

Prix des denrées alimentaires et la santé: Une évolution préoccupante

Adam Drewnowski, PhD

Director, Center for Public Health Nutrition,
Professor of Epidemiology
University of Washington, Seattle, WA



AAF 5 novembre 2025 (visio)

Adam Drewnowski – academic history



Université de Paris





Energy dense foods can promote overeating –

Barbara Rolls Volumetrics

High energy density



1575 Kcal
High Energy Density

Low energy density



1575 Kcal
Low Energy Density

The concept of nutrient density 2005

Protein, fiber, vitamins, minerals, fatty acids

 **The American Journal of
CLINICAL NUTRITION**

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Commentary

Concept of a nutritious food: toward a nutrient density score¹⁻³

Adam Drewnowski

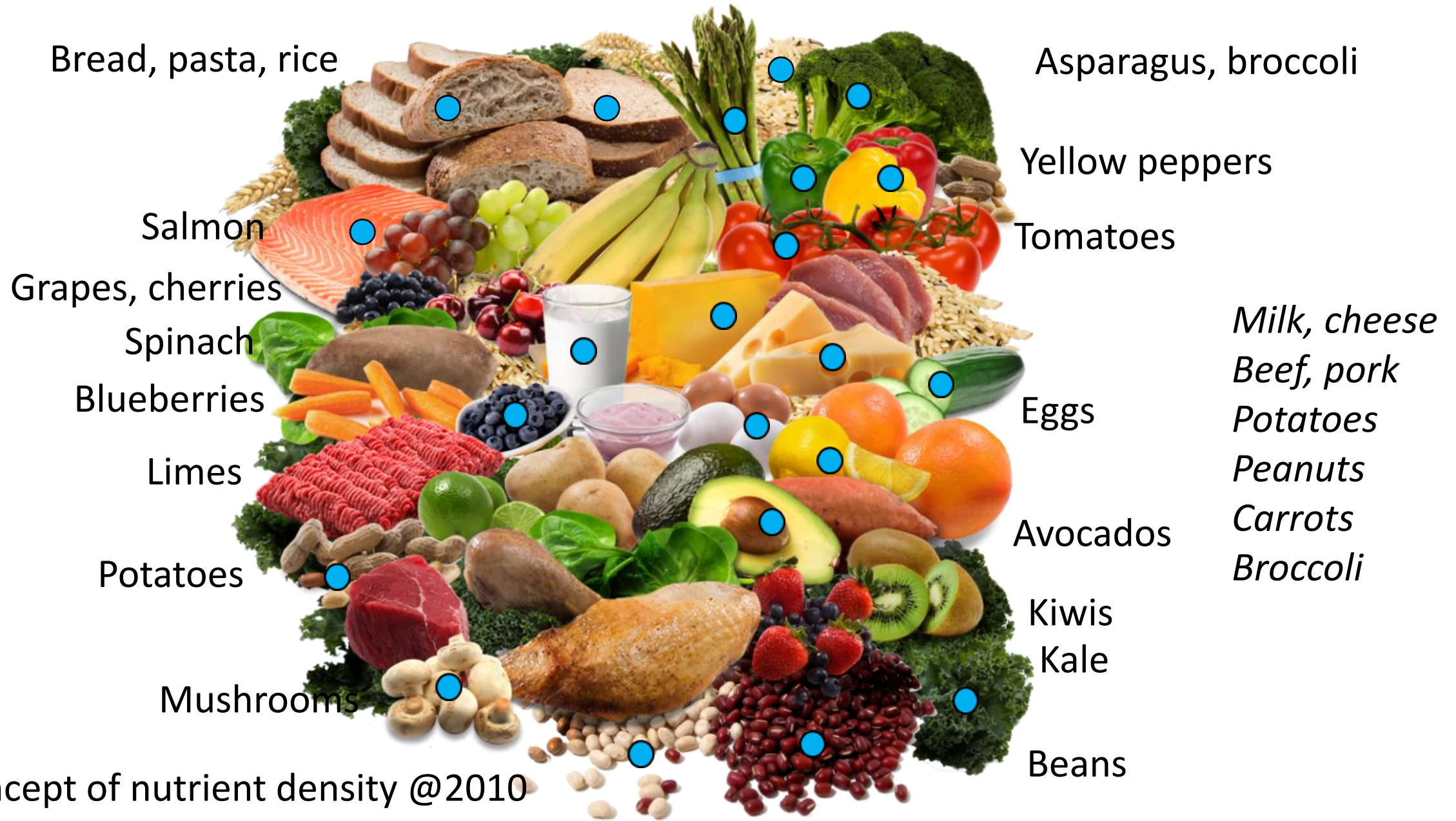
ABSTRACT

The American diet is said to be increasingly energy-rich but nutrient-poor. To help improve the nutrient-to-energy ratio, the 2005 *Dietary Guidelines for Americans* recommend that consumers replace some foods in their diets with more nutrient-dense options. Such dietary guidance presupposes the existence of a nutrient density standard. However, a review of the literature shows that the concept of a nutritious food is not based on any consistent standards or criteria. In many cases, healthful foods are defined by the absence of problematic ingredients—fat, sugar, and sodium—rather than by the presence of any beneficial nutrients they might contain. Past attempts to quantify the nutrient density of foods have been based on a variety of calories-to-nutrient scores, nutrients-per-calorie indexes, and nutrient-to-nutrient ratios. The naturally nutrient rich (NNR) score, which is based on mean percentage daily values (DVs) for 14 nutrients in 2000 kcal food, can be used to assign nutrient density values to foods within and across food groups. Use of the NNR score allows consumers to identify and select nutrient-dense foods while permitting some flexibility where the discretionary calories are concerned.

Energy-dense sweets and fats have long been contrasted, unfavorably, to foods that contained substantial amounts of key nutrients per serving or per unit weight. The terms *energy-dense* and *nutrient-poor* are commonly used to characterize foods perceived as unhealthy and to distinguish them from more nutritious options (8). Disparaging terms such as *junk foods* (13) or *empty calories* (14) are commonly used in antithesis to such descriptors as *healthful*, *packed with nutrients*, *nutrient-dense*, or *nutrient-rich*.

The problem is that nutrient-dense foods lack a common definition (15, 16). A 1977 review of the literature (15) showed that there were only limited efforts to define the concept of a nutritious food. General statements that such a food should provide “significant amounts of essential nutrients” were not backed by any firm standards or criteria (15). Three decades later, in 2004, there was still no agreement as to the definition of a nutrient-dense food or a healthful beverage (16). The various attempts to define and quantify the nutrient density of foods over the past 30 y are the topic of this report.

