, osmotic dehydration, solar drying, and hot air drying. The selection of the most appropriate method was based on

technical and economic criteria extracted from specialized literature (Ochoa, 2012; Parzanese, 2000), weighing factors such as energy efficiency, conservation of nutritional and microbiological properties, and cost-benefit ratio. Hot air drying was chosen as the most cost-effective and effective alternative to preserve the quality of the product.

Subsequently, a pilot test was carried out at the processing plant of the Pedagogical and Technological University of Colombia (UPTC), Duitama Section, dehydrating 10 kg of fresh gooseberry to systematically record the operating temperature, the duration of the process, the final humidity and the sensory quality (color, texture and flavor).

**5. Financial and Statistical Analysis**

A financial model was built with a five-year projection. The model included an initial investment of COP $217 million, a working capital of COP $115 million for the first two months and the associated operating costs. For the evaluation of profitability, a discount rate of 11.43% (DTF + 7%) was used and key indicators such as Net Present Value (NPV), Internal Rate of Return (IRR) and benefit-cost ratio were calculated.

For the analysis of the primary data, the SPSS software (version 25) was used. Descriptive statistics (frequencies, averages, percentages) were applied to analyze the responses of the surveys and identify relevant patterns and relationships between the productive and commercial variables of the sector.

## RESULTS

The application of the previously described methodology allowed to collect and analyze a set of data that addresses the key dimensions of the project's feasibility. In this section, the most relevant findings are presented, starting with a detailed characterization of the productive supply of cape gooseberry in Boyacá, followed by an analysis of the behavior of demand in the European market. Subsequently, the results of the technical evaluation of the selected dehydration process are presented and, finally, the projections of the financial study that support the economic profitability of the initiative.

### Description of production and supply.

The producers who were surveyed showed an average weekly production of more than 12 tons of fresh gooseberry, which is carried out mostly at elevations between 1,800 and 2,800 meters above sea level (masl), taking advantage of the favorable climatic conditions of the region. According to figures from the sector, in 2022 there were around 441 farms dedicated to the cultivation of cape gooseberry in Colombia, scattered throughout several producing departments (Sánchez et al., 2022).

The supply is mainly composed of family crops with more than 10 years of productive experience, which indicates the consolidation and maturity of the sector in the department. These producers have formed strong business links with renowned exporting companies, such as Novacampo and Andex Export, which require international phytosanitary standards and quality certifications to be respected, thus ensuring that the product is competitive in foreign markets.

### Demand behaviour in Europe

With around 94% of the world's supply of gooseberry, Colombia is established as a global leader in its production (CCI, 2005). Colombian exports have had a steady increase. In 2022, they reached 38.2 million dollars with 8,541 tons shipped, which represents an increase of 1% in value and 8.5% in volume compared to the previous year (Analdex, 2023).

In the context of Europe, the main markets are Germany, Belgium, the Netherlands and the United Kingdom. The country that imports the most is the Netherlands, as it accounts for 64.2% of the continent's imports in 2022 (Analdex, 2023). With a 6.7% share, Germany occupied the third position; However, other developing markets such as the United States saw significant increases of 22.2% during the same period.

This behavior is part of a growing global trend in the consumption of dried fruits. According to estimates, the European dehydrated food market is increasing at a CAGR of 4.1% and is projected to constitute 35% of the global market value by 2025, thanks to busy lifestyles and demand for nutritious and functional products (Mordor Intelligence, 2023).

**Results of the assessment of the technical process**

The hot air drying method chosen proved effective in generating a final product with a residual moisture of less than 10%, which meets the technical standards required for long-term preservation. This procedure made it possible to preserve the organoleptic characteristics and nutritional properties of the product, especially preserving the texture and flavour profile of the cape gooseberry.

The pilot test met food safety and production efficiency standards, which validated the technical feasibility of the method. The fact that the process is scalable and can be adapted to be implemented at an industrial level, according to the results obtained, is an essential element for the commercial development of the project.

**Financial Study**

The study estimates that the IRR will be 92%, that the NPV will reach COP $198 million and that the benefit-cost ratio will be 1.22, which confirms how economically profitable it is and how attractive it is for investors in the agribusiness sector.

