TECHNISCHE UNIVERSITÄT MÜNCHEN

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ZIEL
Zentralinstitut für Ernährungs- und Lebensmittelforschung

General Concept of Nutrient Profiles

Traditional Dogma of Nutritional Sciences

There are no „bad (unhealthy)“ foods, however, there are „bad (unhealthy)“ diets.

No need for nutrient profiles for individual foods!

Position of the American Dietetic Association: Total diet approach to communicating food and nutrition information

POSITION STATEMENT

It is the position of the American Dietetic Association that all foods can fit in a healthful eating style. The ADA strives to communicate healthful eating messages to the public that emphasize the total diet, or overall pattern of food eaten, rather than any one food or meal. If consumed in moderation with appropriate portion size and combined with regular physical activity, all foods can fit into a healthful diet.

100 / January 2002 Volume 102 Number 1

Convincing evidence for causal relationship between dietary factors and disease (WHO 2003)

Energy/energy density	Obesity
Total fat	Obesity
Saturated fatty acids	CVD
Sodium/Salt	High Blood Pressure
Sugar	Caries

Effect of longer-term modest salt reduction on blood pressure (Review)

He FJ, MacGregor GA

This record should be cited as:
He FJ, MacGregor GA. Effect of longer-term modest salt reduction on blood pressure. *The Cochrane Database of Systematic Reviews* 2004, Issue 1. Art. No.: CD004937. DOI: 10.1002/14651858.CD004937.

This version first published online: 26 January 2004 in Issue 1, 2004.
Date of most recent substantive amendment: 06 October 2003

Authors' conclusions

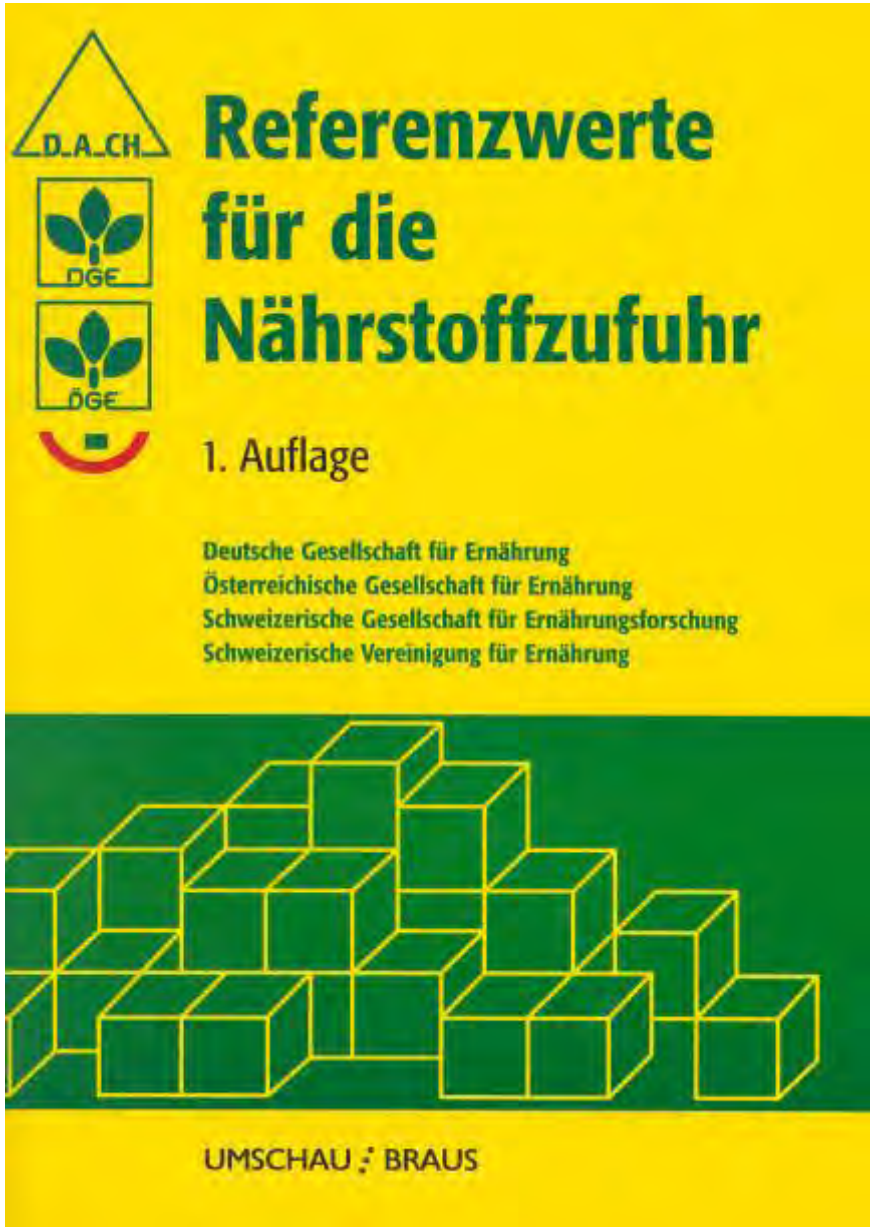
Our meta-analysis demonstrates that a modest reduction in salt intake for a duration of 4 or more weeks has a significant and, from a population viewpoint, important effect on blood pressure in both individuals with normal and elevated blood pressure. These results support other evidence suggesting that a modest and long-term reduction in population salt intake could reduce strokes, heart attacks, and heart failure. Furthermore, our meta-analysis demonstrates a correlation between the magnitude of salt reduction and the magnitude of blood pressure reduction. Within the daily intake range of 3 to 12 g/day, the lower the salt intake achieved, the lower the blood pressure.