The concept of nutrient density 2010

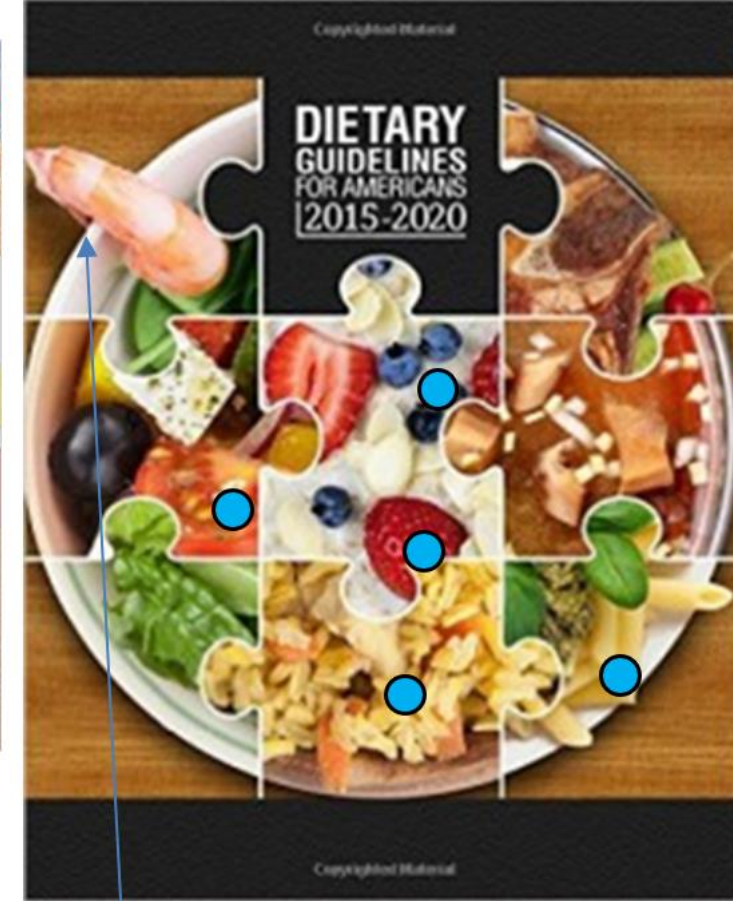
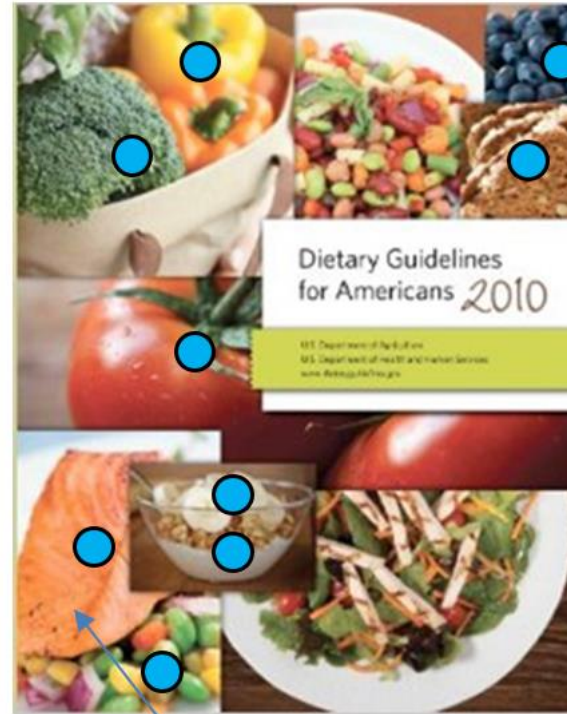


The concept of nutrient density @2010

Nutrient density in US Dietary Guidelines



DIETARY
GUIDELINES
FOR AMERICANS
2015-2020
EIGHTH EDITION

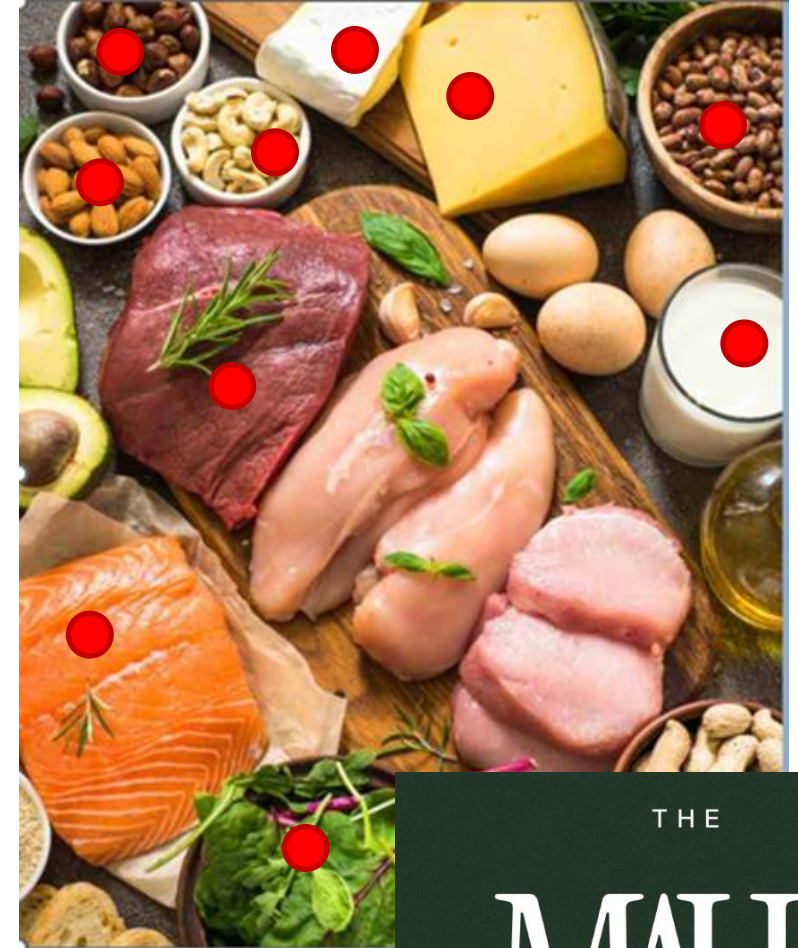


Note: Beef, salmon, tuna, shrimp, pork

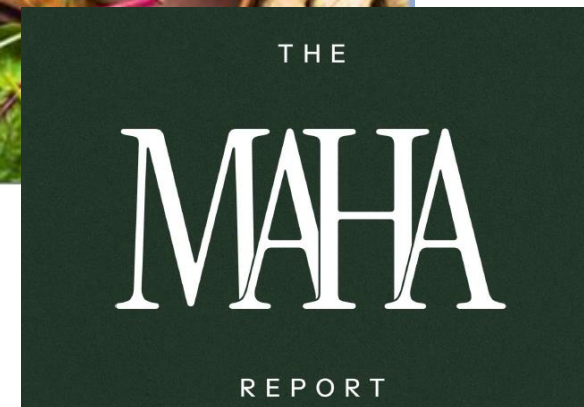
Make America Healthy Again (MAHA)

