

Menu Catalog API

REST API untuk manajemen menu catalog dengan Express.js dan Turso (serverless SQLite).

✓ **PROJECT STATUS:** API ini telah di-deploy dan berjalan di production:

🔗 **Backend API:** <https://gdgoc-backend-ameliaocha.vercel.app/>

🌐 **Frontend App:** <https://gdgoc-frontend-ameliaocha.vercel.app/>

🌟 Fitur Unggulan

API ini dilengkapi dengan **Google Gemini AI** untuk memberikan analisis dan rekomendasi yang lebih canggih:

- 🤖 **AI Menu Generator** - Generate menu otomatis berdasarkan kategori, budget, dan preferensi
- 🍽️ **Calorie Calculator & Exercise Recommendations** - Hitung kalori total dan dapatkan rekomendasi olahraga yang dipersonalisasi menggunakan Gemini AI
- 🎯 **Smart Menu Recommendations** - Rekomendasi menu cerdas berdasarkan budget, dietary restrictions, preferensi, dan occasion menggunakan AI
- 📊 **Nutritional Analysis** - Analisis nutrisi lengkap (protein, karbohidrat, lemak, fiber) dengan AI
- 🏃 **Personalized Exercise Plans** - Rekomendasi olahraga yang disesuaikan dengan kalori yang dikonsumsi

🚀 Quick Start (Production Ready)

API ini siap digunakan tanpa perlu setup! Langsung test dengan:

🌐 **Frontend Demo:** Kunjungi <https://gdgoc-frontend-ameliaocha.vercel.app/> untuk mencoba fitur-fitur API melalui chatbot interface yang interaktif!

📡 Test API Langsung:

```
# Test kesehatan API
curl https://gdgoc-backend-ameliaocha.vercel.app/api

# Lihat semua menu
curl https://gdgoc-backend-ameliaocha.vercel.app/api/menu

# Hitung kalori (AI-powered)
curl -X POST https://gdgoc-backend-ameliaocha.vercel.app/api/menu/calculate-calories \
  -H "Content-Type: application/json" \
  -d '{
    "menu_items": [
      {"name": "Nasi Goreng", "quantity": 1},
      {"name": "Es Teh Manis", "quantity": 2}
    ]
  }'
```

```
# Dapatkan rekomendasi menu (AI-powered)
curl -X POST https://gdgoc-backend-
ameliaocha.vercel.app/api/menu/recommendations \
-H "Content-Type: application/json" \
-d '{
  "budget": 100000,
  "preferences": ["manis", "coklat"],
  "meal_type": "lunch"
}'
```

Base URL Production: <https://gdgoc-backend-ameliaocha.vercel.app/api>

🔗 **Tips:** Gunakan [Frontend App](#) untuk pengalaman yang lebih interaktif dengan chatbot interface!

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Project overview

REST API untuk manajemen menu catalog dengan Express.js dan Turso (serverless SQLite database).

Project layout (top-level):

```
gdgoc/
├─ src/                # app source: config, controllers, models,
  routes, services, middlewares, utils
├─ .env                # Environment variables (not committed)
├─ .env.example        # Environment variables template
├─ database.sqlite     # SQLite DB file (legacy, not used in
production)
├─ package.json
```

```
|— TURSO_MIGRATION.md    # Panduan lengkap migrasi ke Turso
|— CALORIES_API.md
|— CALORIES_FEATURE_SUMMARY.md
|— CALORIES_IMPLEMENTATION.md
|— ID_MANAGEMENT.md
|— RECOMMENDATIONS_API.md
|— README.md             # This merged documentation
```

Setup

Opsi 1: Gunakan API yang Sudah Di-Deploy (Recommended)

API ini sudah berjalan di production dan siap digunakan:

Base URL: <https://gdgoc-backend-ameliaocha.vercel.app/api>

Contoh endpoint:

- GET <https://gdgoc-backend-ameliaocha.vercel.app/api/menu>
- POST <https://gdgoc-backend-ameliaocha.vercel.app/api/menu/calculate-calories>
- POST <https://gdgoc-backend-ameliaocha.vercel.app/api/menu/recommendations>

Opsi 2: Setup Local Development

Jika ingin menjalankan di local untuk development:

1. Install dependencies:

```
npm install
```

2. Setup Turso Database (REQUIRED):

Jika belum punya Turso account:

```
# Install Turso CLI
curl -sSfL https://get.tur.so/install.sh | bash

# Login
turso auth login

# Buat database baru
turso db create gdgoc-menu-api

# Dapatkan database URL
turso db show gdgoc-menu-api --url

# Dapatkan auth token
turso db tokens create gdgoc-menu-api
```

Buat tabel di Turso:

```
turso db shell gdgoc-menu-api
```

Jalankan SQL berikut:

```
CREATE TABLE IF NOT EXISTS menu (  
  id INTEGER PRIMARY KEY AUTOINCREMENT,  
  name TEXT NOT NULL,  
  category TEXT NOT NULL,  
  calories INTEGER NOT NULL,  
  price REAL NOT NULL,  
  ingredients TEXT NOT NULL,  
  description TEXT,  
  created_at TEXT DEFAULT CURRENT_TIMESTAMP,  
  updated_at TEXT DEFAULT CURRENT_TIMESTAMP  
);
```

Ketik `.quit` untuk keluar.

3. Setup Google Gemini API Key:

API ini menggunakan **Google Gemini AI (gemini-2.5-flash)** untuk fitur-fitur advanced seperti:

- Generate menu otomatis
- Kalkulasi kalori dan rekomendasi olahraga
- Rekomendasi menu yang dipersonalisasi
- Analisis nutrisi

Dapatkan API Key:

1. Kunjungi [Google AI Studio](#)
2. Login dengan Google account
3. Buat API key baru
4. Copy API key untuk digunakan di `.env`
5. Copy dan setup environment file:

```
cp .env.example .env
```

Edit `.env` dan isi dengan nilai yang benar:

```
PORT=3000
NODE_ENV=development
BASE_URL=http://localhost:3000

# Google Gemini API Key (REQUIRED untuk fitur AI)
# Dapatkan di: https://makersuite.google.com/app/apikey
GEMINI_API_KEY=your_gemini_api_key_here

# Turso Database Configuration
# Dari Turso setup di atas
TURSO_DATABASE_URL=libsql://your-database.turso.io
TURSO_AUTH_TOKEN=your_turso_auth_token_here
```

5. Run the app:

```
# Development
npm run dev


# Production
npm start
```


 Untuk panduan lengkap migrasi dan troubleshooting, lihat [TURSO_MIGRATION.md](#)


Production Deployment

Status Deployment

✓ **API sudah di-deploy dan aktif**

 **Backend API:** <https://gdgoc-backend-ameliaocha.vercel.app/>

 **Frontend App:** <https://gdgoc-frontend-ameliaocha.vercel.app/>

 **Database:** Turso (serverless SQLite)

 **AI Engine:** Google Gemini 2.5 Flash

Informasi Deployment:

Platform: Vercel

Region: Auto (edge network)

Database: Turso (multi-region)

Environment: Production

Frontend: React + Vite (Chatbot Interface)

Testing Production API:

```
# Test endpoint kesehatan
curl https://gdgoc-backend-ameliaocha.vercel.app/api
```

```
# Get semua menu
curl https://gdgoc-backend-ameliaocha.vercel.app/api/menu

# Hitung kalori (contoh)
curl -X POST https://gdgoc-backend-
ameliaocha.vercel.app/api/menu/calculate-calories \
  -H "Content-Type: application/json" \
  -d '{"menu_items": [{"name": "Nasi Goreng", "quantity": 1}]}'
```

Setup Deployment Sendiri (Opsional)

Jika ingin deploy ke Vercel sendiri:

1. Setup Environment Variables di Vercel:

1. Buka Vercel Dashboard → Project Settings → Environment Variables
2. Tambahkan:
 - **GEMINI_API_KEY** - API key dari Google AI Studio (untuk fitur AI)
 - **TURSO_DATABASE_URL** - URL database Turso
 - **TURSO_AUTH_TOKEN** - Auth token Turso
 - **NODE_ENV=production**

2. Deploy:

```
vercel --prod
```

Atau push ke GitHub untuk auto-deployment.

⚠ **PENTING:** Vercel tidak support SQLite lokal. Wajib menggunakan Turso!