**Table 1. Historical evolution of cape gooseberry production and demand in Boyacá, Colombia and exports (1995–2023)**

| Year | Planted area (ha) Boyacá / Colombia | Production (t) Boyacá / Colombia | Yield (t/ha) | Total exports | Fountain |
|---|---|---|---|---|---|
| 1995 | Boyacá: 15 / Colombia: 25 | Boyacá: 60 / Colombia: 125 | 4 | Per capita consumption 0.001 kg/year | Silva (1999); KIC (2005) |
| 2002 | Boyacá: 180 (est.) / Colombia: 416 | Boyacá: 2,880 (est.) / Colombia: 6,518 | 16 | Annual consumption growth 79% (1995-2003) | Ministry of Agriculture (2002); ICC (2005) |
| 2003 | Boyacá: 220 (est.) / Colombia: 480 (est.) | Boyacá: 2,640 (est.) / Colombia: 5,760 (est.) | 12.0 (est.) | Annual per capita consumption 0.16 kg | ICC (2005) |
| 2014 | Boyacá: 350 (est.) / Colombia: 1.268 | Boyacá: 3,920 (est.) / Colombia: 15,754 | 11,2 | Growing exports | Ministry of Agriculture (2014) |
| 2017 | Boyacá: 520 (est.) / Colombia: 1,561 | Boyacá: 6,188 (est.) / Colombia: 18,889 | 11,9 | 6,333 t fresh fruit | Ministry of Agriculture (2017) |
| 2018 | Boyacá: 557 / Colombia: 1,605 | Boyacá: 7,172 / Colombia: 16,109 | 12 | 7,872 t for US$37.8 million | Ministry of Agriculture (2018) |
| 2019 | Boyacá: 496 / Colombia: 1,713 | Boyacá: 7,192 (est.) / Colombia: 16,377 | Boyacá: 14.5 / Colombia: 12.4 | 8,287 t for US$35.7 million | SIOC-Minagricultura (2019); FAO (2019) |
| 2020 | Boyacá: 498 / Colombia: 1.650 (est.) | Boyacá: 7,470 (est.) / Colombia: 17,820 (est.) | 10.8 (est.) | 7,363 t for US$32.7 million | ADR (2021); AQI (2022) |

| | | | | | |
|---|---|---|---|---|---|
| 2021 | Boyacá: 485 (est.) / Colombia: 1,680 (est.) | Boyacá: 7,275 (est.) / Colombia: 18,480 (est.) | 11.0 (est.) | 7,872 t for US$37.8 million | ICA (2022); Agrosavia (2022) |
| 2022 | Boyacá: 470 (est.) / Colombia: 1,720 (est.) | Boyacá: 7.520 (est.) / Colombia: 20.000 | 12.0 (est.) | 8,541 t for US$38.2 million | Sánchez et al. (2022); Analdex (2023) |
| 2023 | Boyacá: 475 (est.) / Colombia: 1,750 (est.) | Boyacá: 7,600 (est.) / Colombia: 21,000 (est.) | 12.0 (est.) | 8,550 t for US$39.8 million | Asohofrucol (2023); UPRA (2023) |

*Fountain.* Authors' elaboration based on Silva (1999), CCI (2005), Ministry of Agriculture and Rural Development (2002–2018), SIOC-Minagricultura (2019), FAO (2019), ADR (2021), ICA (2022), Agrosavia (2022), Sánchez et al. (2022), Analdex (2023), Asohofrucol (2023), UPRA (2023). (est.) = Estimated based on historical trends and technical methodologies.

Table 1 presents a detailed reconstruction of the trajectory of the cape gooseberry sector in Colombia over almost three decades, illustrating its transformation from an incipient agricultural activity to a consolidated agro-industrial chain with a clear export vocation. The data reveal a sustained growth in both the planted area and the volume of production at the national level, and at the same time underline the constant prominence of the department of Boyacá as the main producer. This historical evolution provides the fundamental context for understanding the department's current supply capacity and future potential for value-adding projects, such as the production of dried cape gooseberry. The methodology used to estimate the data is detailed below and the main trends derived from the table are analyzed.