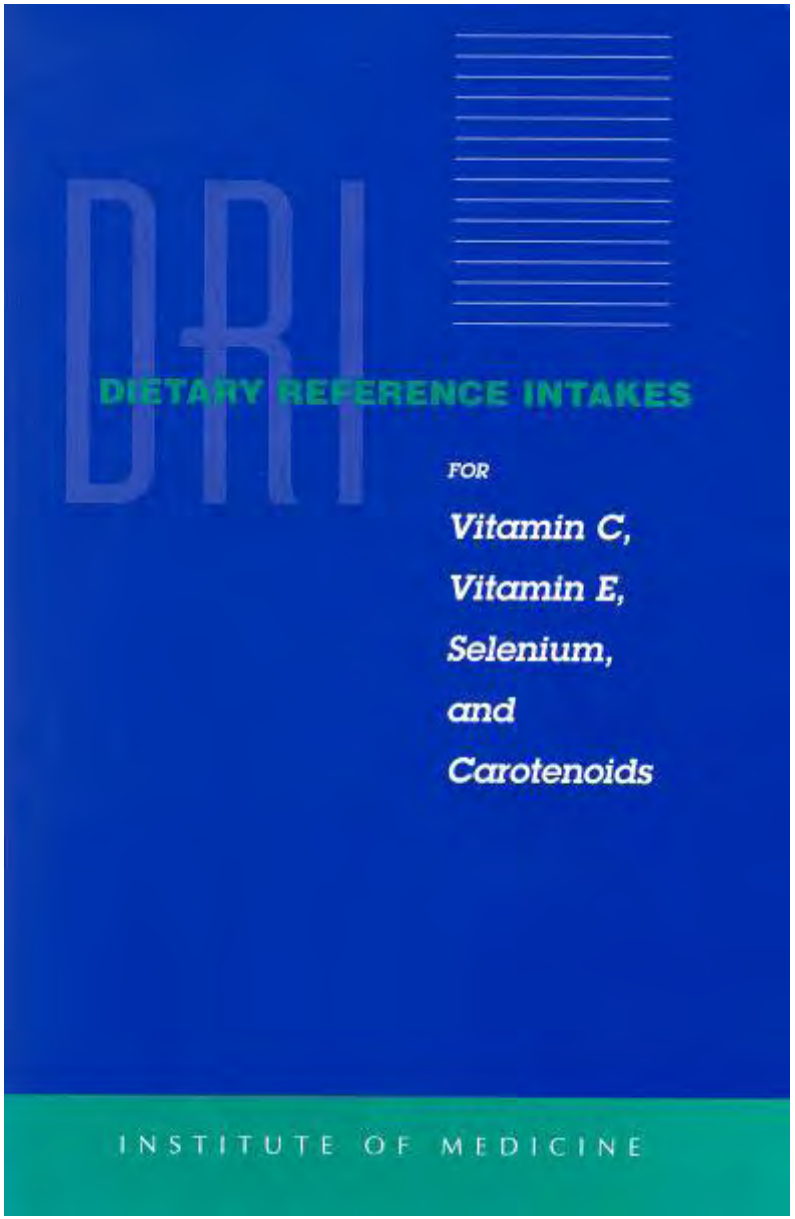
SYNOPSIS

Current public health recommendations in most developed countries are to reduce salt intake by about half, i.e. from approximately 10 grams per day to 5 grams per day. Our pooled analysis of randomised trials of 4 weeks or more in duration showed that reduction in salt intake lowers blood pressure both in individuals with elevated blood pressure and in those with normal blood pressure. These results support other evidence for a modest and long term reduction in population salt intake. If this occured it would result in a lower population blood pressure, and presumably a reduction in strokes, heart attacks and heart failure. Furthermore, our study is consistent with the fact that the lower the salt intake, the lower the blood pressure. The current recommendations to reduce salt intake to 5 grams per day will lower blood pressure, but a further reduction to 3 grams per day will lower blood pressure more.

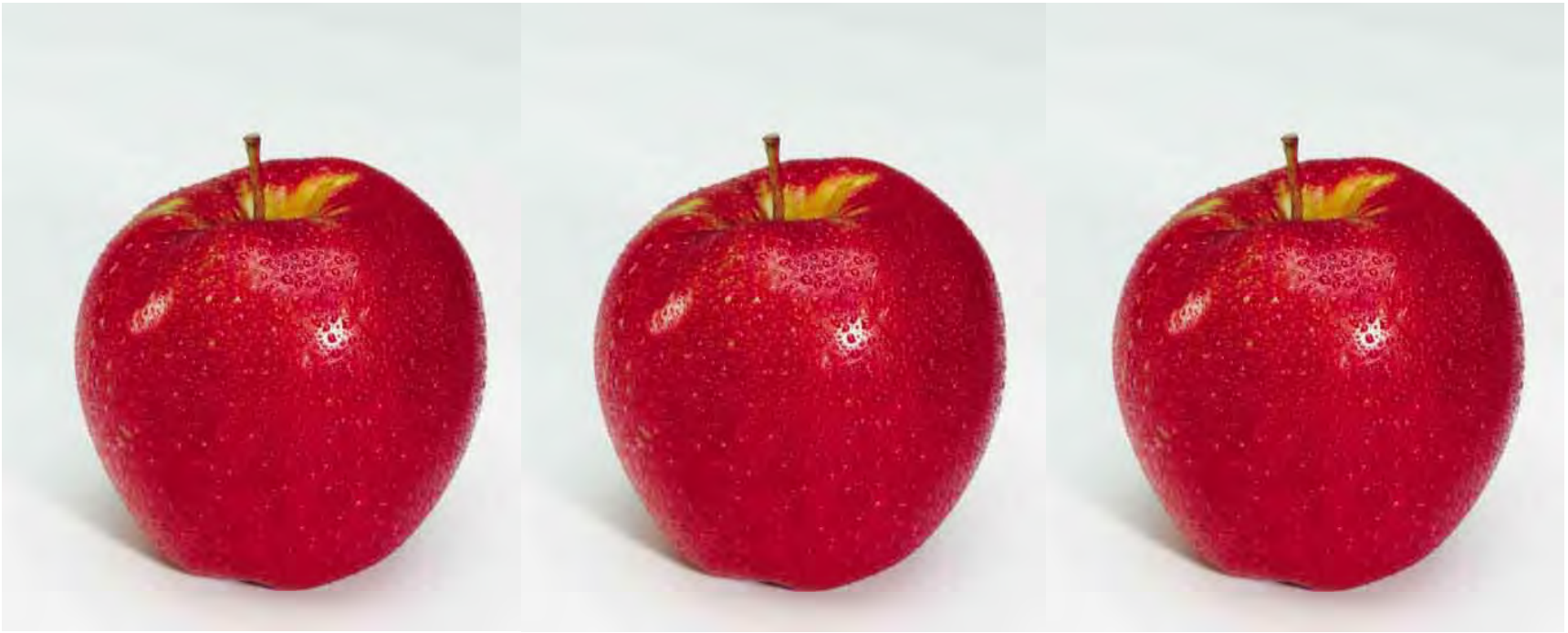
Basic considerations

- Nutrient profiles for foods with health claims only?
- Only „negative“ nutrients to consider in profiling?
- Nutrient profiles for foods in general (across-the-board) or for different food categories?
- Natural foods included or only processed foods?
- Individual nutrients, complex foods, meals?
- How to set the thresholds of the „negative“ nutrients?
- What will be used as the reference, e.g. per serving, per 100 g, per 100 kJ (kcal)?


D-A-CH
DGE
ÖGE
Referenzwerte für die Nährstoffzufuhr
1. Auflage
Deutsche Gesellschaft für Ernährung
Österreichische Gesellschaft für Ernährung
Schweizerische Gesellschaft für Ernährungsforschung
Schweizerische Vereinigung für Ernährung
UMSCHAU : BRAUS


DRI
DIETARY REFERENCE INTAKES
FOR
Vitamin C,
Vitamin E,
Selenium,
and
Carotenoids
INSTITUTE OF MEDICINE

