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# EVALUATING THE NUTRITIONAL AND ECONOMIC DIFFERENCES BETWEEN NATURAL AND BRANDED MILK

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## ABSTRACT

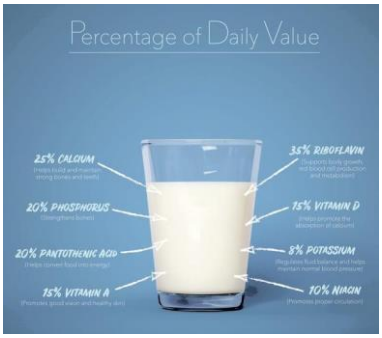
This study compares natural milk and branded milk by looking at both their nutritional content and cost. Natural milk is usually taken straight from the farm with little processing, while branded milk goes through more treatments like pasteurization (heating to kill bacteria), homogenization (evenly mixing the fat), and sometimes adding extra vitamins or minerals. The research analyzes important nutrients such as protein, fat, vitamins, and minerals to see if there are any significant differences between the two types. It also compares how much each type of milk costs, including the price per liter, and how the cost affects consumers and the dairy industry. The study finds that branded milk is often more expensive because of the added processes, packaging, and branding. However, branded milk also has a longer shelf life and is considered more reliable in terms of nutrition, with some brands adding extra nutrients like vitamin D or calcium. On the other hand, natural milk is perceived as fresher and may contain higher levels of certain nutrients, but it may not last as long and can vary in quality. Overall, this research helps consumers understand the pros and cons of both types of milk. It also provides important information for making informed decisions about what to buy, taking into account both nutrition and cost. The study is valuable for individuals seeking to make healthier food choices and for those interested in the economic aspects of the dairy industry.

**KEYWORDS:** Natural milk, Branded milk, Nutritional content, Cost comparison.

## INTRODUCTION

The milk industry stands as a cornerstone of global agriculture, catering to diverse consumer demands and serving as a vital source of nutrition worldwide. From traditional dairy products to innovative alternatives, the industry continually evolves in response to shifting consumer preferences, technological advancements, and economic dynamics.[1] This comprehensive overview delves into the global scenario of the milk industry, exploring key trends, challenges, and opportunities shaping its trajectory.[2]

Historically, milk has been revered as a symbol of sustenance and abundance across civilizations. [3]Its consumption dates back millennia, with evidence of the early domestication of dairy animals such as cows, goats, and sheep. Ancient cultures recognized the nutritional value of milk, harnessing its proteins, fats, vitamins, and minerals to nourish populations and sustain agricultural communities. The advent of dairy farming revolutionized human societies, providing a reliable source of protein and essential nutrients, particularly in regions where crop cultivation was challenging.[4]




As societies evolved, so too did the milk industry.[5] The rise of agrarian civilizations saw the development of dairy farming practices, including selective breeding, animal husbandry techniques, and the establishment of dairy cooperatives. These innovations laid the groundwork for more efficient milk production and distribution systems, enabling dairy products to become staples in diets around the world.[6]

In Europe, the medieval era witnessed the proliferation of monasteries as centers of dairy production, with monks pioneering techniques in cheese and butter making that would endure for centuries.[7]

The consumption of milk dates back thousands of years, with archeological evidence suggesting that humans have been milking animals since the domestication of cattle, goats, and sheep around 9,000 years ago.[8] The ancient civilizations of Mesopotamia, Egypt, and the Indus Valley all practiced dairy farming, and milk was highly valued for its nutritional content.[9] Over time, the methods of milk production and processing evolved, leading to the development of cheese, butter, and other dairy products, which could be preserved for longer periods.[10]

In the 20th century, the milk industry experienced unprecedented growth and diversification, driven by advancements in science, technology, and marketing. Pasteurization became standard practice, ensuring the safety of milk by eliminating harmful bacteria while preserving its nutritional integrity.[12]

## OBJECTIVES OF THE STUDY

1. To understand the preference toward packaged milk among consumers.
2. Determine the factors influencing consumers' preferences when purchasing packaged milk.

3. To study the influence of the brand name of the milk in the purchase decision of consumers.
4. To analyze demographic factors that show a preference for PDDP milk compared to other milk brands.

## SCOPE OF THE STUDY

The scope of this study, "A comparative study on consumer preference towards PDDP milk and other milk brands," encompasses a comprehensive analysis of the various factors influencing consumer choices in the milk market. This research aims to delve into the multifaceted dimensions of consumer preferences, comparing PDDP milk with other competing brands to offer a detailed understanding of the market dynamics.

Firstly, the study will examine the primary factors that drive consumer preferences in the context of milk consumption.[18] These factors include but are not limited to price, quality, taste, packaging, brand reputation, and availability. By dissecting these elements, the research seeks to uncover the underlying motivations that prompt consumers to choose one brand over another. This will involve a thorough review of existing literature to identify theoretical frameworks and previous findings related to consumer behavior in the dairy sector.