Boyacá planted area:

- 2002-2003: Estimated considering the proportional growth of the national sector and the historical participation of Boyacá (~43% average)
- 2014: Calculated as 35% of national area, based on typical regional share
- 2017: Estimated as 35% of the national 1,561 hectares
- 2021-2023: Projected considering adjustments for external factors and trends in productive reconversion

Planted area Colombia:

- 2003: Estimated by applying 15% growth over the 416 hectares of 2002
- 2020-2023: Projected based on installed capacity and sector reports

Production (Boyacá and Colombia):

- Formula applied: Planted area × Expected average yield
- Factors considered: Technological improvements, climatic conditions, accumulated production experience
- 2020-2021: Adjustments for impacts of logistical and health disruptions

Yields:

- 2003: Post-peak standardisation of 2002 (16 t/ha)
- 2020: Estimated temporary reduction due to external factors (10.8 t/ha)
- 2021-2023: Recovery and stabilisation at 12 t/ha (consolidated technological level)

**Boyacá's participation in national production**

The table shows that Boyacá maintains an average participation of 40% to 45% in national production, which confirms its consolidated sectoral leadership. The variation, from 24.9% in 2014 to 48.0% in 1995, reflects both the maturation of the sector in other regions and the stabilization of Boyacá's productive capacity.

**Production and supply**

Surveys carried out among producers in Boyacá show a weekly production of more than 12 tons of fresh cape gooseberry, grown mostly between 1,800 and 2,800 meters above sea level, with a good level of technification (Ministry of Agriculture, 2018). Most of the producers are small and medium-sized, have more than 10 years of experience and market their product under quality standards, in alliance with companies such as Novacampo and Andex Export.

**European demand**

Colombia contributes 94% of the world's cape gooseberry production. The volume exported has had a sustained growth, going from 6,333 tons in 2017 to 7,872 tons (US$37.8 million) in 2018, and remaining stable between 2019 and 2022, with figures ranging between 7,850 and 8,200 tons and approximate values between US$37.8 and US$41 million. Boyacá's share of national exports has remained at around 38%, reaffirming its relevance as the main producing and exporting region (Analdex, 2018; Ministry of Agriculture, 2018-2022; DIAN-DANE, 2022; Secretariat of Agriculture of Boyacá).

In the European market, the Netherlands remains the main destination for Colombian fresh gooseberry, with 58.7% of imports, followed by Germany and Belgium. This growing demand accompanies the global trend of increasing consumption of dried fruits, projected to reach 4 million tons by 2025 (ECLAC, 2016).

**Table 2. Colombian Gooseberry Exports and Participation of Boyacá (2017–2022)**

| Year | Total Export (tons) | Value (US$ million) | Boyacá Share (%) | Fountain |
|---|---|---|---|---|
| 2017 | 6,333 | N/A | 38 | Analdex (2018) |
| 2018 | 7,872 | 37.8 | 38 | Ministry of Agriculture (2018) |
| 2019 | 8,139 | 39.1 | ~38 | Ministry of Agriculture (2019); ICA (2020) |
| 2020 | 7,85 | 38.5 | ~38 | Ministry of Agriculture (2020) |
| 2021 | 7,95 | 37.8 | 38 | ICA (2021); Ministry of Agriculture Boyacá (2021) |
| 2022 | 8,2 | 41.0 | 38 | DIAN-DANE (2022); Ministry of Agriculture Boyacá (2022) |

*Source: Authors' elaboration based on Analdex (2018), Ministry of Agriculture (2018–2022), ICA (2020, 2021), DIAN-DANE (2022), Ministry of Agriculture of Boyacá (2021, 2022)*

Increase in exports Between 2017 and 2022, the total number of gooseberry exported increased from 6,333 tons to 8,200 tons, which is equivalent to an approximate growth of 29.5% in six years. This increase signals relatively constant external demand, with an already established market that exhibits slight annual fluctuations. Constant participation of Boyacá. Throughout the period, Boyacá's contribution to total exports remained stable at approximately 38%.

This stability shows that, despite national growth, the department maintained its market share and consolidated itself as the main source of cape gooseberry exported from Colombia.

International prices have been influenced by elements such as seasonality, the cost of logistics or global supply, as the value of exports has not followed a linear upward trend and fluctuated between US$37.8 million (2018 and 2021) and US$41 million (2022).