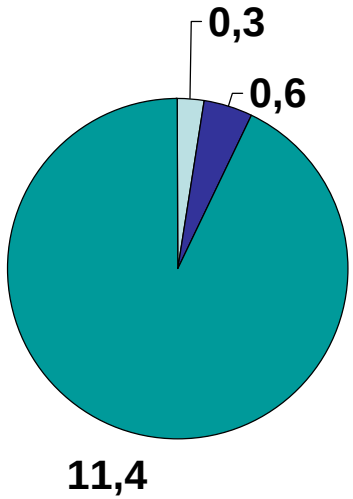
Energy density



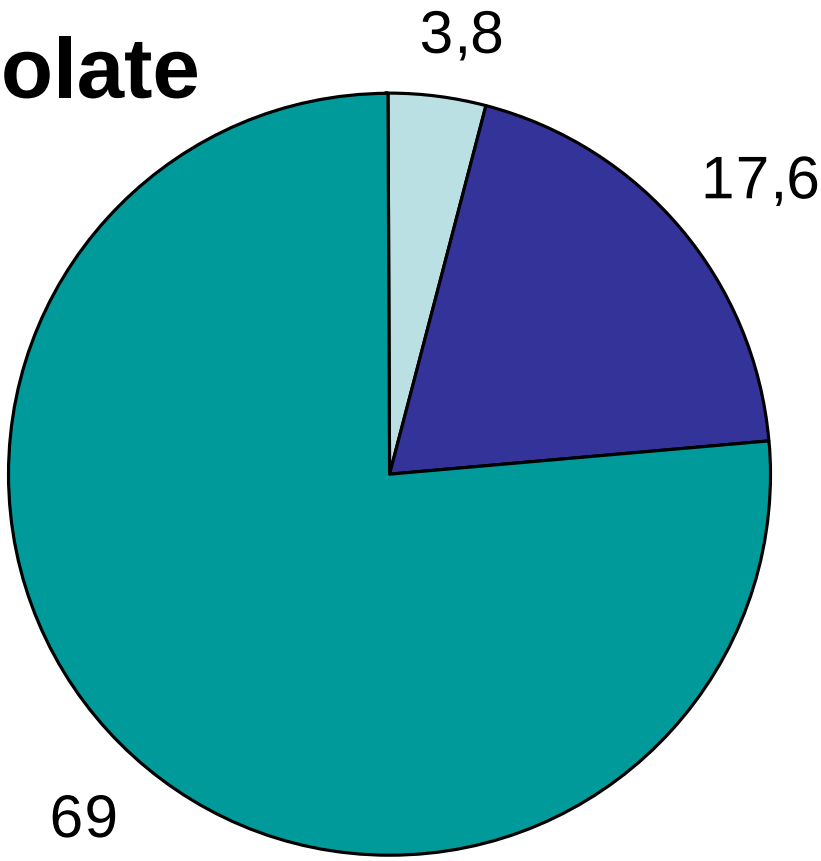
equal to

Comparison of energy content and the nutrient profile [100 g]

Apple



Chocolate bar



Protein Fat Carbohydrate

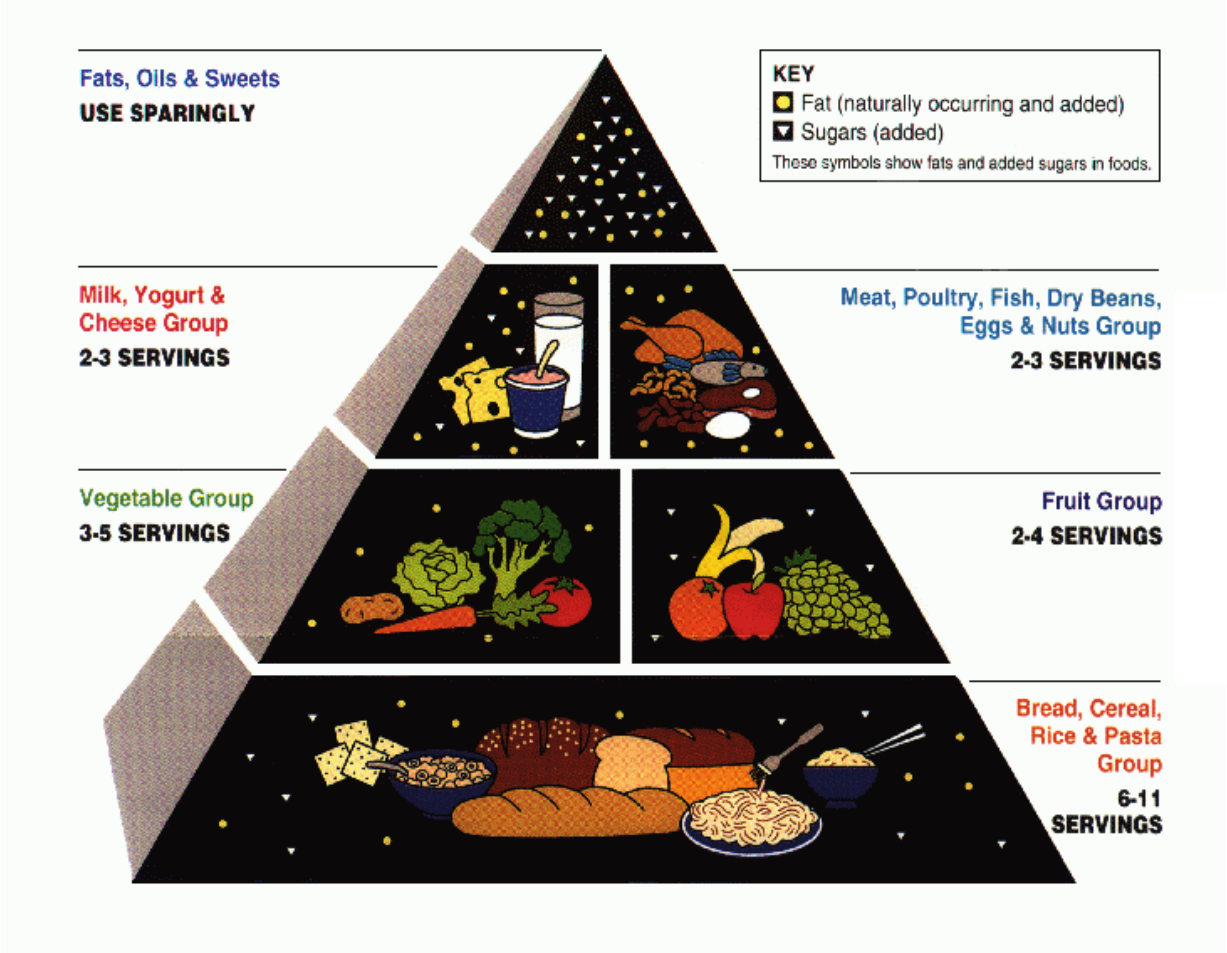
Energy **54 kcal** **449 kcal**

Food-based dietary guidelines

- Depicted food categories partly depend on the traditional use of foods (e.g. olive oil in the mediteranean diet)
- Differences in scientific judgement of food categories and their impact on health
- Food categories defined very broadly, e.g. only a few categories are considered
- Emphasis on natural foods, processed foods are not addressed in detail

