Controversies in Nutrition: Separating Facts from Fads and Fallacies

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Introduction

• It is becoming increasingly fashionable that at the beginning of every year we make new resolutions to improve our health.

• We are bombarded with publications of diet books that claim to promote health and reduce diseases.
Introduction

• This makes it necessary for us to take a close look at what we eat and make informed choices if we are to be able to achieve our goals.

• By informing people of the scientific basis of nutrition, irrational beliefs in food faddism and fallacies are dispelled.
Faddism/fallacy

• Food faddism is a food practice based upon an exaggerated belief in the effect of food on health and disease.

• Exaggerated beneficial impacts without sound scientific basis
Fallacy

• Food fallacy is basically a myth about food. They are not true.
• It is a wrong opinion about the consumption certain foods
• Diet myth is advice that becomes popular without scientific (l) facts to back it up.
Fads /fallacies

• When it comes to weight loss, many popular beliefs are myth and others are only partly true and this is becoming worrisome

• Here are some examples
Hot bread is hard to digest

This is another fallacy
The fact is that if the bread is thoroughly baked.
It is well digested whether hot or cold. A soggy dough in bread or biscuit will not be digested and may cause gas or cramps,
Low-fat means no calorie

- This is a fad The fact is: a no-fat is often lower in calories than the same portion-size of the full fat product.
- However, many low-fat or no-fat foods have added sugar, flour, starch thickeners and salt to improve flavour and texture for the reduction in fat.
Low fat means no calories

- These "wonder" foods often have just as many calories, or more, than the regular version because these ingredients add calories. It has no advantage on weight or disease prevention.

- TIP Check the nutrition label to see how many calories are in a serving.
Eating at night will make you fat

This is a myth. The fact is: People who eat late at night do tend to put on extra weight.

One possible reason is that late-night eaters tend to choose high-calorie treats.

Some people who snack after dinner do not sleep well, which can lead to unhealthy cravings the next day.

Eating and sleeping provides no room for expenditure
Eating at night

• **TIP:** If you are hungry after dinner, limit yourself to healthy snacks such as low-fat yogurt
• or baby carrots
• or garden eggs.
• Or cucumber
Skimmed milk

• There is this fallacy that skimmed milk is worthless
• The fact is that when cream is removed from milk,
  • the fat content is reduced,
  • flavour is changed, and
• there is loss of vitamin A, however, skimmed milk is still rich in sugar which gives energy.
Skimmed milk

- Rich in protein for muscle building, minerals such as calcium and phosphorus for bones and teeth, and
- vit B1 and B2 needed for the metabolism of carbohydrate and a pellagra preventing vitamin.
Meat is bad for your health

• There is no basis for this belief. Eating lean meat in small amounts can be part of a healthy weight-loss plan.

• Red meat, pork, chicken and fish contain cholesterol and saturated fat though in varying proportion.

• However, they also contain proteins, iron and zinc.
Meat is bad for your health

- **TIP** it is better to select cuts of meat low in fat and also trim all visible fat and pay attention to portion size.
- Replacing red and processed meat with nuts, beans, fish or poultry (without the skin)
- seems to lower risk of heart disease and diabetes
Too much protein is bad for bones and kidney

- It is true that eating protein increases calcium excretion from the bones in the short term,
- but the long term studies actually show the opposite effect
- High level of animal protein associated with lower risk decline in functional capacity in elderly adults
Too much protein is bad......

• However, bottom Line:
• Eating a high protein diet is associated with improved bone health and a lower risk of fracture.
• High protein also lowers blood pressure and improves diabetes symptoms,
• Lowers the risk of kidney failure in normal adults
Confused by healthy diet advice? Doctors offer their verdicts on everything from booze to butter

Dr Saleyha Ahsan and Dr Michael Mosley want to help you get your head around the baffling diet advice out there
Eggs are bad for you.

**FACTS:** Egg happens to contain a large amount of cholesterol and therefore considered to increase the risk of heart disease.

• Some researches are questioning this assertion

• However, exogenous cholesterol from eggs or beef can affect total cholesterol and thus increase rate of heart disease (American Heart Foundation)
Eggs are bad for you contd

• Eggs contain unique antioxidants that are good for the eye and sterols can increase good cholesterol, (4,5)

• Despite this wide spread enthusiasm individuals prone to cardiovascular diseases are advised to be seriously limit intake to three eggs a week (6)
Eggs are bad for you contd

• Giving eggs to a child will not make him steal. This is pure fallacy.
• Children need the goodness in eggs for proper growth and development.
• The egg yolk is a very good source of vitamin A
Associations of egg and cholesterol intakes with carotid intima-media thickness and risk of incident coronary artery disease according to apolipoprotein E phenotype in men: the Kuopio Ischaemic Heart Disease Risk Factor Study\textsuperscript{1,2}

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Associations of egg and cholesterol intakes with carotid intima-media thickness and risk of incident coronary artery disease according to apolipoprotein E phenotype in men: the Kuopio Ischaemic Heart Disease Risk Factor Study

Jyrki K Virtanen, Jaakko Mursu, Heli EK Virtanen, Mikael Fogelholm, Jukka T Salonen, Timo T Koskinen, Sari Voutilainen, and Tomi-Pekka Tuomainen

Frequencies of the ApoE phenotypes among 1032 men from the KIHD

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<th>Proportion, %</th>
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1ApoE, apolipoprotein E; KIHD, Kuopio Ischaemic Heart Disease Risk Factor Study.

