

... Some dietary myths dispelled ...



Will caffeinated drinks make you dehydrated? Should you limit egg consumption or avoid cooking vegetables? Can eating certain nutrients at certain times of the day help you lose weight? Fact is not always easy to distinguish from fiction.

Do caffeinated drinks have a dehydrating effect and increase fluid requirements?

Studies have shown that normally consumed amounts of caffeine in drinks such as tea, coffee and colas do not increase fluid loss. But caffeine has been reported to have a diuretic effect above 250 mg per day and it can therefore lead to increased water loss and possibly to body water deficit (this effect may be less pronounced in regular caffeine consumers). So, the water we get from caffeinated drinks can contribute to our total fluid when consumed in moderation. National authorities around Europe recommend a water intake from beverages of at least 1.2 litres (4-6 glasses) in adults. This is in addition to the water we get from food and our metabolism, to replace losses through urine, faeces, perspiration and the lungs.^{1,2}

Should you eat no more than three eggs per week?

High blood cholesterol levels are a known risk factor for coronary heart disease. This has led to the idea that egg yolks, which are rich in cholesterol (about 225 mg in a medium sized egg), must be bad for your heart. However, we make over 75% of the body's cholesterol ourselves, and the dietary cholesterol generally has very little effect on the level in the blood. While some people may respond to dietary cholesterol, saturated fat has a much greater effect on blood cholesterol, especially LDL-cholesterol, and eggs are low in saturated fat. Most health and heart advisory bodies in Europe and elsewhere no longer set a limit on the number of eggs consumed, provided they are eaten as part of an overall healthy balanced diet that is low in saturated fats.^{3,4}

Does cooking destroy all the goodness in vegetables?

Vitamin C and folic acid are water soluble and susceptible to oxidation, so much is lost when foods containing these vitamins, such as green vegetables, are cooked in large volumes of water which is discarded. This loss and that of other vitamins and minerals can be minimised if vegetables are not cut up, plunged straight into boiling water and served immediately, or better still are steamed or cooked with very little water in a microwave oven. However, other important constituents, such as fibre, lycopene in tomatoes and other antioxidants remain in the vegetables and may become more available to the body through cooking. Additionally, proper cooking increases the microbiological safety of foods and enhances their flavour.⁵⁻⁷

Can "chrono-nutrition" help you lose weight?

The concept of "chrono-nutrition" was developed by a French nutritionist in 1986. The theory behind it is that there is an ideal time for digesting the macronutrients protein, carbohydrates and fat. For example, foods containing proteins, fats and slowly digested carbohydrates (such as those from wholegrain and fibre-rich sources) should be eaten at breakfast and mainly protein containing foods at lunch. Macronutrients eaten outside the periods of optimal digestion will not be utilised but stored as fat, resulting in weight gain.

It is true that we all have a circadian rhythm, a biological clock linked to sunlight and temperature, which is reflected in small fluctuations through the day and night in the levels of various substances, such as hormones, in our bodies. However, whenever we eat proteins, fats or carbohydrates our body responds by increasing the production of all substances needed to digest and utilise them. Any weight loss experienced with this diet is likely due to the reduction of calorie intake that tends to occur when individual meals are restricted to certain food items.^{8,9}

