

Optimization of the Perfumery Industry Production Process with the Replacement of Raw Material

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Abstract

The present work tends to investigate the lean production through the materials needed for the manufacture of perfumery products (cologne, deo cologne, eau de toilette), reduce its costs significantly, by proposing coherent substitutions to those used regularly, bringing improvements and productivity with the help of Kaizen tools. According to this comparison between inputs and their possible substitutes, all their processing and production are decisive for a more viable option according to the research theme and the viability of lean production in the most varied types of products, in the field of perfumery. In the differences between the given raw materials and the cost benefit, it is possible to promote higher productivity, without changing the performance of the products, even if there is a slight oscillation, but fulfilling the right role to the consumer, enhancing the ecological awareness and generating greater profitability.

Keywords: Perfumery products; Substitution of inputs; Product performance.

1. Introduction

With the fierce dispute between countries for leadership in world consumption of perfumes, Brazil has been in first place since 2011 (but data was established in 2014), which also offers considerable positions as 2nd in specific products male, female, etc. Currently 4th in beauty product consumption, and 10th in dermatological by-products.

However, in addition to the risk of the cooling of the national general market and the obstacles caused by the oscillation of inflation, prices tend to increase, value-added competition with international brands and the current economic instability index make companies tend to dry their production in a fixed way, but without losing its quality, otherwise, it would have harmful consequences to the profitability of the organization in the medium term.

To defend against competitive forces, [1] proposes that industrial companies adopt, among others, three generic competitive strategies: cost leadership, differentiation or focus. Some companies base their competition strategies on controlling, maintaining, and tracking production costs in order to maximize results by reducing costs or even conforming to market rules.

Others seek, through systematic procedures, excellent products and techniques, to offer products with different characteristics compared to the competition. There are also companies that disseminate their strategies aimed at serving a specific segment or type of customers [2].

Among this leadership in perfumery consumption, over 60% is focused on the national perfumery itself, and in this ranking, the main domain is between Natura (direct sale) and O Boticario (sale by franchise and currently also by direct sale). Direct selling, which would be another determining factor for increased product consumption and accessibility to consumers.

The need to cut costs and maintains or increase profitability creates a look at production as a whole, and tends to wipe out sectors, costs, and materials.

This work aims not only to evaluate lean production methods in the manufacture of perfumery products, but also to suggest notions for such direction in order to improve treated physical resources as material for the production of the product in question.

For [3], Strategic Cost Management (GEC) results from the combination of three underlying themes on strategic management found in the literature. These are: (i) value chain analysis, a set of value-creating activities from basic raw material sources to product delivery in the hands of the consumer; (II) strategic positioning, choosing how the company will compete, either through lower costs (cost leadership) or through superior products (differentiation); and finally, (III) cost drivers, factors that interrelate in a complex way, causing costs for the company.

Evaluating all materials used in its manufacture, there is a large financial investment in inputs to bring the desired quality and configure this same quality in a particular product within the brand.

This article gives absolute advantages over the cost reduction of a company, sheds light on the process in which a perfumery product is manufactured and improves productivity without significantly losing its quality.

2. Theoretical Reference

2.1. The Perfumery Market

This product is part of this market every product that aims to perfume the body be it a perfume, cologne or cologne [4].

If Brazil's cosmetics market is already the third largest in the world, the perfumery category is already in first place in the world ranking since 2010. Brazil is the country that sells most perfumes and deodorants

in the world, ahead of the United States and France, two traditional fragrance markets [5].

According to the Brazilian Association of the Personal Hygiene, Perfumery and Cosmetics Industry [4], between 2003 and 2008, a strong increase in the Brazilian perfumery market was identified and, in 2009, the segment reached US \$ 4.81. billion, reaching a 13.1% share of the world market. By 2010, that number had risen to \$ 6.10 billion, a 33 percent increase that pushed the country to the top of the US-led ranking. According to data from [6], in 1985 there were 100 new releases of perfumery products. Ten years later, in 1995, more than 200 new products were launched. In 2009, when this scenario underwent a sudden change, we had approximately 900 new and similar perfumes entering the market that year. In 2011 there were over 1000.

This growing movement in the number of launches feeds back, as with the hot market more companies want to be part of it, bringing more companies into the game and consequently more products. Just as organizations already in this lucrative market drive more and more investment into the creative and marketing industries, making launches more frequent and more profitable. Only Natura, for example, launched in the last half of 2011 19 new perfumes in the market.

