

What is Natural?*

A. E. Bender

2 Willow Vale, Fetcham, Leatherhead, Surrey KT22 9TE, UK

ABSTRACT

The term 'natural', with its emotive appeal, has been taken over by marketing men. At one time used mostly by the health food business, it has now spread so widely that restrictions are proposed on its use.

There are clearly some uses which are blatantly misleading to the consumer and others where the term may be used reasonably, but in between these extremes is a vast area of doubt. Because of this, and the problem of laying down precisely just when the word (and similar emotive terms such as traditional and home-made) may be used, it is suggested that guidelines restricting the use of these terms should be voluntary, with a body that may give advice to manufacturers on the permitted use of the terms.

'Natural' foods are popularly considered both nutritious and safe but, in fact, many unprocessed, natural foods, contain known toxins and from time to time give rise to problems among consumers.

INTRODUCTION

Everyone knows there are 'good' and 'bad' words—white is good, black is bad, clean is good, dirty is bad; so far as foods are concerned natural is good, artificial, synthetic, man-made, factory, processed, refined—are all 'bad'. Natural conveys the impression of healthy, goodness, tradition, family, what-grandmother-made (even if she was a poor cook), wholesome, Garden of Eden, countryside, cows and sheep.

After many years of great, perhaps excessive, respect for advanced technology there appears to be a reaction of back-to-Nature. Organically grown foods are sold at much higher prices than ordinary foods and their

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TABLE 1
Some Uses of the Word 'Natural'

	natural raw cane sugar
	natural unrefined Demerara sugar
	the natural goodness of whole wheat grain
Spirulina satisfies your appetite	naturally
stabilised wheat germ is a	natural source of protein
slimming tea made from carefully selected	natural plants by Natural Products Ltd
	natural sea salt
	natural wheat bran
	natural yogurt
	natural sesame
	butter is natural
margarine is made from	natural oils
	guaranteed 100% natural
Sunmaid raisins are 100%	natural
	natural mineral water
	from a natural filter of porous rock
Tryptophan is a natural	food supplement

emotional appeal is bolstered by inaccurate claims for higher nutritional value, better taste (proven untrue in controlled trials—Bender, 1985) and absence of damage to the environment (animal manure also poses problems).

This, together with the chance to revolt against regimentation and bureaucracy made the description 'natural' attractive. The impression is conveyed that natural foods are nutritionally superior and 'healthier'.

This is not new, it has been the stock-in-trade of the health food business for many years but recently advertisers have made increasing use of terms such as Mother Nature, traditional, natural goodness, naturally better, in ways that are often meaningless, sometimes calculated to mislead (Table 1).

We see butter advertised as natural and margarine as being made from natural ingredients. Brown sugar is advertised as natural in contrast with the slightly more highly refined white products; one side of a packet of sugar is labelled 'natural raw cane sugar' and the other '99% sucrose'.

Natural yogurt means simply unflavoured, but natural sea salt is in opposition to the same chemical derived from land. We even have natural baked beans. These are identical with the ordinary variety except that they are sweetened with apple juice concentrate instead of sugar. By the time the sucrose has been heated in the can it is largely glucose and fructose, the same sugars as found in the apple juice. The picture is completed on the label depicting cowboys sitting round a camp fire in North West London.

The list is endless, natural pickled cucumber, natural roasted salted peanuts, natural herbal remedies and, outside the food area, we read that Nivea cream makes you a natural woman!

FOOD ADDITIVES

To most people nutrition is a mystery. What are polyunsaturates, is cholesterol good or bad, is brown sugar better than white, can copper bracelets prevent rheumatism, is dietary fibre good or bad, is low in sodium as good as low in calcium?

Into the middle of this confusion additives were catapulted. After being used for many years they suddenly hit the headlines for two reasons. First, the European Community decided to simplify food labels and identify approved additives by giving them E numbers and manufacturers could put the number or the chemical name or both on the label. Most chose E numbers.

The second reason was the late discovery of additives by a small group of self-seeking publicists and some politically motivated groups. They decided that they could not agree with the opinions of the toxicologists who advised the Ministries and promoted their point of view that some additives are harmful, and more were of doubtful safety. Many other publicists then joined the bandwagon.