References

1. Scientific Opinion of the Panel on Dietetic Products, Nutrition and Allergies on a request from the EC on dietary reference values for water. The EFSA Journal (200x) xxx, 1-49. Available at: http://www.efsa.europa.eu/cs/BlobServer/DocumentSet/nda_op_drv_water_draft_en_released_for_consultation.pdf?ssbinary=true
2. Maughan RJ and Griffin J (2003) Caffeine ingestion and fluid balance: a review. *Journal of Human Nutrition and Dietetics* 16:411-420
3. Gray J and Griffin B (2009) Eggs and dietary cholesterol – dispelling the myth. *British Nutrition Foundation Nutrition Bulletin* 34:66-70
4. European Heart Network (2002) Food, Nutrition and Cardiovascular Disease Prevention in the European Region: Challenges for the New Millennium. www.ehnheart.org/content/itemPublication.asp?docid=4518&level10=1455&level1=1499
5. Food Standards Agency (2008) *The Manual of Nutrition*, 11th ed. UK
6. Miglio C et al (2008) Effects of different cooking methods on Nutritional and physicochemical characteristics of selected vegetables. *Journal of Agriculture and Food Chemistry* 56:139-47
7. Shi J and LeMaquer M (2000) Lycopene in tomatoes: chemical and physical properties affected by food processing. *Critical Reviews in Food Science and Nutrition* 40:1-42
8. Gibney MJ et al (eds) (2009) *Introduction to Human Nutrition*, 2nd ed. Oxford:Wiley-Blackwell
9. Waterhouse J et al (1997) Chronobiology and meal times: internal and external factors. *British Journal of Nutrition* 77:S29-38

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... Meat: a lot in a little ...



Fossil evidence indicates that humans have been eating meat for a very long time. Meat contains a wide variety of important nutrients, including high-quality protein, vitamin D, B vitamins, particularly vitamin B₁₂, as well as iron, zinc and selenium. Consumed in moderation, meat forms part of a healthy balanced diet.

Rich in nutrients

Protein

The protein in meat is high quality, containing a complete and well-balanced range of amino acids, the building blocks for growth. Protein is particularly important for children and teenagers, athletes and pregnant women, as well as older people, when recovering from surgery or illness.

Minerals – iron, zinc and selenium

Meat is a major source of iron, and in general, the redder the meat, the higher the iron content. Although iron is found in a number of foods, meat and seafood are the only sources of haem iron. This type of iron is absorbed by the body much more easily than the iron in vegetables and cereals. Iron is needed to produce healthy blood, carrying oxygen as part of haemoglobin to all parts of the body, including the brain and muscles. A lack of iron can cause tiredness, difficulty concentrating and a reduced ability to fight infection. It is still one of the most common nutritional deficiencies across Europe. Eating meat regularly is one way to help prevent iron deficiency.²

Like haem iron, zinc from meat is more available to the body than plant zinc, making meat a significant source of this mineral, and one of the most common in Europe. Zinc is needed for growth and reproduction as well as to fight infection and heal wounds.²

Meat is also an important source of selenium. The selenium content of soil determines how much is found in the pasture and grain on which animals are fed and, therefore, in meat. In our body, certain selenium-requiring proteins are involved in antioxidant defence and DNA repair.

Vitamin B₁₂

Meat contains a number of B vitamins, but vitamin B₁₂ is particularly important as it is only found, naturally, in animal foods (e.g. meat, milk and dairy products, eggs and seafood). Vitamin B₁₂ is needed to build our genetic material, DNA, so has many functions in the body, including the production of healthy blood and a well-functioning nervous system. Deficiency of this vitamin, which can cause neurological dysfunction, is becoming of increasing concern amongst older people due to a reduced rate of absorption as well as inadequate intake.

Fat

Meat fat is an important source of energy, some fat soluble vitamins and essential fatty acids. The type of fat found in meat is almost evenly split between saturated and monounsaturated. Small amounts of polyunsaturated fat may be found in meat, and these will be higher in meat from animals raised on pasture or given a specific diet, compared to those fed traditional grain. The overall fat content of meat has decreased over the years through breeding, feed changes and an increased level of trimming, before and after purchase. The use of low fat cooking methods, such as grilling, can add to this reduction. Trimmed of fat, lean meat (including skinless poultry) is low in saturated fat, with many cuts containing less than 10% fat.²⁻⁴

