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What are 'e-nose' and 'e-tongue' techs being deployed at Tirumala temple?

Published On: 25-02-2026



New Food Testing Lab at Tirumala

The Andhra Pradesh government is setting up a modern food testing laboratory at the Tirumala Tirupati Devasthanams to ensure the quality of food served to devotees.

The project cost is about ₹25 crore.

Why the Lab Is Needed

The move follows concerns about adulterated ghee and ingredients used in preparing prasadam (sacred food offerings).

The lab aims to strengthen food safety, restore public confidence, and monitor quality more effectively.

Advanced Technology: E-Nose and E-Tongue

The lab will be equipped with electronic nose (e-nose) and electronic tongue (e-tongue) machines.

These machines are sensor-based tools that check food smell and taste profiles to detect impurities or quality changes.

E-nose analyses aroma and volatile compounds, while e-tongue examines taste-related chemical components.

Both systems use pattern-recognition software to compare samples with standard quality profiles.

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How They Work

E-nose uses gas sensors that identify volatile organic compounds to flag bad smell or contamination.

E-tongue uses electrochemical sensors that react to chemicals affecting taste.

Data from both devices is processed by computers using statistical and AI models to classify food quality.

Together, they help detect adulteration or spoilage faster than traditional lab tests.

What Will Be Tested

The lab will examine around 60 raw materials used in prasadam, including ghee, dry fruits, spices, sugar, and more.

It can also test water and finished prasadam for pesticide residues, microbes, heavy metals, and other contaminants.

The facility will use about 50 sophisticated instruments and trained staff for day-to-day testing.

When It Will Start

The food testing lab is nearly complete, with operations expected to begin next month.

The e-nose and e-tongue machines are likely to be installed and fully functional by May 2026.

Benefits of These Technologies

These systems help check food quality quickly and automatically without human tasting.

They can act as early screening tools to catch quality issues before foods are served.

The technology adds accuracy and speed to routine quality monitoring at the temple.