Another fact that illustrates the rapid growth of this category is the strong increase in its penetration, recorded by [5]. Currently the northeast has more than 80% penetration, which means that more than 80% of the population uses perfumery products. In the southern region this data is lower, but still growing. The maturation of the market, coupled with the good economic times in the country, allowed consumers of all classes to include in their basket products such as perfumes and colognes.

Through a benchmarking survey conducted by the Massachusetts Institute of Technology (MIT) that resulted in the publication of the book “The Machine That Changed the World” in 1992 by authors Womack and Jones, lean manufacturing gained prominence and spread worldwide. . The focus of the research was to identify companies that applied in their activities the concept of doing more, with less and less.

2.2 Raw Materials and Supplies and Their Contextual Comparatives

2.2.1 Absolute ethyl alcohol

It is regular ethyl alcohol at the level of 98.5 to 99% abv, but because it does not have the necessary lightness and amenity, treatment for adequacy excluding industrial denaturants and dilution through hydration to the level 72% is essential. essential oil is used since, if using essences, the level of dipropylene (which is a suitable type of alcohol functional for chemical aromas) would aid in the dilution of this alcohol. If there is not the whole process described, it is entirely excluded its use in this follow-up.

2.2.2 Rectified ethyl alcohol

This alcohol is also a safe source because it was exposed to the following distillations, a process called rectification. It can also be obtained from other sources such as cassava, for example, but because it contains 95.6% concentration, it needs hydration, which can be done in the same way as in absolute alcohol, but without the need for treatment to suit it. , since it contains no denaturants and is also suitable for general human consumption.

2.2.3 Cereal Ethyl Alcohol

It is ethyl alcohol with the same or similar properties as regular ethyl alcohol, but obtained from sources such as corn, giant transgenic rice (Brs Ag) or wheat starch.

This being a hydroxyl attached to saturated polycarbons. Corn ethanol will be the proposed objective of the topic.

2.2.4 Corn Ethyl Alcohol

Resulting from the fermentation of properties present only in cereals, the fungi die and the alcohol is separated and distilled to obtain "alcohol 96" because it contains 4% hydration, which may vary depending on the purpose and demand (about 70% for products). of perfumery). This alcohol has intense volatility and does not harm dermatology, its ethanol extraction process tends to be longer and although its consumption is not harmful, it can bring long term health problems, except in dermatological use these alcoholics They are more productive, with less quantity, higher yield and faster fermentation, which makes it more accessible.

2.2.5 Deionized water

It is water without mineral salts and where ions are removed that would alter a certain commercial purpose with it. Water is passed through the process called deionization that occurs through two specific systems: One is by passing through ion exchange vessels in the reverse osmosis equipment, where all the ions are removed, and this removal stabilizes the water for various purposes. The second is through the evaporation / condensation process of the generated vapors, which would significantly remove the ions, making them suitable for their transformation into raw materials.

This potabilization method consists not only in removing the present salts, gases like carbon, where their tolerance according to what is considered potable for the productivity in question according to ANVISA RDC Resolution No. 48 of October 28, 2013, is not more than 0.5 mg / l, as well as aerobic-type microorganisms not limited to 100 cfu / ml and total absence of faecal coliforms on a scale of every 100 ml.

Pharmacotechnically, constituents such as those mentioned and others of lower expression, in addition to health problems, especially dermatological, would cause technical problems in the finished product and in the medium term, the loss of space in the market in which the given product (s). (s) are targeted.

Another factor that brings advantages is the conductivity balance, which indirectly would contribute to the "harmonization" factor of the product content, in addition to the physicochemical and microbiological quality of the raw material.

2.2.6 Distilled water

In turn it is obtained when a non-pure water (with dissolved substances) is condensed and boiling separates most mineral salts (distillation does not evaporate all salts), gases and residual substances that may exist in a regular water. .

In processing, if there is a distillation uptake (similar to the extraction of essential oils) the purity of the water is almost identical to that of deionized water, but this system requires more production slack, since the accumulation of water subsequently treated fractional distillation is slower than regular distillation, that

is, where water is boiled at a certain temperature so that there is general cleanliness in its matter and the minimum tolerance of residual substances that would not affect the final quality is regulated. of the product that will compose. The process is therefore simple and economical.

2.3 Essential Oil x Essence

2.3.1 Essential oil

It is the material extracted from a given raw material, whether vegetable or even animal, that concentrates all the properties offered by the organic factor, that is, derived from its exuberant chemical composition. These oils can range in price from affordable to unfeasible, such as “oud” or even rose essential oil, which, due to the symbolism of this flower, the difficulty of extraction, the extremely sensitive raw material and the minimum yield, makes it one of the most expensive in the world and makes the products that contain them more expensive.