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API Endpoints (summary)

Production Base URL: <https://gdgoc-backend-ameliaocha.vercel.app/api>

Local Base URL: <http://localhost:3000/api>

Core Menu Management:

- POST /menu — create menu
- GET /menu — list menus (filter, pagination)
- GET /menu/:id — get menu by id
- PUT /menu/:id — update menu
- DELETE /menu/:id — delete menu
- DELETE /menu/all — delete all menus (resets ID sequence)
- GET /menu/group-by-category — group by category

- GET /menu/search — search



AI-Powered Endpoints (menggunakan Google Gemini):

- **POST /menu/auto-generate** — Generate menu otomatis dengan AI
 - Input: kategori, jumlah item, preferensi
 - Output: Menu items yang di-generate dengan detail lengkap
- **POST /menu/calculate-calories** — Kalkulasi kalori & rekomendasi olahraga
 - Input: daftar menu items dengan quantity
 - Output: Total kalori, breakdown nutrisi, rekomendasi olahraga dengan durasi dan intensitas
 - AI Features: Personalized exercise plans, health notes, workout tips
- **POST /menu/recommendations** — Rekomendasi menu cerdas
 - Input: budget, dietary restrictions, preferences, meal type, cuisine, occasion
 - Output: Rekomendasi main course, beverage, dessert dengan alasan pemilihan
 - AI Features: Smart matching, personalized reasons, budget optimization

🔔 **Catatan:** Semua endpoint AI menggunakan model **gemini-2.5-flash** untuk analisis yang cepat dan akurat.

Refer to the dedicated sections for full request/response examples, validation rules, and error cases.

Calories Calculator & Exercise Recommendations (Full API)

This endpoint computes total calories from user-selected menu items and returns exercise recommendations to burn those calories using **Google Gemini AI**.

POST /api/menu/calculate-calories

Production URL: <https://gdgoc-backend-ameliaocha.vercel.app/api/menu/calculate-calories>

Request body example:

```
{
  "menu_items": [
    { "id": 1, "quantity": 2 },
    { "name": "Nasi Goreng", "quantity": 1 }
  ]
}
```

Field descriptions:

- menu_items (array, required): list of selected menu items
 - id (integer, optional): menu id in DB (use id or name)

- name (string, optional): menu name in DB (use id or name)
- quantity (integer, optional): number of portions (default: 1)

Response (200 OK) example:

```
{
  "status": "success",
  "message": "Calorie calculation and exercise recommendations generated successfully",
  "data": {
    "total_calories": 1450,
    "nutritional_breakdown": {
      "protein": "45g",
      "carbohydrates": "180g",
      "fats": "55g",
      "fiber": "12g"
    },
    "menu_details": [
      { "name": "Nasi Goreng Spesial", "calories": 650, "quantity": 1, "subtotal_calories": 650 },
      { "name": "Es Teh Manis", "calories": 200, "quantity": 2, "subtotal_calories": 400 },
      { "name": "Pisang Goreng", "calories": 400, "quantity": 1, "subtotal_calories": 400 }
    ],
    "exercise_recommendations": [
      { "name": "Jogging", "duration_minutes": 120, "intensity": "moderate", "calories_burned_per_hour": 450, "description": "Jogging at a steady pace of 5-6 mph", "tips": "Maintain a consistent pace and stay hydrated" },
      { "name": "Swimming", "duration_minutes": 90, "intensity": "moderate", "calories_burned_per_hour": 500, "description": "Swimming laps using various strokes", "tips": "Mix different strokes for a full-body workout" }
    ],
    "health_notes": "This meal provides a good balance of macronutrients. Consider incorporating more vegetables for additional fiber and micronutrients.",
    "summary": "Your selected meal contains 1,450 calories. To burn these calories, you could jog for 2 hours, swim for 1.5 hours, or choose from the other exercise options provided. Remember to stay hydrated during exercise!"
  }
}
```

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Error examples:

- 400 Bad Request — empty menu_items


```
{
  "error": "Validation Error",
  "message": "Invalid calories calculation request",
  "details": ["menu_items array cannot be empty"]
}
```

- 400 Bad Request — invalid format

```
{
  "error": "Validation Error",
  "message": "Invalid calories calculation request",
  "details": [
    "Menu item at index 0 must have either 'id' or 'name' field",
    "Menu item at index 1: quantity must be a positive integer"
  ]
}
```

- 404 Not Found — menu not found

```
{
  "status": "error",
  "message": "Menu item \"Rendang Sapi\" not found in database"
}
```

