FARM to FAPM: Building a Full-Circle Food = Medicine Ecosystem Through AI-Enabled Agriculture, Research, and Precision Medicine

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Abstract

Background: Food is recognized as a contributor to health, a concept now reflected in the growing **Food Is Medicine (FIM)** movement. Widespread implementation of food-based healthcare remains limited by fragmented systems separating food production, nutrition science, and clinical care.

Methods and Results: We propose the **FARM to FAPM framework**, an integrated model that expands the FIM movement into a complete **Food = Medicine continuum** by incorporating **Food Produced for Medicine (FPM)** and use of **Food As Precision Medicine (FAPM)**. This framework leverages **Florida's strengths in Agriculture, Research, and Medicine (FARM)** to connect agricultural production, nutrition research, healthcare delivery, and use of FAPM within a single ecosystem. FPM focuses on production of foods with defined and verified nutrient composition suitable for medical applications, while FAPM applies those foods as individualized patient therapeutic interventions administered with the precision expected of modern medical treatments. A key example is the University of Florida's **Precision Ketogenic Therapy (PKT)** Program, a FAPM program developed over three decades that demonstrates both the clinical potential and implementation challenges of using FAPM. To address barriers to broader adoption, the framework incorporates human directed artificial intelligence to reduce labor-intensive activities, improve nutrient characterization, support clinical decision making, automate workflow tasks, and enhance monitoring of outcomes. Implementation is organized around four interconnected stakeholder groups: Producers, Patients/Persons, Professionals, and Possibilities (the 4Ps).

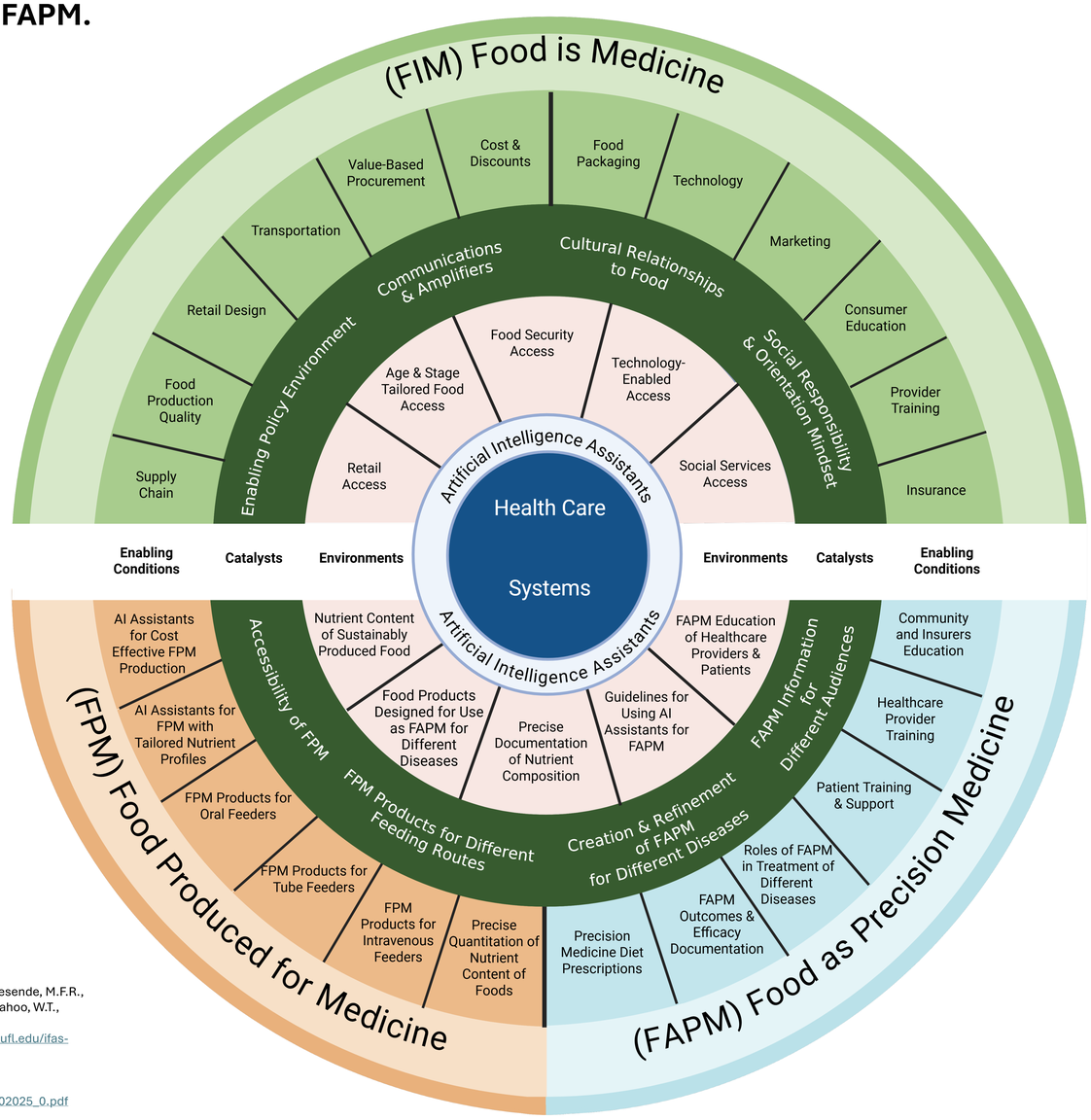
Conclusion: Together, these elements create a scalable model to integrate into routine healthcare and position the University of Florida as a leader in advancing a comprehensive Food = Medicine ecosystem.