From this study

Egg or cholesterol intakes were not associated with increased CAD risk in this particular study

However other studies say otherwise.
Panel's Conclusions

Elevated blood cholesterol level is a major cause of coronary artery disease.

It has been established beyond a reasonable doubt that lowering definitely elevated blood cholesterol levels (specifically blood levels of low-density lipoprotein cholesterol) will reduce the risk of heart attacks due to coronary heart disease.
The Fat War

• There so much controversy surrounding how fat may affect our health.

• While some researchers report no evidence of that low consumption of total saturated fats and high consumption of PUFAs affected relative risks.
Fat wars

• However, a publication in Circulation (2017) says that lowering intake of saturated fat coupled with higher intake and PUFAs and monosaturated fat would reduce cardiovascular disease by about 30%
Fat war

- Others found no evidence that lowering intake of total saturated fats and high consumption of PUFAs affected relative risks for coronary artery disease, or with type 2 diabetes (29, 30.).
- so what do I eat now
Eating foods that contain saturated fats raises the level of cholesterol in your blood. High levels of LDL cholesterol in your blood increase your risk of heart disease and stroke. (American Heart Foundation). AHA recommends that only 5-6% of fat intake should come from saturated fats.
Fish consumption, fish oils, and cardiovascular events: still waiting for definitive evidence

Paul M Ridker*

Center for Cardiovascular Disease Prevention, Brigham and Women’s Hospital, Harvard Medical School, Boston, MA
Fish consumption, fish oils, and cardiovascular events: still waiting for definitive evidence

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✓ SUGGESTED BENEFITS
✓ potential for beneficial effects on.
✓ Platelet Activity,
✓ Blood Pressure,
✓ Arrhythmia Thresholds,
✓ Endothelial Function,
✓ Lipid Concentrations, and
✓ Immune Modulation.
Fish consumption, fish oils, and cardiovascular events: still waiting for definitive evidence

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Japan Eicosapentaenoic Acid Lipid Intervention Study (JELIS) Study
Sample Size: 18,645 statin-treated patients
Treatment: 1800 mg EPA was compared with placebo
Outcome: no benefit on sudden death or coronary death was observed
REASONS FOR NULL TRIAL DATA

Secondary factor associated with fish consumption

Unique genetic signature in persons

Incorrect combinations of active agents

Bioavailability of different commercial fish-oil preparations

Insufficient doses
Controversies in omega-3 efficacy and novel concepts for application

J.E. Radcliffe a,1, J. Thomas b,1, A.L. Bramley a, A. Kouris-Blazos a, B.E. Radford a, A.B. Scholey b, A. Pipingas c, C.J. Thomas a, C. Itsiopoulos a,*

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Food with unsaturated fats
ORIGINAL HYPOTHESIS: CVD protection is based on a high LCn3 containing diet (namely a high marine fat diet):

Clinical trials since have focused on EPA and DHA supplementation

RESULTS of repeated meta-analyses give conflicting results.
Higher consumption of unsaturated fats linked with lower mortality

• Consuming higher amounts of unsaturated fat was associated with lower mortality, according to a study from Harvard T.H. Chan School of Public Health.

• In a large study population followed for more than three decades, researchers found that higher consumption of saturated and trans fats was linked with higher mortality compared with the same number of calories from carbohydrates.
Controversies in omega-3 efficacy and novel concepts for application


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DIET vs SUPPLEMENT?
Controversies in omega-3 efficacy and novel concepts for application

J.E. Radcliffe a,1, J. Thomas b,1, A.L. Bramley a, A. Kouris-Blazos a, B.E. Radford a, A.B. Scholey c, A. Pipingas c, C.J. Thomas b, C. Itsiopoulos a,*

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DIET vs SUPPLEMENT?

