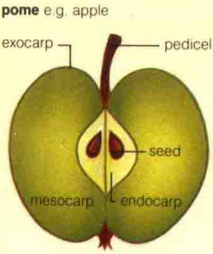
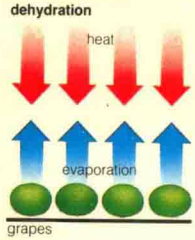
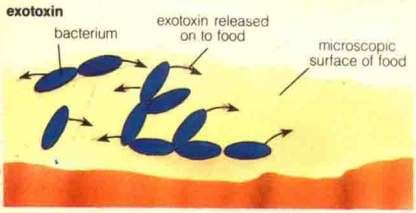
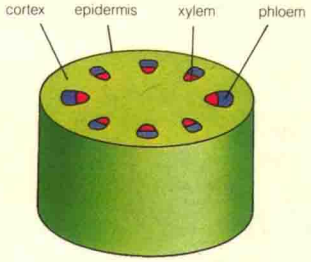
LONGMAN ILLUSTRATED DICTIONARY OF FOOD SCIENCE

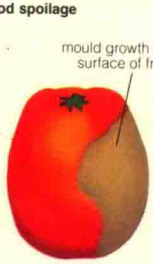
food, its components, nutrition, preparation and preservation

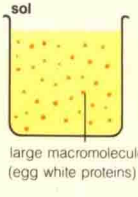


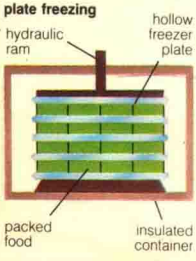


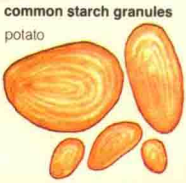


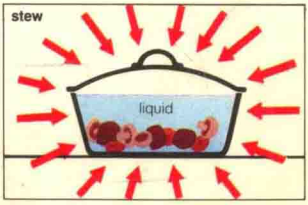












NICHOLAS LIGHT BSc PhD FIFST

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food, its components, nutrition, preparation and preservation

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Contents

How to use the dictionary

This dictionary contains over 1200 words used in the food sciences. These are arranged in groups under the main headings listed on pp. 3–4. The entries are grouped according to the meaning of the words to help the reader to obtain a broad understanding of the subject.

At the top of each page the subject is shown in bold type and the part of the subject in lighter type. For example, on pp. 74 and 75:

74 · VITAMINS/VITAMINS E, K AND C

VITAMINS/VITAMIN B · **75**

In the definitions the words used have been limited so far as possible to about 1500 words in common use. These words are those listed in the 'defining vocabulary' in the *New Method English Dictionary* (fifth edition) by M. West and J.G. Endicott (Longman 1976). Words closely related to these words are also used: for example, *characteristics*, defined under *character* in West's *Dictionary*.

In addition to the entries in the text, the dictionary has several useful appendixes which are detailed in the Contents list and are to be found at the back of the dictionary.

1. To find the meaning of a word

Look for the word in the alphabetical index at the end of the book, then turn to the page number listed.

In the index you may find words with a number at the end. These only occur where the same word appears more than once in the dictionary in different contexts. For example, **nucleus**

nucleus[1] is the centre of an atom;

nucleus[2] is a cell organelle.

The description of the word may contain some words with arrows in brackets (parentheses) after them. This shows that the words with arrows are defined near by.

(↑) means that the related word appears above or on the facing page;

(↓) means that the related word appears below or on the facing page.

A word with a page number in brackets after it is defined elsewhere in the dictionary on the page indicated. Looking up the words referred to may help in understanding the meaning of the word that is being defined.

In some cases more than one meaning is given for the same word. Where this is so, the first definition given is the more (or most) common usage of the word. The explanation of each word usually depends on knowing the meaning of a word or words above it. For example, on p.92 the meaning of *Maillard browning*, *sugar amine* and the words which follow depends on the meaning of *non-enzymic browning*, which appears above them. Once the earlier words are understood those that follow become easier to understand. The illustrations have been designed to help the reader understand the definitions but the definitions are not dependent on the illustrations.