Food Produced for Medicine (FPM)

Most of our healthcare dollars care for chronic diseases linked to diet issues. Food accessibility is important, but that food must deliver the nutrients needed by the individual with a composition specificity dictated by their metabolic status. Production of enough food with the documented needed composition is the first challenge in feeding a population. In 2025, a University of Florida–led publication in *PNAS*, spearheaded by **Dr. Andrew Hanson**, highlighted the essential role of agricultural producers in enabling Food Is Medicine (1). Building on this momentum, **Dr. Scott Angle** emphasized in a January 2026 blog that Florida is uniquely positioned to lead national FIM efforts (2).

References
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FARM to FAPM leverages **Florida's** strengths in **Agriculture, Research, and Medicine (FARM)** to complete the **Food = Medicine** framework. It expands FIM by incorporating **Food Produced for Medicine (FPM)** and **Food As Precision Medicine (FAPM)**, ensuring access to foods with optimal nutrient composition not only for community nutrition but also as a **prescribed component of precision medical care**. By integrating expertise across the University of Florida, this approach enables delivery of the right nutrients, in the right amounts, across the lifespan and in all metabolic contexts—from health maintenance to intensive care. **"Food = Medicine" is the sum of FPM + FIM + FAPM.**



Food Is Medicine (FIM)

ecosystem was depicted as a half-circle framework by the **U.S. Department of Health and Human Services in 2024** (3) and is included as the top half of the circle diagram. The UF Food is Medicine initiative (4) addresses chronic disease by making healthy foods more accessible and integrating them into health care. The initiative is accelerating FIM work by providing seed funding for collaborative projects across UF through **PLANTMED (UF/IFAS Projects Linking Agriculture, Nutrition, and Therapeutic Medicine for Every Diet).**

Food As Precision Medicine (FAPM)

extends the community medicine FIM approach to individuals requiring prescribed nutrient intake as one component of precision medicine. Due to their narrowed metabolic window of tolerance, their food intake requires a more precise nutrient prescription both for support of nutritional status and as a critical component of their disease treatment. As symptoms change, their precision medicine treatment (including nutrient intake) must change in concert with their current metabolic status. Thus, the nutrient prescription must be precise and highly personalized.

Precision Ketogenic Therapy (PKT)

The (PKT) Program for treating seizures is an extension of the Ketogenic Diet treatment first published in the 1920s. PKT extends the FIM diet approach of a recommended pattern of foods and extends it to individuals with a narrowed and frequently changing metabolic window of tolerance requiring regular and frequent precision medical care. PKT, developed over the past 30 years, is **exemplar of Food as Precision Medicine (FAPM)**. This 30-year collaboration across UF has resulted in a **Pediatric PKT Clinic** and **an Adult PKT Clinic** at Shands with some patients receiving PKT for more than 20 years.
Like other precision medicine approaches, FAPM involves multiple, complex, and time-intensive components. Integrating Copilot tools into routine workflows has freed clinical time, enabled more personalized patient care and supported broader **clinical adoption of PKT**. We are working to improve characterization of food composition, constituent macronutrient-based dosing, and enhanced monitoring of clinical outcomes.

Acknowledgment: We thank all our patients over the past 30 years for the multitude of things they have graciously taught us.