Safe to eat

Most countries now have quality assurance schemes, which cover all aspects of meat production from farm to fork and which promote good farming practices and food safety. In addition, legislation may be set at either national or European Union (EU) level. For example, the use of growth-promoting hormones is banned in the EU, and some countries (e.g. Denmark) allow antibiotics only for medicinal purposes. If treated, animals cannot be slaughtered until residues have dropped below a defined level.^{5,6} While most dietary guidelines in Europe recommend to have meat, poultry or fish on a daily basis, the World Cancer Research Fund advises to limit the intake of red meat (such as beef, pork and lamb) to a maximum of 500 g (cooked weight) per week.⁷

Table 1. Nutrient composition of various meats

Nutrient/Energy	Beef ^a	Pork ^a	Lamb ^a	Chicken ^b
kcal/kJ	108/455	105/443	117/491	145/607
Protein (g)	22.0	22.0	20.8	22.2
Fat (g)	1.9	1.9	3.7	6.2
Iron (mg)	2.1	1.0	1.6	1.1
Zinc (mg)	4.3	2.4	2.9	no data
Selenium (µg)	5.4	12.0	4.1	6.2
Vitamin B ₁₂ (µg)	5.0	2.0	2.7	0.4

^a muscle tissue

^b breast with skin

Source ⁸

References

- Mann N (2007). Meat in the human diet: An anthropological perspective. *Nutrition & Dietetics* 64 (Suppl 4):S102-S107
- Williamson CS, Foster RK, Stanner SA and Buttriss JL (2005). Red Meat in the Diet. *Nutrition Bulletin* 30:323-355
- Li D, Siriamornpun S, Wahlqvist ML, Mann NJ and Sinclair AJ (2005). Lean meat and heart health. *Asia Pacific Journal of Clinical Nutrition* 14(2):113-9
- Honikel K-O (2008). Meat – an essential part of a balanced diet. *Fleischwirtschaft International* 4:21-26
- UK Department for Environment, Food and Rural Affairs. Animal health & welfare section: <http://www.defra.gov.uk/>
- European Commission, Food Safety section:

http://ec.europa.eu/food/food/chemicalsafety/residues/fcr_qanda_en.pdf;
http://ec.europa.eu/food/food/chemicalsafety/contaminants/hormones/index_en.htm

7. WCRF International. Food, Nutrition, Physical Activity and the Prevention of Cancer: a Global Perspective - Online. Recommendations section. Available at: http://www.dietandcancerreport.org/?p=recommendation_05
8. Food Composition and Nutrition Tables, 7th revised and completed edition, Ed. SW Souci, W Fachmann, H Kraut. Wissenschaftliche Verlagsgesellschaft mbH, Stuttgart, 2008.

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... Nutritional programming – mother’s diet and baby’s health ...



Pregnancy is a time of constant change as the new baby develops in the mother’s womb. However, have you considered that the food the mother eats during pregnancy can affect her child’s health even decades later? Understanding such ‘nutritional programming’ may help prevent diet-related diseases early on.

Programming health before birth

For some time scientists have suggested that the nutritional conditions that exist while a baby is developing in the mother’s womb, and the nutrition it receives during infancy, affect a person’s development and future health.¹ This seems to be especially true for some chronic diseases such as heart disease and diabetes. It is thought that there are critical periods during pregnancy and infancy where ‘nutritional programming’ occurs.

Research into nutritional programming

The research into nutritional programming (or the ‘foetal origins of disease’ as it is sometimes known) is growing rapidly.²⁻⁵ In particular, a study of survivors of the Dutch famine of 1944-1945 showed that when pregnant women were exposed to famine conditions, their children were more likely to develop type 2 diabetes, obesity, hypertension and cardiovascular disease.²

The people of the Dutch Famine cohort are still being followed and interesting findings continue to be revealed. For example, it was recently shown that those who were exposed early prenatally – during the first 16 weeks of gestation – to the famine prefer eating fatty foods, which could increase the risk of developing high blood cholesterol if high in certain saturated fatty acids or trans fatty acids. But also, those people tended to be less physically active.²

It is clear from this research that changes in nutrition at specific stages of pregnancy can result in very different outcomes for the child’s health. Currently two EU-funded projects, EDEN (Study of pre- and early postnatal determinants of the child’s development and health) and EARNEST (Early Nutrition Programming Project) are looking in detail at these issues.^{3,4}

What aspects of development and health are affected by nutritional programming?

