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The Ecological Future: a Data-Based Strategy

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THE MARKET

Bioecofresh is a family business founded in 2018 by the Reyes brothers in Monterrey, México. Concerned about the environment and the growing interest of consumers in sustainable goods, they decided to start a company that specialized in the production of biodegradable cleaning products. They had the vision of being leaders in the industry across the country offering high quality alternatives, additional to being environmentally friendly and accessible for the Mexican families.

Since its opening, the company has faced several challenges like the optimization of resources, demand management, and the constant need to innovate and be differentiated from the competition. Thus, they have managed to be positioned in the

Each product is designed with biodegradable ingredients and recyclable packaging, meeting strict environmental standards.



Image. Freepik, 2025

market thanks to their commitment to sustainability and their approach to satisfy the needs of the market.

Today, they have a production plant in Monterrey where they manufacture their main products: liquid laundry detergent and liquid dish soap. As the company grows, the owners have identified the need to adopt tools and strategies that enable them to reach data-based, better informed decisions, especially in areas like production planning, sales projection, and internal processes optimization.

Bioecofresh seeks to educate the community about the relevance of reducing the environmental footprint using biodegradable products. This philosophy has enabled them to establish a loyal customer base; nevertheless, they are now facing the challenge of adapting to the changing demands and maintaining a balance between sustainability and profitability.

LINEAR PROGRAMMING

The company has experienced an increase in the demand for their products due to the awareness campaign regarding the relevance of taking care of the environment. Nevertheless, this growth has also meant significant challenges in resource management and production planning.

Bioecofresh has launched a commercial strategy to improve the distribution of their two flagship products; they have designed two types of packages that combine both products with the aim of optimizing their logistics and profitability.

The company has 1,200 bottles for laundry detergent and 1,800 for dish soap. Each type A package makes a \$16 dollar profit (USD), and type B, \$15 dollars (USD).

At Bioecofresh they want to maximize their profits. If they receive an additional 50 bottles of each type of product, how would the optimal solution change? Given the fluctuating economic context of the country, they are wondering: what would happen if the profit of the type A package decreased three dollars? What would happen if the profit of the type B package decreased five dollars?

Images: Mihimihi and Freepik in Flaticon, 2025.

PACKAGES:

TYPE A:

includes
3 laundry
detergent
and 3 dish
soap bottles.



TYPE B:

includes 2 laundry detergent
and 4 dish soap bottles.



PROJECTIONS

Today, Bioecofresh monitors the consumption trend of their products, helping to maintain the company competitive and develop data-based planning strategies which enable them to be one step ahead of demand and manage their stock and production capacity adequately.

To improve their sales projections, they have collected historical data of liter sales of their main products. [See information HERE.](#)

In the company, they want to apply several methods to forecast their sales, so they will carry out a comparative exercise to choose the most accurate. In the process, they must answer the following: which differences can be observed between the forecasting methods?

Additional to their own sales records, Bioecofresh has accessed data of Mexico's industry, that is, information of the cleaning products sector in Mexico taken from Passport. They intend to study the sales behavior of market participants, make projections for the next five years, and establish actions to increase the revenue of each product. [See database HERE.](#)



Image. Freepik, 2025.

Being an emerging company in the ecological cleaning products in the market, Bioecofresh wants to anticipate demand with precision, thus optimizing their production and distribution.

WAITING LINES

In the face of an increase in the demand of their products, there are bottlenecks in the production lines packaging stage, causing delays in deliveries.

Bioecofresh has a single packaging line, but the management has identified that waiting times are increasing, which could affect efficiency. The Operations Manager needs to assess whether the current capacity is enough or if it is necessary to implement a second packaging line to streamline the production flow. However, before reaching a decision, it is crucial to analyze the current delay times in this stage, as sometimes the empty bottles arrive faster than they can be filled up.

The manager measured:

- Empty bottles arrival rate; 360 bottles per hour.
- Service rate: each bottle takes 6.67 minutes to be filled up.
- Current capacity: 1 packaging line.
- Line operation cost: \$4,000 (MXN) daily.
- Cost for delay in the production line: \$2,500 (MXN).

Given that the arrival rate is very close to the service rate, the accumulation of waiting bottles is a frequent problem. This affects productivity, so the manager is considering two possible solutions:

1. Maintaining the operation with a single line and assuming delay costs.
2. Implementing a second line to increase capacity and reducing waiting times.

In the company, they are also wondering: which option is less costly, the current one or having two lines? If the bottle arrival rate increases to 600 per hour, would a second line be enough, or would another strategy be necessary?