## RESEARCH METHODOLOGY

Research is a systematic process of investigating a particular concern or problem using scientific methods. According to American Sociologist Eari Robert Babble, research involves systematic inquiry to describe, explain, predict, and control observed phenomena, utilizing both inductive and deductive methods. Research methodology refers to the strategic approach to systematically solving a research problem.[20]

It focuses on the logical process of conducting research, encompassing the overall strategy and rationale behind the investigation.[21] The methodology outlines the work plan, guiding the selection of strategies, materials, tools, and techniques necessary for problem resolution. Essentially, it serves as a blueprint for a research project, detailing how data will be collected, analysed, and interpreted.[22]

Research methods are the specific techniques and procedures used to conduct research. They encompass a range of activities, including formulating the research problem, conducting an extensive literature review, developing hypotheses, preparing the research design, determining the sample design, collecting data, testing hypotheses, generalizing findings, interpreting results, and preparing the final research report.[23] These steps collectively form the research process, ensuring a structured and systematic approach to investigation.[24]

**Table: Change in Sales of Milk Alternatives.**

| 2016 Year to Date (Through 12/25) | Volume Sales (in gallons) | Vol Share of Nondairy Milk Alternatives | Volume % Change From Prior Year |
|---|---|---|---|
| Fat-free Milk | 585 515 643 | __ | -4.4% |
| Total non-dairy | 246 476 933 | 100% | +5.4% |
| Almond | 170 569 523 | 69.2% | +10.1% |
| Soy | 42 389 236 | 17.2% | -11.0% |
| Coconut | 16 693 335 | 6.8% | +10.7% |
| Cashew | 8 123 609 | 3.3% | +12.2% |
| All other | 6 455 724 | 2.6% | -3.3% |
| Rice | 2 245 263 | 0.9% | -6.1% |
| All other non-dairy products include chocolate drinks, goat milk, horchata, and others. Source: Industrial Research Institute database.6. | | | |


## CONSUMER PREFERENCE

Consumer preferences play a central role in shaping markets and driving economic activity. Understanding these preferences is essential for businesses and policymakers alike.[27] By analyzing consumer preferences through the lens of utility, economists can gain insights into how individuals make choices and allocate their resources.[28]

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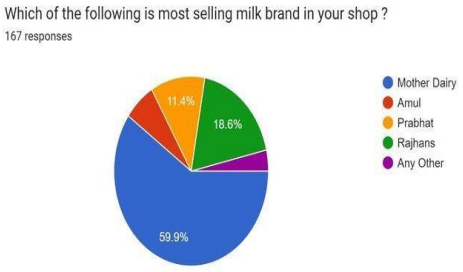
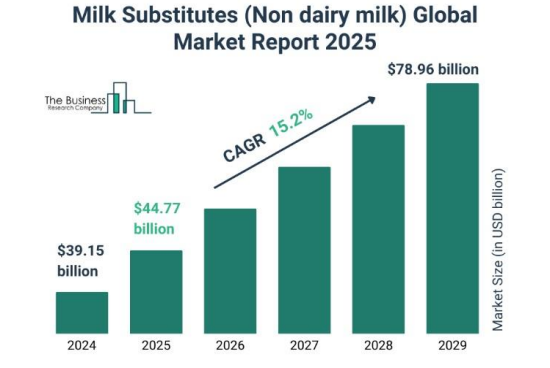



**Figure No - 01.**

As shown in graph no. 01 59.9 percentage of the distributor and retailer in the research has Mother Dairy is the most selling milk brand in their shop or firm.[31] Most of them are franchise holders, distributors, and retailers of only Mother dairy milk.[32] But as shown in graph 40.1percentage of the distributors and retailers also send other brands like Amul, Prabhat, Godavari, Rajhans, and other local brands.[33] The reason behind selling other brands is to retain customers who are price sensitive and also like to purchase another brand of milk. Most retailers are trying to maintain their customer base of every brand, so they sell a variety of brands of milk as per customer likes in their area.[34]

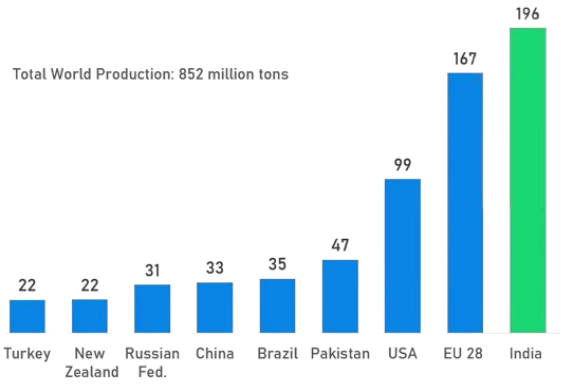


The Non-Dairy Milk Market is segmented by Product Type (Almond Milk, Cashew Milk, Coconut Milk, Hazelnut Milk, Hemp Milk, Oat Milk, Soy Milk), by Distribution Channel (OffTrade, On-Trade) and by Region (Africa, Asia-Pacific, Europe, Middle East, North America, South America).[35] Market Value in USD and Volume are both presented. Key Data Points observed include per capita consumption, Population, and Production volume of plant-based products.[36]