The MAHA report advises **consumers** to replace UPF with:

- Leafy greens for magnesium and folate
- Salmon for omega-3 fatty acids.
- Nuts for magnesium
- Beef for protein
- Whole milk and dairy for calcium, vitamin D, and bioactive fatty acids
- Legumes for fiber and resistant starch



Who will pay for it is not clear.
This is viewed as consumer responsibility



MAHA and foodwatch – shared ideology?



Make France Healthy Again (MAFA)

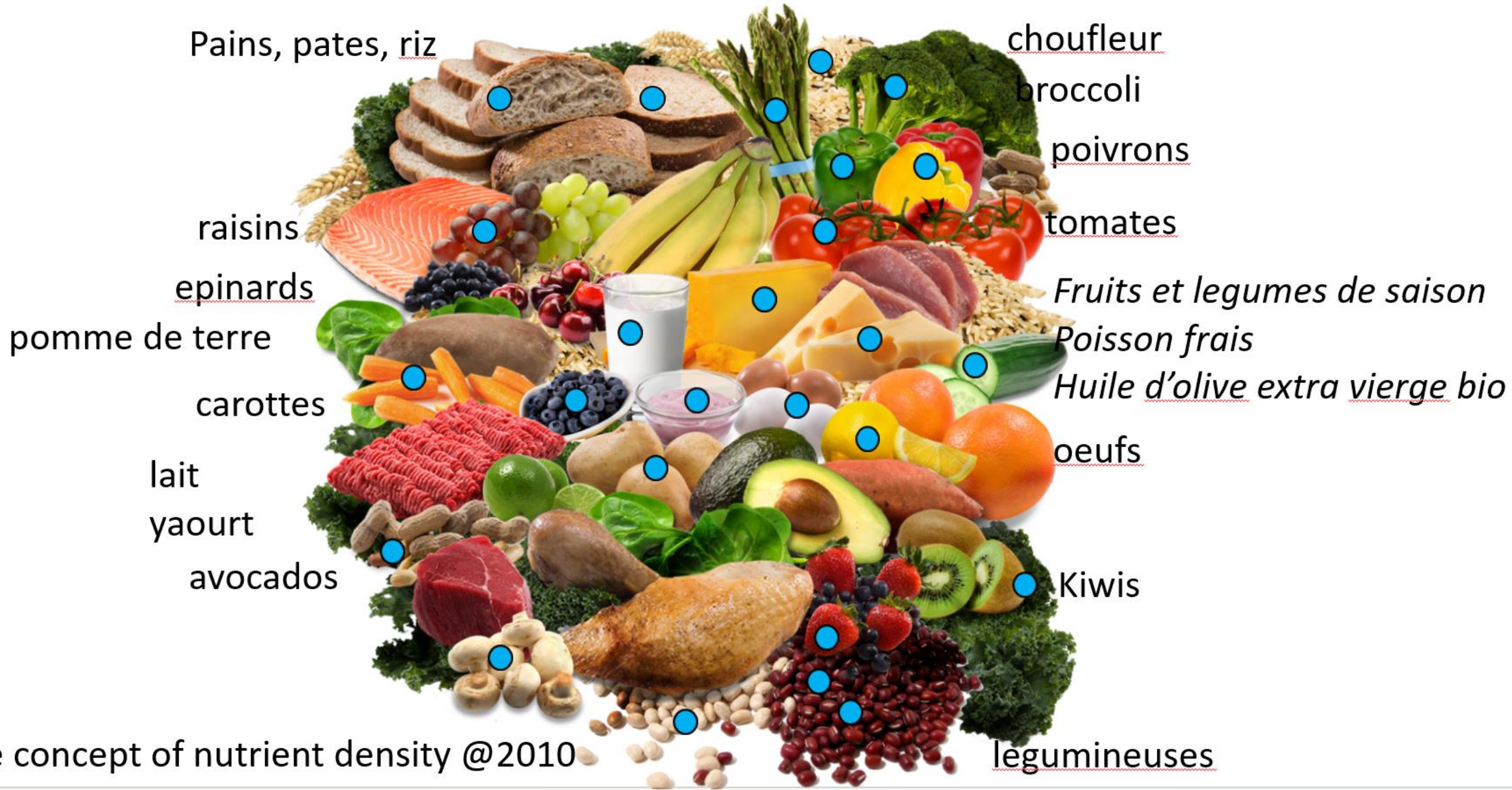
The foodwatch report asks government to force supermarkets to sell luxury products at cost:

- Seasonal fresh produce for magnesium and folate
- Mackerel for omega-3 fatty acids.
- Nuts for magnesium
- Pulses for protein
- Low fatmilk and dairy for calcium, vitamin D, and bioactive fatty acids
- Legumes for fiber and resistant starch
- Extra virgin olive oil bio for je ne sais quoi



The capitalists will pay for it – that is clear.
This is viewed as government responsibility

Produits frais et bio France 2025



The concept of nutrient density @2010

Fruits et légumes bio

Familles de produits	Nombre de produits	Exemples de produits
CATÉGORIE DU PNNS "A"		
 Fruits et légumes frais (liste non-exhaustive, à adapter selon les saisons)	13 légumes et fruits frais dont 5 bio*	Fruits et légumes de saison: carottes, poireaux, courges, chou-fleurs, navets, <u>kiwis</u> , pommes, poires, raisins, etc.
 Fruits et légumes en conserves ou surgelés de produits non transformés	12 conserves et surgelés dont 6 produits bio*	Conserves ou surgelés : tomates, haricots verts, <u>épinards</u> , petits pois, maïs, etc.
 Fruits à coque sans sel ajouté	4 produits dont 1 bio*	Sachets ou vrac: noix, noisette, <u>amande</u> et pistache.
 Légumineuses ou légumes secs	8 produits dont 3 bio*	En conserves, surgelés ou secs: lentilles, pois chiches, pois cassés, haricots rouges / blancs, etc.