US-Dietary Guidelines

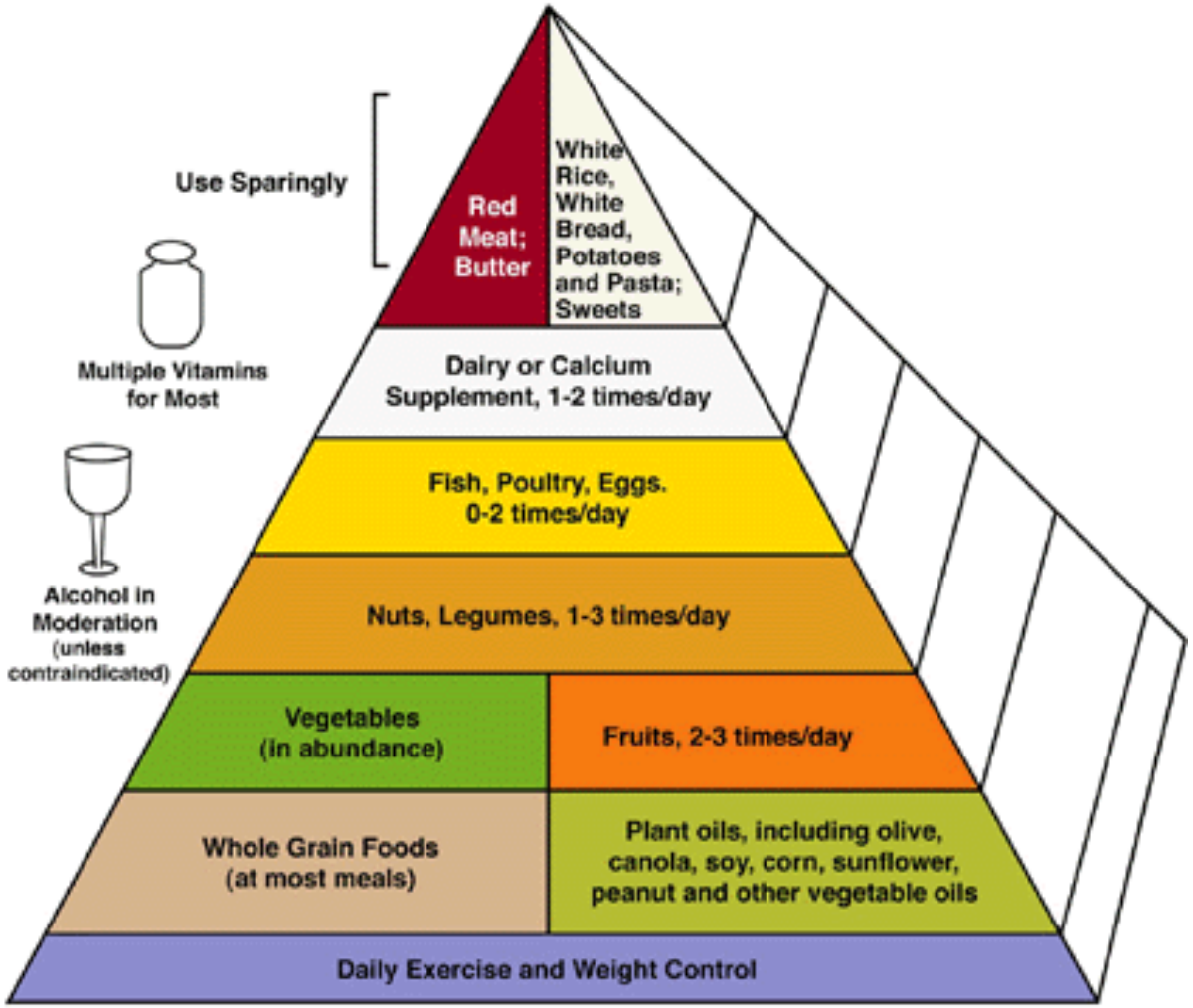
Old



New

Healthy Eating Pyramid

W. Willet, Harvard School of Public Health

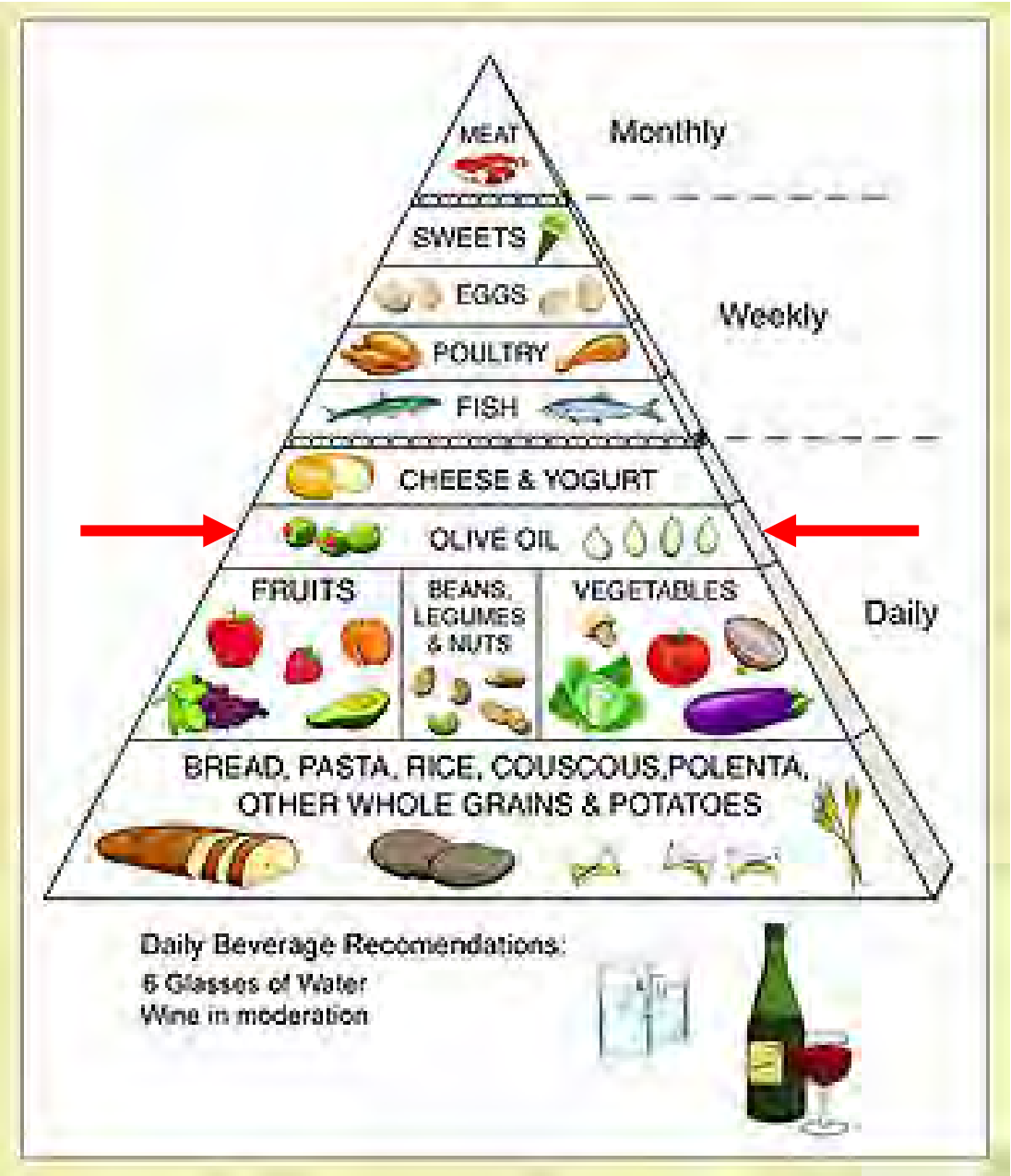


The use of glycaemic index tables to predict glycaemic index of composite breakfast meals.

