

**“Studies on Quality Aspects of Indigenous Milk Products and  
It’s Impact on Socio-economic Status of Milk Producers in  
Marathwada region of Maharashtra State”**

A Synopsis for the Degree of

DOCTOR OF PHILOSOPHY IN DAIRY SCIENCE

*Submitted to*



**Swami Ramanand Teerth Marathwada University, Nanded**

BY

**Mr.Balasaheb Diliprao Landge**

**M.Sc. (Dairy Science)**

RESEARCH GUIDE

**Dr. Rajkumar Sopanrao Sonwane**

**Professor & Head**

Department of Dairy Science

Yeshwant Mahavidyalaya, Nanded.

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## **Title of Research:**

# **“Studies on Quality Aspects of Indigenous Milk Products and It’s Impact on Socio-economic Status of Milk Producers in Marathwada region of Maharashtra State”**

## **Introduction**

Marathwada is one of the developing regions of Maharashtra state. It comprised eight administrative districts viz Aurangabad, Beed, Jalna, Osmanabad, Hingoli, Nanded, Parbhani and Latur. Aurangabad is supposed to be regional headquarter. Out of the eight districts Hingoli is backward area, some part of Nanded district occupied by tribal and Beed, Osmanabad, Latur is mainly the area of Balaghatrange. Total population is 20 lacs of which 70 per cent people engaged in agricultural; most of them are small and marginal farmers. The area is under deccan platu and based on dry land (rain fed) agriculture. In these contents. Dairy farming supports socio economic status of dairy farmers and *halwai*. There is a high demand for certain Indigenous dairy products in the region.

The study will be carried out with respect to know the role of these Indigenous products in socio-economic development of people of this district. Indigenous dairy products i.e., *basundi*, *kallam*, *kunthalgiri pedha*, *dharur pedha*, *khoa*, *dahi* from neighboring villages etc are playing very important role in this district. By understanding the importance of these dairy products Gaikwad and Hembade (2009), Kulkarni and Hembade (2010) conducted study to evaluate the economic analysis of these products.

Khoa and Khoba Bais Product (Pedha) is very Popular Indigenous Dairy product in Nanded Districts. *Ujani basundi* is very popular Indigenous diary product of Latur district. *Kunthalgiri pedha* only manufactured in Kunthalgiri of district Beed and *Kallam* only manufactured in Parbhani district of Marathwada region. Instead of all above region-specific dairy products, some more might be found which may be hidden and not known due to marketing deficits. Therefore, there is need to find out such region-specific dairy products and come to know every people of India. The importance of Indigenous dairy products also

underlined by many researchers i.e. Patil, (2000), Rajorhia, (2006) and Rao, et al., (2003) etc.

In the world, India has emerged as the largest milk-producing country with an annual growth rate of 5.7percentcompared to the previous year as well as annual milk production is 198.4 MT and with per capita availability of milk has increased up to 407 grams per day during the year 2019-20. Maharashtra ranked 7<sup>th</sup> place in India for milk production (116.55 Lakh MT) next to Uttar Pradesh (1<sup>st</sup>), Rajasthan (2<sup>nd</sup>), Madhya Pradesh (3<sup>st</sup>), Andhra Pradesh (4<sup>th</sup>), Gujarat (5<sup>th</sup>) and Punjab (6<sup>th</sup>) in 2018-19 (Economic survey, 2020-21).

Indian sweetmeats are very popular in worldwide. Around 50% milk produced in India is converted to Indian dairy products. Several types of sweets are prepared in different parts of country and categorized by different name and taste. Mostly, khoa based and chhana based are used for the preparation of sweets. Khoa based sweets are Pedha, kalakand, milk cake etc. while chhana based sweets are Rasogolla, Rasomalai, Sandesh etc. In addition to this, few sweets were prepared with the help of Chhana and khoa like Kala-Jamun, Pantooa etc. It shall be free from added starch and added sugar. The extracted fat from Khoa shall meet the standards for Reichert Meissl value, Polenske value and Butyro-refractometer reading as prescribed for ghee.

Out of the total milk produced in India, 46.00% liquid milk is consumed as whole milk and 54.00% is converted into Indigenous value-added milk products like *khoa* and *khoa* based sweet, chhana, and chhana based sweet, fermented milk products and frozen milk products which played a significant role in the farmer and Indian economy. Milk is consumed as a whole or by converting it into various milk products such as coagulated, fermented, heat desiccated, and frozen milk products (Venketesh, 2003). Nanded district is situated in the Maharashtra state of India, in which Nanded city is the district headquarters and 14 Tahasil place. The Nanded district is in the east part of the Maharashtra state.

**Objectives:**

- 1) To Study the Physico-chemical and microbiological quality including Sensory evaluation of the region-specific products and their impact on the Socio-economic status of milk producer.
- 2) To detect the adulterants in the region-specific products and to suggest the measures to deal with such adulteration
- 3) To find out the major constraints and problems faced by the producer of the products under study.
- 4) To estimate the cost of milk production.
- 5) To estimate cost of Selected Indigenous Milk Products at producer's level.

