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Red Meat and Nutrition

Historically meat has been essential for our evolution and we choose to eat meat for enjoyment, ease and convenience and for optimum nutritional status. Evidence from the Palaeolithic period suggests that man has had a long history of consuming a meat-based diet. Cave drawings illustrating hunting scenes indicate just how important meat was to the diet and lives of our ancestors.

As a result, meat has played a central role in many traditional cuisines with foods from indigenous groups exhibiting distinctive preferences, often based on what was accessible to them or what could be successfully domesticated and bred.

Definitions

The term 'meat' encompasses the muscle tissue that provides steaks, joints, cubed and minced meat but also organs like liver and kidneys which are termed offal. Red meat includes beef, veal, pork and lamb (fresh, minced and frozen). Processed meat includes meat that has been preserved by methods other than freezing, such as salting, smoking, marinating, air-drying or heating e.g. ham, bacon, sausages, hamburgers, salami, corned beef and tinned meat (Linseisen 2002),

Health Benefits

Red meat contains high biological value protein and important micronutrients, all of which are essential for good health throughout our life. A recognised healthy balanced diet includes lean meat in moderate amounts, together with starchy carbohydrates (including wholegrain foods), plenty of fruit and vegetables, and moderate amounts of milk and dairy foods.

Protein

Red meat is an excellent source of high biological value protein and an important source of the eight essential amino acids for adults (lysine, threonine, methionine, phenylalanine, tryptophan, leucine, isoleucine and valine) and histidine which is considered to be an additional essential amino acid for children. The pattern of amino acids in animal cells is comparable to the pattern in human cells which means that it is highly digestible and can be utilised by the body with the minimum of waste.

Eating protein-rich foods such as lean red meat with meals and snacks may help curb hunger between meals, helping to facilitate weight loss and weight maintenance.

Minerals

Red meat is an important dietary source of bioavailable minerals and trace elements, in particular iron and zinc. Red meat contributes approximately 17% of total iron intake in the UK and contains a type of iron (haem iron) that is more readily absorbed than the non-haem iron found in vegetables, fortified foods and supplements.

In the UK almost 50% of women of child bearing age have iron intakes below the lower reference nutrient intake (LRNI) – the amount of nutrient that is sufficient only for a small proportion of individuals (Henderson et al 2003b). A number of studies have confirmed the positive effect of including meat in the diet, on intakes of dietary iron (Gibson & Ashwell 2003) (Nathan et al 1996) (Wells et al 2003).

Low intakes of zinc are also a concern for certain population groups in the UK, such as young women, children and infants. Red meat contains substantial amounts of zinc, which is available in a form that is readily absorbed by the body.

Meat and meat products also contain useful amounts of magnesium, copper, cobalt, phosphorus, chromium and nickel. Meat is now of more importance as a source of selenium because intakes in the UK have been decreasing as European wheat has replaced selenium-rich wheat from North America.

Vitamins

Red meat contains a variety of vitamins, including a range of B vitamins, and in particular red meat is a rich source of vitamin B3 (niacin) and B12. As vitamin B12 is only found naturally in foods of animal or bacterial origin, people who do not consume meat or other animal products may have inadequate intakes. Red meat is also a valuable source of thiamine and riboflavin, with pork richer in thiamine than the other red meats.

Red meat, and offal in particular, is a rich source of vitamin A. Because liver is particularly rich in vitamin A and excessive amounts of this nutrient can cause malformation in the foetus, pregnant women should avoid eating liver. However, red

meat is safe. Low vitamin D status is common in the UK, particularly amongst children, pregnant women, older adults and people with darker skins. For those who do not get enough vitamin D through sunlight exposure (the main route for most people), red meat is an important dietary source as the vitamin D found in meat is thought to be more easily utilised than the vitamin D found in some other foods.

Fat

In a number of Western countries, red meat consumption has declined, partly due to concerns about its fat content. However, advances in animal husbandry and butchery techniques over the last 40 years have reduced the fat content of carcass meat by 10-30%. This means that the fat content of lean red meat is much less than many consumers perceive; typically the total fat content of lean red meat is only 5-10g /100g.

Consumers can further reduce the fat content of their meat dishes by grilling, baking or dry frying, and by trimming the visible fat off meat.

There are also misconceptions about the type of fat red meat contains. Red meat contains both saturated and unsaturated fat in roughly equal quantities, depending on the type of meat and the cut. The main saturated fatty acids in red meat are palmitic acid and stearic acid. There are also minor amounts of myristic acid and lauric acid, which are thought to increase blood cholesterol levels more potently than palmitic acid. However, the levels of these cholesterol-raising fatty acids are relatively low (Wyness et al 2011). Stearic acid has no effect on blood cholesterol levels (Daley et al 2010) and other cardiovascular risk factors.

Although meat contains only a small amount of long-chain n-3 polyunsaturated fatty (PUFAs) acids (EPA and DHA) and n-6 PUFAs (arachidonic acid), there are very few rich sources apart from oily fish, and therefore meat can usefully contribute to intakes of these important fatty acids for those who consume little or no oily fish (Higgs 2000). In the UK, meat and meat products contribute substantially to intakes, providing 18% of n-6 PUFAs and 17% of total n-3 PUFAs (Henderson et al 2003a).

Nutrient content of red meat

Nutrient	Nutrients per 100g cooked meats		
	Beef (grilled steak)	Lamb (grilled chop)	Pork (grilled chop)
Energy Kcal	176	213	184
Protein (g)	26.6	29.2	31.6
Fat (g)	7.7	10.7	6.4
Saturated fatty acids (g)	3.4	4.9	2.2
Monounsaturated fatty acids (g)	3.3	4.0	2.6
Polyunsaturated fatty acids (g)	0.3	0.6	1.0
Carbohydrate (g)	Nil	Nil	Nil
Vitamin B ₁₂ (µg)	2	3.0	1.0
Iron (mg)	1.4	2.1	0.7
Zinc (mg)	4.3	3.6	2.4

(Chan et al 1995)

In Conclusion

Meat and meat products can make an important contribution to nutrient intakes in the diet. They provide a number of essential nutrients, including protein, long chain n-3 fatty acids, iron, zinc, selenium, vitamin D and vitamin B12. In particular, some of these nutrients are more bioavailable in meat than in alternative food sources and can make a significant contribution to dietary intakes for some population groups.

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