

Nutrient dense foods can help combat unhealthy inflammation and slow the aging process.

New tools are needed to create healthier diets from a series of interconnected, smart food choices.



## THE PATH TO IMPROVED HEALTH

### SMART FOOD CHOICES

In the world of nutrition, one size does not fit all. A person's age, weight, level of activity and health status all impact daily nutrient needs. But how can a person lacking a nutrition degree and access to a lab make smart food choices?

Consumers are looking for more information and deeper insights into ways to integrate better nutrition into personal food tastes and preferences. Organic farmers are pushing the envelope to provide their customers with tastier, fresher, and more nutrient-dense foods.

*Muddling along in combating overweight and diabetes is no longer an option. Big changes are needed and anything less will likely fail to turn the tide.*

In the hope of reversing the upward trajectory of obesity and diabetes, policy-makers, business leaders, and major food companies are pushing for ambitious goals at all stages of the food value chain. There is near-universal agreement that more nutrition must be packed into reduced-calorie processed foods. Muddling along is no longer an option.

But a nagging question remains – what exactly is a smart food choice and how can real progress toward healthier diets be measured?

A smart food choice is one that:

- Pleases the palate,
- Delivers healthy portions of essential nutrients at a relatively low caloric cost and within a family's budget, and
- Avoids baggage that can erode health, e.g. added sugar, salt or saturated fat, pesticide or animal drug residues, and artificial food additives.

Consumers, farmers, the food industry, and government all need and will benefit from new tools to measure the nutritional quality of a typical serving of food, or 100-calories of one food compared to others. The Organic Center's Nutritional Quality Index (TOC-NQI) is one such tool. It provides a comprehensive, data-driven measure of the nutritional benefits of individual foods, meals, and daily diets. It is the only nutrient profiling system that estimates the overall nutritional quality of a food or meal based on their content of 27 nutrients, including phytochemicals.



### HOW DOES IT WORK?

The Organic Center's Nutritional Quality Index encompasses 27 nutrients: eleven vitamins, eight minerals, protein, fiber, antioxidant activity as measured by total ORAC (Oxygen Radical Absorbance Capacity), lutein + zeaxanthin, linoleic acid and linolenic acid (essential fatty acids), lycopene, and choline.

A food's TOC-NQI value is the sum of its contribution to daily nutrient needs across the above 27 nutrients. The food's share of a given nutrient, say vitamin C, is a simple ratio – the amount of vitamin C in the food, divided by the amount of vitamin C the person should ingest in a day according to the applicable Recommended Dietary Allowance (RDA) or Adequate Intake (AI).

The system can rank food nutritional quality per serving, per calorie, or per gram and can use customized RDAs for people with unique health and nutritional needs. Unlike in other systems, the importance given to specific nutrients reflects their abundance or lack thereof in today's typical diets, as well as their importance in promoting good health.



### HOW IS THE TOC-NQI DIFFERENT?

The Center's NQI is a flexible analytical system that takes into account:

- Nutrient deficiencies and excesses in a person's diet,
- Differing nutrient needs across segments of the population (children, adult women, elderly men),
- Food processing and preparation, and whether a food is fortified via supplementation with specific nutrients, and
- The impact of farm management systems and yield goals on the nutrient content of food.

Our new system can generate TOC-NQI values for single ingredient foods (a tomato versus an apple), multi-ingredient foods (pepperoni pizza versus a fast-food burger), and for the first time, even daily diets.

It is 100% open access – all methods and equations are disclosed, as are all sources of data. No black boxes, proprietary formulas, or adjustment factors set by expert panels based on subjective criteria.



# MAKING SENSE OF THE NUMBERS

## NUTRITION UNITS

TOC-NQI values are scaled so that a daily diet that supplies exactly the recommended amounts of all 27 nutrients—no more, no less—will have the value of 1, or one nutrition “unit.” But no food or diet has such an exact distribution of all 27 nutrients. Some nutrients are bound to be present at higher than recommended amounts. To account for these surpluses, a healthy diet should have a total TOC-NQI value of 1.5 or higher.



Fresh vegetables deliver the greatest nutrient bang per calorie. A 100-calorie portion of the top 10 most widely consumed vegetables delivers an average TOC-NQI of 0.25, or 0.25 “nutrition units.” So, very roughly speaking, if all 27 nutrients were distributed exactly in line with RDAs/AIs across four different vegetables, just these four 100-calorie portions of vegetables could provide adequate amounts of the nutrients needed by a person in a given day (and at the “expense” of only about 18% of daily caloric intake)!

The best way to improve most American diets is to choose more foods with higher TOC-NQI values per 100 calories. Valuable examples are fruits, vegetables, whole grains, and whole-food sources of fat such as nuts, whole dairy foods, whole soy foods, avocado, and salmon.

Of course, many factors drive food choices in addition to nutrient content—among them taste, cost, convenience, and availability. Our TOC-NQI provides consumers a practical way to make food choices that make nutritional sense, leaving these other factors to personal tastes and preferences.

## TOC-NQI Values of Common Foods\*

### Ranked per serving

Meats and seafoods – 0.145 nutrition units  
Fortified whole grain cereals – 0.13  
Fortified refined grain cereals – 0.10  
Fruits – 0.064  
Dairy foods – 0.057  
Whole grains – 0.054  
Vegetables – 0.042  
Refined grain breads – 0.024

### Ranked per 100 calories

Romaine lettuce – 0.766  
Vegetables – 0.244  
Whole grains – 0.107  
Fruits – 0.098  
Refined cereals – 0.092  
Meats and seafoods - 0.091  
Dairy foods – 0.057  
Fast foods – 0.025

\* Food group values are averages

## THE SEARCH FOR SOLUTIONS

We are a nation deeply troubled—and divided—by food. Indeed, almost everything about food is being re-evaluated—from where and how it is grown, reliance on processed versus whole foods, biotechnology versus organic farming, and the impacts of added fat, salt, and sugars.

A healthy debate is underway about “next steps,” but consensus is proving hard to come by. In terms of obesity and diabetes, a palpable sense of urgency is shared by individuals and in families, and among nutritionists, educators, and the medical community. For this reason, the time is ripe for novel ideas and new policy initiatives to gain traction, but whether they will be sufficient to overcome the societal factors underlying the upward trends in body weight and diabetes remains to be seen.

By evaluating the nutrient quality of various foods and diets, our TOC-NQI can provide much needed hard data in answering several important questions:

- How do different farming systems and technologies alter the nutritional quality of food, and indirectly, the health of people consuming it?
- Will genetically engineered rice or organically grown carrots and squash more effectively provide the vitamin A needed by hundreds of millions of children around the world?
- How can farmers maximize the nutrition units produced on their land, as opposed to just their crop yields?

It is often said “What gets measured, gets managed.” We hope that our NQI will give people new motivation to improve their daily diets, plus useful guidance to do so wisely.

Access more information on the Nutritional Quality Index at [www.organic-center.org/TOC-NQI](http://www.organic-center.org/TOC-NQI), or contact Dr. Charles Benbrook, at [cbenbrook@organic-center.org](mailto:cbenbrook@organic-center.org).



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sometimes the greatest ideas are the simplest.

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