- 500 Internal Server Error — Gemini API error

```
{
  "status": "error",
  "message": "Failed to calculate calories and generate exercise recommendations"
}
```

Usage examples (curl):

```
# Production API
curl -X POST https://gdgoc-backend-
ameliaocha.vercel.app/api/menu/calculate-calories \
  -H "Content-Type: application/json" \
  -d '{"menu_items": [{"id": 1, "quantity": 1}, {"id": 5, "quantity":
2}]}'

# Local API (development)
curl -X POST http://localhost:3000/api/menu/calculate-calories \
```

```
-H "Content-Type: application/json" \
-d '{"menu_items": [{"id": 1, "quantity": 1}, {"id": 5, "quantity": 2}]}'
```

AI Features:

- 🍽️ Automatic calorie calculation from menu items
- 📊 Detailed nutritional breakdown (protein, carbs, fats, fiber)
- 🏃 Personalized exercise recommendations with duration and intensity
- 💡 Health notes and workout tips powered by Gemini AI

If quantity omitted, default is 1.

Calories Feature Summary

Key changes and files added/modified for the calories feature:

- `/src/services/geminiService.js` — adds `calculateCaloriesAndExercise(menuItems)` which calls Google Gemini (model: gemini-2.5-flash) to compute total calories, nutrition breakdown, and exercise recommendations.
- `/src/controllers/menuController.js` — adds `calculateCaloriesAndExercise(req, res, next)` to validate input, fetch menu items from DB (by id or name), and call `geminiService`.
- `/src/routes/menuRoutes.js` — adds `POST /menu/calculate-calories` with a validator middleware.
- `/src/middlewares/validator.js` — adds `validateCaloriesRequest` to ensure `menu_items` is an array & valid.
- New docs & test artifacts: `CALORIES_API.md`, `CALORIES_IMPLEMENTATION.md`, `CALORIES_FEATURE_SUMMARY.md`, `calories-api-postman.json`, `test-calories-api.sh`.

Highlights:

- Flexible input: lookup by `id` or `name`.
- Quantity support.
- Nutrition breakdown and 3–5 exercise recommendations returned.
- Gemini model and prompt engineered to return JSON in the specified schema.

Calories Implementation Details

Overview of how the feature is implemented and the components involved.

Architecture flow:

- Client -> `menuRoutes` -> `menuController.calculateCaloriesAndExercise`
- Controller fetches menu data via `menuService` (by id or name), prepares menu details with quantities, and calls `geminiService.calculateCaloriesAndExercise(menuDetails)`.

- **geminiService** sends a prompt to Google Gemini (gemini-2.5-flash) with configuration: temperature 0.7, topK/topP, max tokens, and requests JSON response in the agreed schema.

Output JSON schema (from Gemini):

```
{
  "total_calories": number,
  "nutritional_breakdown": { "protein": "string", "carbohydrates":
"string", "fats": "string", "fiber": "string" },
  "menu_details": [...],
  "exercise_recommendations": [{ "name": "string", "duration_minutes":
number, "intensity": "low|moderate|high", "calories_burned_per_hour":
number, "description": "string", "tips": "string" }],
  "health_notes": "string",
  "summary": "string"
}
```

Validation & errors handled at controller/middleware level: missing items -> 400, menu not found -> 404, Gemini errors -> 500.

Testing suggestions:

- Unit tests for validator, controller (happy path + menu-not-found), and geminiService (mock Gemini responses).
- Integration: run **test-calories-api.sh** or use the provided Postman collection.

Performance notes:

- Gemini latency typically 2–5s; consider caching frequent combinations.
- Keep prompt concise to reduce token usage.

Menu Recommendations API (Full)

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Endpoint: POST **/api/menu/recommendations**

Production URL: **<https://gdgoc-backend-ameliaocha.vercel.app/api/menu/recommendations>**

Purpose: Use **Gemini AI** to generate personalized menu recommendations using only menu items present in the database.