Economist, 26 October 1985: 'Food additives are virtually unregulated'. 'Manufacturers make a lot of money out of processed foods in which cheap materials are transformed into unrecognisable but affordable products'. 'Nothing has been done about our diet'.

'British MPs of all major political parties have pledged support for a renewed campaign to limit the use of food additives'. News item, 6 January 1986 (before the General Election). 'Campaign for enlightened eating—a major investigation into a subject that is causing increasing public concern'. 'More and more additives are going into our food'. *Sunday Times Magazine*, 20 October 1985.

It was this last article that threw some light on the reason for the rapid spread of concern. 'It was another very unlikely statistical survey which highlighted how concerned consumers were becoming about the effect of additives on health—Hanssen's *E for Additives* was selling like hot cakes.' Although Hanssen was careful to suggest only that some additives might affect certain sensitive people the alarm was raised and the phrase "additive-free" began to be regarded as the signpost for healthy eating'. Other organisations were not so careful in their wording and the magazine quoted the Soil Association as dividing all additives into Beware, Suspect and Safe and linking many additives with feeling vaguely miserable and unwell. (Look again at the label—Soil Association.)

'Menace of food additives: *The Star* is backing a campaign to ban all hazardous additives from our food.' 10 October 1985.

Additives had become a bad word. The solution for many salesmen was to replace synthetic additives with natural ones so permitting a label stating

'free from artificial additives'. Natural was obviously the opposite and therefore good. As stated in the report of the Food Standards Committee (MAFF, 1987) 'consumers had been led to accept the idea that food described as natural is somehow of greater worth than food not so described, although there is no inherent reason why this should be so'.

NATURAL TOXICANTS

In fact many natural, i.e. untreated, foods contain known toxins. While many of these are present in very small amounts which the body apparently deals with, there are many cases of food poisoning from natural foods, sometimes with fatal consequences. For example, butter beans contain cyanide although no one seems to have suffered—so far as we know. On the other hand, cassava contains cyanide in quantities sufficient to cause deaths in some countries. Rhubarb contains oxalic acid and about 5 lb supplies a lethal dose. If an average portion is a quarter or half a pound then this is 5–10% of a lethal dose. (NB: food additives are usually permitted in amounts not exceeding 1% of the *maximum no-effect dose*.)

A few years ago in this country there were some 25 outbreaks, involving 800 people, of poisoning from lectins in incompletely cooked red kidney beans. About 100 people die each year in Japan from eating puffer fish. There is currently a fear that goat's milk and its products may be toxic because goats browse on toxic weeds. Whole columns are devoted to the toxins that occur in natural products.

NATURAL ADDITIVES

Nevertheless, 'natural' carries the day.

'For today's healthier life-style Blank's squash is now artificial-colour free'. This advertisement epitomises the confusion instilled into the minds of consumers. A healthy life-style is the message of the health educators specifically used with regard to diseases of affluence—coronary heart disease, disorders of the bowel, obesity, etc. A healthy life-style is achieved by following a set of dietary guidelines; namely, less fat and sugar, more dietary fibre, and has no relation to artificial colours. The advertisement also implies that artificial colours are harmful, which is not true. In fact, artificial colours have been tested more thoroughly than extracts and concentrates from natural sources.

Some artificial colours are the cause of intolerance or allergy in some individuals but then so are some natural colours and many natural,

unprocessed foods. One change consequent on changing from artificial to natural colours is that the pigments need to be something like one hundred times more concentrated since they are less intense than synthetic colours. Another problem is that they are often sensitive to light, or to the acidity of the product or to heat and consequently it is often necessary to add preservatives to stabilise them in contrast with the synthetic varieties. In some instances it is necessary to add emulsifiers and stabilisers to render them miscible with the food.

As the Director of one food company put it, we have replaced artificial colours with natural ones in response to consumer demand but that does not make the food any safer.

At a meeting of the Parliamentary Food and Health Forum, 28 June 1988, the Head of Foodstuff's Division, EEC Commission DG III, Mr Paul Gray, pointed out that the greatest problem facing the Community was the potential spread and increase in food-borne disease. One reason is the reaction against additives, and the consequent reduction in their use has meant that in some cases their preservation properties had been lost.