2. To find related words

Look in the index for the word you are starting from and turn to the page number shown. Because this dictionary is arranged by ideas, related words will be found in a set on that page or one near by. The illustrations will also help to show how words relate to one another.

For example, words relating to enzymes are on pp. 68–71. On p.68 *enzyme* is followed by *catalyst* and *catalysis* and there is an illustration showing the function of enzymes in the catalysis of reactions; p.69 continues to explain and illustrate enzymes explaining the different types of enzymes and illustrating the action of proteolytic enzymes; turning to p.70 inhibition is explained in its various forms and non-competitive inhibition is illustrated; and p.71 gathers together the remaining words relating to enzyme reactions.

3. As an aid to studying or revising

The dictionary can be used for studying or revising a topic. For example, to revise your knowledge of ingestion, you would look up *ingestion* in the alphabetical index. Turning to the page indicated, p.37, you would find *ingestion, mastication, saliva, mucin,* and so on; turning over to p.38 you would find *gastric juice, rennin, pepsin,* and so on. On p.39 you would find *jejunum, intestinal juice,* etc.

In this way, by starting with one word in a topic you can revise all the words that are important to this topic.

4. To find a word to fit a required meaning

It is almost impossible to find a word to fit a meaning in most dictionaries, but it is easy with this book. For example, if you had forgetten the word for the inner tissues that make up the pit of a fruit, all you would have to do would be to look up *pit* in the alphabetical index and turn to the page indicated, p.109. There you would find the word *endocarp* and a diagram to illustrate its meaning.

5. Abbreviations used in the definitions

abbr	abbreviation	p.	page
adj	adjective	pl	plural
e.g.	*exempli gratia* (for example)	pp	pages
etc	*et cetera* (and so on)	sing.	singular
i.e.	*id est* (that is to say)	v	verb
n	noun	=	the same as

THE DICTIONARY

element (*n*) a natural substance containing atoms of the same kind. Elements are substances with their own characteristics and cannot be changed into other elements except by dividing or adding to the atoms of which they are made. Most elements can unite with other elements to form other substances by chemical reaction (p.12). The common elements found in food are carbon, hydrogen, oxygen and nitrogen.

symbol (*n*) the letter or letters which stand for the name of an element (↑), e.g. carbon (C), oxygen (O), hydrogen (H), nitrogen (N), chlorine (Cl).

formula (*n*) the set of letters and numbers which stand for the kind and number of atoms in a substance. Carbon dioxide, which contains one atom of carbon and two atoms of oxygen has the formula CO_2. **formulae** (*pl*).

atom (*n*) the smallest part of any element (↑). Atoms are made of protons (↓), electrons (↓) and neutrons (↓). Every atom contains equal numbers of electrons and protons. **atomic** (*adj*).

sub-atomic (*adj*) of particles (p.24) smaller than atoms.

symbol

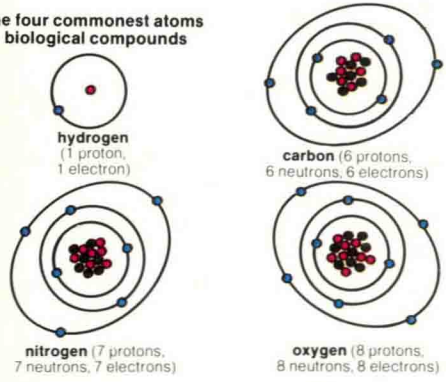
C carbon

O oxygen

formula

CO_2 carbon dioxide

the four commonest atoms in biological compounds



neutron (*n*) a sub-atomic (↑) particle found in all atoms except hydrogen. The neutron has no electric charge and has the same weight as the proton (↓).