Flint A, Moller BK, Raben A, Pedersen D, Tetens I, Holst JJ, Astrup A.

Department of Human Nutrition, Centre for Advanced Food Studies, The Royal Veterinary and Agricultural University, DK-1958 Frederiksberg C, Denmark. afl@kvl.dk

The applicability of the glycaemic index (GI) in the context of mixed meals and diets is still debatable. The objective of the present study was to investigate the predictability of measured GI in composite breakfast meals when calculated from table values, and to develop prediction equations using meal components. Furthermore, we aimed to study the relationship between GI and insulinaemic index (II). The study was a randomised cross-over meal test including twenty-eight healthy young men. Thirteen breakfast meals and a reference meal were tested. All meals contained 50 g available carbohydrate, but differed considerably in energy and macronutrient composition. Venous blood was sampled for 2 h and analysed for glucose and insulin. Prediction equations were made by regression analysis. **No association was found between predicted and measured GI**. The meal content of energy and fat was inversely associated with GI (R(2) 0.93 and 0.88, respectively; P<0.001). Carbohydrate content (expressed as percentage of energy) was positively related to GI (R(2) 0.80; P<0.001). Using multivariate analysis the GI of meals was best predicted by fat and protein contents (R(2) 0.93; P<0.001). There was no association between GI and II. In conclusion, the present results show that the GI of mixed meals calculated by table values does not predict the measured GI and furthermore that carbohydrates do not play the most important role for GI in mixed breakfast meals. Our prediction models show that **the GI of mixed meals is more strongly correlated either with fat and protein content, or with energy content, than with carbohydrate content alone**. Furthermore, GI was not correlated with II.


MEAT
Monthly
SWEETS
EGGS
Weekly
POULTRY
FISH
CHEESE & YOGURT
OLIVE OIL
FRUITS
BEANS, LEGUMES & NUTS
VEGETABLES
Daily
BREAD, PASTA, RICE, COUSCOUS,POLENTA, OTHER WHOLE GRAINS & POTATOES
Daily Beverage Recomendations:
6 Glasses of Water
Wine in moderation

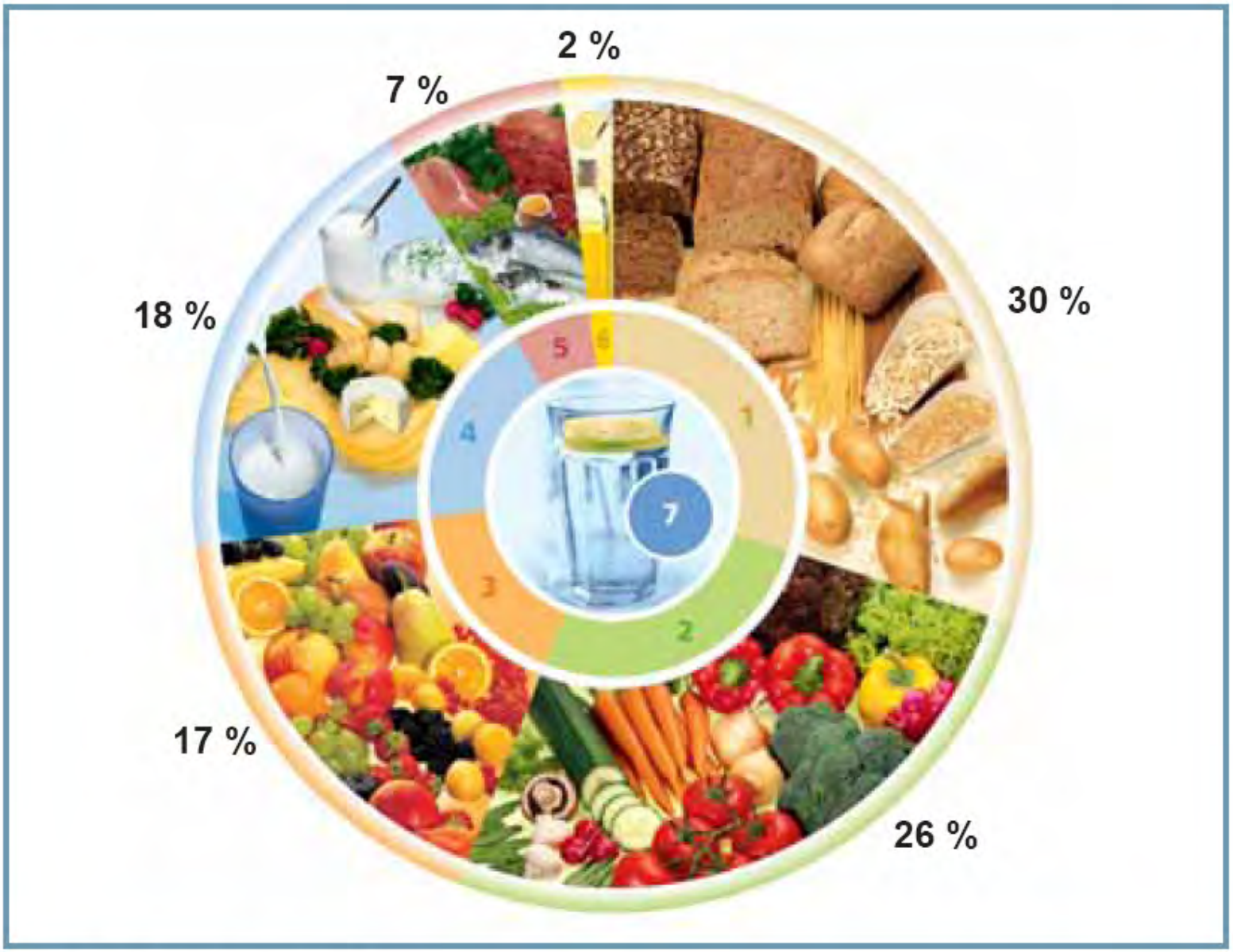


Abb. 1: DGE-Ernährungskreis

Food based dietary guidelines and health claims for foods

- Food based dietary guidelines (e.g. food guide pyramid) are depicting a few food categories and place the emphasis on the context of a healthy dietary pattern
- Health claims will be used for individual foods either in a generic way (functional claims) or even a product specific way (reduction of disease risk claims)

Nutrition Profiling is currently being used or proposed to be used in many different ways