**National status:**

There are varieties in Indigenous milk-based sweets, manufactured in the country. The market size is around Rs.12000 crore. However, there are very few nationally known brands in this category. Many of the organized dairies are involved in the manufacture of varieties of milk-based sweets: pedha, paneer, shirkhand, etc. With the increase in the availability of liquid milk and Western dairy products, refinement in the marketing network and significant improvement in percapita income, there is an increased pressure for the restructuring of the indigenous milk product industry. Now, the organized sector has started showing keen interest in processes and equipment for manufacturing Indigenous products standardization of products, as well as refinement in packaging and improvement in safety and shelf life. Any innovation which can enable the organized sector to manufacture and market indigenous milk products on an industrial scale can have a far-reaching impact on the dairy industry as well as on the economic condition of milk producers. India as blessed with several competitive advantages, one of which is the highly skilled, unskilled and expensive manpower resource to cater to the ever-increasing manpower demands, both at the national and global levels. In the 21<sup>st</sup> century, an important watershed of our industrial evolution is expected to take place, wherein agroindustry and especially dairying would play a pivotal role with the increasing pull of the market vis-à-vis push of

production, significant, opportunities are knocking at our doors, for both domestic and export market.

Dairy is a supplementary activity to agriculture. It has potential for generating additional income & employment opportunities for the rural households besides improving nutrition levels. These Indigenous dairy products have a great influence in the social, economic and cultural prospects of Indian tradition. About 45 -50 percent of milk produced is converted to indigenous dairy products and only 5-6 percent is used to manufacture the western dairy products (Sindhu, et al, 2000).

### **International Status**

Milk plays a significant role as a source of animal protein in the average Indian diet which is predominantly vegetarian. Because of higher ambient temperatures prevailing in Indian sub-continent, ancient Indians developed more stable products from milk for conservation of its nutritional goodness. So, the ethnic dairy foods, commonly termed as Indigenous or Indian indigenous milk products, were developed over ages utilizing locally available equipment, utensils and manufacturing procedures.

India has become the largest producer of milk in the world. It produces more than 210 million tons of milk annually, as in the year 2020-21. Milk production in India is highly seasonal. The availability of milk is abundant after monsoons and all through the winter which is flush season, the quantity of milk in the summer declines which is lean season. It is happening over the centuries in our country. When we have too much production of any commodities without a matching demand, price come down and that is where the indigenous dairy products play their balancing role. Surplus milk in the evening is boiled and converted into dahi, then to makkhan and finally to ghee which has a shelf life of about one year.

In India only 5-6% of total milk is converted into western type of products in the organized sector. Nearly half of the milk produced in India (50-55%) is utilized for the manufacture of Indigenous milk products and approximately 45.7% is used as fluid milk. Only about 20% of the total

milk produced is processed by the organized dairy sector. Collection of the entire surplus milk from about 5.8 lakh villages and its processing requires huge capital investment on equipment's, buildings and other infrastructure. The milk that is supplied in the cities and towns is very expensive as a result of high costs of procurement, processing and packaging and due to losses because of souring of milk. Conversion of surplus milk into indigenous milk products in and around production areas is least expensive and more profitable. A large proportion of the milk is converted into indigenous dairy products such as khoa, chhana, paneer and khoa and chhana based sweets

### **Significance of the study**

The indigenous dairy products are India's largest selling and most profitable segment after liquid milk and account for more than 50 percent of milk utilization. Significant headway has been made in the industrial production of Indigenous sweets such as shrikhand, gulabjamunm peda and burfi. India's dairy market is multilayered, shaped like a pyramid with the base made up to the vast market for low cost, liquid raw milk. The narrow tip at the top is a small but affluent market, largely for western type and fresh packaged dairy products. The market for indigenous products far exceeds that for Western dairy products like butter, milk powder and cheese. A great scope exists for further expansion of the market for indigenous milk products, provided quality and safety are ensured and the shelf life is extended to facilitate distribution over larger areas. Major innovations are needed in manufacturing, quality assurance, packaging and process engineering to adapt these products to current marketing and consumer requirements. Some commercial processes have been developed to manufacture ghee, khoa, shrikhand and Gulab jamun, but much is required to be done.

### **Outline of the Research Problem**

- 1.Introduction
- 2.Review of literature
- 3.Materials and Methodology
- 4.Result and Discussion Conclusion and Recommendations.

### **Review of literature: -**

The work done by earlier workers have been revived and are presented in the following paragraphs.

**Patel, et al., (2006)** studied the chemical composition of Indigenous and mechanically prepared peda. In this investigation they reported that the peda manufactured using Indigenous method from different traders were superior in chemical and sensory quality than those manufactured using mechanized methods. Peda made by Indigenous method fetched considerably higher score for flavor, total score and body and texture than peda made using mechanized method. Peda made by Indigenous method and mechanized had lactose content of 15.7 and 16.6%, respectively. The values for fat, ash and acidity were 18.4 and 15.3%, 2.4 and 2.8% and 0.40 and 0.54% lactic acid.