Exports fell to 7,850 tonnes in 2020, which was likely due to the constraints on international trade and logistics that arose due to the COVID-19 pandemic. However, since 2021 the volume has been restored and exceeded the levels that existed before the pandemic.

**Strengths and challenges**

Strength: Boyacá demonstrates a consolidated and constant productive capacity, contributing about two-fifths of the national total exported.

Between 2017 and 2022, Colombia managed to consolidate its cape gooseberry exports in volume and value, with Boyacá as a strategic player thanks to its stable and significant contribution. The challenge for the future will be to expand profitability margins and take advantage of the expected growth in markets such as Europe and Asia

The export of cape gooseberry from Colombia to the European Union represents a fundamental pillar for the Boyacá economy, not only because of its direct contribution to export revenues, but also because of the multiplier effect it generates on employment, rural development and regional socioeconomic sustainability.

- Contribution to regional GDP and job creation:

  Boyacá, the main national producer of cape gooseberry, contributes about 38% of the total volume exported by Colombia (Ministry of Agriculture, 2018). Exporting companies based in this region, such as Novacampo and Frutireyes S.A.S., generate hundreds of formal jobs, with a high percentage of women heads of household, strengthening the economic and social stability of many rural families (MINCIT, 2023; ICA, 2021; Analdex, 2018). Of the total production costs, approximately 45% corresponds to labor, indicating the high labor dependence of the sector (ICA, 2021).

- Rural development and strengthening of peasant economies:

  The cape gooseberry production chain has fostered agricultural diversification and economic formalization in rural areas of the department, allowing peasant families to expand their productive and commercial capacity, with access to technical training and quality certifications such as EurepGap, necessary for international markets (Ministry of Agriculture Boyacá, 2022; CCI, 2005). This process has decreased rural-to-urban migration and improved the local quality of life.

- International positioning and competitiveness:

  Boyacá's access to free trade agreements with the European Union, together with the implementation of phytosanitary regulations and quality standards, improves the department's competitiveness against other producing countries and consolidates its prestige as a reliable supplier. This positioning has allowed the Colombian cape gooseberry to lead among the most exported exotic fruits, increasing added value with dehydrated products (Analdex, 2018; FAO, 1997; Hernández & Ruiz, 2001).

- Environmental impact and sustainability:

  Although the cultivation of cape gooseberry requires inputs such as water and fertilizers, its production in Boyacá has advanced towards sustainable agricultural practices, minimizing environmental impacts and adapting to European regulations. In addition, innovation in the dehydration and packaging process contributes to the reduction of waste and improves the logistics chain, integrating environmental responsibility into export activity (Ochoa, 2012; Silva, 1999).

- Multiplier effect and agro-industrial chain:

  The cape gooseberry not only generates income from direct exports, but also promotes other activities such as industrial transformation (dried fruit, jams, preserves), logistics, marketing and related services, expanding the economic base of the department and diversifying sources of employment (Parzanese, 2000; Ministry of Commerce, 2013).

**Table 3. Evolution of exports, domestic purchases and estimated demand for Colombian cape gooseberry to the European Union (2018–2022)**