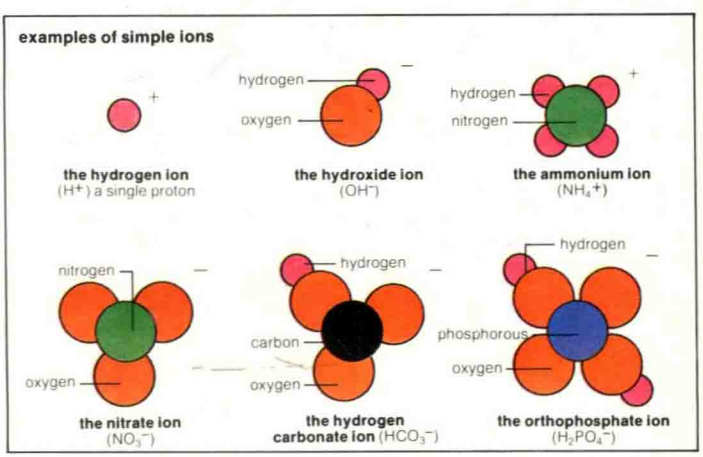
proton (*n*) a sub-atomic (↑) particle with a positive electric charge. The size of this electric charge is exactly equal to the size of the negative charge on the electron (↓). As atoms contain equal numbers of protons and electrons they have no charge.

electron (*n*) a sub-atomic (↑) particle 1840 times smaller than the proton (↑) which is in constant movement around the nucleus (↓) of the atom. The electron has a negative charge exactly equal to the positive charge of the proton. Atoms which lose or gain electrons become charged particles called ions (↓).

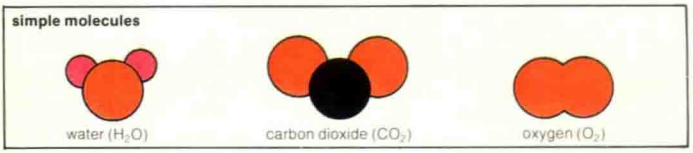
nucleus[1] (*n*) the central part of the atom which contains the protons (↑) and neutrons (↑).

orbital (*n*) the path that can be followed by each electron (↑) around the nucleus (↑) of the atom.

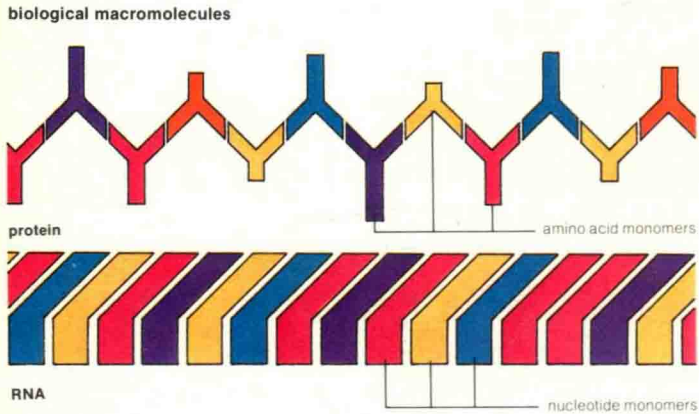
ion (*n*) an atom or molecule containing an unequal number of protons (↑) and electrons (↑) and, therefore, it has an electric charge. An ion with a positive charge has more protons than electrons and an ion with a negative charge has more electrons than protons. **ionization** (*n*), **ionizing** (*adj*), **ionic** (*adj*).



anion (*n*) an ion (p.9) with a positive charge.
cation (*n*) an ion (p.9) with a negative charge.



molecule (*n*) the smallest part of an element (p.8) that can exist alone. Molecules contain atoms held together by strong forces. A molecule of water contains two hydrogen atoms and one oxygen atom (H_2O). The smallest molecule is hydrogen which contains two hydrogen atoms. **molecular** (*adj*).
macromolecule (*n*) any large molecule containing many atoms, e.g. nucleic acids (p.31), carbohydrates (p.43), proteins (p.61).