2.3.2 Essence

It is a mixture of oily and / or aromatic compounds of synthetic origin that may also contain natural by-products to produce the aroma of a given raw material as well as dipropylene for stability of its final product. Here there is no presence of the assets present in the plant or raw material as those extracted directly from them as is the case with essential oils. The essences have only olfactory qualities, i.e., aimed at trade, which does not change the quality of products manufactured from their use. In the case of rose, the aroma of its oil can be imitated through this process which, although apparently complex, is generally more affordable, which consistently lowers the cost of the final product.

2.4. Production Cost

The cost variable addressed by the present study refers to "the value of goods and services consumed in the production of other goods or services" (Mattos and Toledo, 1998, p. 19). Total and variable costs increase with production. In the short term, production costs are analyzed with respect to total cost, marginal cost and average cost.

Cost has two components: fixed cost and variable cost. Fixed costs are costs that do not vary with the production rate. Variable costs are the costs that vary with the use of variable inputs in the production process [7]. Thus, the total cost is the sum of the fixed cost and the variable cost [8].

The marginal cost, according to [9] is the cost increase caused by the production of an extra unit of product. In other words, it indicates how much each unit increase in production costs. In addressing cost systems, a cost system consists of a general principle and costing methods. The principle is related to the definition of the most appropriate information to the needs of the company. In general, the principle guides the analysis of direct and indirect cost portions that should be taken into account.

Costing methods deal with the operational part, that is, the processing of data and information. According to [10] costing principles are linked to the objectives of cost systems, where they are related to the objectives of cost accounting, namely: inventory valuation and control and decision-making aid. After presenting the costing principles, this paper approaches the absorption costing method and the target costing, adopted empirically and disposed in the literature as a distinct view of cost appropriation to the products,

treated below.

Given the literature search, two costing methods are prominent: absorption with evolution to activity-based costing and variable costing. For [11] as a common point is that they are concerned with the management of indirect costs. As the main difference is that each of them can produce different information that will meet different needs.

Absorption costing consists of the appropriation of direct costs and indirect costs to the elaborated products. Fixed costs are allocated to products through apportionment, variable costs are allocated directly to products, and expenses are carried to the income statement. According to [12] absorption costing, because it is more conservative, makes entrepreneurs more relaxed, because all costs were appropriate and, as a result, the parameters for sales price formation would be better based.

Absorption costing is one that charges all costs in the manufacturing area to the cost of products, whether these costs are defined as direct or indirect, fixed or variable, structural or operational costs. According to [11] the procedure is to make each product or production (or service) absorb part of the direct and indirect costs related to manufacturing. The following figure schematically represents the absorption costing method.

2.5 Process Optimization

Nowadays, it is undisputed the importance of organizations to adapt to environmental changes; Consequently, actions need to be foreseen and proposed to minimize their likely impacts on the company. The concept of flexible organization implies an organizational structure capable of identifying and classifying organizational processes within the company. Identify the production and support processes and classify them according to their strategic relevance to the organization. [13].

This segregation is performed according to each business model and sector in which the company is inserted. According to [13], "This definition takes into account the business branch of the organization in order to subsidize the delimitation of the productive and strategic processes." Once known the relevance of each process becomes possible to draw a strategy for outsourcing activities that do not add value to processes strategic aspects of the company, as well as the processes considered of support. [13] describe the sequence as follows: necessary actions to adapt the organizations to the concept of flexible organization: Environment and its strategic elements; Permanent interaction with the market and customers; Structuring of activities by processes; Subcontracting, partnerships and outsourcing; Form of use of people; Application of information technology resources; Economic management and evaluation; Excellence benchmarks.

3. Methodology

Firstly, there was a bibliographic research on the proposed theme and, according to it, the profitable potential in the Brazilian perfumery business tends to contribute positively to the commercial movement. This data was linked to the application of Kaizen, in the context of productivity improvements in question, where it was concluded that, taking the common areas between companies in the perfumery sector, there is

a range of possible cost reductions related to raw materials and materials, paramount in any production in this field.

Knowing that there are three raw materials and main materials, it was possible to replace them with similar ones without losing performance of the products, thus keeping it competitive. According to the accuracy described on chemical / productive value of similar inputs, it was possible to make a careful comparison between them and attest their potential, and ensure their substitution without problems.

