SESSION 6 • SAFE MILK FOR NUTRITION AND LIVELIHOOD

Ensuring Safety in the Milk Supply Chain

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FOCUS REGION	KEY BRAND	APPROACH
Madhya Pradesh & Bhopal Model	Sanchi Dairy (MPCDF)	Farm-to-Consumer Cold Chain

1. SECTION COVERAGE

Global & Indian Dairy Scenario: Scale & Challenges

Largest Global Producer

248 Million Tonnes annual output (~24% of global production)
Value of output at - USD 135 Billion is more than the combined value of cereals and pulses.

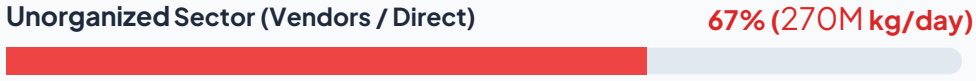
Smallholder Backbone

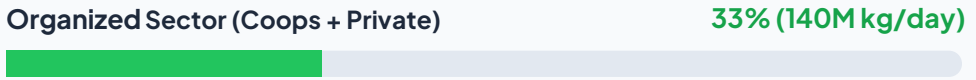
84% female bovine assets owned by landless/marginal farmers.

High Surplus Volume

63% total milk produced is marketable surplus (410M kg/day).

National Surplus Distribution Gap





⚠ **Supply Chain Vulnerability:** High informal dominance leads to microbial growth risk and unmonitored cold chain breaks before processing.

REGULATORY & QUALITY MANDATE

Why FSSAI Schedule IV Part III Compliance is Essential

Biological Risk Mitigation

Milk is a nutrient-dense biological fluid prone to rapid microbial growth if temperature control breaks.

Residue & Udder Health Control

Enforces strict withdrawal periods for antibiotics and mandatory mastitis segregation at farm gate.

Economic Security & Trust

Protects national GDP assets by preventing market spoilage and building consumer brand equity.

END-TO-END INTERVENTIONS

What Needs to Be Done: The Integrated Safety Chain

STAGE 1

Farm Hygiene

Clean udder washing, sanitised SS pails, and veterinary health audits.

STAGE 2

Rapid Testing

Organoleptic & strip testing at village DCS before loading tankers.

STAGE 3

Chilling ≤ 4°C

Rapid BMC chilling within 3 hours to prevent bacterial multiplication.

STAGE 4

Retail Cold Chain

Strict ≤ 8°C storage at parlours; zero ambient display exposure.

STATE BASELINE ANALYSIS

Current Facts & Bottlenecks in MP Milk Unions

3.7 Cr Litres

Daily Marketable Surplus in MP (6.1 Cr LPD Total Production)

Cooperative Capture Bottleneck
Organised cooperatives capture only ~3.5% of total marketable surplus.

Ageing Processing Infrastructure
Plants built in the 1980s face chilling breakdowns and maintenance delays.

Vast Geographical Spans
Unions covering up to 18 districts create long transit times and cold chain gaps.

Fodder Deficit & Low AI Coverage
35% green fodder deficit and ~15% AI coverage impact fat/SNF composition.

5. TURNAROUND METRICS

Progress Under NDDB Management (2025–2026)

+23% **Functional DCS Expansion**
5,763 → 7,100+ Active Societies (1,752 new, 701 revived)

+10% **Daily Procurement Growth**
8.73 → 9.67 Lakh Kg/Day

+15% **Producer Payout Expansion**
₹1,398 Cr → ₹1,609 Cr Direct Payments

Infrastructure Expansion Added

- **153 New Bulk Milk Coolers (BMCs)** installed at key collection routes.
- **949 AMCU / DPMCU Units** deployed for instant testing at village level.
- **Transparent Quality Payouts** encouraging clean milk adoption.