Organic Hayward Kiwi

The ultimate winter fruit, thanks in particular to its high vitamin content

IN STOCK
Home or office delivery only.
Delivery from **tuesday 04 november** | [Details](#)

+

1

-

500 grams

Price : **3.40 €**

Price per kilo: 6.80 €

1

One kilo

Price : **6.55 € (3.28 € the unit)**

Price per kilo: 6.55 €

6.55€/kg

3.04 € 08 €

✓ **Cultivé en agriculture BIO**



Pistaches Et Amandes

Casa Cañada - Villamalea, Espagne

Taille de la caisse

2,00 kg

75,43 €

Type de commande

☑ Commande ponctuelle

Quantité

1

+

2,00 kg

75.43€/2 kg

Poissons frais et huile extra vierge

	Produits céréaliers	17 produits dont 9 produits bio* et 5 semi-complets ou complets	Pains, pâtes, riz, semoule, farine de blé, quinoa, blé, pâtes fraîches, etc.
	Produits laitiers	10 produits laitiers dont 4 bio* non-sucré et sans édulcorant	Lait 1/2 écrémé, fromage blanc nature non sucré (3% MG), yaourt nature non sucré, bûche de chèvre, emmental, tomme de vache, etc.
	Poissons et fruits de mer	3 produits	En frais de préférence mais possible en conserve ou surgelé (hors produits transformés): Moules, sardines, maquereau, hareng, etc. Pas de saumon, crevette et thon.
	Huiles	5 produits dont 2 bio*	Parmi: huile d'olive extra vierge, huile de colza , huile de noix. Une autre huile riche en Oméga 3 sans additif est possible.



Quinoa Bio Cereal Bio

3,19 € et plus de prix

Monoprix... et plus



Maquereau 16-20 pièces 1 kg

130,00 ₹

Maquereaux calibre 16-20 par kg *non nettoyés

- 1 +

Ajouter au panier

130 €/kg



PRIX santé
BIEN MARCHER

1^{er} Prix 2024
marmiton
BIO

★★★★★ 9.6/10 (49)

Huile D'Olive Vierge Extra...

13,99 €

13.99€

Thé vert et miel origine France

 Pour cuisiner maison	11 produits dont 4 bio*	Parmi: vinaigre de vin sans sucre ajouté, vinaigre de cidre, poivre, <u>sucré blanc de betterave uniquement bio, sucre de canne et miel origine France.</u>
 Œufs	2 produits dont 1 bio*	Boîte de 6 œufs moyen plein air, boîte de 10 œufs bio, etc.
 Pomme de terre	2 produit dont 1 bio*	Pomme de terre en filet, pomme de terre en vrac, etc.
 Boisson	5 produits dont 2 bio*	Café moulu arabica, thé vert, tisanes, etc.
 Produits pour bébé	8 produits dont 3 bio*	Lait en poudre, lait de croissance, purée de fruits, purée de légumes, etc.



Miel de Forêt
Origine France...

15,89 €
La Fourche
+ 7,90 € de frai...



3.59€/kg



Ethiquable - Thé
vert de Ceylan

3,53 €
greenweez.com
+ 6,90 € de frai...

Exigeons 100 produits à prix coûtant

- Familles Rurales, foodwatch et le Secours catholique exigent donc une mesure simple et urgente : imposer à la grande distribution de vendre à prix coûtant 100 produits alimentaires prioritaires.
- Les experts de santé publique du Programme National Nutrition Santé (PNNS) recommandent de fruits et légumes de saison, poisson frais, produits céréaliers, et aussi des œufs, des produits laitiers et du poisson.
- La liste exigée à prix coûtant **ne propose pas de produits du groupe « à réduire » (viandes, charcuteries, UPF, boissons) dont la consommation excessive peut nuire à la santé**
- On propose un régime quasi végétal avec une proportion significative d'aliments bio.
- Cette mesure ne doit pas avoir une incidence négative sur les prix d'achats des productions agricoles.
- En même temps les supermarchés Casino ferment ses portes



Liste de 100 produits prioritaires, selon les recommandations du Programme National Nutrition Santé (PNNS)



Marges bénéficiaires des supermarchés



- Les supermarchés ont des marges bénéficiaires faibles, généralement entre 1 et 5 %.
- Les produits ultra-transformés (calories, sucres, gras) ont les marges les plus basses.
- Les fruits et légumes frais, la viande et les poissons frais, les plats préparés et les produits de boulangerie sont les plus rentables.
- La marge sur les fruits et légumes est de 25 à 50 %.
- La marge sur les fruits et légumes biologiques est de 40 à 60 %.
- En effet, un supermarché marche grâce aux prix des fruits et légumes.
- **Ce que les ONG « exigent », c'est la faillite des magasins bio et des supermarchés en général.**

Les produits frais sont devenus produits luxe

DIETARY

Nutrients are expensive. Calories are not.

Low nutrient density, 2000 kcal	High nutrient density, 2000 kcal
\$3.52	\$36.32
	

Monsivais, P. and Drewnowski, A. 2007. The Rising Cost of Low-Energy-Density Foods. *Journal of American Dietetic Association* 107:2071-2076.