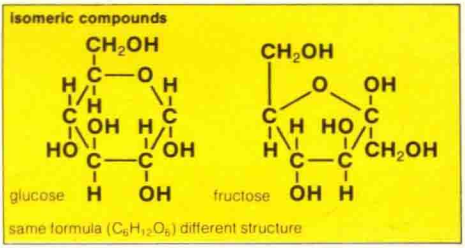


polymer (*n*) a macromolecule (↑) containing many molecules of the same sort joined together, e.g. starch (p.48), cellulose (p.49). Polypeptides (p.63) and nucleic acids (p.31) are sometimes called polymers but are more properly called macromolecules.

monomer (*n*) a single molecule from which a polymer (↑) is made, e.g. monosaccharides (p.43), amino acids (p.61), nucleotides (p.31).

crystal (*n*) a solid structure with a regular arrangement of molecules all of the same kind and size. **crystalline** (*adj*), **crystallize** (*v*).

compound (*n*) a substance which contains one kind of molecule consisting of more than one atom, e.g. common salt (NaCl).



mixture (*n*) a substance which contains more than one kind of molecule, e.g. air is a mixture of carbon dioxide (CO_2), oxygen (O_2) and nitrogen (N_2).

isomer (*n*) molecules which have the same kinds and numbers of atoms. Isomers may have different chemical and physical properties. **isomeric** (*adj*).

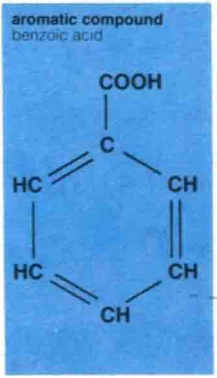
organic (*adj*)of compounds built around the carbon atom. Not all compounds containing carbon are organic, e.g. carbonates ($CaCO_3$, calcium carbonate). All living organisms are made mainly of water and organic compounds.

inorganic (*adj*)of compounds which are not organic (↑).

aliphatic (*adj*)of organic (↑) compounds which contain chains of carbon atoms.

aromatic (*adj*) of organic (↑) compounds which contain carbon atoms joined together in rings. Aromatic compounds often have a characteristic smell.

hydrocarbon(*n*) an organic (↑) compound containing only carbon and hydrogen atoms.



alkane (*n*) a hydrocarbon (p.11) containing only saturated (p.18) or single bonds (p.18). Many of the simple alkanes are used as fuels, e.g. methane, propane, butane.

alkene (*n*) a hydrocarbon (p.11) containing double bonds (p.18) between carbon atoms. Ethene (p.110), a gas made by plants which speeds the ripening of fruits, is an alkene.

alkyne (*n*) a hydrocarbon (p.11) containing triple bonds (p.18) between carbon atoms. The simplest alkyne is the gas ethyne (acetylene) which is used as a fuel.

reaction

$$A + B \rightleftharpoons C + D$$

example of a chemical reaction

$$NaHCO_3 + HCl = NaCl + H_2O + CO_2$$

sodium bicarbonate | hydrochloric acid | sodium chloride | water | carbon dioxide (gas)

reaction (*n*) a chemical change in which one or more molecules produce a different molecule or molecules. Reactions always either use or give off energy. The molecules in a reaction may be the same or different kinds. **reactive** (*adj*), **react** (*v*).

exergonic (*adj*) of a chemical reaction (↑) which gives off energy, e.g. as heat.

endergonic (*adj*) of a chemical reaction (↑) which needs energy to drive it, e.g. the reacting chemicals become cold as they take up heat from their surroundings.

equilibrium (*n*) the point at which a chemical reaction (↑) stops.

inert (*adj*) of a substance or element (p.8) which does not react (↑) easily with any other substances or elements, e.g. the noble gases such as helium (He) and argon (Ar). Some substances used in the food industry are inert, e.g. PTFE (p.164) which is used in the production of plastics (p.165) for wrapping food.