4. Application of Study and Results

4.1. Process Structure

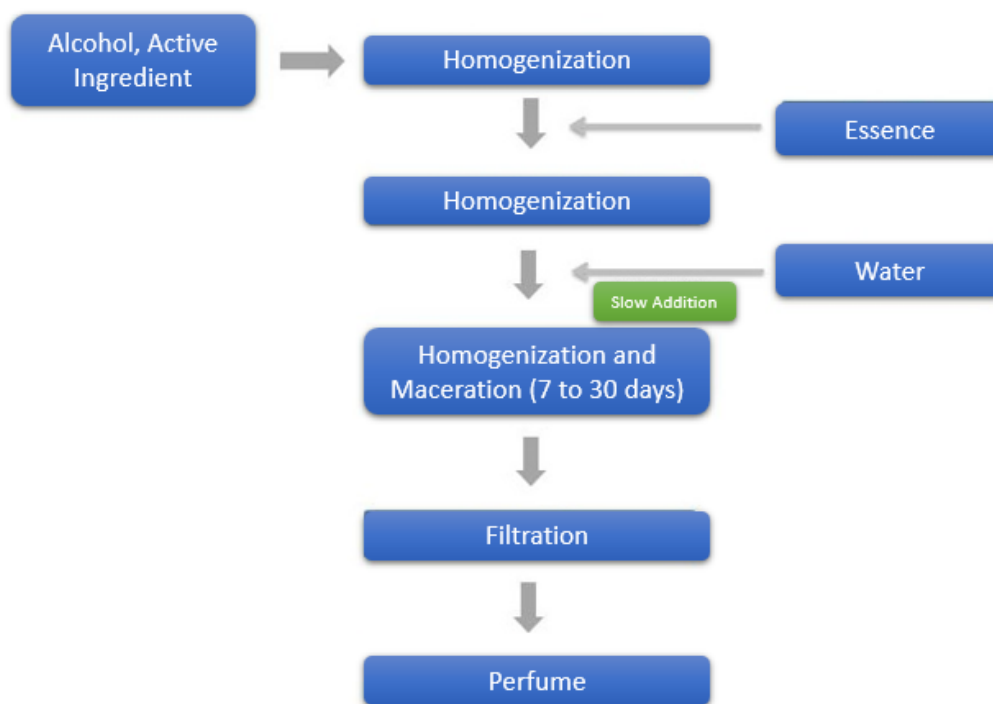


Figure 1 – Perfume manufacturing process

Source: Own Author

The materials are used three, to give a perfumery structural body, which are: rectified ethyl alcohol, deionized water and blend of essential oils. In this case, it is optional to use dipropylene as a solvent, since the maceration time and the alcohol itself try to replace it.

After this, the product should be "resting" for a week to a month, so that not only the essential oils, but also the chemical compounds involved (alcohol and water) interact.

Distilled-rectified ethyl alcohol, deionized water and essential oil can be quietly replaced by anhydrous cereal-corn alcohol, distilled water and mostly essence.

The process (the processes are similar from business to business) starts with alcohol as this is the main volatile material, heavier oils for fragrance durability and optionally adding other active ingredients that accompany them in a ton for first homogenization which will later receive the essential oil or essence for the second homogenization.

In this case there are solvents such as dipropylene present in essences further facilitating the next

homogenization. The water, which must be deionized or distilled for the removal of salts, is gradually added in the last homogenization, to control the texture and the adherence of the water itself to the predecessor mixture and passed through the maceration phase, which lasts between 7 and 30 days. , which allows proximity to the final product, after which the product is filtered through an electric filter and inspected so that there is no residue resulting from the previous processes.

After this the mixture is ready for the processes of transformation into finished product: The material is put in its regular container either of glass or plastic, which in factory, is generally called "glass" or "container" and thus fitted and blended for be dispatched in logistics and directed to the customer.

4.2 Problem Identification

Ethanol productivity and its origins.

Common Sugar Cane - Regular Ethyl Alcohol / Absolute Ethyl Alcohol / Rectified Ethyl Alcohol: Regularly Used in Perfumery.

1 tonne produces between 85/90 liters of ethanol;

Your fermentation 38/45 hours.

Corn- Cereal Ethyl Alcohol / Corn Ethyl Alcohol: Suggested Substitute

1 tonne produces between 400/480 liters of ethanol;

Your fermentation 10/12 hours.

Regular ethyl alcohol produces 5 times less with one ton, which increases the need for more planting space, makes the outsourced product more expensive and contributes to ecological degradation. Your fermentation period is three times longer, which could possibly delay a certain demand for your outsourced product and make up for poor productivity.

The deionized water goes through an ion exchange process, where in the end all the minerals present for desalination are removed in a specific reverse osmosis equipment, which would be an extra expense its outsourcing and the suitability of this raw material would be more. time consuming than the proposed method.