VARIETY IS KEY
Review

A review on antioxidants, prooxidants and related controversy: Natural and synthetic compounds, screening and analysis methodologies and future perspectives

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Antioxidant supplements

• Due to the evidence that fruits and vegetables and seed contain antioxidants that protect against heart diseases, cancers and other chronic diseases, and aging process
• Supplementary industries promote the benefits of antioxidant supplements.
• However, antioxidant supplementation research has reported either neutral or negative results
Review Article

Clinical trials of antioxidants as cancer prevention agents: Past, present, and future

Michael Goodman a,b,⁎, Roberd M. Bostick a,b, Omer Kucuk b,c, Dean P. Jones c

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b Winship Cancer Institute, Atlanta, GA, USA
c Emory University School of Medicine, Atlanta, GA 30322, USA
Review Article

Actions of “antioxidants” in the protection against atherosclerosis

Maria E. Lönn a, Joanne M. Dennis a, Roland Stocker b,∗

a Centre for Vascular Research, School of Medical Sciences (Pathology), and Bosch Institute, Sydney Medical School, University of Sydney, Sydney, NSW 2006, Australia
b Victor Chang Cardiac Research Institute, Darlinghurst, NSW 2010, Australia
Figure: Broad scope of antioxidants

- **Enzymatic**
  - Superoxide dismutase
  - Catalase
  - Glutathione peroxidase

- **Non-enzymatic**
  - Antioxidant enzyme cofactors (Se, Coenzyme Q₁₀)
  - Oxidative enzyme inhibitors (aspirin, ibuprofen)
  - Transition metal chelators (EDTA)
  - Radical scavengers (vitamin C and E)

- **Biological**
- **Dietary**
- **Chemical**
The Chemistry behind Antioxidant Capacity Assays

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Food Science and Technology Program, Department of Chemistry, National University of Singapore, Singapore 117543, Singapore; Brunswick Laboratories, 6 Thatcher Lane, Wareham, Massachusetts 02571; and Arkansas Children’s Nutrition Center, Agricultural Research Service, U.S. Department of Agriculture, 1120 Marshall Street, Little Rock, Arkansas 72202

THE SELENIUM EXAMPLE
REVIEW

The Chemistry behind Antioxidant Capacity Assays

DEJIAN HUANG,*† BOXIN OU,§ AND RONALD L. PRIOR#

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FREE RADICAL SCAVENGERS
Review

Evaluating the antioxidant capacity of natural products: A review on chemical and cellular-based assays

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‘To nut or not to nut’

• Another myth is that nuts are fattening and should be avoided when dieting

• In small amounts, nuts can be part of a healthy dietary pattern associated with improvement in ASCDV risk factors.

• Nuts are high in fat and calories but also rich in proteins and minerals
Nuts contd

- but the fats in nuts are healthy and do not clog arteries.
- Nut also contain fiber, magnesium and copper, complex carbohydrates, phytosterols, and polyphenols
- Nut may substituted in iso-caloric amounts for foods that contain ‘empty calories’. Boiled nuts are preferable because they are more nutritious.

- **TIP**: due to its dense calorie content, nuts should be consumed in controlled amounts
- Nut may substituted in iso-caloric amounts for foods that contain ‘empty calories’.
- Boiled nuts are preferable.
Associations between nut consumption and inflammatory biomarkers 

Zhi Yu, Vasanti S Malik, NaNa Keum, Frank B Hu, Edward L Giovannucci, Meir J Stampfer, Walter C Willett, Charles S Fuchs, and Ying Bao

*Corresponding author.
Relative concentrations (95% CIs) of inflammatory biomarkers by frequency of nut consumption among participants in the NHS and HPFS$^1$

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<th>Fasting biomarker relative concentration</th>
<th>Frequency of nut consumption</th>
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Fruits before or After meals

• Myth : Fruit should be eaten on an empty stomach, if it is eaten with other foods it can cause fermentation and rot in the stomach, affecting digestion

• **Fact:** Fruit can be eaten at any time and it can be eaten along with other foods. The body produces digestive enzymes for protein, fat, and carbohydrates which help it digest mixed meals. Besides, since the stomach has a high concentration of hydrochloric acid, bacteria is killed before it is able to reproduce so fermentation cannot take place in the stomach.
Gluten-free diet has health benefits.

- This is another myth uninformed individuals are embracing for weight loss.
- Gluten is a composite storage protein stored with starch in the endosperm of wheat, barley, oat.
- The fact is for individuals without celiac disease should not worry.
Gluten free diet

• A gluten free diet reduces morbidity and mortality only for individuals with celiac disease
• There is no evidence that avoidance of gluten by healthy individuals will result in weight loss or that gluten promotes weight gain.
Gluten free diet

• Individuals with proven gluten related disorders should take gluten free diets containing fruits vegetables, legumes, seeds and low-fat dairy and healthy fats.