NATURAL SUGARS

The health food business has long capitalised on the word natural, even to the extent of blessing sugars when they are naturally present in foods. For example, two-thirds of the total weight of dried fruits such as dates, figs and raisins are sugars (sucrose, fructose and glucose) yet these products are often used as ingredients of foods labelled 'No added sugar'.

Honey is also used as a sweetener in health shop products—no added sugar bars—although it is three-quarters sugars.

Along similar lines are 'no added sugar jams' where the sweetener is apple juice. An eating apple is 83·4% water and 11·8% sugars, which is 75% of the dry matter. This is referred to as a natural sweetener 'because it contains no additives or preservatives' (nor, incidentally, does refined sugar). The apple sweetener is claimed to be naturally high in fructose, which is the natural sugar which has a minimal effect on blood sugar (and, reassuringly, has no radioactive residues). The situation has clearly got out of hand.

CURRENT SITUATION

In a written reply to a parliamentary question the Parliamentary Secretary to the Ministry said 'I am aware of the increasing use of the word natural . . . and I have recommended that some of these (words and phrases) may be misleading the consumer' (MAFF, 1987).

He commissioned the Local Authorities Co-ordinating Body on Trading Standards (LACOTS) in 1986 to carry out a survey on the use of the word natural on food labels and in advertising and their Report was considered by the Food Advisory Committee. The FAC concluded that there is a clear and increasing risk of consumers being misled despite the protection in Section 6 of the Food Act (1984) against misleading descriptions. FAC considered that this was not an area of labelling which readily lent itself to the precise definitions required by law so that voluntary guidelines on the appropriate and inappropriate use of natural claims would be helpful.

As long ago as 1966 the Report on Claims and Misleading Descriptions by the then Food Standards Committee recommended that the word natural should only be used without qualification in two senses. First, in the case of products such as colours and flavours where many are synthetic, to indicate that the product is derived from biological material; secondly, to mean a raw, unmixed, unadulterated and unprocessed product with no additions. 'We would not object to the word being used to describe a product in conjunction with some expression which indicates a process or the use of an additive, e.g. natural lemon juice with preservative or pasteurised natural lemon juice'.

In that Report the word 'pure' was considered in the same way and it was proposed that 'home-made', which is applied to foods made in factories, should be used without qualification only if made in a domestic kitchen.

In their 1987 Report (MAFF, 1987) FAC stated 'we have confirmed our view that there are many elements of current labelling and advertising which seem to be inaccurate and misleading and not therefore in the best interests of the consumer or fair trading. We are also concerned that the concentration on "naturalness" is diverting attention from more important nutritional messages'. They recommend that the term should be used only to describe single foods or food ingredients to which nothing has been added and (this is the difficult part) which have been subjected only to such processing as to render them suitable for consumption. Compound foods should not be described as natural but if all the ingredients meet the above criteria they may be described as being made from natural ingredients.

A food should not be claimed to have been made by a natural process. Natural or its derivatives should not be included in brand or fancy names. The same principles should apply to terms such as real, genuine, traditional, pure, etc.

There are instances where natural is obviously acceptable, as in the clearly defined natural mineral waters, and others in which the intention to mislead is painfully obvious, but in between there is opportunity for argument.

A book on Natural Cooking extols the virtues of natural brandy, made by fermenting grape juice and then distilling it, but condemns as unnatural and

TABLE 2
Classification Suggested by the Canadian Bureau of Consumer Affairs (1985)

<i>Natural processes^a</i>	<i>Not natural processes^b</i>
Aeration	Anion exchange
chilling (incl. refrigerating and freezing)	bleaching
churning	cation exchange
concentration	curing (with chemical addition)
defatting (without chemical change)	decaffeination (with chemical addition)
drying	hormonal action
emulsifying (without synthetic chemical addition)	hydrogenation
fermentation	smoking (with chemical addition)
heating (incl. baking, canning)	tenderising (with chemical addition)
puffing	
smoking	

^a Processes that produce a minimum of physical, chemical or biological change.

^b Processes that produce a maximum of change.

bad the process of fermenting grapes and then adding previously distilled brandy, i.e. fortified wine.

Clearly it is difficult to define the term. The Canadian Bureau of Consumer Affairs (1985) has been tackling the problem for several years—a communiqué in 1981 proposed guidelines; after receiving comments a second communiqué was published in 1983 and a third in 1985. The objective was to 'preserve and protect the utility of the term natural so that it could be used in a meaningful and equitable manner' and to identify practices considered to be misleading, deceptive and in violation of regulations.

