

# Traceability in Dairy: Keeping Pace with India's Perishable Supply Chain

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The phone rings at the customer care desk a little after 6:30 a.m. A consumer is on the line: the curd tasted off, but her kids had already eaten some of it before she noticed, and she wants to know if it's something to worry about.

The executive asks for the basics — batch number, manufacturing date, best-before date, printed on the lid. Usually that's a ten-second answer. Not this time: the print is smudged, half-faded, a digit missing from the date. The one thing meant to identify this exact tub isn't legible enough to read.

Now there's a harder question sitting underneath the simple one: is this one bad tub, or a bad day's production? Without a clean code, there's no quick way to know — and no quick way to trace which chilling centre the milk came from, which line packed it, or which other shops got tubs from the same run.

That's the traceability problem in Indian dairy, in one line: the information usually exists somewhere. It just depends on whether the code linking to it was legible enough to read in the first place.

Now picture the same tub with a GS1-powered QR code instead of a printed number. One scan resolves to that tub's exact identity — batch, manufacturing date, expiry — and pulls up the full trail behind it: chilling centre, production line, shift, distribution route. What took twenty minutes of digging through registers now takes seconds. This isn't hypothetical — GS1 India has already piloted exactly this for ghee, tracking a product from farm to shelf. The technology exists today.

I've spent more than two decades selling coding and marking equipment to dairy plants across India, and the same pattern shows up almost everywhere I go. Enormous investment goes into cold chain, pasteurisation and packaging lines — and the printer putting the batch code on the pack gets treated as an afterthought, the last five feet of a very long chain. It's rarely the most expensive machine on the floor, and it's almost never the first thing anyone budgets to upgrade. That's backwards. It's the one piece of equipment every other traceability investment depends on.

None of this is a simple switch to flip, though. Printing a QR code that scans reliably at line speed usually means upgrading the coding equipment itself — most lines running basic batch and date codes today aren't built to print dense 2D codes cleanly — and the data behind the code has to live in one system, not scattered across registers and spreadsheets. That's real investment, not just intent. Which is why legible coding is the practical place to start, and GS1-powered QR the goal to build toward: get the printed code clean and consistent first, and a plant has already fixed the weakest link a QR rollout would otherwise inherit.

That's a bigger ask in India than it sounds. The country produced 247.87 million tonnes of milk in 2024–25, much of it moving through plants that run several SKUs in a single shift, switching formats and batch codes as they go, often on lines that have been in service for a decade or more — never built with legible 2D printing in mind. The milk feeding those lines has usually passed through several hands already, too: village-level collection, chilling centres, and multiple intermediaries before it ever reaches the plant, with roughly 46% of India's milk never entering an organised channel at all. Fixing code legibility has to work inside that reality, not assume a clean-sheet, fully digital operation.

FSSAI already treats batch and lot codes as basic to any recall, and the cost of getting them wrong is well documented: a 2009 study in *Agribusiness: An International Journal* found direct recall costs for a 150,000-kilogram batch of milk climbed from under €100,000 to over €140,000 as initiation was delayed past 16 hours. A recall's cost isn't fixed — it grows with every hour spent figuring out what happened.

Which is why code legibility isn't a minor detail — it's what the rest depends on. A GS1 QR code is only as good as its weakest physical link: the print on the pack. Smudged, off-position, or missing, and the phone won't scan it, no matter how good the system behind it is.

There's also a deadline quietly approaching that makes this more urgent than it looks. GS1's global Sunrise 2027 initiative is pushing retail point-of-sale systems worldwide to read 2D barcodes by the end of 2027 — not a law, but an industry alignment that major retailers are already building toward. Indian dairy isn't exempt from that shift just because it hasn't arrived on these shores yet. The plants that spend the next couple of years getting basic code legibility right won't be starting from zero when 2D becomes the

baseline. The ones that wait will be solving a print-quality problem and a compliance deadline at the same time.

That discipline can be built in-house, or with an equipment partner — which is the work I do with dairy manufacturers at Domino. Either way, the habit worth building now is the same: a code that's legible on every pack, every SKU, every shift. Everything India's dairy sector wants from traceability starts there — from a ten-second answer on a customer care call, to a 2D code that resolves a product's full history.

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*References: DAHD Basic Animal Husbandry Statistics 2025; DAHD/NDDB data on organised vs. rural milk consumption; FSSAI food recall and milk/milk-product FSMS guidance; Velthuis, Meuwissen & Huirne, "Distribution of Direct Recall Costs Along the Milk Chain," Agribusiness: An International Journal, 25(4), 2009; GS1 Digital Link standard (GS1 Global); GS1 Sunrise 2027 initiative; GS1 India ghee traceability pilot case study.*