Many aspects of a newborn’s health and wellbeing seem to be affected by the mother’s nutritional status, her weight before pregnancy and how much weight she gains during pregnancy. This in turn affects the size of the baby at birth and also has an influence on whether the baby is born prematurely. It is known, for example, from several population studies that small size at birth is associated with greater risk of developing cardiovascular disease.

One study from the EARNEST project found that eating a healthy diet during pregnancy, including some good sources of omega-3 fats (e.g. oily fish such as salmon, herring and mackerel) may give some protection against chronic diseases such as asthma, possibly by having a beneficial effect on the immune system.⁴

Other studies have shown that a high intake of omega-3 fats during pregnancy benefits the growth of the baby before birth and also reduces risk of preterm delivery, but these did not take the mother’s body mass index (BMI) into account. The EDEN project has examined in detail the type of fat a woman eats just before and during pregnancy and the growth of the unborn child. In particular, it would seem that in overweight women, a higher pre-pregnancy intake of omega-3 fats (relative to total polyunsaturated fat intake) is associated with improved (closer to normal) foetal growth.³

Beyond birth

Health in adulthood may also be determined to some extent by nutrition during infancy. Breastfeeding is optimal for the baby for a number of psychological and physiological reasons. Studies have found that breastfed infants are less likely to become obese as adults, and 5-7 months of breastfeeding seem to produce the most favourable outcome.⁵ This is in line with the World Health Organization’s recommendations advocating exclusive breastfeeding for the first 6 months of life.⁶

Clearly, more research is needed to understand what could be the optimal diet during pregnancy and infancy, but currently, there appears to be strong evidence that a balanced diet and a healthy weight during pregnancy programmes many aspects of good health in infancy and beyond.

Further information:

EARNEST website: <http://www.metabolic-programming.org//>

EDEN publications: <http://www.ifr69.idf.inserm.fr/page.asp?page=2248>

References

1. Barker DJ (1997) Fetal nutrition and cardiovascular disease in later life. *Br Med Bull* 53:96-108
2. Lussana F, Painter RC, Ocke MC, Buller HR, Bossuyt PM, Roseboom TJ (2008) Prenatal exposure to the Dutch Famine is associated with a preference for fatty foods and a more atherogenic lipid profile. *Am J Clin Nutr* 88:1648-52
3. Drouillet P, Forhan A, De Lauzon-Guillain B, Thiébauges O, Goua V, Magnin G, Schweitzer M, Kaminski M, Ducimetière P, Charles MA (2008) Maternal fatty acid intake and fetal growth: evidence for an association in overweight women. The ‘EDEN mother-child’ cohort (study of pre- and early postnatal determinants of the child’s development and health). *Br J Nutr* 101:583-91
4. Olsen SF, Østerdal ML, Salvig JD, Mortensen LM, Rytter D, Secher NJ, Henriksen TB (2008) Fish oil intake compared with olive oil intake in late pregnancy and asthma in the offspring: 16 y of registry-based follow-up from a randomized controlled trial *Am J Clin Nutr* 88:167-75
5. O’Tierney PF, Barker DJ, Osmond C, Kajantie E, Eriksson JG (2009) Duration of breast-feeding and adiposity in adult life. *J Nutr* 139(2):422S-5S
6. WHO (2001) The optimal duration of exclusive breastfeeding - a systematic review. Available at: http://whqlibdoc.who.int/hq/2001/WHO_NHD_01.08.pdf

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... Physical activity and safety concerns ...



Physical activity is part of a healthy, balanced lifestyle as it helps individuals to maintain a healthy weight, is beneficial for bone and muscle health, helps with psychological well-being and reduces the risk of certain diseases including cancers, heart disease and diabetes. But it is important to be aware of safety concerns that can be associated with engaging in physical activities.

