News and Perspectives

Can AI Accurately Estimate Nutrition From a Food Photo?

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Abstract

Nutrition tracking can be a useful tool for achieving health and fitness goals, and AI photo features may help alleviate some of the burden of tracking food manually. In this *News and Perspectives* article, JMIR Correspondent Anna Zucker reports on the accuracy and potential trade-offs of these new AI features.

Key Takeaways:

- AI in food-tracking mobile apps can estimate a meal's nutritional content from a photo, potentially making tracking faster and easier.
- Recent research suggests accuracy varies by AI model, portion size, and macronutrient. Findings apply to the versions tested and may not reflect the latest models.
- Accuracy matters less for building general awareness, while inaccuracy may have consequences for those tracking for medical reasons. Registered dietitians can interpret AI estimates, recommend next steps, and determine whether tracking is appropriate.

Assessing dietary intake helps clinicians treat patients with nutrition-related issues, but it relies on self-reported food intake. Tracking—especially manually entering each food in an app—can be time-consuming, burdensome, and sometimes selective and potentially inaccurate. AI offers a shortcut: users can photograph a meal and upload it to a generative AI tool like ChatGPT or Claude and get an estimate of its ingredients, calories, and macronutrients. Many food-tracking apps also now include AI tools within them that let users upload photos instead of entering ingredients.

Lauren M, a 32-year-old woman, has tracked her dietary intake in an app for 7 months to increase awareness of her eating and lose weight. She has tried its AI photo feature but questioned its accuracy and returned to logging each food separately. She would welcome an easier option, noting that, "After manually tracking for so long, it does start to feel tiring, and I would consider skipping."

How much the accuracy of AI estimates matters depends on the individual's background and goals.

Recognizing Food Isn't the Same as Measuring Nutrition

Kylie King, MS, RD, owns a nutrition clinic in Los Angeles and has over 15 years of experience in behavioral weight management. "A photo can usually show what's on the plate, but it can't reliably show how much there is of each ingredient," King explains, adding that a tablespoon of olive oil "adds about 120 calories and is practically invisible once it's cooked in." Lauren experienced this when she tried using the feature herself. After preparing a bowl of rice, eggplant, tofu, and sauce, AI estimated a three-ounce serving of tofu, but she knew she had cooked eight ounces.

In a 2025 study published in *Nutrients*, researchers uploaded 114 meal photos of 38 meals at 3 portion sizes to GPT-4. Overall, GPT-4 achieved 93% precision in identifying foods. It performed well at estimating the weights of small-portion meals and ranking meals by nutritional content. It performed poorly at estimating medium- and large-portion weights—tending to underestimate them—and also tended to underestimate nutrient content across portion sizes.

In a 2026 study published in *Scientific Reports*, researchers evaluated 40 vision-language models using meal photographs. Accuracy and performance varied by model. GPT-5 initially performed best, but was outperformed by GPT-5.1 in subsequent evaluations, with Gemini 3 Pro ultimately outperforming all models. In a separate analysis using 23 photos, a human nutritionist's estimates were more accurate than the original models, especially when estimating protein. The newer models added at revision were not included in that comparison.

Avery Zenker, MAN, RD, works 1-on-1 with patients with a variety of health goals in a private practice and a clinical setting in Ontario, Canada. Zenker explains that similar-looking foods, like mashed cauliflower and mashed potatoes, have very different nutritional profiles that a photograph wouldn't reveal.

When an Estimate Is Useful Enough

AI photo tools aren't perfect, but neither is manual tracking, Zenker explains. How useful a tool is depends partly on how consistently someone will use it. "An imperfect method that someone consistently uses can sometimes be more useful than a highly accurate method they discontinue quickly," she says.

Lauren returned to manual tracking after questioning the accuracy of the AI's estimate from a photo of a complete meal. Checking individual ingredients seemed difficult once they were already combined and photographed. She found it easier, though tiring, to weigh and track each ingredient before combining them. King recommends "taking the photo for speed, then fixing the items with the most calories, which are usually the cooking fat, the dressing or sauce, and the portion size." Still, King adds, "What we don't know yet is whether photo logging leads to better long-term results than manual logging."

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>
> Avery Zenker, MAN, RD

Better accuracy matters most when, as King explains, "the number drives a medical decision." She points to the need for accurate carbohydrate counts for proper insulin dosing in type 1 diabetes, or for monitoring nutrients in kidney disease, where individuals may need accurate potassium, phosphorus, or sodium counts.

In hospitals, dietary assessment can help prevent malnutrition and guide nutritional care. A 2026 study published in *Nutrients* compared AI models to human registered dieticians (RDs) at estimating the nutrient content of hospital meals in photographs. They found that AI estimated calories and carbohydrates adequately but was less reliable for protein and fat. The authors suggest that as accuracy improves, AI-assisted dietary assessment in hospitals could eventually let human RDs spend more time on counseling and medical nutrition therapy rather than data entry.

Where Professional Guidance Fits In

Digital health tools like AI-powered food tracking can help users collect data conveniently, though accuracy varies. A human professional can help them understand the data and decide what actions to take next.

Zenker starts by asking what the person wants from the data. For general dietary quality, she may focus on meal composition rather than calorie totals. For specific nutrient targets, she pays closer attention to portion sizes, ingredients, and preparation methods.

King starts with "what the camera couldn't see." She asks how the meal was cooked, how much oil or butter was used, whether there was dressing, sauce, or unphotographed drinks, and how much was eaten. Then, she says, she will "check the portion of the most calorie-dense item against a food scale, the package label, or the restaurant's nutrition information."

The ease of AI nutrition estimates from photos could reduce some of the friction of tracking, but food tracking isn't appropriate for all patients, especially those with a history of disordered eating. Zenker adds that some people—even those without a history of disordered eating—become preoccupied with the "numerical targets rather than paying attention to hunger, fullness, satisfaction, and their overall nutritional needs." King screens for eating disorders before recommending tracking, explaining that it can be "harmful" when "numbers start causing anxiety, guilt, or rigid rules."

The AI models themselves could also use some fine-tuning. "I'd want independent testing of the [model] people are actually using, compared against weighed meals," says King. She also emphasizes assessing the pattern of errors: "An app that's consistently 25% low," or underestimating nutrient content, "is a different problem than one that's randomly off by 25%."

Zenker would like future research to evaluate new versions "in the way [in] which the average user would interact with it," since "there's a big difference between nutrition researchers entering daily food journal data manually compared to the average user." AI accuracy currently lags when users track meals in everyday life: at restaurants, in social settings, or in mixed dishes, baked goods, and beverages.

Ultimately, food photographs may offer value beyond the accuracy of their estimated nutrient content. They can build awareness, give dietitians insight into eating patterns, and help them assess whether tracking supports their clients' needs. "The photo is often more useful to me than the number attached to it," King says. To see benefits beyond convenient tracking, however, new AI food-tracking apps or new large language models may need to evolve and require continued evaluation.

Keywords: digital health; artificial intelligence; AI; nutrition; diet; mHealth; mobile health; mobile apps

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