Request example:

```
{
  "budget": 100000,
  "dietary_restrictions": ["vegetarian", "halal"],
  "dislikes": ["kopi", "pedas", "durian"],
  "preferences": ["manis", "coklat", "cheese"],
```

```
"meal_type": "lunch",
"cuisine": "Indonesian",
"occasion": "casual dining",
"additional_notes": "Saya ingin makanan yang mengenyangkan dan tidak
terlalu berminyak"
}
```

Response example (success):

```
{
  "success": true,
  "message": "Menu recommendations generated successfully",
  "data": {
    "recommendations": {
      "main_course": { "id": 1, "name": "Nasi Goreng Spesial Sayuran",
"category": "main-course", "description": "...", "price": 35000,
"calories": 450, "ingredients": [...], "reason": "..." },
      "beverage": { "id": 15, "name": "Es Teh Manis", "price": 8000,
"calories": 120, "reason": "..." },
      "dessert": { "id": 23, "name": "Cheese Cake Coklat", "price":
45000, "calories": 380, "reason": "..." }
    },
    "total_price": 88000,
    "total_calories": 950,
    "summary": "Kombinasi menu ini dipilih khusus untuk Anda..."
  }
}
```

Errors:

- 400 — missing preferences or insufficient menu items in DB for required categories.
- 500 — Gemini or processing error.

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Notes & tips:

- System only recommends items that exist in DB; ensure DB has **main-course**, **beverage**, and **dessert** categories.
- Provide as much detail as possible in request to improve recommendations.
- **AI Features:**
 - 🎯 Smart menu matching based on preferences and restrictions
 - 💰 Budget optimization
 - 🎥 Contextual recommendations (meal type, cuisine, occasion)
 - 📝 Detailed reasoning for each recommendation
 - 🤖 Powered by Gemini 2.5 Flash for fast and accurate analysis

ID Management (Full)

This project contains an ID management system that ensures predictable IDs and auto-reset behavior when DB becomes empty.

Key behaviors:

- New items receive ID = MAX(id) + 1; if DB empty, ID starts at 1.
- When all rows are deleted (`DELETE /api/menu/all`) or when the last item is removed, the ID sequence is reset so the next inserted item is ID 1.
- Implementation uses SQLite sequences / `sqlite_sequence` and AUTOINCREMENT behavior; reset performed with `DELETE FROM sqlite_sequence WHERE name='menu'` when appropriate.

API examples:

- `DELETE /api/menu/:id` — deletes an item; if DB becomes empty, reset sequence.
- `DELETE /api/menu/all` — deletes all items and resets sequence (use with caution).

Warnings:

- `DELETE /api/menu/all` is destructive and permanent. Back up DB before use.

Database schema

```
CREATE TABLE menu (  
  id INTEGER PRIMARY KEY AUTOINCREMENT,  
  name TEXT NOT NULL,  
  category TEXT NOT NULL,  
  calories INTEGER NOT NULL,  
  price REAL NOT NULL,  
  ingredients TEXT NOT NULL,  
  description TEXT,  
  created_at TEXT DEFAULT CURRENT_TIMESTAMP,  
  updated_at TEXT DEFAULT CURRENT_TIMESTAMP  
)
```

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Testing

Test scripts and Postman collection provided in the project root:

- `test-calories-api.sh` — bash script with test cases for the calories endpoint.
- `calories-api-postman.json` — Postman collection.

Run the test script:

```
chmod +x test-calories-api.sh  
./test-calories-api.sh
```

Or import the Postman collection.

🔧 Tech stack

- **Backend Framework:** Express.js 5.x
- **Database:** Turso (libSQL/SQLite-compatible serverless database) - ✔ **Active & Connected**
- **Database Client:** @libsql/client
- **AI Integration:** @google/generative-ai (Gemini 2.5 Flash) - ✔ **Integrated**
- **Deployment:** Vercel (Production) - ✔ **Live at <https://gdgoc-backend-ameliaocha.vercel.app/>**
- **Environment:** dotenv
- **Middleware:** cors, morgan
- **Development:** nodemon

Kenapa Turso?

- ✔ SQLite-compatible (smooth migration)
- ✔ Serverless & edge-ready
- ✔ Perfect for Vercel deployment
- ✔ Low latency with global distribution
- ✔ Generous free tier
- ✔ **Sudah terhubung dan aktif di production**

Kenapa Gemini AI?

- ✔ Fast inference dengan model gemini-2.5-flash
- ✔ Excellent for structured JSON output
- ✔ Cost-effective untuk production use
- ✔ Advanced natural language understanding
- ✔ **Terintegrasi untuk fitur: auto-generate, calories calculation, dan recommendations**