

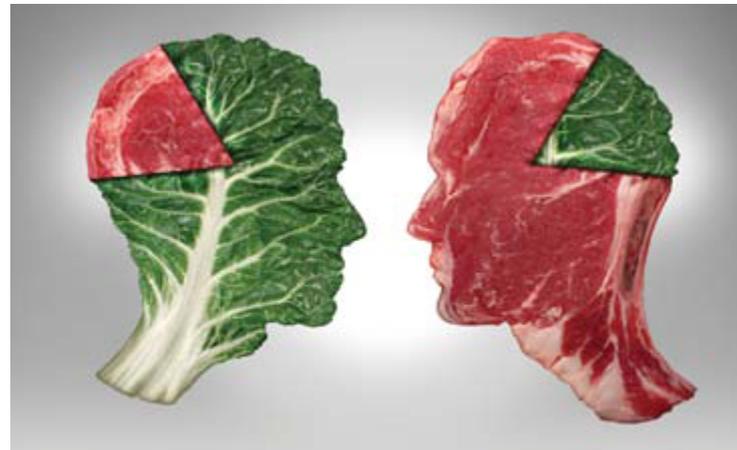
# RED MEAT & NUTRITION

## Bioavailability of nutrients – focus on protein, iron and vitamin A

Bioavailability refers to the extent to which a nutrient present in the food is available for absorption and utilization in the human body, i.e. the proportion of a nutrient that is absorbed from the diet and used for normal body functions.

- ✓ For protein to be adequately absorbed and utilized in the human body, all the essential amino acids (building blocks of protein) should be present (in the right proportions) in the meal. Animal source foods, like red meat, contain the correct proportions of all these essential amino acids and are called sources of complete protein.
- ✓ Heme iron is the most bioavailable form of iron, found only in animal products, with red meat and offal being excellent sources of heme iron.
- ✓ Vitamin A found in animal foods occurs as retinol. The bioavailability of retinol is generally high (ranging from 70 to 90%) when compared to the bioavailability of other forms of vitamin A such as beta-carotene.

The correct assessment of the adequacy of dietary intakes of nutrients requires not only knowledge of the nutrient content of the foods ingested, but also the extent to which the nutrient present in the diet is available for absorption and utilization. Bioavailability is the technical term used to convey the fact that not 100% of nutrients ingested will be absorbed, irrespective if consumed in the form of food or supplements. Bioavailability aims to describe the effect of a sequence of metabolic events, including digestion, solubilisation, absorption, organ uptake and release, enzymatic transformation, secretion and excretion.



### Enhancers & Inhibitors

- ✓ Nutrients can interact with one another or with other dietary components at the site of absorption, resulting in a change in bioavailability.
- ✓ Enhancers can act in different ways such as keeping a nutrient soluble or protecting it from interaction with inhibitors. Meat, fish and poultry, while containing highly bioavailable iron themselves, are also known to enhance the absorption of iron from other foods ingested at the same time.
- ✓ Inhibitors may reduce bioavailability of a nutrient by either binding to the nutrient and rendering it unavailable for absorption, or competing for the same uptake system. Phytic acid (abundant in certain plant foods) binds with minerals such as iron and reduces their bioavailability.

Until a nutrient passes from the digestive system into the bloodstream, it has little or no value. Although bioavailability is only a partial measure of the body's ability to benefit from a nutrient, this factor quantifies the amount of a substance that successfully enters the bloodstream. Once in the bloodstream, the nutrient must cross cellular membranes before it can nourish body cells. Although red meat is a nutrient-dense food, i.e. contains many nutrients in ample amounts, it also contains many of these nutrients in their most bioavailable forms, i.e. protein, iron and vitamin A.



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### Lamb & Mutton South Africa

An educational campaign translating current science into consumer friendly messages. Supported by the Red Meat Industry of South Africa.

