

A Food as Medicine Ontology built on Traditional Chinese Medicine Energetics and Food Actions – Abstract

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Abstract

This work introduces the Food as Medicine Ontology (FAMO), which formalizes the properties of foods based on Traditional Chinese Medicine (TCM) principles. FAMO facilitates the integration of TCM knowledge of food ingredients using an ontological framework, which sets the foundation to bridge ancient and contemporary medical philosophies, as envisioned by Lifestyle Medicine.

Keywords

Food as medicine, Ontology, Traditional Chinese Medicine (TCM), Dietetics

1. Introduction

This presentation introduces the Food as Medicine Ontology (FAMO), which formalizes the therapeutic properties of foods within the context of Traditional Chinese Medicine (TCM). Central to TCM philosophy is the recognition of food (*Gu Qi*) as a vital source of the true core life force (*Zhen Qi*), contributing to maintaining health and restoring energetic balance. FAMO aims to provide a structured framework for representing the energetic and action properties of foods and their therapeutic actions based on TCM principles. In FAMO, the TCM energetics and actions of food are captured and are cross-referenced with FoodOn concepts where possible. FAMO thus enriches the representation of TCM-specific concepts within the broader food ontology landscape. FAMO aims to provide the requisite knowledge representation structure to support better integration of TCM principles into Western medicine informatics frameworks, where ontologies are an underpinning construct. In this presentation, I will provide a brief overview of *Zhen Qi* and how *Gu Qi* was used as the construct here to develop a systematic approach to identify energetic properties associated with food ingredients, including those that are represented in FoodOn.

2. Methods

The development of FAMO involved a review of Chinese dietetic and TCM references, with a primary focus on the *Neijing Suwen*, a foundational medical text dating back to the Han dynasty.

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From this review, the energetic properties of foods and their therapeutic actions were selected as candidates for integration into an ontology framework. These identified properties were then used as characteristics of food ingredient concepts, with an emphasis on those referenced in contemporary Chinese cookbooks or TCM dietetic references. FAMO food concepts were then mapped to corresponding concepts in the FoodOn ontology. In this presentation, I will review the process and provide insight into how the properties were selected and their alignment with TCM philosophy.

3. Results

Two distinct categories of TCM properties were developed within FAMO: (1) *energetics* and (2) *actions*. Under the category of energetics, two properties were identified: (1) *tcm_si* (representing thermal nature: cold, cool, neutral, warm, or hot) and (2) *tcm_wei* (representing taste: salty, sour, bitter, sweet, or acrid). Within the category of actions, two properties were identified: (1) *tcm_zangfu* (indicating organ/channel: lung, large intestine, liver, gall bladder, heart, small intestine, stomach, spleen, kidney, or urinary bladder) and (2) *tcm_xing* (representing element: water, wood, fire, earth, or metal). To demonstrate the feasibility and applicability of these properties, they were applied to over 250 ingredients from contemporary Chinese cookbooks. In this presentation, I will detail the TCM properties developed for FAMO and summarize their application to the ingredients.

4. Discussion

The development and application of FAMO to categorize TCM food properties is an initial step in using ontology principles to incorporate ancient healing knowledge into Western medicine frameworks (e.g., Food as Medicine). This work lays the foundation for supporting future research endeavors in Lifestyle Medicine, which weaves together Western and Eastern medical principles. This study did reveal that there are Chinese food ingredients missing from FoodOn, suggesting the opportunity to expand FoodOn to encompass a wider array of food ingredients from diverse culinary traditions. FAMO's ongoing evolution holds promise for leveraging contemporary computational approaches for personalized nutrition guidance and healthcare practices. For the discussion, I will aim to contextualize FAMO relative to the overall goals of Lifestyle Medicine.

5. Conclusion

FAMO offers a structured approach to represent the therapeutic properties of foods using TCM principles, focusing on food energetics and actions with respect to *Qi*. Furthermore, the identification of missing Chinese recipe ingredients in existing ontologies highlights the need for broader culinary representation. I will end my presentation with a formal release of FAMO as well as provide future plans for the work and seek collaboration from workshop attendees.