The 1985 communiqué includes two lists of processes (Table 2), one that produces a minimum of physical, chemical and biological changes and may be called natural, and the second a list of processes that produce a maximum (*sic*) of such changes and cannot therefore be called natural.

Comments on earlier versions revealed the inevitable disagreement with any classification between different industries and interests. Scientifically we may consider that any heat process (e.g. baking and cooking) produces considerable changes; yet it is 'natural' to cook most foods. Can adding smoke to food be considered natural or merely traditional? If the nature-identical chemicals from smoke were added to food would this differ from the use of 'natural' smoke?

The FAC recognised the difficulties in attempting to lay down firm rules and wisely suggested voluntary guidelines and a body to advise on the use of the terms in specified cases.

Some parts of the Canadian proposals illustrate the problems. For

example, removal of caffeine with the use of chemicals is classed as an unnatural process. Since decaffeination can now be carried out with water it is likely that this process might be regarded as natural. Apart from this, if caffeine is considered to be in any way undesirable, is a process that removes an undesirable substance from a natural food to be down-graded? (Is fermented and roasted coffee natural?)

'A natural food is not expected to contain an added vitamin'. This is very restrictive and complicated. A food richer than usual in vitamins can be produced by (1) fortifying with a synthetic vitamin, (2) fortifying with a nature-identical product, (3) fortifying with a vitamin extracted from a natural source, (4) adding that source, e.g. cod liver oil, to the food in partial replacement of an ordinary fat so that it is an ingredient, not an additive, (5) feeding the animal on a synthetic, nature-identical or natural vitamin, or a food rich in the vitamin. (This last became an issue in research on the possible protection offered by vitamin A against sprained tendons in race horses. As a practical trial the horses were entered into races but it is not permitted to give any 'medicament' to a race horse so retinol and cod liver oil could not be used; it was, however, permissible to feed them carrots.)

When a chicken is fed with the carotenoid pigment, canthaxanthin, it colours both the flesh of the chicken and the yolk of the egg. Canthaxanthin occurs naturally but is not converted into retinol when consumed by man. Another carotenoid, apo-8-carotenal, which is an intermediate in the metabolism of carotene and is converted into retinol, in the human body, can be added to chick feed to colour the yolk of the egg but not the flesh. Feeding marigold petals colours both yolk and flesh. Which is natural?

NATURAL VITAMINS

Great play is made with natural versus nature-identical vitamins in the health food business, although the explanations offered are somewhat contradictory. On the one hand one spokesperson claims that natural vitamins are superior to 'doctors' vitamins' because they are purer. Another spokesperson claims they are superior because they are not pure, and contain additional substances.

It is a popular belief, in keeping with the general feeling, that natural products are somehow better, that natural vitamins are different from and superior to products that have been synthesised in the factory. In the public mind there is natural and there is synthetic, and the concept of nature-identical is merely confusing.

It is, indeed, difficult to persuade the layman that the synthesised product is identical with the natural one. He has to be convinced that the nutritionist,

when he has discovered a vitamin, proceeds to isolate and purify it. The final step in the identification is to get the chemist to synthesise the product; if it is not identical then the chemist has failed the task set him.

Quite apart from this it is rarely explained that some of the procedures for purifying a vitamin from its natural source are more complex than some of the processes of synthesis. For example, to prepare retinol from fish liver calls for solvent extraction, saponification, further extraction and concentration involving the use of several 'chemicals'—a term considered to be the very antithesis of natural.

CONCLUSIONS

A study showed that 35% of the respondents had stopped buying at least one product because of the presence of additive, while 43% reported buying at least one product because of low or zero content of additives (Drew & Lyons, 1988).

These authors point out that the growth of health foods brought additives and their acceptability into the foreground—being the perceived antithesis of all that is natural, wholesome and good.

There seems to be greater sales appeal in labelling foods 'free from' than with what they actually contain, with the epitome coming from an American all-vegetable protein sold for weight gain ('are you tired of being skinny?'). This is advertised as containing no milk or dairy products, no meat products, no eggs, no sugar, no fat, no artificial flavours, no artificial colours. Another fast weight-gain product claims no salt but the product boasts of its minerals.

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