Cardiovascular Risk

It is known that physical activity generally decreases the risk of certain diseases, including heart disease in individuals, but cardiovascular problems such as a heart attack or arrhythmia are some of the risks that may arise when taking part in physical activity. While some may feel that the majority of heart attacks happen to individuals during exercise, approximately 90% of all heart attacks actually occur at rest and not while exercising.¹

For an individual without existing heart disease the risk of a serious heart complication during exercise is 1 in 400,000 – 800,000 hours of exercise, whereas an individual who already has existing heart disease has an average risk of 1 in every 62,000 hours of exercise.¹ In comparison, a person training for 1.5 h on 5 days per week accumulates a total of 11,700 h of exercise over 30 years. This essentially shows that even individuals who exercise regularly and extensively have a very low risk of serious cardiac events. It has also been noted that the risk of a heart attack in a sedentary person doing exercise is 50% greater than that of a person who exercises five times a week, which yet again translates into a very low risk.

Although the risk of a heart complication is small it is always wise to know the warning signs of a heart attack which include a feeling of discomfort in the chest (which may include pain that radiates to the arms, back or shoulder areas ("pins and needles")), heart rhythm abnormalities like palpitations, skipping or thudding patterns, an unusual breathlessness or shortness of breath, dizziness or light-headedness.

Joint and mobility risk

Joints of the body, including the knees and ankles, have to bear a lot of stress from movement, especially in overweight or obese individuals. The body weight of an individual, along with the activity that they participate in, and the mechanical movement determines the load of force on a joint.² For example, running has a greater impact on the joints than biking, and this effect is compounded by higher body weight.

Muscle weakness is also a factor which can cause joint problems and it has been shown that even small reductions in body weight can significantly reduce the stress on an overweight individual's joints.^{2,3} However, research shows that those healthy individuals who participate in moderate, lower impact activities (such as walking, swimming, rowing) without previous joint problems do not have an increased risk of osteoarthritis - a degenerative joint disease - in the knee, however elite athletes who perform in vigorous activities such as running, squash and tennis, may be at higher risk of developing osteoarthritis in the knee due to the higher impact of these activities.⁴

How to play it safe

Physical activity is essential for a healthy body and mind and although there are valid safety concerns, generally more good than harm comes from engaging in physical activity. Choosing an appropriate environment for one's preferred activity contributes to a high safety level and may be guided by the following list⁵:

- Physical separation from motor vehicles, such as pavements, walking paths, or bike lanes;
- Neighbourhoods with traffic-calming measures that slow down traffic;
- Places to be active that are well-lighted, where other people are present, and that are well-maintained (no litter, broken windows);
- Shock-absorbing surfaces on playgrounds;
- Well-maintained playing fields and courts without holes or obstacles;
- Padded and anchored goals and goal posts at soccer and football fields.

Additionally, it is recommended to wear appropriate protective gear and get professional advice before embarking on an exercise programme so that the schedule is tailored to the individual's needs and abilities.

Further information:

EU Physical Activity Guidelines 2008

http://ec.europa.eu/sport/what-we-do/doc/health/pa_guidelines_4th_consolidated_draft_en.pdf

References

1. Myers J (2003) Exercise and cardiovascular health. *Circulation* 107:e2-e5
2. Hunter DJ, Eckstein F (2009) Exercise and osteoarthritis. *Journal of Anatomy* 214:197-207
3. Messier SP, Gutekunst DJ, Davis C et al (2005) Weight loss reduces knee-joint loads in overweight and obese older adults with knee osteoarthritis. *Arthritis and Rheumatism* 52:2026-2032
4. Cooper C, Snow S, McAlindon TE et al (2000) Risk factors for the incidence and progression of radiographic knee osteoarthritis. *Arthritis and Rheumatism* 43:995-1000
5. U.S Department of Health and Human Services (2008) 2008 Physical Activity Guidelines for Americans. Available at: <http://www.health.gov/PAGuidelines/pdf/paguide.pdf>

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