3. INFRASTRUCTURE ASSESSMENT

Madhya Pradesh Cooperative Dairy Network & Assets

Procurement & Chilling Infra

1,187 Units
Bulk Milk Coolers (BMCs)

52 Centres
Chilling Centres (23.37L LPD Capacity)

17 Plants
Dairy Processing Plants (18L LPD)

Marketing & Distribution Reach

1,217 Units
Sanchi Milk Parlours

506 Booths
Dedicated Distribution Booths

6,425 Points
Retail Agencies & Outlets

6. VETERINARY & REGULATORY FOCUS

FSSAI Schedule IV (Part III) Hygienic & Sanitary Controls

Animal Health & Veterinary Hygiene

Mandatory animal health checks, udder hygiene SOPs, immediate isolation of mastitic animals, and strict withdrawal period compliance for veterinary drug residues.

Collection & Rapid Testing

Organoleptic checks, alcohol/acidity tests at village DCS. Immediate rejection of adulterated milk before loading into common tankers.

Chilling & Transport Integrity

Chilling to ≤4°C within 3 hours of milking. Food-grade SS insulated tankers with temperature data loggers and unbroken security seals.

Veterinary Mandate: Primary food safety is established at the farm gate; post-collection chilling preserves initial microbial quality.

Field Study: Udder-Level Milk Quality

Milk samples collected during milking to assess fat, SNF and baseline quality

63	36	33	4
udder milk samples	cows	farmers	DCSs

Sampling

- 41 morning and 22 evening samples
- Collected during milking
- Average milk production: 6.4 kg/cow/day

Average Milk Composition

- Fat: 5.1% (FSSAI benchmark: 3.2%)
- SNF: 8.4% (FSSAI benchmark: 8.3%)

SNF Findings

- Around 40% of samples had SNF below 8.3%
- All samples were above 7.5%, the minimum acceptance level

KEY FINDING

Average udder-level fat and SNF were satisfactory, but a notable share of samples had SNF below 8.3%.

Milk Quality Assurance Across the Collection Chain

Potential dilution is a risk to investigate; the study does not conclusively identify where or why it occurs

1 Cow / Udder

Average fat 5.1%
Average SNF 8.4%

→

2 DCS Collection

Testing gaps may limit early detection

→

3 Milk Transit

Verify quality and volume at dispatch / receipt

→

4 Chilling Centre

Pooled milk sometimes below 8.3% SNF

Potential Contributing Factors

- Irregular, inadequate or non-functional DCS testing facilities
- Imbalanced diets, including possible protein and calcium/phosphorus deficiencies
- Limited reconciliation of quality and volume between DCSs and chilling centres

Recommended Actions

- Ensure functional, calibrated testing equipment and routine DCS testing
- Strengthen chilling-centre checks and reconcile dispatch/receipt volume, fat and SNF
- Promote balanced feeding, quality cattle feed and mineral-mixture supplementation
- Use transparent testing and quality-linked procurement to build producer confidence

KEY MESSAGE

Strengthen traceable testing from DCS dispatch to chilling-centre receipt. Lower pooled-milk SNF warrants investigation, but does not by itself prove water adulteration.

6. EXTENSION IMPACT

Extension Strategy and farmers awareness: Over 11,000 Farmer Meetings

11,000+

Farmer Extension Meetings

Massive ground-level training program reaching **80000+** of dairy farmers across MP to enforce clean milk practices.

Hygienic Milking Protocols

Clean udder washing, dry wiping, and hand hygiene before every milking session.

Sanitary Utensil Handling

Transition from non-food grade plastic pails to seamless SS utensils and proper cleaning.