**PRICE**

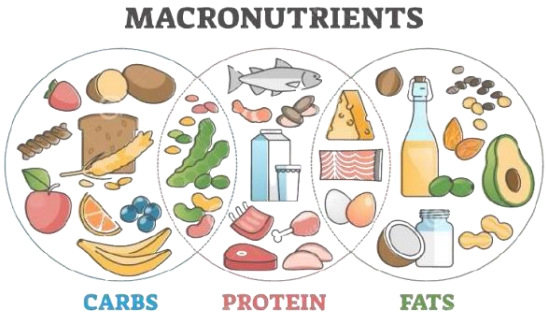
India: In June 2024, the Gujarat Cooperative Milk Marketing Federation (GCMMF), which markets Amul products, increased milk prices by ₹2 per liter. Consequently, Amul cow milk was priced at ₹58 per litre (approximately ₹219.14 per gallon).[37]

International: In November 2024, Dutch dairy cooperative Friesland Campina set its Integral Milk Price at €60.06 per 100 kilograms (approximately €0.60 per litre or €2.27 per gallon).




**Protein**

Fat-free cow's milk and soy milk contain similar amounts of protein, 8 and 7 g, respectively. Almond, cashew, coconut, and rice milk contain 1, 1, 0, and 0 g of protein per serving, respectively.10 The DV for protein is 50 g based on a 2000-calorie diet.12 The total percent of calories provided by protein from unsweetened cow's and soy milk is 39% and 35%, respectively.[38] The best milk option for protein quality is determined by assessing the protein digestibility-corrected amino acid scores.18 Protein digestibility-corrected amino acid scores are the criterion-standard measure of protein quality. The values are as follows: cow's milk and soy are 100%; cashew, 90.3%; almond, ranging from 39% to 92%; rice, 61%; and coconut milk, 54%.19Y23 If individuals are consuming milk primarily for protein content and quality, soy is the only NDMA that provides amounts similar to cow's milk. [39]



## RESULTS

### Unsweetened Milks

### Fortified Nutrients: Vitamins A, D, and Calcium

Full-fat cow's milk is a naturally good source of vitamin A. However, vitamin A is a fat-soluble vitamin, and some of its content is lost when fat is reduced in milk. Non-dairy milk alternatives and lower-fat milks are usually fortified to approximate the level of vitamin A found in whole cow's milk (Figure 1), providing approximately 500 IU per serving.10,11 Cow's milk is a major source of vitamin D in the American diet; each 1-cup (8-fl oz) serving, regardless of its fat percentage, contains approximately 100 IU of vitamin D, which is mostly fortified.10 The Recommended Dietary Allowance (RDA) for vitamin D is 600 IU/d for individuals 9 to 70 years old; NDMAs are also fortified with vitamin D and provide an amount comparable to cow's milk (Figure 1).11 Milk products are a major source of calcium in the American diet.


The RDA for calcium for healthy adults from ages 19 to 50 years is 1000 mg, and most of the US population falls short.11 Specifically, calcium intakes of girls 9 to 18 years old and women older than 50 years fall short of the RDA of 1300 and 1200 mg, respectively.12 While cow's milk naturally contains approximately 300 mg of calcium per serving, NDMAs are typically fortified to levels that provide similar amounts of calcium (Figure 1). Although the calcium content is similar between cow's milk and the NDMAs, the source of the supplemented calcium varies in bioavailability. Golden et al. 13 found that the calcium in soy- and almondbased beverages may have reduced bioavailability compared with cow's milk.

Zhao et al14 found that, compared with cow's milk, calcium carbonate had similar bioavailability, whereas Heaney15 found that tricalcium phosphate bioavailability was reduced. Therefore, if only NDMAs fortified with vitamins A, D, and calcium are considered, the NDMAs have a nutrient profile similar to cow's milk for these 3 nutrients. Infrequently, individual nutrients, other than the 3 listed above, are fortified to levels higher than those found in cow's milk. Fortifying NDMAs with specific nutrients may be a potential strategy to increase shortfall nutrient intakes in non-dairy milk consumers. Non-dairy milk alternatives are sometimes fortified with 20% and 50% of the daily value (DV) for vitamins E and B12, respectively, making NDMAs a superior source of these nutrients.

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