**Khaskheli, et al., (2008)** was conducted study to evaluate the chemical and sensory quality of indigenous milk-based product "Rabri". Samples were purchased from randomly selected Sweet/Dairy shops (25) situated at different areas at Hyderabad city and Latifabad. The concentration of different components of Rabri varied greatly sample to sample. The percentage of moisture content ranged between 24.33 and 38.85%, fat 16.23 and 22.55%, protein 9.94 and 12.01%, lactose/sucrose 27.08 and 43.72% and ash 2.09 and 2.84%.

**Gaikwad and Hembade, (2009)** studied the cost analysis of Indigenously manufactured *Ujani basundi* by collecting data through questionnaire. The interest on fixed cost contributes the maximum as compared to other expenditure. The lowest cost was spent towards license fee and taxes. In variable cost, milk contributes major amount of cost as compared to other costs. In the manufacturing process, the only non-milk product added was the sugar. All the manufacturers use wood as a fuel for preparation of the product, which costed Rs.9.10/kg of product. The total cost of production was about Rs. 79.08 per kg and market sale price is Rs. 100 per kg.

**Raj Ezhil, et al., (2009)** while studying economics of butter production and occupational pattern of butter producers in Utupuli Block of Tamilnadu reported that medium unit constituted higher proportions to the total units followed by larger units and small units.

**Gaikwad and Hembade, (2010)** studied the manufacturing technique and marketing of *Ujani basundi* manufacturing techniques in this region. Indigenously, in some part of Ausa Tehsil the product is prepared by progressive boiling results to more and more skin formation, which is removed and collected on top side of *karahi* and when desired concentration is reached the sugar is added to 10:1. Whereas in Ujani village, the milk is continuously boiled, scrapped till the desired concentration is reached and then sugar is added @ 10:1. The final product has characteristic flavour, body and texture, colour and appearance, which is responsible to its popularity in this area.

### **Materials and Methods**

Dairy farming supports socio economic status of dairy farmers and halwai. There is a high demand for certain Indigenous dairy products in the region. The study will be carried out with respect to know the role of the Indigenous products in socioeconomic development of people of Nanded district. Indigenous dairy products i.e., basundi, kallam, kunthalgiri pedha, dharur pedha, khoa, dahi are playing very important role in this district. For this study the Marathwada region will be selected in that purposively random districts and its Tahsil will be selected.

Collect information regarding socioeconomic problem of each milk producers and manufacturers and sellers with pretested questionnaires. From this Tahsils in districts and tehsils purposively simple random samples will be collected. In this way data from the 160-180 Indigenous dairy product manufacturers will be collected.

### **Collection of Indigenous dairy product Samples**

During present investigation for compositional analysis 10 samples of each Indigenous dairy product will be purchased from the study area and transport to the laboratory within 7 hours in an iced stainless-steel container with tightly closed lids. The samples will be kept overnight at refrigerated temperature before analysis.

### **Chemical analysis of Indigenous dairy products**

The physicochemical parameters of Indigenous dairy product like moisture by standard gravimetric method (IS 1981), fat (IS 1967), protein by



the standard method (AOAC 1970), ash (IS 1980), sucrose (IS 1981) will be determined.

### **Microbiological analysis of Indigenous dairy products**

Microbiological quality parameters of Indigenous dairy product like standard plate count, spore count and yeast and mold count will be determined by standard method (IS 1981).

### **Sensory evaluation**

The sensory evaluation will be done by a panel of judges by using 9point hedonic scale.

### **Cost of the products**

Will be determined by existing market prices of ingredients.

### **Statistical Analysis**

Data obtained during the present investigation will be subjected to statistical analysis by suitable model, using appropriate computer packages.

### **Year-wise plan of work and targets to be achieved**

<b>FIRST YEAR</b>		
Completion of course work:	:	At S.R.T.M.U. Nanded/ Yeshwant College, Nanded.
Collection of references and review of literature writing	:	M.A.U. Parbhani, S.R.T.M.U. Nanded N.D.R.I. Karnal, Bangalore, CFTRI, Mysore and other relevant sources by refereeing books and reputed scientific Journals.
Review of existing manufacturing practices	:	By Survey method
Preliminary surveys for estimating demand and importance of milk products	:	Collect Indigenous dairy products from selected milk and milk products producer pockets, areas in Marathwada region
<b>SECOND YEAR</b>		
Sensory evaluation of preliminary trials	:	By panel of judges
Sensory evaluation of samples	:	By panel of judges

Physico-chemical, microbial analysis, energy value of samples	:	By standard procedure
To study shelf life of finished product	:	By standard method
Determination of cost of the milk and finished product	:	Considering existing prices of ingredients
<b>THIRD YEAR</b>		
Statistical analysis of data	:	By standard method
Writing research paper	:	National and International journals
Submission of Final synopsis	:	To S.R.T.M.U. Nanded
Pre-PhD seminar	:	At Yeshwant College, Nanded.
Thesis writing	:	To S.R.T.M.U. Nanded

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Signature Signature

Signature

(Research Scholar)

(Research Guide)