

MANAGING INFLAMMATION HEALTH APP



Sweat Sensor: Real-Time Inflammation Management App

Midterm Project - Product strategy

Project Title: Sweat Sensor: Real-Time Inflammation Management App

Motivation: My best friend suffered from chronic inflammation, which created daily challenges for him and his family. They were always worried about what he ate, how it affected his inflammation, and how to manage it long term. Since current methods are invasive, slow, or confined to labs and clinics, I wanted to find a simpler, real-world solution to help him to track and control inflammation in real time.

Chronic Inflammation: Causes, Impact & Management

- **What Causes It?** Poor diet (high in processed foods, sugar, trans fats), lack of exercise, chronic stress, exposure to pollutants, infections, and obesity can all trigger or worsen inflammation over time.
- **Why It Matters:** When inflammation becomes constant, it contributes to joint pain, digestive issues, heart disease, diabetes, and even mental health challenges. It affects quality of life and creates ongoing health risks.
- **Current Management Approaches:** Doctors rely on blood tests or occasional at-home kits to measure indicators like CRP, but these give only records. Treatment often involves medications, general diet recommendations, and lifestyle advice which is not real-time feedback.
- **Gaps & Needs:** People need an affordable tool that shows how everyday choices affect their inflammation instantly, helping them adjust diet and habits before symptoms flare.

Problem Statement: Many of us have no idea how our meals affect inflammation until it's too late. Right now, people rely on costly lab tests or endlessly logging every bite in apps, and they must wait days or weeks for feedback. We need a simple, real-time solution that shows inflammation rate as they happen and gives instant guidance on what to eat next.

Overview: This idea is a consumer-friendly mobile application paired with a comfortable wearable patch. It continuously monitors key inflammation indicators in sweat like CRP, IL-6, and calprotectin, and delivers instant, personalized dietary recommendations to help users make smarter food choices and keep inflammation in check.

Market Analysis:

Direct Competitors			
Categories	Manual tracks	Food logs	at-home test kits
Name	Bearable - Cara Care	MyFitnessPal - Cronometer	Everlywell Inflammation Panel - LetsGetChecked Kits
How it works	log meals, symptoms (pain, mood), and triggers - rely entirely on user input	food-log tracking calories, and nutrients but they don't connect to any biological data	Provide clinical accuracy, but require mailing samples and waiting days for results
Research Prototypes			
Categories	Research Prototype	Clinical Pilot	
Canada How it works	McMaster University – Canada A lab-developed, skin patch that can track glucose and lactate in real time, and while the platform is general enough to measure various biomarkers, it has not yet been validated for specific inflammatory markers (e.g., CRP, cytokines).	-	
US How it works	Caltech CRP Patch (California, US) A lab-developed wearable that uses graphene-based electrodes to detect CRP in sweat. Demonstrates feasibility but isn't commercial	EnLiSense IBD Aware Sensor (Texas, US) A sweat-sensing patch measuring calprotectin and cytokines in research trials for IBD patients. Offers continuous monitoring but no meal-recommendation.	

Key Gaps: There's no all-in-one consumer product that combines continuous, objective sweat-based inflammation tracking with immediate, personalized dietary advice. Although Canadian research like McMaster shows local development, no solution is commercially available to Canadians. Existing options are manual logging apps, mail-in lab kits, or in the research prototypes stage which not sold to end users.

Market Size

TAM: All Canadian adults who could potentially use a health-monitoring app.

Adults (aged 18 to 64) involved approximately 65% of the Canadian population: ~30M

2021 data showing 45.1% of adult live with at least one major chronic disease: $\sim 45.1\% \times 30\text{M}$ adults $\approx 13.5\text{M}$

SAM: Since my app focus *only* on inflammatory conditions (arthritis, IBS, etc.), I estimate 30% of TAM suffer from it, so about 4M Canadians could directly benefit from an inflammation-focused app.

SOM: I believe enthusiastic early adopters of wearable health technology can be captured during our initial launch. Early adopters typically represent 5–15% of the market; assuming we secure 10% of our SAM, that gives us approximately 400,000 reachable users in the launch phase.

Product Strategy

1- Data Collection

Users apply a lightweight, flexible patch to their hand. The patch gather sweat throughout the day; no special exercise needed. Embedded sensors detect key metrics (CRP, IL-6, calprotectin) continuously, sampling sweat every hour. Data is sent via Bluetooth to the app, ensuring near real-time updates.

2- Data Processing & Analysis

All variables like sweat rate, pH, and skin temperature adjusted to ensure readings are accurate and comparable. The app analyze data to highlight patterns and flags significant inflammation rates.

3- Nutrition Recommendation

A library of anti-inflammatory foods, recipes, and portion guidelines, conducted by nutrition experts. AI could suggest based on user's inflammation patterns with their logged meals (via quick camera upload or manual entry) to generate personalized food swaps and recipes in under 10 seconds. The app, beyond meal suggestion, could offer daily and weekly adjusted grocery lists, meal planning, and long-term habits.

4- User Experience

Notify users to change meals, hydrate, or reapply the patch when needed. For data privacy users can control what data to share with their healthcare provider or family via secure export options (PDF reports).

5- Differentiation & Impact

The only consumer solution combining continuous sweat-based inflammation sensing with dietary guidance. We can provide immediate food suggestions and turn data into actionable steps which boost user habit formation. By this app we empower people to see, understand, and manage their inflammation day-to-day and making healthier choices.

6- Privacy & Security

All sweat and health data are encrypted on the device and during Bluetooth transmission. Users can choose what data to share, with whom, and can delete their history at any time. We also followed health guidelines for handling personal health information.

7- Pilot Testing & Validation

We run a small pilot by recruit ~20 participants for a 2-week trial to wear the patch daily and use the app. At the end, we use survey them to evaluate usability, comfort, and clarity of the app's recommendations and track app engagement, meal suggestions to assess its potential impact on their health.

Persona



Alexandra

- Age: 35
- Occupation: Product Manager at a Toronto fintech startup
- Location: Toronto
- Income: ~\$85,000 CAD per year
- Status: Single, rents a condo in downtown

Bio

Alexandra works 10-hour days, often grabbing lunches from food trucks. She's noticed issue after richer meals but can't link foods to it.

Needs:

- She wants a solution that quietly tracks inflammation and offers quick meal swaps so she can stay productive without extra planning.

Personality



Maria

- Age: 45
- Occupation: High school teacher in Mississauga
- Location: Prince Edward Island
- Income: ~\$60,000 CAD per year
- Status: Married with two children

Bio

Maria lives with rheumatoid arthritis and must go to a clinic monthly for blood tests. She finds needles stressful and lab waits disrupt her schedule.

Needs:

- She needs daily insight into her inflammation to adjust meals and avoid painful flare-ups without extra medical visits.

Personality





Jordan

- Age: 21
- Occupation: Second-year Computer Science student at the University of Toronto
- Location: living in on-campus dormitory
- Status: in relation

Bio

Jordan busy with classes, labs, and late-night coding sessions. He orders takeout often but wonders how his meals affect stress and his focus, and he is tired most of the time.

Needs:

- He wants simple, real-time feedback on how certain foods impact his inflammation and cognitive energy.

Personality