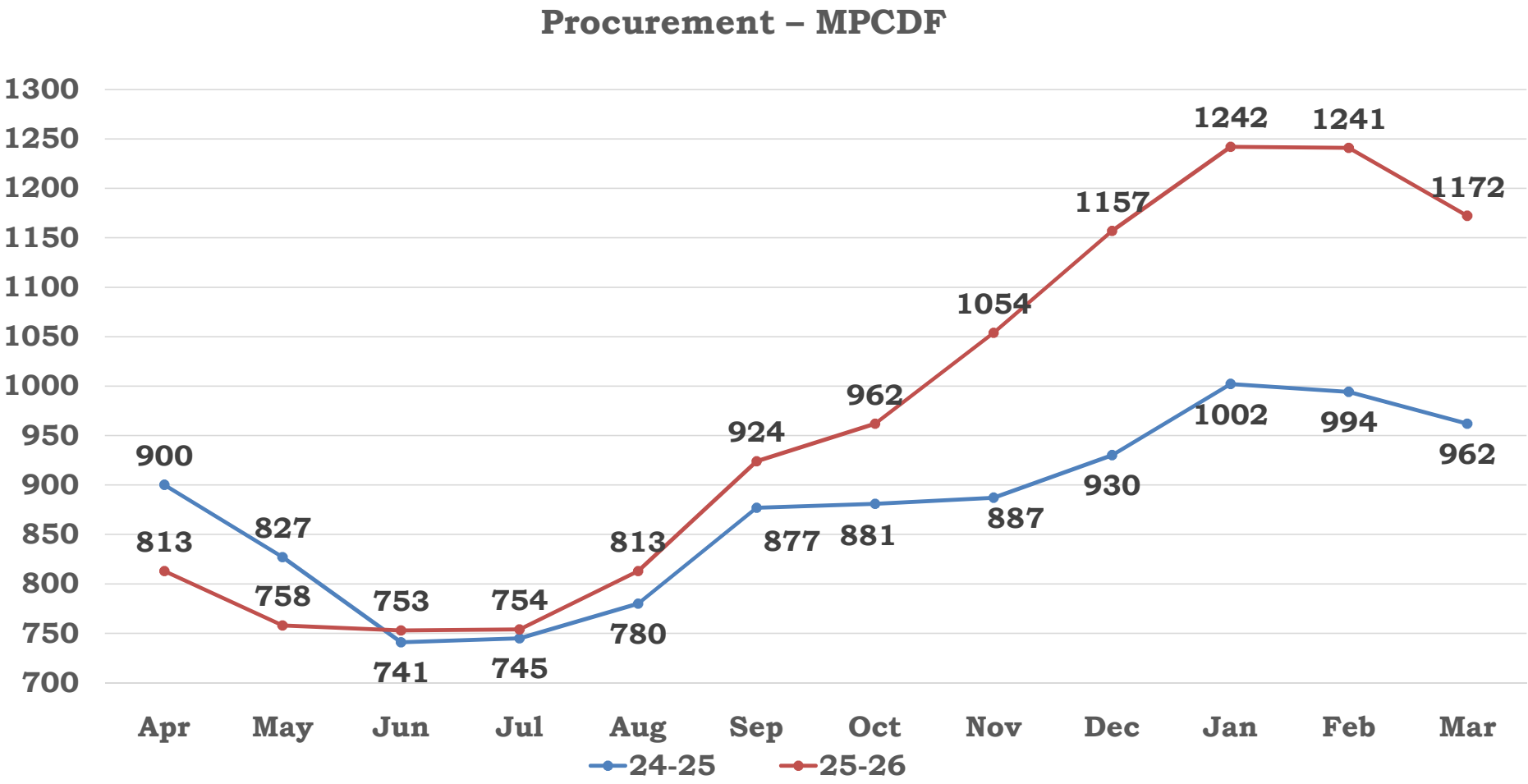
Rapid Village Delivery

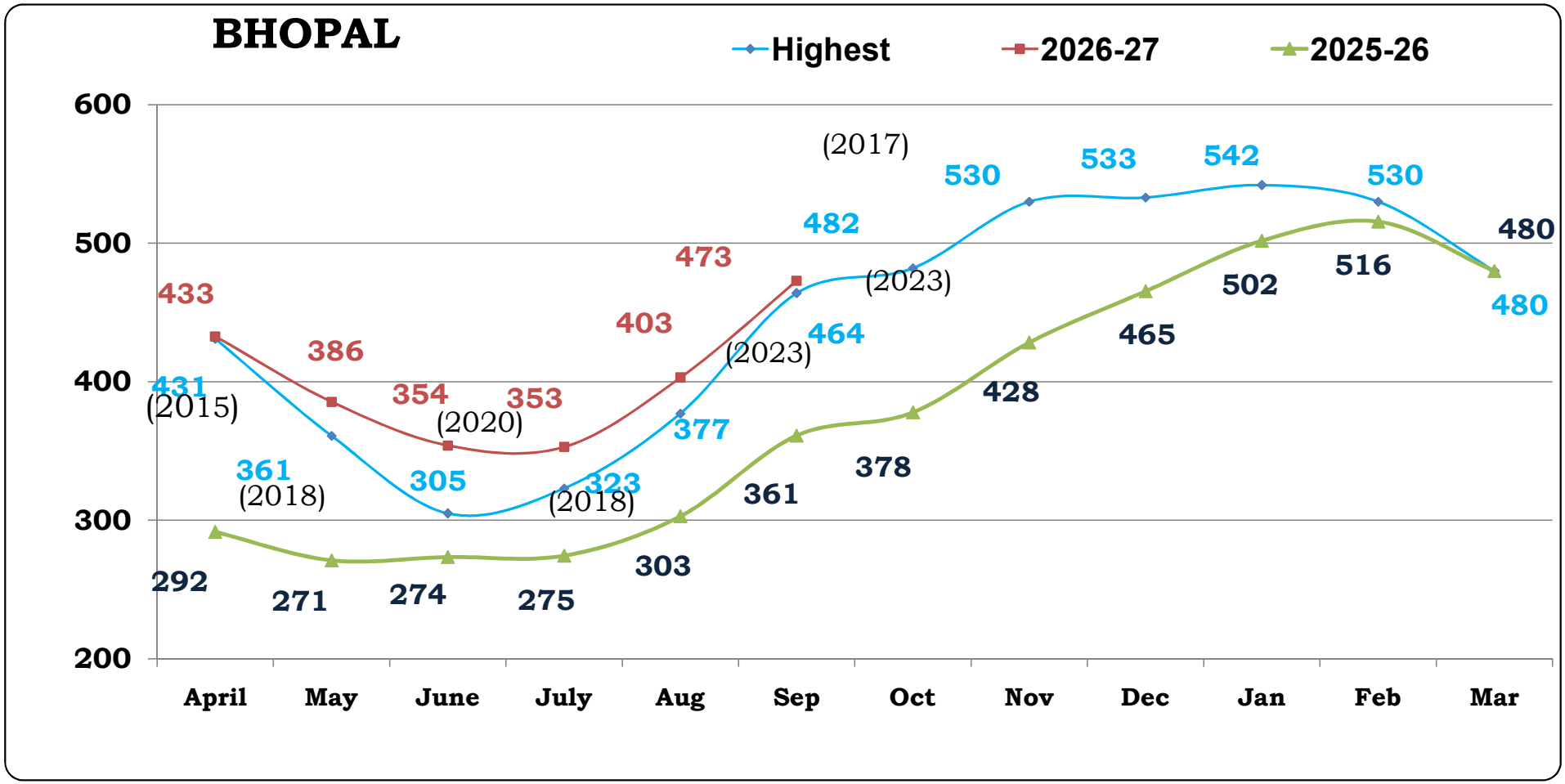
Strict time windows from milking to BMC chilling to prevent bacterial proliferation.




महिला दुग्ध उत्पादक सह. समिति मर्या. सेजवानी
Shot on OnePlus
Powered by Dual Camera

Trend Analysis (TKgPD)




BHOPAL
Highest
2026-27
2025-26
600
500
400
300
200
April
May
June
July
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
433
386
354
353
403
473
431
(2015)
(2020)
361
(2018)
305
323
(2018)
377
482
(2017)
530
533
542
530
480
(2023)
464
480
516
502
465
428
378
361
303
292
271
274
275

7. DISTRIBUTION & RETAIL FOCUS

Cold Chain Management at Retailer Points & Smart Parlours

Sanchi Smart Parlours

Modernizing traditional booths into temperature-controlled, highly visible Smart Parlours equipped with dedicated visicoolers and deep freezers.

Retail Cold Chain Discipline

Enforcing mandatory ≤8°C retail storage. Eliminating ambient pouch display to prevent spoilage, souring, and curdling at retail.

Depot Timings & Replenishment

Optimizing early-morning delivery schedules and aligning depot operating hours to prevent stockouts and stock exposure.

