

Model Optimization and Tuning Phase

Date	18 February 2026
Team ID	LTVIP2026TMIDS66312
Project Title	Advancing Nutrition Science through GeminiAI – NutriGen
Maximum Marks	10 Marks

Model Optimization and Tuning Phase

Model Optimization and Tuning Phase in NutriGen focuses on improving the quality, safety, personalization accuracy, and nutritional relevance of AI-generated diet plans.

Since NutriGen uses a pre-trained Gemini model, no neural network training or backpropagation is performed. Instead, optimization is achieved through:

Health-focused prompt engineering

Controlled generation parameter tuning

Structured output formatting and parameter tuning.

Hyperparameter Tuning Documentation:

Model	Tuned Hyperparameters
Gemini Flash Lite	<p>Temperature: Controls creativity of output (set to a moderate value for balanced creativity).</p> <p>Top-p: Limits token selection to the most probable tokens for coherent responses.</p> <p>Top-k: Restricts token sampling to reduce irrelevant content.</p> <p>Max Output Tokens: Ensures generated recipe blogs match the desired word count.</p>

	Response Format: Set to plain text for easy display in the UI.
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Final Model Selection Justification:

Final Model	Reasoning
Gemini Flash Lite (models/gemini- flash-latest)	Selected due to its fast inference speed, efficient resource usage, strong contextual understanding of structured health prompts, high-quality personalized nutrition generation, and seamless integration with real-time web applications like Streamlit.