DIETARY GUIDELINES AMERICANS 2015-2020



Encore des idées reçues

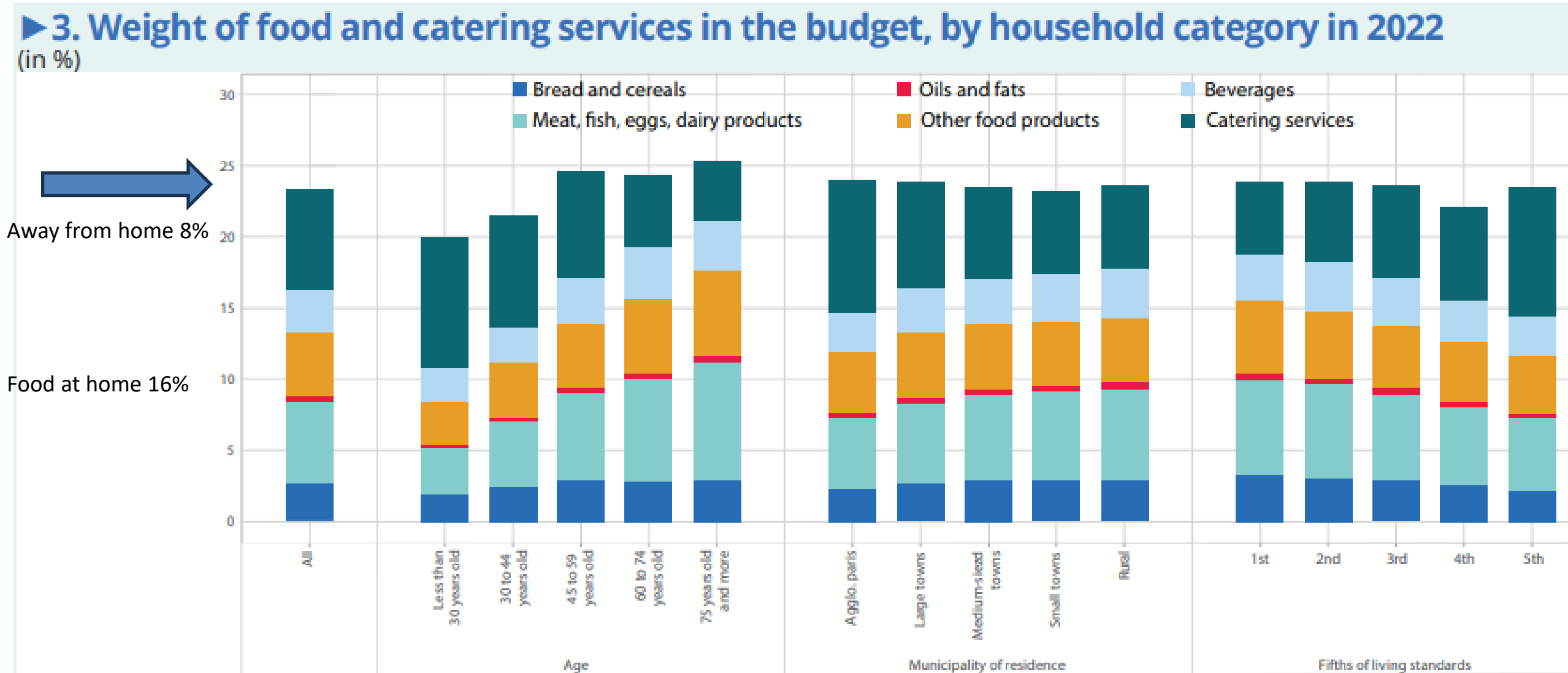
ETATS GENERAUX
de l'éducation à l'alimentation
et au bien manger

Mercredi 15 octobre 2025



- Un Français consacre environ **12 à 13%** de sa rémunération à son alimentation. Cette proportion n'a jamais été aussi basse.
- En 2024, **29% des adultes et 60%** des 18-24 ans ont été en situation de précarité alimentaire.
- On favorise de plus en plus l'achat de produits transformés par rapport aux produits bruts, par **question de temps**.
- Les produits transformés sont souvent **bien plus chers et beaucoup moins sains**.
- Une forte consommation de produits ultra-transformée est donc souvent corrélée avec des situations de surpoids ou d'obésité.

Food budget: close to 24% of incomes



Relation inverse: Qualité-prix

- La densité énergétique (kcal/g) et la densité nutritionnelle (nutriments/100 kcal) sont inversement proportionnelles.
- Les féculents, produits sucrés et les matières grasses, riches en énergie, coûtent moins cher pour 100 kcal.
- Les aliments riches en nutriments coûtent plus cher pour 100 kcal, mais pas forcément par nutriment.
- L'accessibilité financière est également évaluée en fonction des revenus.

The Nutrient Rich Food Index 2008

Special Article

Nutrient profiling of foods: creating a nutrient-rich food index

Adam Drewnowski and Victor Fulgoni III

Nutrient profiling of foods, described as the science of ranking foods based on their nutrient content, is fast becoming the basis for regulating nutrition labels, health claims, and marketing and advertising to children. A number of nutrient profile models have now been developed by research scientists, regulatory agencies, and by the food industry. Whereas some of these models have focused on nutrients to limit, others have emphasized nutrients known to be beneficial to health, or some combination of both. Although nutrient profile models are often tailored to specific goals, the development process ought to follow the same science-driven rules. These include the selection of index nutrients and reference amounts, the development of an appropriate algorithm for calculating nutrient density, and the validation of the chosen nutrient profile model against healthy diets. It is extremely important that nutrient profiles be validated rather than merely compared to prevailing public opinion. Regulatory agencies should act only when they are satisfied that the scientific process has been followed, that the algorithms are transparent, and that the profile model has been validated with respect to objective measures of a healthy diet.

© 2008 International Life Sciences Institute

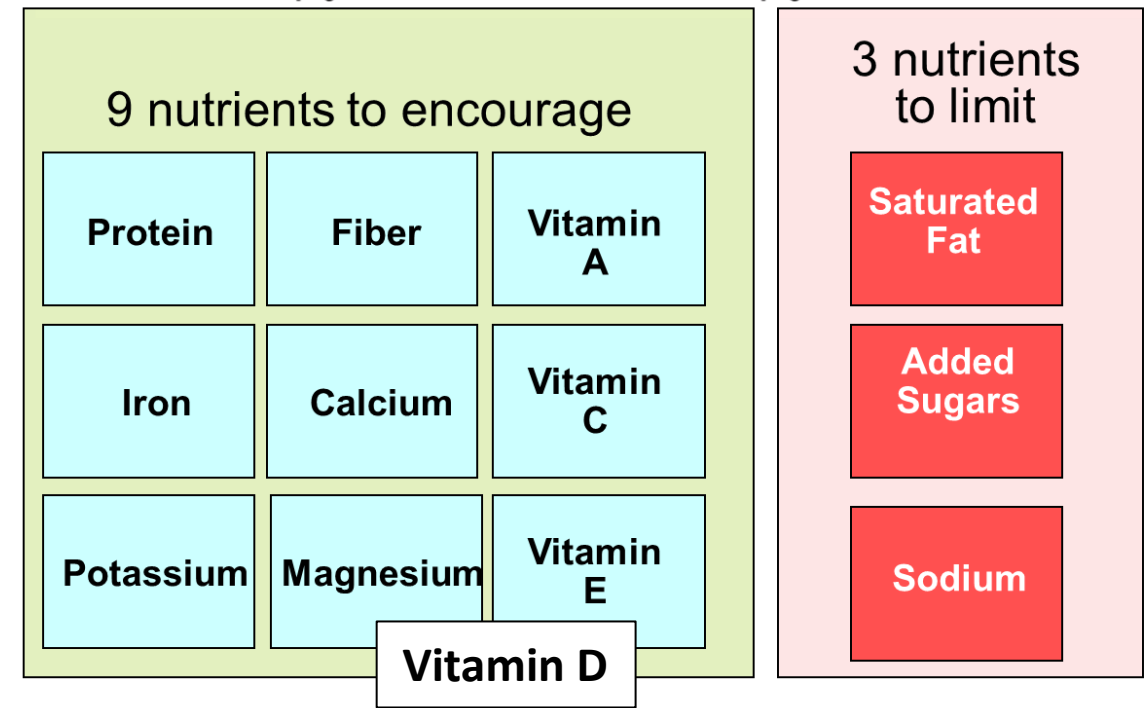
Development and Validation of the Nutrient-Rich Foods Index: A Tool to Measure Nutritional Quality of Foods¹⁻³