BHOPAL INTERVENTION CASE STUDY–CONSUMER ENLIGHTENMENT

”Doodh Ka Doodh, Paani Ka Paani” Mobile Testing Campaign

THE CHALLENGE (PRE-JUNE 2025)

Declining sales, market adulteration rumors, and public distrust in packaged dairy products in Bhopal region.

THE INTERVENTION

Deployment of **Sanchi Rath** Mobile Diagnostic Units equipped with FTIR analyzers & BR refractometers for on-the-spot doorstep testing (1,200+ consumer samples).

QUALITY OUTCOME

Substandard sample rate collapsed from **35.6%** (Jun-Aug 2025) down to **9.9%** (Dec-Feb 2026) ($\chi^2 = 66.89$, $p < 0.001$).

Commercial Sales Recovery

+55.5%

Ghee Sales Jump (71.27 → 110.86 MT)

+19.8%

Paneer Sales Volume Increase

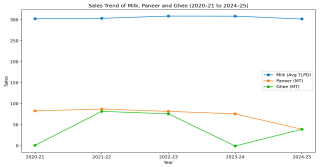
Transparent testing restored consumer trust in quality-sensitive value-added products.

Impact of Mobile Diagnostic Units on Dairy Quality, Consumer Trust and Sales

Bhopal Milk Union, Bhopal

Introduction

Between 2020–21 and 2024–25, the Bhopal Milk Union operational area witnessed a steady decline in milk and product sales, exacerbated by quality-related issues in 2024–25. Following a continued downward trend in early 2025–26, the **"Doodh Ka Doodh, Paani Ka Paani"** consumer-centric intervention was launched in June 2025 to deter adulteration and restore confidence



Methodology

1. Data Integration:

•**Sales Data**: Monthly volumes for Milk (TLPD), Ghee (MT), and Paneer (MT) (April 2020 – March 2026).

•**Lab Data:** Mobile Laboratory logs (>1200 samples) from June 2025 to February 2026.

Statistical Framework:

- - **Chi-Square Analysis:** Tested independence of milk quality relative to (Early vs. Late).
- **Correlation Analysis:** Calculated between testing intensity and sales volume.
- **Comparative Metrics:** Percentage growth was calculated by comparing the 2024-25 baseline to the 2025-26 intervention period.





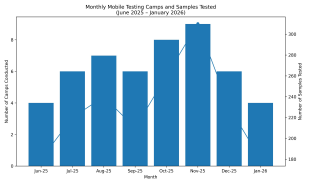




Mobile testing van:

Equipment: FTIR-based milk analyzers, BR meters (for Ghee), and Delmos Research strip-based adulteration kits.

Operations: >50 camps conducted with over 1200 samples tested over a course of 8 months since June 2026 in Bhopal and Rajgarh (focused on weekends).



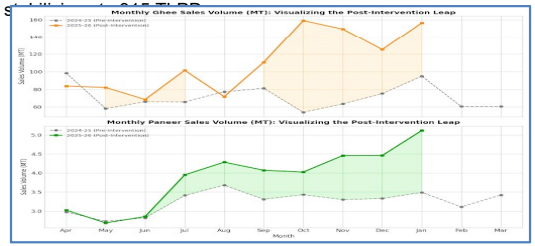
Doorstep Testing ⇒ **Transparency & Awareness** ⇒ **Consumer Trust** ⇒ **Sales Growth & Compliance**

Impact on Market Growth The introduction of mobile testing in 2025-26 coincided with significant expansion in value-added products.

•**Ghee:** Average monthly sales rose from **71.27 MT** (Pre-intervention) to **110.86 MT** (Intervention), a **55.5% growth**.

•**Paneer:** Sales volume increased from **3.25 MT** to **3.89 MT** (**+19.8%**).