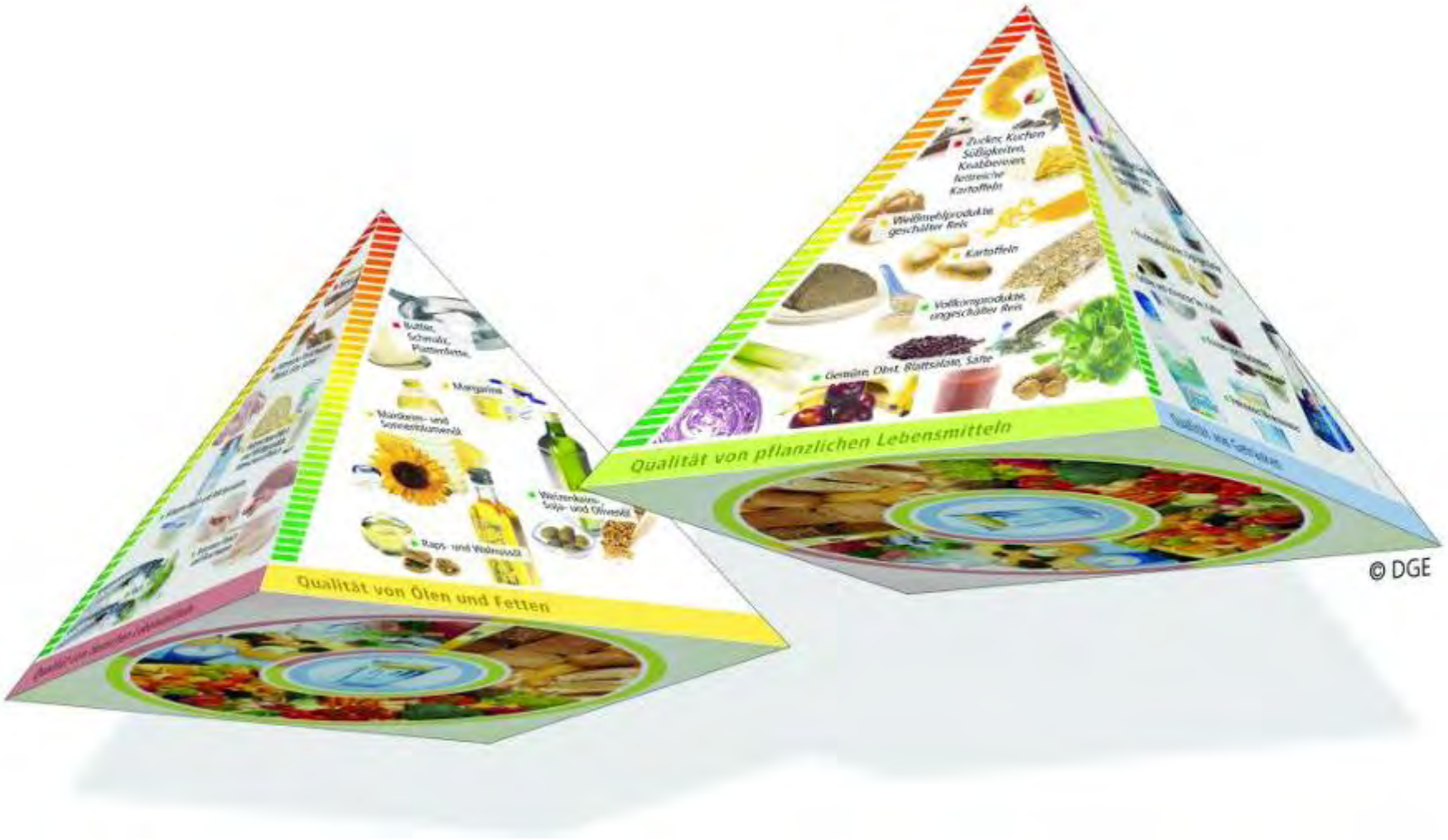
Organization	Criteria	Applied to:
American Heart Association (US)	*Threshold: Fat, sat. Fat, Cholesterol, Sodium, 10% DV of Vit. A/C, Ca, Fe, Fiber, Protein*	No differentiation
Nat. Heart Foundation (AUS)	*Threshold: Energy, Fat, sat. Fat, Sodium, added Sugar, Fiber*	60 Categories
Nat. Food Administration (SWE)	*Threshold: category specific…* *Low Fat, sat. Fat, Sugar, Sodium, high Fiber*	26 Categories
H & S Foundation (CAN)	*Threshold: category specific criteria, low Fat, low Sugar, lean Meat etc.*	32 Categories
Borden Center for Nutrition (US)	*Scoring: Energy, Fat, sat. Fat, Sugar, Protein, Fiber, Ca, Fe, Vit. A, Vit. C*	Categories/Snacks
Food Standards Agency (UK)	*Scoring: Energy, sat. Fat, NME Sugars, Sodium, Ca, Fe, n-3-PUFAs, Fruits and Vegetables*	No differentiation
Pepsi	*Threshold: Fat, sat. Fat, Cholesterol, added Sugar*	Categories
Kraft Foods	*Threshold: Energy, Fat, sat./trans Fat, Cholesterol, Sodium, added Sugar*	35 Categories

Do nutrient profiles for foods with health claims make sense in a total dietary context?

What is the contribution of foods bearing health claims to the overall intake of nutrients and is the nutritional profile of the daily (weekly) intake significantly changed to affect health?

Do nutrient profiles make sense for comparisons within or between different food categories, respectively?

“Nutrient profiling” in the food guide pyramid of the German Nutrition Society




© DGE

EU Regulation on Nutrition and Health Claims made on Foods

The nutrient profiles for food and/or certain categories of food shall be established taking into account in particular:

- the quantities of certain nutrients and other substances contained in the food, such as fat, saturated fatty acids, trans-fatty acids, sugars and salt/sodium;
- the role and importance of the food (or of categories of food) and the contribution to the diet of the population in general or, as appropriate, of certain risk groups including children;
- the overall nutritional composition of the food and the presence of nutrients that have been scientifically recognised as having an effect on health.

The nutrient profiles shall be based on scientific knowledge about diet and nutrition, and their relation to health

Nutritional profiling schemes have been defined in order to

(1)help consumers to make reasoned food choice,

(2)identify products eligible for health claims,

(3)determine marketing programmes directed to kids and

(4)evaluate nutritional quality of food products.

Basic Rules in the EU-Regulation

- Nutrient profiling will only be applied to foods bearing claims
- Exemptions possible for nutrition claims, one disqualifying nutrient may exceed the allowed content (threshold) and still a nutrition claim can be made
- No such exemptions for health claims

Additional considerations

- In nutritional science a shift in paradigm is currently taking place by putting much more emphasis on the health effects of whole foods as opposed to the traditional way of investigating/considering the individual food components/nutrients present in that food.

- The combination of bioactive components in a food may have different (synergistic) health effects compared to the individual (additive) activity.

Nutrient profiling is the science of categorising foods according to their nutritional composition

M. Rayner, P. Scarborough, L. Stockley

FSA Final Report 2004

Are bioactive non-nutrients considered?

Factors to consider in nutrient profiling

- Amount of food consumed
- Frequency of consumption of the food
- Food in relation to other foods in the diet, e.g. dietary patterns
- Threshold or scoring systems applied
- Reference base
- Qualifying and disqualifying food components

Synthesis of the criteria to be eligible for health claims (FDA, US), across the board, with thresholds in quantity of nutrients per serving

Nutrient	Maximum amount* (disqualifying threshold)	Meaning
Total Fat	13 g	20% DRV
Saturated Fatty Acids	4 g	20% DRV
Cholesterol	60 mg	20% DRV
Sodium	480 mg	20% DRV
	Minimum amount* (qualifying threshold) for at least 1 out of the following 6 nutrients	
Vitamin A	500UI	10% DRV
Vitamin C	6 mg	10% DRV
Iron	1.8 mg	10% DRV
Calcium	100 mg	10% DRV
Protein	5 g	10% DRV
Fibre	2.5 g	10% DRV

per serving, or for 50g in case of servings < 30g
* source : Reference Daily Intakes (RDI) and Daily Reference Values (DRV) in FDA site

- Will natural foods be able to carry health claims?