Victor L. Fulgoni III,^{4*} Debra R. Keast,⁵ and Adam Drewnowski⁶

⁴Nutrition Impact, LLC, Battle Creek, MI 49014; ⁵Food and Nutrition Database Research Inc., Okemos, MI 48864; and ⁶Center for Public Health Nutrition, School of Public Health, University of Washington, Seattle, WA 98195

The Nutrient Rich Foods (NRF) Index

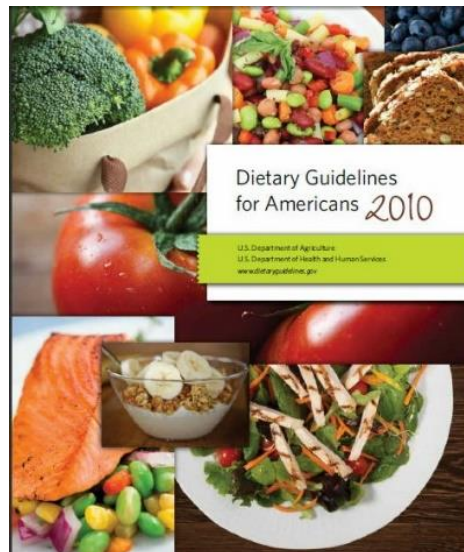
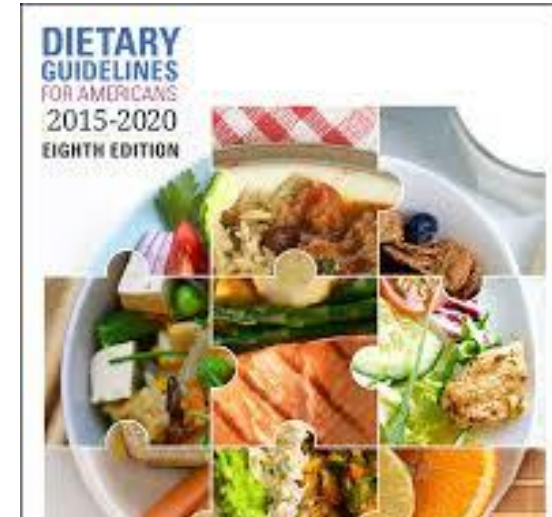
$$\text{NRF9.3} = \sum_{i=9} (\% \text{DV}/100\text{kcal}) - \sum_{i=3} (\% \text{DV}/100\text{kcal})$$



Drewnowski, Fulgoni. Nutr Rev 2008

Joining nutrient density with food prices

- Nutrient composition data from the USDA Food and Nutrient Database for Dietary Studies (FNDDS) were merged with USDA national food prices.
- The goal was to explore the cost of US foods as related to their nutritive value.



The cost of US foods as related to their nutritive value¹⁻³

Adam Drewnowski

ABSTRACT

Background: Comparisons of the cost of different foods relative to their energy and nutritive value were conducted in the 1800s by the US Department of Agriculture (USDA).

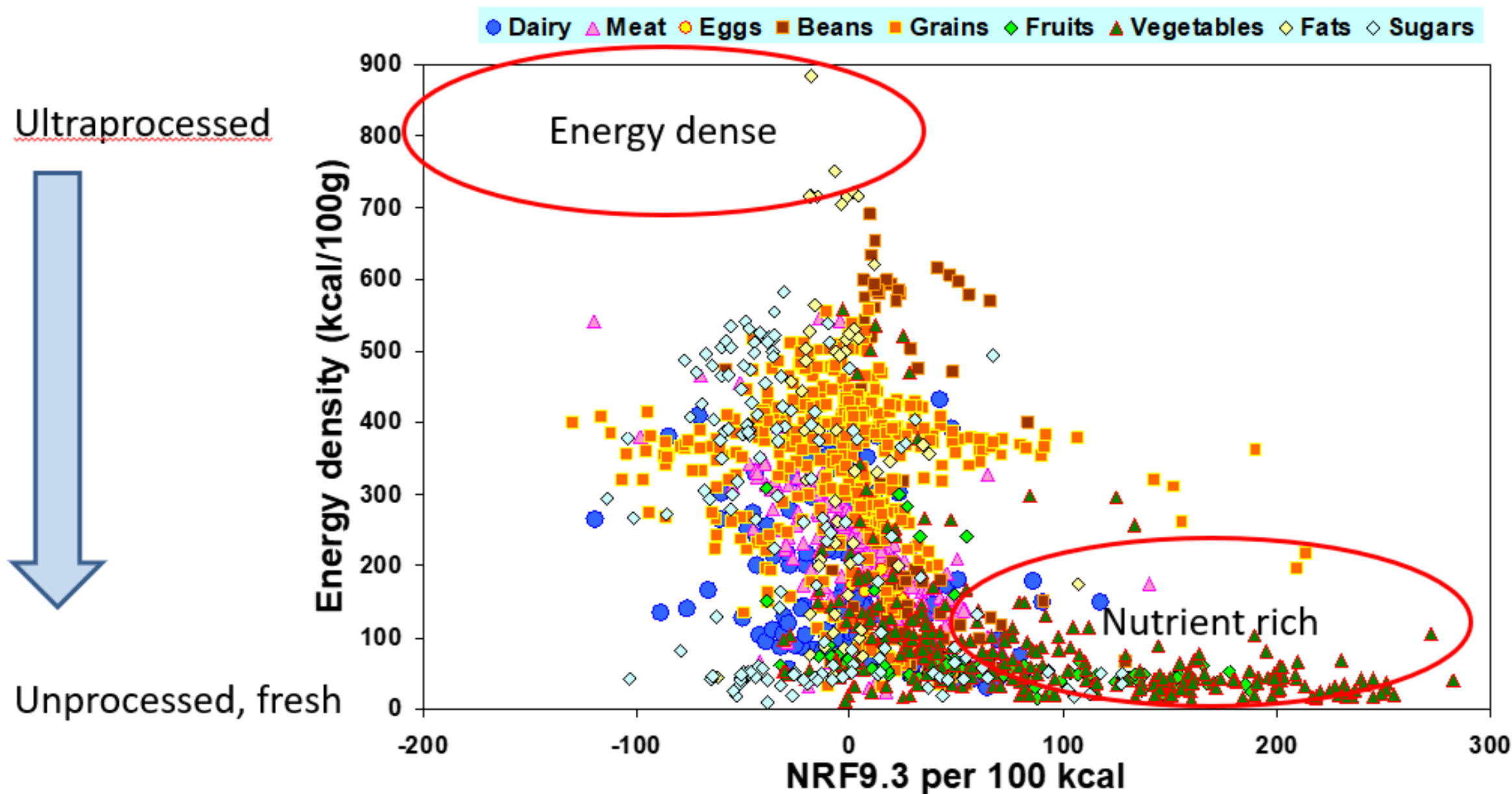
Objective: The objective was to reestablish the relations between food cost, energy, and nutrients by using contemporary nutrient composition and food prices data from the USDA.