| Year | Country | Exported Volume (t) | Value exported (USD million) | Volume purchased in Colombia (t) | Value purchased in Colombia (USD million) | EU demand (t) |
|---|---|---|---|---|---|---|
| 2018 | Netherlands | 4,565 | 22.2 | 1,5 | 10.0 | 6,065 |
| 2018 | Germany | 626 | 3.2 | 1,5 | 10.0 | 2,126 |
| 2018 | Belgium | 315 | 1.2 | 1,5 | 10.0 | 1,815 |
| 2018 | United Kingdom | 415 | 2.3 | 1,5 | 10.0 | 1,915 |
| 2019 | Netherlands | 4,8 | 23.7 | 1,575 | 10.7 | 6,375 |
| 2019 | Germany | 680 | 3.4 | 1,575 | 10.7 | 2,255 |
| 2019 | Belgium | 340 | 1.4 | 1,575 | 10.7 | 1,915 |
| 2019 | United Kingdom | 463 | 2.5 | 1,575 | 10.7 | 2,038 |
| 2020 | Netherlands | 4,89 | 24.4 | 1,653 | 11.45 | 6,543 |
| 2020 | Germany | 695 | 3.5 | 1,653 | 11.45 | 2,348 |
| 2020 | Belgium | 352 | 1.5 | 1,653 | 11.45 | 2,005 |
| 2020 | United Kingdom | 480 | 2.6 | 1,653 | 11.45 | 2,133 |
| 2021 | Netherlands | 5,01 | 25.0 | 1,736 | 12.26 | 6,746 |
| 2021 | Germany | 692 | 3.5 | 1,736 | 12.26 | 2,428 |
| 2021 | Belgium | 358 | 1.6 | 1,736 | 12.26 | 2,094 |
| 2021 | United Kingdom | 502 | 2.7 | 1,736 | 12.26 | 2,238 |
| 2022 | Netherlands | 5,115 | 25.7 | 1,823 | 13.12 | 6,938 |
| 2022 | Germany | 705 | 3.6 | 1,823 | 13.12 | 2,528 |
| 2022 | Belgium | 365 | 1.6 | 1,823 | 13.12 | 2,188 |
| 2022 | United Kingdom | 525 | 2.8 | 1,823 | 13.12 | 2,348 |

*Source: Authors' elaboration based on ECLAC (2016), CCI (2005) and the Ministry of Agriculture and Rural Development until 2022. The values of internal purchases are referential and must be contrasted with official sources. The "EU Demand" column estimates the amount supplied from Colombia for each European country, adding exports and national purchases destined for this market.*

**CONCLUSIONS**

The results of this analysis strongly confirm that the project for the production and export of dehydrated cape gooseberry from the department of Boyacá to the European Union is technically, commercially and financially viable. The research demonstrates that the transition from the export of fresh fruit to a value-added product is not only a strategic response to logistical challenges, but represents a highly profitable

business opportunity with a profound impact on regional development. The viability of the project is based on the confluence of a solid and consolidated productive offer due to the experience of its farmers, a favorable and clearly expanding international demand driven by healthy consumption trends in Europe, and a technical feasibility validated through pilot tests that is complemented by exceptionally attractive financial projections.

Beyond its economic profitability, the implementation of this project is emerging as an engine of sustainable development for Boyacá. Its execution has the potential to strengthen the entire agro-industrial chain, from cultivation to final marketing, generating formal and quality employment with a significant social impact, especially for women heads of household in the rural sector. By improving the incomes of peasant families and encouraging economic formalization, it contributes to socioeconomic stability and reduces rural migration. This focus on value addition is crucial, as it allows the region to transcend its role as a supplier of raw materials to position itself as a global benchmark in the production and export of high-quality processed foods, consolidating its competitiveness on the international stage.

To fully capitalize on this opportunity and ensure long-term success, the challenge ahead is to focus on maximizing value per ton exported. This implies going beyond simple dehydration, implementing rigorous quality controls, developing innovative and functional packaging, and obtaining international certifications such as Organic or Fair Trade, which are highly valued by the European consumer and allow access to premium market niches with better prices. At the same time, it is imperative to diversify and deepen the target markets, carrying out specific studies to penetrate other EU countries and explore opportunities in regions such as North America or Asia. For these initiatives to prosper, it is crucial to strengthen public-private articulation, fostering close collaboration between producers, companies, academia and the government to ensure technology transfer, access to financing and continuous support in overcoming trade and phytosanitary barriers.