- Are beneficial food components (naturally present: e.g. dietary fiber, n-3 fatty acids or added: e.g. probiotic microorganisms, phytosterols) considered in the “nutrient” profile?


Emmi
Benecol

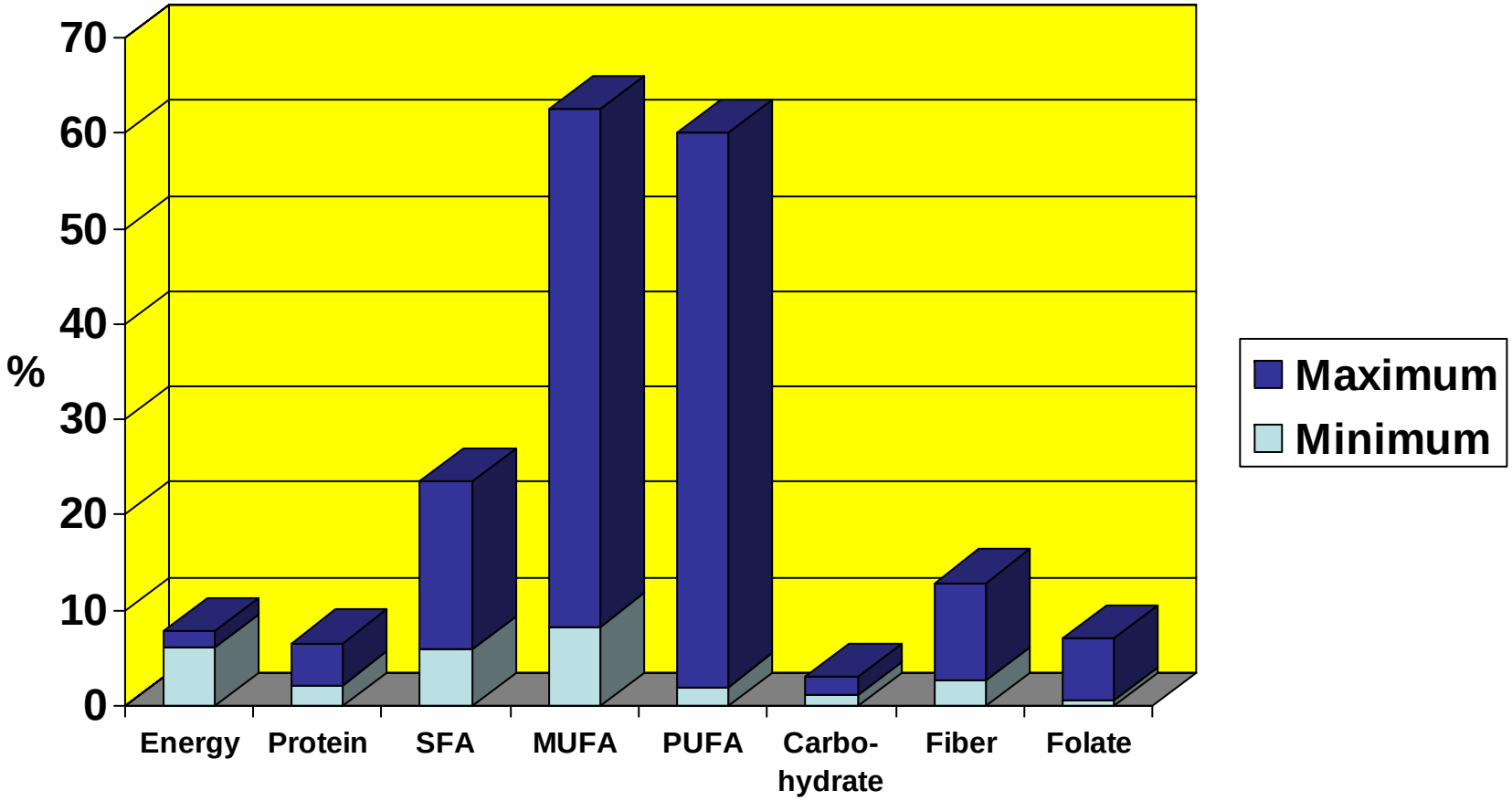

3 x täglich Gesundheit,
die schmeckt!
Becel
NEU
pro-activ
1 Portion = 1 Glas Becel pro-activ Diätgetränk aus 99 % fettarmer Milch (250 ml)
NEU
1 Portion = 1 Becher Becel pro-activ Diät-Joghurterzeugnis (125 g)
1 Portion = 1-2 mit Becel pro-activ Diät-Halbfettmargarine bestrichene Scheiben Brot (10 g)
Becel - nimmt sich Ihre Gesundheit zu Herzen!

FDA APPROVES THE FIRST QUALIFIED HEALTH CLAIM - TREE NUTS AND HEART DISEASE PREVENTION TAKES THE LEAD

DAVIS, CA, July 15, 2003 – The U.S. Food and Drug Administration (FDA) has just approved the first qualified health claim for a food for immediate use on package labels. The claim states,

"Scientific evidence suggests but does not prove that eating 1.5 ounces per day of most nuts, as part of a diet low in saturated fat and cholesterol, may reduce the risk of heart disease. " This FDA announcement comes in response to a petition filed by the International Tree Nut Council Nutrition Research & Education Foundation (INC NREF) in August 2002.

% Contribution of 1 Portion of Nuts (25 g) to USDA Nutrient Requirements (2000 kcal)



Food Category System	'Across the Board' System
Strengths	
•Helps the consumer to make choices within food categories •Does not, in principle, exclude any food categories from making claims •Addresses intrinsic differences between food products •Drives reformulation within a food category e.g. incentive to reduce fat in a food product •Keeps with the principle of dieticians that all foods can be part of a balanced diet •Addresses to some extent the issue of serving size / consumption making comparisons between foods more reasonable	•Simple to establish and execute •Does not require judgment for categorisation •Some food categories considered to be less healthy would be excluded from claims •Could theoretically drive people to choose healthier alternatives from different food categories
Weaknesses	
•Complex to define food categories, regional differences, etc. •Difficult to manage food categories over time •Difficult to deal with borderline products	•Could hypothetically lead to a situation where some foods are excluded from the diet (e.g. cheese, oil etc.) •Does not give incentive to producers to reformulate negative nutrients as goals may not be reachable •Could hypothetically lead to a situation where all foods have similar composition •Uses the same measure for products which are intrinsically different

Nutritional Characterisation of Foods: Science-based Approach to Nutrient Profiling
Summary Report of a ILSI Europe Workshop held in April 2006
Inge Tetens, Regina Oberdörfer, Carina Madsen, Jan de Vries