Design: The USDA Food and Nutrient Database for Dietary Studies 1.0 (FNDDS 1.0) and the Center for Nutrition Policy and Promotion food prices database were used for analysis. For 1387 foods, key variables were as follows: energy density (kcal/g), serving size (g), unit price (\$/100 g), serving price (\$/serving), and energy cost (\$/kcal). A regression model tested associations between nutrients and unit price (\$/100 g). Comparisons between food groups were

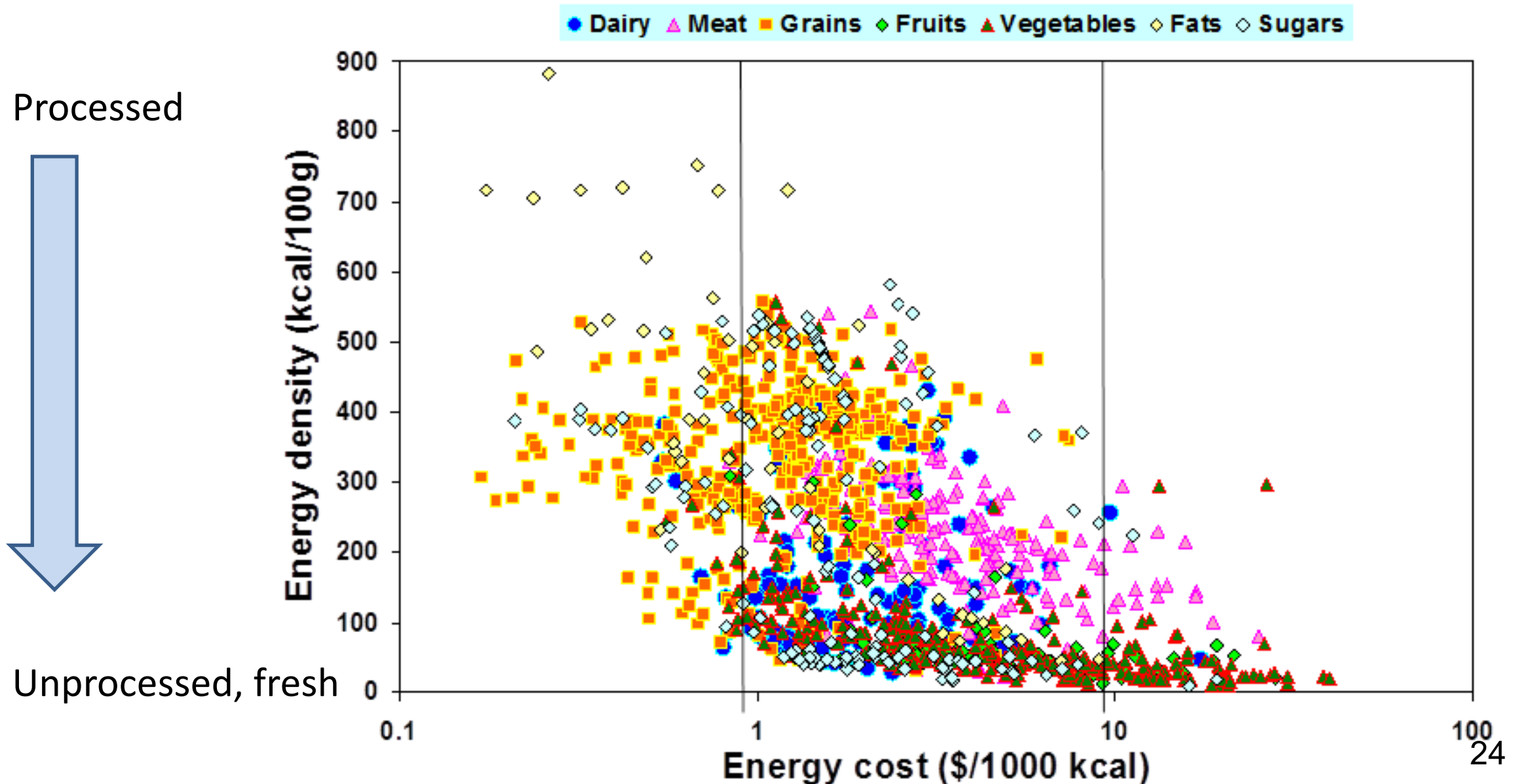
In 1894, Atwater recognized that different foods varied greatly in the proportion of water they contained (1). Because water contributed to food weight but supplied neither nutrients nor calories, Atwater ignored food weight and calculated instead the amounts of energy and nutrients that could be obtained from different foods for a given price. At the time, corn meal, wheat flour, and sugar provided the most calories for 25 cents (1).

Writing on the nutritive value and cost of food in 1902, Milner (4) had this to say about the cost of fresh produce compared with grains: "Cabbage at 2.5 cents per pound seems cheap, but 10 cents worth of cabbage furnishes 500 calories of energy while 10 cents worth of wheat flour at 3 cents per pound furnishes 5490 calories of energy and is truly cheap" (4). In 2009, an article in the Journal still questioned whether energy-dense grain snacks were really