**REFERENCES**


1. Rural Development Agency (ADR). (2021). *Cape gooseberry sector report in Colombia*. Ministry of Agriculture and Rural Development. https://www.adr.gov.co
2. Agrosavia. (2022). *Productive diagnosis of the cape gooseberry chain in Colombia*. Colombian Corporation for Agricultural Research. https://repository.agrosavia.co
3. Analdex. (2018). *Report on Colombian agro-industrial exports*. National Association of Exporters. https://analdex.org
4. Analdex. (2023). *Colombian Exotic Fruit Export Statistics 2022*. National Association of Exporters. https://analdex.org
5. Asohofrucol. (2023). *Annual report of the Colombian fruit and vegetable sector*. Horticultural Association of Colombia. https://www.asohofrucol.com.co
6. International Trade Centre (ITC). (2005). *Strategy for the promotion of the Colombian cape gooseberry in international markets*. ITC.
7. Economic Commission for Latin America and the Caribbean (ECLAC). (2016). *European dried fruit market: trends and opportunities*. ECLAC. https://repositorio.cepal.org/bitstream/handle/11362/40251/S1600668_es.pdf
8. DIAN-DANE. (2022). *Foreign Trade Statistics of Colombia*. National Administrative Department of Statistics. https://www.dane.gov.co
9. Food and Agriculture Organization (FAO). (1997). *Postharvest manual for tropical fruits*. FAO. https://www.fao.org/4/x5055s/x5055s00.htm
10. Food and Agriculture Organization (FAO). (2019). *World agricultural production statistics*. FAO. https://www.fao.org
11. Hernández, L., & Ruiz, J. (2001). *Export of Colombian exotic fruits: Cape gooseberry case*. National University of Colombia.
12. Colombian Agricultural Institute (ICA). (2020). *Phytosanitary report on cape gooseberry exports*. ICA. https://www.ica.gov.co

13. Colombian Agricultural Institute (ICA). (2021). *Annual report on the production of prioritized crops*. ICA. https://www.ica.gov.co
14. Colombian Agricultural Institute (ICA). (2022). *National fruit and vegetable production statistics*. ICA. https://www.ica.gov.co
15. Colombian Agricultural Institute (ICA). (2023). *National Registry of Gooseberry Producers*. ICA. https://www.ica.gov.co
16. Ministry of Agriculture and Rural Development. (2002). *Sectoral Fruit Statistics*. MADR. https://www.minagricultura.gov.co
17. Ministry of Agriculture and Rural Development. (2014). *Statistical Yearbook of the Agricultural Sector*. MADR. https://www.minagricultura.gov.co
18. Ministry of Agriculture and Rural Development. (2017). *Municipal agricultural evaluation*. MADR. https://www.minagricultura.gov.co
19. Ministry of Agriculture and Rural Development. (2018). *Cape gooseberry production chain: indicators and instruments*. MADR. https://www.minagricultura.gov.co
20. Ministry of Agriculture and Rural Development. (2019). *Statistical Yearbook of the Agricultural Sector*. MADR. https://www.minagricultura.gov.co
21. Ministry of Agriculture and Rural Development. (2020). *Municipal agricultural evaluation*. MADR. https://www.minagricultura.gov.co
22. Ministry of Commerce. (2013). *Profitability and competitiveness of agro-industrial export products*. MinComercio. https://www.mincit.gov.co
23. Ministry of Commerce, Industry and Tourism (MINCIT). (2023). *Management report on the trade, industry and tourism sector*. MINCIT. https://www.mincit.gov.co
24. Mordor Intelligence. (2023). *Dried fruits market: Growth, trends, COVID-19 impact, and forecasts (2023-2028)*. Mordor Intelligence. https://www.mordorintelligence.com
25. Ochoa, M. (2012). *Evaluation of cape gooseberry (Physalis peruviana) dehydration techniques*. National Open and Distance University-UNAD.
26. Parzanese, M. (2000). *Food dehydration: processes and equipment*. Editorial Acribia.
27. Sánchez, J., Martínez, P., & González, A. (2022). *Sectoral diagnosis of the cape gooseberry in Colombia*. Asohofrucol. https://www.asohofrucol.com.co
28. Secretariat of Agriculture of Boyacá. (2021). *Sectoral report on the cape gooseberry production chain*. Secretariat of Agriculture of Boyacá.
29. Secretariat of Agriculture of Boyacá. (2022). *Analysis of the competitiveness of the cape gooseberry production chain in Boyacá*. Secretariat of Agriculture of Boyacá.
30. Silva, J. (1999). *Study of the production and consumption of cape gooseberry in Colombia*. Pedagogical and Technological University of Colombia.
31. Management and Performance Information System for Chain Organizations (SIOC-Minagricultura). (2019). *Report of the cape gooseberry chain*. Ministry of Agriculture and Rural Development. https://www.minagricultura.gov.co
32. Rural Agricultural Planning Unit (UPRA). (2023). *Land evaluation for cape gooseberry cultivation at a scale of 1:100,000*. UPRA. https://upra.gov.co