The essential oil, which in turn goes through numerous processes suitable for a particular type of raw material, and which needs a certain amount of it for the extraction of its product, which is ecologically harmful, as in addition to areas degraded to Their crops, many of these oils, are extracted with a whole living structure or plantations, and due to the low yield, thus making the product more expensive, in addition many plants (raw materials) produce their extraction point seasonally or annually, being still more difficult to acquire your oil. Essential oils have an advantageous chemical structure by aromatic rings, which have sensory benefits, but which in popular perfumery, are not of paramount importance.

4.3. Improvement Proposal

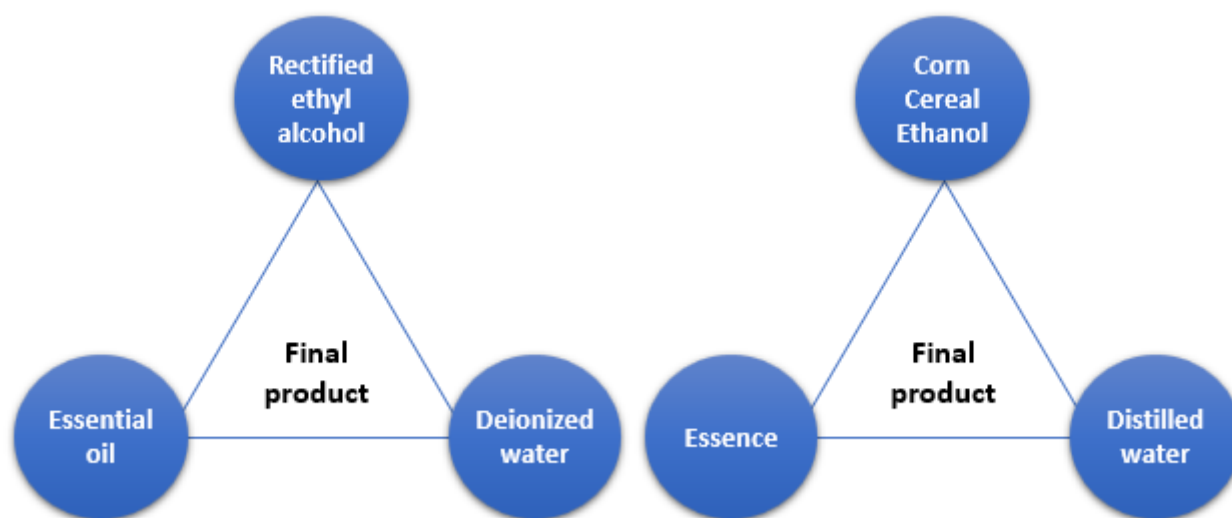


Figure 2 - Replacement structure

Source: Author

With the replacement of its main inputs, these, the most expensive and important ones in the perfumery sector, there were gains not only in cost reduction with cheaper products, shorter waiting period for outsourced inputs, faster processes and decrease in expenses with assets. extra chemicals, but also in the environment in general. Grain-derived ethyl alcohol from maize waste is a more productive source in every way, so cost-effective, and thus more economically less expensive.

Distilled water (which is cost-effective and easy to process) brings the advantages in the perfume industry, practically the same benefit as deionized water, which usually comes as an outsourced product cost. Essences (product which mimics the aroma of certain raw materials or essential oils) is also cheaper and has solvents that accelerate the process already in the industry, further optimizing productivity.

5. Results and Discussions

In the comparison, between the alcohol regularly used in the current perfumery and the corn-based cereals ethyl alcohol, suggested in the research, there were no observable changes in the final result of the finished product, although the productivity is more advantageous with the proposed alcohol in relation to its fermentation period and quantity acquired. The distillation process does not require major complexities in the deionization process, which is more expensive, time consuming and insignificantly in the productive context in question, more advantageous.

Essential oils contain a more complex chemical structure but are fully reproducible olfactory. Containing in their formulation, often solvent compounds, such as dipropylene, the essences intensify and accelerate the maceration process, reducing it by a week, previously longer due to the structural density of essential oils. Essences are more economically accessible because of their relative ease of production.

6. Final Considerations

In the main production processes of the product in question, there were no significant or even noticeable

changes, with the substitution of regular inputs by the optional substitutes gains in the invested income, the more accessible value with both alcohol and essences, and self-production of distilled water instead of purchasing deionized water from suppliers. Other gains in the process period, both in materials, due to faster fermentation, thus the extraction of an optimal substituent of rectified ethyl alcohol, and in the reduced maceration period of one month to between 5 and 7 days, due to solvents. present in essences. The reduction of the ecological impact and the stimulation of the productivity with all these factors, is considerable the investments in these materials, which would promote a reduction between 15 and 25% of the expenses in the sector.

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