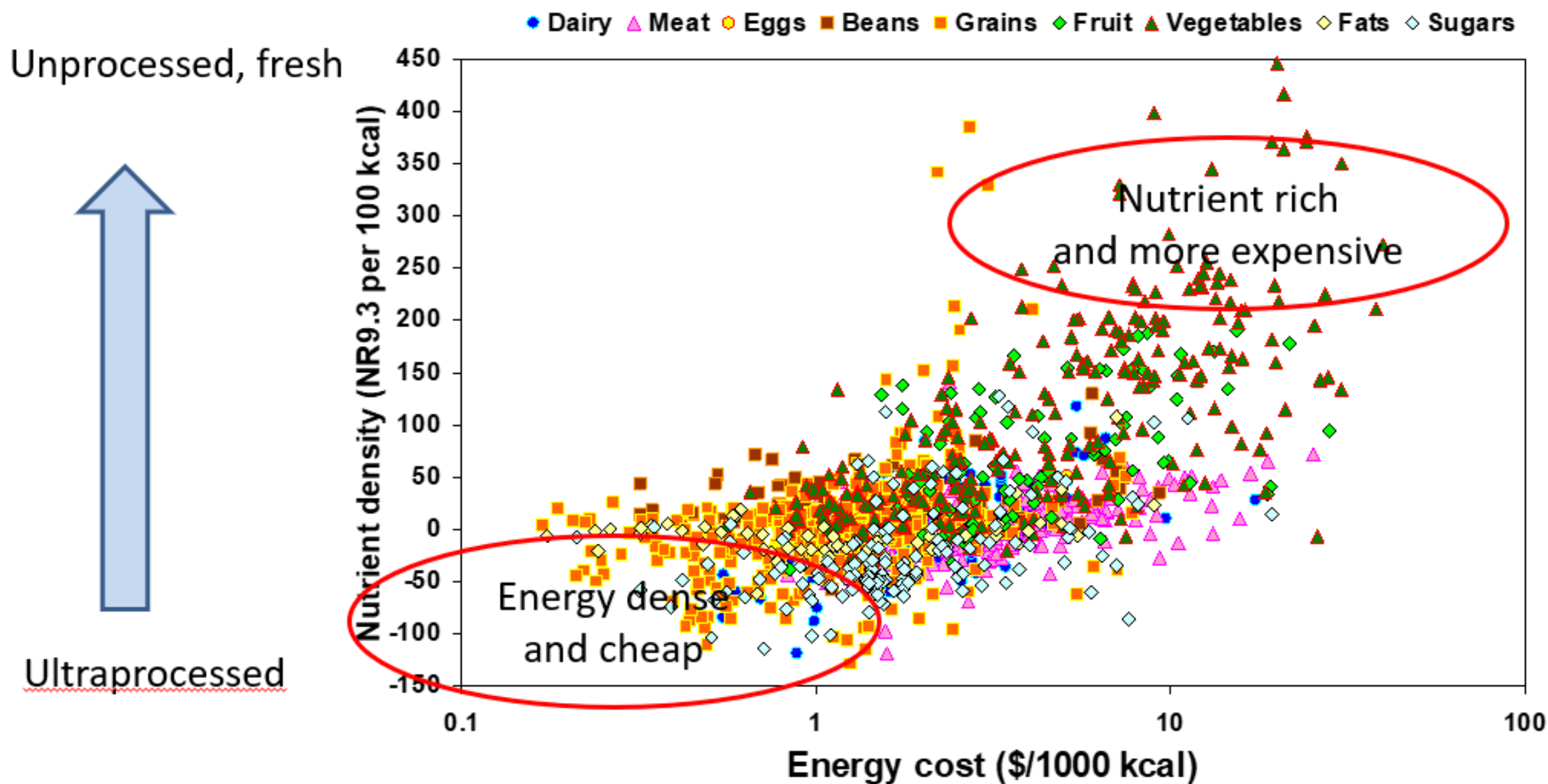
Energy density versus nutrient density



Dry grains, sweets, fats cost less



Fresh and nutrient-rich foods cost more



Linking food, health, and incomes

Poverty and obesity may be linked by the low cost, high reward value, and easy access to energy-dense foods

Energy density and food costs

Drewnowski and Specter AJCN 2004;79:6-16



Food costs (log)

The paradox – Saving on food costs leads to energy dense diets
Energy dense diets permit overeating
Spend less – eat more

Special Article

Poverty and obesity: the role of energy density and energy costs^{1,2}

Adam Drewnowski and SE Specter

ABSTRACT

Many health disparities in the United States are linked to inequalities in education and income. This review focuses on the relation between obesity and diet quality, dietary energy density, and energy costs. Evidence is provided to support the following points. First, the highest rates of obesity occur among population groups with the highest poverty rates and the least education. Second, there is an inverse relation between energy density (MJ/kg) and energy cost (\$/MJ), such that energy-dense foods composed of refined grains, added sugars, or fats may represent the lowest-cost option to the consumer. Third, the high energy density and palatability of sweets and fats are associated with higher energy intakes, at least in clinical and laboratory studies. Fourth, poverty and food insecurity are associated with lower food expenditures, low fruit and vegetable consumption, and lower-quality diets. A reduction in diet costs in linear programming models leads to high-fat, energy-dense diets that are similar in composition to those consumed by low-income groups. Such diets are more affordable than are prudent diets based on lean meats, fish, fresh vegetables, and fruit. The association between poverty and obesity may be mediated, in part, by the low cost of energy-dense foods and may be reinforced by the high palatability of sugar and fat. This economic

Public health policies for the prevention of obesity increasingly call for taxes and levies on fats and sweets, both to discourage their consumption and to help promote alternative and healthier food choices (15, 16). Past studies on dietary antecedents of obesity have addressed taste preferences for sugar and fat as well as preferences for energy-dense foods (17–19). In contrast, the relation between fat and sugar consumption, dietary energy density (MJ/kg), and energy costs (\$/MJ) has not been explored. Establishing associative links between obesity, dietary energy density, and energy costs is the chief focus of this report

POVERTY AND OBESITY

Obesity rates in the United States have risen sharply over the past 2 decades (20–22). By 1999–2000, 64% of adults aged ≥ 20 y were classified as overweight and 30% were classified as obese. Overweight is defined as a body mass index (BMI; in kg/m^2) > 25 , whereas obesity is defined as a BMI > 30 (20). A sharp increase in the number of massively obese people (BMI > 35) has been observed in certain population subgroups (23). There is no question that the rates of obesity and type 2



The American Journal of Clinical Nutrition

Volume 87, Issue 5, May 2008, Pages 1107-1117

Editor's Choice

Does social class predict diet quality? ¹

Nicole Darmon , Adam Drewnowski

Résumé

- Les calories sont moins chères que les nutriments.
- Produits frais sont devenus un luxe.
- Les régimes alimentaires plus sains coûtent plus cher.
- Les régimes alimentaires moins sains sont associés à des dépenses alimentaires moindres et à un statut socio-économique plus bas.
- Les liens entre la qualité de l'alimentation et la santé peuvent s'expliquer par les disparités socio-économiques.
- Tout dépend du prix d'alimentation et du pouvoir d'achat.

Merci

Adam Drewnowski, PhD

Director, Center for Public Health Nutrition,
Professor of Epidemiology, University of Washington, Seattle, WA, USA
Director, UW Center for Obesity Research