• For individuals without gluten related disorder, claims of health benefits are not substantiated.
Cold water and food intake

• It is going viral that cold water when taken while eating will prevent digestion by making the oil to congeal
• But we know that body temperature is about 37oC
• We are also conversant with DIT (diet induced thermogenesis)
• There is therefore no scientific basis for the cold water-fat congeal belief within the GIT
Sugar

• Myth: You will get diabetes if you indulge your sweet tooth

• Fact: If you don’t have diabetes you don’t have to worry about treating yourself to your favourite chocolate cake and ice cream now and then.

• Sugar won’t directly cause diabetes but consuming excess “empty” calories from these goodies can lead to obesity, an important risk factor for diabetes
Sugar is Unhealthy Because it Contains “Empty” Calories

• It is commonly believed that sugar is bad for you because it contains empty calories.

• The harmful effects of sugar go way beyond empty calories.

• Excess sugar wreaks havoc on our metabolism and sets us up for weight gain and many serious diseases.
Sugar-free drinks help weight loss

• Sugar sweetened drinks have been identified as one of the major causes of obesity
• Because it increases daily caloric intake
• Reduction in intake reduces blood sugar and cholesterol levels
Sugar-free soft drinks

• Therefore people tend to take sugar-free soft drinks to lose weight.
• However research shows drinks containing artificial sweeteners do not help weight loss
• possibly because people assume that they can eat more because their diet drinks are low in sugar
Sugar-free soft drinks

• It suggested that sugar intake and therefore weight loss can be tackled by intake of sugar free soft drinks.
• Research shows that such drinks are artificially sweetened.
• Artificially sweetened drinks in the long run may be associated with increased BMI, cardiometabolic disease risk, stroke and dementia.
Reduction in sugar intake advised but is honey better?

• Research has shown that daily intake of 50gm of carbohydrate
• from honey,
• sucrose for 14days
• had similar effect on measures of glycemic, lipid metabolism and inflammation.
• Both increased TG, concentrations
• Fructose found in honey is also in sucrose
• high fructose intake can have etiologic role in the epidemic of obesity, diabetes and cardiorenal disease
Skipping breakfast primes the brain to seek out fat
KETOCENIC DIETS: Any controversy?

Ketosis is different from ketoacidosis.
KETOGENIC DIETS: Clinical applications

- Epilepsy
- Obesity
- Glucose transporter defects and other inborn metabolic disorders
- Slowing the progression of amyotrophic lateral sclerosis
- Alzheimer’s disease
- Parkinson’s disease
- Autism
- Depression
- Polycystic ovary syndrome
- Type2 diabetes mellitus.
Recently, ketogenic diets have been studied as an adjuvant to cancer therapy in both animal models and human case reports.

Most cancer therapies are designed to take advantage of the metabolic and physiological differences that exist between cancer cells and normal cells. Compared to normal cells, cancer cells exhibit increased glucose metabolism as well as alterations in mitochondrial oxidative metabolism that are believed to be the result of chronic metabolic oxidative stress.

Ketogenic diets may act as an adjuvant cancer therapy by two different mechanisms that both increase the oxidative stress inside cancer cells.

Lipid metabolism limits the availability of glucose for glycolysis restricting the formation of pyruvate and glucose-6 phosphate which can enter the pentose phosphate pathway forming NADPH necessary for reducing hydroperoxides.
Review article

The role for ketogenic diets in epilepsy and status epilepticus in adults

Tanya J. Williams, Mackenzie C. Cervenka*

Department of Neurology, Johns Hopkins University School of Medicine, 600 North Wolfe Street, Meyer 2-147, Baltimore, MD, USA
Critical Review

Dietary carbohydrate restriction as the first approach in diabetes management: Critical review and evidence base
SUMMARY

✓ Eat lots of Fruits and Vegetables
✓ Reduce Salt Intake
✓ Exercise Regularly preferably outdoor
✓ Maintain a Healthy BMI
✓ Do not skip breakfast
✓ Have enough sleep
✓ Reduce stress both at home and in the office
✓ If so desire go keto
What about GMO foods?
What is a GMO?

"genetically modified organism (GMO)" defines an organism in which the genetic material has been altered in a way that does not occur naturally by mating and/or natural recombination.

Typically plant modifications.
Summary of data on GMO studies

• The field data represented more than 100 billion animals covering a period before 1996 when animal feed was 100% non-GMO, and after its introduction when it jumped to 90% and more.

• The documentation included the records of animals examined pre and post mortem, as ill cattle cannot be approved for meat.
GMO foods—What is the evidence?

• What did they find? That GM feed is safe and nutritionally equivalent to non-GMO feed. There was no indication of any unusual trends in the health of animals since 1996 when GMO crops were first harvested.

• Considering the size of the dataset, it can reasonably be said that the debate over the impact of GE feed on animal health is closed: there is zero extraordinary impact.
Final words

• Golden Rule:

• Do not criticize what you do not understand
  (Jude 1: 10; 2Peter 2: 10)

• Thanks for your attention