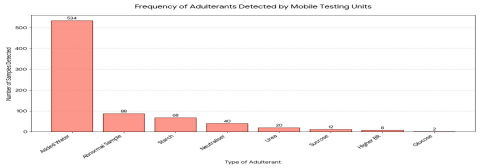
•**Liquid Milk:** Remained resilient with marginal growth (**+0.9%**),



Adulterant Profile & Detection

Mobile units identified specific contamination clusters, preventing hazardous chemicals from entering the supply chain

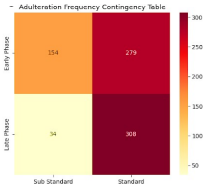
- **Added Water:** 267 instances
- **Starch:** 34 instances (primarily in products).
- **Urea & Neutralizers:** 30 critical instances identified



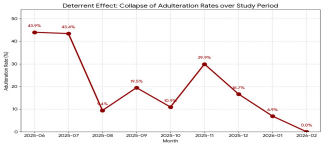
The Adulteration Collapse)

Visible doorstep testing acted as a powerful behavioral deterrent, resulting in a statistically significant reduction in adulteration

- **Early Phase (Jun-Aug 2025):** The sub-standard rate was **35.6%**.
- **Late Phase (Dec-Feb 2026):** The rate dropped significantly to **9.9%**.



The Chi-Square test yielded X^2 = irming the collapse of adulteration is



Statistical Correlation: Testing vs. Sales

Paneer The "Quality-Sensitive" Product

Paneer sales are driven by purity. Paneer buyers care most about the actual reduction in adulteration .

Ghee :The "Trust-Sensitive" Product

The mere presence of the testing vans builds the trust needed to sell high-value Ghee .

Milk is resilient: It is a staple product with stable demand, showing less drastic fluctuations based on testing intensity.

Product	Correlation with Testing Intensity (r)	Correlation with Adulteration Rate (r)
Ghee	**+0.32 (Positive)**	**-0.42** (Negative)
Paneer	+0.03 (Low Positive)	**-0.67 (Strong Negative)**
Milk	+0.02 (Low Positive)	**-0.25** (Moderate Negative)

Conclusions:

- The **Doodh Ka Doodh, Paani Ka Paani** campaign successfully reversed a multi-year decline in milk and milk product sales in Bhopal, with sustained positive growth observed after June 2025.
- **Visible doorstep testing** using mobile diagnostic units produced a **statistically significant reduction in adulteration**, demonstrating a strong deterrent effect.
- A temporary increase in substandard samples during November 2025 was **seasonal**, linked to festive and marriage-related demand surges, and was followed by a sharp post-festive decline.
- **High-value, adulteration-sensitive products**, particularly ghee, showed the strongest positive response to testing and the strongest inverse relationship with detected adulteration.
- Transparent, on-site testing enhanced **consumer trust**, shifted preference towards packaged dairy products, and supported both **public health and commercial outcomes**.

Recommendations:

•**Institutionalize** mobile testing as a permanent quality assurance tool.

•**Increase intensity** during high-risk festive periods.

•**Expand coverage** to underserved geographic areas

•**Integrate data** with regulatory and communication strategies.