Possible Food Categories
•Biological basis (e.g. meat, cereals, milk etc.)
•Food guide, pyramid or vitamin/mineral/trace element rich etc.
•Natural vs. processed or at specific stages along the food chain. Simple for agricultural level, but gets more complex with processing
•Target group/user group defined (i.e. children, adults, athletes)
•Meal types or preferred use (e.g. snack food, breakfast food, spreads)
•Meal situation (e.g. social context) or eating occasion
•According to claim (e.g. nutrient content, health claims, disease risk reduction such as reducing the risk of osteoporosis etc.)
•According to consumer understanding (e.g. role of diet and individual foods for well-being and health)
•Simple foods (e.g. sugar) vs. complex foods

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Reference amount	PROs	CONs
100 g / 100ml	•Easy comparison for foods of same food category •Consistency with existing legislation for labelling & claims •Simplicity for regulator and industry •Real comparison for industry •100 g is internationally accepted basis for claims 'across the board' by Codex Alimentarius, but in USA the reference value is per serving	•Foods can be consumed in (very) different amounts (How important is this for claims and on a food category basis or 'across the board'?) •Difficult to understand for consumers •Does not take into account energy content •Does not take into account health recommendations
100 kcal/kJ	•Relates to some nutrition recommendations, e.g. for dietary fibre •'Across the board', applies to all products except low calorie products? Debatable why this is a 'pro' when per 100 g is a 'con'. •PARNUTS legislation •Reference daily energy needed for different age groups, gender, individuals etc.	•Difficult to understand for consumer (Calculation)

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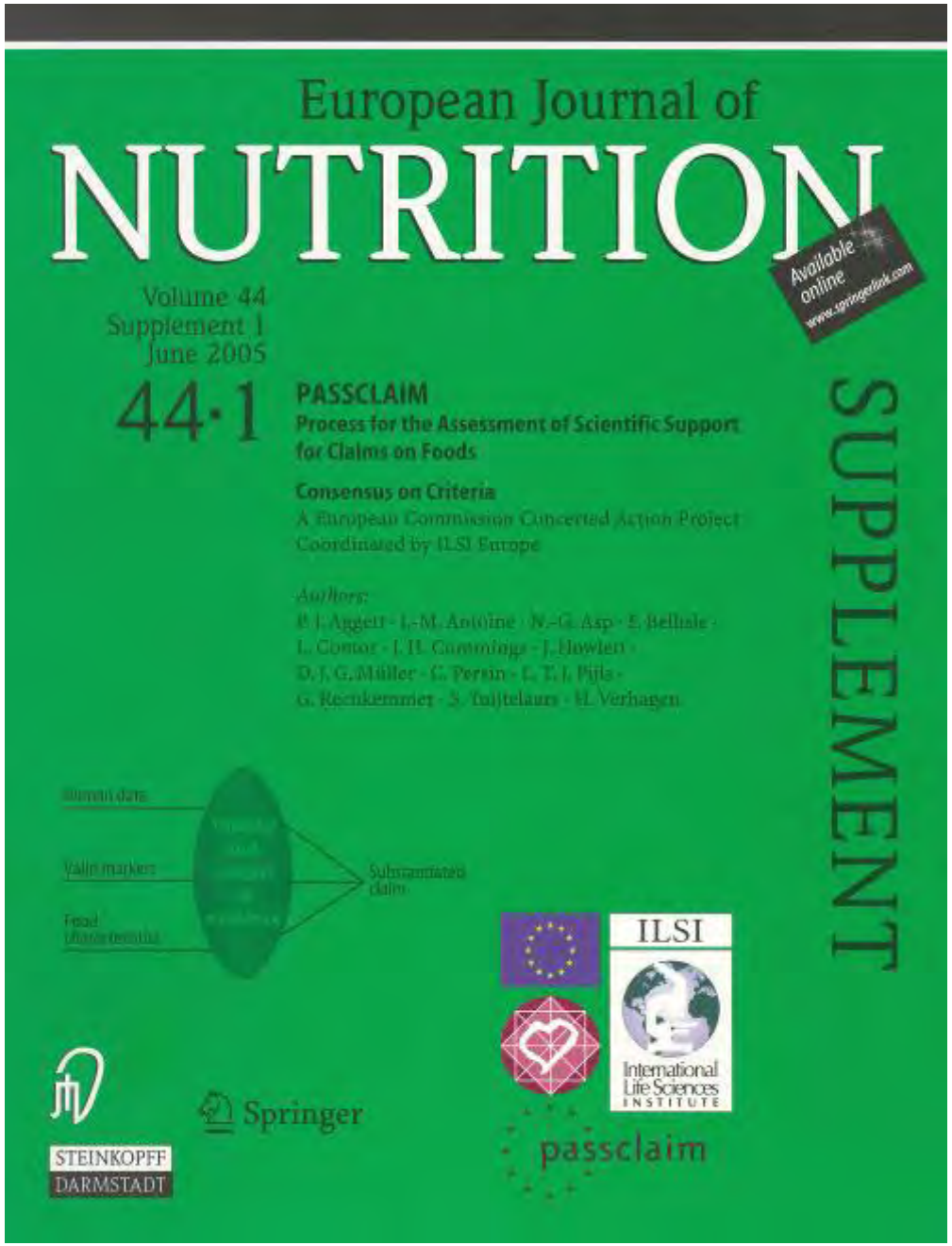
European Journal of
NUTRITION
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Volume 44
Supplement 1
June 2005
44·1
PASSCLAIM
Process for the Assessment of Scientific Support for Claims on Foods
Consensus on Criteria
A European Commission Concerted Action Project
Coordinated by ILSI Europe
Authors:
P. J. Aggett · L.-M. Antoine · N.-G. Asp · E. Bellisle · L. Contor · J. H. Cummings · J. Howlett · D. J. G. Müller · G. Persin · L. T. J. Pijls · G. Rechkemmer · S. Tuijtelaars · H. Verhagen
SUPPLEMENT
Springer
ILSI
International Life Sciences INSTITUTE
passclaim
STEINKOPFF
DARMSTADT

The criteria:

- emphasise the need for direct evidence of benefit to humans in circumstances consistent with the likely use of the food in order for a case to be made;
- recognise the usefulness of markers of intermediate effects when ideal endpoints are not accessible to measurement;
- stress the importance of using only those markers which are of proven validity; and
- highlight the necessity of ensuring that the magnitude and character of effects on which claims are based are statistically and biologically meaningful.

Criterion 2. Substantiation of a claim should be based on human data, primarily from intervention studies the design of which should include the following considerations:

- 2 (a) Study groups that are representative of the target group.
- 2 (b) Appropriate controls.
- 2 (c) An adequate duration of exposure and follow up to demonstrate the intended effect.
- 2 (d) Characterisation of the study groups' background diet and other relevant aspects of lifestyle.
- 2 (e) An amount of the food or food component consistent with its intended pattern of consumption.
- 2 (f) The influence of the food matrix and dietary context on the functional effect of the component.
- 2 (g) Monitoring of subjects' compliance concerning intake of food or food component under test.
- 2 (h) The statistical power to test the hypothesis.

Dietary Supplements

Legally defined as foods

Does nutrient profiling apply to supplements?

Does enforcing nutrient profiling discourage consumers to eat healthy foods and increase the consumption of dietary supplements, respectively?

Thank you for your attention!

Fig. 4 Relationship between health claims addressed by PASSCLAIM and the FUFOSE concept of underlying scientific evidence