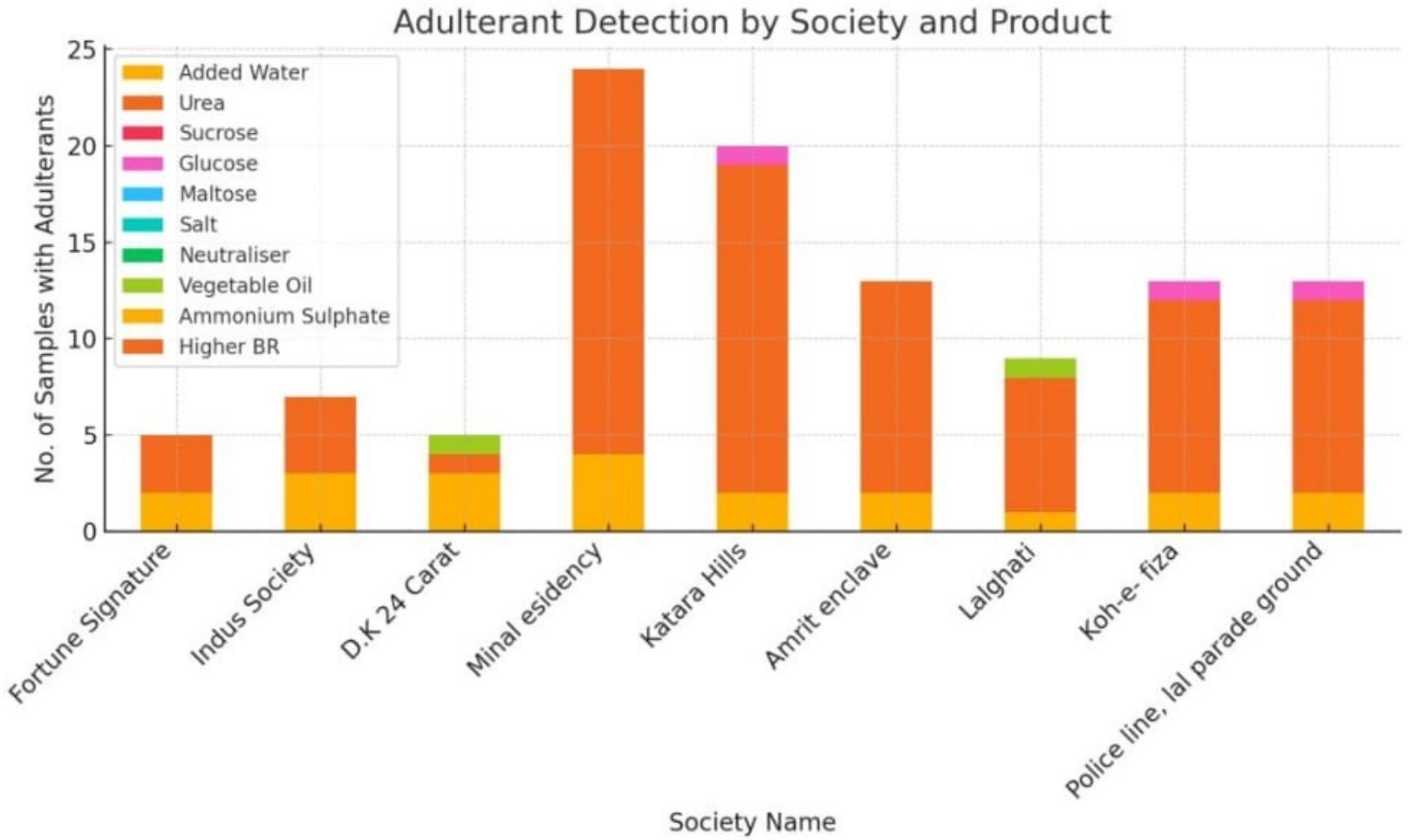
Transparent doorstep testing using mobile diagnostic units simultaneously improves food safety, deters adulteration, and restores consumer trust, leading to measurable gains in dairy sales.

Acknowledgement: Marketing and QC team of Bhopal Milk Union for their relentless and continued efforts.


भोपाल


साँची चल प्रयोगशाला
दूध की गुणवत्ता
अब आपके द्वार




Adulterant Detection by Society and Product
No. of Samples with Adulterants
Society Name
Added Water
Urea
Sucrose
Glucose
Maltose
Salt
Neutraliser
Vegetable Oil
Ammonium Sulphate
Higher BR
0
5
10
15
20
25
Fortune Signature
Indus Society
D.K 24 Carat
Minal esidency
Katara Hills
Amrit enclave
Lalghati
Koh-e- fiza
Police line, lal parade ground

STRATEGIC ROADMAP

Action Plan: Strengthening Milk Safety & Consumer Confidence

1

Farm-Level Extension

Institutionalize veterinary hygiene SOPs, mastitis control programs, and residue monitoring across all primary cooperative societies.

2

Cold Chain Upgrade

Expand BMC coverage to eliminate uncooled collection routes; mandate digital temperature loggers across transit tankers.

3

Smart Retail Points

Upgrade Sanchi parlours with reliable chilling infrastructure, early-morning supply logistics, and high-visibility branding.

4

Consumer Assurance

Scale mobile diagnostic testing vans permanently to deter adulteration and validate brand trust publicly.

CONCLUSION & SUMMARY

Safe Milk Builds Healthy Communities & Sustainable Livelihoods

Thank You | Open for Q&A